PROJECT MANUAL
VOLUME ONE
OSSINING UNION FREE SCHOOL DISTRICT
NEW 7TH & 8TH SCHOOL BUILDING

300 Van Cortlandt Ave

Ossining, New York - 10562

DIVISIONS 00 THROUGH 14

CPL PROJECT NO.: R24.16941.00
DOCUMENT ISSUE DATE: November 10, 2026

NEW YORK STATE EDUCATION DEPARTMENT PROJECT CONTROL NUMBER(S):
7th & 8th School Building: 66-14-01-03-0-028-001

DESIGN PROFESSIONAL'S CERTIFICATION:
The undersigned certifies that, to the best of his or her knowledge, information and belief, that the "Design conforms to all applicable provisions of the current New York State Uniform Fire Prevention Code, Building Code and Energy Conservation Code, the building standards of the New York State Education Department and that the “Work will not involve known or suspected ACBM”.

ALTERATION WARNING STATEMENT:
It is a violation of the New York State Education Law and the Commissioner's regulations for any person, unless acting under the direction of a licensed Architect, Engineer or Land Surveyor, to alter an item in any way. If an item bearing the seal of an Architect, Engineer or Land Surveyor is altered, the altering party shall affix to the item, their seal and the notation " ALTERED BY ", followed by their signature and the date of such alteration, and a specific description of the alteration.

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END OF SECTION 000115

SECTION 001116
INVITATION TO BID

THE OSSINING UNION FREE SCHOOL DISTRICT INVITES BIDS FOR "OUFSD 24BD_ NEW 7-8 SCHOOL BUILDING" PROJECT. SEPARATE SEALED BIDS WILL BE RECEIVED AT THE OSSINING UFSD, 400 EXECUTIVE BOULEVARD, OSSINING NY 10562, UNTIL 3:00 P.M., LOCAL TIME, ON 12-11-2026

1.01 PROJECT INFORMATION

A. Project Identification:OUFSD 24BD_ New 7-8 School Building
   1. Project Location(s):
      a. 7th & 8th School Building, 300 Van Cortlandt Ave, Ossining, New York 10562

B. Owner: Ossining Union Free School District, 400 Executive Boulevard Ossining, NY 10562
   1. Owner's Representative:
      a. Jared Mance
      b. PH: 914-762-5740

C. Architect/Engineer: CPL (Clark Patterson Lee), at 26 IBM Road, Poughkeepsie, NY 12601.

D. Construction Manager: Arris Contracting Company, Inc. - 189 Smith Street Poughkeepsie, NY 12601
   1. Construction Manager's Representatives:
      a. Fred Eberhard
         1) PH: (914) 755-0494
      b. Chris Hanaburgh
         1) PH: (914) 755-4468

E. Project Description: Construction of a new 7th & 8th grade building. Site Construction, General Construction, Mechanical, Electrical, Plumbing and Fire Sprinkler trades will be involved.

F. Construction Contract: Bids will be received for the following Work:
   1. Multiple Contract Project consisting of the following prime contracts:
      a. Site Construction.
      b. General Construction.
      c. Mechanical Construction.
      d. Electrical Construction.
      e. Plumbing Construction.
      f. Fire Sprinkler Construction.

1.02 BID SUBMITTAL AND OPENING

A. Owner will receive sealed lump sum bids until the bid time and date at the location given below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
   1. Bid Date: 12-11-2026
   2. Bid Time: 3:00 p.m. local time.
   3. Location: Ossining UFSD, 400 Executive Boulevard, Ossining NY 10562

B. Bids will be thereafter publicly opened.

1.03 BID SECURITY

A. Bid security shall be submitted with each bid in an amount not less than five percent (5%) of the base bid in the form and subject to the conditions provided in the "Instructions to Bidders".

1.04 PREBID MEETING

A. Prebid Meeting: A Pre-Bid meeting/walk-thru for the Project will be held at 9:30 AM, local time on 11-23-2026, starting at the ACCI Office Trailer at 100 Van Cortland Ave, Ossining, New York 10562. Prospective bidders are **requested** to attend. Prospective bidders may visit the site during business hours by appointment by contacting Fred Eberhard at (914) 755-0494.

1.05 DOCUMENTS

A. Complete digital sets of Bidding Documents may be obtained online (with a free user account) as a download for a nonrefundable fee of One-Hundred ($100.00) Dollars at the following websites: newburgh.cplplanroom.com or projects.biddyhq.com.

B. Complete hard copy sets of Bidding Documents may be obtained from the Office of Biddy c/o Long Island Blueprint, 179 New York Ave. Huntington, NY 11743 (631-271-7033), upon a payment of One-Hundred($100.00) Dollars for each combined set. Checks for payments shall be made payable to Ossining Union Free School District and may be uncertified. Any bidder requiring documents to be shipped shall make arrangements with the printer and pay for all packaging and shipping costs.

C. All bid addenda will be transmitted to registered plan holders via email and will be available at the above referenced websites Plan holders who have paid for hard copies of the bid documents will need to make the determination if hard copies of the addenda are required for their use, and coordinate directly with the printer for hard copies of addenda to be issued. There will be no charge for registered plan holders to obtain hard copies of the bid addenda.

1.06 TIME OF COMPLETION

A. Successful bidder shall begin the Work upon receipt of the Notice to Proceed and shall complete the Work within the Contract Time.

1.07 BIDDER'S QUALIFICATIONS

A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

1.08 NOTIFICATION

A. Attention of the Bidder is particularly called to the Owner's sales tax exemption, the requirements as to conditions of employment to be observed, and the minimum wage rates to be paid under the Contract. In addition, the Bidding Documents contain detailed requirements for the qualification of Bidders. These include, among other things, rigid bonding and insurance requirements, financial statements, bank references, lists of lawsuits, arbitrations or other proceedings in which the Bidder has been named as a party, a statement of surety's intent to issue Performance and Payment Bonds, and a description of other projects of similar size and scope completed by the Bidder.

B. Bids shall be prepared as set forth in "Instructions to Bidders", enclosed in a sealed envelope bearing on its face the name and address of the Bidder and the title of the Work to which the bid enclosed relates.

C. No bids may be withdrawn for a period of forty-five (45) days after opening of bids.

1.09 AWARD OF BIDS

A. The Ossining Union Free School District hereby reserves the right to waive any informalities and reject any, or all, Bids or to accept the one that, in its judgement, will be in the best interest of Ossining Union Free School District.

B. The Owner further reserves its right to disqualify Bidders for any material failure to comply with the "Instructions to Bidders".

END OF SECTION 001116

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SECTION 002000
INSTRUCTIONS TO BIDDERS COVER

PART 1 GENERAL

2.01 SUMMARY

A. Attached is AIA Document A701-2018, Instructions to Bidders.
   1. AIA Document A701-2018 defines the conditions affecting award of contract and procedures with which Bidders must comply.

B. Atached is AIA Document A310-2010 Bid Bond
   1. AIA Document A310-2010 identifies the contractor, surety and owner and specifies the bond amount and project details.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 002000

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AIA® Document A701® – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

OUFSD 2024 Bond – New 7-8 Building
300 Van Cortlandt Ave
Ossining, NY 10562

SED No.: 66-14-01-03-0-028-001

CPL Project No.: R24.16941.00

THE OWNER:
(Name, legal status, address, and other information)

Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

THE ARCHITECT:
(Name, legal status, address, and other information)

CPL Architects, Engineers and Landscape Architect, D.P.C. d/b/a CPL
26 IBM Road
Poughkeepsie, NY 12061

THE CONSTRUCTION MANAGER:

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, New York 12601

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents, apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, including all required allowances, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- **.1** the Bidder has read and understands the Bidding Documents;
- **.2** the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- **.3** the Bid complies with the Bidding Documents;
- **.4** the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- **.5** the Bidder has evaluated and satisfied itself as to the conditions and limitations under which the Work is to be performed, including without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas, (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, and (4) availability and cost of materials, tools and equipment;
- **.6** the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- **.7** the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

§ 2.2 To be considered qualified, the Bidder must demonstrate to the Owner's satisfaction the following:

- **.1** The corporation, partnership, sole proprietorship of other business entity in whose name the Bid is submitted has been in business, continuously, for no less than the previous five (5) years performing or coordinating the work which it is bidding on;
- **.2** The Bidder has satisfactorily completed no less than five (5) projects of comparable size, complexity and type to this Project as a prime contractor to project owner;

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.3 The Bidder is not currently involved in bankruptcy proceedings.
.4 The Bidder is licensed to perform the work it is bidding on in the jurisdiction where the work will take place;
.5 The Bidder is capable of and intends to perform at least 25% of the Work with its own forces;
.6 The Bidder is able to perform the Work with manpower available to it; and
.7 The Bidder and its subcontractors have a minimum of five (5) years' experience in the Work and applicable trades.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders may obtain Bidding Documents as designated in the Advertisement or Invitation to Bid, for the deposit sum and method stated therein.
(Paragraph deleted)
(Paragraphs deleted.)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within thirty (30) days following the award of the Contract or the rejection of the Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.
Good condition as used in this section means that the Bidding Documents must be returned bound as issued, legible, and containing only the markings necessary for bidding purposes.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use for any other purpose is conferred by distribution of the Bidding Documents.

§ 3.1.6 All materials submitted as part of the bid shall become the property of the Owner and will not be returned to the Bidder. The Bidder is responsible for making its own copies of any or all parts of the Bid Documents for its files.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall consider federal, state and local Laws and Regulations and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing via email and shall be received by the Architect at least seven working days prior to the date for receipt of Bids, as follows:

Stephanie Wisniewski; swisniewski@CPLteam.com

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner, including phone calls, shall not be binding, and Bidders shall not rely upon them.

§ 3.2.4 In the absence of an interpretation, correction or change, should the Drawings disagree in themselves or with the Specifications, the better quality, the costlier or the greater quantity of work or materials shall be estimated upon, and unless otherwise ordered, shall be furnished.

§ 3.2.5 Communications regarding the Bidding Documents shall be directed to Stephanie Wisniewski; swisniewski@CPLteam.com

§ 3.2.6 EQUIVALENCY

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§ 3.2.6.1 In the Specifications, if two or more kinds, types, brands, or manufacturers or materials are named, they shall be regarded as the required standard of quality, and are presumed to be equal. The Contractor may select one of these items or, if the Contractor desires to use any kind, type, brand, manufacturer or material other than those named in the Specification, he shall indicate in writing to the Architect and Owner, and prior to the award of Contract, what kind, type, brand or manufacturer is included in the Base Bid for the specified item. Refer to Specification 012519 Equivalents for Equivalent Certification Form.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect no later than ten days prior to the date for receipt of Bids. Requests shall be submitted in the manner established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; (4) all supporting data including technical information, catalog cuts, warranties, installation instructions, operating procedures, significant qualities of proposed substitution (e.g. performance,weight, size, durability and visual effects); (5) samples, if applicable and requested; and (6) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.2.4 By making a request for substitution, the Bidder:

- **.1** represents that a representative of it has personally investigated the proposed substitute product and has determined that it is equal to or superior in all respects to that specified;
- **.2** represents that the warranty for the substitution will be the same, or greater than, that applicable to the specified product;
- **.3** certifies that the cost data is complete and includes all related costs under the Contract to be awarded, including professional services necessary and/or required for the Architect to implement the proposed substitution and waives any and all claims for additional costs related to the substitution which subsequently become apparent;
- **.4** represents that it will coordinate the installation of the accepted substitute, making all such changes to the Drawings effected by the change and to all Specifications as required for the work to be completed in all respects;
- **.5** shall submit an affidavit stating that (a) the proposed substitution conforms and meets all the requirements of the pertinent Specifications and the requirements shown on the Drawings and (b) the Bidder accepts the warranty and correction obligations in connection with the proposed substitution as if originally specified by the Architect; and
- **.6** represents the proposed substitution will have no effect on the construction schedule.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

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§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding *(Paragraphs deleted)*
Documents through the print method stated in the Advertisement or Invitation to Bid.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

§ 3.4.5 The failure of any Bidder to receive any such Addenda will not relieve the Bidder of any obligation contained in the Addenda. Any Addenda issued shall become part of the Bidding Documents and Contract Documents.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.7 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.1.8 In accordance with the Wicks Reform 2008, for Single Prime Contracts for projects under the monetary threshold of $1,500,000, the bid shall be accompanied by a separate sealed envelope naming each subcontractor for the Plumbing, HVAC and Electrical work, and providing the amount to be paid to such subcontractors. After the low bid is announced, the sealed list of subcontractors submitted with such low bid will be opened and the names of such subcontractors shall be announced. Thereafter, any change of subcontractor or agreed-upon amount to be paid to each subcontractor shall require the approval of the public owner that is based on the Bidder or Contractor demonstrating to the public owner a legitimate construction need for the change sought, which demonstration shall be open to public inspection. Legitimate construction need includes a change in the Project specifications, a change in material costs, a change to subcontractor status as determined pursuant to NY Labor Law Section 222(2)(e), or the subcontractor has become otherwise unwilling, unable or unavailable to perform the subcontract. Once the low bidder's list is opened, it must be open for public inspection. The sealed lists of subcontractors submitted by all other bidders shall be returned to them unopened after the contract award.

4.1.9 Pursuant to Section 220-i, each Bidder must provide proof of their registration with the Department of Labor of the State of New York, which proof must, at a minimum, include their certificate of registration. Failure to include proof of their registration will disqualify their bid from consideration for award and will result in rejection of their bid as nonresponsive.

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§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Paragraphs deleted)

Bid Security of not less than five percent (5%) of the total Base Bid (including all allowances) plus the sum of all alternates, in the form of a Bid Bond or a Certified Check made payable to the Owner.

§ 4.2.2 Except as stated under Section 4.4.3 hereof, the Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid, with the understanding that the Bid Security shall guarantee that the Bidder will not withdraw its Bid for a period of forty-five (45) days after the scheduled closing time for the receipt of Bids, and that if its Bid is accepted, the Bidder will enter into a formal contract with the Owner in accordance with the terms stated in the Bid and will furnish any required performance and payment bonds at the time required. In the event of the withdrawal of said Bid within the forty-five (45) day period or the failure of the successful Bidder to enter into the Contract with the Owner or the failure of the successful Bidder to furnish required performance and payment bonds at the time required, the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty, which represents the damage the Owner incurred as a result of the Bidder's default.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Bid Securities shall be returned to all Bidders except the three (3) lowest Bidders within three (3) days after the formal opening of bids. The remaining Bid Securities will be returned within forty-eight (48) hours after the Owner and the successful Bidder have executed the Contract and executed performance and payment bonds have been approved by the Owner. If a Contract has not been executed or performance and payment bonds have not been approved by the Owner within forty-five (45) days after the scheduled closing time for the receipt of bids, and the Bidder notifies the Owner that its bid is withdrawn and requests return of its Bid Security, then the Bid Security will be returned by the Owner within three (3) days after the request for its return unless the Bid Security has been forfeited under § 4.2.2.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in the same sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid, subject to any modification of such date, time and place included in any Addenda. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. The Bidder assumes the risk of any delay in the mail or in the handling of the mail by employees of the Owner and the employees of the mail or delivery service used.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

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§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within three days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect and Owner, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be returned.

§ 4.4.4 Unless a Bid error complies with Section 4.4.3, a Bid may not be modified, withdrawn or canceled by the Bidder for a period of forty-five (45) days following the time and date designated for the receipt of Bids, and each Bidder agrees to this requirement in submitting a Bid.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available for the Project. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests. The responsibility of Bidders and of their proposed subcontractors will be considered in making the award. The Owner, through the Architect and Construction Manager, may make such investigation as the Owner deems necessary to determine the responsibility of any Bidder or to determine the ability of any Bidder to perform the Work.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

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ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

§ 6.1.1 The Owner shall have the right to take such steps as it deems necessary to determine the ability of the Bidder to perform its obligations under the Contract, and the Bidder shall furnish the Owner all such information and data for this purpose as the Owner may request. The right is reserved to reject any Bid where an investigation of the available evidence or information does not satisfy the Owner that the Bidder is qualified and capable to carry out properly the terms of the Contract. The issuing of Bid Documents and acceptance of the Bidder's payment by the Owner shall not be construed as pre-qualification of that Bidder. If the Bidder is later discovered to have misrepresented or provided false or incorrect information with regard to any material party of the information submitted to the Owner, including but not limited to information regarding experience, debarment, claims, lawsuits, arbitrations, mediations, finances, license, contract termination, the Owner reserves the right to reject the Bid of such Bidder and, if a construction contract has been awarded, it will become automatically voidable at the sole discretion and election of the Owner.

§ 6.1.2 Within forty-eight (48) hours after the Bids are opened, the two (2) apparent low Bidders for each Prime Contract must submit the required pre-award submittal package described below to the Construction Manager via email:

.1 Workforce and Work Plan – Provide a detailed written Work Plan which shall demonstrate the Contractor's understanding of overall Project scope and shall include, but not be limited, to the following:

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.2 Sequential listing of specific Project activities required to successfully complete the Work of the Contract Documents.
    .1 Include Schedule and list Critical Milestones.
    .2 Include phasing of the Work, if required.
    .3 Include listing of long lead items.
    .4 Statement the Project can be completed in the established time.
.3 Resumes for the Bidder's proposed supervisory staff, including qualifications for specialized expertise or any certification(s).
.4 Any special coordination requirements with other trades.
.5 Any special storage and/or staging requirements for construction materials.
.6 Detailed Cost Estimate: A copy of a Detailed Cost Estimate outlined in CSI format by material and labor.
.7 A copy of the Bidder's two (2) most recent financial statements audited by a CPA or, if the Bidder has no audited financial statements, then the two (2) most recent financial statements prepared and/or reviewed by a CPA.
.8 A properly completed and executed AIA Document A305™-2020, Contractor's Qualification Statement.
.9 Required insurance certificates.
.10 A designation of the Work to be performed by the Bidder's own forces.
.11 Names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each.
.12 Names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.
.13 Names, addresses and phone numbers of the subcontractors that the Bidder proposes to use on the Project;
.14 A description of the Bidder's experience with at least five similar projects (completed in the last five years) of comparative size, complexity and cost together with documentary evidence showing that said projects were completed to their respective owner's satisfaction and were completed in a timely fashion listing type and scope of work. Provide names, addresses and current phone numbers of owners, architect and Construction manager associated with each project.
.15 The Bidder's proposed site safety plan.
.16 Proposed list of submittals and a proposed schedule for making and issuing them, within the Bidder's proposed work plan and schedule;

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1

(Paragraphs deleted)

Intentionally omitted

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect, Construction Manager and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect or Construction Manager will notify the Bidder if either the Owner, Construction Manager or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner, Construction Manager or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

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§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner, Construction Manager and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner, which may be provided through the Construction Manager.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 The cost of the bonds shall be included in the Bid.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies licensed and admitted to do business in New York State and lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall
(Paragraphs deleted)
each be equal to one hundred (100) percent of the Contract Sum and shall be increased if and when the Contract Sum is increased by any Modification (as defined in AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as revised for this Project) issued after award of the Contract.

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than ten (10) days after the Bidder has received notice of the acceptance of its Bid but in no event shall bonds be delivered later than the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond and shall contain the following modifications in a rider to each bond or stated in the Modifications section of each bond (Section 16 of the Performance Bond and Section 18 of the Payment Bond):

.1 The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Any addition, alteration, change, extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder and notice to the Surety of such matters is hereby waived.

.2 Notwithstanding any prior provision of this bond, the Surety also agrees that no meeting is required to be offered, arranged or held with the Owner, Contractor and/or Surety prior to termination of the Contract or the Contractor. The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner

.3 Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or Surety shall cause written notice of such default (specifying said default in detail) to be given to the Owner, and the Owner shall have fourteen (14) days from receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within fourteen (14) days. Such Notice of Default shall be sent by certified or registered U.S. Mail, return receipt requested, first class postage prepaid, to the Owner.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor,

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(Paragraphs deleted)
Construction Manager as Adviser Edition, as revised for this Project and completed for the Contractor.

(Paragraphs deleted)
.2 AIA Document A132™–2019, Exhibit A, Insurance and Bonds as revised for this Project.

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as revised for this Project.

(Paragraphs deleted)
.4 Not used.

.5 Drawings

Number	**Title**	**Date**
Project Manual Section 000115	List of Drawings	

.6 Specifications

Section	**Title**	**Date**	**Pages**
Project Manual Section 000110	Table of Contents		

.7 Addenda:

Number	**Date**	**Pages**

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

[ ] The Sustainability Plan:

Title	**Date**	**Pages**

[ ] Supplementary and other Conditions of the Contract: Document Title

Document	**Title**	**Date**	**Pages**

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

Advertisement or Invitation to Bid
Instructions to Bidders
Contractor's Bid Form
Contractor's Payment and Performance Bonds

ARTICLE 9: SAGE REQUIREMENTS

§ 9.1 After notification of selection for the award of the Contract, the Bidder shall be required to use the Project Center for

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the transfer of Submittals, Shop Drawings and RFI's. There will be no exceptions to this requirement. The Contractor will be given a Login and Password free of charge.

ARTICLE 10: TAXES

§ 10.1 The Owner is an organization, which is exempt from New York State and Local Sales and Use Taxes. Materials purchased for use in fulfilling this Contract will be exempt from New York Sales Tax. The Owner will provide the Contractor with a completed Form ST-119.1, Exempt Organization Certification. The Contractor shall present a copy of this Form and a completed Form ST-120.1, Contractor Exempt Purchase Certificate, to each supplier.

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SECTION 002600
PROCUREMENT SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 DEFINITIONS

A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.

B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 012500 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

C. Equivalent Product: For products proposed as an Equivalent to the specified product. prior to award of contract use the form located in Section 012519 “Equivalents” after award of bid and prior to entering into a contract.

1.02 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.03 PROCUREMENT SUBSTITUTIONS

A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.

B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
   1. Extensive revisions to the Contract Documents are not required.
   2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
   3. The request is fully documented and properly submitted.

1.04 SUBMITTALS

A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing by **PRIME CONTRACT BIDDER ONLY** in compliance with the following requirements:
   1. Requests for substitution of materials and equipment will be considered if received no later than (10) OR Insert number days prior to date of bid opening.
   2. Submittal Format: Submit electronic copies of each written Procurement Substitution Request, using form bound in section 006000 of this Project Manual.
   3. Submittal Format: Submit Procurement Substitution Request, using format provided on Project Web site.
      a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
      b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
         1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.

2) Copies of current, independent third-party test data of salient product or system characteristics.
3) Samples where applicable or when requested by Architect.
4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
6) Research reports, where applicable, evidencing compliance with building code in effect for Project, from [ICC-ES] OR Insert applicable code organization.
7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.

c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:
1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.

C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 002600

SECTION 003000
REQUESTS FOR CLARIFICATION OF BID DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Requests for clarifications of the Bid Documents shall be submitted by Bidders to the Architect/Engineer via email (send to: SWisniewski@CPLteam.com and LJFasciglione@CPLteam.com) and to the Construction Manager vial email (send to: FEberhard@arriscontracting.com, CHanaburgh@arriscontracting.com and ASmith@arriscontracting.com). Requests shall include the following information:
   1. Project Name: Ossining Union Free School District, OUFSD 24BD_ New 7-8 School Building.
   2. Bidder's name and full contact information.
   3. Subject Specification Number.
   4. Subject Drawing Number.
   5. Clarification request/question.

B. All valid request for clarifications will be answered via written addendum.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 003000

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SECTION 003114
CONSTRUCTION SCHEDULE

PART 1 GENERAL

1.01 CONSTRUCTION SCHEDULE

A. Contractor shall complete work of their Contract per the following Schedule:

Work	Start Date (Date listed or earlier if permitted by Owner)	Completion Date
Submittals:	Submittals to begin upon award of Contract.	Priority submittals within 15 days after NTP/NOA. Balance of submittals within 30 days of NTP/NOA.
Construction:	Refer to Milestone Schedule 011100	Refer to Milestone Schedule 011100

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 003114

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SECTION 003119
EXISTING CONDITION INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITION INFORMATION

A. This Document, with its referenced attachments, is part of the Procurement and Contracting Requirements for this Project. They provide Owner's information for Bidders' convenience and are intended to supplement, rather than serve in lieu of, the Bidders' own investigations. It is made available for Bidders' convenience and information and is not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. Existing drawings that include information on existing conditions, including previous construction at Project Site, are available for viewing or download at the office of the Architect.

C. Existing specifications and submittals that include information on existing conditions, including previous construction at Project Site, are available for viewing or download at the office of the Architect.

D. Site survey information that includes information on existing conditions, prepared by Control Point Associates Inc., P.C., on 15 August 2024, is available for viewing or download at the office of the Architect and as indicated on the drawings.

E. Soils investigation information that includes information on existing conditions, prepared by Terracon, on June 11, 2025, is available for viewing or download at the office of the Architect.

F. Related Requirements:
   1. Section 003132 - Geotechnical Data: Reports and soil-boring data from geotechnical investigations that are made available to bidders.

PART 2 PRODUCTS – (NOT USED).

PART 3 EXECUTION – (NOT USED).

END OF SECTION 003119

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SECTION 003132
GEOTECHNICAL DATA

PART 1 GENERAL

1.01 GEOTECHNICAL DATA

A. This Section with its referenced attachments are part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.

C. A geotechnical investigation report for Project, prepared by Terracon, dated June 11, 2025 and a Recreation Field Slope Stability Analysis and Commentary for Project, prepared byTerracon, dated July 29, 2025 , are available for viewing and is appended to this Document.
   1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
   2. Any party using information described in the geotechnical report shall make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.

D. Related Requirements:
   1. Section 002000 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
   2. Section 003119 "Existing Condition Information" for information about existing conditions that is made available to bidders.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 003132

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Ossining UFSD New Building and Site Improvements

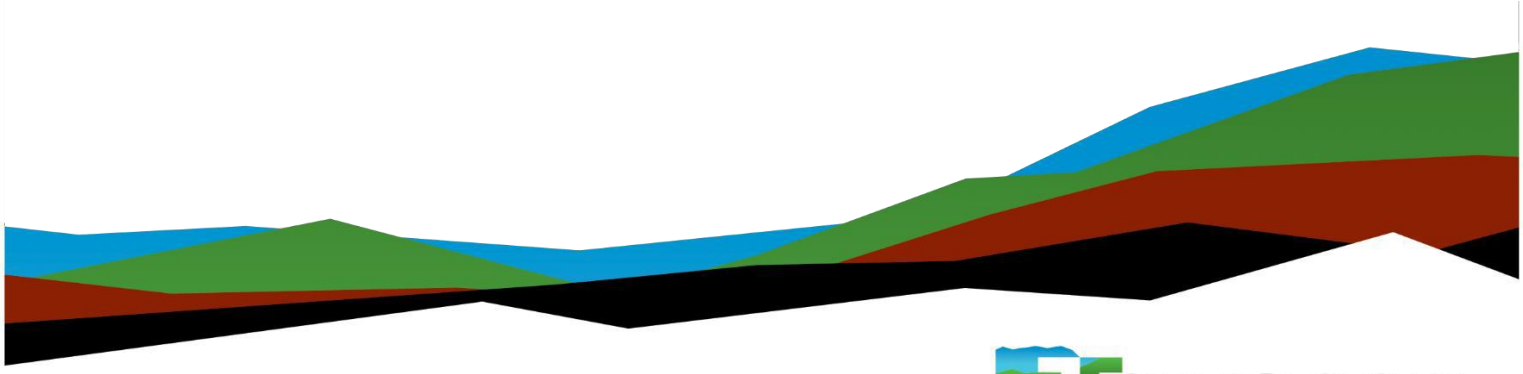
Geotechnical Engineering Report

Ossining, NY

June 11, 2025 | Terracon Project No. JB245223

Prepared for:

CPL Architects Engineers Landscape
Architect & Surveyor DPC
26 IBM Road
Poughkeepsie, NY 12601



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June 11, 2025

CPL Architects Engineers Landscape Architect & Surveyor DPC
26 IBM Road
Poughkeepsie, NY 12601

Lisa J Fasciglione – Architectural Project Manager
P: (845) 522-5796
E: ljfasciglione@cplteam.com

Re: Geotechnical Engineering Report
Ossining UFSD New Building and Site Improvements
100 Van Cortlandt Ave
Ossining, NY
Terracon Project No. JB245223

Dear Ms. Fasciglione:

We have completed the Geotechnical Engineering services for the above referenced project in general accordance with Terracon proposal no. PJB245223 – Rev 1, which was authorized on or about January 18, 2025. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

We appreciate the opportunity to be of service to you. If you have any questions concerning this report or if we may be of further service, please contact us at your convenience.

Sincerely,
Terracon Consultants-NY, Inc.

Asa Barnhill, P.E.
Sr. Staff Geotechnical Engineer

Joseph Robichaud Jr., P.E.
Principal / Operations Manager

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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed new building and site improvements at the Ossining Anne M. Dormer Middle School campus in Ossining, NY. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Dewatering considerations
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressures
- Pavement design and construction
- Frost considerations
- Infiltration test results

The geotechnical engineering scope of services for this project included the advancement of 21 structural, site and infiltration test borings to depths ranging from 9.7 to 34.4 feet below existing site grades, field infiltration testing, limited laboratory testing, an engineering evaluation of the conditions encountered and the preparation of this report. Although a total of 23 test borings were originally planned, borings ST-8 and ST-9 were deleted by CPL on March 4, 2025, following concerns from the school district with having the test borings in the existing baseball field.

Terracon previously completed a geotechnical investigation at this school campus in September 2024 for pavement improvements and to provide preliminary subsurface information for the proposed building development which is the focus of this geotechnical report. Information from the prior investigation has been considered in the preparation of this report and is included herein where applicable.

Figures indicating the site and test boring locations are included as the **Site Location** and **Exploration Plan**, respectively.

Project Description

Our understanding of the project is tabulated below.

Item	Description
Information Provided	■ Email request for proposal quote on October 2, 2024. ■ Follow up request for proposal on November 8, 2024, which included a conceptual site plan and proposed boring locations titled "11-8-24 GEOTECH SCOPE PLAN" (herein referenced as Original Plan). ■ "Conceptual Site Plan" which included existing topography by CPL dated September 12, 2024 (herein referenced as Topo Plan). ■ Previous Terracon Geotechnical Engineering Report, JB245138, prepared for pavement improvements and preliminary information for the proposed 7th/8th grade building, dated September 13, 2024. ■ "Overall Site Plan" drawing number 7&8 C200 by CPL dated May 5, 2025 (herein referenced as Updated Plan). ■ Phone/email correspondences, and collaboration with CPL throughout the project.
Project Description	This project includes construction of a new 7th/8th grade school building as well as new site improvements planned at the campus. Some of the improvements that were indicated on the Original Plan at the time our proposal was prepared, and the test boring scope determined, were eliminated on the Updated Plan provided after completion of the subsurface investigation program. Our understanding of the current improvements planned at the time of this report are based on the Updated Plan referenced above and as follows: ■ A recreational and stormwater treatment/detention area is planned east of the proposed 7th/8th grade building. The area is primarily planned to be developed utilizing sloped site grades rather than retaining walls as was initially indicated on the Original Plan. Retaining walls are not indicated on the Updated Plan, however, we understand they may still be used to establish design grades. ■ New pavements are planned north of the proposed 7th/8th grade building and a drive lane is planned east of the proposed building.

Item	Description
Project Description (continued)	■ Infiltration testing was performed in the planned parking lot area south of the proposed building. ■ Borings were completed to provide subsurface information and groundwater conditions in other areas of site. ■ The potential baseball/multiuse and soccer fields have been eliminated from the project scope.
Proposed Structures	The proposed building is roughly 76,000 square feet in plan based on the layout provided in the Updated Plan. The building is planned to be 3-story and slab on grade.
Building Construction	Assumed to be steel framed with a brick façade.
Finished Floor Elevation	Plans indicate the finished floor elevation at 357.0 feet.
Maximum Loads	In the absence of information provided by the design team, we have assumed the following loads in estimating foundation settlement of the new building based on our experience with similar projects. ■ Columns: 150 kips ■ Walls: 8 kips per linear foot (klf) ■ Slabs: 200 pounds per square foot (psf)
Grading/Slopes	Referencing the Updated Plan, cuts on the order of 5 feet are anticipated within the building pad. Proposed grading of the site has not been fully developed; however, the recreational area is shown with a proposed finished grade of 325 feet on the Updated Plan. Cuts on the order of 25 feet or so and fills on the order of 10 feet or so will be required to establish the finished grade within this area. The Updated Plan shows shaded areas where steep slopes (greater than 20%) and flat slopes (less than 5%) will be required within the recreational area to establish finished grades.
Below-Grade Structures	None anticipated.
Free-Standing Retaining Walls	Retaining walls are no longer indicated on the Updated Plan, however, general earth retaining wall recommendations have been requested by CPL. If retaining walls are incorporated as the site plans are developed, additional subsurface explorations may be required to facilitate design.

Item	Description
Pavements	We have provided recommendations for both flexible (asphalt) and rigid (concrete) pavement sections in our report. The assumed pavement design period is 20 years.
Building Code	2020 Building Code of NYS.

Site Conditions

Existing conditions at the site are summarized in the following table.

Item	Description
Parcel Information	The project is located at the Ossining Anne M. Dormer Middle School campus at 100 Van Cortlandt Ave in Ossining, NY. Latitude/Longitude (approximate): 41.1773° N, 73.8598° W See **Site Location**
Existing Improvements	Existing Middle School, maintenance building and associated asphalt parking and drives. Northern limits of the site are undeveloped.
Current Ground Cover	Asphalt paved or wooded.
Existing Topography (from Conceptual Site Plan)	Existing grades within the proposed building generally range between elevation 357 and 362 feet. Grades east of the proposed building generally slope downhill from east to west towards Sing Song Brook from about elevation 362 feet to elevation 220 feet. Specifically, within the limits of the proposed recreational area, grades slope downhill between elevation 350 feet and 315 feet. Based on review of available USGS topographic mapping, existing slopes in the proposed development area range in inclination from about 1V:12H (8%) to 1V:3.8H (26%).

If any of the above information is incorrect, please let us know so we can review the conclusions and recommendations provided in this report for applicability to the actual design and update the report as appropriate.

As the design of the project progresses and site grading plans and building loads are fully developed, we should be retained to assess this site-specific information relative to the recommendations contained herein.

Subsurface Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual subsurface logs. The subsurface logs can be found in the **Exploration Results** attachment to this report, together with the results of whatever laboratory testing was performed, and the GeoModel can be found in the **Figures** section.

Subsurface Profile

The following model layers were identified within the subsurface profile. For more detail concerning the model layers with their respective depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Fill**	Sandy Silt and Silty Sand, trace gravel, rootlets, organics, and tree roots noted.
2	**Native fine-grained Soils**	Silt with varying amounts of sand and gravel, rootlets noted, soft to very stiff.
3	**Native coarse-grained Soils**	Silty Sand with varying amounts of gravel, schist fragments noted, very loose to dense.
4	**Glacial Till**	Sand with varying amounts of silt and gravel, schist fragments, cobbles and boulders noted, medium dense to very dense.
5	**Weathered Bedrock**	Schist fragments recovered.

Surface Materials

Surface materials at the locations investigated consisted of about 1 to 6 inches of topsoil. The topsoil thickness as indicated on the subsurface logs should be regarded as a rough approximation only; contractors are advised to make their own estimates or determination of existing surface material thickness for bidding purposes.

Fill Soils and Former Topsoil

Fill soils were only encountered in test boring BB-4 to a depth of 4 feet below ground surface (BGS). The fill soils were generally comprised of sandy silt with lesser amounts of gravel and rootlets noted.

Underlying the fill soils at the BB-4 location, an apparent former topsoil layer was encountered from 4 to 4.3 feet BGS. Laboratory organic content testing performed on a representative sample from the 4 to 6-foot split spoon sample indicated the organic content percentage was 12 percent.

Native Soils and Weathered Bedrock

Underlying the surface materials or former topsoil layer at BB-4, native fine-grained or coarse-grained soils were encountered. The fine-grained soils were primarily comprised of silt with varying amounts of sand and gravel, with rootlets noted. The coarse-grained soils were primarily comprised of silty sand with varying amounts of gravel and schist fragments noted. These soil deposits extended to depths of 2 to 15 feet BGS. Boring ST-6 terminated within this layer. The soils were noted to be soft to very stiff in consistency where essentially fine-grained and very loose to dense in relative density where essentially coarse-grained on the basis of measured SPT 'N' values.

Underlying the fine-grained/coarse-grained soil deposits, glacial till was encountered. The glacial till was primarily comprised of sand with varying amounts of silt and gravel. Schist fragments, cobbles and boulders were also noted within this deposit. The glacial till soils were noted to be medium dense to very dense in relative density on the basis of measured SPT 'N' values. The glacial till, where encountered, extended through the depths explored of each boring, the deepest of which was 34.4 feet BGS.

Weathered bedrock was only encountered at 2 of the 23 test borings, R-3 and R-4, at depths of 6 and 15 feet respectively. Schist fragments were recovered from the split spoon samplers and the rock was penetrable with augers. The borings terminated with split spoon refusal at depths of 15.1 and 20.8 feet respectively. It should be noted these borings were located along the eastern limits of the site at the lowest elevations explored.

Groundwater Conditions

Groundwater observations and measurements were made as the boreholes were completed. It should be noted that, in some instances, these measurements may not reflect actual groundwater depth as adequate time may not have passed upon completion of sampling for groundwater to achieve a static level in the augers prior to the measurements being taken.

Measurable groundwater was recorded in 9 of the 23 test borings. It should be noted that in seven of these test borings, the driller indicated that the water level did not stabilize in the borehole at completion of drilling, and therefore we believe these water levels to be perched. The approximate depth to groundwater, where encountered, and corresponding groundwater elevation at each of these locations are tabulated below.

Exploration Number	Approximate Ground Surface Elevation (ft)	Approximate Depth to Groundwater on Date Drilled (ft)	Approximate Groundwater Elevation (ft)
BB-1	362	5.8[1]	356.2
P-1	356	4.2[1]	351.8
P-3	356	4.0[1]	352.0
R-1	336	3.4[1]	332.6
R-3	292	7.3	284.7
R-4	292	6.0	284.0
ST-2	355	4.0[1]	351.0
ST-6	306	4.3[1]	301.7
ST-7	312	5.8[1]	306.2

1. Indicates that the groundwater level encountered and measured is likely indicative of a perched water level.

As indicated above, the groundwater conditions were variable across the site with static groundwater only believed to be encountered in test borings R-3 and R-4 between elevations 284 and 285 feet. We do anticipate that perched water levels will be encountered at various locations and disparate depths. Perched water levels develop when surface water (i.e., precipitation or runoff) enters the subsurface through surficial soils and becomes trapped, or perched, on top of less permeable strata such as fills, fine-grained soils or dense glacial till, each of which were encountered at the site. Mottling, a common indicator of perched/seasonal groundwater levels, was noted in several of the borings and is indicated on the subsurface logs.

In general, the groundwater table is assumed to follow a west to east downward gradient towards Sing Song Brook.

Although not specifically encountered in the test borings at this site, artesian ground water conditions may occur within glacial till deposits, most commonly at the interface of the glacial till and underlying bedrock surface, or where granular seams and/or layers are present within the glacial till stratum.

Groundwater conditions, and the extent of any perched water, should be expected to vary with seasonal fluctuations in precipitation and runoff. Additionally, grade adjustments on and around the site, as well as surrounding drainage improvements, may affect the water table. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Infiltration Testing

Infiltration tests were performed adjacent to test borings I-1 and I-2 and numbered correspondingly. The tests were conducted in general accord with the procedures outlined in Appendix D of the New York State (NYS) Stormwater Management Design Manual. Results of this testing are presented for your use in the **Exploration Results** attachment to this report and summarized in tabular form below.

Infiltration Test No.	Soil Classification	Approx. Test Depth (ft)	Observed Infiltration Rate[1] (in/hr)
I-1	Silty Sand (SM), trace gravel (Glacial Till)	10.0	0
I-2	Silty Sand (SM), trace gravel (Glacial Till)	10.0	0

1. Rate of final trial.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Assignment of Site Class is required to determine the Seismic Design Category for a structure. The Site Class is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC).

Seismic Site Classification

Based on the soil properties observed at the site during this exploration and previous explorations made by Terracon at the site and general project vicinity, it is our professional opinion that the seismic Site Class is D. Subsurface explorations for this project were extended to a maximum depth of 34.4 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions in the site locale. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth, if desired.

Geotechnical Overview

As previously referenced in the **Project Description**, the borings completed for this study were based on the Original Plan and test boring locations selected by CPL. Generally, the proposed building location and size as indicated on the Updated Plan remained the same as the Original Plan, and the test borings are therefore judged representative of the subsurface conditions expected in the building footprint. The northern parking lot layout was revised between plan iterations, however, the borings advanced for this study generally remain with the newly configured parking lot area and are judged representative of the subsurface conditions expected in this area. Following issuance of the Original Plan and completion of the test borings, preliminary grading of the recreation area has been provided in the Updated Plan. Only one of the test borings advanced within the updated recreation area extended below the anticipated cut depths. In order to better define the subsurface soil and groundwater conditions in this area, supplemental investigations are recommended. Additionally, supplemental investigations may be warranted as site plans are further developed.

Generally, the subsurface conditions encountered at the project site are considered suitable for the new building and site improvements with the caveat that additional test borings should be advanced as the site and grading plans are further developed. Based on the conditions disclosed by our investigation, we offer the following general conclusions.

- New foundations and floor slabs may be supported on undisturbed native soils, or on imported Structural Fill which is placed over the native soils after any existing fill, former topsoil, remains of former structures or otherwise unsuitable materials which may be found are removed. Existing fills should not be relied upon for new foundation or floor slab support.

- If existing fill throughout the site is similar in composition to that found in the test borings, consideration may be given to support of new pavements over the existing fill provided the subgrade surfaces are proof-rolled and stabilized as may be required. It should be understood the proof-rolling will lessen, but not

eliminate, the possibility that settlement of pavements constructed over the existing fill may occur over time and require periodic maintenance.

- We expect the soils excavated on site will be excessively silty and considered unsuitable for reuse as fill or backfill in and around the building. It should be assumed that an imported granular material will be required for the purposes of backfill about the structure's foundations and floor slabs, unless otherwise noted. The excavated soils may be considered for general subgrade fills as described below, reused in non-sloping landscape areas, or wasted off-site.

- Due to the appreciable amount of cut and fill required to level proposed development areas, economic site development may be dependent on the reuse of the cut soils as subgrade fill in the recreation area and some pavement areas. The high fines content (% passing the US #200 sieve) of the onsite materials will require careful moisture control during their reuse. Conditional reuse of the excavated soils may be considered for general grade increases in the recreation and pavement areas, provided the limitations of its use are understood. At a minimum, the material should be kept to an elevation of 3 feet or more below finished pavement grades.

- As previously noted, reuse of excavated site soils may be considered for general fills in the proposed recreation area. However, it should be noted that the soils will be silty and inhibit infiltration. An imported granular material should be considered if infiltration is required. Additionally, the excavated soils should not be reused in sloping landscape areas.

- The static groundwater level is generally anticipated to be below foundation excavation depths for the proposed building. However, perched water should be anticipated in places, this dependent on the time of construction and the prevailing weather conditions during construction. In general, we anticipate the use of sump and pump methods for control of groundwater will be feasible provided the contractor prepares foundation bearing grades in accordance with the recommendations outlined in the Foundation Construction Considerations section herein. Dewatering is a means and methods consideration for the contractor.

- Proposed site grading was in the preliminary stage at the time this report was prepared. Whatever cuts, fills, slopes, retaining walls, stormwater management and infiltration practices which are planned must consider the global stability of the sloping site grades. Additional subsurface investigations and analysis should be performed to verify that the global stability of the proposed site geometry meets or exceeds industry standard factors of safety, and that the planned site improvements will not negatively impact slope stability.

The following sections of this report provide more specific recommendations to assist in planning for the geotechnical aspects of the project. We should be provided with the opportunity to review plans and specifications prior to their release for bidding to confirm that our recommendations were properly understood and implemented, and to allow us to refine our recommendations, if warranted, based upon the final design.

The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include clearing and grubbing, stabilization of subgrade surfaces as necessary, foundation excavation and associated site fill and backfill.

The following sections provide recommendations for use in the preparation of specifications for the work. The recommendations include critical quality criteria as necessary to render the site in the state considered suitable in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Construction site safety is the sole responsibility of the contractor, who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility is neither implied nor shall it be inferred.

Site Preparation

Site preparation should begin with stripping of existing topsoil, surficial organic matter, and pavements as applicable from the proposed building, pavement, and recreation areas.

Any existing fills should be removed in their entirety from beneath the proposed building area, extending at least five feet beyond its perimeter. Should the owner elect to leave the existing fills in place beneath new pavements, proof-rolling and stabilization of the subgrades as described below will lessen but cannot eliminate the risk of settlement. If this risk cannot be accepted, the existing fills should be removed and replaced in their entirety beneath new pavements as part of the site preparation.

Prior to placing new fills to raise site grades, and/or after cuts are made to the plan subgrade elevations, the subgrades should be proof-rolled using a steel drum roller with a static weight of at least seven tons. The roller should operate in its vibratory mode, unless requested otherwise by the Geotechnical Engineer observing the work, and travel at a speed not exceeding three feet per second (two miles per hour). The roller/compactor should complete at least two passes over all subgrade surfaces in

opposing directions. The method of proof-rolling may be modified by the Geotechnical Engineer based upon the conditions revealed at the time of construction.

We caution that the subgrade soils at this site will be sensitive to construction activities, especially if perched waters are not eliminated, or the subgrades are allowed to pond water and saturate. Subgrade areas that become saturated and unstable should be undercut to reestablish stable soil subgrade conditions. The Geotechnical Engineer should observe the proof-rolling, excavation of uncontrolled fills and the subgrade conditions immediately prior to the placement of structural fill as applicable within the building, pavement, and recreation areas.

Bulk Cut and Fill Considerations

Should plans call for reuse of excavated on-site soils as new subgrade fills for the recreation or pavement areas, the challenges and limitations associated with their reuse should be understood. The onsite soils contain appreciable quantities of silt and will therefore require careful control of moisture content within narrow limits to achieve requisite in-place density as the material is placed. It may be necessary to either dry the soil in windrows or add water prior to placement and compaction depending on the prevailing weather conditions at the time of construction or the natural moisture content of the soils as they are excavated. Should site development proceed during seasonally wet or cold periods, it will likely be difficult to adequately dry the siltier cut soils and it may be necessary to stabilize these soils with lime or kiln dust, or to use an imported granular fill.

Topsoil, vegetation and other surface materials should be stripped from all cut/fill areas prior to earth moving operations. The subgrade fill should be firm and stable after it is placed and compacted, and should not "pump", "weave" or otherwise exhibit instability during construction. Soils should be undercut and replaced where unsatisfactory. The fill subgrades should also be properly graded, drained, sealed and/or protected from moisture and frost as necessary. Placement of fill over wet, soft, snow covered, or frozen subgrades should not be permitted. All bulk fill placement and compaction should be monitored and tested by a representative of the Geotechnical Engineer on a full-time basis.

In general, permanent cuts or embankment fills should be sloped no steeper than one vertical on three horizontal (1V:3H). Steeper slopes may be considered subject to review on a case-by-case basis. The allowable configuration of steeper slopes will be dependent on location specific conditions, overall slope height and other factors. Runoff should not be allowed to traverse either the filled or excavated slopes at any time. All soil slopes should be thickly vegetated soon after grading or otherwise protected from erosion. Cut slopes may require stone slope protection in places if chronic seepage is encountered.

Based on the findings of the subsurface investigation, bulk cuts across the site are not expected to encounter a generalized groundwater condition, however, further investigations in the recreation area are recommended to provide subsurface conditions at more locations and deeper depths. Perched and/or artesian groundwater may be intercepted in places, and any resulting seepage may necessitate stone slope protection, or the construction of fabric lined and stone filled drainage trenches upon the overburden slopes. Swales should be provided along the toe of all excavated slopes to collect and dispose of such waters. All slopes should be vegetated or otherwise protected from erosion, with runoff diverted away from their faces.

Based on the soil and bedrock conditions encountered, global stability of the eastern slope is not anticipated to be a significant concern for the development of the project. As finalized grading plans are developed for the site, further analyses and potential additional investigation may be required to confirm these assumptions. We can provide these services for a fee if requested.

Fill Material Types

As described in the section above, native soils which are excavated in cut portions of the site may be considered for limited reuse to raise site grades in the recreation and pavement areas, if approved by the Geotechnical Engineer and pending the conditions encountered at the time of construction. That said, we recommend that material within 3 feet of finished grade in the pavement areas consist of imported Structural Fill as described below.

For the purposes of fill/backfill within the proposed building, imported Structural Fill should be used. The Structural Fill should consist of imported sand and gravel which meets the limits of gradation given below. Any imported materials should be free of recycled concrete, asphalt, bricks, glass, and pyritic shale rock.

Imported Structural Fill	
Sieve Size	**Percent Finer**
3”	100
¼”	30 to 75
No. 40	5 to 40
No. 200	0 to 10

Fill Compaction Requirements

New fill placed to raise site grades or for foundation backfill should be placed in uniform loose layers no more than about one-foot thick where heavy vibratory compaction equipment is used. Thinner lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to no less than 95 percent of the material's maximum dry density as determined by the Modified Proctor Compaction Test, ASTM D1557. In landscape areas, the compaction requirement may be relaxed to 90 percent of maximum dry density.

Additionally, new fill should have a moisture content within +/-2 percent of its optimum moisture content when placed and compacted.

Grading and Drainage

All proposed grades should be configured to provide effective drainage away from the proposed structures during and after construction, with such drainage maintained throughout the life of the structures. Water retained next to structures can result in soil movements greater than those outlined in this report, which may in turn lead to unsatisfactory differential floor slab and/or foundation displacements, cracked slabs and walls, or roof leaks.

Temporary Excavations

Excavations must be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P and its appendices, along with any state and local codes, as applicable. The contractor should be aware that slope height, slope inclination, and excavation depth should in no instance exceed OSHA regulations. Flatter slopes than those stipulated by the regulations or temporary shoring may be required depending upon the excavation depth, soil/groundwater conditions encountered and other external factors. OSHA regulations are strictly enforced and if they are not followed, the owner, contractor, and/or earthwork and utility subcontractor could be liable and subject to substantial penalties.

Additionally, excavations should be completed so as not to undermine adjacent buildings, pavements, utilities or other such infrastructure that is to remain in place. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from any existing structures at an inclination of 1V:1.5H. Excavations that encroach within this zone should be sheeted, shored and/or braced as required to support the soil and adjacent structure loads, or the structure should be underpinned to establish bearing at a deeper level.

If groundwater is encountered, construction dewatering should be conducted as required to allow the work to proceed in relatively dry conditions. Surface water should be

intercepted and diverted outside the limits of work to minimize runoff into excavations, and excavated subgrades should be shaped and sloped to shed precipitation as appropriate. The means and methods of dewatering should be made the contractor's responsibility.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of surface materials and any unsuitable fills, proof-rolling, and mitigation of any areas identified as needing improvement through proof-rolling. Each lift of new subgrade fill or Structural Fill should be satisfactorily placed and compacted prior to placement of additional lifts.

The monitoring should also include evaluation of foundation bearing grades along with subgrades for floor slabs and pavements. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

It should be understood that subsurface conditions will be more fully known when the site is excavated. The continuation of the Geotechnical Engineer into the construction phase of the project will allow for validation of the subsurface conditions assumed to exist for this study and in the development of the design recommendations in this report, along with assessing any variations, providing interim recommendations as necessary and reviewing associated design changes.

Shallow Spread Foundations

If the site has been prepared in accordance with the recommendations outlined previously in the **Earthwork** section and under the **Foundation Construction Considerations** below, the following parameters may be assumed in the design of conventional shallow spread foundations for the proposed building.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2, 3]	■ Native fine- or coarse-grained soils (GeoModel Layers 2 or 3) – 3,000 pounds per square foot (psf) ■ Glacial Till (GeoModel Layer 4) – 4,000 psf
Required Bearing Stratum [4]	■ Native fine- or coarse-grained soils (GeoModel Layers 2 or 3) ■ Glacial Till (GeoModel Layer 4) ■ Structural Fill over undisturbed native soils
Minimum Foundation Dimensions	Columns: 36 inches Continuous: 24 inches
Ultimate Coefficient of Sliding Friction [5]	■ 0.35 (concrete on GeoModel Layer 2) ■ 0.40 (concrete on GeoModel Layer 3) ■ 0.45 (concrete on GeoModel Layer 4) ■ 0.45 (concrete on Structural Fill over undisturbed native soils)
Minimum Embedment below Finished Grade [6]	Exterior footings: 48 inches Interior footings in heated areas: 24 inches Interior footings in unheated areas: 48 inches
Estimated Total Settlement from Structural Loads [3]	Less than about (1) inch.
Estimated Differential Settlement [3, 7]	About 3/4 of total settlement.

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20 percent within 10 feet of structure.
2. Values provided are for maximum loads noted in **Project Description** (as applicable).
3. Weathered bedrock is not anticipated to be encountered at foundation bearing elevations.
4. The bearing grades should be prepared per the recommendations presented below in the **Foundation Construction Considerations**.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be disregarded for foundations subject to net uplift conditions.
6. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. Interior footings in heated areas may be seated at the 24-inch depth if allowed by local building codes.
7. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Spread Foundation Construction Considerations

The foundations may be seated directly on undisturbed native soils, or on imported Structural Fill which is placed over the native soils after all topsoil and existing fill is removed, along with whatever remains of former structures or otherwise unsuitable materials that may be found. If over-excavation is required beneath the foundations to remove unsuitable material, the excavation should extend horizontally beyond each side of the foundation a distance equal to at least one-half the depth of the undercut below the final bearing grade elevation. Replacement material should meet the specification and compaction guidelines for Structural Fill as outlined herein.

Foundation bearing grades should be proof-compacted using a mechanical or large reversible plate tamper to densify the soils loosened by the excavation process unless otherwise directed by the Geotechnical Engineer observing the grades. If fine-grained soils are present and/or groundwater seepage occurs, proof-compacting should be eliminated, and a minimum six-inch thick base of clean crushed stone placed over a geotextile fabric should be provided to establish a more uniform and stable base for construction and to assist in dewatering. The stone should be an ASTM C33 Blend 57 aggregate and the fabric a non-woven synthetic filter fabric meeting NYSDOT standard specifications section 737-01C for drainage geotextile.

All final bearing grades should be relatively firm, stable, and free of loose soil, mud, water and frost. The Geotechnical Engineer should approve the condition of the foundation bearing grades immediately prior to placement of reinforcing steel and concrete.

Floor Slabs

Floor Slab Design Parameters

New floor slabs should be constructed upon a minimum six-inch thick subbase course which conforms to the requirements for NYSDOT Type 2 Subbase or ASTM C33 Blend 57 aggregate. Consideration should be given to using a thicker subbase course in areas subject to heavier loads and/or use, or those exposed to freezing temperatures, as may be applicable (see the Frost Considerations section herein).

The use of a vapor retarder along with a base course of ASTM C33 Blend 57 aggregate should be considered beneath concrete slabs-on-grade to be covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding its use and placement.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual.

Floor slab subgrades should be prepared as outlined in the **Earthwork** section herein. Under these conditions, a modulus of subgrade reaction equal to 150 pounds per cubic inch (psi/in) may be assumed at the top of the stone base layer for slab design purposes.

Floor Slab Construction Considerations

Even with the base course recommended above, we caution that the subgrades may not support repeated heavy construction traffic or telehandlers without suffering rutting and weaving that may be especially severe during wet seasons. If the grades are to be repeatedly traversed by these types of equipment, they should be reinforced as necessary to support them. Areas which become disturbed should be excavated and stabilized accordingly.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab subbase course. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Earth Retaining Wall Design

As previously referenced, the earth retaining walls indicated on the Original Plan were eliminated on the Updated Plan provided immediately prior to preparation of this report. However, earth retaining wall recommendations were still requested. The following general parameters and recommendations may be considered for earth retaining wall design. If earth retaining walls are included as the plans/designs progress, additional investigations may be warranted to facilitate design.

Design Parameters

All permanent earth-retaining foundation walls or structures should be designed to resist the lateral pressures generated by earth backfill along with any temporary or permanent surcharge loads. Active earth pressures may be assumed for site walls that are free to deflect as the backfill is placed. At-rest earth pressures should be assumed for all building walls and site walls that are braced prior to backfilling or applying surcharge loads. The following design parameters are provided to assist in calculating lateral earth pressures, whichever apply, and to analyze the stability of unbraced walls by sliding and overturning.

- Soil angle of internal friction - 30 degrees
- Coefficient of At-Rest earth pressure (k_o) - 0.50
- Coefficient of Active earth pressure (k_a) - 0.33
- Coefficient of Passive earth pressure (k_p) - 3.0
- Total unit weight of compacted soil - 120 pcf
- Coefficient of sliding friction - 0.35 (concrete on GeoModel Layer 2)
  - 0.40 (concrete on GeoModel Layer 3)
  - 0.45 (concrete on GeoModel Layer 4)
  - 0.45 (concrete on Structural Fill over undisturbed native soils)

The recommended design parameters assume that backfill consists of imported Structural Fill as described in the **Earthwork** section herein, idealized non-sloping conditions on each side of the wall, and that the backfill remains permanently well-drained. Water must not be allowed to collect against the wall unless the wall is designed to accommodate the added hydrostatic pressure. Drainage system recommendations are provided below.

The Structural Fill backfill material should occupy the entire backfill zone wedge formed by a line extending up and away from a point two feet outside the base of the wall (intersection of stem and base) at an angle no less than 45° off the vertical.

Options to Limit Lateral Earth Pressure

There are several options that may be considered if it is necessary to reduce the lateral loads acting against earth retaining or foundation walls. These include the use of engineered or lightweight materials such as crushed aggregate, expanded shale or expanded polystyrene (geofoam) within the foundation wall backfill zone. Whichever material is selected, the engineered backfill material should occupy the entire backfill zone wedge formed by a line extending up and away from a point two feet outside the base of the wall at an angle no less than 45 degrees off the vertical.

The following parameters may be assumed in the evaluation of engineered wall backfill materials. Note that the parameters are presented unfactored (i.e., they do not include a factor of safety) and assume the backfill remains drained at all times.

Engineered Material	Total Unit Weight (pcf)	Coefficient of Lateral Pressure
ASTM C33 Blend 57 Crushed Aggregate	95	0.23
Nominal 3/8" Expanded Shale Aggregate	65	0.33
Foamed Glass Aggregate	20	0.29
Geofoam (ASTM D6817)	2	N/A

Subsurface Drainage for Earth Retaining Walls

Earth retaining walls should be provided with a foundation level drain which may consist of a nominal 4-inch diameter perforated PVC or corrugated HDPE pipe embedded at the base of a minimum 12-inch wide column of clean crushed stone (e.g., ASTM C33 Blend 57 stone). The stone should be enveloped in an appropriate non-woven filter fabric (meeting NYSDOT standard specifications table 737-01C for drainage geotextile) to inhibit siltation. Backfill soils behind the crushed stone drainage layer should consist of imported Structural Fill. The drain line should be sloped to provide positive gravity drainage to daylight, a stormwater system, or to a sump pit and pump.

Pavements

Flexible Pavement Design

The pavement sections presented below were developed in general accord with AASHTO procedures using a reduced subgrade strength and local experience to account for frost, and to keep the anticipated pavement heave and cracking within generally tolerable limits. A subgrade resilient modulus (M_r) equal to 4,000 psi has been assumed for design purposes.

Two conventional pavement sections were developed, a Light Duty section for automobile parking areas, and a Heavy Duty section for entrance drives or areas subject to occasional truck and bus traffic. For design purposes, it has been assumed that the pavement design life is 20 years, and that daily equivalent single axle loads (ESALs) are equal to 1 for the Light Duty section and 25 for the Heavy Duty section. If the traffic loads vary from these, we should be provided the opportunity to refine the pavement section accordingly.

All materials should meet the requirements specified in the latest edition of the New York State Department of Transportation (NYSDOT) Standard Specifications for Construction and Materials.

Flexible Pavement Design				
Layer	**Material Description**	**NYSDOT Item Number**	**Thickness (inches)**	
			Light Duty	**Heavy Duty**
Top	Asphaltic Concrete	402.127303	1.5	1.5
Binder	Asphaltic Concrete	402.257903	2.0	3.0
Subbase	Crusher-Run Stone	Section 733.04, Type 2	8	12
Fabric	Stabilization Geotextile	Section 737-01, Table E	Single Ply	Single Ply

Rigid concrete pavements, if any, should be provided with a minimum six-inch thick base of crusher-run stone (NYSDOT section 733-04, Type 2 material) placed over a stabilization geotextile. The pavements may be designed assuming a modulus of subgrade reaction equal to 150 pounds per cubic inch at the top of the base layer.

Temporary Construction Access Roadways

The recommended pavement sections are not intended to support heavy construction equipment loads which may require thicker sections. The contractor should construct temporary haul routes and construction roadways on site as appropriate for the weather conditions and the equipment in use, with consideration of the soil conditions encountered in specific areas. Construction traffic should not be routed across the recommended pavement sections unless augmented accordingly.

Pavement Drainage

Accumulation of water on pavement subgrades should be avoided by grading the subgrade to a slope of at least two percent, and/or by providing edge swales or underdrains. Failure to provide adequate drainage will shorten pavement life. Given the subsurface and perched groundwater conditions observed at the site, effective drainage will be critical to the long-term performance and service life of the pavements.

Pavement Maintenance

All pavements require periodic care, and preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Settlement of pavements due to consolidation of the existing fills may also occur and require periodic maintenance.

Frost Considerations

Frost may penetrate beneath sidewalks and pavements (or building slabs in unheated areas) and cause them to heave, and resulting displacements may be differential, particularly where sidewalks and pavements meet building doorways and along curbs. To limit heave and the creation of such uneven joints to generally tolerable magnitudes for most winters, a 16 inch thick base of ASTM C33 Blend 57 crushed stone should be placed beneath sensitive sidewalk or pavement areas, along with an underdrain to relieve any collected waters. The crushed stone should be separated from the surrounding soils with a non-woven synthetic filter fabric meeting the requirements of NYSDOT standard specifications table 737-01C for drainage geotextile.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include, either specifically or by implication, any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in

accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use of or reliance on the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating, including excavation support and dewatering requirements/design, are the responsibility of others.

Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider performing a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Figures

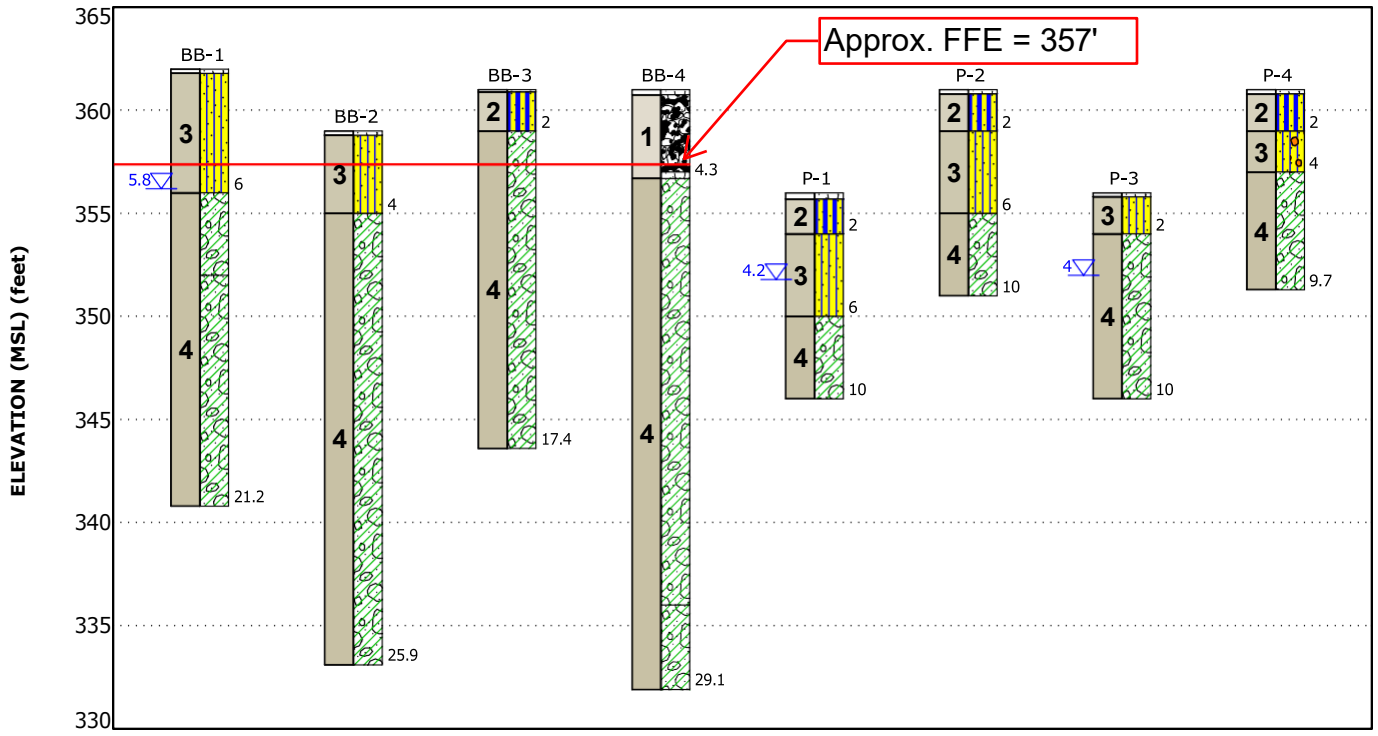
Contents:

GeoModel (3 pages)

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Fill	Sandy Silt and Silty Sand, trace gravel, rootlets, organics, and tree roots noted.
2	Native fine-grained Soils	Silt with varying amounts of sand and gravel, rootlets noted, soft to very stiff.
3	Native coarse-grained Soils	Silty Sand with varying amounts of gravel, schist fragments noted, very loose to dense.
4	Glacial Till	Sand with varying amounts of silt and gravel, schist fragments, cobbles and boulders noted, medium dense to very dense.
5	Weathered Bedrock	Schist fragments recovered.

Legend

- Topsoil
- Glacial Till
- Fill
- Silty Sand
- Sandy Silt
- Silty Sand with Gravel

▽ First Water Observation
▽ Second Water Observation

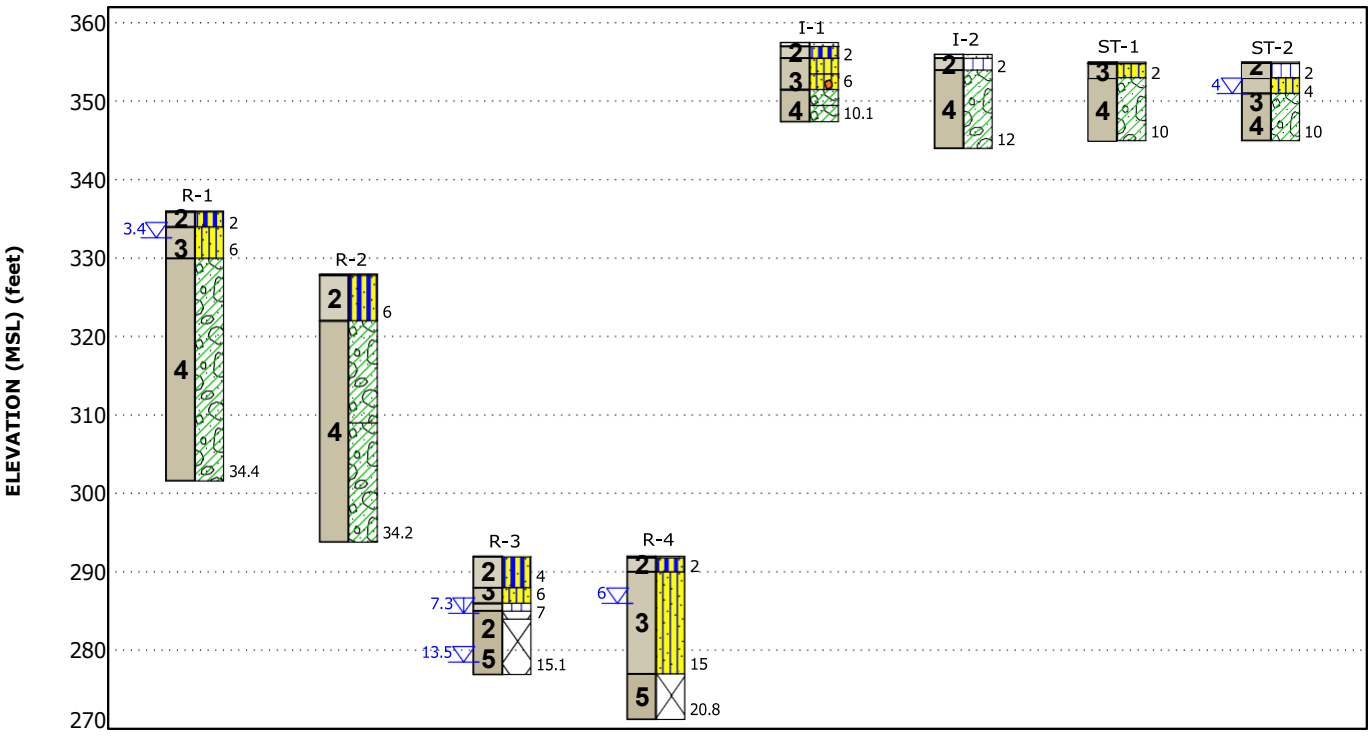
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

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5	**Weathered Bedrock**	Schist fragments recovered.

Legend

- Topsoil
- Sandy Silt
- Silty Sand
- Glacial Till
- Silt
- Weathered Rock
- Silty Sand with Gravel

▽ First Water Observation
▽ Second Water Observation

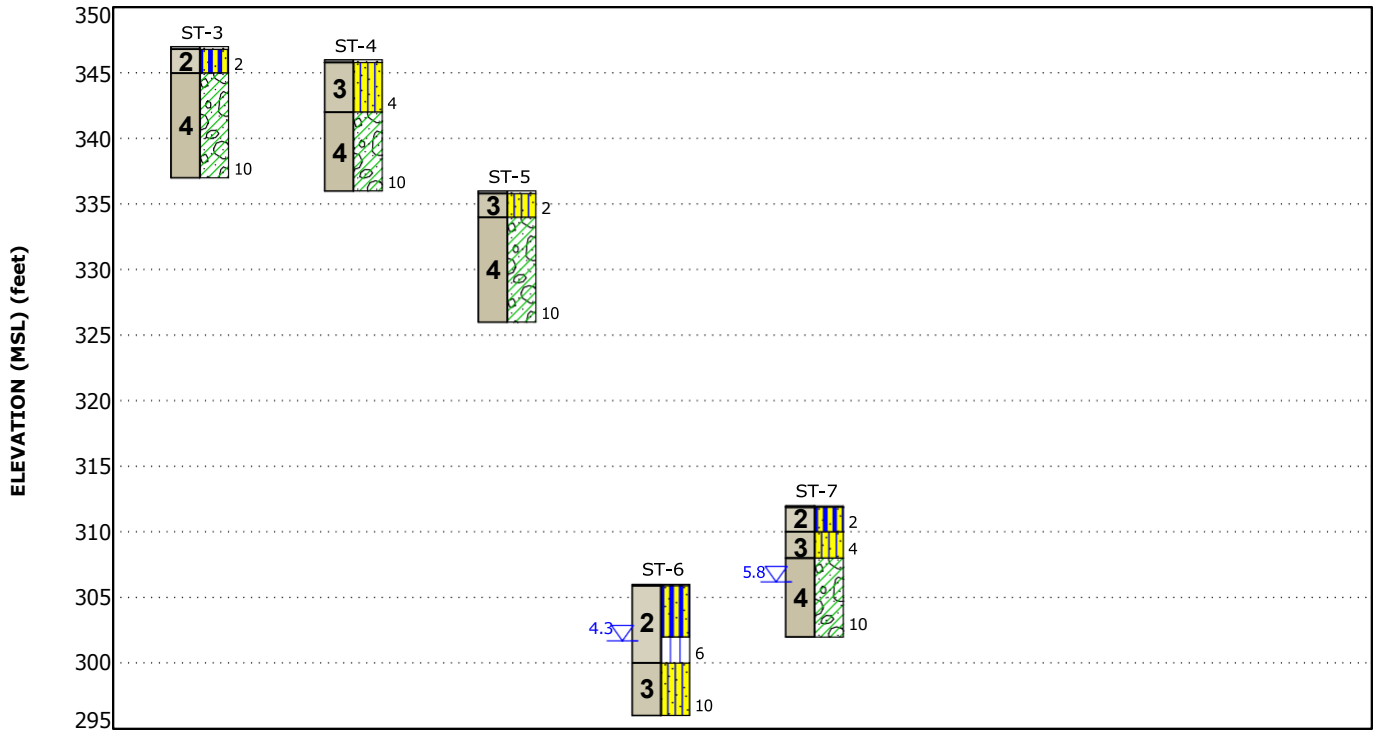
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Legend

- Topsoil
- Sandy Silt
- Glacial Till
- Silty Sand
- Silt

▽ First Water Observation
▽ Second Water Observation

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Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
4	17.4 to 29.1	Building area (BB-series)
4	9.7 to 10	Pavement areas (P-series)
4	15.1 to 34.4	Retaining wall areas (R-series)
7	10	Storm soil profile (ST-series)
2	10.1 to 12	Infiltration test locations (I-series)

Boring Layout and Elevations: The test boring locations were selected by CPL and were established in the field by Terracon using a hand-held GPS unit (estimated horizontal accuracy of ±10 feet), taped measurements and/or visual reference from existing site features within the limitations of access, existing structures and underground/overhead utilities.

Existing ground surface elevation at each borehole location was estimated based upon our interpolation between the topographic contours shown on the site plan provided to us. If more precise locations and/or elevations are desired, the as-completed test locations should be surveyed.

Subsurface Exploration Procedures: The test borings were completed using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the soils were sampled at intervals of five feet or less in accordance with the Standard Method for Penetration Test and Split-Barrel Sampling of Soils, ASTM D1586. Upon completion of drilling the boreholes were backfilled with auger cuttings, sand and/or concrete cylinders.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual descriptions of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. The sampling depths, penetration distances, water level measurements and other information as applicable were recorded on the field boring logs.

The soil samples were placed in appropriate containers and taken to our laboratory for visual classification by a geologist or geotechnical engineer. The soils were described based on the material's color, texture, plasticity, moisture condition, etc. Soil classifications are in general accordance with the Unified Soil Classification System (USCS) as summarized herein. Final boring logs were prepared, and they represent the

Geotechnical Engineer's interpretation based on the field logs and visual classifications, along with any laboratory testing performed.

Laboratory Testing

Selected samples recovered from the test borings were submitted for laboratory testing as part of the subsurface investigation, to confirm the visual classifications and to provide quantitative index properties for use in the geotechnical evaluation. This testing was performed in general accordance with the following standard methods:

- ASTM D2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils (w/o hydrometer)

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

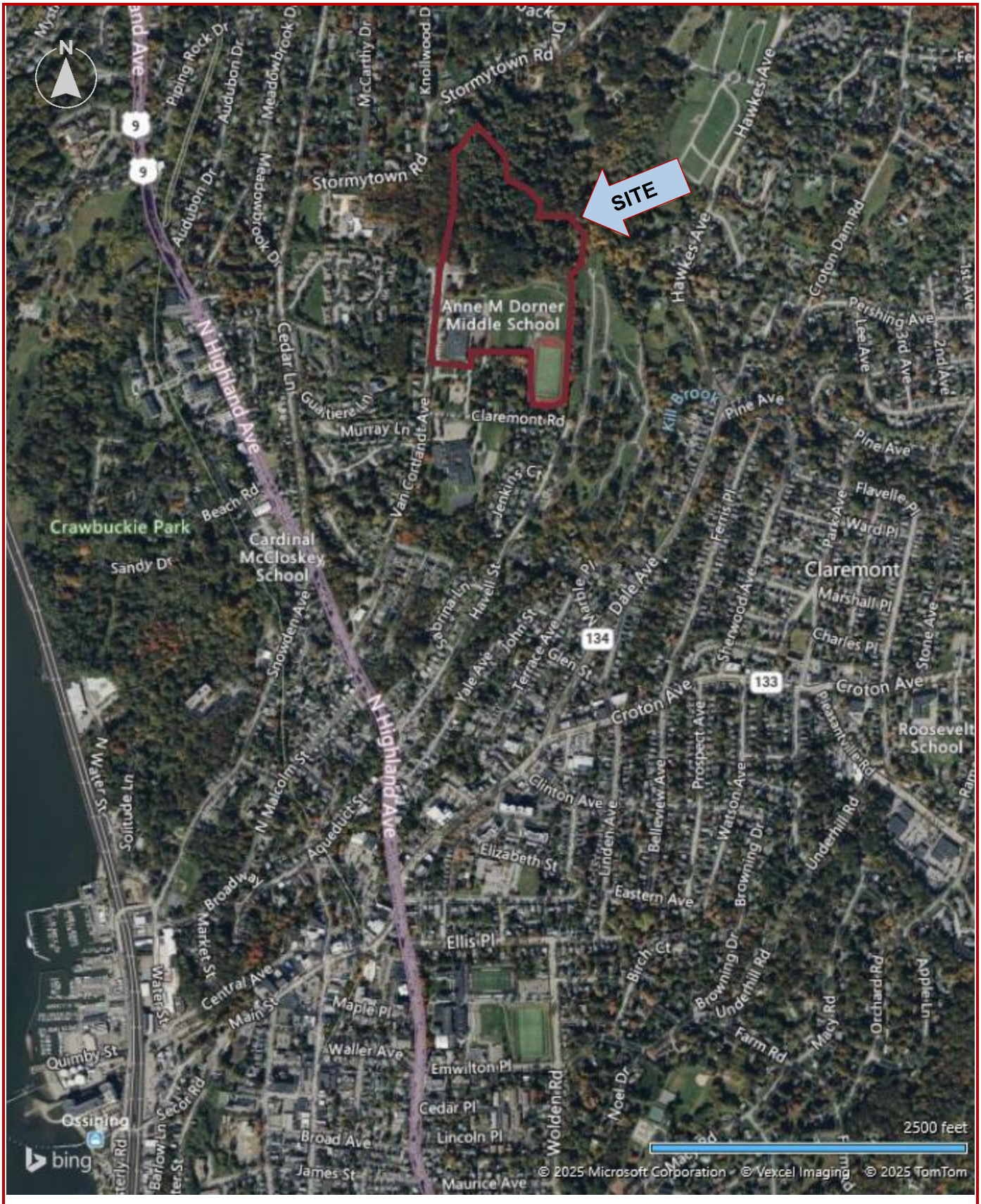


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. MAP PROVIDED BY MICROSOFT BING MAPS.

Exploration Plan

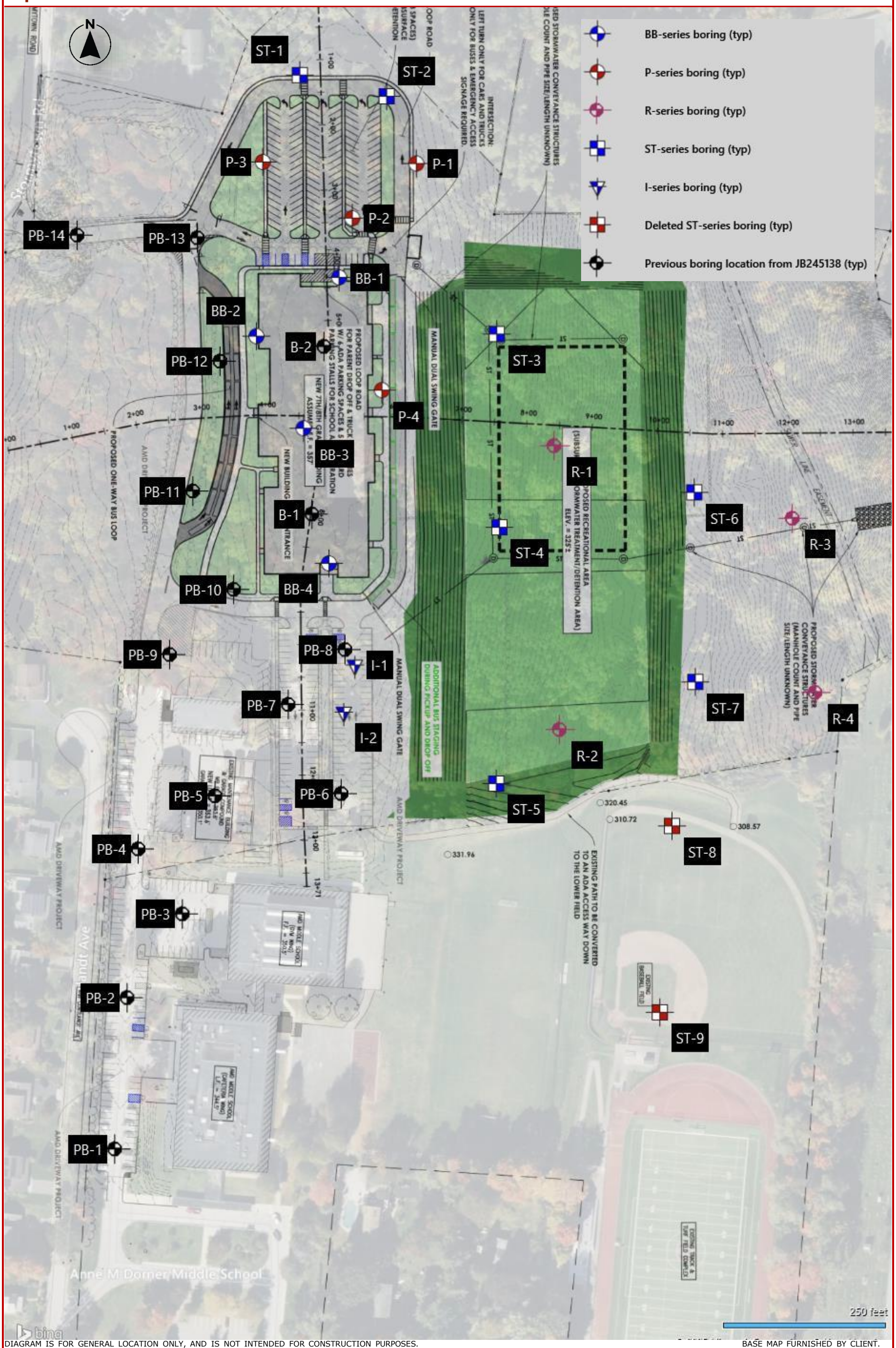


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. BASE MAP FURNISHED BY CLIENT.

Exploration and Laboratory Results

Contents:

Boring Logs (23 pages)
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Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. BB-1

Location: See Exploration Plan

Latitude: 41.1779° Longitude: -73.8592°

Depth (Ft.) | Approximate Elevation: 362 (Ft.)

Model Layer	Depth (Ft.)	Elevation	Description	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3	0.2	361.8	**TOPSOIL**						
			SILTY SAND (SM), trace gravel, brown, loose to dense				17	2-4-5-10 N=9	
							19	12-12-13-13 N=25	10.1
				5			17	18-21-13-10 N=34	
	6.0	356			▽				
4			**SILTY SAND WITH GRAVEL (SM)**, brown, very dense, cobbles noted, (Glacial Till)				10	18-30-50/2"	
	10.0	352		10					
			SILTY SAND (SM), trace gravel, brown, medium dense to very dense, (Glacial Till)				12	10-10-13 N=23	13.3
				15			17	13-15-18 N=33	
				20			7	31-50/2"	
	21.2	340.8							
			Auger Refusal at 21.2 Feet						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 5.8' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-05-2025

Boring Completed
03-07-2025

Notes
Cobbles and boulders frequent from 15ft to 20ft

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. BB-2

Location: See Exploration Plan

Latitude: 41.1776° Longitude: -73.8596°

Depth (Ft.) Approximate Elevation: 359 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3		0.2 **TOPSOIL** 358.8 **SILTY SAND (SM)**, trace gravel, brown, very loose to medium dense - Mottling noted from 2' to 4'			13	1-1-2-5 N=3	
					16	6-6-7-13 N=13	12.5
4		4.0 355 **SILTY SAND WITH GRAVEL (SM)**, brown, dense to very dense, cobbles noted, (Glacial Till)			18	10-18-50-31 N=68	
					11	27-30-43-30 N=73	
					6	17-27-36 N=63	
					12	17-23-21 N=44	
					7	32-50/2"	
		25.9 333.1 ***Spoon Refusal at 25.9 Feet***			10	31-50/5"	

5
10
15
20
25

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes
Difficult drilling from 5ft to 9ft

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-07-2025

Boring Completed
03-07-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
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Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. BB-3

Location: See Exploration Plan

Latitude: 41.1772° Longitude: -73.8594°

Depth (Ft.) Approximate Elevation: 361 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.1 **TOPSOIL** 360.9 **SANDY SILT (ML)**, trace gravel, orangish brown, soft, rootlets noted 2.0 359			12	2-2-2-5 N=4	18.2
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, mottling and cobbles noted, (Glacial Till)			22	11-13-12-15 N=25	
		5			22	10-10-14-17 N=24	
					17	14-18-50/4"	
		10			1	50/5"	
		15			18	27-41-50/4"	
		17.4 343.6 ***Auger Refusal at 17.4 Feet***					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes
Boulder encountered from 12.5ft to 13.5ft

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-05-2025

Boring Completed
03-05-2025

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. BB-4

Location: See Exploration Plan

Latitude: 41.1767° Longitude: -73.8592°

Depth (Ft.) | Approximate Elevation: 361 (Ft.)

Model Layer	Depth (Ft.)	Elevation	Description	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
1	0.3	360.75	**TOPSOIL**				
			FILL - SANDY SILT, orangish brown, rootlets noted		12	2-1-2-4 N=3	
			- Similar, trace gravel		19	6-10-11-13 N=21	
	4.0	357					
	4.3	356.7	**SILTY SAND**, trace gravel, organics and tree roots noted, brown, (former topsoil layer)				
4			**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, cobbles noted, (Glacial Till)		23	8-13-11-12 N=24	20.8
					20	15-15-14-18 N=29	
					13	14-30-22 N=52	
					7	38-50/4"	
					1	50/2"	
	25.0	336					
			SILTY SAND WITH GRAVEL (SM), brown, very dense, cobbles noted, (Glacial Till)		1	50/1"	
	29.1	331.9					
			Auger Refusal at 29.1 Feet		1	50/1"	

Depth (Ft.): 5, 10, 15, 20, 25

Water Level Observations

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-04-2025

Boring Completed
03-04-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. P-1

Location: See Exploration Plan

Latitude: 41.1784° Longitude: -73.8587°

Depth (Ft.) Approximate Elevation: 356 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.3 **TOPSOIL** 355.7 **SANDY SILT (ML)**, trace gravel, brown, soft, rootlets noted 2.0 354			8	WH-WH-2-3 N=2	23.1
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense	▽		24	6-5-9-13 N=14	
		5			22	8-9-15-19 N=24	
4		**SILTY SAND (SM)**, trace gravel, brown, dense to very dense, (Glacial Till) - Mottling noted 10.0 346			18	16-25-19-16 N=44	
		10			24	18-20-44-49 N=64	
		Boring Terminated at 10 Feet					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 4.2' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. P-2

Location: See Exploration Plan

Latitude: 41.1781° Longitude: -73.8591°

Depth (Ft.) | Approximate Elevation: 361 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.2 **TOPSOIL** 360.8 **SANDY SILT (ML)**, brown, soft, rootlets noted 2.0 359			14	1-1-2-4 N=3	
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense 6.0 355			16	7-7-9-10 N=16	
					20	12-13-11-13 N=24	
4		**SILTY SAND (SM)**, trace gravel, brown, dense, cobbles noted, (Glacial Till) 10.0 351			24	11-13-19-16 N=32	
					24	18-23-25-31 N=48	
		Boring Terminated at 10 Feet					

5

10

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. P-3

Location: See Exploration Plan

Latitude: 41.1784° Longitude: -73.8596°

Depth (Ft.) | Approximate Elevation: 356 (Ft.)

Model Layer	Depth (Ft.)	Description	Approx. Elevation	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3	0.2	**TOPSOIL**	355.8					
		SILTY SAND (SM), trace gravel, brown, very loose				17	WH-2-1-3 N=3	18.1
	2.0		354					
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to dense, (Glacial Till)		▽		16	7-11-12-15 N=23	
						24	13-13-15-18 N=28	11.3
	5					16	15-18-21-19 N=39	
						8	18-22-25-27 N=47	
	10.0		346					
	10	***Boring Terminated at 10 Feet***						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 4.0' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. P-4

Location: See Exploration Plan

Latitude: 41.1774° Longitude: -73.8589°

Depth (Ft.) Approximate Elevation: 361 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.2 **TOPSOIL** 360.8 **SANDY SILT (ML)**, trace gravel, brown, soft 2.0 359			16	1-1-3-4 N=4	
3		**SILTY SAND WITH GRAVEL (SM)**, brown, medium dense 4.0 357			20	5-9-9-10 N=18	13.1
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, (Glacial Till)			22	12-13-12-13 N=25	
		5			6	14-11-11-21 N=22	
					24	35-30-50-50/2" N=80	
		9.7 351.3 ***Spoon Refusal at 9.7 Feet***					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-11-2025

Boring Completed
03-11-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-1

Location: See Exploration Plan

Latitude: 41.1772° Longitude: -73.8580°

Depth (Ft.) Approximate Elevation: 336 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.1 **TOPSOIL** 335.9 **SANDY SILT (ML)**, trace gravel, orangish brown, soft 2.0 334			17	1-1-1-3 N=2	
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense 6.0 330	▽		13	5-6-7-9 N=13	13.0
					18	5-7-10-12 N=17	13.1
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, cobbles noted, (Glacial Till)			16	14-18-22-39 N=40	
					1	50/2"	
		- Schist fragments noted			12	8-9-11 N=20	
					8	19-50/4"	8.6
					12	30-32-50/1"	
					8	33-50/2"	

5 10 15 20 25 30

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 3.4' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-11-2025

Boring Completed
03-11-2025

Notes
Boulder noted from 9ft to 10ft
Difficult augering from 9ft to 12ft

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.1772° Longitude: -73.8580° Depth (Ft.) — Approximate Elevation: 336 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, cobbles noted, (Glacial Till) *(continued)*							
		34.4 — 301.6				2	50/3		
		Spoon Refusal at 34.4 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 3.4' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-11-2025

Boring Completed
03-11-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-2

Location: See Exploration Plan

Latitude: 41.1760° Longitude: -73.8579°

Depth (Ft.) Approximate Elevation: 328 (Ft.)

Model Layer	Depth (Ft.)	Elevation	Description	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2	0.2	327.8	**TOPSOIL**				
			SANDY SILT (ML), trace gravel, dark brown and brown, soft to very stiff		11	WH/12"-2-3 N=2	
					22	3-6-13-10 N=19	13.6
	5				19	9-11-13-10 N=24	
	6.0	322			20	21-21-22-21 N=43	
4			**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, (Glacial Till)				
	10				12	13-12-9 N=21	
					16	33-35-50 N=85	
	15						
	19.0	309					
			SILTY SAND WITH GRAVEL (SM), brown, very dense, (Glacial Till)		24	27-40-45 N=85	
	20						
					7	50-50/1"	
	25						
					5	50/5"	
	30						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-13-2025

Boring Completed
03-13-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.1760° Longitude: -73.8579° Depth (Ft.) — Approximate Elevation: 328 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
4		**SILTY SAND WITH GRAVEL (SM)**, brown, very dense, (Glacial Till) *(continued)*						
		34.2 — 293.8						
		Spoon Refusal at 34.2 Feet				2	50/2"	

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-13-2025

Boring Completed
03-13-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
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Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-3

Location: See Exploration Plan

Latitude: 41.1769° Longitude: -73.8566°

Depth (Ft.) Approximate Elevation: 292 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.1 **TOPSOIL** 291.9 **SANDY SILT (ML)**, brown, soft to stiff, rootlets noted through first 2'			11	1-1-1-1 N=2	
					5	4-6-7-6 N=13	27.0
		4.0 288					
3		**SILTY SAND (SM)**, brown, medium dense, schist fragments noted			18	4-5-6-7 N=11	
		6.0 286					
2		**SILT (ML)**, gray, soft, mottling noted			13	5-2-22-10 N=24	
		7.0 285	▽				
		SCHIST FRAGMENTS, pink					
		8.0 284					
5		**SCHIST FRAGMENTS**, brown and gray					
					17	14-31-50/5"	
			▽				
		15.1 276.9					
		Auger Refusal at 15.1 Feet			1	50/1"	

5
10
15

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 13.5' while drilling
▽ 7.3' water in open hole after pulling augers

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-14-2025

Boring Completed
03-14-2025

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. R-4

Location: See Exploration Plan

Latitude: 41.1761° Longitude: -73.8565°

Depth (Ft.) Approximate Elevation: 292 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.2 **TOPSOIL** 291.8 **SANDY SILT (ML)**, trace gravel, brown, soft, rootlets noted 2.0 290			12	WH-1-1-3 N=2	
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense			22	4-5-10-9 N=15	
					20	5-6-7-10 N=13	11.7
					23	10-10-8-8 N=18	
					7	5-5-5 N=10	
		15.0 277					
5		**SCHIST FRAGMENTS**, (soil like structure), brown and gray			13	23-30-40 N=70	
		- Grades gray 20.8 271.2			10	30-50/4"	
		Spoon Refusal at 20.8 Feet					

5 10 15 20

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 6.0' while drilling

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-13-2025

Boring Completed
03-13-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. I-1

Location: See Exploration Plan

Latitude: 41.1763° Longitude: -73.8591°

Model Layer	Depth (Ft.)	Elevation: 357.5 (Ft.) +/-	Installation Details	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
	0.5	**TOPSOIL** 357							
2	2.0	**SANDY SILT (ML)**, trace gravel, orangish brown, soft, rootlets noted 355.5					12	1-2-2-3 N=4	
3	4.0	**SILTY SAND (SM)**, trace gravel, brown, medium dense, mottling noted 353.5	4" PVC set at 10' below grade. Annulus backfilled with soil cuttings to grade.	5			17	5-5-8-4 N=13	
3	6.0	**SILTY SAND WITH GRAVEL (SM)**, brown, dense 351.5					10	12-15-16-18 N=31	
4	8.0	**POORLY GRADED SAND (SP)**, trace gravel and silt, brown, medium dense, (Glacial Till) 349.5					16	17-14-12-12 N=26	
4	10.1	**SILTY SAND (SM)**, trace gravel, brown, very dense, (Glacial Till) 347.4	Undisturbed in situ soil	10			18	30-48-49-50/2" N=97	7.5
		Spoon Refusal at 10.1 Feet					1	50/1"	

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes
Pipe set at 10ft offset of the boring

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. I-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.1761° Longitude: -73.8591° Depth (Ft.) / Elevation: 356 (Ft.) +/-	Installation Details	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
		0.5 **TOPSOIL** 355.5							
2		**SILT (ML)**, trace sand, brown, medium stiff, mottling noted 2.0 354					16	1-3-4-5 N=7	
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, (Glacial Till)	4" PVC set at 10' below grade. Annulus backfilled with soil cuttings to grade.	5			20	13-8-12-11 N=20	
							19	11-19-21-16 N=40	
							17	16-17-12-16 N=29	
				10			20	16-21-25-37 N=46	
		12.0 344	Undisturbed in situ soil				24	20-29-40-45 N=69	10.2
		Boring Terminated at 12 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes
Pipe set at 10ft offset of the boring

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-11-2025

Boring Completed
03-11-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-1

Location: See Exploration Plan

Latitude: 41.1787° Longitude: -73.8594°

Depth (Ft.) Approximate Elevation: 355 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3		0.2 **TOPSOIL** 354.8 **SILTY SAND (SM)**, trace gravel, dark brown and brown, loose, rootlets noted 353			7	2-1-3-5 N=4	
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to very dense, (Glacial Till)			20	7-35-18-11 N=53	10.9
		5			18	12-17-18-21 N=35	
					16	21-13-16-13 N=29	
					22	13-17-17-15 N=34	
		10.0 345 ***Boring Terminated at 10 Feet***					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-2

Location: See Exploration Plan

Latitude: 41.1786° Longitude: -73.8589°

Depth (Ft.) Approximate Elevation: 355 (Ft.)

Model Layer	Depth (Ft.)	Description	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2	0.2	**TOPSOIL** 354.8 **SILT (ML)**, brown, soft, rootlets noted			12	1-1-2-1 N=3	
3	2.0	**SILTY SAND (SM)**, trace gravel, brown, medium dense 353			22	4-5-6-8 N=11	
4	4.0	**SILTY SAND (SM)**, trace gravel, brown, medium dense to dense, cobbles noted, (Glacial Till) 351	▽		18	9-12-13-15 N=25	
					20	18-13-15-12 N=28	
					24	14-20-20-34 N=40	
	10.0	***Boring Terminated at 10 Feet*** 345					

5

10

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 4.0' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-10-2025

Boring Completed
03-10-2025

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-3

Location: See Exploration Plan

Latitude: 41.1776° Longitude: -73.8583°

Depth (Ft.) Approximate Elevation: 347 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.2 **TOPSOIL** 346.8 **SANDY SILT (ML)**, brown, soft, rootlets noted 2.0 345			13	1-1-1-3 N=2	
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to dense, cobbles noted, (Glacial Till)			16	8-14-11-10 N=25	
		5			22	7-10-12-26 N=22	
					24	17-13-13-17 N=26	
					24	18-18-21-25 N=39	
		10.0 337 10					
		Boring Terminated at 10 Feet					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-12-2025

Boring Completed
03-12-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-4

Location: See Exploration Plan

Latitude: 41.1768° Longitude: -73.8583°

Depth (Ft.) Approximate Elevation: 346 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
		0.2 **TOPSOIL** 345.8					
3		**SILTY SAND (SM)**, trace gravel, dark brown, very loose to medium dense			2	1-1-1-2 N=2	
					19	4-7-12-16 N=19	9.8
		4.0 342					
4		**SILTY SAND WITH GRAVEL (SM)**, brown, medium dense to dense, (Glacial Till)			13	23-23-22-28 N=45	
		5			20	23-21-17-15 N=38	
					19	12-13-15-15 N=28	
		10.0 336 10					
		Boring Terminated at 10 Feet					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-12-2025

Boring Completed
03-12-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-5

Location: See Exploration Plan

Latitude: 41.1758° Longitude: -73.8583°

Depth (Ft.) Approximate Elevation: 336 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3		0.2 **TOPSOIL** 335.8 **SILTY SAND (SM)**, trace gravel, brown, loose, rootlets noted 2.0 334			17	WH-2-2-8 N=4	12.4
4		**SILTY SAND (SM)**, trace gravel, brown, medium dense to dense, cobbles noted, (Glacial Till)			19	8-11-16-16 N=27	
		5			20	18-26-23-24 N=49	
					19	24-20-18-14 N=38	
					17	18-20-16-20 N=36	
		10.0 326 10					
		Boring Terminated at 10 Feet					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
Buck Galster

Boring Started
03-13-2025

Boring Completed
03-13-2025

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-6

Location: See Exploration Plan

Latitude: 41.1770° Longitude: -73.8572°

Approximate Elevation: 306 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.1	**TOPSOIL** 305.9						
			SANDY SILT (ML), brown, soft to stiff, rootlets noted				20	1-1-1-2 N=2	30.8
			- Mottling noted				8	4-6-6-10 N=12	
		4.0	302		▽				
			SILT (ML), brown, very stiff, mottling noted	5			18	11-14-8-8 N=22	
		6.0	300						
3			**SILTY SAND (SM)**, trace gravel, brown, loose to medium dense				17	4-4-5-5 N=9	
							20	4-7-9-10 N=16	
		10.0	296	10					
			Boring Terminated at 10 Feet						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 4.3' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-14-2025

Boring Completed
03-14-2025

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. ST-7

Location: See Exploration Plan

Latitude: 41.1762° Longitude: -73.8572°

Approximate Elevation: 312 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
2		0.1	**TOPSOIL** 311.9						
			SANDY SILT (ML), brown, soft, rootlets noted				14	1-1-2-3 N=3	
		2.0	310						
3			**SILTY SAND (SM)**, trace gravel, brown, medium dense				20	3-5-9-10 N=14	11.4
		4.0	308						
4			**SILTY SAND (SM)**, trace gravel, brown, medium dense, cobbles noted, (Glacial Till)	5	▽		17	8-12-16-16 N=28	
							18	8-9-10-10 N=19	
							17	8-9-11-10 N=20	
		10.0	302	10					
			Boring Terminated at 10 Feet						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
▽ 5.8' perched water

Drill Rig
CME 750X

Hammer Type
Automatic

Driller
Caleb Schindler

Logged by
Buck Galster

Boring Started
03-13-2025

Boring Completed
03-14-2025

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Ossining UFSD Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245138

30 Corporate Cir Ste 201
Albany, NY

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 41.1769° Longitude: -73.8593°

Depth (Ft.) | Elevation: 360.1 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3		**SILTY SAND (SM)**, trace gravel, rootlets noted, brown, loose			18	WH-3-6-6 N=9	
		2.5 / 357.6					
4		**SILTY SAND (SM)**, glacial till, trace gravel, brown			19	8-11-18-20 N=29	
		- mottling noted			20	10-12-14-12 N=26	
					22	11-20-25-30 N=45	10.2
		- cobbles and boulders noted			20	15-22-32-38 N=54	
					17	20-33-50/5"	
		16.4 / 343.7					
		Spoon Refusal at 16.4 Feet					

5
10
15

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were surveyed by others and provided to Terracon by CPL.

Water Level Observations
No free water observed

Drill Rig
Diedrich D-50

Hammer Type
Automatic

Driller
Scott Loiselle

Notes
WH = Weight of Hammer

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with soil cuttings upon completion.

Logged by
AEB

Boring Started
08-05-2024

Boring Completed
08-05-2024

Ossining UFSD Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245138

30 Corporate Cir Ste 201
Albany, NY

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 41.1776° Longitude: -73.8592°

Depth (Ft.) Elevation: 362.6 (Ft.) +/-

Model Layer	Graphic Log		Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
3		**SILTY SAND WITH GRAVEL (SM)**, rootlets noted, brown, medium dense						
		2.0 360.6						
4		**SILTY SAND WITH GRAVEL (SM)**, glacial till, brown, medium dense to very dense				19	6-5-6-8 N=11	11.4
						19	11-13-14-15 N=27	
			5			20	9-12-12-13 N=24	
						22	9-9-15-21 N=24	
		- cobbles and boulders noted	10			20	15-22-28-36 N=50	
			15			12	12-19-25-50/5" N=44	
			20			14	10-22-50/2"	
		21.2 341.4						
		Spoon Refusal at 21.2 Feet						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were surveyed by others and provided to Terracon by CPL.

Water Level Observations
No free water observed

Drill Rig
Diedrich D-50

Hammer Type
Automatic

Driller
Scott Loiselle

Logged by
AEB

Boring Started
08-05-2024

Boring Completed
08-05-2024

Notes

Advancement Method
2 1/4" ID HSA

Abandonment Method
Boring backfilled with soil cuttings upon completion.

Terracon
30 Corporate Cir Ste 201
Albany, NY

Summary of Laboratory Results

Boring ID	Depth (Ft.)	Soil Classification USCS	% Gravel	% Sand	% Fines	Water Content (%)	Organic Content (%)
BB-1	2-4	SILTY SAND	6.8	58.2	34.9	10.1	
BB-1	10-11.5	SILTY SAND	8.9	57.7	33.4	13.3	
BB-2	2-4	SILTY SAND	11.0	54.9	34.0	12.5	
BB-3	0-2	SANDY SILT	2.5	46.3	51.2	18.2	
BB-4	4-6	SILTY SAND	5.0	59.5	35.5	20.8	12
P-1	0-2	SANDY SILT	4.5	43.8	51.7	23.1	
P-3	0-2	SILTY SAND	4.1	48.9	47.0	18.1	
P-3	4-6	SILTY SAND	3.1	53.2	43.6	11.3	
P-4	2-4	SILTY SAND WITH GRAVEL	16.0	51.8	32.2	13.1	
R-1	2-4	SILTY SAND	7.5	51.8	40.7	13.0	
R-1	4-6	SILTY SAND	8.3	60.1	31.6	13.1	
R-1	19-19.8	SILTY SAND	8.8	54.2	37.0	8.6	
R-2	2-4	SANDY SILT	4.7	43.9	51.4	13.6	
R-3	2-4	SANDY SILT	0.6	31.1	68.3	27.0	
R-4	4-6	SILTY SAND	11.2	53.9	34.8	11.7	
I-1	8-9.7	SILTY SAND	10.8	53.7	35.5	7.5	
I-2	10-12	SILTY SAND	3.5	66.8	29.7	10.2	
ST-1	2-4	SILTY SAND	6.4	61.8	31.8	10.9	
ST-4	2-4	SILTY SAND	5.5	58.3	36.1	9.8	

Terracon
30 Corporate Cir Ste 201
Albany, NY

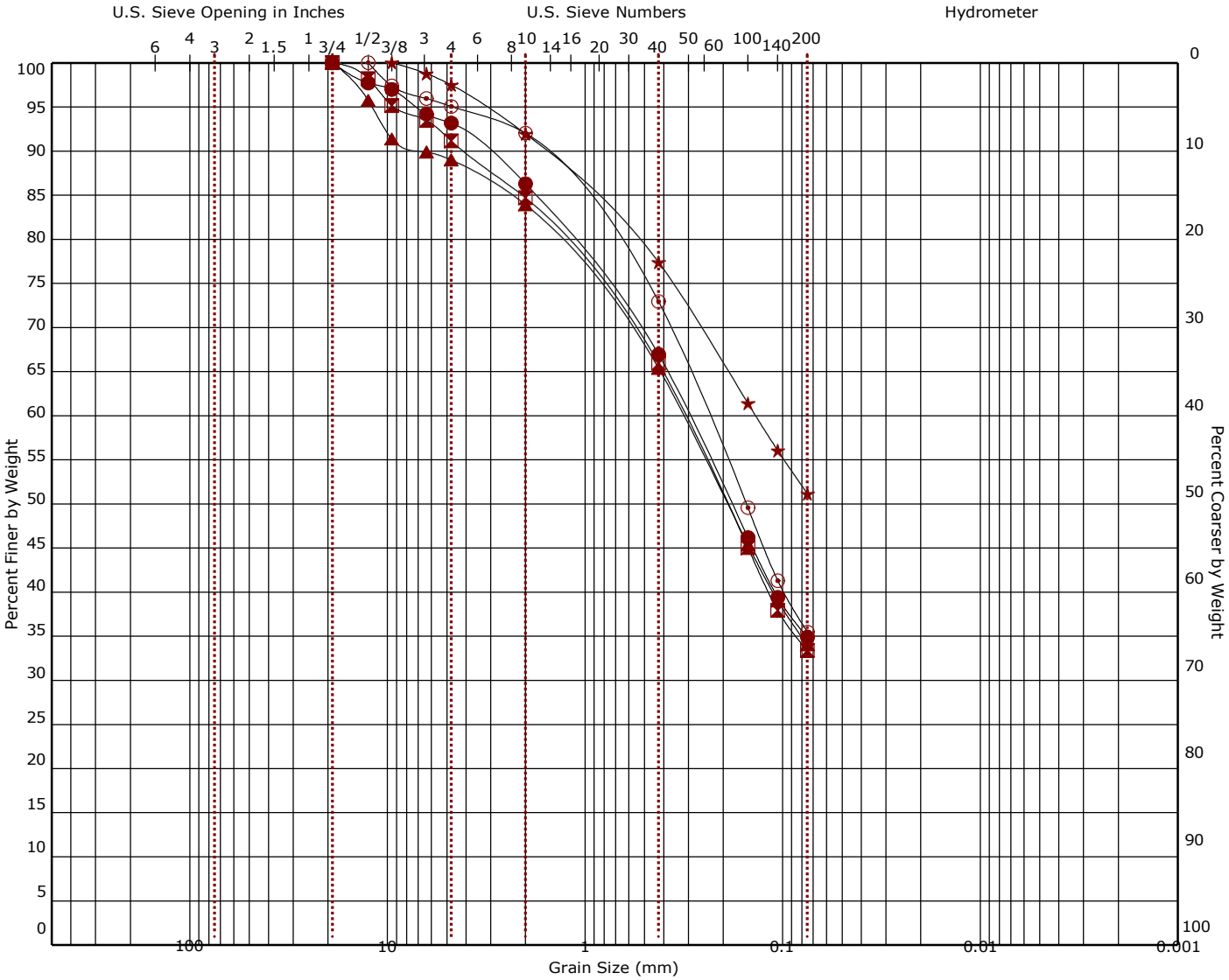
Summary of Laboratory Results

Boring ID	Depth (Ft.)	Soil Classification USCS	% Gravel	% Sand	% Fines	Water Content (%)	Organic Content (%)
ST-5	0-2	SILTY SAND	7.7	59.3	32.9	12.4	
ST-6	0-2	SANDY SILT	0.6	30.9	68.4	30.8	
ST-7	2-4	SILTY SAND	12.5	54.9	32.6	11.4	

Terracon
30 Corporate Cir Ste 201
Albany, NY

Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

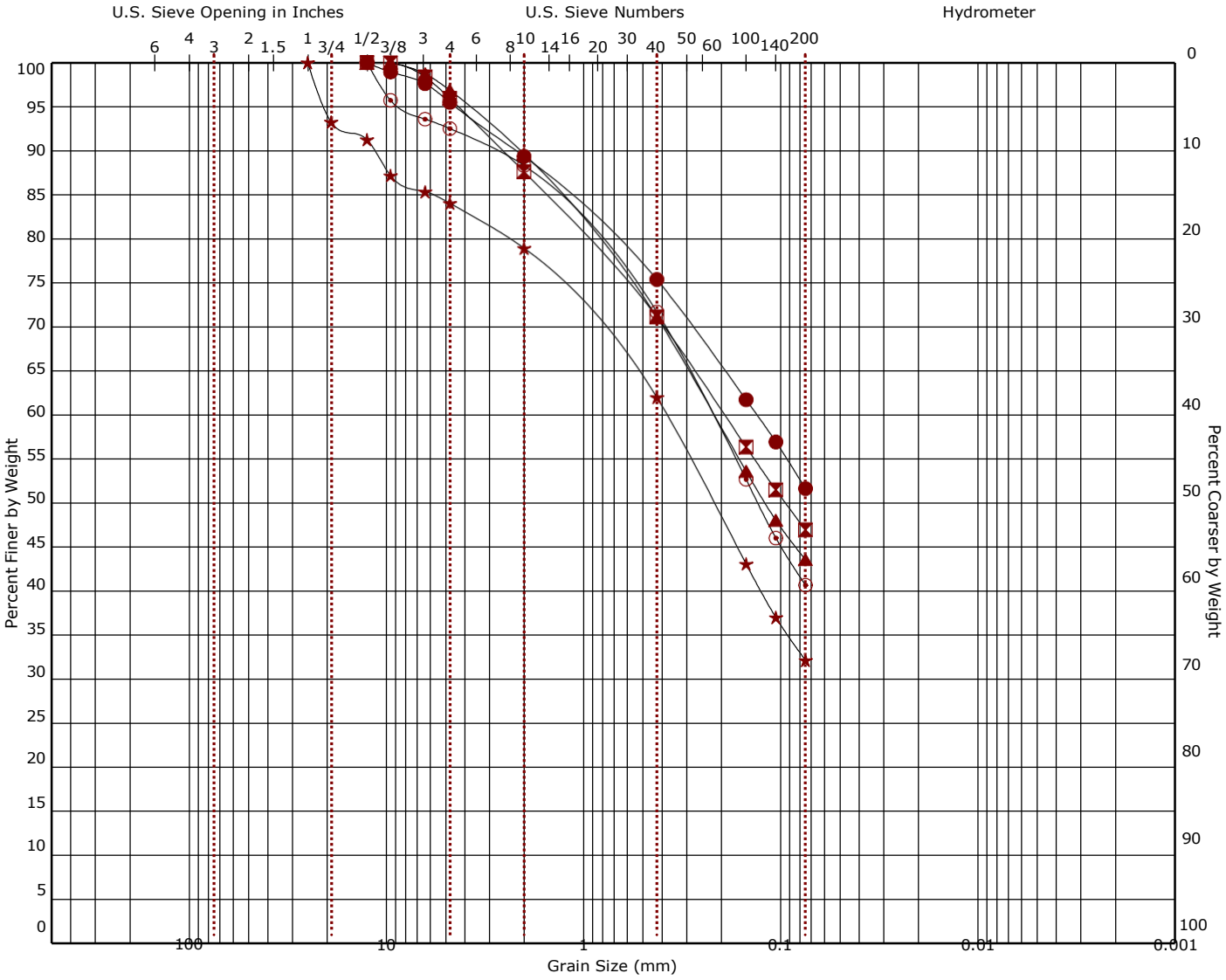
Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
BB-1	2 - 4	SILTY SAND	SM					
BB-1	10 - 11.5	SILTY SAND	SM					
BB-2	2 - 4	SILTY SAND	SM					
BB-3	0 - 2	SANDY SILT	ML					
BB-4	4 - 6	SILTY SAND	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
BB-1	2 - 4	19	0.3			0.0	6.8	58.2	34.9		
BB-1	10 - 11.5	19	0.316			0.0	8.9	57.7	33.4		
BB-2	2 - 4	19	0.321			0.0	11.0	54.9	34.0		
BB-3	0 - 2	9.5	0.137			0.0	2.5	46.3	51.2		
BB-4	4 - 6	12.5	0.239			0.0	5.0	59.5	35.5		

Terracon
30 Corporate Cir Ste 201
Albany, NY

Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

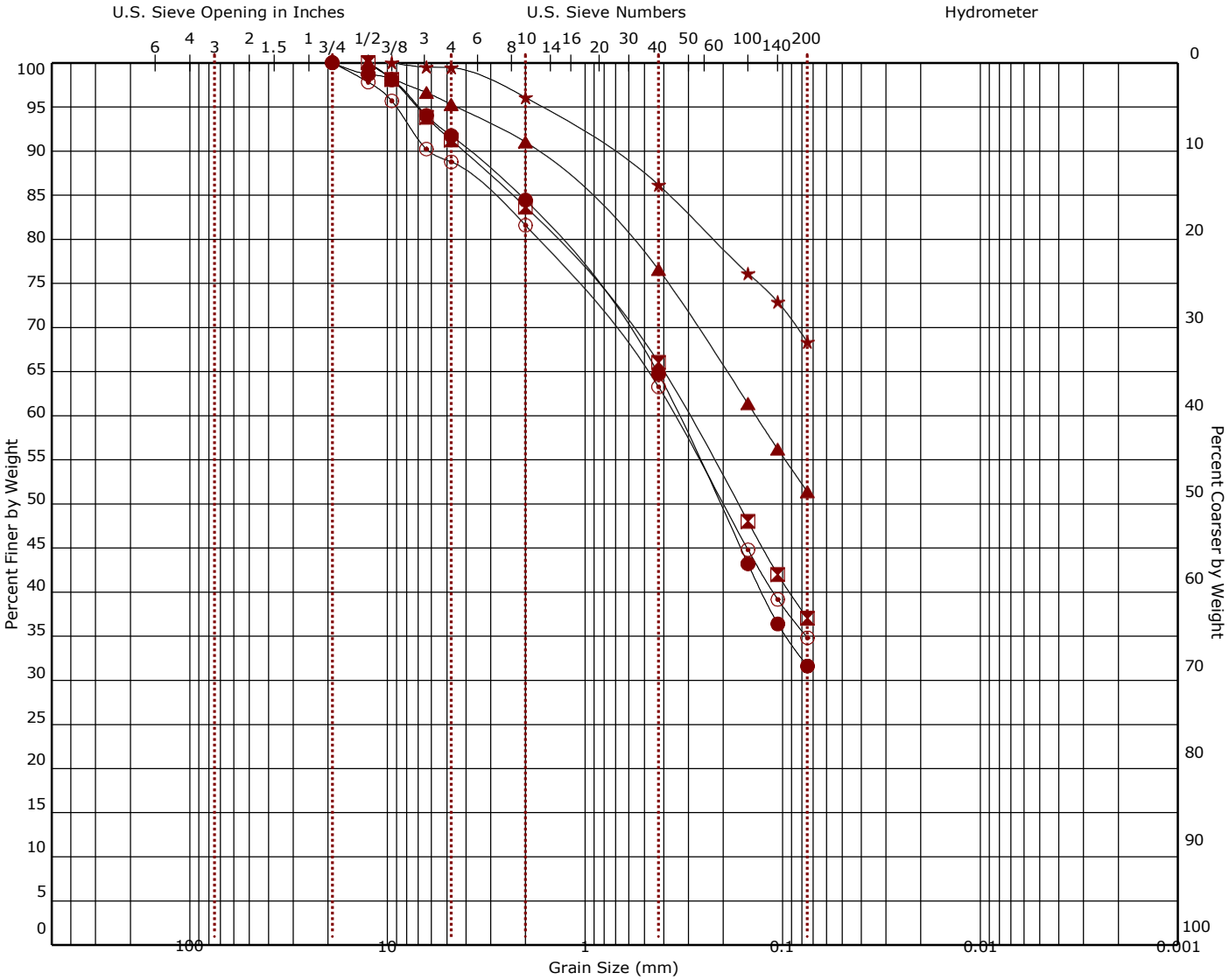
Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
P-1	0 - 2	SANDY SILT	ML					
P-3	0 - 2	SILTY SAND	SM					
P-3	4 - 6	SILTY SAND	SM					
P-4	2 - 4	SILTY SAND with GRAVEL	SM					
R-1	2 - 4	SILTY SAND	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
P-1	0 - 2	12.5	0.132			0.0	4.5	43.8	51.7		
P-3	0 - 2	12.5	0.193			0.0	4.1	48.9	47.0		
P-3	4 - 6	9.5	0.219			0.0	3.1	53.2	43.6		
P-4	2 - 4	25	0.38			0.0	16.0	51.8	32.2		
R-1	2 - 4	12.5	0.223			0.0	7.5	51.8	40.7		

Terracon
30 Corporate Cir Ste 201
Albany, NY

Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

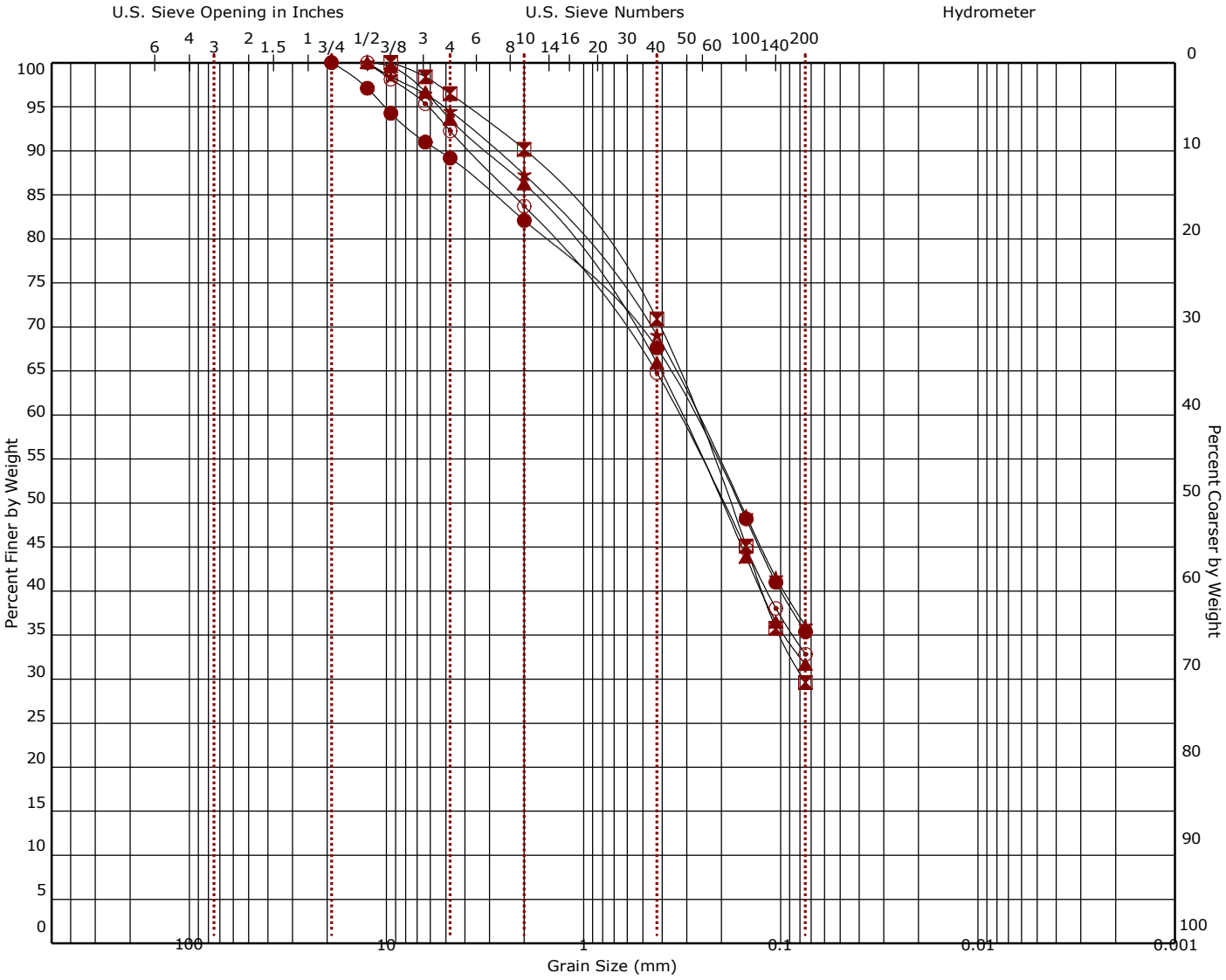
Boring ID		Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
●	R-1	4 - 6	SILTY SAND	SM					
⊠	R-1	19 - 19.8	SILTY SAND	SM					
▲	R-2	2 - 4	SANDY SILT	ML					
★	R-3	2 - 4	SANDY SILT	ML					
⊙	R-4	4 - 6	SILTY SAND	SM					

Boring ID		Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
●	R-1	4 - 6	19	0.338			0.0	8.3	60.1	31.6		
⊠	R-1	19 - 19.8	12.5	0.3			0.0	8.8	54.2	37.0		
▲	R-2	2 - 4	12.5	0.137			0.0	4.7	43.9	51.4		
★	R-3	2 - 4	9.5				0.0	0.6	31.1	68.3		
⊙	R-4	4 - 6	19	0.353			0.0	11.2	53.9	34.8		

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Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

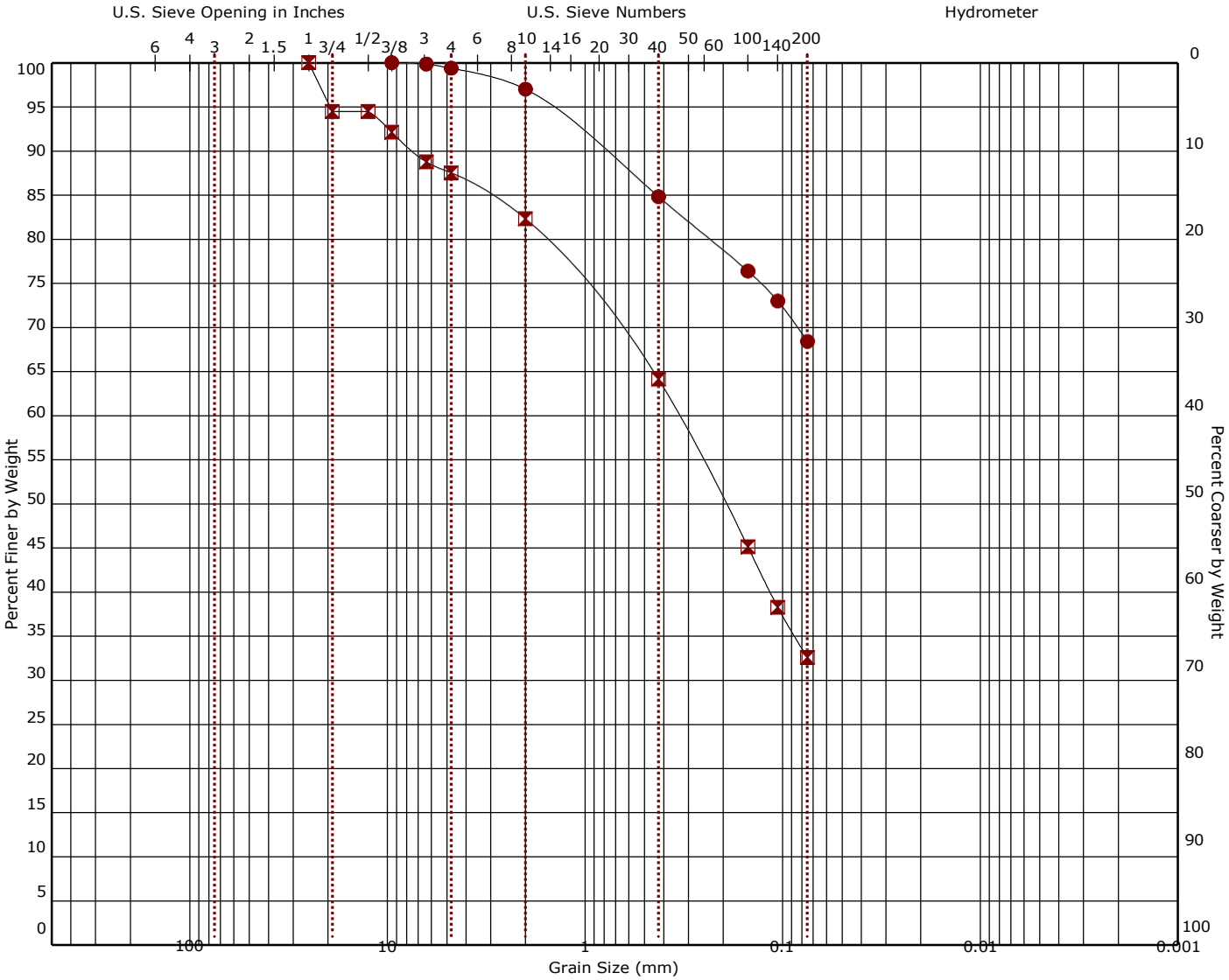
Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
I-1	8 - 9.7	SILTY SAND	SM					
I-2	10 - 12	SILTY SAND	SM					
ST-1	2 - 4	SILTY SAND	SM					
ST-4	2 - 4	SILTY SAND	SM					
ST-5	0 - 2	SILTY SAND	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
I-1	8 - 9.7	19	0.282			0.0	10.8	53.7	35.5		
I-2	10 - 12	9.5	0.273	0.076		0.0	3.5	66.8	29.7		
ST-1	2 - 4	12.5	0.321			0.0	6.4	61.8	31.8		
ST-4	2 - 4	12.5	0.267			0.0	5.5	58.3	36.1		
ST-5	0 - 2	12.5	0.33			0.0	7.7	59.3	32.9		

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Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
ST-6	0 - 2	SANDY SILT	ML					
ST-7	2 - 4	SILTY SAND	SM					

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
ST-6	0 - 2	9.5				0.0	0.6	30.9	68.4		
ST-7	2 - 4	25	0.339			0.0	12.5	54.9	32.6		

INFILTRATION TEST RESULTS					
Project: Ossining UFSD			**Project No.: JB245223**		
Project Location: Ossining, NY			**Tester: BG**		
Test Date: 3/12/25			**Weather: Sunny**		
Test Location	**Test Depth (feet)**	**Trial No.**	**Water Drop (inches)**	**Elapsed Time (hours)**	**Infiltration Rate (inches/hour)**
I-1	10.0	1	2.5	1.0	2.5
		2	2.5	1.0	2.5
		3	2	1.0	2
		4	0	1.0	0
		NOTE: Rate of final trial: 0 in/hr, Average of four trials: 1.8 in/hr			
I-2	10.0	1	0	1.0	0
		2	0	1.0	0
		3	0	1.0	0
		4	0	1.0	0
		NOTE: Rate of final trial: 0 in/hr, Average of four trials: 0 in/hr			

Notes:

1. Test pipes were installed in boreholes made adjacent to test borings I-1 and I-2.
2. According to the driller, it was difficult to seal the bottom of the test pipe at I-1. The infiltration measured in the first 3 runs at I-1 are likely unrepresentative of actual conditions considering the material type (Glacial Till) present at the test depth.

Soil Classification at Test Depth:

Test Location I-1: Silty Sand (SM), trace gravel, (Glacial Till)

Test Location I-2: Silty Sand (SM), trace gravel, (Glacial Till)

Supporting Information

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

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General Notes

Sampling	Water Level	Field Tests
Split Spoon	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 0.25	0 - 1
Soft	0.25 to 0.50	2 - 4
Medium Stiff	0.50 to 1.00	5 - 8
Stiff	1.00 to 2.00	9 - 15
Very Stiff	2.00 to 4.00	16 - 30
Hard	> 4.00	> 30

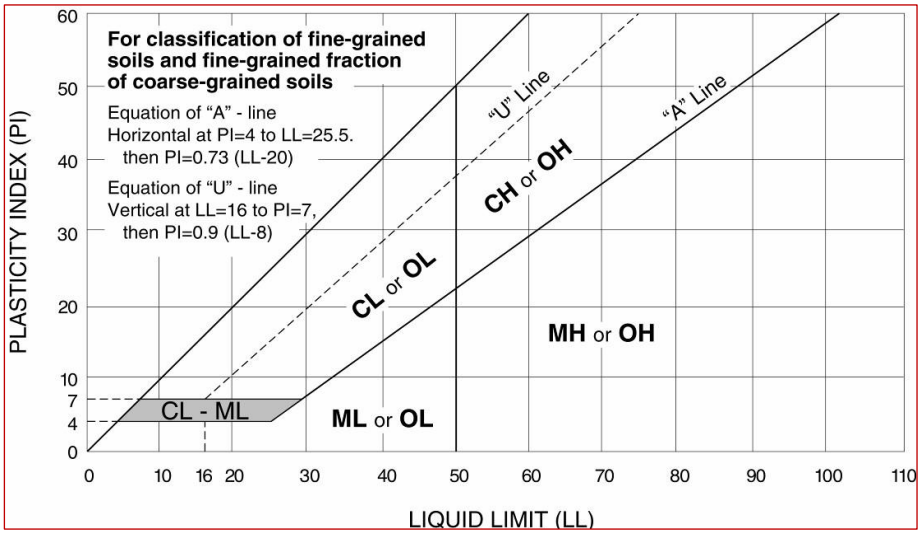
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N] Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P] Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



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July 29, 2026

CPL Architects Engineers Landscape Architect & Surveyor DPC (CPL)
26 IBM Road
Poughkeepsie, NY 12601

Attn: Mr. Tim Moot, P.G. – Vice President
P: (845) 522-5797
E**:** tmoot@cplteam.com

Re: Recreation Field Slope Stability Analysis and Commentary
Ossining UFSD
100 Van Cortlandt Ave
Ossining, New York
Terracon Project No. JB245223

Dear Mr. Moot:

At the request of CPL, Terracon has performed additional subsurface investigations, global stability analyses, and review of CPL design documents associated with the proposed site development for the new school building and site improvements planned at Ossining UFSD. This correspondence summarizes our findings, the results of our analyses, and provides commentary for use by CPL in continued preparation of site plans. Our services were performed in general accordance with the scope of services described in our Change Order No. 2 which was authorized via email by CPL on November 11, 2025, and formally authorized on July 16, 2026, with one revision. Terracon was requested by CPL in a teleconference with Bryce Reecer on July 7, 2026, to review and comment on CPL design details rather than provide a separate reinforced slope design document as the project approach and planned grading were not finalized.

Background

Terracon previously performed a geotechnical investigation for the new 7th/8th grade building and site development, and prepared a geotechnical report issued on June 11, 2025. As the site plans were being developed by CPL, Terracon was requested to provide supplemental geotechnical consulting, specifically related to the recreational field and stormwater treatment/detention area planned east of the new school building. Terracon provided these services under Change Order No. 1 and issued a geotechnical letter on March 5, 2026. In consideration of the recommendations offered in the letter, an additional subsurface investigation and design level global stability analyses were requested by CPL.

Our analyses under Change Order No. 2 were performed using "Work Area 'B' – Utility Plan," drawing number 7&8/C222 by CPL last revised June 18, 2026, and emailed to

Terracon on June 24, 2026. Additionally, "Site Details – 7," drawing number 7&8/C807 by CPL dated April 9, 2026, was emailed to Terracon on July 8, 2026, for use in our analyses.

To assist the reader's understanding of the following discussion, a Project Feature Reference Plan has been included as **Appendix A**. The plan identifies the primary grading features and areas evaluated as part of this analysis. References to these areas throughout this correspondence correlate with the locations shown on the Project Feature Reference Plan.

Additional Subsurface Investigation

Three borings were advanced as part of the Change Order No. 2 additional subsurface investigation, C-1, C-2, and C-3, for the purposes of providing additional subsurface and groundwater information along the proposed cut slope (*Field Cut Slope*). The borings were advanced to depths ranging between 18 and 25.7 feet below existing ground surface (BGS). Subsurface conditions were in general similar to those previously encountered on the site, with silty sand/sandy silt soil overlying glacial till. An additional boring, C-4, was originally planned but was deleted due to accessibility issues at the time of investigation. Refer to the attached Exploration Plan **(Appendix B)** and Supplemental Investigation Boring Logs **(Appendix C)** for approximate boring locations and individual subsurface boring logs.

Additionally, four groundwater monitoring wells were installed. Two were installed within borehole C-2 and two were installed within borehole C-3. A deeper monitoring well was installed to allow subsequent measurement of static groundwater level while a shallower monitoring well was installed to determine the presence of and measure perched groundwater levels. Each monitoring well consisted of one-inch diameter PVC pipe with a slotted screen section at the bottom of the well and solid riser pipe to and extending above the ground surface. The well annulus was backfilled with filter sand within the screened section and bentonite and auger cuttings above the sand to seal the well from surface water infiltration. At C-2, the deeper monitoring well was screened from 15.7 to 25.7 feet BGS, and the shallower monitoring well was screened from 3 to 13 feet BGS. At C-3, the deeper monitoring well was screened from 12 to 22 feet BGS, and the shallower monitoring well was screened from 1 to 11 feet BGS.

After their initial installation and development, groundwater levels in the wells were measured on April 30, 2026, and May 8, 2026. No measurable groundwater was encountered within the shallow wells during either visit. Measurable groundwater was encountered in the deeper wells, and those levels are summarized in the table below:

Observation Well Water Level Summary						
Date Measured	Approximate Water Level in Well (ft)					
	C-2 (deep)			C-3 (deep)		
	Approx. GS[1] Elevation	Depth Below Grade	Groundwater Elevation	Approx. GS[1] Elevation	Depth Below Grade	Groundwater Elevation
4/30/2026	349	17.1	331.9	352	16.6	335.4
5/8/2026		16.7	332.3		14.8	337.2

1. GS = Ground Surface

Groundwater measurements during the monitoring period indicated groundwater elevations ranging between approximately 332 and 337 feet within the *Field Cut Slope* area. While not identified in the shallow groundwater monitoring wells of this additional investigation, locally perched or trapped groundwater has been encountered in our previous investigations and may at times be encountered during construction. Groundwater conditions and the extent of any perched water should be expected to vary with seasonal fluctuations in precipitation and runoff. Additionally, grade adjustments on and around the site, as well as surrounding drainage improvements, may affect the water table.

Understanding of Proposed Grading and Analysis Approach

As described in our Mach 5, 2026 letter, we performed a preliminary slope stability analysis of the cut and fill slopes that are planned to develop the recreational field using the subsurface information gathered during our initial site investigations. We used the additional subsurface and groundwater information to refine our analysis as part of this Change Order No. 2 scope. Referring to the C222 plan, the proposed site grading includes the *Field Cut Slope* which is approximately 22 feet in maximum height on the western limits of the field, and the *Field Fill Slope* which is approximately 30 feet in maximum height on the eastern limits of the field. The *Field Cut Slope* ranges in maximum inclination between about 1V (Vertical):2.2H (Horizontal) and 1V:2.4H. The *Field Fill Slope* has an approximate maximum inclination of 1V:2H.

An underground stormwater detention system *(Detention System)* within the field and a stormwater pond *(Pond)* east of the field are indicated.

The *Detention System* is planned to have an invert elevation of 324.0 feet. We understand this system will be lined with an impermeable HDPE liner to prevent groundwater from

infiltrating into the surrounding soils and slopes. Generally, we understand that the stormwater piping in the field area will collect water and direct it towards structure CB-24 which then outlets into the *Pond* east of the field. The *Detention System* is planned to be utilized as additional storage if structures overflow during heavier storm events. If groundwater enters the *Detention System*, the system will collect the water and discharge it back into the piping system through structure OS-2 when the water levels stabilize.

The *Pond* is planned to have a bottom elevation of 281 feet and be lined with either with a 12-inch thick natural clay liner or HDPE liner to elevation 295 feet to prevent groundwater from infiltrating into the surrounding soils and slopes. We understand the pond is designed to reach a maximum water surface elevation of 293 feet during the 100-year storm event, where water from the *Pond* will enter structure OS-1 and outlet through FES-1 at elevation 274 feet. The outlet follows a natural ravine feature towards Sing Song Creek.

Grading to develop the *Pond* is planned immediately east of the *Field Fill Slope*. A cut slope (*Pond Approach Slope*) with a maximum height of about 20 feet will be required to create the western *Pond* grading and *Pond Crest* elevation of 296 feet. The *Pond Crest* will be about 10 feet in width. Beyond the crest, the *Pond* slope will continue to be cut to a bottom elevation of 281 feet. The maximum inclination of the *Pond Approach Slope* and *Pond* slopes are 1V:3H. An embankment fill will be required on the eastern side of the pond (*Eastern Embankment*) to create grades along the east side of the *Pond*. The *Eastern Embankment* slope will have a maximum height of 13 feet and maximum inclination of 1V:2H.

In order to facilitate our analyses, six subsurface profiles were developed using the existing and proposed grading indicated on the C222 plan provided. The subsurface profiles utilized the initial and supplemental subsurface information obtained in the test borings advanced by Terracon at the project site. The soil strata identified and included in our analysis are native silty sand/sandy silt, glacial till, weathered bedrock, and reused screened onsite soils. Engineering design parameters were estimated for these soil materials based on information obtained from the investigation, laboratory testing of select samples and our local experience.

The inferred subsurface profiles were modeled in the slope stability software, SLOPEW, to determine global stability factors of safety. The generally accepted industry standard minimum factor of safety for slope stability is between 1.3 and 1.5 for the intended site usage. The SLOPEW outputs are provided in **Appendix D.** The analysis and recommendations for the *Field Cut Slope* and *Field Fill Slope*, *Pond Approach Slope*, *Pond*, *Eastern Embankment*, general comments and geotechnical recommendations are further discussed below.

Field Cut Slope Analysis and Recommendations

The additional subsurface investigations advanced for this study provided site specific subsurface soil and groundwater information for the proposed *Field Cut Slope*. This information was used to further analyze the global slope stability of the proposed grading. Through our additional analyses, it was determined that the slope grading has an adequate

factor of safety for slope stability as currently designed. Refer to Profiles 1 through 4 of **Appendix B** and corresponding SLOPEW outputs in **Appendix D** for more information.

Slope stability can be impacted by many factors, including but not limited to the presence of water in the slope. In order to protect the slope and planned site grades, and maintain the factor of safety indicated in our analysis, the following are recommended to be considered in the design:

- A swale should be included at the top of the slope where slopes are greater than 1V:3H in inclination. The swale should be lined with a low permeability material, such as natural clay, HDPE or asphalt, to limit infiltration into the slope and direct runoff from traversing the slope face.
- Based on groundwater elevations measured in the monitoring wells, the toe of the *Field Cut Slope* may encounter groundwater. A French drain should be included along the toe of slope to intercept and collect groundwater and direct it away from the field playing surface and into a closed storm drainage system. It is recommended the French drain trench be a minimum 2 feet wide and 2 feet deep. A minimum 4-inch diameter perforated pipe should be installed at the bottom of the trench to collect water, and the trench backfilled with NYSDOT #1 and #2 clean crushed stone enveloped in a filter fabric of Mirafi 140N type or equivalent. The stone could be held down about six inches from the surface and topsoil or similar material be used to establish the finished surface.
- Refer to the **General Comments and Recommendations** section for additional considerations applicable to slope construction.

Field Fill Slope Analysis and Recommendations

Our analyses prepared for the *Field Fill Slope* indicate that where slopes exceed a 1V:3H inclination, improvements are required to achieve an adequate factor of safety for slope stability. Refer to Profiles 5 and 6 of **Appendix B** and corresponding SLOPEW outputs in **Appendix D** for more information. Note Profile 6 also analyzes the *Pond Approach Slope*, *Pond*, and *Eastern Embankment* described in the next section. As indicated on the attached Marked Up Slope Protection – Fill Slope Detail **(Appendix F)**, geogrid reinforcing is required to be installed at maximum 2 feet vertical spacing, with the lowest geogrid layer installed a maximum of 1 foot below the slope toe elevation. The geogrid layers are to be uni-axial, Mirafi Miragrid 3XT type or equivalent with a minimum Long Term Design Strength (LTDS) of 2195 lbs/ft. The minimum geogrid embedment length should be 15 feet as measured from the face of the slope, excluding the topsoil.

We have attached Typical Reinforced Slope Notes **(Appendix E)** which provides typical notes that may be useful in preparation of the site design documents. Further we recommend the following be considered in the design:

- Reinforced Zone backfill (area of geogrid reinforcing) is to be comprised of onsite materials or imported Structural Fill. Onsite materials should contain no particles larger than 3 inches and should be free of organics, oversized particles, and/or unsuitable foreign matter, pending review and approval by Terracon. Refer to our

geotechnical report for Structural Fill gradation recommendations if utilized as Reinforced Zone backfill.

- Terracon must observe slope subgrades prior to placement of backfill and geogrid reinforcing. The subgrades are to be proof-rolled under observation by Terracon using a smooth drum roller with a static weight of at least 7 tons.
- A swale should be included at the top of the slope where slopes are greater than 1V:3H in inclination. The swale should be lined with a low permeability material, such as natural clay, HDPE or asphalt, to limit infiltration into the slope and direct runoff from traversing the slope face.
- If fencing and/or guiderails are required by local code, their posts should be installed using sonotubes or HDPE pipe segments during construction of the reinforced slopes to allow the geogrid to be cut around the forms.
- Refer to **Appendices E and F** for more information.
- Refer to the **General Comments and Recommendations** section for additional considerations applicable to slope construction.

Pond Approach Slope, Pond, and Eastern Embankment Analysis and Recommendations

The proposed *Pond* grading was evaluated as part of our slope stability analyses utilizing the subsurface profiles described previously. Based on our analyses, the *Pond Approach Slope*, *Pond* slopes, and *Eastern Embankment* slope have an adequate factor of safety for slope stability as currently designed. It was noted during our analyses that portions of the lower *Pond* slopes and *Eastern Embankment* were identified as more critical based on the assumed groundwater conditions and steeper slope inclinations. Refer to Profile 6 of **Appendix B** and corresponding SLOPEW outputs in **Appendix D** for more information.

It should be understood that no borings were advanced specifically for proposed *Pond* design as that stormwater management system and proposed grading were added to the project after our supplemental investigation program. Subsurface conditions utilized in our analyses were inferred from nearby explorations that were advanced during the initial project phase for other purposes and may vary across the *Pond* area. As such, bedrock and groundwater conditions may be encountered at elevations differing from those assumed in the analyses. Accordingly, the following recommendations and considerations should be incorporated into the design:

- Groundwater conditions within the *Pond* were inferred from nearby exploratory borings and groundwater observations. Actual groundwater conditions may vary seasonally and during wet periods. The proposed *Pond* bottom is planned at Elevation 281 feet, which may be below the existing groundwater table based on available subsurface information. The *Pond* liner system and associated appurtenances should be designed by others to resist groundwater uplift and buoyancy forces associated with groundwater levels above the *Pond* bottom elevation. Ballast may be utilized to counteract these forces. The type, extent, and

configuration of any ballast should be coordinated with the civil design and pond liner requirements.

- Some rock excavation may be necessary to establish the proposed *Pond* grades in places. While much of the anticipated rock is expected to be weathered and should be rippable to an extent with suitably sized excavation equipment, it should be understood that bedrock will be more excavation resistant than soil and generally becomes more excavation resistant with depth. Use of a hoe ram or other means of loosening harder rock may be necessary in places to achieve the proposed *Pond* grades.
- The *Eastern Embankment*, which is planned at inclinations up to approximately 1V:2H, marginally exceeded the minimum 1.3 slope stability factor of safety based on the assumptions in our analysis. Consideration should be given to armoring the lower half of the slope with a riprap counterweight up to Elevation 288 feet. The addition of the riprap was shown to increase the slope stability factor of safety from 1.3 to 1.4. Riprap should not extend above this elevation as it will tend to increase driving forces and negatively affect the slope stability. Riprap should meet the requirements for medium stone filling (Item 733-2103) and gradation requirements of Table 733-21A as stipulated in section 733-21 of the NYSDOT Standard Specifications. An appropriate bedding fabric should be considered for the material type proposed.
- The *Pond* outlet should be protected with riprap or another suitable outfall protection measure to control discharge and reduce the risk of erosion.

General Comments and Recommendations

The following recommendations and considerations are generally applicable to the proposed slope construction and should be incorporated into the design and construction, as applicable:

- Slope grades must be permanently stabilized with perennial vegetation or riprap at completion of construction. Refer to Site Civil Drawings for more information.
- Surface water should be directed away from slope crests and uncontrolled discharge onto slope faces should not be permitted.
- Snow, soil, or other materials must not be stockpiled at the top of the slopes or grades within the vicinity of the slopes, either during construction or in the final condition.

We understand that further design changes are being considered to the grading plans including potentially raising the field grades, lessening slope inclinations, and modifying the recreational field location. As plans are further developed, Terracon should continue to be consulted to evaluate whether revisions affect our analyses or recommendations. Additional analysis may be required as warranted. Also, unless addressed otherwise in this correspondence, the recommendations outlined in our geotechnical report and previous correspondences apply.

We appreciate the opportunity to be of service on this project. Please contact us at your convenience if you have any questions or if anything further is needed.

Sincerely,
Terracon Consultants - NY, Inc.

Asa Barnhill, P.E.
Project Geotechnical Engineer

Joseph Robichaud, Jr., P.E.
Senior Principal / Operations Manager

Attachments:

Appendix A – Project Feature Reference Plan
Appendix B – Exploration Plan w/ Approximate Profiles
Appendix C – Supplemental Investigation Boring Logs (C-1, C-2, C-3)
Appendix D – SLOPEW Outputs
Appendix E – Typical Reinforced Slope Notes
Appendix F – Fill Slope Detail Markup



Appendix A

Project Feature Reference Plan

APPENDIX A
PROJECT FEATURE REFERENCE PLAN

EXISTING SANITARY MANHOLES AND SEWER PIPING ARE SHOWN BASED ON RECORD PLANS PROVIDED TO CPL BY THE OSSINING UNION FREE SCHOOL DISTRICT AND ULTIMATELY FROM THE TOWN OF OSSINING. PIPE LOCATION, DEPTH AND SIZE SHALL BE VERIFIED BY CONTRACTOR BEFORE ANY EXCAVATION WORK WITHIN THE SEWER EASEMENT AREA. CONTRACTOR SHALL COORDINATE SEWER CROSSING WITH CM, ARCHITECT, OWNER AND TOWN OF OSSINING.

EASTERN EMBANKMENT

POND

POND CREST

FIELD FILL SLOPE

POND APPROACH SLOPE

FIELD CUT SLOPE

DETENTION SYSTEM

UNDERGROUND STORMWATER DETENTION SYSTEM
14 ROWS @ 160± LF PER ROW OF 48"Ø ADS N-12 OR APPROVED EQUAL
SYSTEM INV. = 324.0'±
SEE SHEET C8XX FOR DETAILS

DMH-13 (60"Ø)
RIM: 277.69'
W INV. IN: 274.49'
E INV. OUT: 274.39'

FES-1
INV. OUT: 274.00'
16' OF 18" SICPP @ 2.48%

24' OF 18" SICPP @ 2.00%

DMH-12 (60"Ø)
RIM: 279.15'
SW INV. IN: 275.06'
E INV. OUT: 274.96'

OS-1 (3' x 3')
RIM: 293.00'
W INV. IN: 290.50'
NE INV. OUT: 290.50'

CB-23 (2' x 2')
RIM: 331.67'
W INV. OUT: 328.68'

CB-24 (60"Ø)
RIM: 331.62'
W INV. IN: 321.33'
E INV. OUT: 321.23'

8' OF 18" SICPP @ 0.50%

OS-2
RIM: 332.3'
S INV. IN: 324.00'
W INV. IN: -0.75'
N INV. OUT: 324.00'

49' OF 36" SICPP @ 0.50%

STRUCTURE - (75)
RIM: 332.4'
W INV. IN: 321.77'
S INV. IN: 323.96'
E INV. OUT: 321.67'

84' OF 36" SICPP @ 0.50%

STRUCTURE - (74)
RIM: 332.8'
W INV. IN: 322.29'
E INV. OUT: 322.19'
S INV. OUT: 324.04'

INLET
RIM: 332.8'
N INV. IN: 324.00'
S INV. OUT: 324.00'
E INV. OUT: 324.00'

8' OF 18" SICPP @ 0.50%

108' OF 24" SICPP @ 0.50%

CB-25 (2' x 2')
RIM: 328.99'
W INV. OUT: 326.75'

244' OF 12" SICPP @ 0.60%

CB-24 (3' x 4')
RIM: 332.86'
E INV. OUT: 329.19'

DMH-8 (60"Ø)
RIM: 329.34'
E INV. IN: 325.43'
N INV. OUT: 324.83'

148' OF 18" SICPP @ 0.50%

DMH-7 (60"Ø)
RIM: 330.82'
S INV. IN: 324.09'
W INV. IN: 325.80'
N INV. OUT: 323.39'

92' OF 24" SICPP @ 0.50%

DMH-5 (72"Ø)
RIM: 331.74'
N INV. IN: 324.34'
S INV. IN: 322.93'
E INV. OUT: 322.83'

DMH-4
RIM: 351.8'
SW INV. IN: 346.59'
E INV. OUT: 344.68'

DMH-6 (60"Ø)
RIM: 331.74'
W INV. IN: 326.85'
E INV. IN: 327.33'
S INV. OUT: 326.25'

DMH-3 (48"Ø)
RIM: 351.33'
NW INV. IN: 343.31' (EXISTING PIPE)
E INV. OUT: 343.17'

SEWER LINE EASEMENT

MATCHLINE 'A-A'

SCALE: 1" = 30'

SHEET C221

WORK AREA 'B' - UTILITY PLAN - RECREATIONAL AREA W/ STORMWATER DETENTION

SCALE: 1" = 30'

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26 IBM Road
Poughkeepsie, NY 12601
CPLteam.com
NY ENGINEERING FIRM CERTIFICATE #0021419

OSSINING
UNION FREE SCHOOL DISTRICT

PROJECT INFORMATION

Project Number
R24.16941.00

Client Name
OSSINING UNION FREE SCHOOL DISTRICT

Project Name
2024 BOND: NEW 7-8 BUILDING

NEW 7TH & 8TH SCHOOL BUILDING

Project Address
100 VAN CORTLANDT AVE,
OSSINING NY 10562

OSSINING UNION FREE SCHOOL DISTRICT
■ 7TH & 8TH SCHOOL BUILDING SED NO. 66-1401-03-0-028-001

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description
01	6/18/2026	ADDENDUM 01

PROFESSIONAL STAMPS

1

NEW YORK STATE EDUCATION LAW 7209(2)
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND THE COMMISSIONER'S REGULATIONS FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, ENGINEER OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ARCHITECT, ENGINEER OR SURVEYOR IS ALTERED, THE ALTERING ARCHITECT, ENGINEER OR SURVEYOR SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

SHEET INFORMATION

Issued	Scale
4/09/2026	AS NOTED
Project Status	
SED SUBMISSION	
Drawn By	Checked By
BGR	JCB

Drawing Title
WORK AREA 'B' - UTILITY PLAN

Drawing Number
7&8
C222

Plotted By: Bryce Racer
Date last plotted: 6/24/2026 4:48 PM
Date last accessed: 6/23/2026 4:03 PM
Sheet size: 30x42
Drawing Name: C:\Users\BRacer\OCUvCCDocs\CPL\R24.16941.00\OUFSD 24' BOND - NEW 7-8 BUILDING\Project Files\01 Design\03 Civil\CAD\Design\OUFSD_R24.16941.00_UT_C.dwg

Appendix B

Exploration Plan w/ Approximate Profiles

Appendix B –Exploration Plan w/ Approximate Profiles

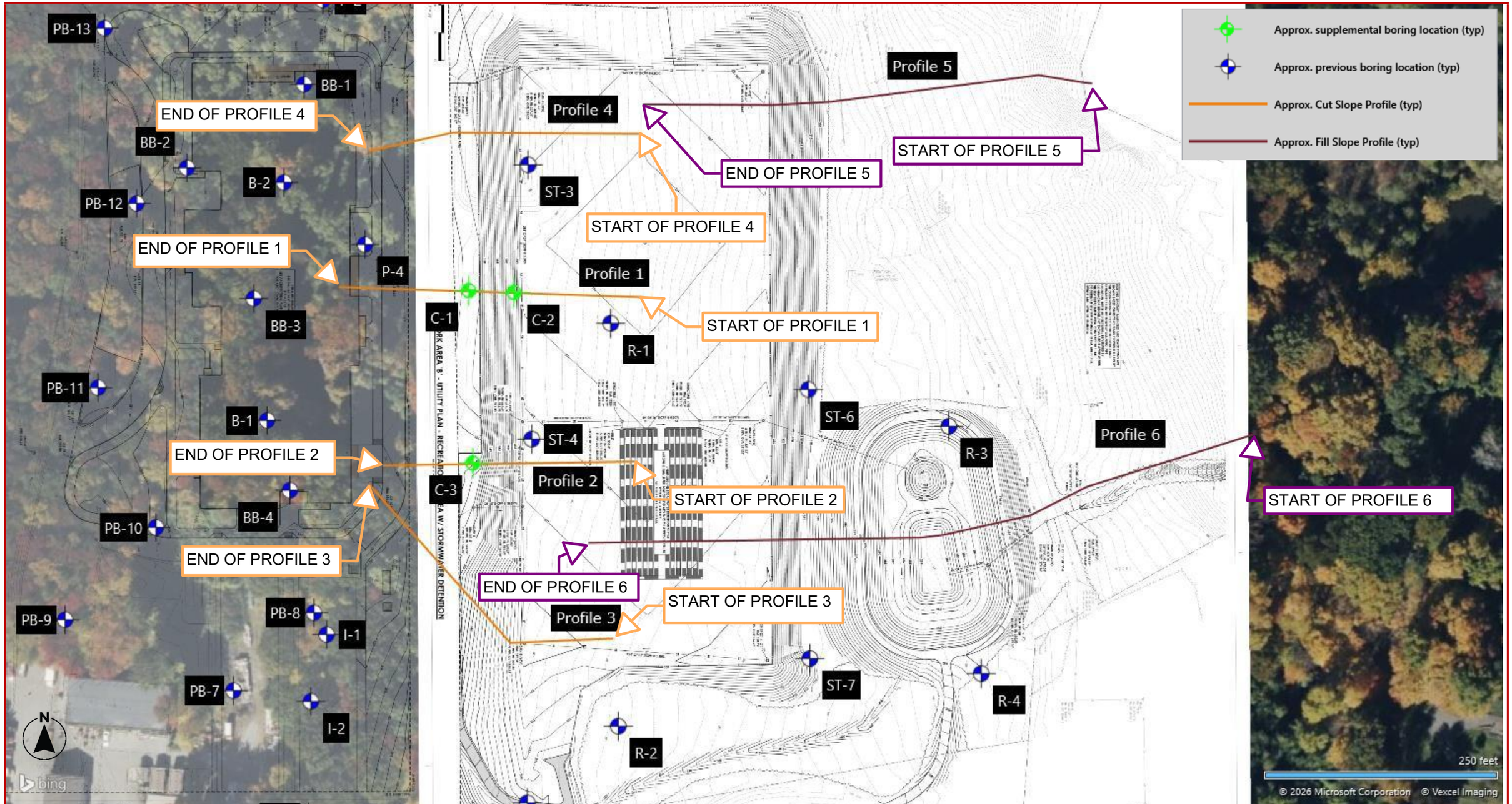


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Appendix C

Supplemental Investigation Boring Logs

(C-1, C-2, C-3)

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. C-1

Location: See Exploration Plan

Latitude: 41.1773° Longitude: -73.8585°

Depth (Ft.) Approximate Elevation: 352 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
		0.5 **TOPSOIL** 351.5					
2		**SANDY SILT (ML)**, brown, soft 2.0 350				1-1-1-3 N=2	16.5
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense 5.0 347				3-4-7-8 N=11	9.2
4		**SILTY SAND (SM)**, trace gravel, cobbles noted, brown, medium dense to very dense, (Glacial Till)				9-11-17-18 N=28	9.6
						14-19-26-26 N=45	10.5
						33-41-50/0"	6.4
		18.0 334					
		Auger Refusal at 18 Feet					

5
10
15

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
No free water observed

Drill Rig
Mobile B-57

Hammer Type
Automatic

Driller
Ed Arfken

Notes

Advancement Method
3 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
DOL

Boring Started
04-28-2026

Boring Completed
04-28-2026

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. C-2

Location: See Exploration Plan

Latitude: 41.1768° Longitude: -73.8585°

Model Layer	Graphic Log	Depth (Ft.)	Approximate Elevation: 348 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
		0.5	**TOPSOIL** 347.5						
2		2.0	**SANDY SILT (ML)**, brown, soft 346					1-2-1-3 N=3	13.6
3		5.0	**SILTY SAND (SM)**, trace gravel, brown, medium dense 343	5				4-6-10-11 N=16	10.7
4		25.7	**SILTY SAND (SM)**, trace gravel, cobbles noted, brown, medium dense to very dense, (Glacial Till) 322.3	10				5-11-12-14 N=23	8.9
								17-18-15-14 N=33	9.1
				15				8-50/4"	9.3
				20				5-17-39-50/2" N=56	8.2
				25				13-50/2"	
			Spoon Refusal at 25.7 Feet						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
21' while drilling
17' on 4/30/2026
16.7' on 5/8/2026

Drill Rig
Mobile B-57

Hammer Type
Automatic

Driller
Ed Arfken

Notes
Two wells installed, both 1" diameter PVC pipe. Deep groundwater monitoring well installed and screened from 15.7 to 25.7 feet. Backfilled up to 13 feet and then shallow groundwater monitoring well installed and screened from 3 to 13 feet. Remainder of well backfilled to ground surface.

Advancement Method
3 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
DOL

Boring Started
04-28-2026

Boring Completed
04-28-2026

Ossining UFSD - New Building and Site Improvements
100 Van Cortlandt Ave | Ossining, NY
Terracon Project No. JB245223

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Log No. C-3

Location: See Exploration Plan

Latitude: 41.1773° Longitude: -73.8583°

Depth (Ft.) Approximate Elevation: 352 (Ft.)

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)
		0.5 **TOPSOIL** 351.5					
2		**SANDY SILT (ML)**, brown, soft 2.0 350				1-1-3-5 N=4	13.9
3		**SILTY SAND (SM)**, trace gravel, brown, medium dense 5.0 347				5-10-9-10 N=19	13.0
4		**SILTY SAND (SM)**, trace gravel, cobbles noted, brown, medium dense to very dense, (Glacial Till)				11-12-13-17 N=25	9.3
						12-14-15-21 N=29	7.2
						49-50/1"	10.3
						25-50/1"	
		22.0 330 ***Spoon Refusal at 22 Feet***					

5 10 15 20

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations

16.6' on 4/30/2026
14.8' on 5/8/2026

Drill Rig
Mobile B-57

Hammer Type
Automatic

Driller
Ed Arfken

Notes

Two wells installed, both 1" diameter PVC pipe. Deep groundwater monitoring well installed and screened from 12 to 22 feet. Backfilled up to 11 feet and then shallow groundwater monitoring well installed and screened from 1 to 11 feet. Remainder of well backfilled to ground surface.

Advancement Method
3 1/4" ID HSA

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
DOL

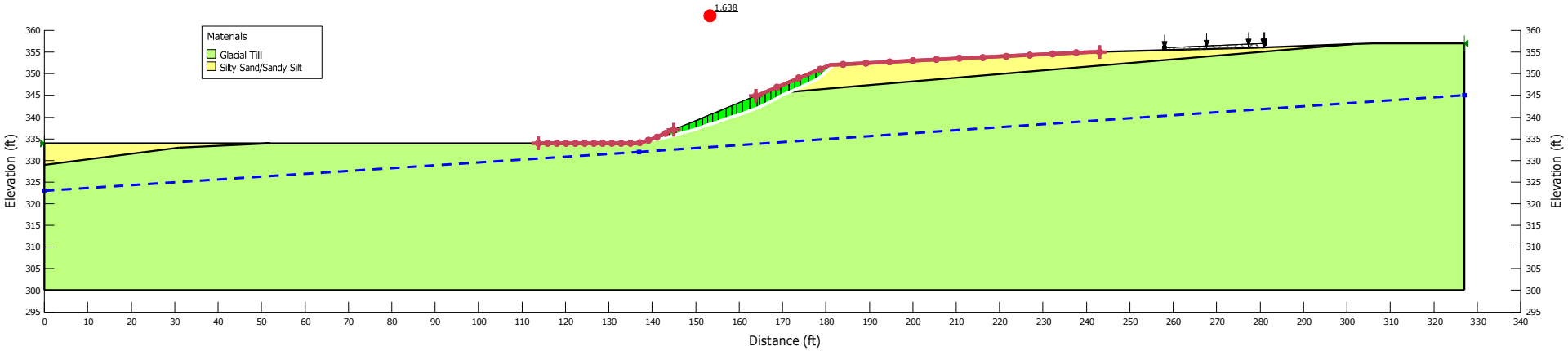
Boring Started
04-29-2026

Boring Completed
04-29-2026

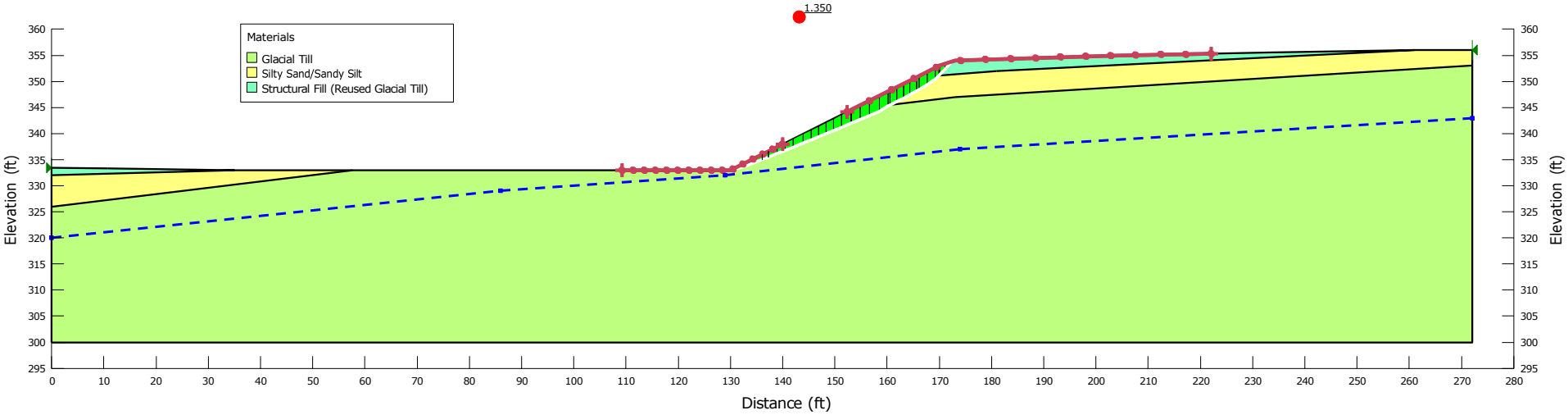
Appendix D

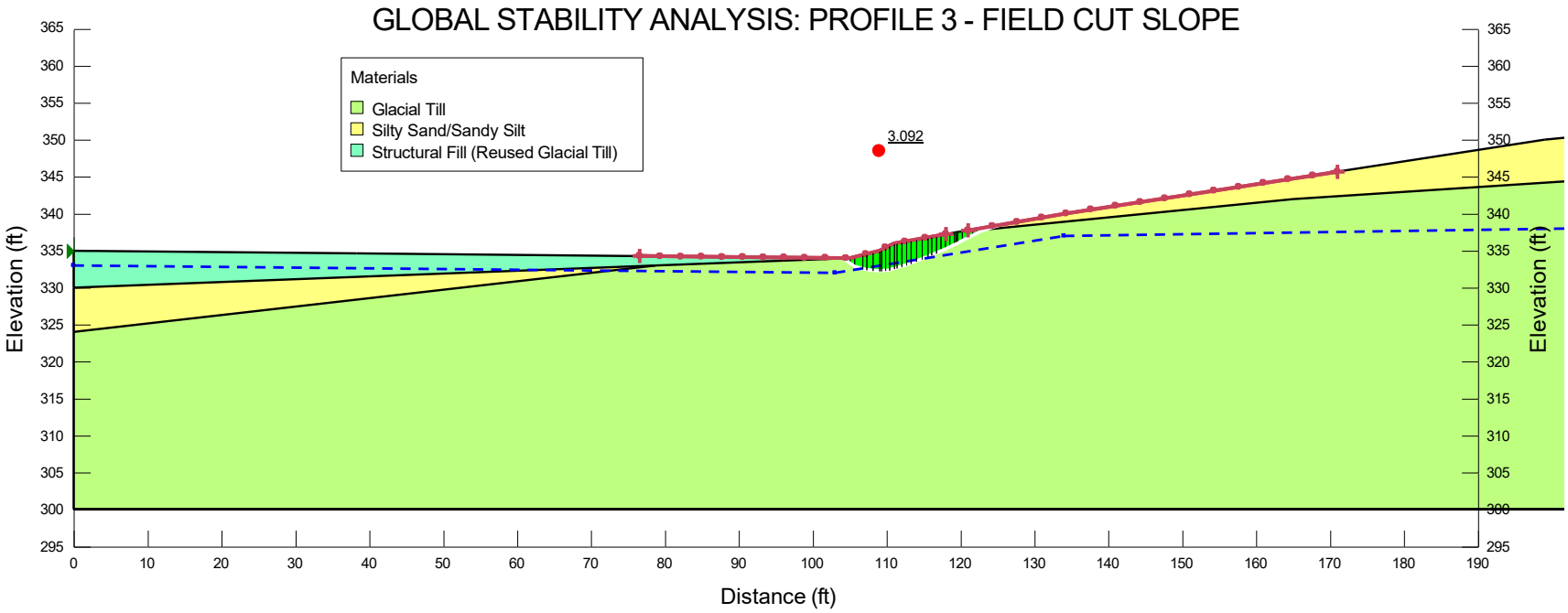
SLOPEW Outputs

GLOBAL STABILITY ANALYSIS: PROFILE 1 - FIELD CUT SLOPE

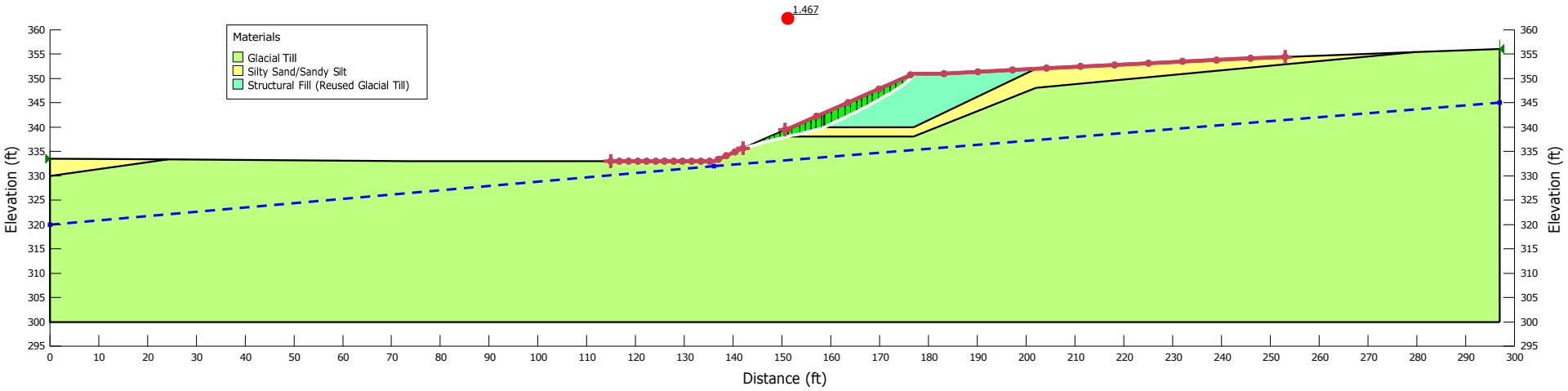


GLOBAL STABILITY ANALYSIS: PROFILE 2 - FIELD CUT SLOPE



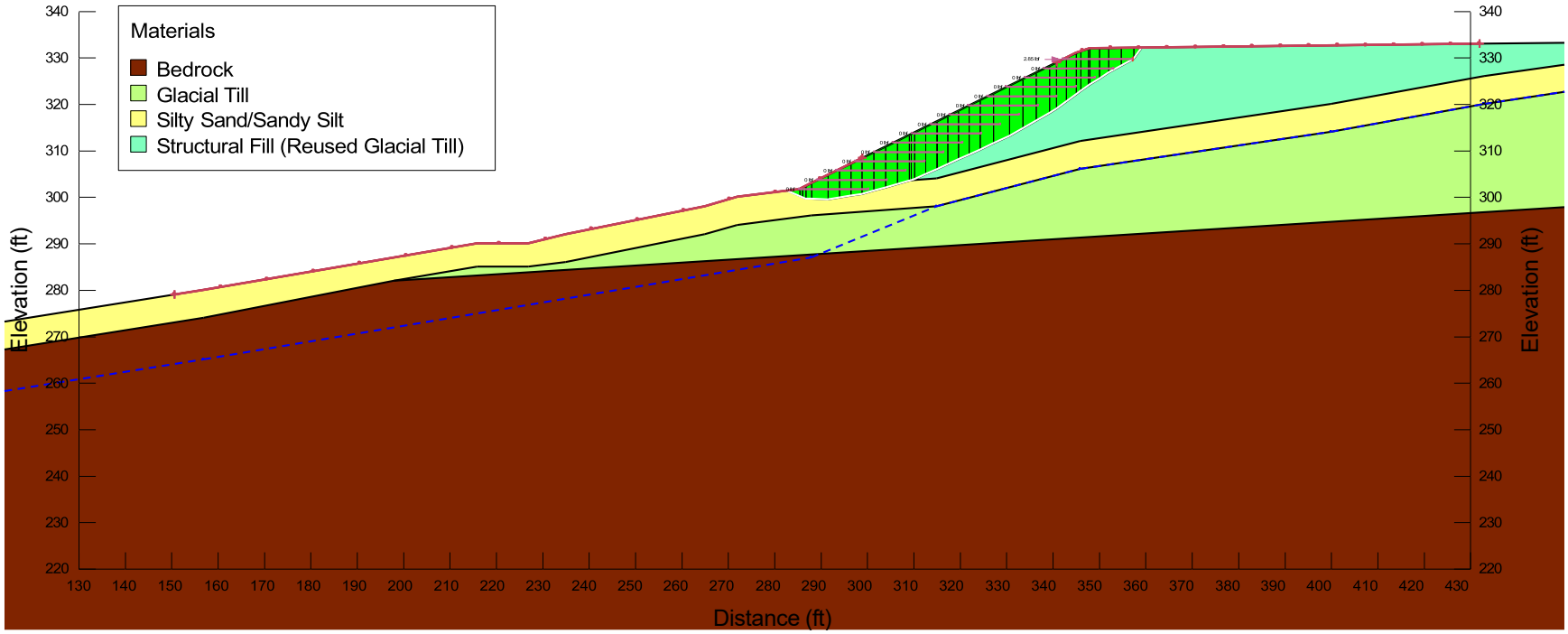

GLOBAL STABILITY ANALYSIS: PROFILE 3 - FIELD CUT SLOPE
Materials
Glacial Till
Silty Sand/Sandy Silt
Structural Fill (Reused Glacial Till)
3.092
Elevation (ft)
Distance (ft)
365
360
355
350
345
340
335
330
325
320
315
310
305
300
295
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

GLOBAL STABILITY ANALYSIS: PROFILE 4 - FIELD CUT SLOPE

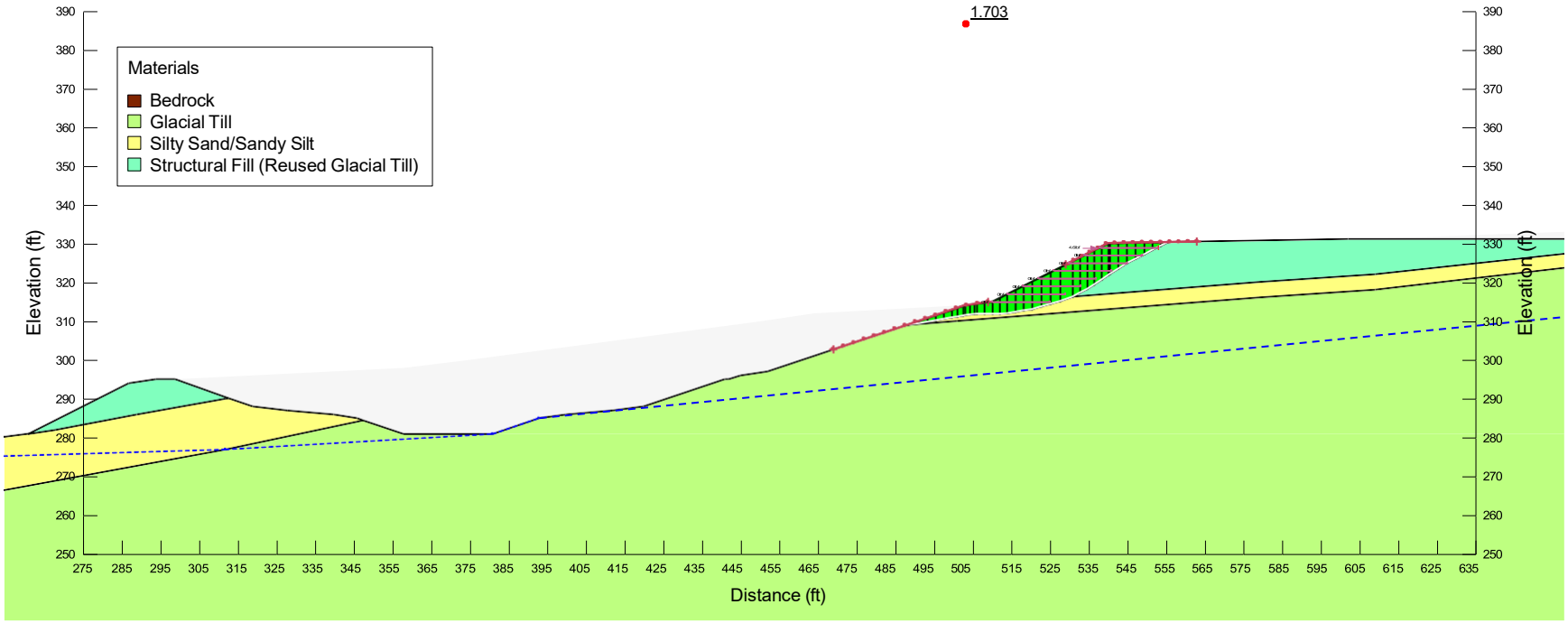


1.464

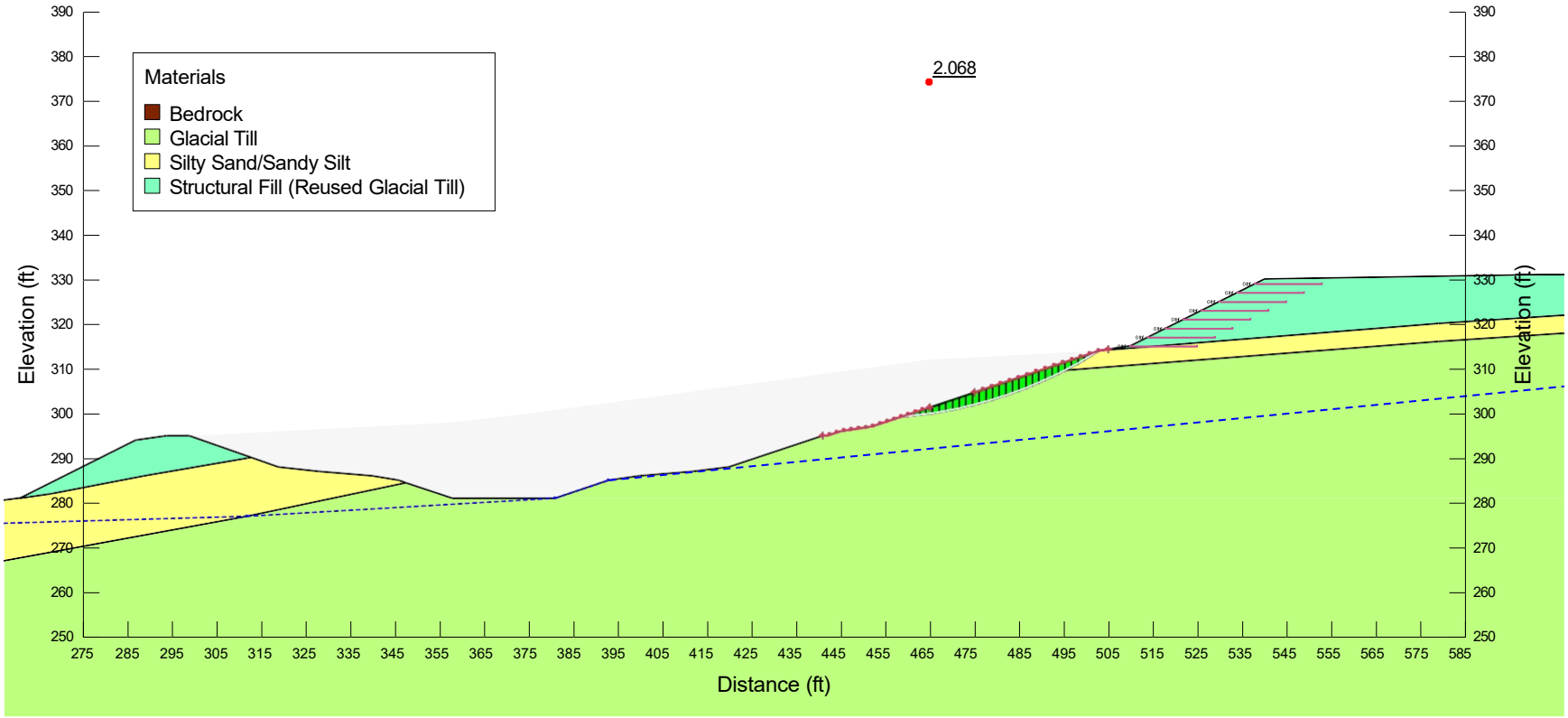
GLOBAL STABILITY ANALYSIS: PROFILE 5 - FIELD FILL SLOPE ANALYSIS



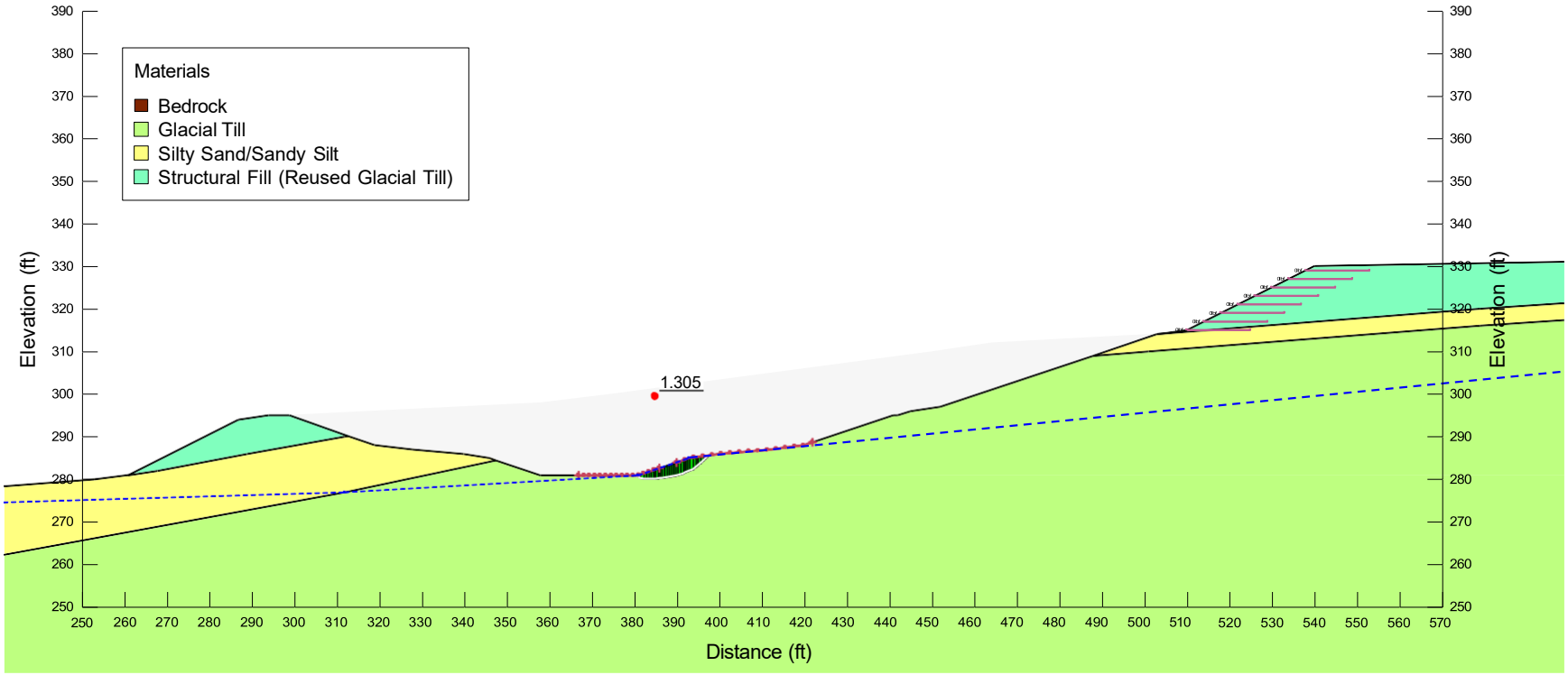
GLOBAL STABILITY ANALYSIS: PROFILE 6 - FIELD FILL SLOPE ANALYSIS

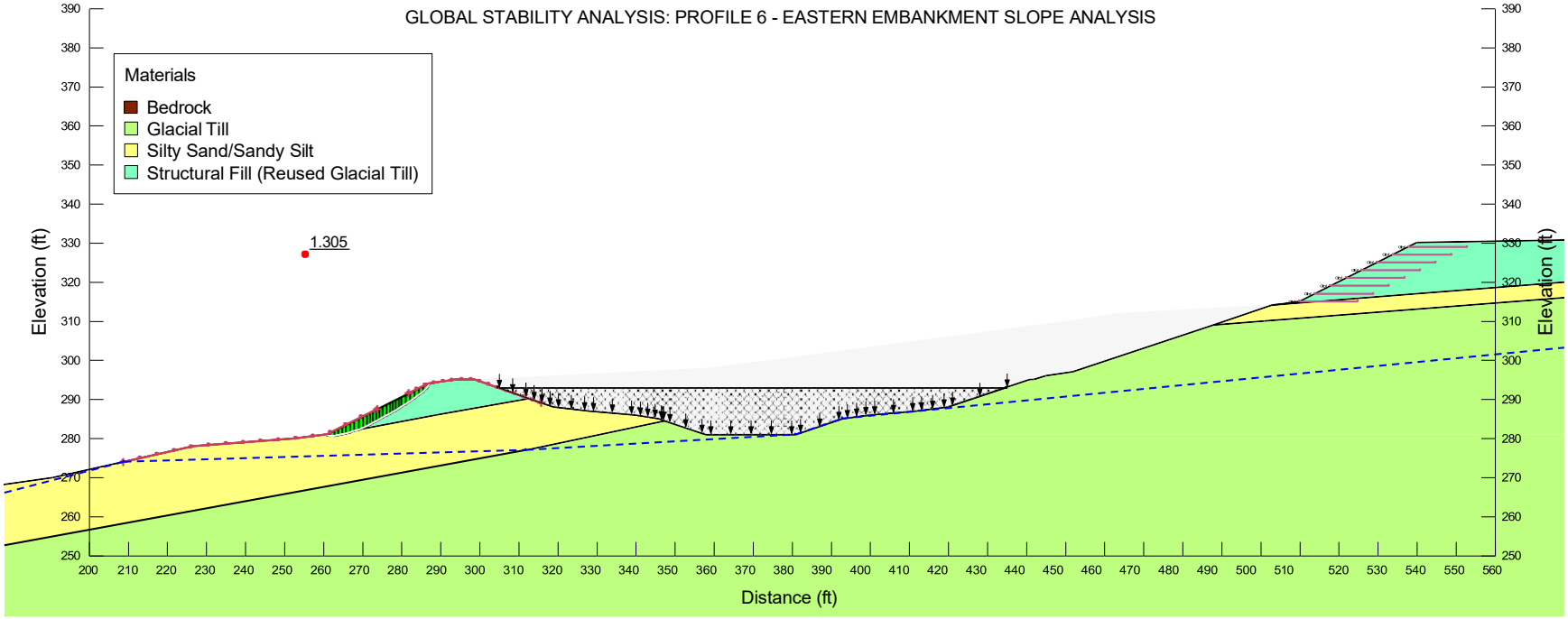


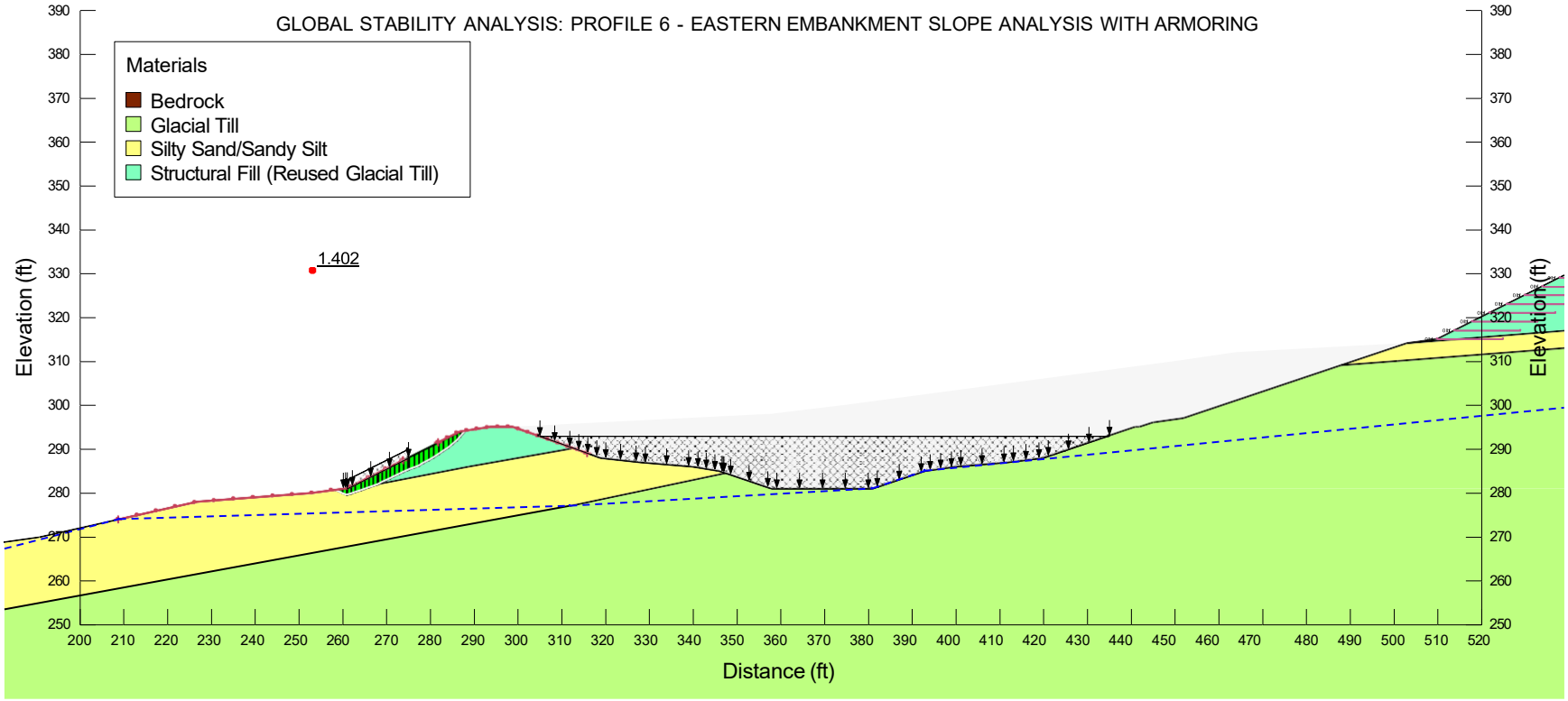
GLOBAL STABILITY ANALYSIS: PROFILE 6 - POND APPROACH SLOPE ANALYSIS



GLOBAL STABILITY ANALYSIS: PROFILE 6 - POND SLOPE ANALYSIS




GLOBAL STABILITY ANALYSIS: PROFILE 6 - EASTERN EMBANKMENT SLOPE ANALYSIS
Materials
Bedrock
Glacial Till
Silty Sand/Sandy Silt
Structural Fill (Reused Glacial Till)
1.305
Elevation (ft)
Distance (ft)


GLOBAL STABILITY ANALYSIS: PROFILE 6 - EASTERN EMBANKMENT SLOPE ANALYSIS WITH ARMORING
Materials
Bedrock
Glacial Till
Silty Sand/Sandy Silt
Structural Fill (Reused Glacial Till)
1.402
Elevation (ft)
Distance (ft)

Appendix E

Typical Reinforced Slope Notes

30 Corporate Circle, Suite 201
Albany, NY 12203
p (518) 266-0310
f (518) 805-6001
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Appendix E – Typical Reinforced Slope Notes

The following typical reinforced slope notes are provided for consideration by the civil designer during preparation of the site design documents. Final incorporation, modification, and coordination of these notes should be performed by the design team, as applicable to the project plans and specifications.

General Notes

- Work should be completed in general accordance with the design drawings, details, notes, and specifications prepared for the reinforced slope improvements.
- The contractor is responsible for protecting the work area from runoff and erosion during the construction period.
- Terracon should be retained to provide construction-period observation and testing services to evaluate whether the slopes are constructed in accordance with the design drawings, details, notes, and specifications.
- Snow should not be stockpiled at the top of the slopes or grades within the vicinity of the slopes, either during construction or in the final condition.
- The reinforced slope section pertains to fill slopes steeper than 1V:3H. The maximum slope inclination is 1V:2H.
- Slope grades should be permanently stabilized with perennial vegetation at completion of construction. Refer to the site civil drawings for additional information.

Materials

- Substitutions for specified materials should be reviewed and approved by Terracon.
- Materials used for construction should meet the minimum requirements of the recommended manufacturer, as approved by Terracon.
- In reinforced slope areas, geogrid reinforcement should consist of Mirafi Miragrid 3XT uni-axial type or equivalent, as specified on the drawings.

Technical Requirements

- Backfill should be placed from the slope face toward the ends of the geogrid so the geogrid remains in tension.
- The slope face should be compacted using light mechanical or hand-operated equipment to compact the face and limit material from sloughing down the slope. Means and methods should be demonstrated to Terracon in the field and adjusted as warranted.

Geogrid Requirements for Reinforced Slope

- Geogrids should be placed at the locations within the slope profile, and at the lengths and spacings shown on the contract drawings, in accordance with the manufacturer's recommendations.
- Geogrid reinforcement should be continuous throughout its embedment.
- Prior to fill placement, geogrids should be laid flat and pulled taut to remove slack.
- Tracked construction equipment should not be operated directly on the geogrid. A minimum fill thickness of 6 inches should be provided before operating tracked vehicles

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over the geogrid. Turning of tracked vehicles should be kept to a minimum to reduce the potential for displacement of fill and/or geogrid.

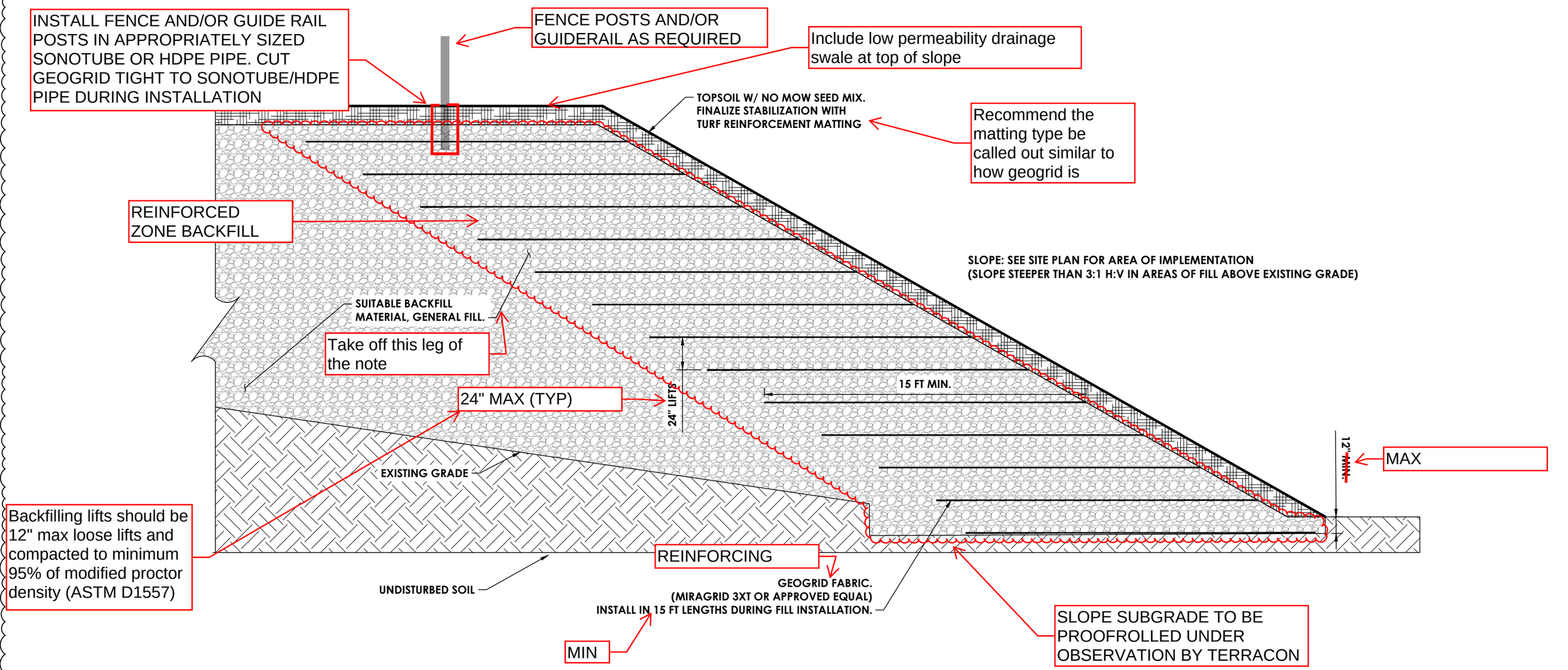
- Rubber-tired vehicles may pass over the geogrid reinforcement at slow speeds less than 5 mph. Sudden braking and sharp turning should be avoided.
- Geogrids should be rolled out with the machine direction perpendicular to the slope face.
- Changes to the geogrid layout, including but not limited to length, geogrid type, or spacing, should not be made without Terracon's review and consent.

Reinforced Zone Backfill

- If onsite material is planned to be reused as Reinforced Zone backfill, the material should contain no particles larger than 3 inches and should be free of organics, oversized particles, and/or unsuitable foreign matter, pending review and approval by Terracon. If Imported Structural Fill is planned to be used refer to our geotechnical report for gradation recommendations.
- Backfill should be placed in maximum 12-inch loose lifts and compacted using equipment capable of satisfying the in-place density requirements specified below.
- Backfill should be uniformly and thoroughly compacted to at least 95 percent of the maximum dry density and within +/- 2 percent of optimum moisture content as determined by the Modified Proctor test, ASTM D1557, unless otherwise recommended by Terracon.
- Backfill within 3 feet of the slope face should be compacted with light mechanical or hand-operated compaction equipment. Fill should be compacted until firm and unyielding to the satisfaction of the Terracon representative.
- At the end of each workday, backfill should be graded away from the slope crest and rolled to reduce the potential for ponding of water and erosion of the slope face.

Appendix F

Fill Slope Detail Markup



APPENDIX F
FILL SLOPE DETAIL MARKUP

1 SLOPE PROTECTION - FILL SLOPE
N.T.S.

SECTION 003140
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

PART 1 GENERAL

1.01 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. This Section with its referenced attachments are part of the Procurement and Contracting Requirements for the Project. They provide additional project information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations and documentation.

B. A Stormwater Pollution Prevention Plan (SWPPP), prepared by CPL, dated September 2025, revised October 2026 is available for viewing and is appended to this Document.

C. Related Sections:
   1. Section 312500 "Erosion and Sedimentation Control".

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 003140

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OSSINING UNION FREE SCHOOL DISTRICT

ANNE M. DORNER MS DRIVEWAY & NEW 7/8 BUILDING PROJECTS

STORMWATER POLLUTION PREVENTION PLAN

SEPTEMBER 2025

Revised: October 2026

TOWN & VILLAGE OF OSSINING
WESTCHESTER COUNTY
NEW YORK

PREPARED FOR:
OSSINING UNION FREE SCHOOL DISTRICT
400 EXECUTIVE BOULEVARD
OSSINING NY, 10562

PREPARED BY:
CPL
26 IBM ROAD
POUGHKEEPSIE NY, 12601

CPL
ARCHITECTURE
ENGINEERING
PLANNING
CPLteam.com

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1 INTRODUCTION

The purpose of this report is to present erosion & sediment control measures and stormwater management practices that will be implemented as part of the multiphase project including access improvements (new driveway), drainage improvements (new collection, treatment & detention systems) and ultimately a new middle school building with numerous parking lots, sidewalks, various utilities and external recreational spaces (The Project). The Project is located at the parcel, Tax ID: 89.07-3-68, located on Stormytown Road in the Town of Ossining, County of Westchester and State of New York. The site is located on the neighboring parcel from the current Ossining Union Free School District's Anne M. Dorner Middle School Campus which is located at 100 Van Cortlandt Ave, Ossining NY, as shown in Figure 1. The Ossining Union Free School District (Applicant) is proposing to construct a new driveway primarily to allow a secondary means of access to the school's campus. This driveway and its improvements will also support the new 7/8 middle school building that is to be built in a second phase of construction. The complete development will include but is not limited to the following; stormwater management facilities, concrete sidewalks, asphalt parking lots for teachers, staff and parents, recreational spaces for students and site lighting. The following Stormwater Pollution Prevention Plan (SWPPP) has been completed to mitigate any increase in stormwater peak flow rates and while providing runoff water quality associated with the proposed improvements at the site. Mitigation measures will include standard management practices as outlined in the New York State Stormwater Management Design Manual and the New York State Standards and Specifications for Erosion and Sediment Control.

Owner/Operator Contact Information:

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Ossining, NY 10562

1.1 DESIGN REQUIREMENTS

Pursuant to Section 401 of the Clean Water Act, Stormwater discharges from construction activities to surface waters of the United States are unlawful unless they are authorized by a Pollution Discharge Elimination System permit. Given the scope of the project, coverage under the New York State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-25-001) is required, and is attached in Appendix A. As such, a Notice of Intent (NOI) is required to be filed with the New York State Department of Environmental Conservation (NYSDEC). The NOI Acceptance Letter will be inserted in Appendix A once it is obtained.

This Stormwater Pollution Prevention Plan (SWPPP) for the Project was prepared in accordance with the following:

- NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-25-001)
- New York State Stormwater Management Design Manual, July 2024
- New York State Standards and Specifications for Erosion and Sediment Control, York State Department of Environmental Conservation, November 2016.

The SWPPP outlines site specific guidelines for preventing stormwater runoff and potential pollutants from adversely impacting water resources during and following site construction. The three components of a SWPPP are the control of erosion and sediment, water quantity control, and water quality control. The objective of the SWPPP is to comply with the NYSDEC SPDES Permit GP-0-25-001 guidelines for the following practices:

- Prevention of sediment to receiving waters during construction,
- Prevention of adverse effects to the stormwater quality impacts upon receiving waters during and after construction,
- Attenuation of peak runoff rates following development when compared to pre-developed rates,
- Maintenance of stormwater facilities during and after construction.
- Demonstrate consideration of the future physical risks due to climate change pursuant to the CRRA, 6 NYCRR Part 490, and associated guidance per Part III.A.2. of GP-0-25-00

The SWPPP, as contained herein, may be revised based upon site conditions observed during or following construction. All proposed modifications shall be in accordance with the NYSDEC technical standards as outlined in GP-0-25-001 and shall be approved prior to implementation. This plan represents the minimum measures required to prevent erosion and sediment loss and control stormwater runoff and water quality. The contractor is responsible for installing additional measures as directed by the Engineer-in-Charge to prevent water quality violations and maintain compliance with the SPDES permit conditions. Revisions to the SWPPP should be noted.

1.2 EXISTING CONDITIONS

The project site is located on the border between the Town of Ossining and the Village of Ossining. The site currently is home to the Ossining Union Free School District's (The District) Anne M. Dorner Middle School. That campus sits between Van Cortlandt Ave and the Dale Cemetery. The site has two individual tax parcels. The middle school campus sits on the southerly parcel, Tax ID: 89.11-2-27 (Parcel 2). The project will have work on said parcel as well as the northerly parcel, Tax ID: 89.07-3-68 (Parcel 1) which is currently houses several buildings and equipment for the Facilities and Grounds Department, the rest of the lot is mature forest. This parcel is bordered by various commercial and residential properties on the north and west. The western border also includes Stormytown Road. The eastern border of the site is the Sing Sing Kill. New & redevelopment activities will occur on Parcel 1 while redevelopment activities will occur on Parcel 2. The general topography of the site slopes west to east (Stormytown Road to the Sing Sing Kill). Starting with relatively mellow slopes (1%-10%) throughout the site until around the middle of the property where the slope begins to drop and slopes increase to steep slopes 30%+. Ultimately, draining a majority of the site towards the Sing Sing Kill. The Sing Sing Kill discharges to the Hudson River.

Review of Flood Insurance Rate Maps (FIRM) prepared by FEMA the project site sits within the Zone X (Area of Minimal Flood Hazard). The project area can be found on map panel 36119C0136F, included as Figure 5 of this report.

According to the USGS Web Soil Survey, there are eleven (11) soil types present at the site. The Hydrologic Soil Group (HSG) ratings vary throughout with a combination of B's, C's and D's (see Appendix F). The following is a list of those soil types within the project area.

Table 1: Project Site Hydrologic Soil Groups

Map Unit Symbol	Map Unit Name	Rating	Acres
ChE	Charlton loam, 25 to 35 percent slopes	B	9.7
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.5
CsD	Chatfield-Carlton complex, 15 to 35 percent slopes, very rocky	B	1.6
Ff	Fluvaquents-Udifluvents complex, frequently flooded	A/D	0.8
LcB	Leicester loam, 3 to 8 percent slopes, stony	A/D	0.4
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	C	15.8
PnD	Paxton fine sandy loam, 15 to 25 percent slopes	C	0.0
RdB	Ridgebury complex, 3 to 8 percent slopes	D	8.5
Sh	Sun loam	C/D	1.8
Ub	Udorthents, smoothered	B	6.1
WdB	Woodbridge loam, 3 to 8 percent slopes	CD	13.0

1.3 PROPOSED CONDITIONS

The proposed construction activities (all phases) will disturb a total of approximately fifteen (15) acres. The overall development is broken into two phases (Phase 1 – AMD Driveway Project & Phase 2 – New 7/8 Building Project). Phase 1 is going to have more than 5 acres of soil disturbance but will not go over the 5 acre maximum without receiving a waiver from the NYSDEC. Phase 2 has approximately 15.5 acres of soil disturbance, however, soil disturbance activities will be phased to keep under the 5 acre maximum to avoid the need to request a waiver. Tree clearing activities will include temporary stabilization to keep disturbed areas under the 5 acre threshold. Phase 1 includes a heavy-duty asphalt driveway to connect Ossining Middle School and other District buildings to Stormytown road with concrete sidewalks for site navigation as well as a new staff parking lot. There will be some stormwater conveyance and treatment/detention facilities installed as well as some street lighting. Phase 2 includes the installation of the New Building Campus; 140,000 SF building, concrete sidewalks, asphalt parking lot, grass recreation play areas, additional stormwater conveyance and treatment/detention facilities as needed, and other necessary utilities for the operation of the new building (water, sanitary sewer, electric, natural gas etc.). At the end of each phase all areas of disturbance will be permanently stabilized.

In general, the construction activities for both phases to be performed include but aren't limited to:

- Installation of erosion and sediment control measures/fencing,
- Tree clearing and bulk grading
- Clearing, grubbing and stripping of topsoil,
- Establish soil stockpile areas,
- Begin Site Utility (water, sewer, storm, elec etc.) installations.
- Begin excavations for retaining walls and building foundations.
- Backfill areas of excavation.
- Construct new buildings.
- Installation of Sidewalk, fencing and areas adjacent to building construction.
- Installation of stormwater management areas.
- Final grading and pavement/concrete.
- Stabilization of disturbed areas, as necessary throughout construction.
- Permanent stabilization of disturbed areas.

The main purpose of this study is to analyze the stormwater runoff generated by the developed conditions while providing improved stormwater quality. The stormwater runoff under proposed conditions will maintain existing drainage patterns and ultimately drain into the Sing Sing Kill, following the eastern property line.

The proposed onsite improvements have been designed to limit their impact on natural features. The areas draining to the analysis points have been delineated using topographic maps, aerial and field surveys, and proposed grading plans.

2 HYDROLOGIC STORMWATER MANAGEMENT

2.1 HYDROLOGIC ANALYSIS METHODOLOGY

The quantity of stormwater runoff generated from a watershed can be affected by land development and site improvement projects. Construction activities that change surface vegetation, grades and amounts of impervious areas can decrease the groundwater infiltration. This reduction in infiltration will result in an increase in overland stormwater runoff rates. As a result, hydrologic modeling analyses are performed to evaluate the net effect the proposed site improvements will have on the existing site.

Guidelines outlined by USDA Soil Conservation Services were followed while calculating the runoff curve number and time of concentration for each subarea. The runoff curve numbers (CN) are based on weighted averages of ground cover and soil types. Topographic maps, soils surveys and site visits were used to determine ground cover and underlying soils.

Time of concentration (Tc) represents the time it takes for surface runoff to travel from the most hydraulically distant point within the watershed to the point of analysis. Surface slope, roughness, channel slope and shape, flow patterns and runoff velocities are factors that directly affect the time of concentration. Runoff velocities are based on ground characteristics and flow type. Stormwater runoff flows through drainage areas as sheet flow, shallow concentrated flow, open channel flow or flow in storm sewers. Runoff often begins as sheet flow in the upper limits of the subarea and can be characterized as flow over a broad surface area such as short stretches of grass and/or pavement. Sheet flow then gradually develops into shallow concentrated flow. Open channel flow or concentrated flow occurs when shallow concentrated flow converges into well-defined ditches or storm sewers. The sum of each travel time over the individual surfaces within the subarea determines the time of concentration.

To determine net changes in hydrologic conditions from proposed construction at the site, it was necessary create a model of how the site currently exists and compare that with proposed site conditions. Below are descriptions of how modeling was performed.

2.2 HYDROLOGIC STORM EVENTS

HydroCAD V10 software was used to create hydrologic models and using synthetic storm events to calculate runoff hydrographs. These synthetic storm events are based on statistical analysis of actual storm events for different durations over a broad geographical area. The Soil Conservation Services categorizes rainfall by distribution type associated to a geographical area and by the total number of inches of precipitation that is assumed to occur over a 24-hour duration.

The proposed project lies within the geographical boundary of the Type III rainfall distribution area. The following table lists the rainfall depth for each design storm event to be analyzed, which were obtained through the NRCC & NRCS Extreme Precipitation in New York & New England web service and included in Appendix B for reference. As part of the Stormwater Management Design Manual, July 2024 (Design Manual), specifically section 4.9 Rainfall Data, Distribution Curves and Hydrologic Modeling speaks to creating project specific rainfall distribution curves versus using the pre-established rainfall distributions (Type I, II, III, IV). These steps were followed and project specific rainfall distribution curves were used to analyze the runoff for the project. Table 2, below, indicates rainfall depth from each storm event.

Table 2: Rainfall Data

Design Storm Event	Total Rainfall Depth (Inches)
1-Year	2.78
2-Year	3.41
10-Year	5.14
25-year	6.50
50-year	7.77
100-Year	9.29
200-Year	11.13

3 HYDROLOGIC ANALYSIS OF EXISTING CONDITIONS – PHASE 1

3.1 EXISTING CONDITIONS

For the purposes of this analysis, the extent of the hydrologic model was limited to those areas impacted by the proposed improvement areas. All areas within the project limits currently drain to four design points defined to characterize the natural drainage pattern of the watershed.

Design Point 1 (DP-1) is a low point along the northern property boundary where runoff leaves the site. DP-1 consists of one contributing catchement identified as 1E. Drainage catchment 1E is approximately 2.23 acres in size and mainly consists of mature forest, an old gravel access drive and a federal wetland. Runoff from this area begins with sheet flow from a high spot, continues as shallow concentrated flow through the mature forest with varying understory into the Woodland Federal wetland until it reaches DP-1. Design Point 2 (DP-2) is a low point along the western property line, north of the Van Cortlandt Avenue Cul-da-sac, where runoff leaves the site. DP-2 consists of one contributing catchment identified as 2E. Drainage catchment 2E is approximately 6.02 acres in size and mainly consists of mature forest, with its western boundary acting as the low points within the isolated federal wetland. There is also a portion of the gravel access drive passing through catchment 2E. Runoff from this area begins with sheet flow from a high spot through dense woods, continues as sheet flow across the gravel path, and then continues as sheet flow through more dense mature forest. The runoff then changes to shallow concentrated flow through wooded area and ends with channel flow through a wetland until it reaches DP-2. Design Point 3 (DP-3) is manhole rim & outlet pipe of an existing structure within the Middle School Property. Runoff flows west and south from the existing building and collected and transported through a series of existing pipes and structures until ultimately reaching DP-3 and going into the municipal drainage system. DP-3 consists of one contributing catchment identified as 3E. Drainage catchment 3E is approximately 3.62 acres in size and consists of woods, grassed areas, paved areas for parking & recreational activities, paved roads with curbs and storm sewers, and buildings. Runoff from this area begins with sheet flow near the school gym. It begins to flow through grass, continues across some concrete sidewalk and continues as sheet flow across grass. The runoff then changes to shallow concentrated flow through grassed areas, continues through pavement where it ultimately is collected into the stormwater collection system via an existing catch basin. From there, runoff continues with pipe flow until it reaches DP-3. Design Point 4 (DP-4) is a low point along the eastern property boundary where runoff leaves the site via the Sing Sing Kill. DP-4 consists of one contributing catchment identified as 4E. Drainage catchment 4E is approximately 18.56 acres in size and mainly consists of mature forest. In addition, some of the area consists of gravel impervious surfaces as well as some grass lawn. Runoff from this area begins with sheet flow through a light wooded area, continues as shallow concentrated flow through woods, then crosses a utility access road traveling east down the hill. It continues as shallow concentrated flow through mature forest again. Runoff leaves the site as channel flow in the Sing Sing Kill ultimately at DP-4.

The limits of the drainage boundaries were defined based on surveyed topography, additional Lidar contours from NYS and USGS maps. A copy of the existing conditions drainage map is included as Figure 2.

See Table 3 below for a summary of the existing subareas.

Table 3: EXISTING CONDITIONS - DRAINAGE AREAS

Design Point	Drainage Area	Area (Acres)	Weighted CN	Tc (mins)
DP-1	Drainage Area – 1 DA-1/1E	2.226	80	19.1
DP-2	Drainage Area – 2 DA-2/2E	6.017	83	47.3
DP-3	Drainage Area – 3 DA-3/3E	3.612	93	13.4
DP-4	Drainage Area – 4 DA-4/4E	18.56	75	26.4

3.2 EXISTING CONDITIONS – HYDROLOGIC ANALYSIS RESULTS

The following table (Table 4) summarizes the peak flows generated from the watershed for the existing site for the various storm events (see Appendix for HydroCAD calculations and results).

Table 4: RUNOFF – EXISTING CONDITIONS

DESIGN POINT	1-YEAR STORM	10-YEAR STORM	100-YEAR STORM
DP-1	1.90 cfs	4.87 cfs	9.74 cfs
DP-2	3.75 cfs	9.10 cfs	17.92 cfs
DP-3	6.99 cfs	12.58 cfs	20.96 cfs
DP-4	9.47 cfs	29.36 cfs	64.64 cfs

4 HYDROLOGIC ANALYSIS OF PROPOSED CONDITIONS – PH 1 & 2

4.1 PROPOSED CONDITIONS (PH 1 – COMPLETE)

The proposed project involves the construction of a heavy-duty asphalt driveway to connect Ossining Middle School buildings to Stormytown road with sidewalks for site navigation, there will also be one parking lot installed to promote staff to park on the property and not along Van Cortlandt Avenue. Stormwater runoff from the construction will be directed to the proposed stormwater collection & management facilities. The stormwater management facilities, along with green infrastructure techniques (where applicable), will provide the required runoff reduction volume, water quality volume, and water quantity mitigation as outlined in the New York State Stormwater Management Design Manual.

The proposed onsite improvements have been designed to limit their impact on natural features when practical. To comply with the water quality and quantity requirements of the General Permit GP-0-25-001, the stormwater runoff from portions of the proposed site will be directed to the stormwater management facilities. Portions of the site will be re-contoured to accommodate the proposed site improvements. To analyze the proposed site improvements, the stormwater management plan utilizes the same four design points as discussed from the existing conditions (see Figure 3).

Design Point 1 (DP-1) is a low point along the northern property boundary where runoff leaves the site. DP-1 consists of one contributing catchement identified as Drainage Area – 1 (DA-1/1P). Drainage catchment 1P is approximately 1.75 acres in size and mainly consists of mature forest and a federal wetland. Runoff from this area begins with sheet flow from a high spot, continues as shallow concentrated flow through the mature forest with varying understory into the Woodland Federal wetland until it reaches DP-1. Design Point 2 (DP-2) is a low point along the western property line, north of the Van Cortlandt Avenue Cul-da-sac, where runoff leaves the site. DP-2 consists of one contributing catchment identified as Drainage Area – 2 (DA-2/2P). Drainage catchment 2P is approximately 2.72 acres in size and mainly consists of mature forest, with its western boundary acting as the low points within the isolated federal wetland. The drainage area starts along the back of the curbline of the new roadway. Runoff from this area begins with sheet flow from a high spot of the driveway through grass/meadow & dense woods. The runoff then changes to shallow concentrated flow through wooded area and ends with channel flow through a wetland until it reaches DP-2. Design Point 3 (DP-3) is manhole rim & outlet pipe of an existing structure within the Middle School Property. Runoff flows west and south from the existing building and collected and transported through a series of existing pipes and structures until ultimately reaching DP-3 and going into the municipal drainage system. DP-3 consists of one contributing catchment identified as Drainage Area – 3 (DA-3/3P). Drainage catchment 3P is approximately 3.68 acres in size and consists of grassed areas, paved areas for parking & recreational activities, paved roads with curbs and storm sewers, and buildings. Runoff from this area begins with sheet flow near the school gym. It begins to flow through grass, continues across some concrete sidewalk and continues as sheet flow across grass. The runoff then changes to shallow concentrated flow through grassed areas, continues through pavement where it ultimately is collected into the stormwater collection system via a new catch basin. From there, runoff continues with pipe flow until it reaches DP-3.

Design Point 4 (DP-4) is a low point along the eastern property line where runoff leaves the site via the Sing Sing Kill. DP-4 consists of three contributing catchments identified as Drainage Area – 4A, Drainage Area – 4B, and Drainage Area – 4C (DA-4A/4AP, DA-4B/4BP, DA-4C/4CP). Drainage

catchment 4AP is 4.528 acres in size and consists of mature forest, grassed area/sediment basin and a portion of the new driveway. Runoff from this area begins with sheet flow from a high spot located in the forested area. It then changes to a shallow concentrated flow through woods and onto the proposed roadway. Next, the runoff changes to pipe flow through 12" pipes. Lastly, it ends in pipe flow through an 18" pipe and discharges into the sediment basin. This basin collects and detains runoff for the duration of construction of Phase 1. Drainage catchment 4BP is 1.403 acres in size and consists of woods, paved parking, and some grassed areas. Runoff from this area begins with sheet flow from a high spot located in the mature forested area, continues through grassed area, and across the sidewalk/asphalt roadway. Then, it continues as shallow concentrated flow across the parking lot where it is collected via a catch basin. It continues as pipe flow in a 15" pipe that discharges to a flared end section with rip rap. Drainage catchment 4CP is 16.601 acres in size and consists mainly of mature forest, some gravel surfaces and wetlands surrounding the Sing Sing Kill. Runoff from this area begins with sheet flow from a high spot located in the mature forest. Then, it changes to shallow concentrated flow through the woods, crossing the utility driveway, and continues back through the mature forest. Finally, it switches to channel flow in the Sing Sing Kill and ultimately leaves the site at DP-4. 4AP & 4BP reach through 4CP to the ultimate outlet of DP-4 via some nature channels and shallow concentrated flow down the existing slope.

See Table 5 for a summary of the proposed subareas.

Table 5: PROPOSED CONDITIONS – DRAINAGE AREAS

Design Point	Drainage Area	Area (Acres)	Weighted CN	Tc(min)
DP-1	Drainage Area – 1 DA-1/1P	1.096	79	19.1
DP-2	Drainage Area – 2 DA-2/2P	2.715	84	31.7
DP-3	Drainage Area – 3 DA-3/3P	3.684	93	13.2
DP-4	Drainage Area – 4A DA-4A/4AP	4.528	84	21.6
	Drainage Area – 4B DA-4B/4BP	1.403	95	21.2
	Drainage Area – 4C DA-4C/4CP	16.601	74	26.4

4.2 PROPOSED CONDITIONS – HYDROLOGIC ANALYSIS RESULTS

The following table summarizes the peak flows generated from the proposed site for the various storm events at the analysis point (see Appendix D for hydrologic calculations and results).

Table 6: RUNOFF – PROPOSED CONDITIONS

DESIGN POINT	1-YEAR STORM	10-YEAR STORM	100-YEAR STORM
DP-1	1.39 cfs	3.70 cfs	7.53 cfs
DP-2	2.24 cfs	5.21 cfs	9.97 cfs
DP-3	7.17 cfs	12.89 cfs	21.47 cfs
DP-4	14.28 cfs	39.14 cfs	82.22 cfs

Using the same design points as defined under existing conditions, stormwater flows have been reviewed to ensure the peak flows are mitigated per the SPDES General Permit. Table 6 summarizes the peak flows generated from the site under existing and proposed conditions for the various storm events at each design point. The stormwater filtering practices, and underground stormwater detention and respective outlet structures have been designed to limit the projects impact on natural features and to reduce the peak flow rates from the site for the 1-year, 10-year and 100-year 24-hour storm events to comply with the water quantity requirements of the General Permit GP-0-25-001 (see Appendix C and D for computer calculations and results).

Table 7: RUNOFF – EXISTING, PROPOSED & MITIGATED CONDITIONS

DESIGN POINT 1	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	1.90 cfs	4.87 cfs	9.74 cfs
Proposed Conditons	1.39 cfs	3.70 cfs	7.53 cfs
Mitigated Conditions	1.39 cfs	3.70 cfs	7.53 cfs

DESIGN POINT 2	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	3.75 cfs	9.10 cfs	17.92 cfs
Proposed Conditons	2.24 cfs	5.21 cfs	9.97 cfs
Mitigated Conditions	2.24 cfs	5.21 cfs	9.97 cfs

DESIGN POINT 3	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	6.99 cfs	12.58 cfs	20.96 cfs
Proposed Conditons	7.17 cfs	12.89 cfs	21.47 cfs
Mitigated Conditions	7.17 cfs	12.89 cfs	21.47 cfs

DESIGN POINT 4	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	9.47 cfs	29.36 cfs	64.64 cfs
Proposed Conditons	14.28 cfs	39.14 cfs	82.22 cfs
Mitigated Conditions	8.81 cfs	28.64 cfs	62.95 cfs

4.3 PROPOSED CONDITIONS (PH 2)

The proposed phase of the project involves the construction of a new middle school building (77,000 SF three-story building) along with but not limited to parking lots, access roadways (operational use and emergency use), sidewalks, recreational areas, building underground utilities as well as stormwater collection/detention facilities. Stormwater runoff from the construction will be directed to the proposed stormwater collection & management facilities. The stormwater management facilities, along with green infrastructure techniques (where applicable), will provide the required runoff reduction volume, water quality volume, and water quantity mitigation as outlined in the New York State Stormwater Management Design Manual.

The proposed onsite improvements have been designed to limit their impact on natural features when practical. To comply with the water quality and quantity requirements of the General Permit GP-0-25-001, the stormwater runoff from portions of the proposed site will be directed to the stormwater management facilities. Portions of the site will be re-contoured to accommodate the proposed site improvements. To analyze the proposed site improvements, the stormwater management plan utilizes the same four design points as discussed from the existing conditions (see Figure 3).

Design Point 1 (DP-1) is a low point along the northern property boundary where runoff leaves the site. DP-1 consists of one contributing catchement identified as Drainage Area – 1 (DA-1/1P). Drainage catchment 1P is approximately 1.09 acres in size and mainly consists of mature forest and a federal wetland. Runoff from this area begins with sheet flow from just off of Stormytown Road in the northwest corner of the DA, continues as shallow concentrated flow through the mature forest with varying understory into the Woodland Federal wetland until it reaches DP-1.

Design Point 2 (DP-2) is a low point along the western property line, north of the Van Cortlandt Avenue Cul-da-sac, where runoff leaves the site. DP-2 consists of one contributing catchment identified as Drainage Area – 2 (DA-2/2P). Drainage catchment 2P is approximately 2.45 acres in size and mainly consists of mature forest, with its western boundary acting as the low points within the isolated federal wetland. The drainage area starts along the back of the curbline of the new roadway. Runoff from this area begins with sheet flow from a high spot of the driveway through grass/meadow & dense woods. The runoff then changes to shallow concentrated flow through wooded area and ends with channel flow through a wetland until it reaches DP-2.

Design Point 3 (DP-3) is manhole rim & outlet pipe of an existing structure within the Middle School Property. Runoff flows west and south from the existing building and collected and transported through a series of existing pipes and structures until ultimately reaching DP-3 and going into the municipal drainage system. DP-3 consists of one contributing catchment identified as Drainage Area – 3 (DA-3/3P). Drainage catchment 3P is approximately 3.68 acres in size and consists of grassed areas, paved areas for parking & recreational activities, paved roads with curbs and storm sewers, and buildings. Runoff from this area begins with sheet flow near the school gym. It begins to flow through grass, continues across some concrete sidewalk and continues as sheet flow across grass. The runoff then changes to shallow concentrated flow through grassed areas, continues through pavement where it ultimately is collected into the stormwater collection system via a new catch basin. From there, runoff continues with pipe flow until it reaches DP-3.

Design Point 4 (DP-4) is a low point along the eastern property line where runoff leaves the site via the Sing Sing Kill. DP-4 consists of four (4) contributing catchments identified as Drainage Area – 4A, Drainage Area – 4B, Drainage Area – 4C and Drainage Area – 4D (DA-4A/4AP, DA-4B/4BP, DA-4C/4CP, DA-4D/4DP). Drainage catchment 4AP is 6.65 acres in size and consists of the New Building, the new parking lot, access driveways, sidewalks, portions of the existing driveway, grass areas and some remaining mature forest. Runoff from this area begins at the face of building on the southwestern corner as sheet flow, traveling across grass and sidewalk before turning to shallow concentrated flow. The Runoff shortly after continues into the pavement of the existing driveway as shallow concentrated flow. Finally, entering a catch basin where the runoff continues as pipe flow through the conveyance system ultimately entering the Stormwater Pond. Drainage catchment 4BP is 7.47 acres in size and consists of a recreation field for students use, asphalt pathways to get from the building to the rec field and a meadow embankment. Runoff from this area begins in the center of the rec field which is graded with a crown. From there the runoff travels via sheet flow and eventually as shallow concentrated flow through the grassed rec field until it enters a catch basin at

the corner of the field. The perimeter catch basins each have perimeter ditch lines directing runoff to the various inlet structures. The runoff continues to the Stormwater Pond via pipe flow.

Drainage catchment 4CP is approximately 9.72 acres in size and consists mainly of mature forest, some gravel surfaces and wetlands surrounding the Sing Sing Kill. Runoff from this area begins with sheet flow from a high spot located on the embankment of the rec field. Then, it changes to shallow concentrated flow through the woods, crossing the utility driveway, and continues back through the mature forest. Finally, it switches to channel flow in the Sing Sing Kill and ultimately leaves the site at DP-4. 4AP, 4BP & 4DP all get conveyed and detained within the stormwater pond which then reaches through 4CP to the ultimate outlet of DP-4 via an armored natural channel.

Drainage catchment 4DP is 1.36 acres in size and consists of paved parking, sidewalks, and some grassed areas. Runoff from this area begins with sheet flow from the crown in the existing access road, flows to the east via sheet flow into an existing catch basin. Then from that point runoff is conveyed via pipe flow until it reaches an intermediate detention/infiltration system. Runoff from this system is released via a control structure into the stormwater conveyance system that leads to the Stormwater Pond and Design Point – 4.

See Table 8 for a summary of the proposed subareas.

Table 8: PROPOSED CONDITIONS – DRAINAGE AREAS

Design Point	Drainage Area	Area (Acres)	Weighted CN	Tc(min)
DP-1	Drainage Area – 1 DA-1/1P	1.096	80	12.2
DP-2	Drainage Area – 2 DA-2/2P	1.473	83	36.4
DP-3	Drainage Area – 3 DA-3/3P	3.684	93	13.2
DP-4	Drainage Area – 4A DA-4A/4AP	6.651	93	12.6
	Drainage Area – 4B DA-4B/4BP	7.473	74	17.1
	Drainage Area – 4C DA-4C/4CP	9.715	71	12.4
	Drainage Area – 4D DA-4D/4DP	1.363	95	6

The following table summarizes the peak flows generated from the proposed site for the various storm events at the analysis point (see Appendix D for hydrologic calculations and results).

Table 9: RUNOFF – PROPOSED CONDITIONS

DESIGN POINT	1-YEAR STORM	10-YEAR STORM	100-YEAR STORM
DP-1	1.15 cfs	2.93 cfs	5.78 cfs
DP-2	1.77 cfs	4.26 cfs	8.31 cfs
DP-3	7.17 cfs	12.89 cfs	21.47 cfs
DP-4	22.70 cfs	56.62 cfs	114.75 cfs

Using the same design points as defined under existing conditions, stormwater flows have been reviewed to ensure the peak flows are mitigated per the SPDES General Permit. Table 6 summarizes

the peak flows generated from the site under existing and proposed conditions for the various storm events at each design point. The stormwater filtering practices, and underground stormwater detention and respective outlet structures have been designed to limit the projects impact on natural features and to reduce the peak flow rates from the site for the 1-year, 10-year and 100-year 24-hour storm events to comply with the water quantity requirements of the General Permit GP-0-25-001 (see Appendix C and D for computer calculations and results).

Table 10: RUNOFF – EXISTING, PROPOSED & MITIGATED CONDITIONS

DESIGN POINT 1	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	1.90 cfs	4.87 cfs	9.74 cfs
Proposed Conditons	1.15 cfs	2.93 cfs	5.78 cfs
Mitigated Conditions	1.15 cfs	2.93 cfs	5.78 cfs

DESIGN POINT 2	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	3.75 cfs	9.10 cfs	17.92 cfs
Proposed Conditons	1.77 cfs	4.26 cfs	8.31 cfs
Mitigated Conditions	1.77 cfs	4.26 cfs	8.31 cfs

DESIGN POINT 3	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	6.99 cfs	12.58 cfs	20.96 cfs
Proposed Conditons	6.99 cfs	12.58 cfs	20.96 cfs
Mitigated Conditions	6.99 cfs	12.58 cfs	20.96 cfs

DESIGN POINT 4	1-YEAR STORM EVENT	10-YEAR STORM EVENT	100-YEAR STORM EVENT
Existing Conditions	9.47 cfs	29.36 cfs	64.64 cfs
Proposed Conditons	22.70 cfs	56.62 cfs	114.75 cfs
Mitigated Conditions	5.47 cfs	28.64 cfs	62.95 cfs

5 STORMWATER MANAGEMENT FACILITY - HYDRAULIC SUMMARY

5.1 STORMWATER MANAGEMENT FACILITY RESULTS (PHASE 1)

Stormwater management facilities will be constructed at the site and receive drainage from the developed impervious areas. The stormwater management facilities are designed to mitigate the increased stormwater runoff generated from the addition of impervious cover. The stormwater management facilities will decrease the rate at which the stormwater is discharged from the site.

The stormwater management facilities have been sized using the criteria set forth within the NYS Stormwater Management Design Manual and the computer modeling software "HydroCAD." This software analyzes the peak inflow from the watershed areas and calculates discharge based upon storage characteristics such as depth, area, volume, and outlet structure controls (computer calculations and results are included in Appendix D).

As part of Phase 1, two management facilities are being installed. One is a permanent facility, that being an underground infiltration system. The second is a temporary sediment basin which will be installed and maintained throughout Phase 1 construction and during the beginning of Phase 2's construction. At that point it will be demolished/relocated as necessary.

The following stormwater management facilities have been designed to mitigate the 10-year and 100-year storm events as required by the SPDES General Permit. Additionally, the facilities have been designed to provide 24-hour extended detention volume of the post-development 1-year storm (Channel Protection Volume, CPv).

The facilities provide more than the 4,500 cubic-feet of storage needed to provide extended detention of the 1-year storm. The channel protection volume release rate is controlled by the outlet structures. Required outlet size to meet the required release rate was however smaller than three (3) inches in diameter so the outlet sizes have defaulted to three (3) inch diameter openings. The total storage provided is approximately 15,856 cubic-feet.

The peak outflows and ponding elevations from the stormwater management facilities during the various storm events is summarized in Table 8.

Table 11: UNDREGROUND DETENTION SYSTEM

Design Storm Event	Post-Dev. Inflow (cfs)	Post Dev Outflow (cfs)	Time to Peak Outflow (hrs)	Ponding Elevation (ft)	Storage Volume Used (cf)
1-Year	2.33	0.24	13.20	348.18	5,227
10-Year	4.10	1.60	12.66	349.05	8,843
100-Year	6.81	3.33	12.42	350.22	12,632
Chamber Bottom Elev.	347.50'				
Outlet Pipe Elev.	347.00'				
Outlet Str. Top Elev.	356.78'				

Table 12: SEDIMENT BASIN

Design Storm Event	Post-Dev. Inflow (cfs)	Post Dev Outflow (cfs)	Time to Peak Outflow (hrs)	Ponding Elevation (ft)	Storage Volume Used (cf)
1-Year	4.59	0.24	13.20	341.89	14,767
10-Year	10.52	1.54	13.30	343.96	40,449
100-Year	19.88	5.26	12.89	346.66	56,497
Basin Bottom Elev.	338.00’				
Outlet Pipe Elev.	336.00’				
Outlet Str. Top Elev.	347’.00’				
Overflow Spillway	349.00’				

These stormwater management facilities mitigate the 10-year (Qp) and 100-year (Qf) storm events and provide the Channel Protection Volumes (CPv) as required by the New York State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-25-001.

5.2 STORMWATER MANAGEMENT FACILITY RESULTS (PHASE 2)

Stormwater management facilities will be constructed at the site and receive drainage from the developed impervious areas. The stormwater management facilities are designed to mitigate the increased stormwater runoff generated from the addition of impervious cover. The stormwater management facilities will decrease the rate at which the stormwater is discharged from the site.

The stormwater management facilities have been sized using the criteria set forth within the NYS Stormwater Management Design Manual and the computer modeling software “HydroCAD.” This software analyzes the peak inflow from the watershed areas and calculates discharge based upon storage characteristics such as depth, area, volume, and outlet structure controls (computer calculations and results are included in Appendix D).

Phase 2 incorporates one large stormwater permanent micropool extended detention pond to mitigate the peak inflow in the proposed development conditions. This system has been designed to appropriately treat both necessary water quality volume as well as detain the larger storm events effectively.

The following stormwater management facility has been designed to mitigate the 10-year and 100-year storm events as required by the SPDES General Permit. Additionally, the facility has been designed to provide 24-hour extended detention volume of the post-development 1-year storm (Channel Protection Volume, CPv).

The facility provides more than the 59,720 cubic-feet of storage needed to provide extended detention of the 1-year storm. The channel protection volume release rate is controlled by the outlet structure. The outlet size required to meet the required release rate is four (4) inches in diameter. The total storage provided is approximately 217,293 cubic-feet.

The peak outflows and ponding elevations from the stormwater management facilities during the various storm events is summarized in Table 8.

Table 13: MICROPOOL EXTENDED DETENTION POND (MEDP-1)

Design Storm Event	Post-Dev. Inflow (cfs)	Post Dev Outflow (cfs)	Time to Peak Outflow (hrs)	Ponding Elevation (ft)	Storage Volume Used (cf)
1-Year	15.06	0.68	12.15	289.27	48,975
10-Year	30.01	8.65	12.13	291.05	89,681
100-Year	56.31	29.72	12.14	292.45	125,758

Basin Bottom Elev.	280.5’
Outlet Pipe Elev.	279.50’
CPv Device Elev.	286.50’
Weir (24” W x 12” H) x 3	290.50’
Outlet Str. Top Elev.	292.50’
Overflow Spillway	293.50’

These stormwater management facilities mitigate the 10-year (Qp) and 100-year (Qf) storm events and provide the Channel Protection Volumes (CPv) as required by the New York State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-25-001.

5.3 ON-SITE SEWER DESIGN METHODOLOGY

The proposed onsite stormwater drainage pipes are designed to capture the stormwater runoff associated with the proposed buildings, parking lots, sidewalks, bus loop and access road and then direct it to the stormwater chambers. HydroCAD was used to size the full flow capacities for the proposed storm sewer system using Smooth Interior Corrugated Polyethylene Pipe (HDPE) with a Manning’s roughness coefficient of 0.013.

Calculations for stormwater conveyance are included within Appendix E.

6 STORMWATER QUALITY MANAGEMENT

6.1 STORMWATER QUALITY ANALYSIS METHODOLOGIES

The quality of runoff generated within a watershed can be affected by land development and site improvement projects. Pollutants carried by surface runoff can degrade the water quality downstream.

The minimum threshold for mitigating water quality has been established within the NYS SPDES General Permit requirements for stormwater discharges from construction disturbances greater than one (1) acre. The technical standards associated with the SPDES General Permit require the capture and treatment of 90% of the average annual stormwater runoff volume.

Water quality can be further enhanced by meeting the runoff reduction volume requirement. The intent of the requirement is to utilize green infrastructure techniques and standard stormwater management practices to replicate pre-development hydrology. Runoff reduction volume is a function of the Hydrologic Soil Group Specific Reduction Factor and can be calculated using the methods given in the NYS DEC Stormwater Management Design Manual. The Uniform Stormwater Sizing Criteria within the manual was used to calculate the required water quality volume and runoff reduction volume for the project. The calculations are included in **Appendix E**.

6.2 STORMWATER QUALITY & RUNOFF REDUCTION ANALYSIS DATA

New development projects require water quality volume (WQv) treatment for 100% of the new impervious cover if standard stormwater practices are utilized. Required water quality volume is adjusted based on the amount of new impervious cover. Redevelopment projects require different levels of water quality volume treatment depending on what category the project falls under while also treating 100% of all new impervious area that is included in the project. Redevelopment Projects are not required to meet the Run Off Reduction component as it sometimes is difficult due to existing site conditions.

As this project is being constructed in multiple phases, as previously discussed, installation of all necessary water quality practices wasn't practical during each phase. To ensure the best practices for stormwater water quality treatment for the entire project site a portion of the Phase 1 WQv will not be treated as part of the first phase and will be treated through various practices installed during Phase 2. In Phase 1, an underground infiltration system is going to be installed to treat a sub-catchment that includes both new development and redevelopment. There will also be an alternative practice (flow based) device installed as part of Phase 1 containing redevelopment areas.

To begin to meet the full water quality volume (WQv) and minimum runoff reduction volume (RRv) criteria for the entire project, stormwater devices are proposed to be used at the site as described below:

Phase 1 – AMD Driveway & Parking Lot

The project is a redevelopment project that contains portions of new developed impervious areas, redeveloped impervious areas and redeveloped impervious to pervious areas. Due to this fact, 100% Water Quality Volume is required for all the new impervious areas. For the areas of redevelopment, they fall into one of the various options, for this project specifically Option II & Option IV as described in Chapter 9 of the Design Manual. As the project is a redevelopment project, Run Off Reduction isn't required in the redevelopment areas.

Due to the phased nature of the project, installing all final SMPs for WQv treatment isn't practical, this specifically applies to Drainage Area – 4 that contains three (3) subcatchments. Catchment 4BP includes about 50% redeveloped impervious area and 33% new impervious area, with the remaining 17% being new pervious grassed areas. This catchment will be collected via a stormwater collection system and then treated by an underground infiltration system. This system will treat both the necessary WQv for all areas and the RRv for the new impervious areas. Subcatchment 4AP includes mostly new impervious areas with a small amount of redeveloped impervious area, grassed areas adjacent to the driveway and the mature forested area that's remaining. This areas have been collected and sent to the Temporary Sediment Basin that will be used during Phase 1 and continuing into Phase 2. With the earth work necessary to build the system it was not practical to install the underground infiltration system as it will need to function with the site as designed in Phase 2. With this being the case the WQv will be accounted for in practice installed as part of Phase 2. Subcatchment 4CP is undeveloped and is to remain mostly that way throughout Phase 2.

Drainage Area – 3 has one subcatchment that includes mostly redeveloped impervious area and some new impervious areas. As this basically the existing school campus (driveway, parking areas, maintenance/garage buildings) there is not a lot of space and head to construction a SMP that would treat the necessary WQv for both new impervious and redeveloped impervious as well as the necessary RRv. With those conditions, a proprietary flow through practice is being proposed. This unit has been approved by the necessary agencies to be used not only for redevelopment projects but for new development projects as well. The sizing criteria for the Contech Jellyfish Unit (or approved equal) was based off of the Design Manual Appendix B. DP-3 will have runoff flow across redeveloped hardscapes and be collected with new drainage structures with sumps promoting solids to settle out of the system. Ultimately, runoff will flow through a proprietary practice (proprietary filter unit). Device will be an online practice with an internal bypass.

DP-1 & DP-2 have reductions in impervious area and will receive soil restoration as necessary to create new pervious areas.

The water quality and runoff reduction requirements for the project site were analyzed for the disturbed development area and are summarized below for DP-3 and DP-4:

Table 14: Required & Provided WQv (Phase 1)

DESIGN POINT	Total Req. WQv	Total Provided WQv	Practice Used
DP-3	5,722 cf	5,722> cf	Flow Through Practice
DP-4	4,084 cf	15,849.6 cf	Underground Infiltration (Phase 1)
	4,614 cf	111,339.5 cf	Underground Infiltration (Phase 2)

The following section discusses the techniques used to reduce the RRv and measures reviewed to achieve the RRv.

Soil Restoration

Soil restoration is required for this project for the pervious areas located within the development area where soils have been disturbed and will be vegetated after construction. This process will restore the original properties and porosity of the soil by deep till and amendment as detailed in the Stormwater Management Design Manual.

The potential Green infrastructure techniques used for Runoff Reduction are discussed below based on the site limitations and constraints.

Sheet flow to Filter Areas/Strips

Areas that are undeveloped that do not flow to the stormwater management practices will continue to flow to undisturbed areas such as surrounding vegetation and the existing drainage swales.

Tree Planting/Tree Pit

A landscaping plan has not been developed for this phase. Should a landscaping plan be developed under a future project, tree planting/tree pits will be considered.

Green Infrastructure

The proposed underground infiltration system has been designed to provide treatment to meet the requirements for WQv & RRv. The system has been sized to reduce 4,084 cf. The WQv not treated as part of phase will be accounted for in the sizing of the underground infiltration system that is proposed as part of phase 2. Calculations will indicate that as such and will account for the impervious area that is to be built in Phase 1 as new impervious in Phase 2.

Alternative Proprietary Devices

As previously discussed due to limiting site conditions a proprietary practice is being proposed in the place of a standard SMP. This practice is a filter unit and is sized as such. The Jellyfish (Contech) or Bayfilter (ADS) or an approved equal, will be used for this project. The filter unit has individual cartridges that allow water to flow throw them, adding the additional cartridges allows for more surface area to be obtained in a relatively small area allowing the unit to be placed in a completely developed area that would typically not be able to have a water quality practice. This unit is sized to treat the remainder of the required water quality volume, 3,590 cf.

Phase 2 – New Building, Parking Lot and Recreational Field Project

During the continued design of the phased project it was determined that a singular large infiltration system was not going to be practical to provide the necessary treatment of a new building, parking lots and a new recreational field area plus the required WQv from Phase 1 that could not be treated during that construction project. Phase 2 incorporates three practices to treat all of the requirements for RRv and WQv. They are the following, Conservation of Natural Areas (RR-1), Filtration Bioretention (F-5) and Micropool Extended Detention (P-1). Between these three practices all Run Off Reduction and Water Quality Volume was met. In a good faith effort to meet the greatest intent of the General Permit, Phase 2 was designed as a New Development Project even though it a continuation of the original Phase 1 project, that was in fact a redevelopment project of an existing school site.

Phase 2 focuses on Drainage Area – 4 to provide the necessary Water Quality Volume and Run Off Reduction for the New Building Site Development. DA-4 is made up of four sub-catchments. Catchment 4AP & 4DP incorporate both new development/redevelopment from Phase 1 as well as

the new development of the building and its associated parking, sidewalks, pathways, grassed play areas and landscaping. Catchment 4BP consists mostly of the recreational play area (grassed field) and it includes the asphalt pathway to get to the field. Catchment 4CP is mostly undeveloped and as such has minimal WQv. Overall DP-4 has approximately 24.7 acres of contributing area and is about 27% impervious. The Required Water Quality Volume for Phase 2 of this Project is 39,111 cubic feet or 0.90 acre-feet.

DP-1, DP-2 & DP-3 have either no work associated to them in Phase 2 or they have reductions in impervious area and will receive soil restoration as necessary to create new pervious areas.

Table 15: Required & Provided WQv & RRv (Phase 2 Revised)

DESIGN POINT	Total Req. WQv	Total Provided RRv	Total Provided WQv	Provided RRv	Provided WQv	Practice Used
DP-4	39,111 cf	9,140 cf	35,392	6,545 cf	-	Conservation of Natural Areas (RR-1) – RRv
				2,595 cf	1,745 cf	Filtration Bioretention (F-5)
				-	33,647 cf	Micropool Extended Detention Pond (P-1)

6.3 CLIMATE CHANGE CONSIDERATIONS

This report presents the consideration for future physical risks due to climate change, in accordance with Part III.A.2 of the permit. Overall site planning, control measures and practices, conveyance systems and detention systems were evaluated against the seven (7) physical risks identified by NYSDEC due to climate change pursuant to the Community Risk and Resiliency Act (CRRA), 6 NYCRR 490, and associated guidance. Appendix J provides a description of each consideration, specific to the project.

7 EROSION AND SEDIMENT CONTROL MEASURES

7.1 SUMMARY OF EROSION AND SEDIMENT CONTROL MEASURES

Temporary erosion and sediment control features have been incorporated into the design of the proposed site improvements. These measures shown on the plans and in the SWPPP indicate the suggested minimum measures required by the NYS SPDES General Permit. Site conditions may warrant the installation of additional measures and/or the modification of existing measures. Erosion and sediment control is an ever-changing process that is dependent on-site conditions and construction methods employed.

A temporary construction entrance and staging areas will be established for the project area to prevent sediment and debris from being transported by vehicles off the construction site. Stockpile areas will be surrounded with a silt fence to prevent the movement of soil. The permanent erosion and sediment control features include the re-establishment of permanent grass, a turf field that drains through sand and an isolator row within the underground chamber facility.

The erosion and sediment control plans have been developed to prevent the unwanted movement of soil during the construction phase. Temporary filter fabric inlet protection will be placed around

drainage structures, silt fence will be installed throughout the site, and check dams will be placed within the any swales.

7.2 SUMMARY OF POLLUTION PREVENTION MEASURES

All construction materials (oils, hydraulic fluids, etc.) shall be stored within a storage trailer to prevent exposure to stormwater, thus preventing the materials from becoming a pollutant source. Additionally, the contractor shall review the site daily and collect all waste material. All waste material shall be immediately removed from the site to prevent exposure to stormwater. On the occasion where the material cannot be immediately removed, silt fence and trenches shall be installed immediately. Any spills shall be immediately removed from the site and disposed of in a legal and environmentally sensitive manner.

The contractor will be required to be familiar with the requirements of the SPDES General Permit, the construction documents and this Stormwater Pollution Prevention Plan. Conditions may require amendments to the Stormwater Pollution Prevention Plan, but only with the authorization from a qualified professional.

7.3 CONSTRUCTION SEQUENCE SCHEDULE

A detailed construction sequence has been included on the site plans and summarized below;

Construction Sequence

Step 1 – Pre-Construction Actions

The stabilized construction entrances shall be established to capture mud and debris from entering the public highways, clear and grub areas as necessary. All bare areas shall be stabilized within 14 days with gravel or vegetative cover. Construction ditches, silt fence, and orange construction fencing shall be installed as shown on the construction drawing prior to work. Sediment Basin Installation is to be a primary focus before tree clearing efforts being.

Step 2 – Tree Clearing & Grubbing & Bulk Grading

Clear and grub areas indicated for tree removal. Mulch and stabilize as necessary to keep the total soil disturbance at any given time to 5 acres or less. Bulk Grade and stabilize as necessary.

Step 3 – Site Staging and Coordination

Coordinate staging areas with Owner, Architect, Engineer, and Construction Manager as necessary.

Step 4 – Runoff and Drainage Control

Divert offsite stormwater runoff from disturbed areas. All temporary and permanent ditches shall be installed and lined with stone/rock or seeded (as needed). Install sediment basin and stabilize area.

Step 5 – Demolition, Excavation, Drainage & Grading

Demolition, Excavation, Backfill and Temporary Stabilization

Once the sediment basin is in place, new drainage is to be installed along the road corridor. Subsequently, grade and stockpile surplus soils at indicated locations. Throughout bulk grading, demolition and any excavation work maintained a maximum of 5 acres of soil disturbance. All drainage trenches to be backfilled and temporarily stabilized.

Step 6 – Grading

Limit the initial clearing to areas where sediment control measures need to be installed. Once all sediment control measures are installed, excavation and fill activities associated with the with bulk grading for the parking areas and access driveway can begin. As fill is being brought to the site, wall

foundations and building slabs should be installed to protect all subgrades from weathering or erosion. Unsuitable soils will have to be removed and replaced with structural fill. All topsoil shall be stockpiled, protected, and stabilized. The asphalt areas shall be stabilized with their subbase to prevent erosion. Limit all grading and clearing activities to under 5 acres. Stabilize disturbed areas with temporary or permanent erosion control measures before starting additional disturbance.

Step 7 – Erosion Control

All perimeter areas and slopes shall be stabilized immediately. If construction activities cease during construction, stockpiles and exposed areas shall be stabilized by seed, mulch or other appropriate measures as soon as possible, but in no case more than 14 days after construction activity has ended. All areas shall be temporarily or permanently stabilized if work is delayed.

Step 8 – Sediment Control

All temporary silt fencing shall be in place to prevent sediment from being transported offsite. All areas shall be stabilized with stone fill or seeded as shown on the construction drawings. All sediment from the temporary inlet protection areas shall be removed as necessary. All necessary controls shall be kept in place and maintained to prevent sediment entering existing municipal infrastructure until the site is stabilized.

Step 9 – Maintenance and Inspection

During construction, inspection shall be performed every 7 calendar days by an owner retained qualified professional and recorded in the inspection schedule. Two inspections every 7 calendar days will be required once greater than 5 acres of earth has been disturbed. All practices shall be adequately operational, maintained and sediment removed as needed. All inspections shall look for evidence of erosion on the site, sediment entering the drainage systems, and signs of soil and mud transported from the site. All control measures shall be routinely maintained and whenever a problem is identified. All paperwork shall be kept on-site.

Step 10 – Building Pad, Driveways, Parking Lot, Site Improvements & Utility Construction

Once all erosion and sediment controls are in place and bulk grading has been completed contractor is to start fine grading for building pad (including excavations for foundations), driveways & parking lot construction and storm utilities. All excavations are to be backfilled with suitable material (general fill in unpaved areas and subbase/structural fill in areas of pavement and concrete. Keep all un-stabilized soil disturbance to a maximum of five (5) acres at a given time.

Step 11 – Grading and Landscaping

All disturbed areas shall be stabilized with either stone or the appropriate seed mixture as defined in the contract documents. All stabilization shall be completed no later than 14 days after construction activity has ended. All temporary measures shall be removed once grass, etc. has been established. Install all plantings within stream bank and within the stormwater planters.

Step 12 – Final Restoration and Stabilization

Once all project components are installed all areas are to receive final stabilization (seed and mulch mix or impervious surface). Sediment basin to be converted to permanent stilling basin. Remove all temporary erosion and sediment control devices.

7.4 POST CONSTRUCTION MAINTENANCE PLAN

Maintenance of the stormwater management facilities and storm sewer system will be part of the annual maintenance completed by the Owner and Operator of the property. The stormwater management facilities should be inspected every five years and periodically cleaned to remove the

accumulation of sediment. Trash and debris should be removed from the stormwater structures as needed.

8 SUMMARY OF FINDINGS

The proposed Stormwater Management Plan provides water quality treatment with opportunities for infiltration of surface runoff and reduces the potential for soil erosion.

8.1 SUMMARY OF PROPOSED HYDROLOGIC STORMWATER MANAGEMENT

The stormwater management facilities have been designed to utilize detention to attenuate the peak runoff rates. The impacts of the proposed improvements are evaluated by comparing the proposed and existing peak discharge rates at the analysis point located at the final discharge point for stormwater runoff generated from each subarea. The SPDES General Permit for Stormwater Discharges identifies the 10-year and 100-year storm frequencies as the desired design storm events in which the existing peak stormwater discharge rate represents the peak allowable discharge rate under developed conditions. The water quality volume (WQv) components have also been met through the application of an underground infiltration system and a proprietary treatment unit.

8.2 SUMMARY OF PROPOSED EROSION AND SEDIMENT CONTROL

The Stormwater Management Plan for the proposed site improvements utilizes best management practices outlined in New York State Stormwater Management Design Manual and New York Standards and Specifications for Erosion and Sediment Control. Disturbance to areas within the project work limits will be minimized. Those areas to be disturbed by construction activities are mitigated using methods outlined on the Erosion and Sediment Control Plan and Detail Sheets. Additionally, all the general recording requirements for inspections outlined within the SPDES General Permit shall be followed accordingly.

9 OWNER RESPONSIBILITY

9.1 SITE ASSESSMENT AND INSPECTIONS

The following requirements set forth apply to all permittees applying for coverage under the SPDES General Permit for Stormwater Runoff from Construction Activities, GP-0-25-001 and are contained within said permit. **The requirements detailed below are only a partial list and are the sole responsibility of the Operator/Owner. For a complete list of Operator/Owner responsibilities and requirements, please refer to GP-0-25-001.**

The operator/owner shall:

- In accordance with the requirements in the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control, inspect the erosion and sediment controls identified in the SWPPP to insure they are being maintained in effective operating condition always.
- For construction sites where soil disturbance activities have been temporarily suspended (winter shutdown, etc.) and temporary stabilization measures have been applied to all disturbed areas, the owner or operator can stop conducting inspections. The owner or operator shall begin conducting inspections in accordance with Part IV.B.1 as soon as soil disturbance activities resume.
- For construction sites where soil disturbance activities have been shut down with partial project completion, the owner or operator can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.
- Have a qualified professional (professional engineer, certified professional in erosion and sediment control or soil scientist) conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP and have been installed or implemented to ensure the overall preparedness of the site for commencement of construction.
- For construction sites where soil disturbance activities are on going, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.
- For construction sites where soil disturbance activities are on going and the owner or operator has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the qualified inspector shall conduct at least two (2) site inspections every seven (7) calendar days. When performing just two (2) inspections every seven (7) calendar days, the inspection shall be separated by a minimum of two (2) full calendar days.
- For construction sites where soil disturbance activities have been temporary suspended (winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.
- For construction sites where the soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all

post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown the owner or operator shall have a qualified inspector(s) perform a final inspection and certify that all disturbed areas have achieved final stabilization, all temporary, structural erosion and sediment control measures have been removed, and all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the Notice of Termination (NOT). The owner or operator shall then submit the competed NOT form to the address in Part II.B.1.

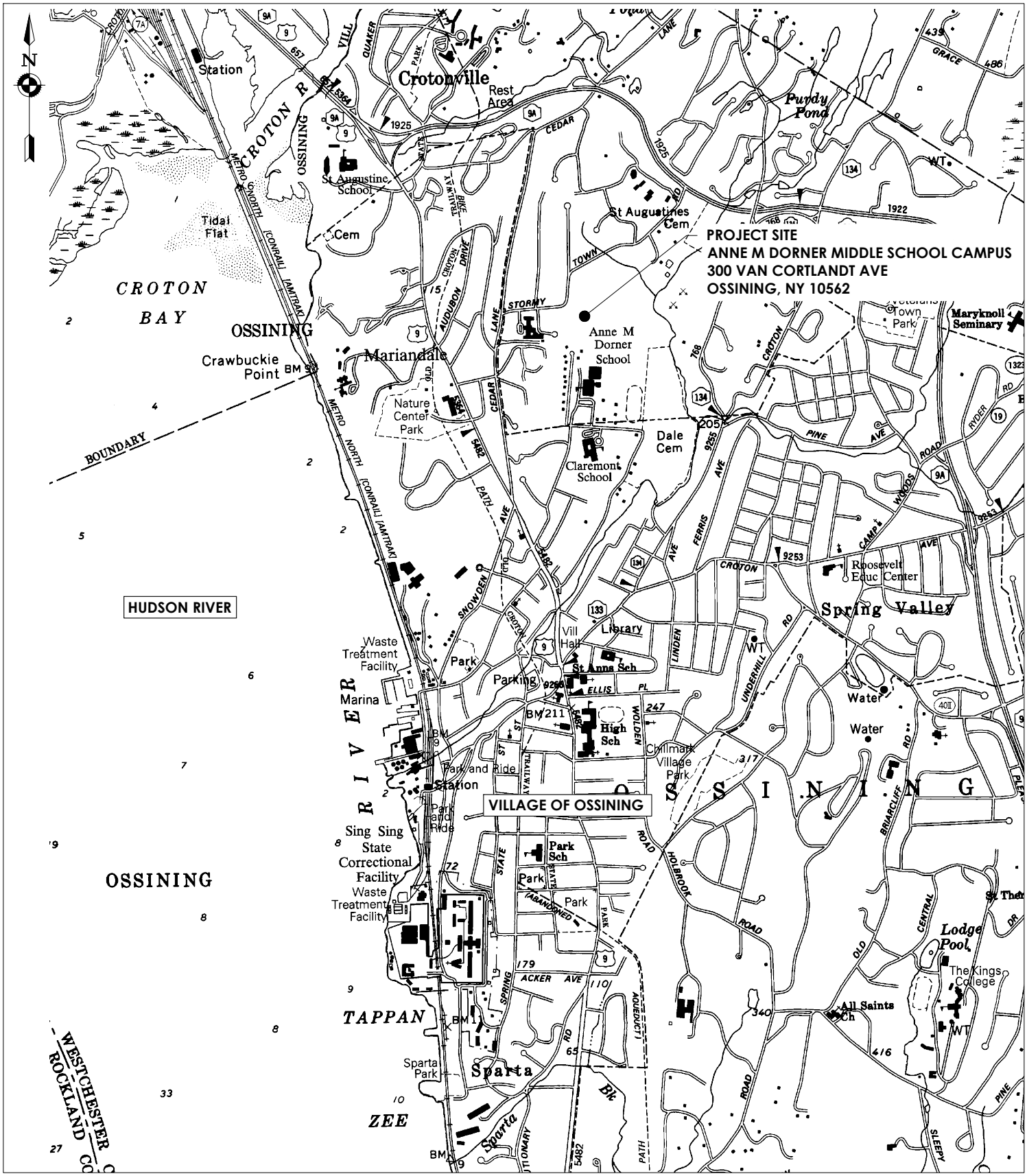
- At a minimum, the qualified inspector shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved final stabilization, and all points of discharge from the construction site.
- The qualified inspector shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include or address the following:
    - Date and time of inspection;
    - Name and title of person(s) performing inspection;
    - A description of the weather and soil conditions (dry, wet, saturated) at the time of the inspection;
    - A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharge of sediment from the construction site. Include discharges from conveyance systems (pipes, culverts, ditches, etc.) and overland flow;
    - Identification of all erosion and sediment control practices that need repair or maintenance;
    - Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
    - Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;
    - Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards; and
    - Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).
    - Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching;
    - Document any excessive deposition of sediment or ponding of water along barrier or diversion systems;
    - Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water;

    - Maintain a record of all inspection reports.
- Within one (1) business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor (or subcontractor) identified in Part III.A.6 of any corrective actions that need to take place. The contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.
- All inspection reports shall be signed by a qualified inspector. Pursuant to Part II.D.2, the inspection reports shall be maintained on site with the SWPPP.
- The operator shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
- The operator shall make all contractors and subcontractors sign a copy of the certification statement in Part III.A.6 of the Permit, GP-0-25-001. All certifications must be included in the SWPPP and all new contractors and subcontractors need to similarly certify;
- The operator shall retain copies of the SWPPP, NOI, NOI Acknowledgment Letter, MS4 SWPPP Acceptance form, Inspection Reports and any reports submitted in conjunction with this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of five years from the date that the site is finally stabilized;
- The operator shall retain copies of the SWPPP required by this permit at the construction site from the date of initiation of construction activities to the date of final stabilization.

Additional requirements are listed in the SPDES General Permit, GP-0-25-001 and are the sole responsibility of the Operator/Owner.

FIGURE 1

SITE LOCATION MAP



Project Number	Drawn By	Checked By	Scale	Issued
R24.16941.00	BGR	JCB	AS NOTED	10/26/2026

CPL | Architecture Engineering Planning

26 IBM Road
Poughkeepsie, NY 12601

CPLteam.com

NY ENGINEERING FIRM CERTIFICATE #0021419

Client Name

OSSINING UNION FREE SCHOOL DISTRICT

Project Name

2024 BOND: NEW 7-8 BUILDING

Drawing Title

LOCATION MAP

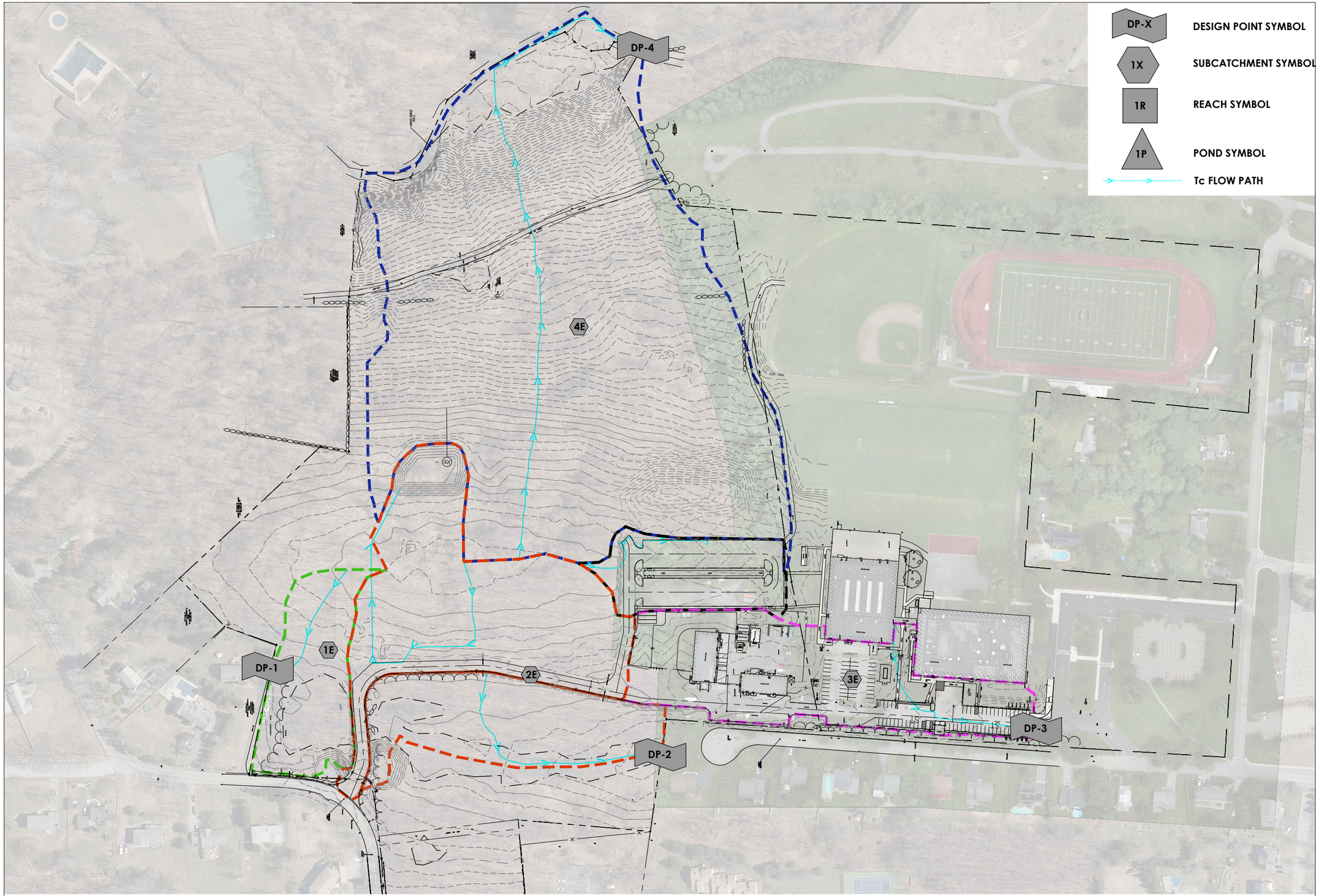
Drawing Number

FIG-1

Drawing Name: C:\Users\BRecer\DC\ACCDocs\CPL\R24.16941.00-OUFSD 24 BOND - NEW 7-8 BUILDING\Project Files\01 Design\03 Civil\CAD\Design\OUFSD_R24.16941.00_SWPPP_c.dwg
Date last accessed: 10/21/2026 2:56 PM
Date last plotted: 10/21/2026 7:14 PM
Plotted By: Bryce Recer

FIGURE 2

PRE-DEVELOPMENT CONDITIONS MAP



CPL | Architecture Engineering Planning

26 IBM Road
Poughkeepsie, NY 12601

CPLteam.com

NY ENGINEERING FIRM CERTIFICATE #0021419

OSSINING
UNION FREE SCHOOL DISTRICT

PROJECT INFORMATION

Project Number
R24.16941.00

Client Name
OSSINING UNION FREE SCHOOL DISTRICT

Project Name
2024 BOND: NEW 7-8 BUILDING

Project Address
300 VAN CORTLANDT AVE.
OSSINING NY 10562

SHEET INFORMATION

Issued	Scale
10/26/2026	AS NOTED
Drawn By	**Checked By**
BGR	JCB

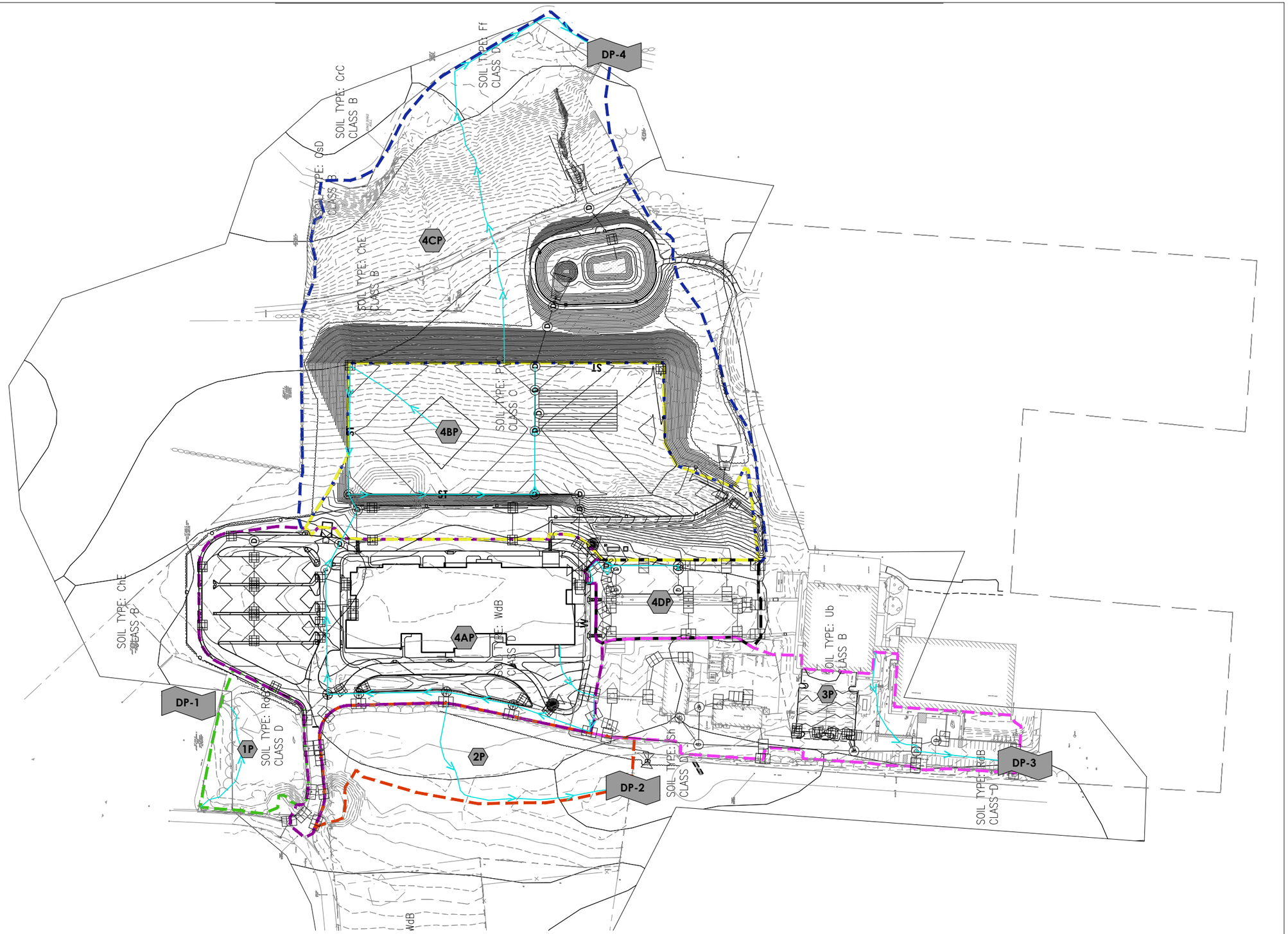
Drawing Title
PRE-DEVELOPMENT CONDITIONS

Drawing Number
7&8
FIG-2

Plotted By: Bryce Recer
Date last plotted: 10/21/2026 7:14 PM
Date last accessed: 10/21/2026 2:56 PM
Drawing Name: C:\Users\BRecer\DC\ACCDocs\CPL\R24.16941.00-OUFSD 24' BOND - NEW 7-8 BUILDING\Project Files\01 Design\03 Civil\CAD\Design\OUFSD_R24.16941.00_SWPPP_c.dwg
Sheet size: 11x17

FIGURE 3

POST-DEVELOPMENT CONDITIONS PLAN



CPL | Architecture Engineering Planning

26 IBM Road
Poughkeepsie, NY 12601

CPLteam.com

NY ENGINEERING FIRM CERTIFICATE #0021419

OSSINING
UNION FREE SCHOOL DISTRICT

PROJECT INFORMATION

Project Number
R24.16941.00

Client Name
OSSINING UNION FREE SCHOOL DISTRICT

Project Name
2024 BOND: NEW 7-8 BUILDING

Project Address
300 VAN CORTLANDT AVE.
OSSINING NY 10562

SHEET INFORMATION

Issued	Scale
10/26/2026	AS NOTED
Drawn By	**Checked By**
BGR	JCB

Drawing Title
POST-DEVELOPMENT CONDITIONS

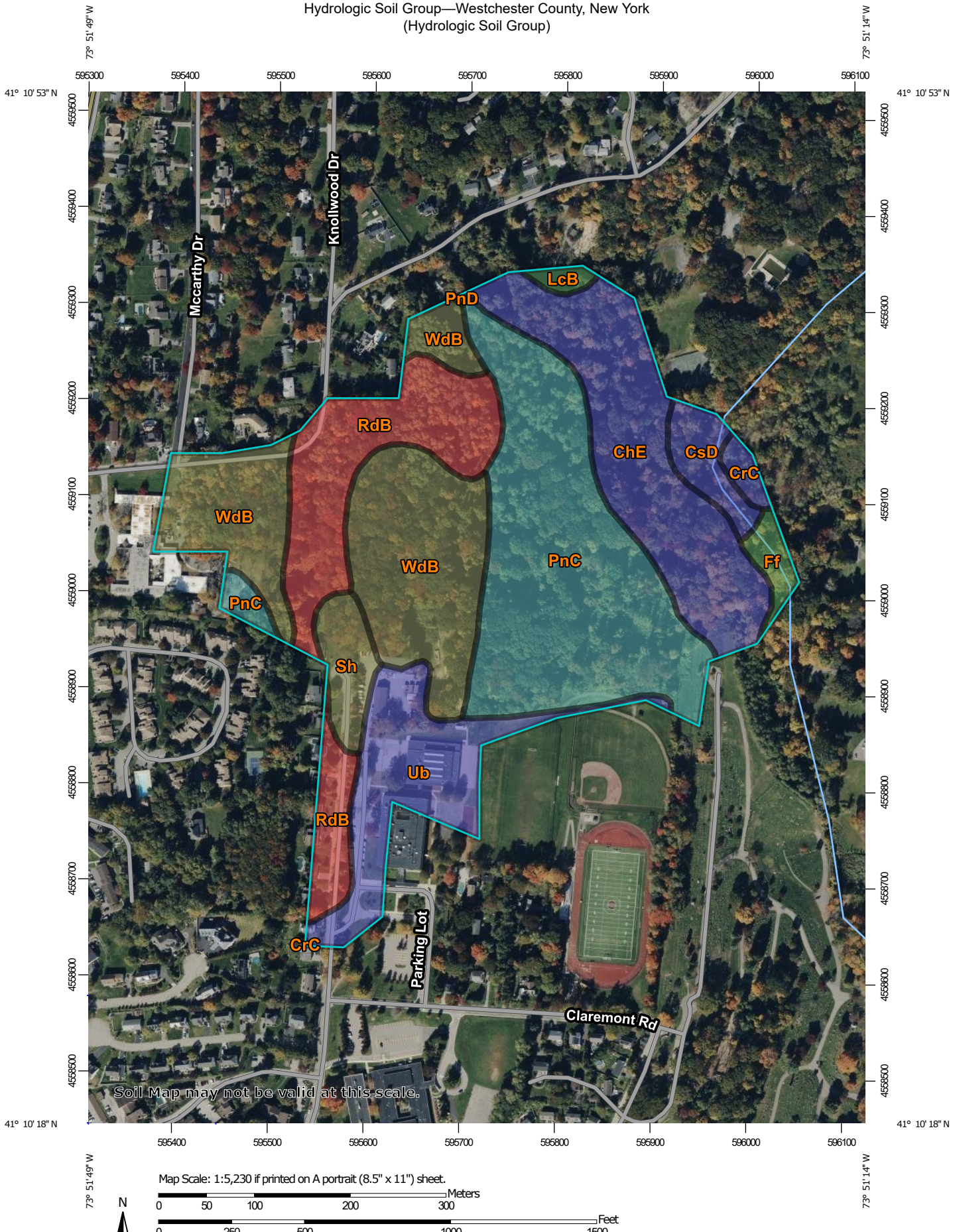
Drawing Number
7&8
FIG-2

Plotted By: Bryce Recer
Date last plotted: 10/21/2026 7:14 PM
Date last accessed: 10/21/2026 2:56 PM
Drawing Name: C:\Users\BRecer\DC\ACCDocs\CPL\R24.16941.00-OUFSD 24' BOND - NEW 7-8 BUILDING\Project Files\01 Design\03 Civil\CAD\Design\OUFSD_R24.16941.00_SWPPP_c.dwg
Sheet size: 11x17

FIGURE 4

SOILS MAP

Hydrologic Soil Group—Westchester County, New York
(Hydrologic Soil Group)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 20, Aug 26, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ChE	Charlton loam, 25 to 35 percent slopes	B	9.7	16.7%
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.5	0.9%
CsD	Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky	B	1.6	2.7%
Ff	Fluvaquents-Udifluvents complex, frequently flooded	A/D	0.8	1.4%
LcB	Leicester loam, 3 to 8 percent slopes, stony	A/D	0.4	0.6%
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	C	15.8	27.0%
PnD	Paxton fine sandy loam, 15 to 25 percent slopes	C	0.0	0.0%
RdB	Ridgebury complex, 3 to 8 percent slopes	D	8.5	14.6%
Sh	Sun loam	C/D	1.8	3.1%
Ub	Udorthents, smoothed	B	6.1	10.5%
WdB	Woodbridge loam, 3 to 8 percent slopes	C/D	13.0	22.3%
Totals for Area of Interest			**58.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

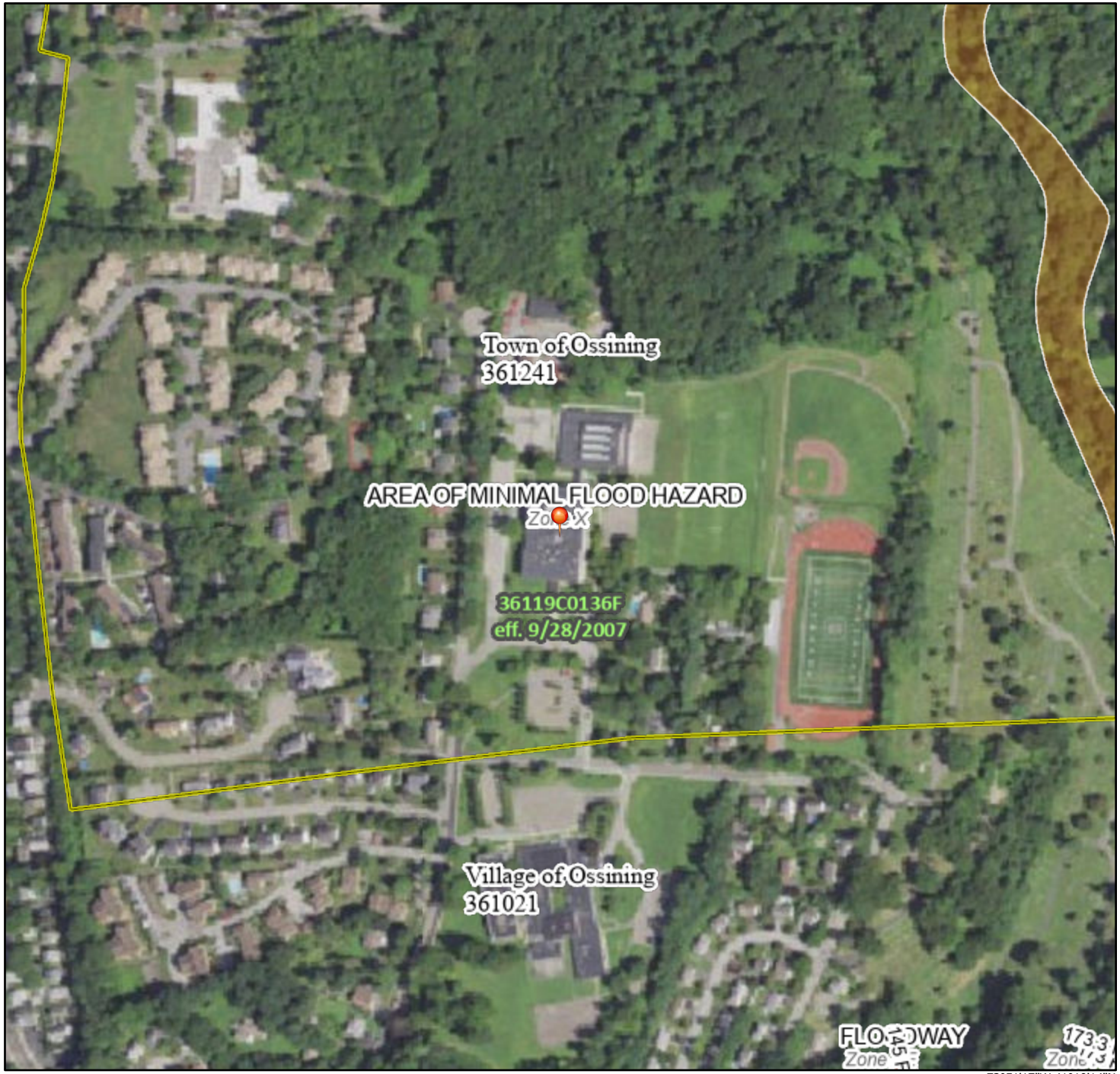
FIGURE 5

FEMA FIRMETTE MAP

National Flood Hazard Layer FIRMette

FEMA

73°51'54"W 41°10'42"N



73°51'17"W 41°10'14"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/20/2025 at 1:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX A

GENERAL PERMIT GP-0-25-001
NOTICE OF INTENT
NOTICE OF TERMINATION

Construction General Permit (CGP) Electronic Notice of Intent (eNOI) GP-0-25-001

version 1.11

(Submission #: HQF-F325-446MW, version 1)

Details

Originally Started By	Bryce Recer
Alternate Identifier	Anne M Dorner Middle School Driveway Project—Region 3
Submission ID	HQF-F325-446MW
Status	Draft

Form Input

Eligibility

Disturbance Threshold

1. Will the construction activity involve soil disturbances listed in Part I.A.1 of GP-0-25-001?
Yes

1.a. Will any runoff from the site enter a sewer system classified as a combined sewer?
No

1.b. Is this a remediation project being done under a Department approved work plan (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) with a SWPPP which meets the substantive requirements of GP-0-25-001?
No

1.c. Is the construction activity related to a stormwater discharge that does not require a permit as described in 40 CFR 122.3(e), e.g. non-point source agriculture or silviculture activities?
No

Other SPDES Permits

2. Will the discharge from the construction activity meet all conditions listed in Part I.A.2 of GP-0-25-001?
Yes

Threatened and Endangered Species

3. Will the construction activity potentially adversely affect a species that is endangered or threatened per Part I.A.3.?
No

State Historic Preservation Act (SHPA)

4. Is the construction activity designated by the Commissioner of the Office of Parks, Recreation and Historic Preservation (OPRHP), pursuant to 9 NYCRR §§428.12 or 428.13 as exempt from the SHPA review (see Attachment 2 of the Letter of Resolution between NYSDEC and OPRHP, dated January 9, 2015)?
No

4.a. Will the construction activity:

a) occur within an archeologically sensitive area indicated on the sensitivity map, or

b) have the potential to affect a property that is listed or determined to be eligible for listing on the Na or State Registers of Historic Places, or

c) include a new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old and OPRHP, a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determinec historically/archeologically significant building, structure, or object:

- 1-5 acres of disturbance—20 feet
- 5-20 acres of disturbance—50 feet
- 20+ acres of disturbance—100 feet?

No

4.b. Is there documentation at the construction site demonstrating:

a) that the construction activity is not within an archeologically sensitive area indicated on the sensiti map, and that the construction activity is not immediately adjacent to a property listed or determined t eligible for listing on the National or State Registers of Historic Places, and

b) that there is no new permanent building to be built on the construction site within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the construction site within those parameters that OPRHP, a Historic Preserva Commission of a Certified Local Government, or a qualified preservation professional has determinec the building, structure, or object more than 50 years old is not historically/archeologically significant:

- 1-5 acres of disturbance – 20 feet
- 5-20 acres of disturbance – 50 feet
- 20+ acres of disturbance – 100 feet?

Yes

State Environmental Quality Review (SEQR)

5. Is the construction activity subject to SEQR (Part I.A.5.), or the equivalent environmental review from another NYS or federal agency (Part I.A.6.)?
Yes

5.a. Has the owner/operator obtained documentation that the project review pursuant to SEQR, or the equivalent, has been satisfied per Part I.A.5. or I.A.6. of GP-0-25-001?
Yes

Uniform Procedures Act (UPA) Permits

6. Has the owner/operator obtained all necessary UPA permits from NYSDEC, or the equivalent from another NYS or federal agency per Part I.A.7.a. of GP-0-25-001?
Yes

Steep Slope

7. Is the construction activity within the watershed of surface waters of the State classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website?
No

Owner/Operator Information

8. Owner/Operator Name
Ossining Union Free School District

9. Owner/Operator Contact Person Information

First and Last Name	Phone	E-mail
Mary Alter-Fox	914-941-7700	mfoxalter@ossiningufsd.org

10. Owner/Operator Mailing Address

400 Executive Boulevard
Ossining, NY 10562
USA

11. Is the billing contact different from the Owner/Operator Contact?
Yes

11.a. Billing Contact Person Information

First and Last Name	Phone	E-mail
Alita McCoy	914-941-7700	amccoy@ossiningufsd.org

11.b. Billing Mailing Address

400 Executive Boulevard
Ossining, NY 10562
USA

12. What type of organization is the owner/operator?
School District

Site Information

13. Project/Site Name
Anne M Dorner Middle School Driveway Project

14. Site Address

100 Van Cortlandt Ave
Ossining, NY 10562
Westchester

DEC Region
3

15. Site Latitude & Longitude
41.17352027030029,-73.86058665149388

Project Details

16. This eNOI submission is for:
One or more phases of a common plan of development or sale in accordance with Part I.D.1.c.

16.a. Does the entire common plan of development or sale meet the eligibility requirements in Part I.A.5. or 6.?
Yes

16.b. Does the phase or phases meet all other eligibility requirements in Part I.A.?
Yes

> Per Part I.D.1.c.iii., the Required SWPPP Components by Project Type from Part III.C. is based on the entire common plan of development or sale, not the phases.

17. Does the project type fall under Table 1 or Table 2 of Appendix B of GP-0-25-001? If any portion of the construction activity falls under Table 2, regardless of the size of the disturbance, select "Table 2".
Table 2

18. Consistent with Part III.B.1.c.i. of GP-0-25-001, provide a concise overview of the project. Describe existing and proposed conditions, and include any other relevant information.
Existing Site has the District's Middle School Building, Maintenance and Facilities Buildings, parking areas, sports fields, sidewalks and other school related amenities.

Proposed Conditions will ultimately have a new driveway entrance off of the neighboring street (Stormytown Road) and connect to the existing parking lot by the Middle School. Project will disturb just under 5 acres of soil.

Enter the total project site acreage, the acreage to be disturbed, and the future impervious area (acreage) within the disturbed area, rounded to the nearest tenth of an acre.

19. Total Site Area (acres)
61.5

20. Total Area to be Disturbed (acres)
9.6

21. Existing Impervious Area to be Disturbed (acres)
2.3

22. Future Impervious Area Within Disturbed Area (acres)
4.1

Nature of the project:
Redevelopment with increase in impervious area

23. Do you plan to disturb more than 5 acres of soil at any one time?
No

---

24. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.

A (%)
0

B (%)
33

C (%)
32

D (%)
35

25. Enter the planned start and end dates of the disturbance activities.

Start Date
11/03/2025

End Date
09/07/2026

26. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
Sing Sing Creek and tribs - 1301-0118

27. Type of waterbody identified in question 26?
Stream/Creek On Site
Wetland/Federal Jurisdiction On Site
Wetland/State Jurisdiction On Site

28. Has the surface waterbody in question 26 been identified as a 303(d) segment in Appendix D of GP-0-25-001?
No

29. Is this project located in one of the Watersheds identified in Appendix C of GP-0-25-001?
No

30. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?
No

31. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
Yes

31.a. What is the name of the municipality/entity that owns the separate storm sewer system? If the separate sewer system is owned by an MS4 Operator, enter the MS4 Operator name.
Town of Ossining

32. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?
No

33. Is this property owned by a state authority, state agency, federal government or local government?
No

Required SWPPP Components

General SWPPP Requirements

34. Has a SWPPP been developed in conformance with the requirements in Part III. of GP-0-25-001?
Yes

35. Does the SWPPP demonstrate consideration of the future physical risks due to climate change pursuant to the CRRA, 6 NYCRR Part 490, and associated guidance per Part III.A.2. of GP-0-25-001?
Yes

36. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?
Yes

37. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the NYS Stormwater Management Design Manual?
Yes

37.a. Which version of the NYS Stormwater Management Design Manual was used to develop the SWPPP?
2024

SWPPP Preparer

39. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

40. Name of the person who prepared the SWPPP
James Basile, PE

41. SWPPP Preparer Organization Name
CPL Architects, Engineers, Landscape Architect, & Planners

42. SWPPP Preparer Contact Information

First and Last Name	Phone	E-mail
James Basile	585.324.0454	jbasile@cplteam.com
Bryce Recer	518.915.7457	brecer@cplteam.com

43. SWPPP Preparer Address

255 Woodcliff Drive

Fairport, NY 14450

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form
2) The certified SWPPP preparer should sign this form
3) Upload the completed form
Download SWPPP Preparer Certification Form

44. Please upload the SWPPP Preparer Certification

SWPPP Preparer Certification Form_Signed.pdf - 09/17/2025 08:17 AM

Comment

James Basile, PE from CPL is the SWPPP Preparer.

44.a. Has the SWPPP Preparer Certification Form been signed by the SWPPP preparer in accordance with Part VII.J of GP-0-25-001?

Yes

Erosion & Sediment Control Criteria

45. Has a construction sequence schedule for the planned management practices been prepared?

Yes

Post-Construction Criteria

Site Planning and Soil Restoration

46. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

Reduction of Clearing and Grading
Cul-de-sac Reduction

47. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 ("Soil Restoration") of the Design Manual.

All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

Water Quality Criteria

49. Water Quality Sizing Criteria

Total WQv required (acre-feet)	Total RRv provided (acre-feet)	Minimum RRv (acre-feet)	Total WQv provided (acre-feet)	Sum of RRv and WQv provided
.331	.2	.08	.131	0.331

Water Quantity Criteria

50. Per Section 9.2.1.C.VI and VII of the 2024 Design Manual, is there 0% change to hydrology that increases the discharge rate and volume from the project site?
Yes

Operation and Maintenance

53. Has a long-term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?
Yes

53.a. Identify the entity responsible for the long-term Operation and Maintenance.
Ossining Union Free School District

Post-Construction SMP Identification

54. Post-Construction RR Techniques and Standard SMPs

RR Techniques and SMPs	Contributing Impervious Area (acres)	Total Contributing Area (acres)
Underground Infiltration System (I-4)	1.440	

55. Alternative SMPs

Type of Alternative SMP	Manufacturer of the Alternative SMP	Name of the Alternative SMP	Contributing Impervious Area (acres)
Hydrodynamic	Contech	CDS	0.96

Other Permits

56. Identify other permits, existing and new, that are required for this project/facility.
Water Quality Certificate
USACE Wetland Permit

56.a. Indicate the Size of Impact from the USACE Wetland Permit, in acres, to the nearest tenth.
.1

57. Is this NOI for a change in owner/operator per Part I.G.?
No

MS4 SWPPP Acceptance

59. Will the construction activities be within the municipal boundary(ies) of Traditional Land Use Control MS4 Operator(s) and discharge to the MS4(s)?
Yes

59.a. Which form is required per Part I.D.2.b.ii.?
MS4 No Jurisdiction Form

MS4 No Jurisdiction Form Download

Download the MS4 No Jurisdiction Form from the link below.
MS4 No Jurisdiction Form

60. MS4 Acceptance or No Jurisdiction Form Upload

MS4 Non-Jurisdictional Form - Signed.pdf - 09/08/2025 06:12 PM

Comment

NONE PROVIDED

60.a. Has the form been signed by the principal executive officer or ranking elected official—or duly authorized representative of that person—in accordance with Part VII.J. and submitted along with this NOI?

Yes

Owner/Operator Certification

Owner/Operator Certification Form Download

Download the Owner/Operator Certification Form by clicking the link below.
Owner/Operator Certification Form

61. Upload Owner/Operator Certification Form

OWNER_OPERATOR FORM SIGNED.pdf - 09/08/2025 06:12 PM

Comment

NONE PROVIDED

61.a. Has the Owner/Operator Certification Form from Appendix J been signed by the owner/operator, or a representative of the owner/operator in accordance with Part VII.J of GP-0-25-001 and uploaded to the eNOI?

Yes

Additional Project Information

62. Enter any additional pertinent project information in the text box below.

NONE PROVIDED

Attachments

Date	Attachment Name	Context	User
9/17/2025 8:17 AM	SWPPP Preparer Certification Form_Signed.pdf	Attachment	Bryce Recer
9/8/2025 6:12 PM	OWNER_OPERATOR FORM SIGNED.pdf	Attachment	Bryce Recer
9/8/2025 6:12 PM	MS4 Non-Jurisdictional Form - Signed.pdf	Attachment	Bryce Recer

NEW YORK STATE | Department of Environmental Conservation

KATHY HOCHUL
Governor

AMANDA LEFTON
Commissioner

September 17, 2025

Ossining Union Free School District
Mary Alter-Fox
400 Executive Boulevard
Ossining, NY 10562

RE: Letter of Authorization (LOA) for Coverage Under
SPDES General Permit for Stormwater Discharges from Construction Activity (CGP)
General Permit No. GP-0-25-001

Dear Owner or Operator,

The New York State Department of Environmental Conservation (NYSDEC) received a complete electronic Notice of Intent (eNOI) for coverage under GP-0-25-001 for construction activities located at:

Project Name: Anne M Dorner Middle School Driveway Project
Project Address: 100 Van Cortlandt Ave
Ossining, NY 10562 Project County: Westchester

Through submission of the eNOI on September 17, 2025, the owner or operator certified that the eligibility requirements in Part I.A. of GP-0-25-001 have been met, where required.

As a reminder, the owner or operator must meet the requirements in Part I.E.6. of GP-0-25-001 prior to disturbing greater than five acres of soil at any one time. Further, this LOA is not the permit document. The owner or operator is required to comply with all requirements in GP-0-25-001, which is accessible on NYSDEC's website: dec.ny.gov

The project is authorized to commence construction activity in accordance with Part I.D.3.b. of GP-0-25-001 as follows:

- Project Name: Anne M Dorner Middle School Driveway Project
- eNOI Submission ID: HQF-F325-446MW
- Date authorized to commence construction activity: September 17, 2025

Note that the NYSDEC SPDES Permit Identification No. (SPDES Permit ID) for this project will be sent in a separate correspondence. Also, please be advised there is an annual regulatory fee of $110, which is billed by NYSDEC in the late fall. The regulatory fee covers a period of one calendar year. In addition, there is an initial authorization fee of $110 per acre of land disturbed and $675 per acre of future impervious area. The initial authorization fee covers the duration of the authorized disturbance.

If there are any questions regarding the requirements in GP-0-25-001, please contact me.

Sincerely,

John Muthersbaugh

John Muthersbaugh

Assistant Engineer

Division of Water, Bureau of Water Permits
625 Broadway, Albany, NY 12233 | dec.ny.gov | john.muthersbaugh@dec.ny.gov | (518) 402-8188

NEW YORK STATE | Department of Environmental Conservation

MS4 No Jurisdiction Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information

a. Owner/Operator Name: Ossining Union Free School District

b. Contact Person: Mary C. Fox-Alter, Superintendent of Schools

c. Street Address: 400 Executive Blvd.

d. City/State/Zip: Ossining, NY 10562

II. Project Site Information

a. Project/Site Name: Anne M. Dorner Middle School

b. Street Address: 100 Van Cortlandt Ave.

c. City/State/Zip: Ossining, NY 10562

d. eNOI Submission ID:

III. Traditional Land Use Control MS4 Operator Information

a. Name of MS4 Operator: Town of Ossining (Jon Turnquist, Stormwater Management Officer)

b. MS4 SPDES Permit ID Number: NYR20A370

c. Street Address: 16 Croton Avenue

d. City/State/Zip: Ossining, NY 10562

e. Telephone Number: 914-762-8419

IV. Certification Statement

In accordance with CGP Part I.D.2.b.ii.3., I hereby certify that the Traditional Land Use Control MS4 Operator identified in section III. of this form does not have review authority over the construction project identified in section II. of this form, which is owned/operated by the entity identified in section I. of this form. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.:
Elizabeth R. Feldman

b. Title/Position: Town Supervisor

c. Signature:

d. Date: 08-18-2025

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:	
Title/Position:	
Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL
CONSERVATION (NYSDEC)

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP-0-25-001

Construction General Permit (CGP)

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2025 Expiration Date: January 28, 2030

Scott E. Sheeley

Chief Permit Administrator

Scott E. Sheeley JAN. 29, 2025

Authorized Signature Date

Address: NYSDEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act (CWA), and 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), *stormwater discharges* from certain *construction activities* are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program. New York State administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, and Article 70, as well as 6 NYCRR Parts 621 and 750.

C*onstruction activities* constitute construction of a *point source* and, therefore, pursuant to ECL sections 17-0505, 17-0701, and 17-0803, the *owner or operator* must have coverage under a SPDES permit prior to *commencement of construction activities*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES CONSTRUCTION GENERAL PERMIT (CGP) GP-0-25-001
FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

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Part I. How to Obtain Coverage and General Requirements

To be covered under this permit, the *owner or operator* must meet all eligibility requirements in Part I.A. and follow the requirements for obtaining permit coverage in Part I.D., F., or G.

A. Eligibility Requirements

For a *common plan of development or sale*, the *phase(s)* that meet the eligibility requirements in Part I.A. may obtain coverage under this permit even if other *phase(s)* of the same *common plan of development or sale* do not meet the eligibility requirements and require an individual SPDES permit.

1. The *owner's or operator's construction activities* involve soil disturbances of:

    a. one or more acres; or

    b. less than one acre which are part of a *common plan of development or sale* that will ultimately disturb one or more acres; or

    c. less than one acre where NYSDEC has determined that a SPDES permit is required for *stormwater discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of pollutants to *surface waters of the State*.

        i. 5,000 square feet or more, but less than one acre, and are in the New York City Watershed located east of the Hudson River, Appendix C Figure 1; or

        ii. 20,000 square feet or more, but less than one acre, within the municipal boundaries of the City of New York (NYC); or

        iii. less than 20,000 square feet which are part of a *common plan of development or sale* that will ultimately disturb 20,000 square feet or more, but less than one acre, within the municipal boundaries of NYC; or

        iv. that creates 5,000 square feet or more of *impervious area* within the municipal boundaries of NYC.

2. *Discharges* from the *owner's or operator's construction activities* are/were not:

    a. already covered by a different SPDES permit; or

    b. covered under a different SPDES permit that was denied, terminated, or revoked; or

    c. identified in an expired individual SPDES permit that was not renewed; or

    d. required to obtain an individual SPDES permit or another general SPDES permit in accordance with Part VII.K.

3. If *construction activities* may adversely affect a species that is endangered or threatened, the *owner or operator* must obtain a:

    a. permit issued pursuant to 6 NYCRR Part 182 for the project; or

    b. letter issued by NYSDEC of non-jurisdiction pursuant to 6 NYCRR Part 182 for the project.

4. If *construction activities* have the potential to affect an *historic property*, the *owner or operator* must obtain one of the following:

    a. documentation that the *construction activity* is not within an archeological buffer area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant:

        i. 1-5 acres of disturbance - 20 feet; or

        ii. 5-20 acres of disturbance - 50 feet; or

iii. 20+ acres of disturbance - 100 feet.

b. NYSDEC consultation form sent to OPRHP,[1] and copied to NYSDEC's Agency Historic Preservation Officer (APO), and

i. the State Environmental Quality Review Act (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or

ii. documentation from OPRHP that the *construction activity* will result in No Impact; or

iii. documentation from OPRHP providing a determination of No Adverse Impact; or

iv. a Letter of Resolution signed by the *owner or operator*, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA).

c. documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

i. No Affect; or

ii. No Adverse Affect; or

iii. Executed Memorandum of Agreement.

d. documentation that SHPA Section 14.09 has been completed by NYSDEC or another state agency.

5. If *construction activities* are subject to SEQR, the *owner or operator* must obtain documentation that SEQR has been satisfied.

6. If *construction activities* are not subject to SEQR, but subject to the equivalent environmental review from another New York State or federal agency, the

[1] The consultation form can be submitted, along with other project information, through OPRHP's Cultural Resource Information System (CRIS) portal. If submitted through CRIS, paper copies of the consultation form need not be mailed.

owner or operator must obtain documentation that project review, pursuant to a process equivalent to SEQR from another New York State or federal agency, has been satisfied.

7. If *construction activities* require Uniform Procedures Act (UPA) Permits (see 6 NYCRR Part 621) from NYSDEC, or the equivalent from another New York State or federal agency, the *owner or operator* must:

a. obtain all such necessary permits; or

b. receive notification from NYSDEC pursuant to 6 NYCRR 621.3(a)(4) excepting Part I.A.7.a.

8. *Construction activities* are not eligible if they meet the following criteria in Part I.A.8.a. or b.:

a. For linear transportation and linear utility project types, the *construction activities*:

i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

ii. are undertaken on land with no existing *impervious cover*; and

iii. disturb two or more acres of *steep slope*.

b. For all other project types, the *construction activities*:

i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

ii. are undertaken on land with no existing *impervious cover*; and

iii. disturb one or more acres of *steep slope*.

B. Types of *Discharges* Authorized

1. The following *stormwater discharges* are authorized under this permit:

   a. *Stormwater discharges*, including *stormwater* runoff, snowmelt runoff, and surface runoff and drainage, associated with *construction activity*, are authorized under this permit provided that appropriate *stormwater* controls are designed, installed, and maintained in accordance with Part II. and Part III.

   b. *Stormwater discharges* from construction support activities at the *construction site* (including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas) if the following requirements are met:

      i. The support activity is directly related to the *construction site* required to have permit coverage for *stormwater discharges*; and

      ii. The support activity is not a commercial operation, nor does it serve multiple unrelated *construction sites*; and

      iii. The support activity does not continue to operate beyond the completion of the *construction activity* at the site it supports; and

      iv. *Stormwater* controls are implemented in accordance with Part II. and Part III. for *discharges* from the support activity areas.

2. The following non-*stormwater discharges* associated with *construction activity* are authorized under this permit:

   a. Non-*stormwater discharges* listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "*Discharges* from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; and

   b. Non-*stormwater discharges* of waters to which other components have not been added that are used in accordance with the *SWPPP* to control dust or irrigate vegetation in stabilized areas; and

   c. Uncontaminated *discharges* from *dewatering* operations

3. Authorized *discharges* of *stormwater* or authorized *discharges* of non-*stormwater*, commingled with a *discharge* authorized by a different SPDES permit and/or a *discharge* that does not require SPDES permit authorization, are also authorized under this permit.

C. Prohibited *Discharges*

1. Non-*stormwater discharges* prohibited under this permit include but are not limited to:

   a. Wastewater from washout of concrete; and

   b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; and

   c. Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance; and

   d. Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

   e. Toxic or hazardous substances from a spill or other release.

D. Electronic Notice of Intent (eNOI) Submittal

To receive authorization in accordance with Part I.D.3.b., the *owner or operator* must submit a complete eNOI in accordance with the requirements in Part I.D. The eNOI contains questions to: ensure eligibility requirements in Part I.A. have been met; obtain *owner or operator* contact information; obtain the total area to be disturbed and the existing/future *impervious areas* (rounded to the nearest tenth of an acre); confirm *Traditional Land Use Control MS4 Operator* jurisdiction over construction projects; satisfy the EPA eRule requirements; confirm that the Water Quality-Based Effluent Limitations in Part II. have been met; demonstrate consideration of the future risks due to climate change in accordance with Part III.A.2.; and confirm that the other *Stormwater Pollution Prevention Plan (SWPPP)* requirements in Part III. have been met.

1. An eNOI may be submitted for:

   a. *construction activities* that are not part of a *common plan of development or sale*; or

b. an entire *common plan of development or sale*; or

c. separate *phase(s)* of a *common plan of development or sale* if the following requirements are met:

   i. the *common plan of development or sale* meets the eligibility requirements of Part I.A.5. or 6.; and

   ii. the *phase(s)* meet(s) all other eligibility requirements of Part I.A.; and

   iii. Part III.C. Required *SWPPP* Components by Project Type is based on the *common plan of development or sale*, not the *phase(s)*; or

d. *tree clearing* that is associated with, or will support, a *renewable energy* generation, transmission, or storage project that meets Part I.A.5. and 6., if the *tree clearing*:

   i. meets all other eligibility requirements of Part I.A.; and

   ii. will occur in NYSDEC's Regions 3-9; and

   iii. is not within ¼ mile of a bat hibernaculum protected pursuant to 6 NYCRR Part 182; and

   iv. will occur between November 1st and March 31st.

2. As prerequisites for submitting an eNOI, the *owner or operator* must:

   a. prepare a *SWPPP* for Part I.D.1.a., b., c., or d. in accordance with Part III.; and

   b. based on the following criteria, upload the following signature forms signed in accordance with Part VII.J. to the eNOI prior to submission:

      i. for all eNOIs:

         1. the SWPPP Preparer Certification Form, Appendix F, signed by the *SWPPP* preparer; and

         2. the Owner/Operator Certification Form, Appendix J, signed by the *owner or operator*; and

      ii. if an eNOI includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that will *discharge* to the *MS4(s)*:

         1. determine if the *Traditional Land Use Control MS4 Operator(s)* have review authority. A *Traditional Land Use Control MS4 Operator* does not have review authority where:

            a. the *owner or operator* of the *construction activities* in Part I.D.2.b.ii. is the same entity as the *Traditional Land Use Control MS4 Operator* identified in Part I.D.2.b.ii.; or

            b. there is a statute exempting the *owner or operator* from zoning review by the *Traditional Land Use Control MS4 Operator*; or

            c. there is no such statute per Part I.D.2.b.ii.1.b., the *Traditional Land Use Control MS4 Operator* concludes, after public hearing, that it does not have zoning review authority in accordance with Legal Memorandum LU14 Updated January 2020 "Governmental Immunity from Zoning and Other Legislation"; and

         2. if the *Traditional Land Use Control MS4 Operator(s)* have review authority, submit the *SWPPP* to the *Traditional Land Use Control MS4 Operator(s)* for review and have:

            a. if outside the municipal boundaries of NYC: the MS4 SWPPP Acceptance Form, Appendix G, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.; or

b. if within the municipal boundaries of NYC: The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval Form, Appendix H, signed by the principal executive officer or ranking elected official from the Traditional Land Use Control MS4 Operator, or by a duly authorized representative of that person in accordance with Part VII.J.2.; and

3. if the *Traditional Land Use Control MS4 Operator* does not have review authority, have the MS4 No Jurisdiction Form, Appendix I, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.

3. Submitting an eNOI:

a. The *owner or operator* must submit a complete Notice of Intent electronically using a NYSDEC approved form.[2]

b. The *owner or operator* is authorized to *commence construction activity* as of the authorization date indicated in the Letter of Authorization (LOA), which is sent by NYSDEC after a complete eNOI is submitted.

i. If an eNOI is received for a *SWPPP* that deviates from one of the technical standards but demonstrates *equivalence* in accordance with Part III.B.1.a.ii. or Part III.B.2.b.ii., if the *SWPPP* includes *construction activities* that are not within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)*, and/or if the *SWPPP* includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that do not have review authority in accordance with Part I.D.2.b.ii.1., the authorization date indicated in the LOA will be 60 business days after the eNOI submission date.

[2] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

c. If *Traditional Land Use Control MS4 Operator(s)* have review authority in accordance with Part I.D.2.b.ii.2., the *owner or operator* must, within five business days of receipt of the LOA, send an electronic copy of the LOA to the *Traditional Land Use Control MS4 Operator(s)* with review authority.

E. General Requirements for *Owners or Operators* with Permit Coverage

1. As of the date the LOA is received, the *owner or operator* must make the eNOI, *SWPPP*, and LOA available for review and copying in accordance with the requirements in Part VII.H. When applicable, as of the date an updated LOA is received, the *owner or operator* must make the updated LOA available for review and copying in accordance with the requirements in Part VII.H.

2. The *owner or operator* must ensure compliance with all requirements of this permit and that the provisions of the *SWPPP*, including any changes made to the *SWPPP* in accordance with Part III.A.5., are properly implemented and maintained from the *commencement of construction activity* until:

a. all areas of disturbance have achieved *final stabilization;* and

b. the owner's or operator's coverage under this permit is terminated in accordance with Part V.A.5.a.

3. As of the date of the *commencement of construction activities* until Part I.E.2.a. and b. have been met, the *owner or operator* must maintain at the *construction site*, a copy of:

a. all documentation necessary to demonstrate eligibility with this permit; and

b. this permit; and

c. the *SWPPP*; and

d. the signed SWPPP Preparer Certification Form; and

e. the signed MS4 SWPPP Acceptance Form or signed NYCDEP SWPPP Acceptance/Approval Form or signed MS4 No Jurisdiction Form (when applicable); and

f. the signed Owner/Operator Certification Form; and

g. the eNOI; and

h. the LOA; and

i. the LOA transmittal to the Traditional Land Use Control MS4 Operator in accordance with Part I.D.3.c. (when applicable).

4. The *owner or operator* must maintain at the *construction site*, until Part I.E.2.a. and b. have been met, as of the date the documents become final or are received, a copy of the:

   a. responsible contractor's or subcontractor's certification statement(s) in accordance with Part III.A.7.; and

   b. inspection reports in accordance with Part IV.C.4. and 6.; and

   c. Request to Disturb Greater Than Five Acres and the Authorization Letter to Disturb Greater Than Five Acres in accordance with Part I.E.6. (when applicable); and

   d. Request to Continue Coverage and the Letter of Continued Coverage (LOCC) in accordance with Part I.F.2. and 4. (when applicable); and

   e. The updated LOA(s) in accordance with Part I.E.9. (when applicable).

5. The *owner or operator* must maintain the documents in Part I.E.3. and 4. in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection. The documents must be paper documents unless electronic documents are accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be. If electronic documents are kept on site, the *owner or operator* must maintain functional equipment on site available to an inspector during normal hours of operation such that an inspector may view the electronic documents in a format that can be read in a similar manner as a paper record and in a legally dependable format with no less evidentiary value than their paper equivalent.

6. The *owner or operator* must meet the following requirements prior to disturbing greater than five acres of soil at any one time:

   a. The *owner or operator* must submit a written Request to Disturb Greater Than Five Acres to:

   i. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, if a *Traditional Land Use Control MS4 Operator* does not have review authority in accordance with Part I.D.2.b.ii.1.; or

   ii. the *Traditional Land Use Control MS4 Operator*, if a *Traditional Land Use Control MS4 Operator* has review authority in accordance with Part I.D.2.b.ii.1.; or

   iii. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, and each involved *Traditional Land Use Control MS4 Operator*, if the project spans multiple municipalities with more than one *Traditional Land Use Control MS4 Operator* involved with review authority in accordance with Part I.D.2.b.ii.1.

   b. The written Request to Disturb Greater Than Five Acres must include:

      i. The SPDES permit identification number (Permit ID); and

      ii. Full technical justification demonstrating why alternative methods of construction that would result in five acres of soil disturbance or less at any one time are not feasible; and

      iii. The phasing plan for the project and sequencing plans for all *phases* from the *SWPPP* in accordance with Part III.B.1.d.; and

      iv. Plans with locations and details of erosion and sediment control practices such that the heightened concern for erosion when disturbing greater than five acres at one time has been addressed; and

      v. Acknowledgment that "the *owner or operator* will comply with the requirements in Part IV.C.2.b."; and

      vi. Acknowledgment that "the *owner or operator* will comply with the requirements in Part II.B.1.b."

   c. The *owner or operator* must be in receipt of an Authorization Letter to Disturb Greater Than Five Acres, which will include when the

authorization begins and ends and indicate a maximum area (acres) of soil disturbance allowed at any one time, from:

i. NYSDEC, if Part I.E.6.a.i. or iii. apply; or

ii. the *Traditional Land Use Control MS4 Operator*, if Part I.E.6.a.ii. applies.

7. Upon a finding of significant non-compliance with the practices described in the *SWPPP* or violation of this permit, NYSDEC may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order must be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

8. If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE).[3] *Construction activity* shall not resume until written permission to do so has been received from the RWE.

9. To be authorized to implement modifications to the information previously submitted in the eNOI, the *owner or operator* must:

   a. notify NYSDEC via email at Stormwater_info@dec.ny.gov requesting access to update the eNOI; and

   b. update the eNOI to reflect the modifications and resubmit the eNOI in accordance with Part I.D.; and

   c. receive an updated LOA.

10. The eNOI, *SWPPP*, LOA, updated LOAs (when applicable), and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

[3] The Regional Water Manager where a DEC Region does not have a RWE.

F. Permit Coverage for *Discharges* Authorized Under GP-0-20-001

When applicable:

1. Upon the effective date of this permit, an *owner or operator* of *a construction activity*, with coverage under GP-0-20-001, will have interim coverage under GP-0-25-001 for 45 calendar days starting on the effective date of GP-0-25-001 so long as the *owner or operator* maintains compliance with all applicable requirements of this permit.

2. Within 30 calendar days of the effective date of this permit, the *owner or operator*, with coverage under GP-0-20-001, must submit a complete Request to Continue Coverage electronically using a NYSDEC approved form,[4] which contains the information identified in Part I.F.3. below, if:

   a. the *owner or operator* continues to implement the SMP component in conformance with the technical standards in place at the time of initial project authorization; and

   b. the *owner or operator* will comply with all non-design requirements of GP-0-25-001.

3. The Request to Continue Coverage form contains questions to: ensure eligibility requirements in Part I.A. have been met; verify *owner or operator* contact information; verify the permit identification number; verify the original eNOI submission ID, if applicable; verify Part I.F.2.a. and b.; verify the version of the Design Manual that the technical/design components conform to; and receive an updated Owner/Operator Certification Form, Appendix I.

4. The *owner or operator* has obtained continued coverage under GP-0-25-001 as of the date indicated in the LOCC, which is sent by NYSDEC after a complete Request to Continue Coverage form is submitted.

5. If the owner or operator does not submit the Request to Continue Coverage form in accordance with Part I.F.2. and 3., coverage under this permit is automatically terminated after interim coverage expires.

[4] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

G. Change of *Owner or Operator*

When applicable:

1. When property ownership changes, or when there is a change in operational control over the construction plans and specifications, the following process applies:

   a. The new *owner or operator* must meet the applicable prerequisites for submitting an eNOI in accordance with Part I.D.2.; and

   b. The new *owner or operator* must submit an eNOI in accordance with Part I.D.3.; and

   c. Permit coverage for the new *owner or operator* will be effective upon receipt of the LOA in accordance with Part I.D.3.b.; and

   d. The new *owner or operator*, upon receipt of their LOA, must provide their Permit ID to the original *owner or operator*; and

   e. If the original *owner or operator* will no longer be the *owner or operator* of the *construction activity* identified in the original *owner's or operator's* eNOI, the original *owner or operator*, upon receipt of the new *owner's or operator's* Permit ID in accordance with Part I.G.1.d., must submit to NYSDEC a completed eNOT in accordance with Part V. that includes the name and Permit ID of the new *owner or operator*; or

   f. If the original *owner or operator* maintains ownership of a portion of the *construction activity*, the original *owner or operator* must maintain their coverage under the permit by modifying their eNOI; modifications to the eNOI must include:

      i. the revised area of disturbance and/or *impervious area(s)*; and

      ii. the revised SMP information, if applicable; and

      iii. a narrative description of what has changed; and

      iv. the new *owner's or operator's* Permit ID for the portion of the project removed from the eNOI.

   Owners or operators must follow Part I.E.9. to modify the eNOI.

Part II. Water Quality-Based Effluent Limitations

A. Maintaining Water Quality

NYSDEC expects that compliance with the requirements of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any *discharge* to either cause or contribute to a violation of the following *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York:

1. There must be no increase in turbidity that will cause a substantial visible contrast to natural conditions; and

2. There must be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There must be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the *stormwater discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standard,* the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this permit and document in accordance with Part IV.C.4. of this permit. To address the *water quality standard* violation the *owner or operator* must include and implement appropriate controls in the *SWPPP* to correct the problem or obtain an individual SPDES permit.

If, despite compliance with the requirements of this permit, it is demonstrated that the *stormwater discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if NYSDEC determines that a modification of this permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit, and the *owner or operator* must obtain an individual SPDES permit prior to further *discharges* from the *construction site*.

B. Effluent Limitations Applicable to *Discharges* from *Construction Activities*

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part II.B.1.a., b., c., d., and e. These limitations represent the

degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement, and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part II.B.1.a., b., c., d., and e. and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (BB), dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in *SWPPP* the reason(s) for the deviation, or alternative design, and provide information in the *SWPPP* demonstrating that the deviation or alternative design is *equivalent* to the technical standard.

    a. **Erosion and Sediment Controls.** At a minimum, erosion and sediment controls must be selected, designed, installed, implemented, and maintained to:

        i. *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s; and

        ii. Control *stormwater discharge*s, including both peak flow rates and total *stormwater* volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points; and

        iii. *Minimize* the amount of soil exposed during *construction activity*; and

        iv. *Minimize* the disturbance of *steep slope*; and

        v. *Minimize* sediment *discharge*s from the site; and

        vi. Provide and maintain *natural buffers* around surface waters, direct *stormwater* to vegetated areas and maximize *stormwater* infiltration to reduce *pollutant discharge*s, unless *infeasible*; and

        vii. *Minimize* soil compaction. *Minimizing* soil compaction is not required

where the intended function of a specific area of the site dictates that it be compacted; and

        viii. Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

        ix. *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of *pollutants* that could be discharged from the site.

    b. **Soil Stabilization**. In areas where soil disturbance activity has ceased, whether permanently or *temporarily ceased*, the application of soil stabilization measures must be initiated by the end of the next business day and completed within 14 calendar days from the date the current soil disturbance activity ceased. For *construction sites* that *directly discharge* to one of the 303(d) segments listed in Appendix D, or are located in one of the watersheds listed in Appendix C, or are authorized to disturb greater than five acres in accordance with Part I.E.5.a.viii., the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven calendar days from the date the soil disturbance activity ceased.

    c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

    d. **Pollution Prevention Measures**. Select, design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be selected, designed, installed, implemented, and maintained to:

        i. *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. Soaps, detergents and solvents cannot be used; and

        ii. *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation

and to *stormwater*. *Minimization* of exposure is not required in cases where the exposure to precipitation and to *stormwater* will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of *stormwater* contamination (such as final products and materials intended for outdoor use); and

iii. Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Surface Outlets.** When discharging from basins and impoundments, the surface outlets must be designed, constructed, and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-Construction Stormwater Management Practice (SMP) Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction SMPs, in accordance with Part III.C., must select, design, install, implement, and maintain the SMPs to meet the *performance criteria* in the New York State Stormwater Management Design Manual, dated July 31, 2024 (DM), using sound engineering judgment. Where SMPs are not designed in conformance with the *performance criteria* in the DM, the *owner or operator* must include in the *SWPPP* the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity*, that requires SMPs in accordance with Part III.C., must design the practices to meet the applicable *sizing criteria* in Part II.C.2.a., b., c., or d.

a. Sizing Criteria for *New Development*

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the total WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv must be calculated in accordance with the criteria in Section 4.2 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the requirements in Part II.C.2.a.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.4 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs without detention or velocity controls; or

3. The site *directly discharges* into a fifth order or larger water body (stream, river, or lake), or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watersheds

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24-hour design storm over the post-developed watershed and must be calculated in accordance with the criteria in Section 4.3 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part II.C.2.b.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include

documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.5 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs; or

3. The site *directly discharges* to tidal waters, or a fifth order or larger water body (stream, river, or lake) where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

c. *Sizing Criteria* for *Redevelopment Activity*

i. Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* must be addressed by one of the following options, as outlined in Section 9.2.1. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C) must calculate the WQv in accordance with Section 4.3 of the DM. All other *redevelopment activities* must calculate the WQv in accordance with Section 4.2 of the DM.

1. Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the DM must be applied to all newly created pervious areas; or

2. Capture and treat 100% of the required WQv, for a minimum of 25% of the disturbed redevelopment *impervious area*, by implementation of standard SMPs or reduced by application of runoff reduction techniques; or

3. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a volume-based alternative SMP, as defined in Section 9.4 of the DM; or

4. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a flow-through alternative SMP sized to treat the peak rate of runoff from the WQv design storm; or

5. Application of a combination of 1 through 4 above that provide a weighted average of at least two of the above methods. Application of this method must be in accordance with the criteria in Section 9.2.1(A)(V) of the DM; or

6. If there is an existing SMP located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 through 5 above.

ii. Channel Protection Volume (CPv) is not required if there is 0% change to hydrology that increases the *discharge* rate and volume from the project site.

iii. *Overbank* Flood Control (Qp) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

iv. Extreme Flood Control (Qf) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

d. *Sizing Criteria* for Combination of *Redevelopment Activity* and *New Development*

Construction projects, that include both *new development* and *redevelopment activity*, must use SMPs that meet the *sizing criteria* calculated as an aggregate of the *sizing criteria* in Part II.C.2.a. or b. for the *new development* portion of the project and Part II.C.2.c. for the *redevelopment activity* portion of the project.

Part III. Stormwater Pollution Prevention Plan (SWPPP)

A. General *SWPPP* Requirements

1. A *SWPPP* must be prepared and implemented by the *owner or operator* of all *construction activity* covered by this permit. All authorized *discharges* must be identified in the *SWPPP*. The *SWPPP* must document the selection, design, installation, implementation and maintenance of the control measures and

practices that will be used to meet the effluent limitations in Part II.B. and, where applicable, the SMP requirements in Part II.C.

2. The *SWPPP* must demonstrate consideration in narrative format of the future physical risks due to climate change pursuant to the Community Risk and Resiliency Act (CRRA), 6 NYCRR Part 490, and associated guidance.

    a. The owner or operator must consider:

        i. the following physical risks due to climate change:

            (i) increasing temperature; and

            (ii) increasing precipitation; and

            (iii) increasing variability in precipitation, including chance of drought; and

            (iv) increasing frequency and severity of flooding; and

            (v) rising sea level; and

            (vi) increasing storm surge; and

            (vii) shifting ecology.

        ii. for each of the following:

            (i) overall site planning; and

            (ii) location, elevation, and sizing of:

                a. control measures and practices; and

                b. conveyance system(s); and

                c. detention system(s).

3. The *SWPPP* must describe the erosion and sediment control practices and where required, SMPs that will be used and/or constructed to reduce the *pollutants* in *stormwater discharges* and to assure compliance with the

requirements of this permit. In addition, the *SWPPP* must identify potential sources of pollution which may reasonably be expected to affect the quality of *stormwater discharges*.

4. All *SWPPPs*, that require the SMP component in accordance with Part III.B.2., must be prepared by a *qualified professional*.

5. The *owner or operator* must keep the *SWPPP* current so that, at all times, it accurately documents the erosion and sediment control practices that are being used or will be used during construction, and all SMPs that will be constructed on the site. At a minimum, the *owner or operator* must modify the *SWPPP*, including construction drawings:

    a. whenever the current provisions prove to be ineffective in *minimizing pollutants* in *stormwater discharges* from the site; and

    b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* NYSDEC, or other regulatory authority; and

    d. to document the final construction conditions in an as-built drawing.

6. NYSDEC may notify the *owner or operator* at any time that the *SWPPP* does not meet one or more of the minimum requirements of this permit. The notification must be in writing and identify the provisions of the *SWPPP* that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by NYSDEC, the *owner or operator* must make the required changes to the *SWPPP* and submit written notification to NYSDEC that the changes have been made. If the *owner or operator* does not respond to NYSDEC's comments in the specified time frame, NYSDEC may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4.

7. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting, and maintaining the erosion and sediment control practices included in the *SWPPP* and the

contractor(s) and subcontractor(s) that will be responsible for constructing the SMPs included in the *SWPPP*. The *owner or operator* must have each of the contractors and subcontractors identify at least one person from their company to be *trained contractor* that will be responsible for implementation of the *SWPPP*. The *owner or operator* must ensure that at least one *trained contractor* is on site daily when soil disturbance activities are being performed.

The *owner or operator* must have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before the *commencement of construction activities*:

> "I hereby certify under penalty of law that I understand and agree to comply with the requirements of the *SWPPP* and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the requirements of the most current version of the New York State Pollutant Discharge Elimination System (SPDES) Construction General Permit (CGP) for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the *SWPPP* that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for *SWPPP* implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* must attach the certification statement(s) to the copy of the *SWPPP* that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the *SWPPP* after the *commencement of construction activities*, they must also sign the certification statement and provide the information listed above prior to performing *construction activities*.

B. Required *SWPPP* Contents

1. Erosion and sediment control component - The *owner or operator* must prepare a *SWPPP* that includes erosion and sediment control practices.

    a. Erosion and sediment control practices must be designed:

        i. in conformance with the BB; or

        ii. *equivalent* to the BB if deviating from Part III.B.1.a.i.

    b. If the erosion and sediment control practices are designed in conformance with Part III.B.1.a.ii., the *SWPPP* must include a demonstration of *equivalence* to the BB.

    c. At a minimum, the erosion and sediment control component of the *SWPPP* must include the following:

        i. Background information about the scope of the project, including the location, type and size of project; and

        ii. A site map/construction drawing(s) with north arrows for the project, including a general location map. At a minimum, the site map must show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the *stormwater discharge*(s) and receiving surface water(s); and

        iii. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG); and

        iv. A phasing plan for the project and sequencing plans for all *phases*, both of which must address clearing and grubbing, excavation and grading, utility and infrastructure installation, *final stabilization*,

and any other *construction activity* at the site that will result in soil disturbance.

1. The phasing plan must include:

    a. a map delineating and labeling the limits of soil disturbance for all *phases* of a project; and

    b. a table identifying the order and intended schedule of when each *phase* will begin and end its sequencing plan. The table must identify the total disturbed area for each *phase* at any one time and the total disturbed area for the overall project at any one time all on one timeline showing all overlapping quantities of disturbed area at any one time; and

2. A sequencing plan for a specific *phase* must include:

    a. a table indicating the order and intended schedule of *construction activities* within a *phase*, and corresponding construction drawings with a description of the work to be performed; and

    b. all permanent and *temporary stabilization* measures; and

v. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented; and

vi. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice; and

vii. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any

temporary sediment basins and structural practices that will be used to divert flows from exposed soils; and

viii. A maintenance inspection schedule for the contractor(s) and subcontractor(s) identified in Part III.A.7. to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule must be in accordance with the requirements in the BB technical standard; and

ix. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the *stormwater discharges*; and

x. A description and location of any *stormwater discharges* associated with industrial activity other than construction at the site, including, but not limited to, *stormwater discharges* from asphalt plants and concrete plants located on the *construction site*; and

xi. Identification of any elements of the design that are not in conformance with the design criteria in the BB technical standard. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. SMP component – The *owner or operator* of *construction activity* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs.

    a. SMPs must be designed in conformance with the applicable *sizing criteria* in Part II.C.2.a., c., or d.; and

    b. SMPs must be designed in conformance with the *performance criteria*:

        i. in the DM; or

        ii. *equivalent* to the DM if deviating from Part III.B.2.b.i.; or

        iii. in the New York State Stormwater Management Design Manual, dated January 2015 (2015 Design Manual), or *equivalent* to it, if the following criteria are met:

1. The eNOI is submitted in accordance with Part I.D. before January 29, 2027 for *construction activities* that are either:

    a. subject to governmental review and approval:

        i. where the *owner or operator* made any application to that governmental entity prior to the effective date of this permit; and

        ii. such application included a *SWPPP* developed using the 2015 Design Manual or *equivalent* to it; or

    b. not subject to governmental review and approval:

        i. where a fiscal allocation for the *construction activities* has been developed and approved by a governmental entity; and

        ii. the *SWPPP* was developed using the 2015 Design Manual or *equivalent* to it; and

c. If SMPs are designed in conformance with Part III.B.2.b.ii., the *SWPPP* must include the reason(s) for the deviation or alternative design and a demonstration of *equivalence* to the DM; and

d. If SMPs are designed in conformance with Part III.B.2.b.iii., the *SWPPP* must include supporting information or documentation demonstrating that Part III.B.2.b.iii.1.a. or b. apply; and

e. The SMP component of the *SWPPP* must include the following:

    i. Identification of all SMPs to be constructed as part of the project, including which option the SMP designs conform to, either Part III.B.2.b.i., ii., or iii. Include the dimensions, material specifications and installation details for each SMP; and

    ii. A site map/construction drawing(s) showing the specific location and size of each SMP; and

iii. A Stormwater Modeling and Analysis Report that includes:

    (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points; and

    (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and SMPs; and

    (iii) Results of *stormwater* modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre- and post-development runoff rates and volumes for the different storm events; and

    (iv) Summary table, with supporting calculations, which demonstrates that each SMP has been designed in conformance with the *sizing criteria* included in the DM; and

    (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part II.C.; and

    (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the DM. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the DM.

iv. Soil testing results and locations (test pits, borings); and

v. Infiltration test results, when required in accordance with Part III.B.2.a.; and

vi. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each SMP. The plan must identify the entity

that will be responsible for the long-term operation and maintenance of each practice; and

3. Enhanced Phosphorus Removal Standards - The *owner or operator* of *construction activity* identified in Table 2 of Appendix B that is located in a watershed identified in Appendix C must prepare a *SWPPP* that includes SMPs designed in conformance with the applicable *sizing criteria* in Part II.C.2.b., c., or d. and the *performance criteria* Enhanced Phosphorus Removal Standards included in the DM. At a minimum, the SMP component of the *SWPPP* must meet the requirements of Part III.B.2.

C. Required *SWPPP* Components by Project Type

Owners or operators of *construction activities*, identified in Table 1 of Appendix B, are required to prepare a *SWPPP* that only includes erosion and sediment control practices designed in accordance with Part III.B.1. *Owners or operators* of the *construction activities*, identified in Table 2 of Appendix B, must prepare a *SWPPP* that also includes SMPs designed in accordance with Part III.B.2 or 3.

For the entire area of disturbance, including the entire *common plan of development or sale* if applicable, the owner or operator must evaluate every bullet from Appendix B Table 1 and Table 2 separately. If bullets from both Table 1 and Table 2 apply, the *SWPPP* must include erosion and sediment control practices for all *construction activities* but SMPs for only those portions of the *construction activities* that fall under Table 2 bullet(s).

Part IV. Inspection and Maintenance Requirements

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures), and all SMPs identified in the *SWPPP*, are inspected and maintained in accordance with Part IV.B. and C.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity*, identified in Tables 1 and 2 of Appendix B, must have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being

implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor must:

a. if the corrective action does not require engineering design:

   i. begin implementing corrective actions within one business day; and

   ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

   i. begin the engineering design process within five business days; and

   ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

2. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. The *trained contractor* must begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational.

C. *Qualified Inspector* Inspection Requirements

1. With the exception of the following *construction activities* identified in Tables 1 and 2 of Appendix B, a *qualified inspector* must conduct site inspections for all other *construction activities* identified in Tables 1 and 2 of Appendix B:

   a. the construction of a single-family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than or equal to five (5) acres and is

not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

b. the construction of a single-family home that involves soil disturbances of one (1) or more acres but less than or equal to five (5) acres and is not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

c. construction on *agricultural property* that involves soil disturbances of one (1) or more acres but less than five (5) acres; and

d. *construction activities* located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances of 5,000 square feet or more, but less than one acre.

2. The *qualified inspector* must conduct site inspections in accordance with the following timetable:

a. For *construction sites* where soil disturbance activities are on-going, the *qualified inspector* must conduct a site inspection at least once every seven (7) calendar days; or

b. For *construction sites* where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part I.E.6. to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days; or

c. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* must conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas under the jurisdiction of a *Traditional Land Use Control MS4 Operator,* the *Traditional Land Use Control MS4 Operator* (provided the *Traditional Land Use Control MS4 Operator* is not the *owner or operator* of the *construction activity*) by hard copy or email prior to reducing the inspections to this frequency and again by hard copy or email prior to re-commencing construction; or

d. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the requirement to have the *qualified inspector* conduct inspections ceases if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1., the *Traditional Land Use Control MS4 Operator(s)* (provided the *Traditional Land Use Control MS4 Operator(s)* are not the *owners or operators* of the *construction activity*) in writing prior to the shutdown and again in writing prior to resuming *construction activity*. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* must terminate coverage by meeting the requirements of Part V; or

e. For *construction sites* involving soil disturbance of one (1) or more acres that *directly discharge* to one of the 303(d) segments listed in Appendix D or is located in one of the watersheds listed in Appendix C, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* must inspect:

a. all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness; and

b. all SMPs under construction to ensure that they are constructed in conformance with the *SWPPP*; and

c. all areas of disturbance that have not achieved *final stabilization*; and

d. all points of *discharge* to *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site*; and

e. all points of *discharge* from the *construction site*.

4. The *qualified inspector* must prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report must include and/or address all of the following, for all *construction activities* except those listed in Part IV.C.1.:

   a. Permit identification number; and

   b. Date and time of inspection; and

   c. Name and title of person(s) performing inspection; and

   d. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection, including the temperature at the time of the inspection; and

   e. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This must include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow; and

   f. A description of the condition of all *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This must include identification of any *discharges* of sediment to the *surface waters of the State*; and

   g. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance; and

   h. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced; and

   i. Description and sketch (map) of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection; and

   j. Estimates, in square feet or acres, of the following areas:

      i. Total area with active soil disturbance (not requiring either *temporary stabilization* or *final stabilization*); and

      ii. Total area with inactive soil disturbance (requiring either *temporary stabilization* or *final stabilization*); and

      iii. Total area that has achieved *temporary stabilization*; and

      iv. Total area that has achieved *final stabilization*; and

   k. Current stage of construction of all SMPs and identification of all *construction activity* on site that is not in conformance with the *SWPPP* and technical standards; and

   l. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the SMP(s); and

   m. Identification and status of all corrective actions that were required by previous inspection; and

   n. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* must attach color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* must also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* must attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* must notify the *owner or operator*, and appropriate contractor or subcontractor identified in Part III.A.7., of any corrective actions that need to be taken. The contractor or subcontractor must:

   a. if the corrective action does not require engineering design:

i. begin implementing corrective actions within one business day; and

ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

i. begin the engineering design process within five business days; and

ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

6. All inspection reports must be signed by the *qualified inspector.* In accordance with Part I.E.3., the inspection reports must be maintained on site with the *SWPPP*.

Part V. How to Terminate CGP Coverage

A. Electronic Notice of Termination (eNOT) Submittal

The eNOT contains questions to ensure requirements in Part V.A. have been met.

1. An *owner or operator* must terminate coverage when one or more of the following requirements have been met:

a. Total project completion:

i. all *construction activity* identified in the *SWPPP* has been completed; and

ii. all areas of disturbance have achieved *final stabilization*; and

iii. all temporary, structural erosion and sediment control measures have been removed; and

iv. all SMPs have been constructed in conformance with the *SWPPP* and are operational; and

v. an as-built drawing has been prepared; or

b. Planned shutdown with partial project completion:

i. all soil disturbance activities have ceased; and

ii. all areas disturbed as of the project shutdown date have achieved *final stabilization*; and

iii. all temporary, structural erosion and sediment control measures have been removed; and

iv. all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational; and

v. an as-built drawing has been prepared; or

c. In accordance with Part I.G. Change of Owner or Operator; or

d. The *owner or operator* has obtained coverage under an alternative general SPDES permit or an individual SPDES permit.

2. For *construction activities* that require *qualified inspector* inspections in accordance with Part IV.C.1. and have met Part V.A.1.a. or b., the *owner or operator* must have the *qualified inspector* perform a final site inspection prior to submitting the eNOT. The *qualified inspector* must, by signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice(s)” certification statements on the eNOT, certify that all the requirements in Part V.A.1.a. or b. have been achieved.

3. For *construction activities* that are subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1. and meet Part V.A.1.a. or b., the *owner or operator* must have the *Traditional Land Use Control MS4 Operator(s)* sign the “MS4 Acceptance” statement on the eNOT in accordance with the requirements in Part VII.J. A *Traditional Land Use Control MS4 Operator* official, by signing this statement, determined that it is acceptable for the *owner or operator* to submit the eNOT in accordance with the requirements of this Part. A *Traditional Land Use Control MS4 Operator* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*’s final site inspection certification(s) when required in Part V.A.2.

4. For *construction activities* that require SMPs and meet Part V.A.1.a. or b., the *owner or operator* must, prior to submitting the eNOT, ensure one of the following:

    a. for SMP(s) that were constructed by a private entity, but will be owned, operated, and maintained by a public entity, the SMP(s) and any right-of-way(s) needed to operate and maintain such practice(s) have been deeded to the municipality in which the practice(s) is located; or

    b. for SMP(s) that are privately owned, but will be operated and maintained by a public entity, an executed operation and maintenance agreement is in place with the municipality that will operate and maintain the SMP(s); or

    c. for SMP(s) that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record; or

    d. for SMP(s) that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility, the *owner or operator* has policies and procedures in place that ensure operation and maintenance of the practices in accordance with the operation and maintenance plan.

5. An *owner or operator* that has met the requirements of Part V.A.1., 2., 3., and 4. must request termination of coverage under this permit by submitting a complete Notice of Termination form electronically using a NYSDEC approved form.[5]

    a. The owner's or operator's coverage is terminated as of the termination date indicated in the Letter of Termination (LOT), which is sent by NYSDEC after a complete eNOT is submitted.

[5] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

Part VI. Record Retention and Reporting

A. Record Retention

The *owner or operator* must retain a copy of the documents listed in Part I.E.3. and a copy of the LOT for a period of at least five years from the date that NYSDEC accepts a complete NOT submitted in accordance with Part V.

B. Reporting

Except for the eNOI, the signature forms associated with the eNOI, and the eNOT, all other written correspondence requested by NYSDEC, including individual permit applications, must be sent to the address of the appropriate DOW (SPDES) Program contact at the Regional Office listed in Appendix E.

Part VII. Standard Permit Requirements

For the purposes of this permit, examples of contractors and subcontractors include: third-party maintenance and construction contractors.

A. Duty to Comply

The *owner or operator*, and all contractors or subcontractors, must comply with all requirements of this permit. Any non-compliance with the requirements of this permit constitutes a violation of the New York State Environmental Conservation Law (ECL), and its implementing regulations, and is grounds for enforcement action. Filing of a request for termination of coverage under this permit, or a notification of planned changes or anticipated non-compliance, does not limit, diminish or stay compliance with any requirements of this permit.

B. Need to Halt or Reduce Activity Not a Defense

The necessity to halt or reduce the *construction activity* regulated by this permit, in order to maintain compliance with the requirements of this permit, must not be a defense in an enforcement action.

C. Penalties

There are substantial criminal, civil, and administrative penalties associated with violating the requirements of this permit. Fines of up to $37,500 per day for each

violation and imprisonment for up to 15 years may be assessed depending upon the nature and degree of the offense.

D. False Statements

Any person who knowingly makes any false material statement, representation, or certification in any application, record, report, or other document filed or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance must, upon conviction, be punished in accordance with ECL §71-1933 and or New York State Penal Law Articles 175 and 210.

E. Re-Opener Clause

Upon issuance of this permit, a determination has been made on the basis of a submitted Notice of Intent, plans, or other available information, that compliance with the specified permit requirements will reasonably protect classified water use and assure compliance with applicable *water quality standards*. Satisfaction of the requirements of this permit notwithstanding, if operation pursuant to this permit causes or contributes to a condition in contravention of State *water quality standards* or guidance values, or if NYSDEC determines that a modification is necessary to prevent impairment of the best use of the waters or to assure maintenance of *water quality standards* or compliance with other provisions of ECL Article 17 or the Clean Water Act (CWA), or any regulations adopted pursuant thereto, NYSDEC may require such modification and the Commissioner may require abatement action to be taken by the *owner or operator* and may also prohibit such operation until the modification has been implemented.

F. Duty to Mitigate

The *owner or operator*, and its contractors and subcontractors, must take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

G. Requiring Another General Permit or Individual SPDES Permit

NYSDEC may require any *owner or operator* authorized to *discharge* in accordance with this permit to apply for and obtain an individual SPDES permit or apply for authorization to *discharge* in accordance with another general SPDES permit.

1. Cases where an individual SPDES permit or authorization to discharge in accordance with another general SPDES permit may be required include, but is not limited to the following:

   a. the *owner or operator* is not in compliance with the conditions of this permit or does not meet the requirements for coverage under this permit; and

   b. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of *pollutants* applicable to the *point source*; and

   c. new effluent limitation guidelines or new source performance standards are promulgated that are applicable to *point sources* authorized to *discharge* in accordance with this permit; and

   d. existing effluent limitation guidelines or new source performance standards that are applicable to *point sources* authorized to *discharge* in accordance with this permit are modified; and

   e. a water quality management plan containing requirements applicable to such *point sources* is approved by NYSDEC; and

   f. circumstances have changed since the time of the request to be covered so that the *owner or operator* is no longer appropriately controlled under this permit, or either a temporary or permanent reduction or elimination of the authorized *discharge* is necessary; and

   g. the *discharge* is in violation of section 17-0501 of the ECL; and

   h. the *discharge(s)* is a significant contributor of *pollutants*. In making this determination, NYSDEC may consider the following factors:

      i. the location of the *discharge(s)* with respect to *surface waters of the State*; and

      ii. the size of the *discharge(s)*; and

      iii. the quantity and nature of the *pollutants discharged* to *surface waters of the State*; and

      iv. other relevant factors including compliance with other provisions of ECL Article 17, or the CWA.

2. When NYSDEC requires any *owner or operator* authorized by this permit to apply for an individual SPDES permit as provided for in this subdivision, it must notify the *owner or operator* in writing that a permit application is required. This notice must include a brief statement of the reasons for this decision, an application

form, a statement setting a time for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from the *owner's or operator's* receipt of the notification letter, whereby the authorization to *discharge* under this permit must be terminated. NYSDEC may grant additional time upon demonstration, to the satisfaction of the RWE,[6] that additional time to apply for an alternative authorization is necessary or where NYSDEC has not provided a permit determination in accordance with 6 NYCRR Part 621.

3. When an individual SPDES permit is issued to an *owner or operator* authorized to *discharge* under this permit for the same *discharge(s)*, this permit authorization for *construction activities* authorized under the individual SPDES permit is automatically terminated on the effective date of the individual SPDES permit unless termination is earlier in accordance with 6 NYCRR Part 750.

H. Duty to Provide Information

The *owner or operator* must furnish to NYSDEC, within five business days, unless otherwise set forth by NYSDEC, any information that NYSDEC may request to determine whether cause exists to determine compliance with this permit or to determine whether cause exists for requiring an individual SPDES permit in accordance with 6 NYCRR 750-1.21(e) (see Part VII.G. Requiring Another General Permit or Individual Permit).

The *owner or operator* must make available to NYSDEC, for inspection and copying, or furnish to NYSDEC within 25 business days of receipt of a NYSDEC request for such information, any information retained in accordance with this permit.

Except for Part I.D.4. and 5. and Part I.G., the following applies: where the *owner or operator* becomes aware that it failed to submit any relevant facts on the Notice of Intent, or submitted incorrect information in a Notice of Intent or in any report to NYSDEC, the *owner or operator* must submit such facts or corrected information to NYSDEC within five business days.

I. Extension

In the event a new permit is not issued and effective prior to the expiration of this permit, and this permit is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, then the *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the requirements of this permit until a new permit is issued and effective.

[6] The Regional Water Manager where a DEC Region does not have a RWE.

J. Signatories and Certification

The Notice of Intent, Notice of Termination, and reports required by this permit must be signed as provided in 40 CFR §122.22.

1. All Notices of Intent and Notices of Termination must be signed as follows:

   a. For a corporation. By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

      (ii) the manager of one or more manufacturing, production or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for Notice of Intent or Notice of Termination requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

      Note: NYSDEC does not require specific assignments or delegations of authority to responsible corporate officers identified in 40 CFR §122.22(a)(1)(i). NYSDEC will presume that these responsible corporate officers have the requisite authority to sign the Notice of Intent or Notice of Termination unless the corporation has notified NYSDEC to the contrary. Corporate procedures governing authority to sign a Notice of Intent or Notice of Termination may provide for assignment or delegation to applicable corporate positions under 40 CFR §122.22(a)(1)(ii) rather than to specific individuals.

   b. For a partnership or sole proprietorship. By a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency. By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

   1. the chief executive officer of the agency; or

   2. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. All reports required by this permit, and other information requested by NYSDEC, must be signed by a person described in Part VII.J.1., or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part VII.J.1. or using the Duly Authorized Form, found on the DEC website; and

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

   c. The written authorization is submitted to NYSDEC.

3. Changes to authorization. If an authorization under Part VII.J.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the *construction activity*, a new authorization satisfying the requirements of Part VII.J.2. must be submitted to NYSDEC prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under Part VII.J.1. or 2. must make the following certification:

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who

manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

5. Electronic reporting. If documents described in Part VII.J.1. or 2. are submitted electronically by or on behalf of the *construction activity* with coverage under this permit, any person providing the electronic signature for such documents must meet all relevant requirements of this section, and must ensure that all of the relevant requirements of 40 CFR Part 3 (including, in all cases, subpart D to Part 3) (Cross-Media Electronic Reporting) and 40 CFR Part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

K. Inspection and Entry

The *owner or operator* must allow NYSDEC, the USEPA Regional Administrator, the applicable county health department, or any authorized representatives of those entities, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the *discharge*, upon the presentation of credentials and other documents as may be required by law, to:

1. enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the requirements of this permit; and

2. have access to and copy at reasonable times, any records that must be kept under the requirements of this permit, including records required to be maintained for purposes of operation and maintenance; and

3. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

4. sample or monitor at reasonable times, for the purposes of assuring general SPDES permit compliance or as otherwise authorized by the CWA or ECL, any substances or parameters at any location; and

5. enter upon the property of any contributor to the regulated facility or activity under authority of the *owner or operator*.

L. Confidentiality of Information

The following must not be held confidential: this permit, the fact sheet for this permit, the name and address of any *owner or operator*, effluent data, the Notice of Intent, and information regarding the need to obtain an individual permit or an alternative general SPDES permit. This includes information submitted on forms themselves and any attachments used to supply information required by the forms (except information submitted on usage of substances). Upon the request of the *owner or operator*, NYSDEC must make determinations of confidentiality in accordance with 6 NYCRR Part 616, except as set forth in the previous sentence. Any information accorded confidential status must be disclosed to the Regional Administrator upon his or her written request. Prior to disclosing such information to the Regional Administrator, NYSDEC will notify the Regional Administrator of the confidential status of such information.

M. Other Permits May Be Required

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

N. NYSDEC Orders or Civil Decrees/Judgments

The issuance of this permit by the NYSDEC, and the coverage under this permit by the *owner or operator*, does not supersede, revoke, or rescind any existing order on consent or civil Decree/Judgment, or modification to any such documents or to any order issued by the Commissioner, or any of the terms, conditions, or requirements contained in such order or modification therefore, unless expressly noted.

O. Property Rights

Coverage under this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining the assent of any other jurisdiction as required by law for the *discharge* authorized.

P. Compliance with Interstate Standards

If the *construction activity* covered by this permit originates within the jurisdiction of an interstate water pollution control agency, then the *construction activity* must also comply with any applicable effluent standards or *water quality standards* promulgated by that interstate agency and as set forth in this permit for such *construction activities*.

Q. Oil and Hazardous Substance Liability

Coverage under this permit does not affect the imposition of responsibilities upon, or the institution of any legal action against, the *owner or operator* under section 311 of the CWA, which must be in conformance with regulations promulgated pursuant to section 311 governing the applicability of section 311 of the CWA to *discharges* from facilities with *NPDES* permits, nor must such issuance preclude the institution of any legal action or relieve the *owner or operator* from any responsibilities, liabilities, or penalties to which the *owner or operator* is or may be subject pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. section 9601 et seq. (CERCLA).

R. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, must not be affected thereby.

S. NYSDEC Approved Forms

The *owner or operator* must provide all relevant information that is requested by NYSDEC, and required by this permit, on all NYSDEC approved forms.

APPENDIX A – Abbreviations and Definitions

Abbreviations

APO – Agency Preservation Officer
BB – New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), dated November 2016
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
CPv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DM – New York State Stormwater Management Design Manual (Design Manual), dated July 31, 2024
DOW – Division of Water
EAF – Environmental Assessment Form
ECL – chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law
EPA – U.S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NYC – The City of New York
NYCDEP – The City of New York Department of Environmental Protection
NYSDEC – The New York State Department of Environmental Conservation
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RR – Runoff Reduction
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SMP – Post-Construction Stormwater Management Practice
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit. If a word is not italicized in the permit, use its common definition.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property – the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023).

Alter Hydrology from Pre- to Post-Development Conditions – the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer System – a sewer system which conveys sewage and *stormwater* through a single pipe system to a publicly owned treatment works.

Commence (Commencement of) Construction Activities – the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the *SWPPP*. See definition for "*Construction Activity(ies)*" also.

Common Plan of Development or Sale – a contiguous area where multiple separate and distinct *construction activities* are occurring, or may occur, under one plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQR) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating *construction activities* may occur on a specific plot. A *common plan of development or sale* is comprised of two or more *phases*.

Common plan of development or sale does not include separate and distinct *construction activities* that are occurring, or may occur, under one plan that are at least 1/4 mile apart provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Construction Activity(ies) – identified within 40 CFR 122.26(b)(14)(x), 122.26(b)(15)(i), and 122.26(b)(15)(ii), any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, mechanized logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal.

Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, which is excluded from the calculation of the soil disturbance for a project. Routine maintenance includes, but is not limited to:

- Re-grading of gravel roads or parking lots; and
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of the ditch; and
- Replacement of existing culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of a ditch; and
- Replacement of existing bridges that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity beneath the bridges; and
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch); and
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*; and
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material; and
- Long-term use of equipment storage areas at or near highway maintenance facilities; and
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*; and
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts; and
- Maintenance of ski trails including brush hog use and mowing; and
- Above ground snowmaking pipe replacement; and
- Replacement of existing utility poles; etc.

Construction Site – the land area where *construction activity(ies)* will occur. See also the definitions for "*Commence (Commencement of) Construction Activities"* and "*Common Plan of Development or Sale."*

Dewatering – the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Directly Discharge(s)(ing) (to a specific surface waterbody) – runoff flows from a *construction site* by overland flow and the first point of *discharge* is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system and the first point of *discharge* from the separate storm sewer system is the specific surface waterbody.

Discharge(s)(d) – any addition of any *pollutant* to waters of the State through an outlet or *point source*.

Embankment – an earthen or rock slope that supports a road/highway.

Equivalent (Equivalence) – the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization – all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other *equivalent* stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

Historic Property – any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) – all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and compacted gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – not technologically possible, or not economically practicable and achievable considering best industry practices.

Minimize(ing)(ation) – reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

1. owned or operated by a State, city, town, village, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, *stormwater*, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA, that *discharges* to *surface waters of the State*; and

2. designed or used for collecting or conveying *stormwater*; and

3. which is not a *combined sewer system*; and

4. which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Natural Buffer(s) – an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – any land disturbance that does not meet the definition of *Redevelopment Activity* included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

Nonpoint Source(s) – any source of water pollution or *pollutants* which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank – flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator – the person, persons, or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit requirements.

Performance Criteria – the six performance criteria for each group of SMPs in Chapters 5 and 6 of the technical standard, New York State Stormwater Management Design Manual (DM), dated July 31, 2024. These include feasibility, conveyance, pretreatment, treatment, landscaping, and maintenance. It does not include the *Sizing Criteria* (i.e. WQv, RRv, CPv, Qp and Qf) in Part I.C.2. of the permit.

Phase – a defined area in which *construction activities* are occurring or will occur separate from other defined area(s).

Point Source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be *discharged*.

Pollutant(s) – dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast *discharged* into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq.

Qualified Inspector – a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder or other NYSDEC endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any SMPs that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional – a person that is knowledgeable in the principles and practices of *stormwater* management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other NYSDEC endorsed individual(s). Individuals preparing *SWPPPs* that require the SMP component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the *SWPPP* that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – the disturbance and reconstruction of existing *impervious area*, including *impervious areas* that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Renewable Energy – electricity or thermal energy generated by renewable energy systems through use of the following technologies: solar thermal, photovoltaics, on land and offshore wind, hydroelectric, geothermal electric, geothermal ground source heat, tidal energy, wave energy, ocean thermal, and fuel cells which do not utilize a fossil fuel resource in the process of generating electricity.

Site Limitations – site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical *site limitations* include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of *site limitations* shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – the criteria included in Part I.C.2 of the permit that are used to size SMPs. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

Steep Slope – land area designated on the current United States Department of Agriculture (USDA) Soil Survey as Soil Slope Phase D, (provided the map unit name or description is inclusive of slopes greater than 25%), or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Stormwater – that portion of precipitation that, once having fallen to the ground, is in excess of the evaporative or infiltrative capacity of soils, or the retentive capacity of surface features, which flows or will flow off the land by surface runoff to waters of the State.

Streambank – the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – a project specific report, including construction drawings, that among other things: describes the *construction activity(ies)*, identifies the potential sources of pollution at the *construction site*; describes and shows the *stormwater* controls that will be used to control the *pollutants* (i.e. erosion and sediment controls; for many projects, includes SMPs); and identifies procedures the *owner or operator* will implement to comply with the requirements of the permit. See Part III of the permit for a complete description of the information that must be included in the *SWPPP*.

Surface Waters of the State – shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization – exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Load (TMDL) – the sum of the allowable loads of a single *pollutant* from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a *pollutant* that a waterbody can receive and still meet *water quality standards*, and an allocation of that amount to the *pollutant's* sources. A TMDL stipulates Waste Load Allocations (WLA) for *point source discharges*, Load Allocations (LA) for *nonpoint source*s, and a margin of safety (MOS).

Traditional Land Use Control MS4 Operator – a city, town, or village with land use control authority that is authorized to *discharge* under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Trained Contractor – an employee from the contracting (construction) company, identified in Part III.A.7., that has received four (4) hours of NYSDEC endorsed training

in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.7., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity).

The *trained contractor* is responsible for the day-to-day implementation of the *SWPPP*.

Tree Clearing – *construction activities* limited to felling and removal of trees.

Tree clearing does not include hand felling and leaving the trees in place with no support from mechanized equipment, which is not considered *construction activity* requiring coverage under this permit.

Water Quality Standard – such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1

***CONSTRUCTION ACTIVITIES* THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS**

The following *construction activities* that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres: • Single-family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D • Single-family residential subdivisions with 25% or less *impervious cover* at total site build-out and not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D • Construction of a barn or other *agricultural building*, silo, stock yard or pen. • Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that include construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.
The following *construction activities* that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land: • All construction activities located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.
Within the municipal boundaries of NYC: • Stand-alone road reconstruction, where the total soil disturbance from only that road construction, is less than one (1) acre of land.
The following *construction activities*: • Installation of underground linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, such as wetland mitigation, *stormwater* retrofits, stream restoration, and resiliency projects that reconstruct shoreline areas to address sea level rise • Pond construction • Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an *impervious cover* • Cross-country ski trails, walking/hiking trails, and mountain biking trails, including a de minimis parking lot (maximum 10 spaces total, sized for passenger cars) with 35 feet minimum preservation of undisturbed area downgradient from the parking lot • Dam rehabilitation (the structure of the dam itself) • Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are not part of residential, commercial, or institutional development; • Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path, or walking path.

Table 1 (Continued)
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following *construction activities*:

- Slope stabilization
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Vegetated open space (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) that do not *alter hydrology from pre- to post-development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions
- Demolition where vegetation will be established, and no *redevelopment activity* is planned[1]
- Installation or replacement of either an overhead electric transmission line or a ski lift tower that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*.
- Solar array field areas that have tables elevated off the ground, spaced one table width apart, do not *alter hydrology from pre- to post-development conditions*, and address water quality volume and runoff reduction volume by maintaining sheet flow on slopes less than 8%.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that do not include construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions.
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary *impervious areas* that will be restored to pre-construction conditions once the *construction activity* is complete (in this context, "temporary" means the *impervious area* will be in place for two years or less)
- Other *construction activities* that do not include the construction or reconstruction of *impervious area*, and do not *alter hydrology from pre- to post-development* conditions, and are not listed in Table 2.

1. If the site is redeveloped in the future, a new eNOI must be submitted.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)

The following *construction activities*:

- Single-family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family home that disturbs five (5) or more acres of land
- Single-family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of between 20,000 square feet and one (1) acre of land within the municipal boundaries of NYC with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single-family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a *common plan of development or sale* that will ultimately disturb five (5) or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Creation of 5,000 square feet or more of *impervious area* in the municipal boundaries of NYC
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) that involves soil disturbance greater than five acres.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that involves soil disturbance greater than five acres and include the construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.
- Facility buildings, including ski lodges, restroom buildings, pumphouses, ski lift terminals, and maintenance and groomer garages
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills; including creation of landfills or capping landfills.
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTWs, water treatment plants, and water storage tanks
- Golf courses
- Office complexes

Table 2 (Continued)

***CONSTRUCTION ACTIVITIES* THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)**

The following *construction activities*:

- Permanent laydown yards and equipment storage lots
- Playgrounds that include the construction or reconstruction of *impervious area*
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surfaces
- Road construction or reconstruction, outside the municipal boundaries of NYC
- Road construction within the municipal boundaries of NYC
- Stand-alone road reconstruction, within the municipal boundaries of NYC where the total soil disturbance from that road reconstruction involves soil disturbance of one (1) acre or more of land
- Parking lot construction or reconstruction (as with all Table 2 bullets, this includes parking lots constructed as part of the *construction activities* listed in Table 1, unless a Table 1 bullet specifies otherwise)
- Athletic fields (natural grass) that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations, and well drilling pads, surfaced with *impervious cover,* and constructed as part of an overhead electric transmission line, wind-power, cell tower, oil or gas well drilling, sewer or water main, ski lift, or other linear utility project
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of a residential, commercial or institutional development
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of highway construction or reconstruction
- Solar array field areas on slopes greater than 8% that cannot maintain sheet flow using management practices identified in the BB or the DM
- Solar array field areas on slopes less than 8% that will *alter the hydrology from pre- to post-development* conditions
- Solar array field areas with tables that are not elevated high enough to achieve *final stabilization* beneath the tables
- Traditional *impervious areas* associated with solar development (e.g. roads, buildings, transformers)
- Utility pads surfaced with *impervious cover*, including electric vehicle charging stations
- All other *construction activities* that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre- to post-development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of *construction activities* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs designed in conformance with the Enhanced Phosphorus Removal Standards included in the DM technical standard.

- Entire New York City Watershed located east of the Hudson River – Figure 1
- Onondaga Lake Watershed – Figure 2
- Greenwood Lake Watershed – Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

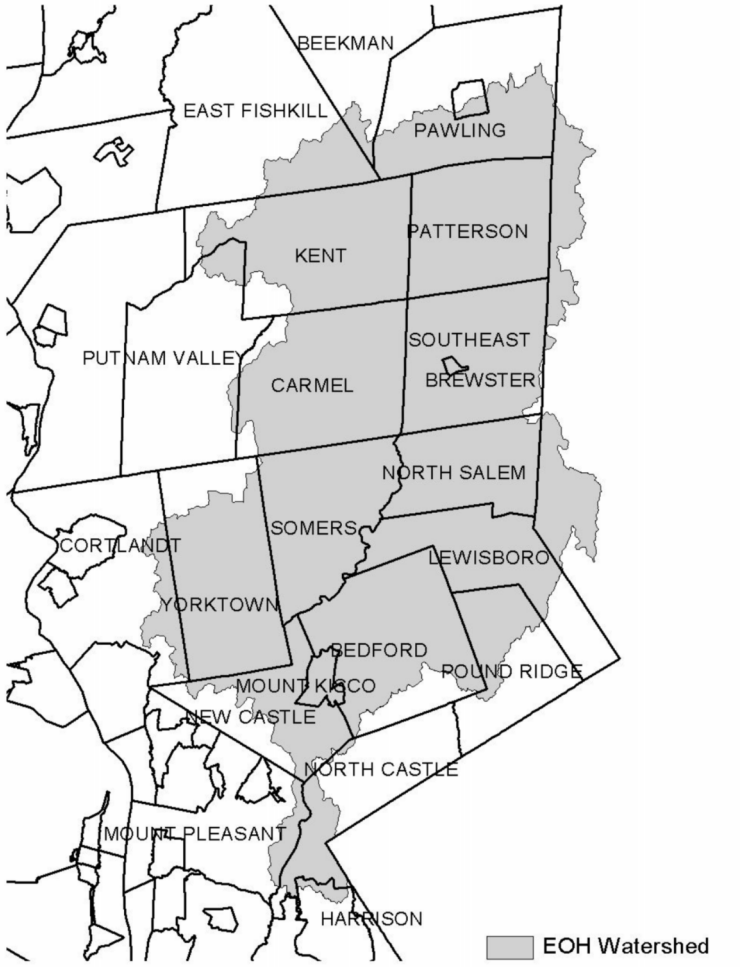


Figure 2 - Onondaga Lake Watershed



Figure 3 - Greenwood Lake Watershed



Figure 4 - Oscawana Lake Watershed

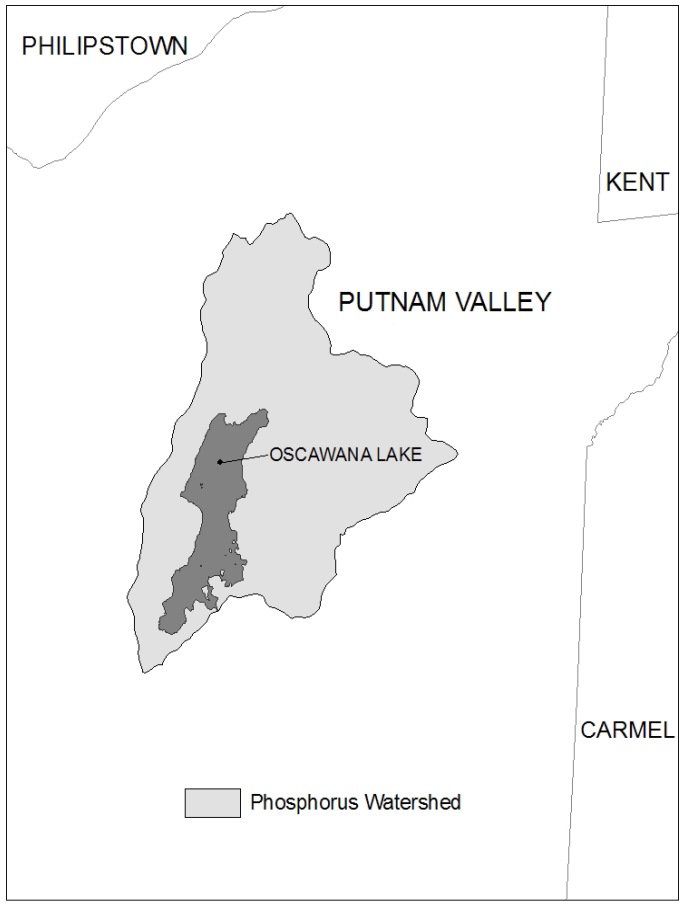
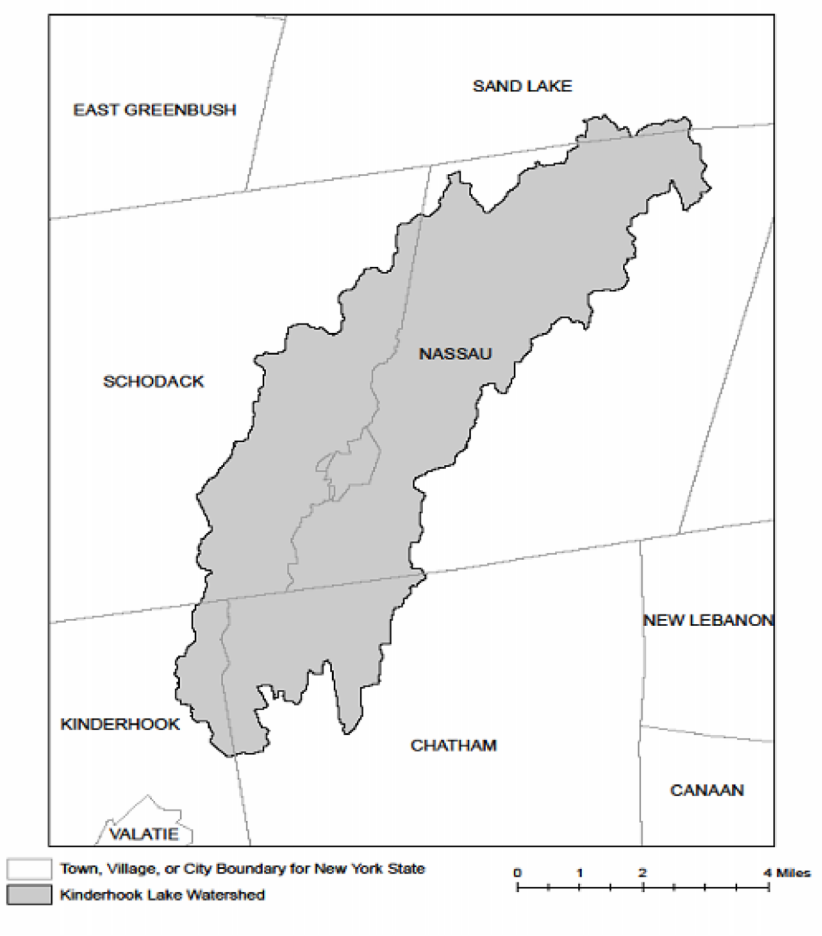


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Impaired Waterbodies (by Construction Related Pollutants)

List of waterbodies impaired by *pollutants* related to *construction activity*, including turbidity, silt/sediment, and nutrients (e.g. nitrogen, phosphorus). This list is a subset of "The Final New York State 2018 Section 303(d) List of Impaired Waters Requiring a TMDL" dated June 2020.

County	Waterbody	Pollutant
Albany	Ann Lee (Shakers) Pond, Stump Pond (1201-0096)	Phosphorus
Albany	Lawsons Lake (1301-0235)	Phosphorus
Allegany	Amity Lake, Saunders Pond (0403-0054)	Phosphorus
Allegany	Andover Pond (0403-0056)	Phosphorus
Bronx	Reservoir No.1/Lake Isle (1702-0075)	Phosphorus
Bronx	Van Cortlandt Lake (1702-0008)	Phosphorus
Broome	Blueberry, Laurel Lakes (1404-0033)	Phosphorus
Broome	Fly Pond, Deer Lake (1404-0038)	Phosphorus
Broome	Minor Tribs to Lower Susquehanna (0603-0044)	Phosphorus
Broome	Whitney Point Lake/Reservoir (0602-0004)	Phosphorus
Cattaraugus	Allegheny River/Reservoir (0201-0023)	Phosphorus
Cattaraugus	Beaver Lake/Alma Pond (0201-0073)	Phosphorus
Cattaraugus	Case Lake (0201-0020)	Phosphorus
Cattaraugus	Linlyco/Club Pond (0201-0035)	Phosphorus
Cayuga	Duck Lake (0704-0025)	Phosphorus
Cayuga	Owasco Inlet, Upper, and tribs (0706-0014)	Nutrients
Chautauqua	Chadakoin River and tribs (0202-0018)	Phosphorus
Chautauqua	Hulburt/Clymer Pond (0202-0079)	Phosphorus
Chautauqua	Middle Cassadaga Lake (0202-0002)	Phosphorus
Clinton	Great Chazy River, Lower, Main Stem (1002-0001)	Silt/Sediment
Columbia	Robinson Pond (1308-0003)	Phosphorus
Cortland	Dean Pond (0602-0077)	Phosphorus
Dutchess	Fallkill Creek (1301-0087)	Phosphorus
Dutchess	Hillside Lake (1304-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Silt/Sediment
Erie	Beeman Creek and tribs (0102-0030)	Phosphorus
Erie	Delaware Park Pond (0101-0026)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Silt/Sediment
Erie	Green Lake (0101-0038)	Phosphorus
Erie	Little Sister Creek, Lower, and tribs (0104-0045)	Phosphorus
Erie	Murder Creek, Lower, and tribs (0102-0031)	Phosphorus

Erie	Rush Creek and tribs (0104-0018)	Phosphorus
Erie	Scajaquada Creek, Lower, and tribs (0101-0023)	Phosphorus
Erie	Scajaquada Creek, Middle, and tribs (0101-0033)	Phosphorus
Erie	Scajaquada Creek, Upper, and tribs (0101-0034)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Silt/Sediment
Genesee	Bigelow Creek and tribs (0402-0016)	Phosphorus
Genesee	Black Creek, Middle, and minor tribs (0402 0028)	Phosphorus
Genesee	Black Creek, Upper, and minor tribs (0402-0048)	Phosphorus
Genesee	Bowen Brook and tribs (0102-0036)	Phosphorus
Genesee	LeRoy Reservoir (0402-0003)	Phosphorus
Genesee	Mill Pond (0402-0050)	Phosphorus
Genesee	Oak Orchard Cr, Upper, and tribs (0301-0014)	Phosphorus
Genesee	Oatka Creek, Middle, and minor tribs (0402-0031)	Phosphorus
Genessee	Tonawanda Cr, Middle, Main Stem (0102-0002)	Phosphorus
Greene	Schoharie Reservoir (1202-0012)	Silt/Sediment
Greene	Sleepy Hollow Lake (1301-0059)	Silt/Sediment
Herkimer	Steele Creek tribs (1201-0197)	Phosphorus
Herkimer	Steele Creek tribs (1201-0197)	Silt/Sediment
Kings	Hendrix Creek (1701-0006) 18	Nitrogen
Kings	Prospect Park Lake (1701-0196)	Phosphorus
Lewis	Mill Creek/South Branch, and tribs (0801-0200)	Nutrients
Livingston	Christie Creek and tribs (0402-0060)	Phosphorus
Livingston	Conesus Lake (0402-0004)	Phosphorus
Livingston	Mill Creek and minor tribs (0404-0011)	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs (0402-0033)	Phosphorus
Monroe	Buck Pond (0301-0017)	Phosphorus
Monroe	Cranberry Pond (0301-0016)	Phosphorus
Monroe	Durand, Eastman Lakes (0302-0037)	Phosphorus
Monroe	Lake Ontario Shoreline, Western (0301-0069) 9	Phosphorus
Monroe	Long Pond (0301-0015)	Phosphorus
Monroe	Mill Creek and tribs (0302-0025)	Phosphorus 2
Monroe	Mill Creek/Blue Pond Outlet and tribs (0402-0049)	Phosphorus
Monroe	Minor Tribs to Irondequoit Bay (0302-0038)	Phosphorus
Monroe	Rochester Embayment - East (0302-0002) [9]	Phosphorus
Monroe	Rochester Embayment - West (0301-0068) 9	Phosphorus
Monroe	Shipbuilders Creek and tribs (0302-0026)	Phosphorus 2
Monroe	Thomas Creek/White Brook and tribs (0302-0023)	Phosphorus

Nassau	Bannister Creek/Bay (1701-0380)	Nitrogen
Nassau	Beaver Lake (1702-0152)	Phosphorus
Nassau	Browswere Bay (1701-0383)	Nitrogen
Nassau	Camaans Pond (1701-0052)	Phosphorus
Nassau	East Meadow Brook, Upper, and tribs (1701-0211)	Silt/Sediment
Nassau	East Rockaway Channel (1701-0381)	Nitrogen
Nassau	Glen Cove Creek, Lower, and tribs (1702-0146)	Silt/Sediment
Nassau	Grant Park Pond (1701-0054)	Phosphorus
Nassau	Hempstead Bay, Broad Channel (1701-0032)	Nitrogen
Nassau	Hempstead Lake (1701-0015)	Phosphorus
Nassau	Hewlett Bay (1701-0382)	Nitrogen
Nassau	Hog Island Channel (1701-0220)	Nitrogen
Nassau	Massapequa Creek, Upper, and tribs (1701-0174)	Phosphorus
Nassau	Milburn/Parsonage Creeks, Upp, and tribs (1701-0212)	Phosphorus
Nassau	Reynolds Channel, East (1701-0215) [12]	Nitrogen
Nassau	Reynolds Channel, West (1701-0216) 12	Nitrogen
Nassau	Tidal Tribs to Hempstead Bay (1701-0218)	Nitrogen
Nassau	Tribs (fresh) to East Bay (1701-0204)	Silt/Sediment
Nassau	Tribs (fresh) to East Bay (1701-0204)	Phosphorus
Nassau	Tribs to Smith Pond/Halls Pond (1701-0221)	Phosphorus
Nassau	Woodmere Channel (1701-0219)	Nitrogen
New York	Harlem Meer (1702-0103)	Phosphorus
New York	The Lake in Central Park (1702-0105)	Phosphorus
Niagara	Bergholtz Creek and tribs (0101-0004)	Phosphorus
Niagara	Hyde Park Lake (0101-0030)	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0053) 9	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0072) 9	Phosphorus
Oneida	Ballou, Nail Creeks (1201-0203)	Phosphorus
Onondaga	Ley Creek and tribs (0702-0001) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nitrogen (NH3, NO2)
Onondaga	Onondaga Creek, Lower (0702-0023) 10	Nutrients (phosphorus)
Onondaga	Onondaga Creek, Lower, and tribs (0702-0023)	Turbidity
Onondaga	Onondaga Creek, Middle, and tribs (0702-0004)	Turbidity
Onondaga	Onondaga Creek, Upper, and tribs (0702-0024)	Turbidity
Ontario	Great Brook and minor tribs (0704-0034)	Phosphorus 2
Ontario	Great Brook and minor tribs (0704-0034)	Silt/Sediment

Ontario	Hemlock Lake Outlet and minor tribs (0402-0013)	Phosphorus
Ontario	Honeoye Lake (0402-0032)	Phosphorus
Orange	Brown Pond Reservoir (1303-0013)	Phosphorus
Orange	Lake Washington (1303-0012)	Phosphorus
Orange	Minor Tribs to Middle Wallkill (1306-0061)	Phosphorus
Orange	Monhagen Brook and tribs (1306-0074)	Phosphorus
Orange	Orange Lake (1301-0008) [16]	Phosphorus
Orange	Quaker Creek and tribs (1306-0025)	Phosphorus
Orange	Wallkill River, Middle, Main Stem (1306-0038)	Phosphorus
Orange	Wallkill River, Upper, and Minor tribs (1306-0017)	Phosphorus
Orleans	Glenvwood Lake (0301-0041)	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0070) 9	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0071) 9	Phosphorus
Oswego	Lake Neatahwanta (0701-0018)	Nutrients (phosphorus)
Oswego	Pleasant Lake (0703-0047)	Phosphorus
Putnam	Lost Lake, Putnam Lake (1302-0053)	Phosphorus
Putnam	Minor Tribs to Croton Falls Reservoir (1302-0001)	Phosphorus
Queens	Bergen Basin (1701-0009) 18	Nitrogen
Queens	Jamaica Bay, Eastern, and tribs, Queens (1701-0005) 18	Nitrogen
Queens	Kissena Lake (1702-0258)	Phosphorus
Queens	Meadow Lake (1702-0030)	Phosphorus
Queens	Shellbank Basin (1701-0001) 18	Nitrogen
Queens	Willow Lake (1702-0031)	Phosphorus
Rensselaer	Nassau Lake (1310-0001)	Phosphorus
Rensselaer	Snyders Lake (1301-0043)	Phosphorus
Richmond	Grassmere Lake/Bradys Pond (1701-0357)	Phosphorus
Rockland	Congers Lake, Swartout Lake (1501-0019)	Phosphorus
Rockland	Rockland Lake (1501-0021)	Phosphorus
Saratoga	Ballston Lake (1101-0036)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Silt/Sediment
Saratoga	Lake Lonely (1101-0034)	Phosphorus
Saratoga	Round Lake (1101-0060)	Phosphorus
Saratoga	Tribs to Lake Lonely (1101-0001)	Phosphorus
Schenectady	Collins Lake (1201-0077)	Phosphorus
Schenectady	Duane Lake (1311-0006)	Phosphorus
Schenectady Lake	Mariaville Lake (1201-0113)	Phosphorus
Schuyler	Cayuta Lake (0603-0005)	Phosphorus

Seneca	Reeder Creek and tribs (0705-0074)	Phosphorus
St.Lawrence	Black Lake Outlet, Black Lake (0906-0001)	Phosphorus
St.Lawrence	Fish Creek and minor tribs (0906-0026)	Phosphorus
Steuben	Smith Pond (0502-0012)	Phosphorus
Suffolk	Agawam Lake (1701-0117)	Phosphorus
Suffolk	Big/Little Fresh Ponds (1701-0125)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Silt/Sediment
Suffolk	Fresh Pond (1701-0241)	Phosphorus
Suffolk	Great South Bay, East (1701-0039)	Nitrogen
Suffolk	Great South Bay, Middle (1701-0040)	Nitrogen
Suffolk	Great South Bay, West (1701-0173)	Nitrogen
Suffolk	Lake Ronkonkoma (1701-0020)	Phosphorus
Suffolk	Mattituck/Marratooka Pond (1701-0129)	Phosphorus
Suffolk	Mill and Seven Ponds (1701-0113)	Phosphorus
Suffolk	Millers Pond (1702-0013)	Phosphorus
Suffolk	Moriches Bay, East (1701-0305)	Nitrogen
Suffolk	Moriches Bay, West (1701-0038)	Nitrogen
Suffolk	Quantuck Bay (1701-0042)	Nitrogen
Suffolk	Shinnecock Bay and Inlet (1701-0033)	Nitrogen
Suffolk	Tidal Tribs to West Moriches Bay (1701-0312)	Nitrogen
Sullivan	Bodine, Mongomery Lakes (1401-0091)	Phosphorus
Sullivan	Davies Lake (1402-0047)	Phosphorus
Sullivan	Evens Lake (1402-0004)	Phosphorus
Sullivan	Pleasure Lake (1402-0055)	Phosphorus
Sullivan	Swan Lake (1401-0063)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Silt/Sediment
Ulster	Ashokan Reservoir (1307-0004)	Silt/Sediment
Ulster	Esopus Creek, Lower, Main Stem (1307-0010) [17]	Turbidity
Ulster	Esopus Creek, Middle, Main Stem (1307-0003) 17	Turbidity
Ulster	Esopus Creek, Upper, and minor tribs (1307-0007)[3]	Silt/Sediment
Ulster	Wallkill River, Lower, Main Stem (1306-0027)	Phosphorus
Warren	Hague Brook and tribs (1006-0006)	Silt/Sediment
Warren	Huddle/Finkle Brooks and tribs (1006-0003)	Silt/Sediment
Warren	Indian Brook and tribs (1006-0002)	Silt/Sediment
Warren	Lake George (1006-0016) and tribs	Silt/Sediment
Warren	Tribs to Lake George, East Shore (1006-0020)	Silt/Sediment
Warren	Tribs to Lake George, Lk.George Village (1006-0008)	Silt/Sediment

Washington	Wood Cr/Champlain Canal and tribs (1005-0036)	Phosphorus
Westchester	Lake Katonah (1302-0136)	Phosphorus
Westchester	Lake Lincolndale (1302-0089)	Phosphorus
Westchester	Lake Meahagh (1301-0053)	Phosphorus
Westchester	Lake Mohegan (1301-0149)	Phosphorus
Westchester	Lake Shenorock (1302-0083)	Phosphorus
Westchester	Mamaroneck River, Lower (1702-0071)	Silt/Sediment
Westchester	Mamaroneck River, Upp, & minor tribs (1702-0123)	Silt/Sediment
Westchester	Saw Mill River (1301-0007)	Phosphorus
Westchester	Saw Mill River, Middle, and tribs (1301-0100)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Silt/Sedimnt
Westchester	Silver Lake (1702-0040)	Phosphorus
Westchester	Teatown Lake (1302-0150)	Phosphorus
Westchester	Truesdale Lake (1302-0054)	Phosphorus
Westchester	Wallace Pond (1301-0140)	Phosphorus

APPENDIX E – List of NYSDEC Regional Offices

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	220 WHITE PLAINS ROAD, SUITE 110 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7438	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7165	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7070

APPENDIX F – SWPPP Preparer Certification Form

The SWPPP Preparer Certification Form required by this permit begins on the following page.

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

Project/Site Name:

eNOI Submission ID:

Owner/Operator Name:

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements of GP-0-25-001. I certify under penalty of law that the SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SWPPP Preparer First Name | MI | SWPPP Preparer Last Name

Signature | Date

Revised: January 2025

APPENDIX G – MS4 SWPPP Acceptance Form

The MS4 SWPPP Acceptance Form required by this permit begins on the following page.

NEW YORK STATE | Department of Environmental Conservation

MS4 SWPPP Acceptance Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4 Operator:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Street Address:
14. City/State/Zip:
15. Telephone Number:

MS4 SWPPP Acceptance Form - **continued**
V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative
I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in section II. of this form has been reviewed and meets the substantive requirements in the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP). Note: The MS4 Operator, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 Operator does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.
Printed Name[1]:
Title/Position:
Signature:
Date:
VI. Additional Information

[1] Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.

APPENDIX H – NYCDEP SWPPP Acceptance/Approval Form

The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval form required by this permit begins on the following page.

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

SWPPP Acceptance/Approval

Application Number:

I. Project Owner/Operator Information

1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:

II. Project Site Information

5. Project/Site Name:
6. Street Address:
7. City/State/Zip:

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance/Approval

8. SWPPP Reviewed by:
9. Title/Position: /
10. Date Final SWPPP Reviewed and Accepted:
11. Acceptance/Approval Expiration Date:

IV. Regulated MS4 Information for projects that require coverage under the NY State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity

12. Name of MS4: *CITY OF NEW YORK*
13. MS4 SPDES Permit Identification Number: *NY-0287890*
14. Contact Person:
15. Street Address: *59-17 Junction Blvd. 9th Floor*
16. City/State/Zip: *Flushing, NY 11373*
17. Telephone Number:

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).

Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Conditions of Acceptance/Approval and Additional Information

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

APPENDIX I – MS4 No Jurisdiction Form

The MS4 No Jurisdiction Form required by this permit begins on the following page.

NEW YORK STATE | Department of Environmental Conservation

MS4 No Jurisdiction Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. eNOI Submission ID:

III. Traditional Land Use Control MS4 Operator Information

a. Name of MS4 Operator:

b. MS4 SPDES Permit ID Number: NYR20A

c. Street Address:

d. City/State/Zip:

e. Telephone Number:

IV. Certification Statement

In accordance with CGP Part I.D.2.b.ii.3., I hereby certify that the Traditional Land Use Control MS4 Operator identified in section III. of this form does not have review authority over the construction project identified in section II. of this form, which is owned/operated by the entity identified in section I. of this form. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.:

b. Title/Position:

c. Signature:

d. Date:

APPENDIX J – Owner/Operator Certification Form

The Owner/Operator Certification Form required by this permit begins on the following page.

NEW YORK STATE | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b. or Part I.F.2. and 3., the completed form must be attached to the eNOI or the Request to Continue Coverage, and submitted to NYSDEC electronically.

Project/Site Name: _____

eNOI Submission ID: _____

eNOI Submitted by: ☐ **Owner/Operator** ☐ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I hereby certify that I read, and will comply with, the GP-0-25-001 permit requirements. I understand that authorization to discharge under the permit for the project/site named above is dependent on receipt of a Letter of Authorization (LOA) or a Letter of Continued Coverage (LOCC) from the New York State Department of Environmental Conservation (NYSDEC) in accordance with CGP Part I.D.3.b. or Part I.F.4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator First Name MI Owner/Operator Last Name

_____

Signature

_____

Date

Revised: January 2025

NEW YORK STATE | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b. or Part I.F.2. and 3., the completed form must be attached to the eNOI or the Request to Continue Coverage, and submitted to NYSDEC electronically.

Project/Site Name: Ossining UFSD: Anne M Dorner MS Driveway & New 7/8 Building

eNOI Submission ID: _____

eNOI Submitted by: ☐ **Owner/Operator** ☒ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I hereby certify that I read, and will comply with, the GP-0-25-001 permit requirements. I understand that authorization to discharge under the permit for the project/site named above is dependent on receipt of a Letter of Authorization (LOA) or a Letter of Continued Coverage (LOCC) from the New York State Department of Environmental Conservation (NYSDEC) in accordance with CGP Part I.D.3.b. or Part I.F.4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator First Name MI Owner/Operator Last Name

Mary C. Fox-Reed

Signature

8-11-25

Date

Revised: January 2025

NEW YORK STATE | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

Project/Site Name:	Anne M Dorner Middle School Driveway Project
eNOI Submission ID:	HQF-0TQP-SSXQ0
Owner/Operator Name:	Ossining Union Free School District

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements of GP-0-25-001. I certify under penalty of law that the SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James	C	Basile
SWPPP Preparer First Name	MI	SWPPP Preparer Last Name

Signature 

8/26/2025
Date

APPENDIX B

EXTREME PRECIPITATION TABLES

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	New York
Location	New York, United States
Latitude	41.177 degrees North
Longitude	73.859 degrees West
Elevation	110 feet
Date/Time	Fri Oct 25 2024 11:45:00 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

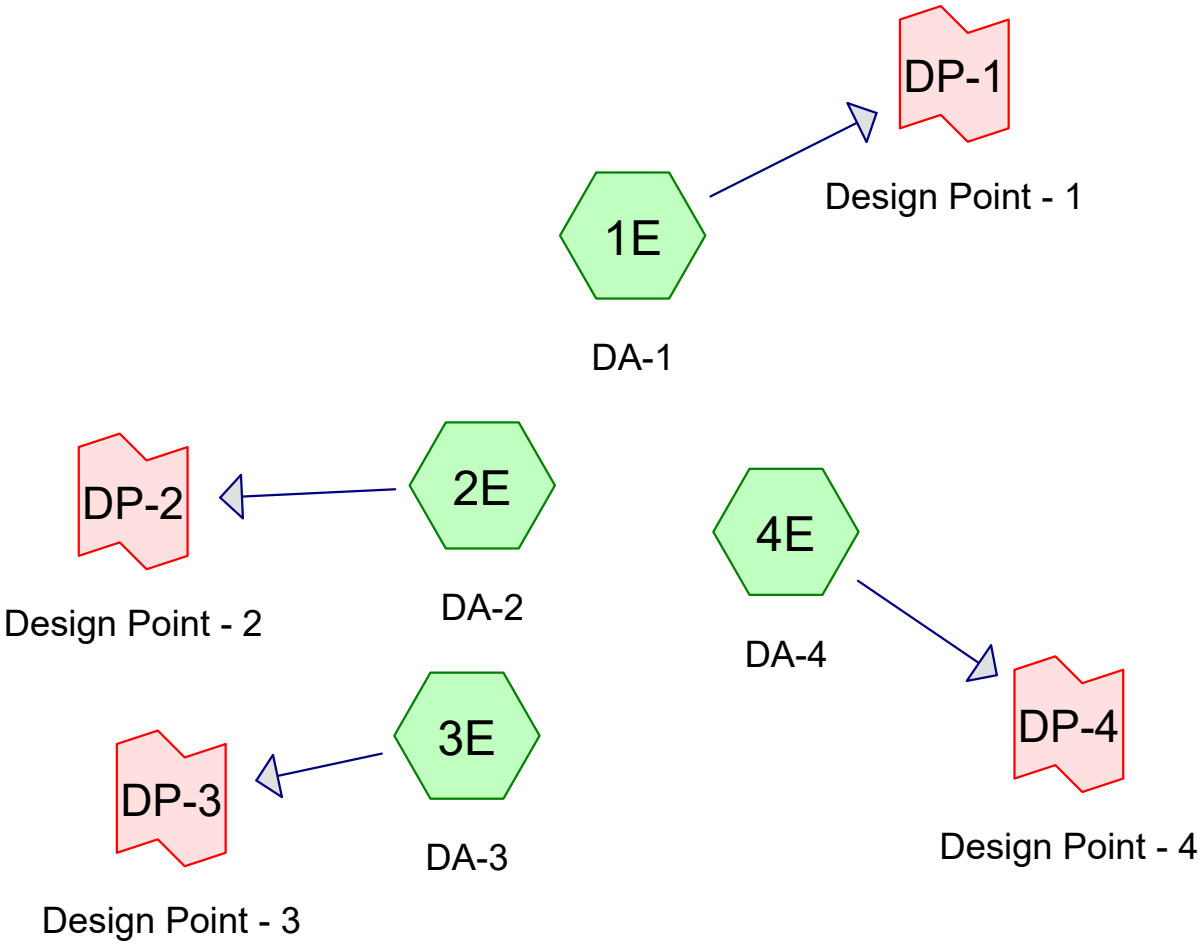
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.34	0.51	0.64	0.84	1.05	1.30	**1yr**	0.90	1.24	1.49	1.84	2.26	2.78	3.16	**1yr**	2.46	3.0
2yr	0.40	0.62	0.77	1.02	1.28	1.60	**2yr**	1.10	1.49	1.84	2.27	2.78	3.41	3.83	**2yr**	3.02	3.6
5yr	0.47	0.73	0.91	1.22	1.56	1.98	**5yr**	1.35	1.83	2.29	2.84	3.50	4.31	4.88	**5yr**	3.81	4.6
10yr	0.52	0.82	1.03	1.40	1.82	2.33	**10yr**	1.57	2.14	2.70	3.37	4.17	5.14	5.86	**10yr**	4.55	5.6
25yr	0.60	0.95	1.21	1.68	2.24	2.89	**25yr**	1.93	2.65	3.38	4.24	5.28	6.50	7.47	**25yr**	5.75	7.1
50yr	0.67	1.08	1.39	1.95	2.62	3.42	**50yr**	2.26	3.10	4.01	5.05	6.29	7.77	8.98	**50yr**	6.87	8.6
100yr	0.76	1.23	1.58	2.25	3.07	4.04	**100yr**	2.65	3.64	4.75	6.02	7.52	9.29	10.80	**100yr**	8.23	10.3
200yr	0.87	1.41	1.83	2.61	3.60	4.77	**200yr**	3.11	4.27	5.63	7.17	8.98	11.13	13.00	**200yr**	9.85	12.5
500yr	1.03	1.69	2.20	3.19	4.46	5.97	**500yr**	3.85	5.29	7.08	9.05	11.38	14.15	16.63	**500yr**	12.53	15.9

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2da
1yr	0.27	0.42	0.51	0.69	0.84	1.15	**1yr**	0.73	1.12	1.34	1.73	2.15	2.37	2.86	**1yr**	2.10	2.7

APPENDIX C

EXISTING CONDITIONS HYDROLOGIC ANALYSIS AND CALCULATION DATA



Subcat Reach Pond Link

Routing Diagram for Pre Development Conditions
Prepared by Clark Patterson Lee, Printed 10/21/2026
HydroCAD® 10.20-8a s/n 00475 © 2025 HydroCAD Software Solutions LLC

Project Notes

Defined 9 rainfall events from NY-Ossining AMD IDF
Copied 9 events from NY-Ossining AMD 24-hr S1 storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	NY-Ossining AMD 24-hr S1	1-yr	Default	24.00	1	2.78	2
2	2-yr	NY-Ossining AMD 24-hr S1	2-yr	Default	24.00	1	3.41	2
3	10-yr	NY-Ossining AMD 24-hr S1	10-yr	Default	24.00	1	5.14	2
4	100-yr	NY-Ossining AMD 24-hr S1	100-yr	Default	24.00	1	9.29	2
5	200-yr	NY-Ossining AMD 24-hr S1	200-yr	Default	24.00	1	11.13	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.181	61	>75% Grass cover, Good, HSG B (4E)
0.023	80	>75% Grass cover, Good, HSG D (4E)
0.147	96	Gravel surface, HSG C (4E)
0.634	96	Gravel surface, HSG D (1E, 2E, 4E)
0.615	79	Pasture/grassland/range, Poor, HSG B (3E)
0.030	98	Paved parking, HSG B (3E)
2.118	98	Paved roads w/curbs & sewers, HSG D (3E)
0.255	98	Roofs, HSG D (3E)
0.071	98	Unconnected pavement, HSG B (3E)
2.363	79	Woods, Fair, HSG D (1E, 2E)
4.798	66	Woods, Poor, HSG B (4E)
10.704	77	Woods, Poor, HSG C (4E)
8.224	83	Woods, Poor, HSG D (2E, 3E, 4E)
0.252	82	Woods/grass comb., Fair, HSG D (1E)
30.415	**79**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.695	HSG B	3E, 4E
10.850	HSG C	4E
13.869	HSG D	1E, 2E, 3E, 4E
0.000	Other	
30.415		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.181	0.000	0.023	0.000	0.204	>75% Grass cover, Good	4E
0.000	0.000	0.147	0.634	0.000	0.781	Gravel surface	1E, 2E, 4E
0.000	0.615	0.000	0.000	0.000	0.615	Pasture/grassland/range, Poor	3E
0.000	0.030	0.000	0.000	0.000	0.030	Paved parking	3E
0.000	0.000	0.000	2.118	0.000	2.118	Paved roads w/curbs & sewers	3E
0.000	0.000	0.000	0.255	0.000	0.255	Roofs	3E
0.000	0.071	0.000	0.000	0.000	0.071	Unconnected pavement	3E
0.000	0.000	0.000	2.363	0.000	2.363	Woods, Fair	1E, 2E
0.000	4.798	10.704	8.224	0.000	23.726	Woods, Poor	2E, 3E, 4E
0.000	0.000	0.000	0.252	0.000	0.252	Woods/grass comb., Fair	1E
0.000	**5.695**	**10.850**	**13.869**	**0.000**	**30.415**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	3E	0.00	0.00	181.0	0.0077	0.013	0.0	15.0	0.0	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1E: DA-1 Runoff Area=96,956 sf 0.00% Impervious Runoff Depth=1.09"
Flow Length=278' Tc=19.1 min CN=80 Runoff=1.90 cfs 0.202 af

Subcatchment2E: DA-2 Runoff Area=262,088 sf 0.00% Impervious Runoff Depth=1.27"
Flow Length=786' Tc=47.3 min CN=83 Runoff=3.75 cfs 0.638 af

Subcatchment3E: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.04"
Flow Length=469' Tc=13.4 min CN=93 Runoff=6.99 cfs 0.615 af

Subcatchment4E: DA-4 Runoff Area=808,501 sf 0.00% Impervious Runoff Depth=0.82"
Flow Length=1,451' Tc=26.4 min CN=75 Runoff=9.47 cfs 1.268 af

Link DP-1: Design Point - 1 Inflow=1.90 cfs 0.202 af
Primary=1.90 cfs 0.202 af

Link DP-2: Design Point - 2 Inflow=3.75 cfs 0.638 af
Primary=3.75 cfs 0.638 af

Link DP-3: Design Point - 3 Inflow=6.99 cfs 0.615 af
Primary=6.99 cfs 0.615 af

Link DP-4: Design Point - 4 Inflow=9.47 cfs 1.268 af
Primary=9.47 cfs 1.268 af

Total Runoff Area = 30.415 ac Runoff Volume = 2.723 af Average Runoff Depth = 1.07"
91.87% Pervious = 27.941 ac 8.13% Impervious = 2.474 ac

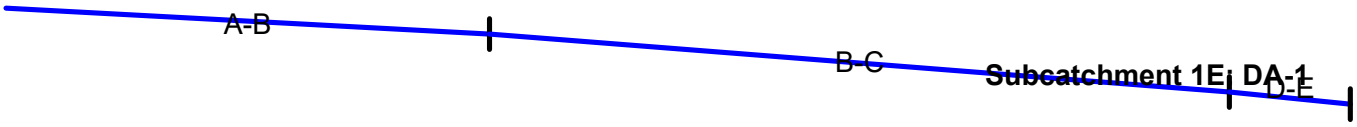
Summary for Subcatchment 1E: DA-1

Runoff = 1.90 cfs @ 12.22 hrs, Volume= 0.202 af, Depth= 1.09"
Routed to Link DP-1 : Design Point - 1

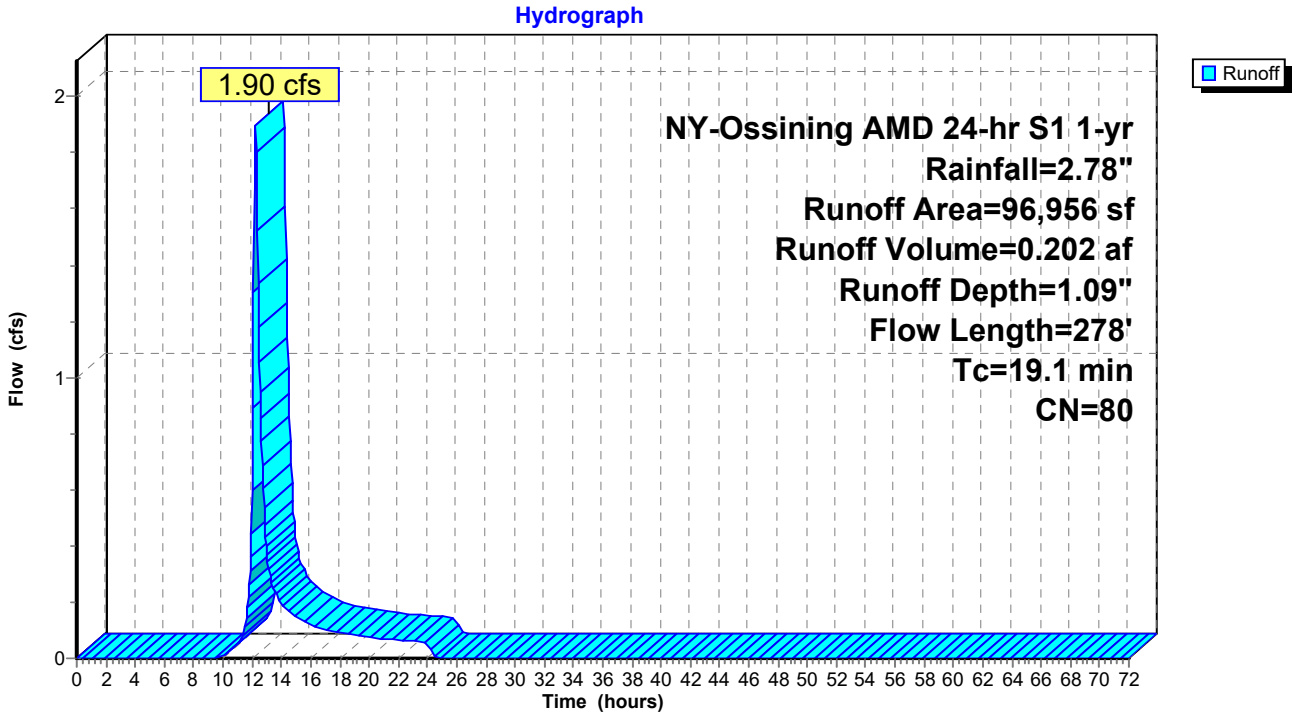
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
83,446	79	Woods, Fair, HSG D
10,983	82	Woods/grass comb., Fair, HSG D
2,527	96	Gravel surface, HSG D
96,956	80	Weighted Average
96,956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0346	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.0651	3.83		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
19.1	278	Total			



Subcatchment 1E: DA-1



Hydrograph for Subcatchment 1E: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.01
11.00	0.74	0.02	0.05
12.00	1.53	0.30	**0.60**
13.00	2.04	0.59	**0.37**
14.00	2.19	0.68	0.20
15.00	2.30	0.75	0.15
16.00	2.38	0.81	0.12
17.00	2.45	0.86	0.10
18.00	2.51	0.90	0.09
19.00	2.57	0.94	0.08
20.00	2.62	0.97	0.08
21.00	2.66	1.00	0.07
22.00	2.70	1.03	0.07
23.00	2.74	1.06	0.06
24.00	**2.78**	**1.09**	0.06
25.00	2.78	1.09	0.00
26.00	2.78	1.09	0.00
27.00	2.78	1.09	0.00
28.00	2.78	1.09	0.00
29.00	2.78	1.09	0.00
30.00	2.78	1.09	0.00
31.00	2.78	1.09	0.00
32.00	2.78	1.09	0.00
33.00	2.78	1.09	0.00
34.00	2.78	1.09	0.00
35.00	2.78	1.09	0.00
36.00	2.78	1.09	0.00
37.00	2.78	1.09	0.00
38.00	2.78	1.09	0.00
39.00	2.78	1.09	0.00
40.00	2.78	1.09	0.00
41.00	2.78	1.09	0.00
42.00	2.78	1.09	0.00
43.00	2.78	1.09	0.00
44.00	2.78	1.09	0.00
45.00	2.78	1.09	0.00
46.00	2.78	1.09	0.00
47.00	2.78	1.09	0.00
48.00	2.78	1.09	0.00
49.00	2.78	1.09	0.00
50.00	2.78	1.09	0.00
51.00	2.78	1.09	0.00
52.00	2.78	1.09	0.00
53.00	2.78	1.09	0.00
54.00	2.78	1.09	0.00
55.00	2.78	1.09	0.00
56.00	2.78	1.09	0.00
57.00	2.78	1.09	0.00
58.00	2.78	1.09	0.00
59.00	2.78	1.09	0.00
60.00	2.78	1.09	0.00
61.00	2.78	1.09	0.00
62.00	2.78	1.09	0.00
63.00	2.78	1.09	0.00
64.00	2.78	1.09	0.00
65.00	2.78	1.09	0.00
66.00	2.78	1.09	0.00
67.00	2.78	1.09	0.00
68.00	2.78	1.09	0.00
69.00	2.78	1.09	0.00
70.00	2.78	1.09	0.00
71.00	2.78	1.09	0.00
72.00	2.78	1.09	0.00

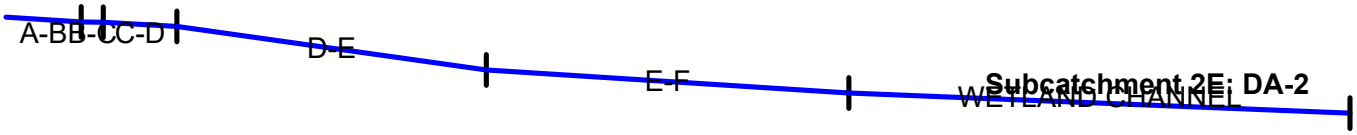
Summary for Subcatchment 2E: DA-2

Runoff = 3.75 cfs @ 12.62 hrs, Volume= 0.638 af, Depth= 1.27"
Routed to Link DP-2 : Design Point - 2

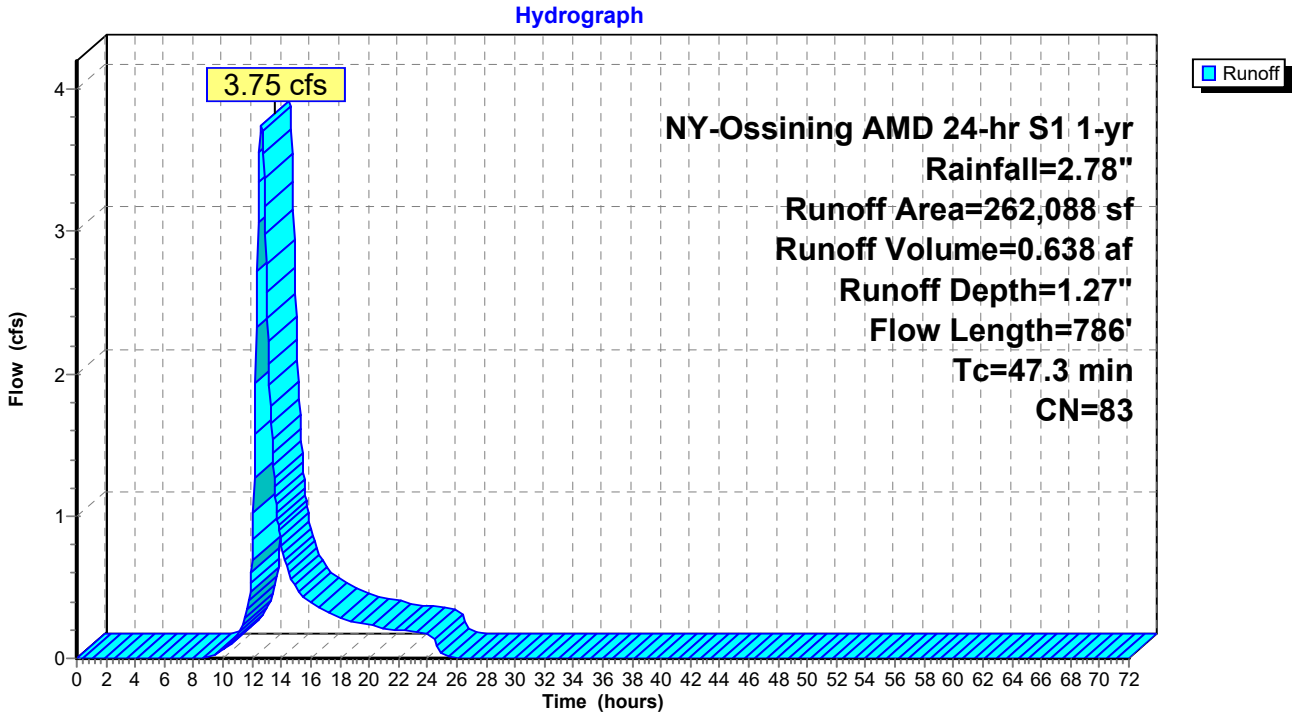
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
230,823	83	Woods, Poor, HSG D
842	96	Gravel surface, HSG D
6,258	96	Gravel surface, HSG D
4,688	96	Gravel surface, HSG D
19,477	79	Woods, Fair, HSG D
262,088	83	Weighted Average
262,088		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	44	0.0230	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.41"
0.3	13	0.0076	0.64		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
18.4	43	0.0202	0.04		**Sheet Flow, C-D** Woods: Dense underbrush n= 0.800 P2= 3.41"
2.7	181	0.0507	1.13		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
4.7	212	0.0229	0.76		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, WETLAND CHANNEL** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
47.3	786	Total			



Subcatchment 2E: DA-2



Hydrograph for Subcatchment 2E: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.01
10.00	0.59	0.01	0.06
11.00	0.74	0.05	0.16
12.00	1.53	0.40	**0.69**
13.00	2.04	0.72	**2.58**
14.00	2.19	0.83	0.80
15.00	2.30	0.91	0.50
16.00	2.38	0.97	0.39
17.00	2.45	1.02	0.33
18.00	2.51	1.07	0.29
19.00	2.57	1.11	0.26
20.00	2.62	1.15	0.23
21.00	2.66	1.18	0.21
22.00	2.70	1.21	0.20
23.00	2.74	1.24	0.19
24.00	**2.78**	**1.27**	0.18
25.00	2.78	1.27	0.03
26.00	2.78	1.27	0.00
27.00	2.78	1.27	0.00
28.00	2.78	1.27	0.00
29.00	2.78	1.27	0.00
30.00	2.78	1.27	0.00
31.00	2.78	1.27	0.00
32.00	2.78	1.27	0.00
33.00	2.78	1.27	0.00
34.00	2.78	1.27	0.00
35.00	2.78	1.27	0.00
36.00	2.78	1.27	0.00
37.00	2.78	1.27	0.00
38.00	2.78	1.27	0.00
39.00	2.78	1.27	0.00
40.00	2.78	1.27	0.00
41.00	2.78	1.27	0.00
42.00	2.78	1.27	0.00
43.00	2.78	1.27	0.00
44.00	2.78	1.27	0.00
45.00	2.78	1.27	0.00
46.00	2.78	1.27	0.00
47.00	2.78	1.27	0.00
48.00	2.78	1.27	0.00
49.00	2.78	1.27	0.00
50.00	2.78	1.27	0.00
51.00	2.78	1.27	0.00
52.00	2.78	1.27	0.00
53.00	2.78	1.27	0.00
54.00	2.78	1.27	0.00
55.00	2.78	1.27	0.00
56.00	2.78	1.27	0.00
57.00	2.78	1.27	0.00
58.00	2.78	1.27	0.00
59.00	2.78	1.27	0.00
60.00	2.78	1.27	0.00
61.00	2.78	1.27	0.00
62.00	2.78	1.27	0.00
63.00	2.78	1.27	0.00
64.00	2.78	1.27	0.00
65.00	2.78	1.27	0.00
66.00	2.78	1.27	0.00
67.00	2.78	1.27	0.00
68.00	2.78	1.27	0.00
69.00	2.78	1.27	0.00
70.00	2.78	1.27	0.00
71.00	2.78	1.27	0.00
72.00	2.78	1.27	0.00

Summary for Subcatchment 3E: DA-3

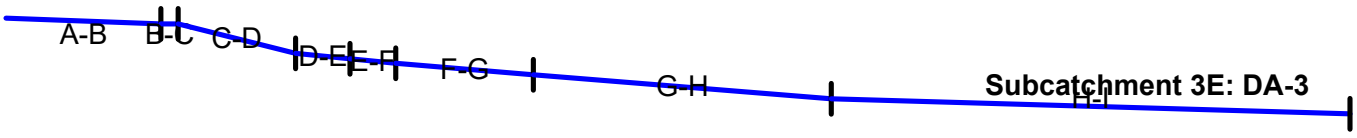
[47] Hint: Peak is 123% of capacity of segment #8

Runoff = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Depth= 2.04"
Routed to Link DP-3 : Design Point - 3

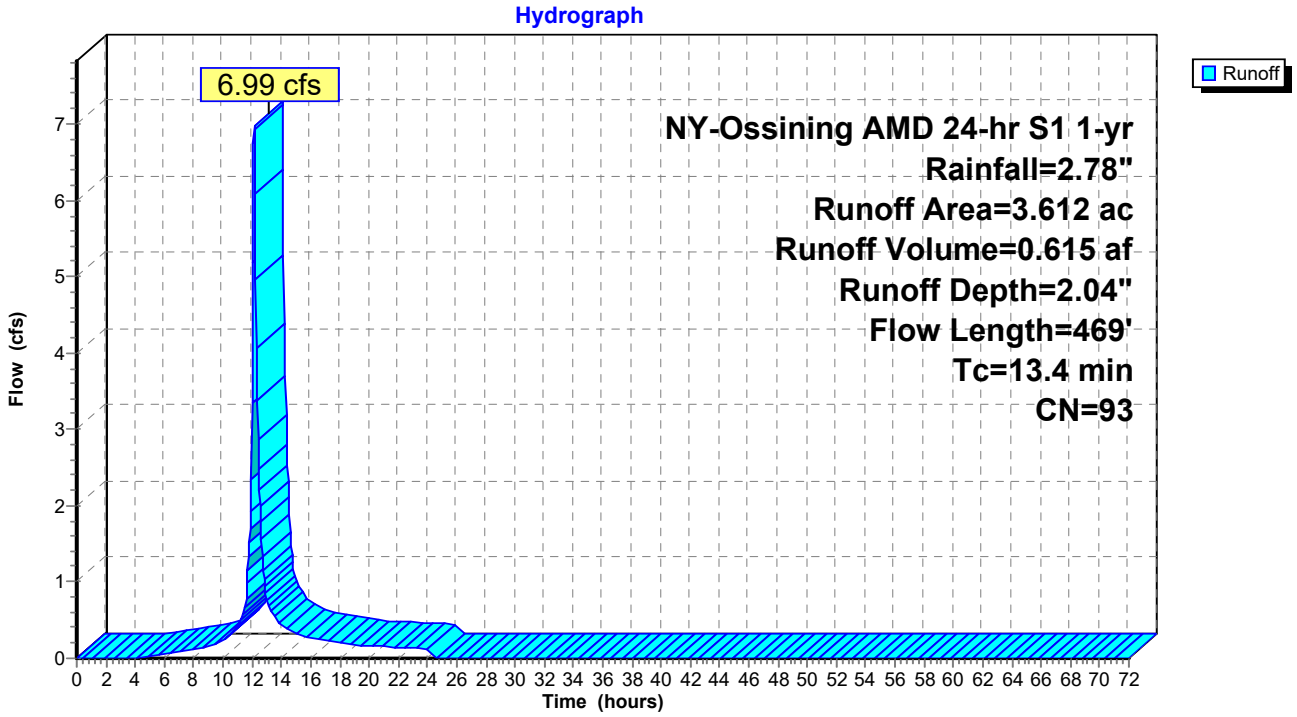
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3E: DA-3



Hydrograph for Subcatchment 3E: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.02
6.00	0.27	0.02	0.05
7.00	0.33	0.03	0.08
8.00	0.40	0.06	0.11
9.00	0.48	0.10	0.16
10.00	0.59	0.16	0.25
11.00	0.74	0.26	0.43
12.00	1.53	0.89	**3.36**
13.00	2.04	1.35	**0.78**
14.00	2.19	1.49	0.44
15.00	2.30	1.59	0.33
16.00	2.38	1.67	0.27
17.00	2.45	1.74	0.23
18.00	2.51	1.79	0.20
19.00	2.57	1.84	0.18
20.00	2.62	1.89	0.16
21.00	2.66	1.93	0.15
22.00	2.70	1.97	0.14
23.00	2.74	2.01	0.13
24.00	**2.78**	**2.04**	0.12
25.00	2.78	2.04	0.00
26.00	2.78	2.04	0.00
27.00	2.78	2.04	0.00
28.00	2.78	2.04	0.00
29.00	2.78	2.04	0.00
30.00	2.78	2.04	0.00
31.00	2.78	2.04	0.00
32.00	2.78	2.04	0.00
33.00	2.78	2.04	0.00
34.00	2.78	2.04	0.00
35.00	2.78	2.04	0.00
36.00	2.78	2.04	0.00
37.00	2.78	2.04	0.00
38.00	2.78	2.04	0.00
39.00	2.78	2.04	0.00
40.00	2.78	2.04	0.00
41.00	2.78	2.04	0.00
42.00	2.78	2.04	0.00
43.00	2.78	2.04	0.00
44.00	2.78	2.04	0.00
45.00	2.78	2.04	0.00
46.00	2.78	2.04	0.00
47.00	2.78	2.04	0.00
48.00	2.78	2.04	0.00
49.00	2.78	2.04	0.00
50.00	2.78	2.04	0.00
51.00	2.78	2.04	0.00
52.00	2.78	2.04	0.00
53.00	2.78	2.04	0.00
54.00	2.78	2.04	0.00
55.00	2.78	2.04	0.00
56.00	2.78	2.04	0.00
57.00	2.78	2.04	0.00
58.00	2.78	2.04	0.00
59.00	2.78	2.04	0.00
60.00	2.78	2.04	0.00
61.00	2.78	2.04	0.00
62.00	2.78	2.04	0.00
63.00	2.78	2.04	0.00
64.00	2.78	2.04	0.00
65.00	2.78	2.04	0.00
66.00	2.78	2.04	0.00
67.00	2.78	2.04	0.00
68.00	2.78	2.04	0.00
69.00	2.78	2.04	0.00
70.00	2.78	2.04	0.00
71.00	2.78	2.04	0.00
72.00	2.78	2.04	0.00

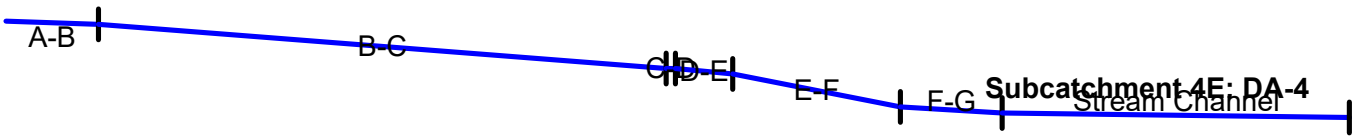
Summary for Subcatchment 4E: DA-4

Runoff = 9.47 cfs @ 12.35 hrs, Volume= 1.268 af, Depth= 0.82"
Routed to Link DP-4 : Design Point - 4

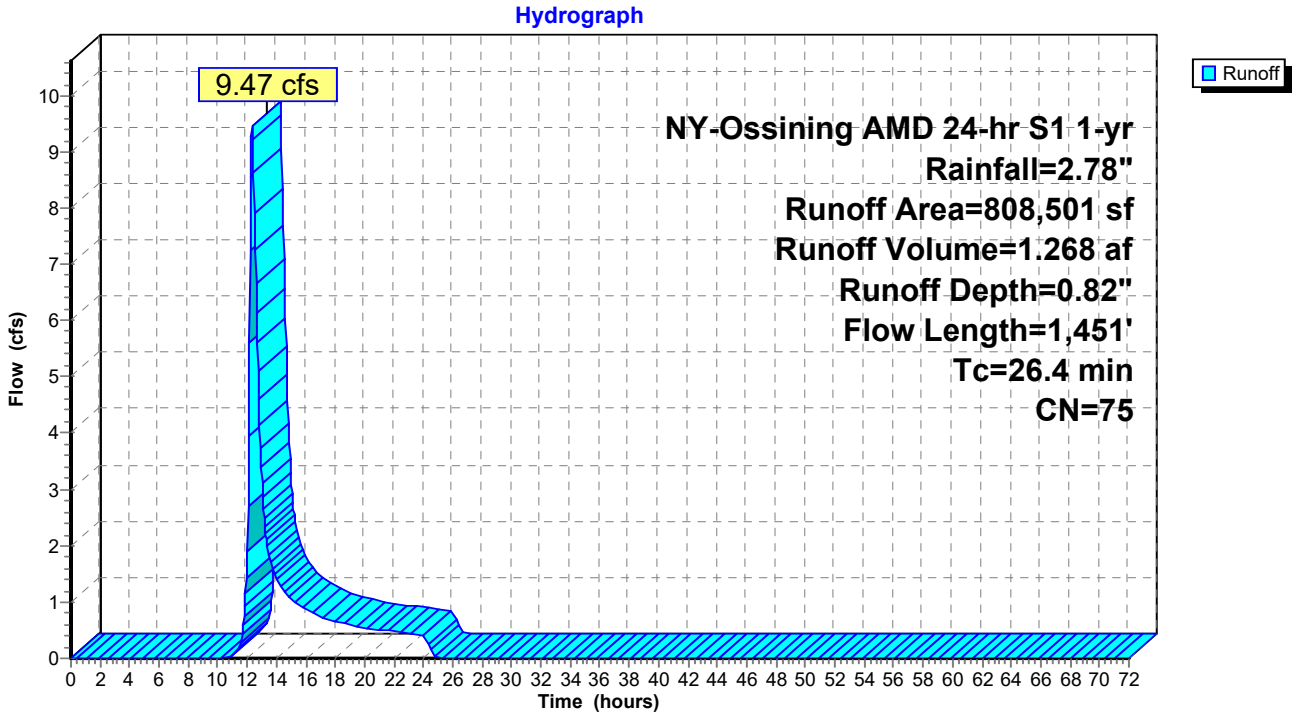
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
4,578	96	Gravel surface, HSG D
6,394	96	Gravel surface, HSG C
104,648	83	Woods, Poor, HSG D
466,246	77	Woods, Poor, HSG C
7,895	61	>75% Grass cover, Good, HSG B
1,011	80	>75% Grass cover, Good, HSG D
209,007	66	Woods, Poor, HSG B
8,722	96	Gravel surface, HSG D
808,501	75	Weighted Average
808,501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0519	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
6.0	613	0.1160	1.70		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
26.4	1,451	Total			



Subcatchment 4E: DA-4



Hydrograph for Subcatchment 4E: DA-4

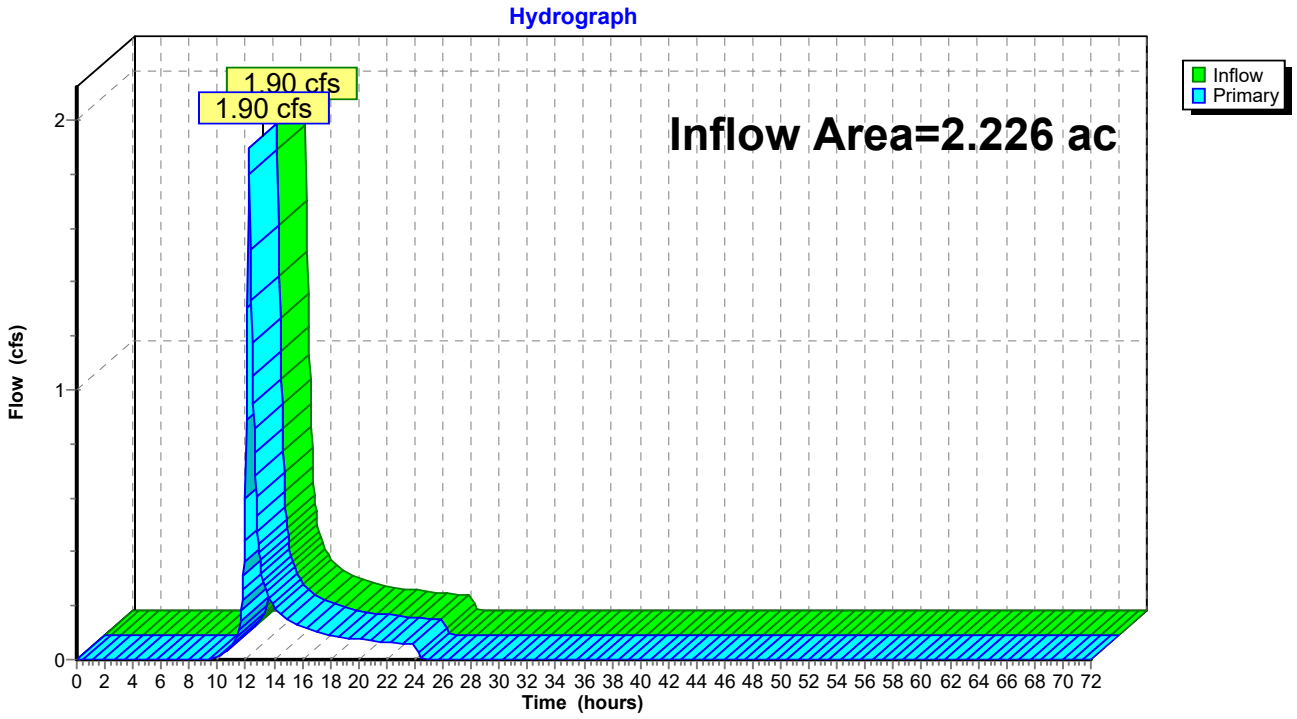
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.00
11.00	0.74	0.00	0.03
12.00	1.53	0.18	**1.90**
13.00	2.04	0.40	**3.10**
14.00	2.19	0.48	1.40
15.00	2.30	0.54	1.04
16.00	2.38	0.58	0.85
17.00	2.45	0.62	0.74
18.00	2.51	0.66	0.66
19.00	2.57	0.69	0.59
20.00	2.62	0.72	0.55
21.00	2.66	0.75	0.51
22.00	2.70	0.77	0.47
23.00	2.74	0.80	0.45
24.00	**2.78**	**0.82**	0.42
25.00	2.78	0.82	0.01
26.00	2.78	0.82	0.00
27.00	2.78	0.82	0.00
28.00	2.78	0.82	0.00
29.00	2.78	0.82	0.00
30.00	2.78	0.82	0.00
31.00	2.78	0.82	0.00
32.00	2.78	0.82	0.00
33.00	2.78	0.82	0.00
34.00	2.78	0.82	0.00
35.00	2.78	0.82	0.00
36.00	2.78	0.82	0.00
37.00	2.78	0.82	0.00
38.00	2.78	0.82	0.00
39.00	2.78	0.82	0.00
40.00	2.78	0.82	0.00
41.00	2.78	0.82	0.00
42.00	2.78	0.82	0.00
43.00	2.78	0.82	0.00
44.00	2.78	0.82	0.00
45.00	2.78	0.82	0.00
46.00	2.78	0.82	0.00
47.00	2.78	0.82	0.00
48.00	2.78	0.82	0.00
49.00	2.78	0.82	0.00
50.00	2.78	0.82	0.00
51.00	2.78	0.82	0.00
52.00	2.78	0.82	0.00
53.00	2.78	0.82	0.00
54.00	2.78	0.82	0.00
55.00	2.78	0.82	0.00
56.00	2.78	0.82	0.00
57.00	2.78	0.82	0.00
58.00	2.78	0.82	0.00
59.00	2.78	0.82	0.00
60.00	2.78	0.82	0.00
61.00	2.78	0.82	0.00
62.00	2.78	0.82	0.00
63.00	2.78	0.82	0.00
64.00	2.78	0.82	0.00
65.00	2.78	0.82	0.00
66.00	2.78	0.82	0.00
67.00	2.78	0.82	0.00
68.00	2.78	0.82	0.00
69.00	2.78	0.82	0.00
70.00	2.78	0.82	0.00
71.00	2.78	0.82	0.00
72.00	2.78	0.82	0.00

Summary for Link DP-1: Design Point - 1

Inflow Area = 2.226 ac, 0.00% Impervious, Inflow Depth = 1.09" for 1-yr event
Inflow = 1.90 cfs @ 12.22 hrs, Volume= 0.202 af
Primary = 1.90 cfs @ 12.22 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

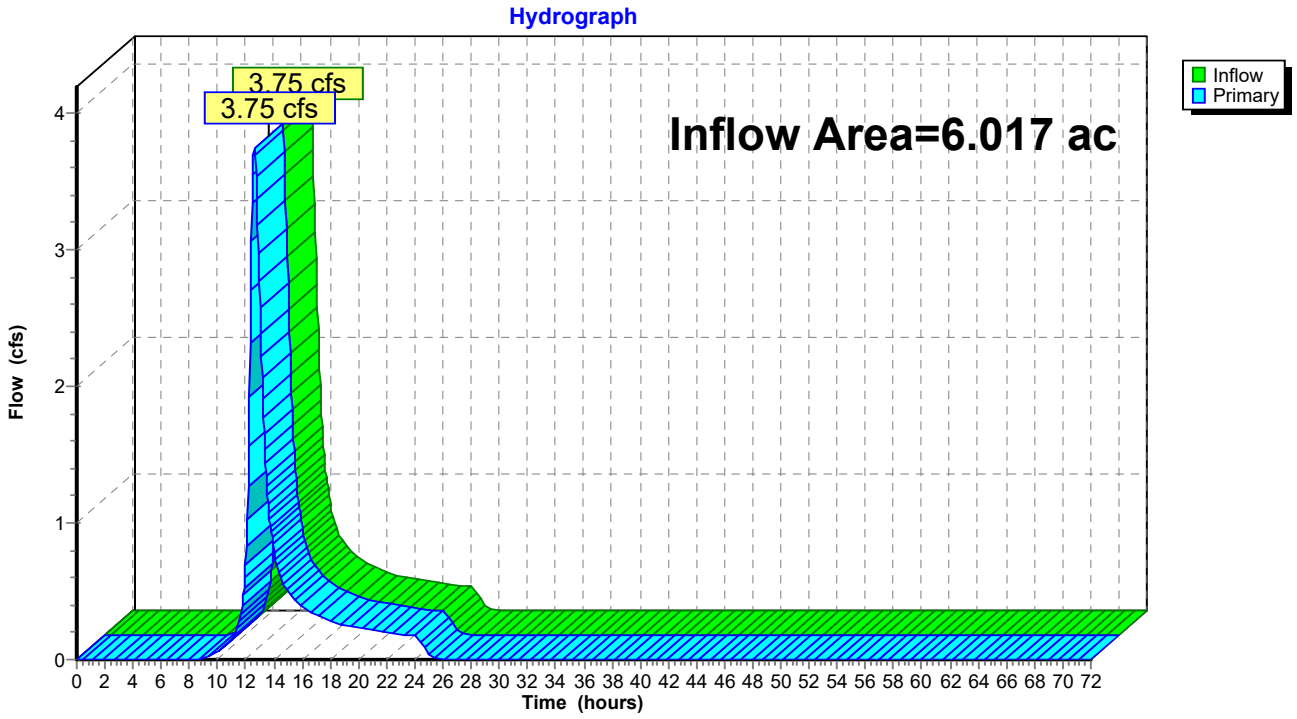
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	62.00	0.00	0.00	0.00
11.00	0.05	0.00	0.05	63.00	0.00	0.00	0.00
12.00	**0.60**	0.00	**0.60**	64.00	0.00	0.00	0.00
13.00	**0.37**	0.00	**0.37**	65.00	0.00	0.00	0.00
14.00	0.20	0.00	0.20	66.00	0.00	0.00	0.00
15.00	0.15	0.00	0.15	67.00	0.00	0.00	0.00
16.00	0.12	0.00	0.12	68.00	0.00	0.00	0.00
17.00	0.10	0.00	0.10	69.00	0.00	0.00	0.00
18.00	0.09	0.00	0.09	70.00	0.00	0.00	0.00
19.00	0.08	0.00	0.08	71.00	0.00	0.00	0.00
20.00	0.08	0.00	0.08	72.00	0.00	0.00	0.00
21.00	0.07	0.00	0.07				
22.00	0.07	0.00	0.07				
23.00	0.06	0.00	0.06				
24.00	0.06	0.00	0.06				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-2: Design Point - 2

Inflow Area = 6.017 ac, 0.00% Impervious, Inflow Depth = 1.27" for 1-yr event
Inflow = 3.75 cfs @ 12.62 hrs, Volume= 0.638 af
Primary = 3.75 cfs @ 12.62 hrs, Volume= 0.638 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

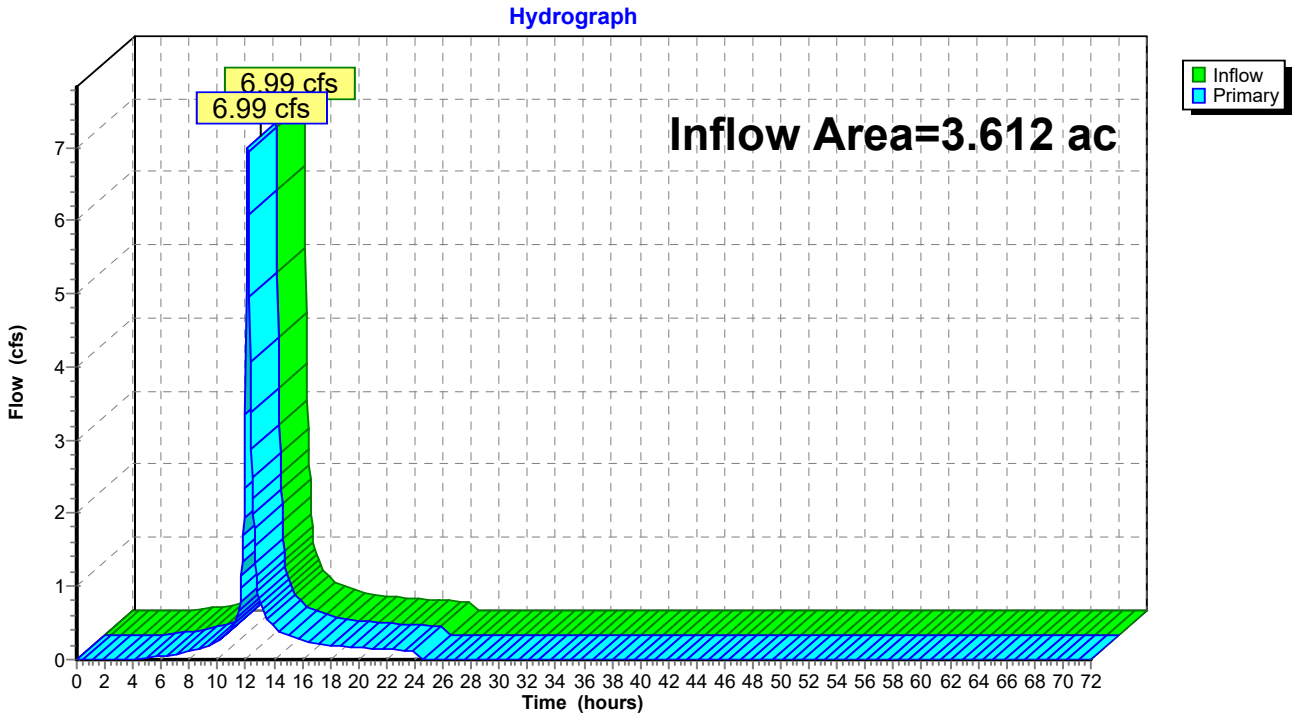
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01
10.00	0.06	0.00	0.06
11.00	0.16	0.00	0.16
12.00	**0.69**	0.00	**0.69**
13.00	**2.58**	0.00	**2.58**
14.00	0.80	0.00	0.80
15.00	0.50	0.00	0.50
16.00	0.39	0.00	0.39
17.00	0.33	0.00	0.33
18.00	0.29	0.00	0.29
19.00	0.26	0.00	0.26
20.00	0.23	0.00	0.23
21.00	0.21	0.00	0.21
22.00	0.20	0.00	0.20
23.00	0.19	0.00	0.19
24.00	0.18	0.00	0.18
25.00	0.03	0.00	0.03
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.04" for 1-yr event
Inflow = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af
Primary = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

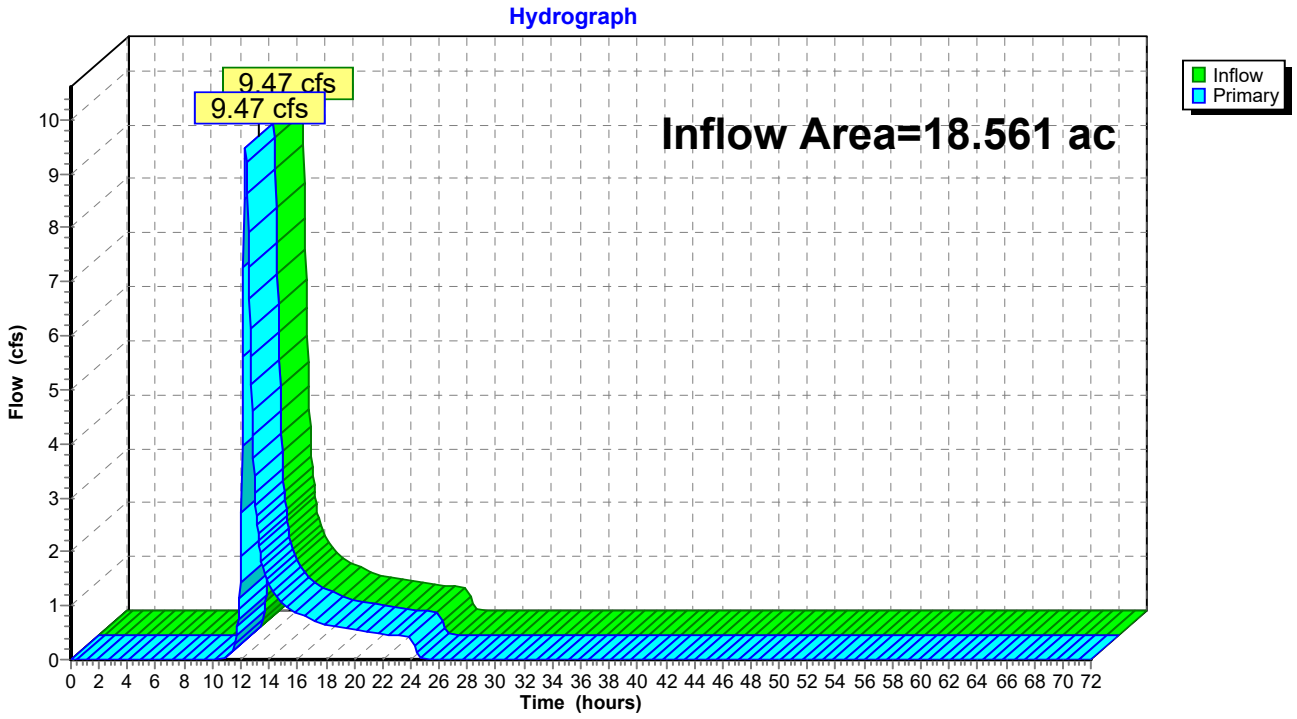
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.02	0.00	0.02	57.00	0.00	0.00	0.00
6.00	0.05	0.00	0.05	58.00	0.00	0.00	0.00
7.00	0.08	0.00	0.08	59.00	0.00	0.00	0.00
8.00	0.11	0.00	0.11	60.00	0.00	0.00	0.00
9.00	0.16	0.00	0.16	61.00	0.00	0.00	0.00
10.00	0.25	0.00	0.25	62.00	0.00	0.00	0.00
11.00	0.43	0.00	0.43	63.00	0.00	0.00	0.00
12.00	**3.36**	0.00	**3.36**	64.00	0.00	0.00	0.00
13.00	**0.78**	0.00	**0.78**	65.00	0.00	0.00	0.00
14.00	0.44	0.00	0.44	66.00	0.00	0.00	0.00
15.00	0.33	0.00	0.33	67.00	0.00	0.00	0.00
16.00	0.27	0.00	0.27	68.00	0.00	0.00	0.00
17.00	0.23	0.00	0.23	69.00	0.00	0.00	0.00
18.00	0.20	0.00	0.20	70.00	0.00	0.00	0.00
19.00	0.18	0.00	0.18	71.00	0.00	0.00	0.00
20.00	0.16	0.00	0.16	72.00	0.00	0.00	0.00
21.00	0.15	0.00	0.15				
22.00	0.14	0.00	0.14				
23.00	0.13	0.00	0.13				
24.00	0.12	0.00	0.12				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-4: Design Point - 4

Inflow Area = 18.561 ac, 0.00% Impervious, Inflow Depth = 0.82" for 1-yr event
Inflow = 9.47 cfs @ 12.35 hrs, Volume= 1.268 af
Primary = 9.47 cfs @ 12.35 hrs, Volume= 1.268 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	63.00	0.00	0.00	0.00
12.00	**1.90**	0.00	**1.90**	64.00	0.00	0.00	0.00
13.00	**3.10**	0.00	**3.10**	65.00	0.00	0.00	0.00
14.00	1.40	0.00	1.40	66.00	0.00	0.00	0.00
15.00	1.04	0.00	1.04	67.00	0.00	0.00	0.00
16.00	0.85	0.00	0.85	68.00	0.00	0.00	0.00
17.00	0.74	0.00	0.74	69.00	0.00	0.00	0.00
18.00	0.66	0.00	0.66	70.00	0.00	0.00	0.00
19.00	0.59	0.00	0.59	71.00	0.00	0.00	0.00
20.00	0.55	0.00	0.55	72.00	0.00	0.00	0.00
21.00	0.51	0.00	0.51				
22.00	0.47	0.00	0.47				
23.00	0.45	0.00	0.45				
24.00	0.42	0.00	0.42				
25.00	0.01	0.00	0.01				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1E: DA-1 Runoff Area=96,956 sf 0.00% Impervious Runoff Depth=1.57"
Flow Length=278' Tc=19.1 min CN=80 Runoff=2.73 cfs 0.290 af

Subcatchment2E: DA-2 Runoff Area=262,088 sf 0.00% Impervious Runoff Depth=1.78"
Flow Length=786' Tc=47.3 min CN=83 Runoff=5.25 cfs 0.894 af

Subcatchment3E: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.65"
Flow Length=469' Tc=13.4 min CN=93 Runoff=8.71 cfs 0.797 af

Subcatchment4E: DA-4 Runoff Area=808,501 sf 0.00% Impervious Runoff Depth=1.24"
Flow Length=1,451' Tc=26.4 min CN=75 Runoff=14.74 cfs 1.916 af

Link DP-1: Design Point - 1 Inflow=2.73 cfs 0.290 af
Primary=2.73 cfs 0.290 af

Link DP-2: Design Point - 2 Inflow=5.25 cfs 0.894 af
Primary=5.25 cfs 0.894 af

Link DP-3: Design Point - 3 Inflow=8.71 cfs 0.797 af
Primary=8.71 cfs 0.797 af

Link DP-4: Design Point - 4 Inflow=14.74 cfs 1.916 af
Primary=14.74 cfs 1.916 af

Total Runoff Area = 30.415 ac Runoff Volume = 3.897 af Average Runoff Depth = 1.54"
91.87% Pervious = 27.941 ac 8.13% Impervious = 2.474 ac

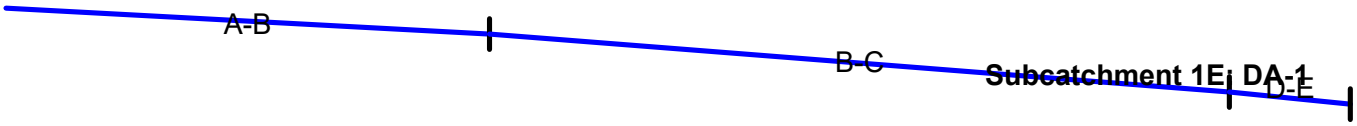
Summary for Subcatchment 1E: DA-1

Runoff = 2.73 cfs @ 12.22 hrs, Volume= 0.290 af, Depth= 1.57"
Routed to Link DP-1 : Design Point - 1

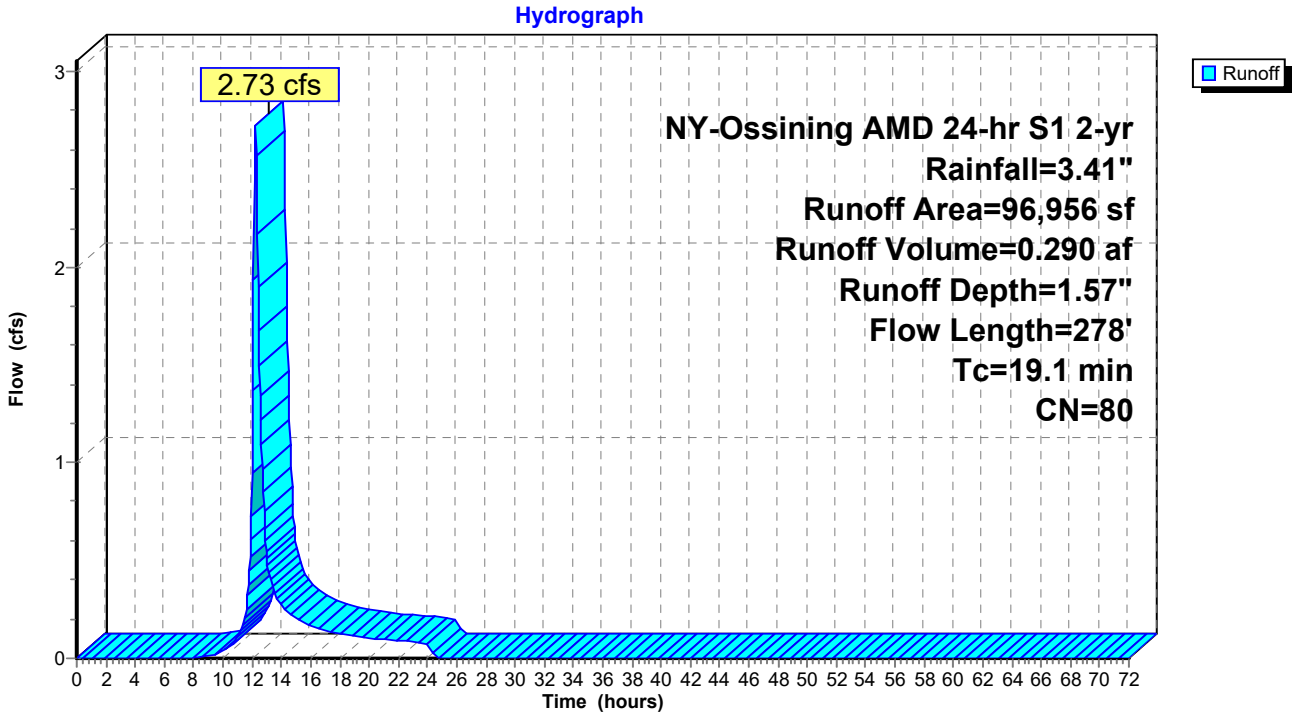
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
83,446	79	Woods, Fair, HSG D
10,983	82	Woods/grass comb., Fair, HSG D
2,527	96	Gravel surface, HSG D
96,956	80	Weighted Average
96,956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0346	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.0651	3.83		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
19.1	278	Total			



Subcatchment 1E: DA-1



Hydrograph for Subcatchment 1E: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.01
10.00	0.73	0.02	0.04
11.00	0.92	0.06	0.11
12.00	1.87	0.48	**0.95**
13.00	2.50	0.89	**0.51**
14.00	2.69	1.02	0.27
15.00	2.82	1.12	0.20
16.00	2.92	1.19	0.16
17.00	3.01	1.26	0.14
18.00	3.08	1.31	0.12
19.00	3.15	1.36	0.11
20.00	3.21	1.41	0.10
21.00	3.27	1.45	0.09
22.00	3.32	1.49	0.09
23.00	3.36	1.53	0.08
24.00	**3.41**	**1.57**	0.08
25.00	3.41	1.57	0.00
26.00	3.41	1.57	0.00
27.00	3.41	1.57	0.00
28.00	3.41	1.57	0.00
29.00	3.41	1.57	0.00
30.00	3.41	1.57	0.00
31.00	3.41	1.57	0.00
32.00	3.41	1.57	0.00
33.00	3.41	1.57	0.00
34.00	3.41	1.57	0.00
35.00	3.41	1.57	0.00
36.00	3.41	1.57	0.00
37.00	3.41	1.57	0.00
38.00	3.41	1.57	0.00
39.00	3.41	1.57	0.00
40.00	3.41	1.57	0.00
41.00	3.41	1.57	0.00
42.00	3.41	1.57	0.00
43.00	3.41	1.57	0.00
44.00	3.41	1.57	0.00
45.00	3.41	1.57	0.00
46.00	3.41	1.57	0.00
47.00	3.41	1.57	0.00
48.00	3.41	1.57	0.00
49.00	3.41	1.57	0.00
50.00	3.41	1.57	0.00
51.00	3.41	1.57	0.00
52.00	3.41	1.57	0.00
53.00	3.41	1.57	0.00
54.00	3.41	1.57	0.00
55.00	3.41	1.57	0.00
56.00	3.41	1.57	0.00
57.00	3.41	1.57	0.00
58.00	3.41	1.57	0.00
59.00	3.41	1.57	0.00
60.00	3.41	1.57	0.00
61.00	3.41	1.57	0.00
62.00	3.41	1.57	0.00
63.00	3.41	1.57	0.00
64.00	3.41	1.57	0.00
65.00	3.41	1.57	0.00
66.00	3.41	1.57	0.00
67.00	3.41	1.57	0.00
68.00	3.41	1.57	0.00
69.00	3.41	1.57	0.00
70.00	3.41	1.57	0.00
71.00	3.41	1.57	0.00
72.00	3.41	1.57	0.00

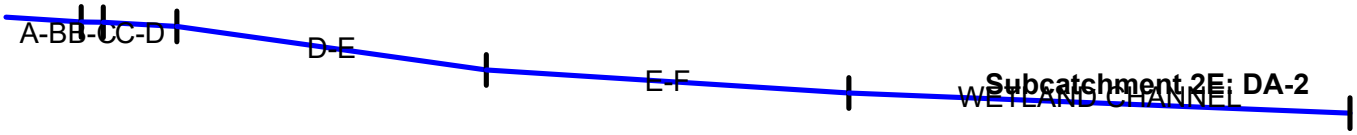
Summary for Subcatchment 2E: DA-2

Runoff = 5.25 cfs @ 12.61 hrs, Volume= 0.894 af, Depth= 1.78"
Routed to Link DP-2 : Design Point - 2

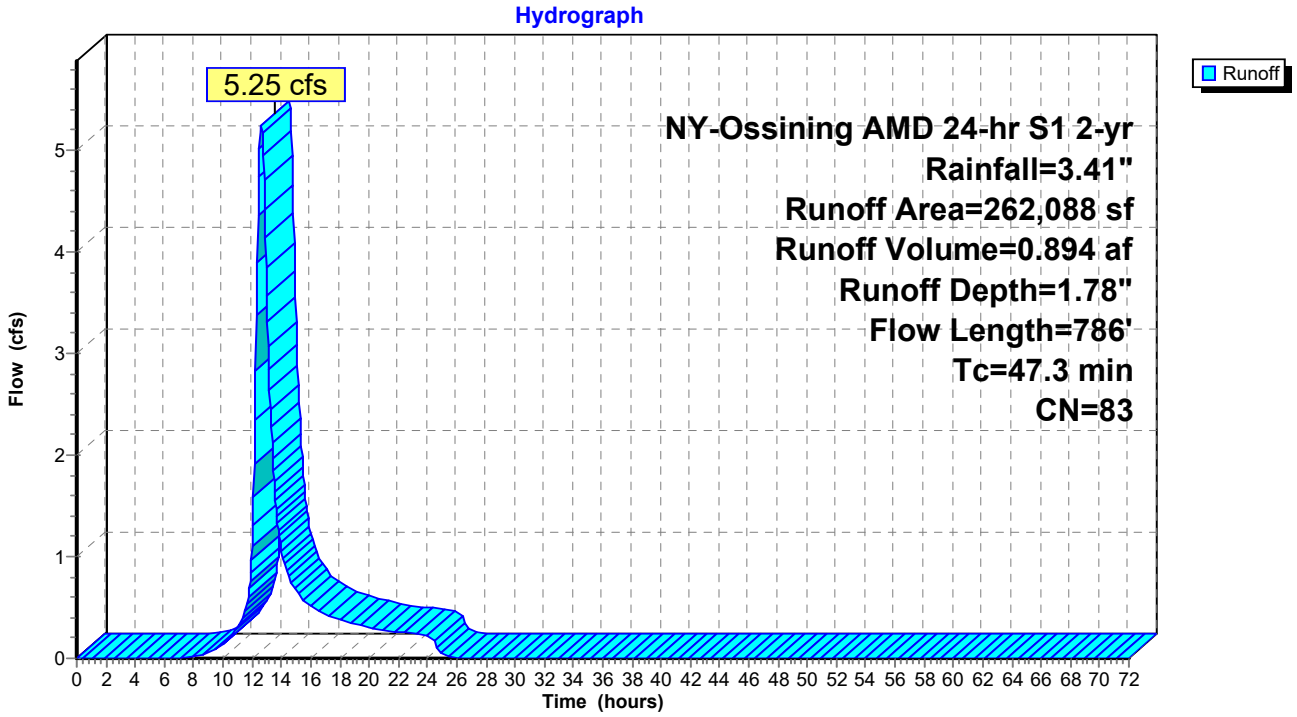
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
230,823	83	Woods, Poor, HSG D
842	96	Gravel surface, HSG D
6,258	96	Gravel surface, HSG D
4,688	96	Gravel surface, HSG D
19,477	79	Woods, Fair, HSG D
262,088	83	Weighted Average
262,088		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	44	0.0230	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.41"
0.3	13	0.0076	0.64		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
18.4	43	0.0202	0.04		**Sheet Flow, C-D** Woods: Dense underbrush n= 0.800 P2= 3.41"
2.7	181	0.0507	1.13		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
4.7	212	0.0229	0.76		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, WETLAND CHANNEL** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
47.3	786	Total			



Subcatchment 2E: DA-2



Hydrograph for Subcatchment 2E: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.01
9.00	0.59	0.02	0.06
10.00	0.73	0.04	0.14
11.00	0.92	0.10	0.30
12.00	1.87	0.61	**1.10**
13.00	2.50	1.06	**3.57**
14.00	2.69	1.20	1.08
15.00	2.82	1.30	0.66
16.00	2.92	1.38	0.52
17.00	3.01	1.45	0.43
18.00	3.08	1.51	0.38
19.00	3.15	1.57	0.34
20.00	3.21	1.62	0.31
21.00	3.27	1.66	0.28
22.00	3.32	1.71	0.26
23.00	3.36	1.75	0.25
24.00	**3.41**	**1.78**	0.23
25.00	3.41	1.78	0.04
26.00	3.41	1.78	0.00
27.00	3.41	1.78	0.00
28.00	3.41	1.78	0.00
29.00	3.41	1.78	0.00
30.00	3.41	1.78	0.00
31.00	3.41	1.78	0.00
32.00	3.41	1.78	0.00
33.00	3.41	1.78	0.00
34.00	3.41	1.78	0.00
35.00	3.41	1.78	0.00
36.00	3.41	1.78	0.00
37.00	3.41	1.78	0.00
38.00	3.41	1.78	0.00
39.00	3.41	1.78	0.00
40.00	3.41	1.78	0.00
41.00	3.41	1.78	0.00
42.00	3.41	1.78	0.00
43.00	3.41	1.78	0.00
44.00	3.41	1.78	0.00
45.00	3.41	1.78	0.00
46.00	3.41	1.78	0.00
47.00	3.41	1.78	0.00
48.00	3.41	1.78	0.00
49.00	3.41	1.78	0.00
50.00	3.41	1.78	0.00
51.00	3.41	1.78	0.00
52.00	3.41	1.78	0.00
53.00	3.41	1.78	0.00
54.00	3.41	1.78	0.00
55.00	3.41	1.78	0.00
56.00	3.41	1.78	0.00
57.00	3.41	1.78	0.00
58.00	3.41	1.78	0.00
59.00	3.41	1.78	0.00
60.00	3.41	1.78	0.00
61.00	3.41	1.78	0.00
62.00	3.41	1.78	0.00
63.00	3.41	1.78	0.00
64.00	3.41	1.78	0.00
65.00	3.41	1.78	0.00
66.00	3.41	1.78	0.00
67.00	3.41	1.78	0.00
68.00	3.41	1.78	0.00
69.00	3.41	1.78	0.00
70.00	3.41	1.78	0.00
71.00	3.41	1.78	0.00
72.00	3.41	1.78	0.00

Summary for Subcatchment 3E: DA-3

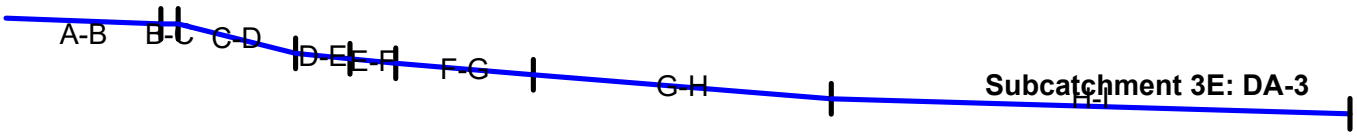
[47] Hint: Peak is 154% of capacity of segment #8

Runoff = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Depth= 2.65"
Routed to Link DP-3 : Design Point - 3

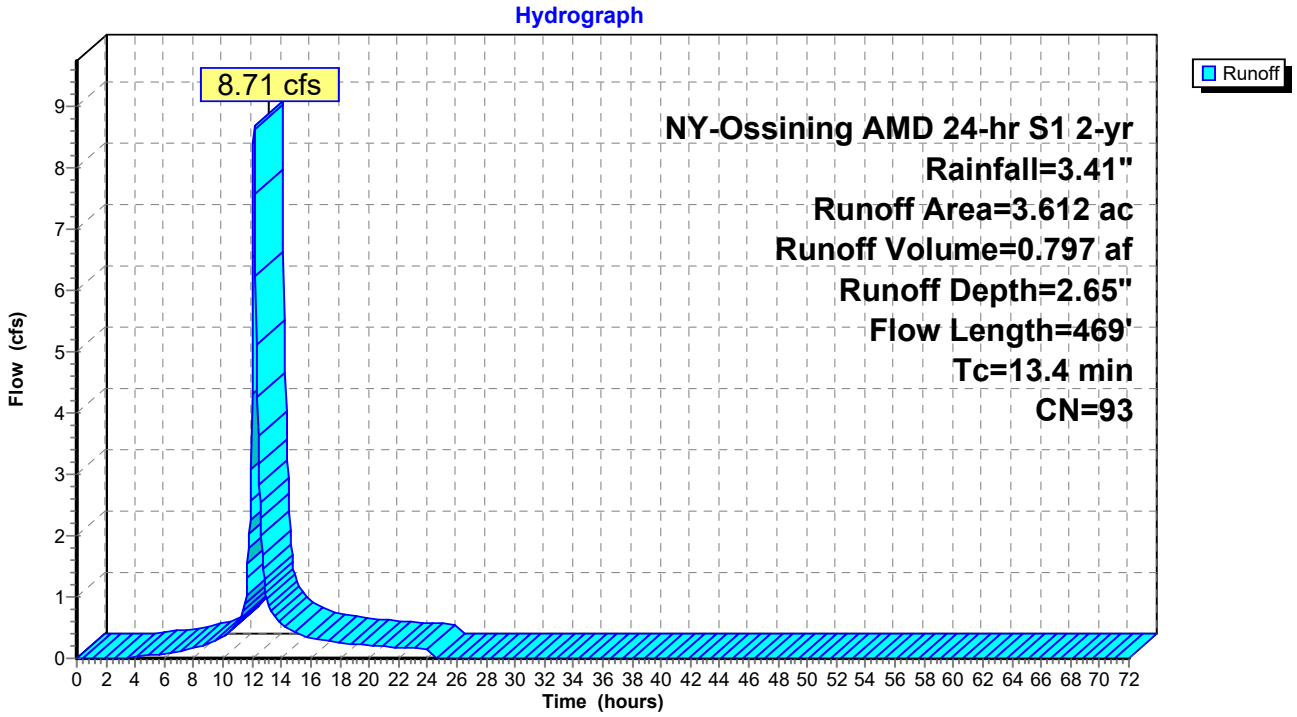
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3E: DA-3



Hydrograph for Subcatchment 3E: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.02
5.00	0.26	0.01	0.05
6.00	0.33	0.03	0.08
7.00	0.40	0.06	0.12
8.00	0.49	0.11	0.17
9.00	0.59	0.16	0.24
10.00	0.73	0.25	0.34
11.00	0.92	0.39	0.59
12.00	1.87	1.19	**4.33**
13.00	2.50	1.78	**0.98**
14.00	2.69	1.96	0.56
15.00	2.82	2.08	0.41
16.00	2.92	2.18	0.34
17.00	3.01	2.26	0.29
18.00	3.08	2.33	0.25
19.00	3.15	2.40	0.23
20.00	3.21	2.46	0.21
21.00	3.27	2.51	0.19
22.00	3.32	2.56	0.18
23.00	3.36	2.60	0.17
24.00	**3.41**	**2.65**	0.16
25.00	3.41	2.65	0.00
26.00	3.41	2.65	0.00
27.00	3.41	2.65	0.00
28.00	3.41	2.65	0.00
29.00	3.41	2.65	0.00
30.00	3.41	2.65	0.00
31.00	3.41	2.65	0.00
32.00	3.41	2.65	0.00
33.00	3.41	2.65	0.00
34.00	3.41	2.65	0.00
35.00	3.41	2.65	0.00
36.00	3.41	2.65	0.00
37.00	3.41	2.65	0.00
38.00	3.41	2.65	0.00
39.00	3.41	2.65	0.00
40.00	3.41	2.65	0.00
41.00	3.41	2.65	0.00
42.00	3.41	2.65	0.00
43.00	3.41	2.65	0.00
44.00	3.41	2.65	0.00
45.00	3.41	2.65	0.00
46.00	3.41	2.65	0.00
47.00	3.41	2.65	0.00
48.00	3.41	2.65	0.00
49.00	3.41	2.65	0.00
50.00	3.41	2.65	0.00
51.00	3.41	2.65	0.00
52.00	3.41	2.65	0.00
53.00	3.41	2.65	0.00
54.00	3.41	2.65	0.00
55.00	3.41	2.65	0.00
56.00	3.41	2.65	0.00
57.00	3.41	2.65	0.00
58.00	3.41	2.65	0.00
59.00	3.41	2.65	0.00
60.00	3.41	2.65	0.00
61.00	3.41	2.65	0.00
62.00	3.41	2.65	0.00
63.00	3.41	2.65	0.00
64.00	3.41	2.65	0.00
65.00	3.41	2.65	0.00
66.00	3.41	2.65	0.00
67.00	3.41	2.65	0.00
68.00	3.41	2.65	0.00
69.00	3.41	2.65	0.00
70.00	3.41	2.65	0.00
71.00	3.41	2.65	0.00
72.00	3.41	2.65	0.00

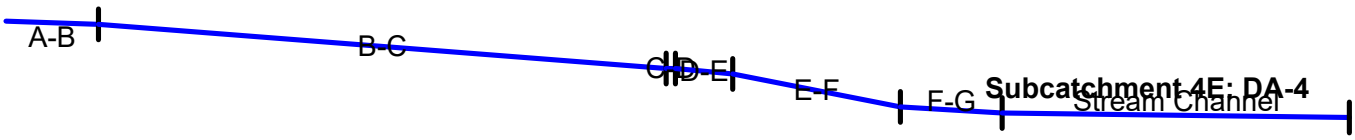
Summary for Subcatchment 4E: DA-4

Runoff = 14.74 cfs @ 12.34 hrs, Volume= 1.916 af, Depth= 1.24"
Routed to Link DP-4 : Design Point - 4

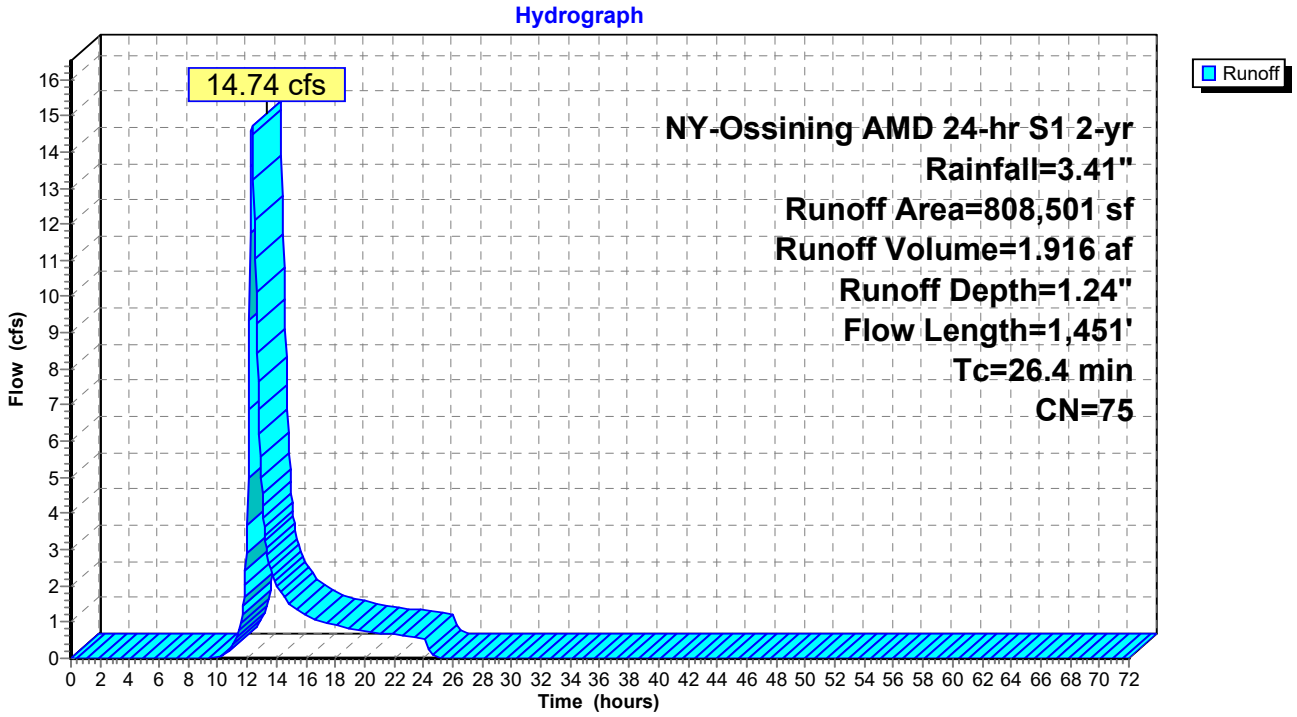
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
4,578	96	Gravel surface, HSG D
6,394	96	Gravel surface, HSG C
104,648	83	Woods, Poor, HSG D
466,246	77	Woods, Poor, HSG C
7,895	61	>75% Grass cover, Good, HSG B
1,011	80	>75% Grass cover, Good, HSG D
209,007	66	Woods, Poor, HSG B
8,722	96	Gravel surface, HSG D
808,501	75	Weighted Average
808,501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0519	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
6.0	613	0.1160	1.70		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
26.4	1,451	Total			



Subcatchment 4E: DA-4



Hydrograph for Subcatchment 4E: DA-4

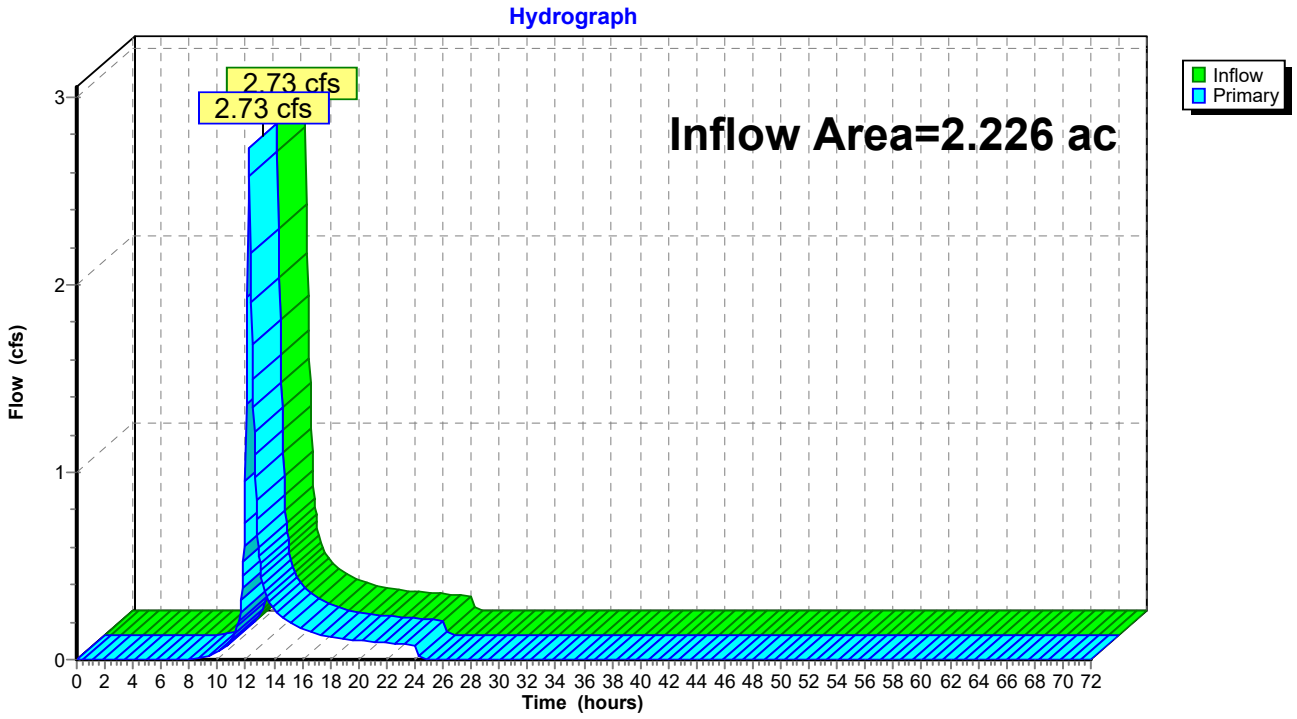
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.00
10.00	0.73	0.00	0.02
11.00	0.92	0.02	0.34
12.00	1.87	0.32	**3.69**
13.00	2.50	0.65	**4.56**
14.00	2.69	0.76	2.00
15.00	2.82	0.84	1.47
16.00	2.92	0.91	1.20
17.00	3.01	0.97	1.03
18.00	3.08	1.02	0.92
19.00	3.15	1.06	0.83
20.00	3.21	1.10	0.76
21.00	3.27	1.14	0.70
22.00	3.32	1.17	0.66
23.00	3.36	1.21	0.62
24.00	**3.41**	**1.24**	0.58
25.00	3.41	1.24	0.01
26.00	3.41	1.24	0.00
27.00	3.41	1.24	0.00
28.00	3.41	1.24	0.00
29.00	3.41	1.24	0.00
30.00	3.41	1.24	0.00
31.00	3.41	1.24	0.00
32.00	3.41	1.24	0.00
33.00	3.41	1.24	0.00
34.00	3.41	1.24	0.00
35.00	3.41	1.24	0.00
36.00	3.41	1.24	0.00
37.00	3.41	1.24	0.00
38.00	3.41	1.24	0.00
39.00	3.41	1.24	0.00
40.00	3.41	1.24	0.00
41.00	3.41	1.24	0.00
42.00	3.41	1.24	0.00
43.00	3.41	1.24	0.00
44.00	3.41	1.24	0.00
45.00	3.41	1.24	0.00
46.00	3.41	1.24	0.00
47.00	3.41	1.24	0.00
48.00	3.41	1.24	0.00
49.00	3.41	1.24	0.00
50.00	3.41	1.24	0.00
51.00	3.41	1.24	0.00
52.00	3.41	1.24	0.00
53.00	3.41	1.24	0.00
54.00	3.41	1.24	0.00
55.00	3.41	1.24	0.00
56.00	3.41	1.24	0.00
57.00	3.41	1.24	0.00
58.00	3.41	1.24	0.00
59.00	3.41	1.24	0.00
60.00	3.41	1.24	0.00
61.00	3.41	1.24	0.00
62.00	3.41	1.24	0.00
63.00	3.41	1.24	0.00
64.00	3.41	1.24	0.00
65.00	3.41	1.24	0.00
66.00	3.41	1.24	0.00
67.00	3.41	1.24	0.00
68.00	3.41	1.24	0.00
69.00	3.41	1.24	0.00
70.00	3.41	1.24	0.00
71.00	3.41	1.24	0.00
72.00	3.41	1.24	0.00

Summary for Link DP-1: Design Point - 1

Inflow Area = 2.226 ac, 0.00% Impervious, Inflow Depth = 1.57" for 2-yr event
Inflow = 2.73 cfs @ 12.22 hrs, Volume= 0.290 af
Primary = 2.73 cfs @ 12.22 hrs, Volume= 0.290 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

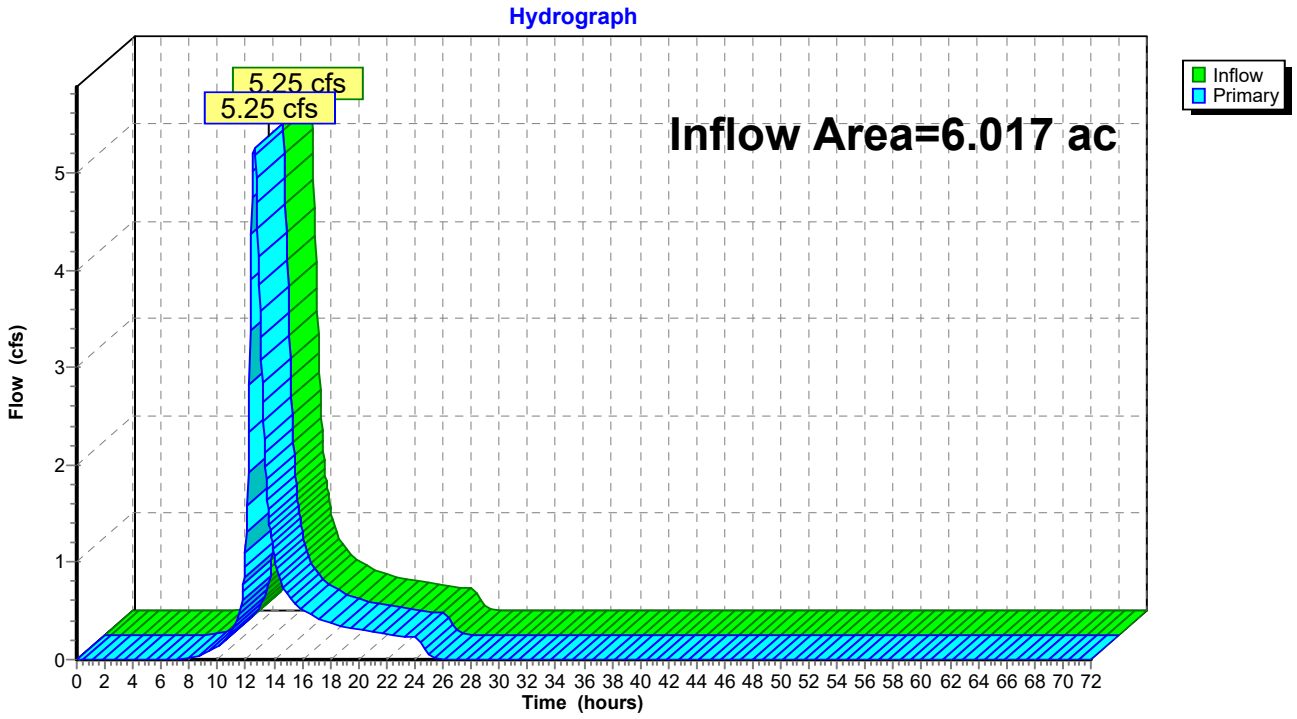
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01	61.00	0.00	0.00	0.00
10.00	0.04	0.00	0.04	62.00	0.00	0.00	0.00
11.00	0.11	0.00	0.11	63.00	0.00	0.00	0.00
12.00	**0.95**	0.00	**0.95**	64.00	0.00	0.00	0.00
13.00	**0.51**	0.00	**0.51**	65.00	0.00	0.00	0.00
14.00	0.27	0.00	0.27	66.00	0.00	0.00	0.00
15.00	0.20	0.00	0.20	67.00	0.00	0.00	0.00
16.00	0.16	0.00	0.16	68.00	0.00	0.00	0.00
17.00	0.14	0.00	0.14	69.00	0.00	0.00	0.00
18.00	0.12	0.00	0.12	70.00	0.00	0.00	0.00
19.00	0.11	0.00	0.11	71.00	0.00	0.00	0.00
20.00	0.10	0.00	0.10	72.00	0.00	0.00	0.00
21.00	0.09	0.00	0.09				
22.00	0.09	0.00	0.09				
23.00	0.08	0.00	0.08				
24.00	0.08	0.00	0.08				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-2: Design Point - 2

Inflow Area = 6.017 ac, 0.00% Impervious, Inflow Depth = 1.78" for 2-yr event
Inflow = 5.25 cfs @ 12.61 hrs, Volume= 0.894 af
Primary = 5.25 cfs @ 12.61 hrs, Volume= 0.894 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

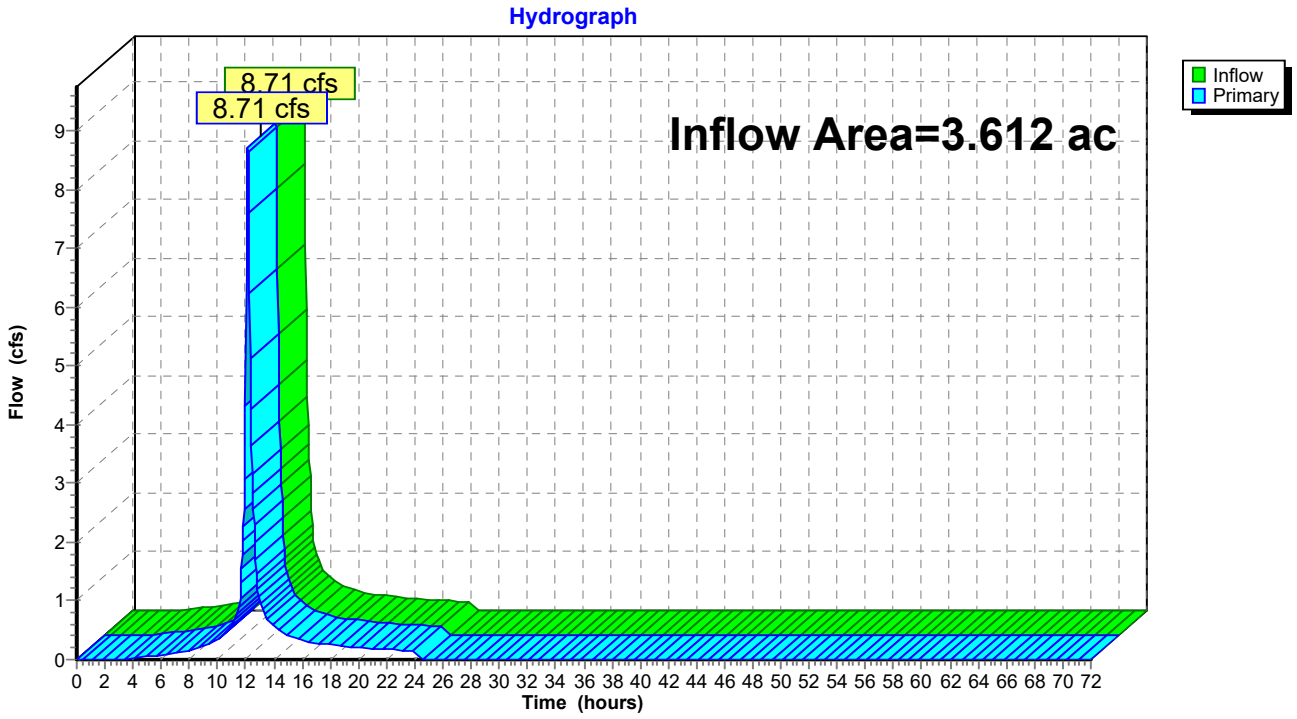
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01	60.00	0.00	0.00	0.00
9.00	0.06	0.00	0.06	61.00	0.00	0.00	0.00
10.00	0.14	0.00	0.14	62.00	0.00	0.00	0.00
11.00	0.30	0.00	0.30	63.00	0.00	0.00	0.00
12.00	**1.10**	0.00	**1.10**	64.00	0.00	0.00	0.00
13.00	**3.57**	0.00	**3.57**	65.00	0.00	0.00	0.00
14.00	1.08	0.00	1.08	66.00	0.00	0.00	0.00
15.00	0.66	0.00	0.66	67.00	0.00	0.00	0.00
16.00	0.52	0.00	0.52	68.00	0.00	0.00	0.00
17.00	0.43	0.00	0.43	69.00	0.00	0.00	0.00
18.00	0.38	0.00	0.38	70.00	0.00	0.00	0.00
19.00	0.34	0.00	0.34	71.00	0.00	0.00	0.00
20.00	0.31	0.00	0.31	72.00	0.00	0.00	0.00
21.00	0.28	0.00	0.28				
22.00	0.26	0.00	0.26				
23.00	0.25	0.00	0.25				
24.00	0.23	0.00	0.23				
25.00	0.04	0.00	0.04				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.65" for 2-yr event
Inflow = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af
Primary = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

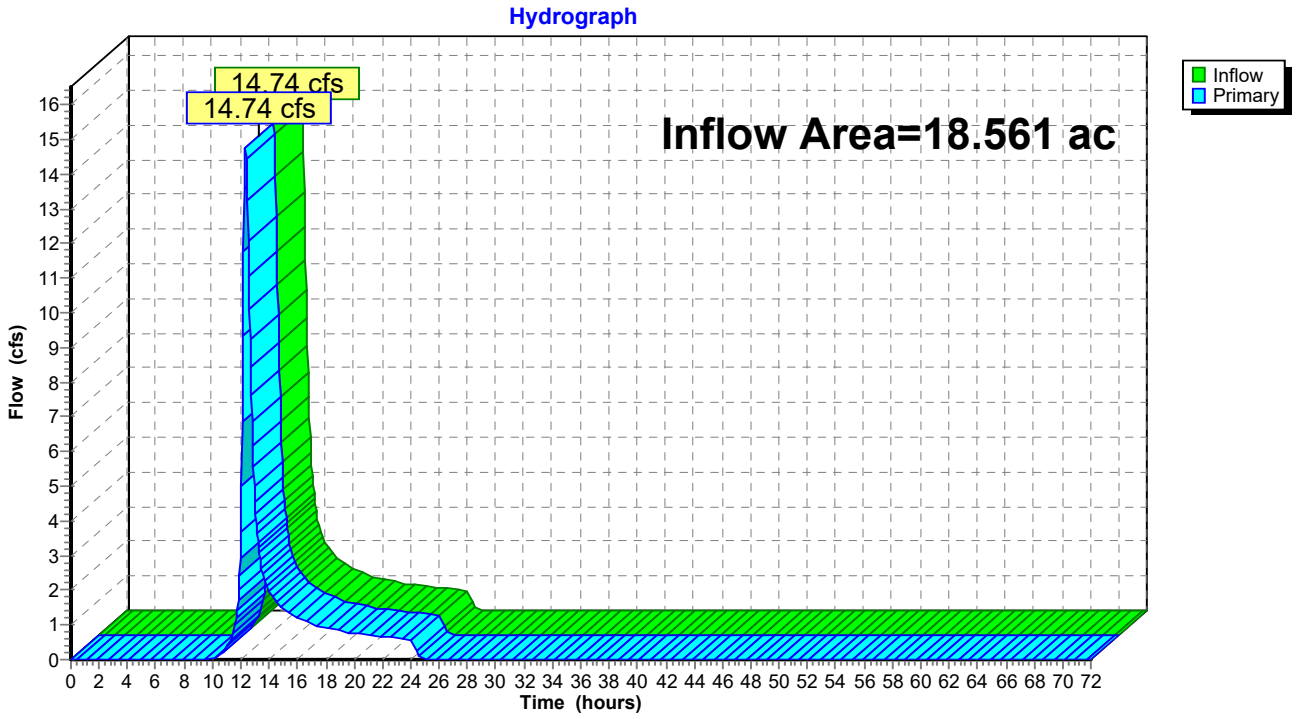
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02
5.00	0.05	0.00	0.05
6.00	0.08	0.00	0.08
7.00	0.12	0.00	0.12
8.00	0.17	0.00	0.17
9.00	0.24	0.00	0.24
10.00	0.34	0.00	0.34
11.00	0.59	0.00	0.59
12.00	**4.33**	0.00	**4.33**
13.00	**0.98**	0.00	**0.98**
14.00	0.56	0.00	0.56
15.00	0.41	0.00	0.41
16.00	0.34	0.00	0.34
17.00	0.29	0.00	0.29
18.00	0.25	0.00	0.25
19.00	0.23	0.00	0.23
20.00	0.21	0.00	0.21
21.00	0.19	0.00	0.19
22.00	0.18	0.00	0.18
23.00	0.17	0.00	0.17
24.00	0.16	0.00	0.16
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 18.561 ac, 0.00% Impervious, Inflow Depth = 1.24" for 2-yr event
Inflow = 14.74 cfs @ 12.34 hrs, Volume= 1.916 af
Primary = 14.74 cfs @ 12.34 hrs, Volume= 1.916 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.02	0.00	0.02	62.00	0.00	0.00	0.00
11.00	0.34	0.00	0.34	63.00	0.00	0.00	0.00
12.00	**3.69**	0.00	**3.69**	64.00	0.00	0.00	0.00
13.00	**4.56**	0.00	**4.56**	65.00	0.00	0.00	0.00
14.00	2.00	0.00	2.00	66.00	0.00	0.00	0.00
15.00	1.47	0.00	1.47	67.00	0.00	0.00	0.00
16.00	1.20	0.00	1.20	68.00	0.00	0.00	0.00
17.00	1.03	0.00	1.03	69.00	0.00	0.00	0.00
18.00	0.92	0.00	0.92	70.00	0.00	0.00	0.00
19.00	0.83	0.00	0.83	71.00	0.00	0.00	0.00
20.00	0.76	0.00	0.76	72.00	0.00	0.00	0.00
21.00	0.70	0.00	0.70				
22.00	0.66	0.00	0.66				
23.00	0.62	0.00	0.62				
24.00	0.58	0.00	0.58				
25.00	0.01	0.00	0.01				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1E: DA-1 Runoff Area=96,956 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=278' Tc=19.1 min CN=80 Runoff=4.87 cfs 0.559 af

Subcatchment2E: DA-2 Runoff Area=262,088 sf 0.00% Impervious Runoff Depth=3.30"
Flow Length=786' Tc=47.3 min CN=83 Runoff=9.10 cfs 1.655 af

Subcatchment3E: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=4.34"
Flow Length=469' Tc=13.4 min CN=93 Runoff=12.58 cfs 1.305 af

Subcatchment4E: DA-4 Runoff Area=808,501 sf 0.00% Impervious Runoff Depth=2.56"
Flow Length=1,451' Tc=26.4 min CN=75 Runoff=29.36 cfs 3.965 af

Link DP-1: Design Point - 1 Inflow=4.87 cfs 0.559 af
Primary=4.87 cfs 0.559 af

Link DP-2: Design Point - 2 Inflow=9.10 cfs 1.655 af
Primary=9.10 cfs 1.655 af

Link DP-3: Design Point - 3 Inflow=12.58 cfs 1.305 af
Primary=12.58 cfs 1.305 af

Link DP-4: Design Point - 4 Inflow=29.36 cfs 3.965 af
Primary=29.36 cfs 3.965 af

Total Runoff Area = 30.415 ac Runoff Volume = 7.484 af Average Runoff Depth = 2.95"
91.87% Pervious = 27.941 ac 8.13% Impervious = 2.474 ac

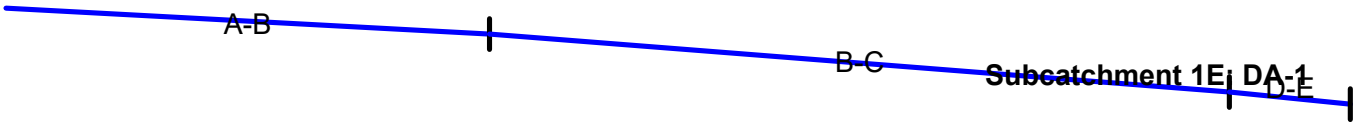
Summary for Subcatchment 1E: DA-1

Runoff = 4.87 cfs @ 12.22 hrs, Volume= 0.559 af, Depth= 3.02"
Routed to Link DP-1 : Design Point - 1

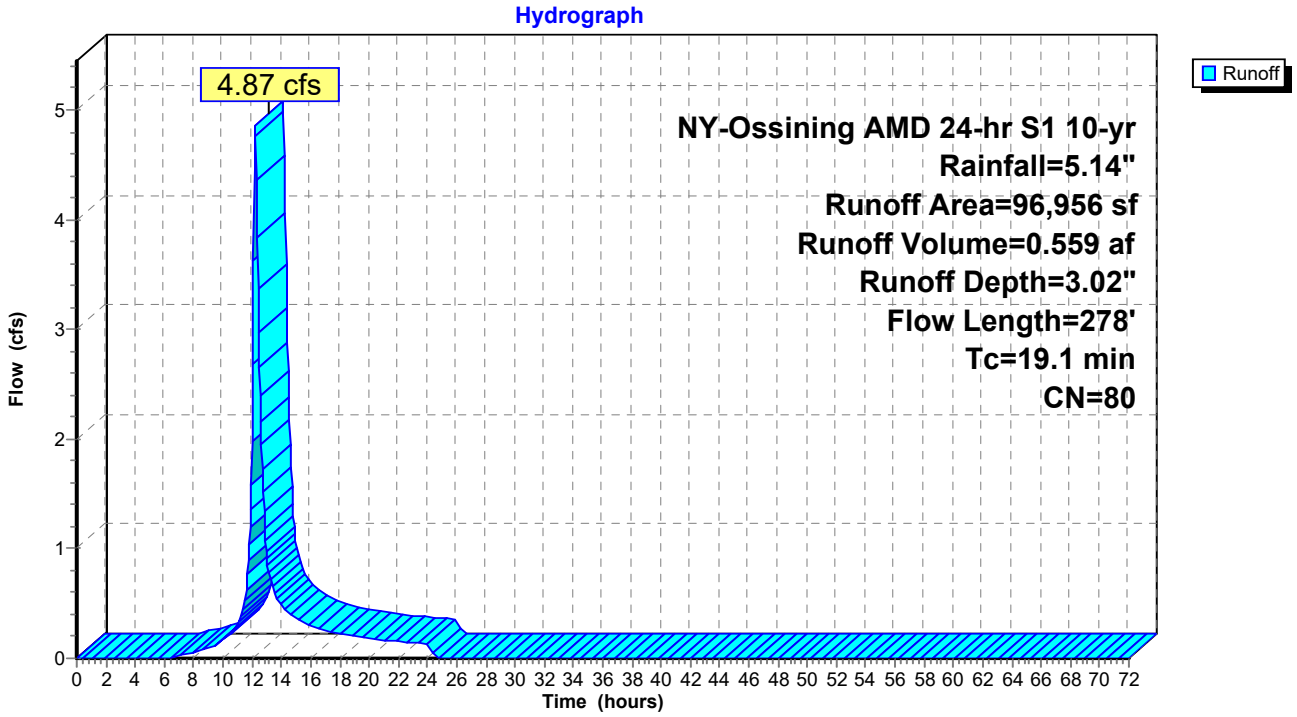
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
83,446	79	Woods, Fair, HSG D
10,983	82	Woods/grass comb., Fair, HSG D
2,527	96	Gravel surface, HSG D
96,956	80	Weighted Average
96,956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0346	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.0651	3.83		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
19.1	278	Total			



Subcatchment 1E: DA-1



Hydrograph for Subcatchment 1E: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.01	0.02
8.00	0.78	0.03	0.05
9.00	0.94	0.07	0.09
10.00	1.14	0.13	0.16
11.00	1.44	0.26	0.31
12.00	2.78	1.09	**1.98**
13.00	3.72	1.81	**0.91**
14.00	4.01	2.05	0.48
15.00	4.21	2.21	0.36
16.00	4.37	2.35	0.29
17.00	4.50	2.46	0.25
18.00	4.62	2.56	0.22
19.00	4.73	2.66	0.20
20.00	4.82	2.74	0.18
21.00	4.91	2.81	0.17
22.00	4.99	2.89	0.16
23.00	5.07	2.95	0.15
24.00	**5.14**	**3.02**	0.14
25.00	5.14	3.02	0.00
26.00	5.14	3.02	0.00
27.00	5.14	3.02	0.00
28.00	5.14	3.02	0.00
29.00	5.14	3.02	0.00
30.00	5.14	3.02	0.00
31.00	5.14	3.02	0.00
32.00	5.14	3.02	0.00
33.00	5.14	3.02	0.00
34.00	5.14	3.02	0.00
35.00	5.14	3.02	0.00
36.00	5.14	3.02	0.00
37.00	5.14	3.02	0.00
38.00	5.14	3.02	0.00
39.00	5.14	3.02	0.00
40.00	5.14	3.02	0.00
41.00	5.14	3.02	0.00
42.00	5.14	3.02	0.00
43.00	5.14	3.02	0.00
44.00	5.14	3.02	0.00
45.00	5.14	3.02	0.00
46.00	5.14	3.02	0.00
47.00	5.14	3.02	0.00
48.00	5.14	3.02	0.00
49.00	5.14	3.02	0.00
50.00	5.14	3.02	0.00
51.00	5.14	3.02	0.00
52.00	5.14	3.02	0.00
53.00	5.14	3.02	0.00
54.00	5.14	3.02	0.00
55.00	5.14	3.02	0.00
56.00	5.14	3.02	0.00
57.00	5.14	3.02	0.00
58.00	5.14	3.02	0.00
59.00	5.14	3.02	0.00
60.00	5.14	3.02	0.00
61.00	5.14	3.02	0.00
62.00	5.14	3.02	0.00
63.00	5.14	3.02	0.00
64.00	5.14	3.02	0.00
65.00	5.14	3.02	0.00
66.00	5.14	3.02	0.00
67.00	5.14	3.02	0.00
68.00	5.14	3.02	0.00
69.00	5.14	3.02	0.00
70.00	5.14	3.02	0.00
71.00	5.14	3.02	0.00
72.00	5.14	3.02	0.00

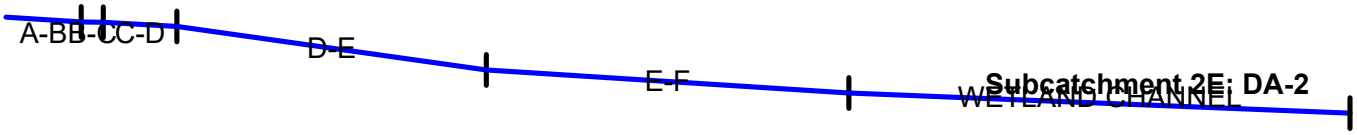
Summary for Subcatchment 2E: DA-2

Runoff = 9.10 cfs @ 12.60 hrs, Volume= 1.655 af, Depth= 3.30"
Routed to Link DP-2 : Design Point - 2

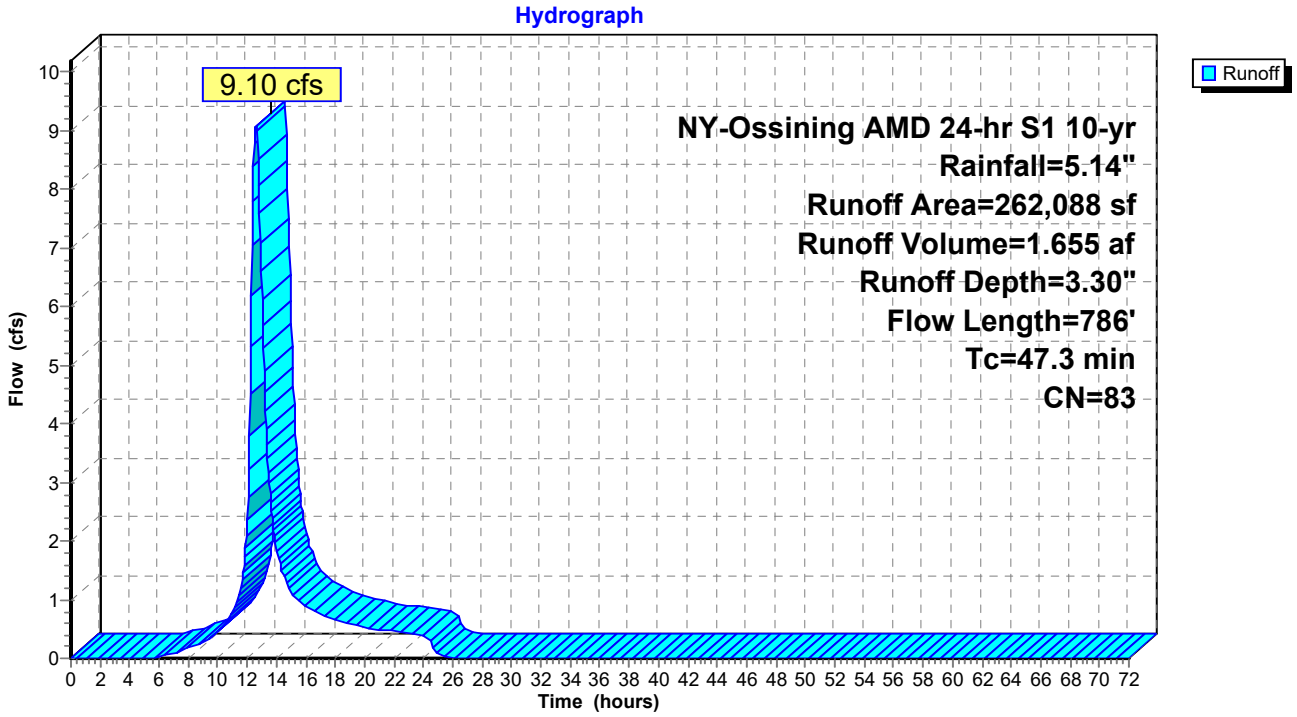
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
230,823	83	Woods, Poor, HSG D
842	96	Gravel surface, HSG D
6,258	96	Gravel surface, HSG D
4,688	96	Gravel surface, HSG D
19,477	79	Woods, Fair, HSG D
262,088	83	Weighted Average
262,088		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	44	0.0230	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.41"
0.3	13	0.0076	0.64		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
18.4	43	0.0202	0.04		**Sheet Flow, C-D** Woods: Dense underbrush n= 0.800 P2= 3.41"
2.7	181	0.0507	1.13		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
4.7	212	0.0229	0.76		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, WETLAND CHANNEL** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
47.3	786	Total			



Subcatchment 2E: DA-2



Hydrograph for Subcatchment 2E: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.01	0.02
7.00	0.64	0.02	0.09
8.00	0.78	0.06	0.17
9.00	0.94	0.11	0.29
10.00	1.14	0.19	0.46
11.00	1.44	0.34	0.79
12.00	2.78	1.27	**2.37**
13.00	3.72	2.04	**6.14**
14.00	4.01	2.29	1.86
15.00	4.21	2.47	1.15
16.00	4.37	2.61	0.90
17.00	4.50	2.73	0.75
18.00	4.62	2.83	0.66
19.00	4.73	2.93	0.59
20.00	4.82	3.01	0.53
21.00	4.91	3.09	0.49
22.00	4.99	3.17	0.46
23.00	5.07	3.24	0.43
24.00	**5.14**	**3.30**	0.40
25.00	5.14	3.30	0.07
26.00	5.14	3.30	0.00
27.00	5.14	3.30	0.00
28.00	5.14	3.30	0.00
29.00	5.14	3.30	0.00
30.00	5.14	3.30	0.00
31.00	5.14	3.30	0.00
32.00	5.14	3.30	0.00
33.00	5.14	3.30	0.00
34.00	5.14	3.30	0.00
35.00	5.14	3.30	0.00
36.00	5.14	3.30	0.00
37.00	5.14	3.30	0.00
38.00	5.14	3.30	0.00
39.00	5.14	3.30	0.00
40.00	5.14	3.30	0.00
41.00	5.14	3.30	0.00
42.00	5.14	3.30	0.00
43.00	5.14	3.30	0.00
44.00	5.14	3.30	0.00
45.00	5.14	3.30	0.00
46.00	5.14	3.30	0.00
47.00	5.14	3.30	0.00
48.00	5.14	3.30	0.00
49.00	5.14	3.30	0.00
50.00	5.14	3.30	0.00
51.00	5.14	3.30	0.00
52.00	5.14	3.30	0.00
53.00	5.14	3.30	0.00
54.00	5.14	3.30	0.00
55.00	5.14	3.30	0.00
56.00	5.14	3.30	0.00
57.00	5.14	3.30	0.00
58.00	5.14	3.30	0.00
59.00	5.14	3.30	0.00
60.00	5.14	3.30	0.00
61.00	5.14	3.30	0.00
62.00	5.14	3.30	0.00
63.00	5.14	3.30	0.00
64.00	5.14	3.30	0.00
65.00	5.14	3.30	0.00
66.00	5.14	3.30	0.00
67.00	5.14	3.30	0.00
68.00	5.14	3.30	0.00
69.00	5.14	3.30	0.00
70.00	5.14	3.30	0.00
71.00	5.14	3.30	0.00
72.00	5.14	3.30	0.00

Summary for Subcatchment 3E: DA-3

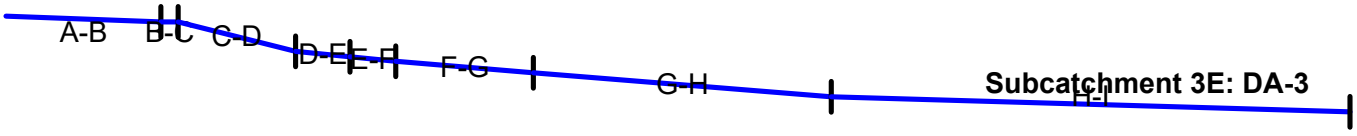
[47] Hint: Peak is 222% of capacity of segment #8

Runoff = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Depth= 4.34"
Routed to Link DP-3 : Design Point - 3

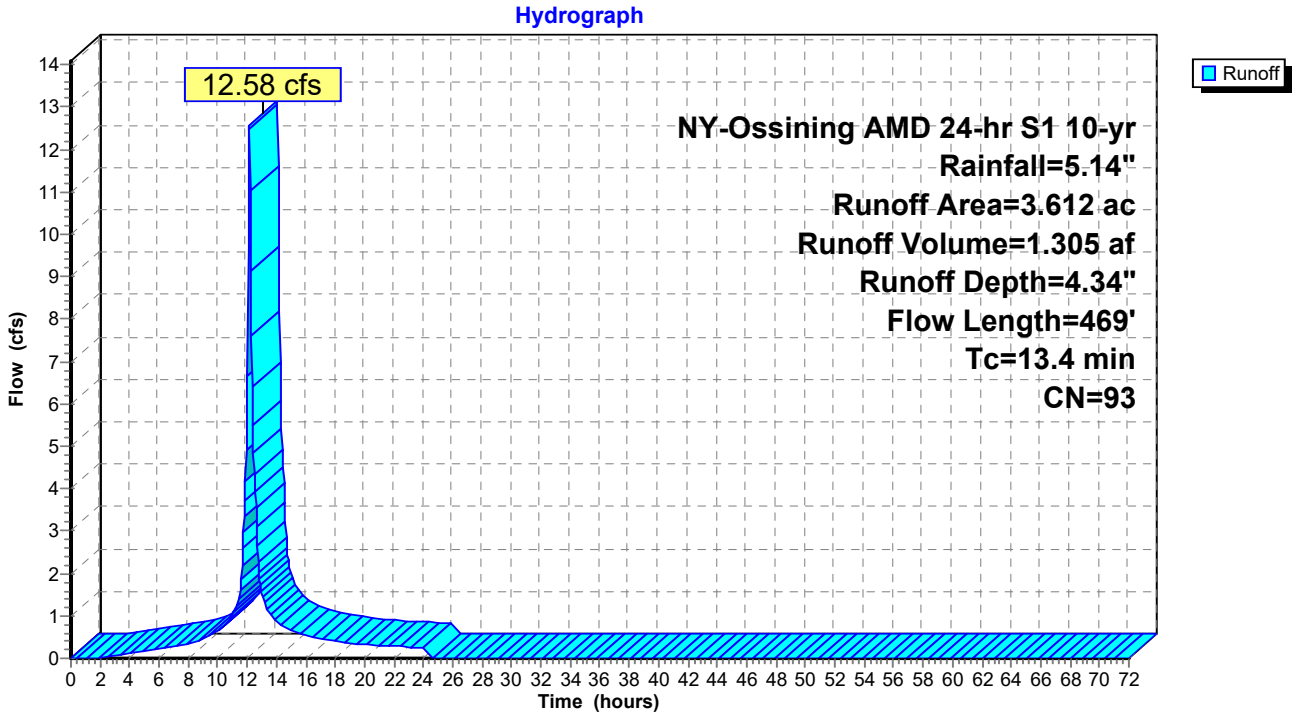
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3E: DA-3



Hydrograph for Subcatchment 3E: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.01	0.05
4.00	0.32	0.03	0.10
5.00	0.42	0.07	0.15
6.00	0.52	0.12	0.21
7.00	0.64	0.19	0.28
8.00	0.78	0.28	0.36
9.00	0.94	0.40	0.47
10.00	1.14	0.56	0.65
11.00	1.44	0.81	1.04
12.00	2.78	2.05	**6.64**
13.00	3.72	2.95	**1.54**
14.00	4.01	3.23	0.89
15.00	4.21	3.42	0.66
16.00	4.37	3.58	0.54
17.00	4.50	3.71	0.46
18.00	4.62	3.83	0.41
19.00	4.73	3.93	0.37
20.00	4.82	4.02	0.33
21.00	4.91	4.11	0.31
22.00	4.99	4.19	0.29
23.00	5.07	4.26	0.27
24.00	**5.14**	**4.34**	0.25
25.00	5.14	4.34	0.00
26.00	5.14	4.34	0.00
27.00	5.14	4.34	0.00
28.00	5.14	4.34	0.00
29.00	5.14	4.34	0.00
30.00	5.14	4.34	0.00
31.00	5.14	4.34	0.00
32.00	5.14	4.34	0.00
33.00	5.14	4.34	0.00
34.00	5.14	4.34	0.00
35.00	5.14	4.34	0.00
36.00	5.14	4.34	0.00
37.00	5.14	4.34	0.00
38.00	5.14	4.34	0.00
39.00	5.14	4.34	0.00
40.00	5.14	4.34	0.00
41.00	5.14	4.34	0.00
42.00	5.14	4.34	0.00
43.00	5.14	4.34	0.00
44.00	5.14	4.34	0.00
45.00	5.14	4.34	0.00
46.00	5.14	4.34	0.00
47.00	5.14	4.34	0.00
48.00	5.14	4.34	0.00
49.00	5.14	4.34	0.00
50.00	5.14	4.34	0.00
51.00	5.14	4.34	0.00
52.00	5.14	4.34	0.00
53.00	5.14	4.34	0.00
54.00	5.14	4.34	0.00
55.00	5.14	4.34	0.00
56.00	5.14	4.34	0.00
57.00	5.14	4.34	0.00
58.00	5.14	4.34	0.00
59.00	5.14	4.34	0.00
60.00	5.14	4.34	0.00
61.00	5.14	4.34	0.00
62.00	5.14	4.34	0.00
63.00	5.14	4.34	0.00
64.00	5.14	4.34	0.00
65.00	5.14	4.34	0.00
66.00	5.14	4.34	0.00
67.00	5.14	4.34	0.00
68.00	5.14	4.34	0.00
69.00	5.14	4.34	0.00
70.00	5.14	4.34	0.00
71.00	5.14	4.34	0.00
72.00	5.14	4.34	0.00

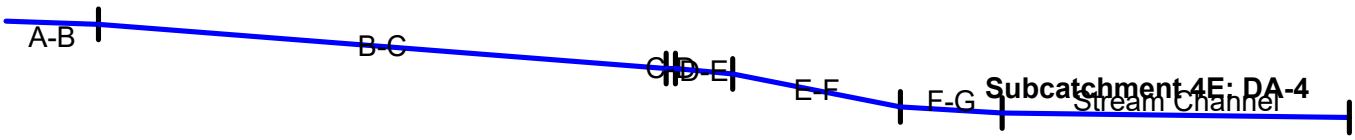
Summary for Subcatchment 4E: DA-4

Runoff = 29.36 cfs @ 12.32 hrs, Volume= 3.965 af, Depth= 2.56"
Routed to Link DP-4 : Design Point - 4

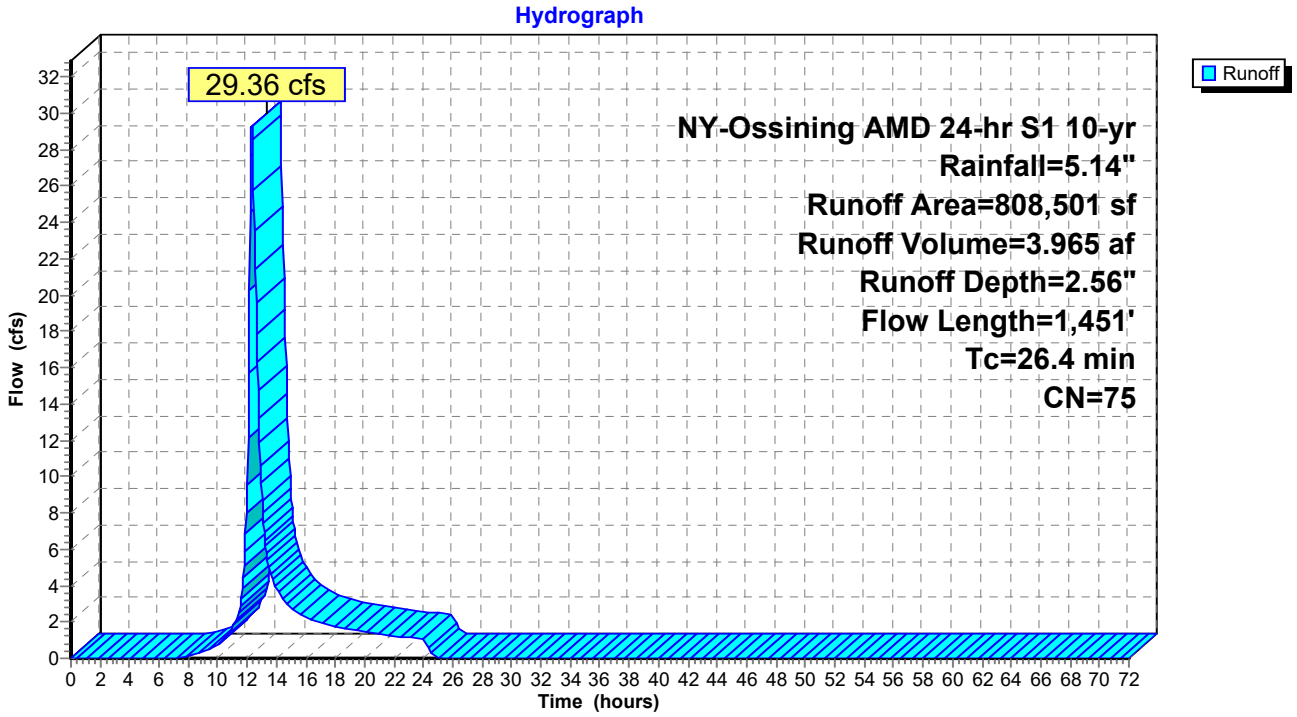
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
4,578	96	Gravel surface, HSG D
6,394	96	Gravel surface, HSG C
104,648	83	Woods, Poor, HSG D
466,246	77	Woods, Poor, HSG C
7,895	61	>75% Grass cover, Good, HSG B
1,011	80	>75% Grass cover, Good, HSG D
209,007	66	Woods, Poor, HSG B
8,722	96	Gravel surface, HSG D
808,501	75	Weighted Average
808,501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0519	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
6.0	613	0.1160	1.70		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
26.4	1,451	Total			



Subcatchment 4E: DA-4



Hydrograph for Subcatchment 4E: DA-4

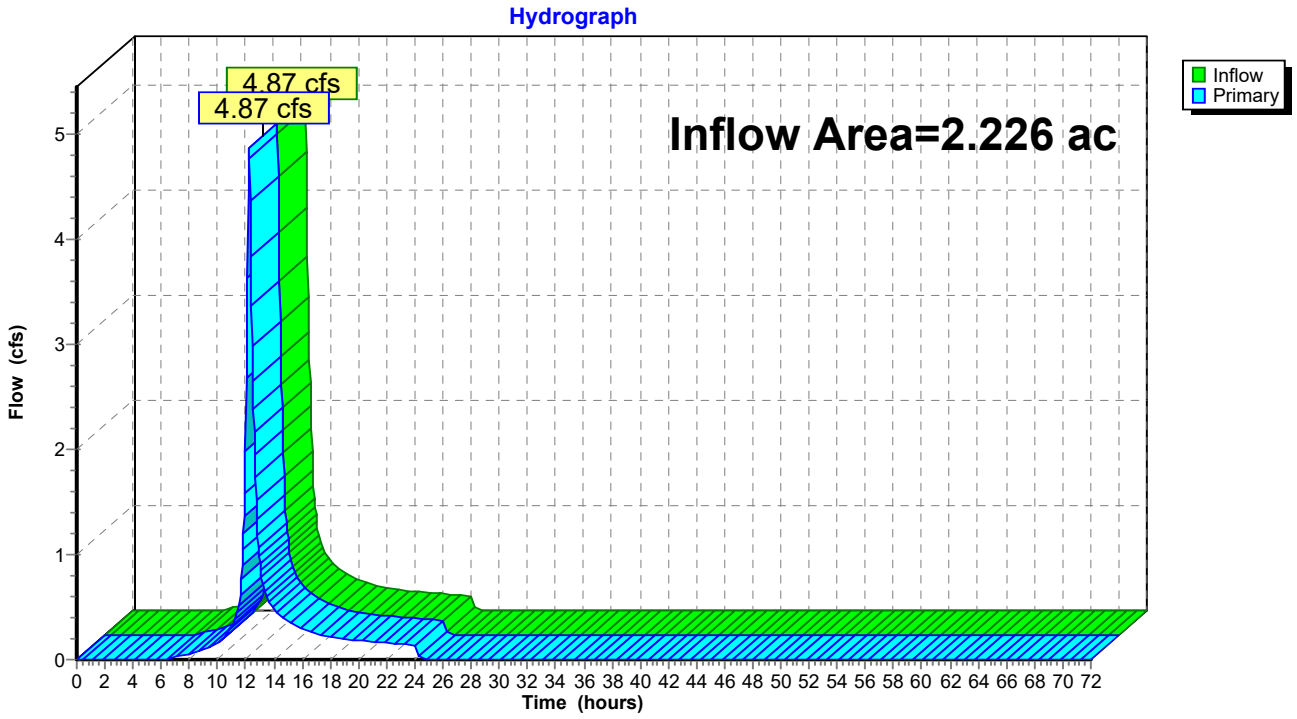
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.00	0.00
8.00	0.78	0.00	0.08
9.00	0.94	0.02	0.34
10.00	1.14	0.06	0.77
11.00	1.44	0.14	1.68
12.00	2.78	0.82	**9.58**
13.00	3.72	1.46	**8.72**
14.00	4.01	1.67	3.79
15.00	4.21	1.82	2.78
16.00	4.37	1.95	2.27
17.00	4.50	2.05	1.95
18.00	4.62	2.15	1.72
19.00	4.73	2.23	1.55
20.00	4.82	2.31	1.42
21.00	4.91	2.38	1.32
22.00	4.99	2.44	1.23
23.00	5.07	2.50	1.16
24.00	**5.14**	**2.56**	1.09
25.00	5.14	2.56	0.02
26.00	5.14	2.56	0.00
27.00	5.14	2.56	0.00
28.00	5.14	2.56	0.00
29.00	5.14	2.56	0.00
30.00	5.14	2.56	0.00
31.00	5.14	2.56	0.00
32.00	5.14	2.56	0.00
33.00	5.14	2.56	0.00
34.00	5.14	2.56	0.00
35.00	5.14	2.56	0.00
36.00	5.14	2.56	0.00
37.00	5.14	2.56	0.00
38.00	5.14	2.56	0.00
39.00	5.14	2.56	0.00
40.00	5.14	2.56	0.00
41.00	5.14	2.56	0.00
42.00	5.14	2.56	0.00
43.00	5.14	2.56	0.00
44.00	5.14	2.56	0.00
45.00	5.14	2.56	0.00
46.00	5.14	2.56	0.00
47.00	5.14	2.56	0.00
48.00	5.14	2.56	0.00
49.00	5.14	2.56	0.00
50.00	5.14	2.56	0.00
51.00	5.14	2.56	0.00
52.00	5.14	2.56	0.00
53.00	5.14	2.56	0.00
54.00	5.14	2.56	0.00
55.00	5.14	2.56	0.00
56.00	5.14	2.56	0.00
57.00	5.14	2.56	0.00
58.00	5.14	2.56	0.00
59.00	5.14	2.56	0.00
60.00	5.14	2.56	0.00
61.00	5.14	2.56	0.00
62.00	5.14	2.56	0.00
63.00	5.14	2.56	0.00
64.00	5.14	2.56	0.00
65.00	5.14	2.56	0.00
66.00	5.14	2.56	0.00
67.00	5.14	2.56	0.00
68.00	5.14	2.56	0.00
69.00	5.14	2.56	0.00
70.00	5.14	2.56	0.00
71.00	5.14	2.56	0.00
72.00	5.14	2.56	0.00

Summary for Link DP-1: Design Point - 1

Inflow Area = 2.226 ac, 0.00% Impervious, Inflow Depth = 3.02" for 10-yr event
Inflow = 4.87 cfs @ 12.22 hrs, Volume= 0.559 af
Primary = 4.87 cfs @ 12.22 hrs, Volume= 0.559 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

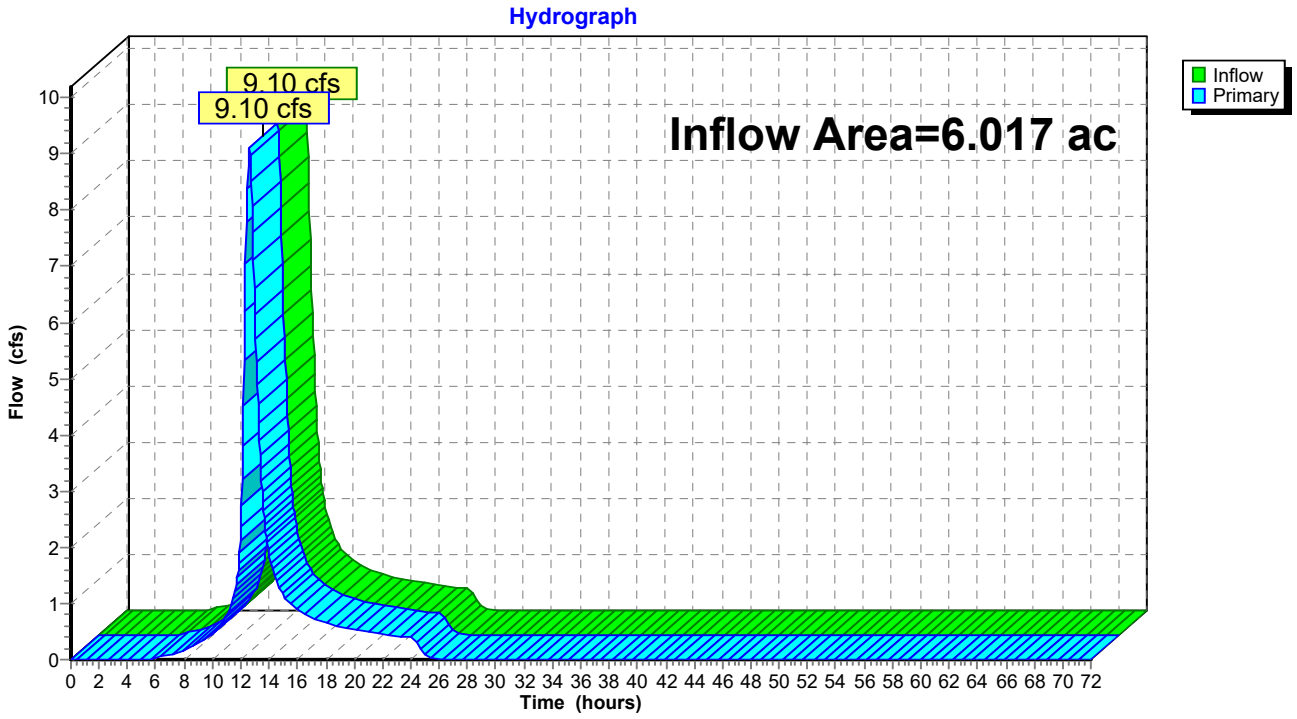
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.02	0.00	0.02
8.00	0.05	0.00	0.05
9.00	0.09	0.00	0.09
10.00	0.16	0.00	0.16
11.00	0.31	0.00	0.31
12.00	**1.98**	0.00	**1.98**
13.00	**0.91**	0.00	**0.91**
14.00	0.48	0.00	0.48
15.00	0.36	0.00	0.36
16.00	0.29	0.00	0.29
17.00	0.25	0.00	0.25
18.00	0.22	0.00	0.22
19.00	0.20	0.00	0.20
20.00	0.18	0.00	0.18
21.00	0.17	0.00	0.17
22.00	0.16	0.00	0.16
23.00	0.15	0.00	0.15
24.00	0.14	0.00	0.14
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 6.017 ac, 0.00% Impervious, Inflow Depth = 3.30" for 10-yr event
Inflow = 9.10 cfs @ 12.60 hrs, Volume= 1.655 af
Primary = 9.10 cfs @ 12.60 hrs, Volume= 1.655 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

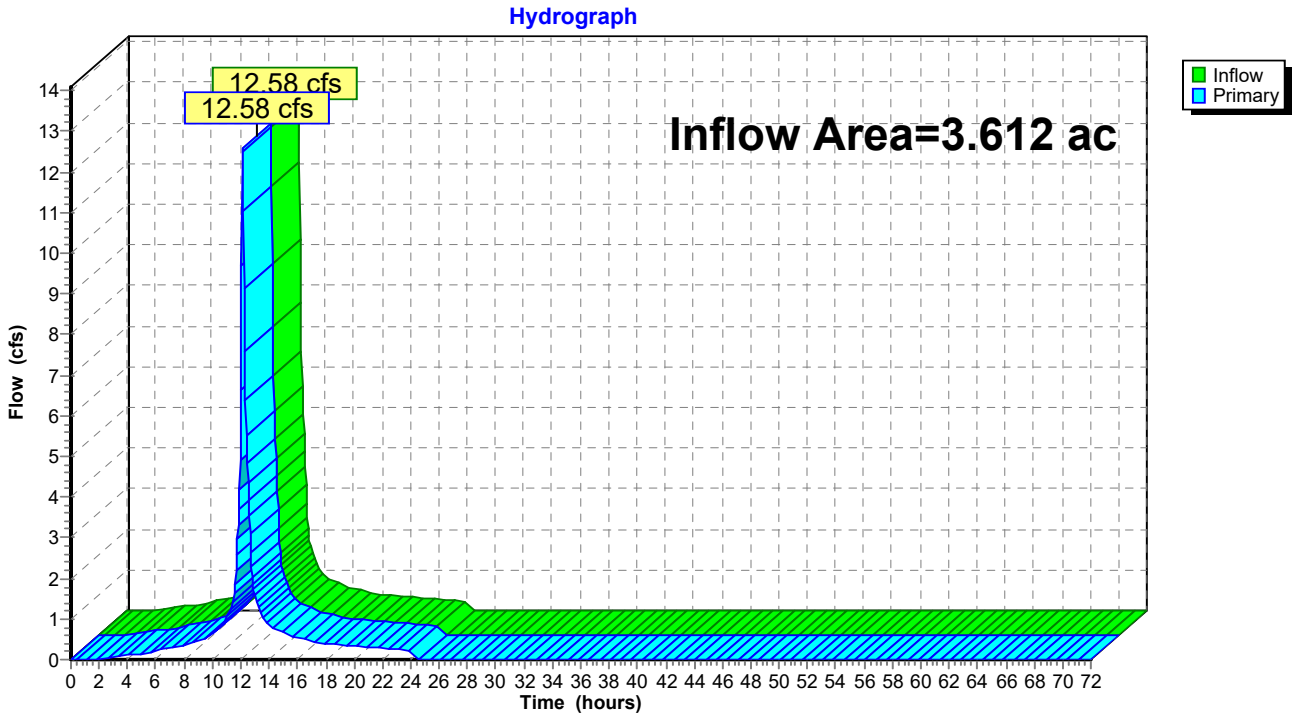
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.02	0.00	0.02
7.00	0.09	0.00	0.09
8.00	0.17	0.00	0.17
9.00	0.29	0.00	0.29
10.00	0.46	0.00	0.46
11.00	0.79	0.00	0.79
12.00	**2.37**	0.00	**2.37**
13.00	**6.14**	0.00	**6.14**
14.00	1.86	0.00	1.86
15.00	1.15	0.00	1.15
16.00	0.90	0.00	0.90
17.00	0.75	0.00	0.75
18.00	0.66	0.00	0.66
19.00	0.59	0.00	0.59
20.00	0.53	0.00	0.53
21.00	0.49	0.00	0.49
22.00	0.46	0.00	0.46
23.00	0.43	0.00	0.43
24.00	0.40	0.00	0.40
25.00	0.07	0.00	0.07
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 4.34" for 10-yr event
Inflow = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af
Primary = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

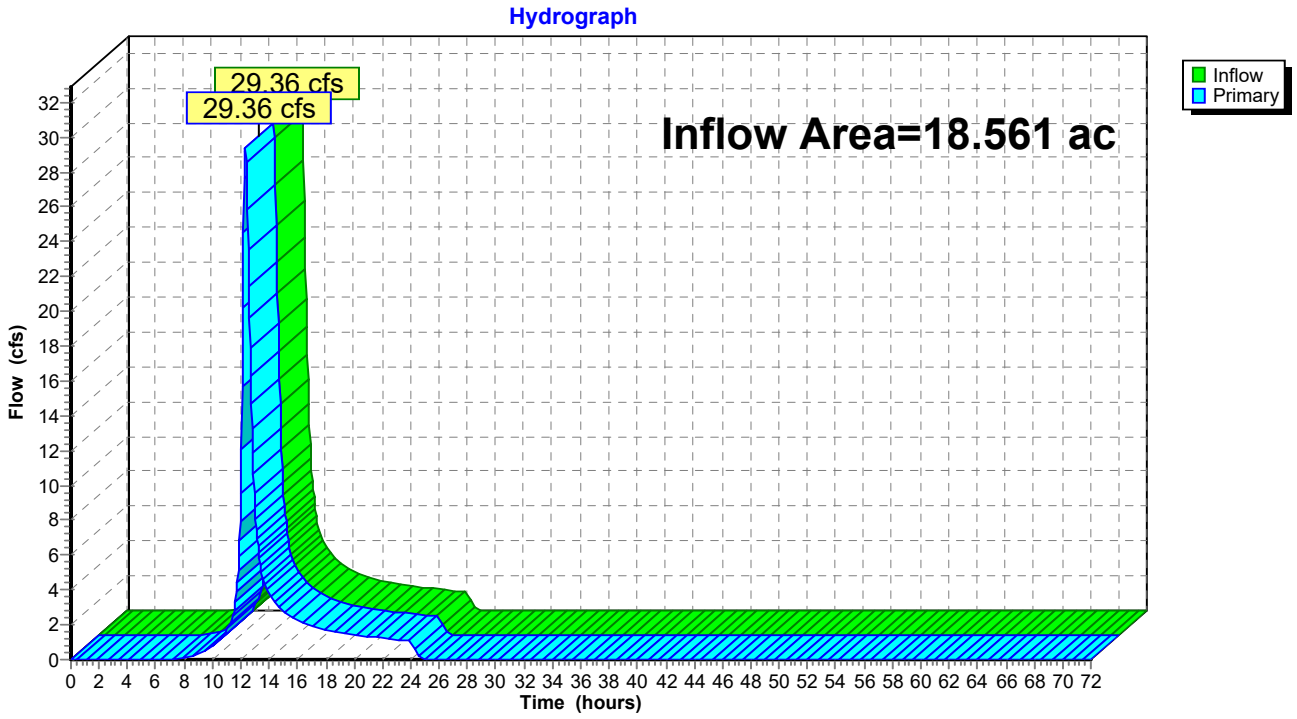
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.05	0.00	0.05
4.00	0.10	0.00	0.10
5.00	0.15	0.00	0.15
6.00	0.21	0.00	0.21
7.00	0.28	0.00	0.28
8.00	0.36	0.00	0.36
9.00	0.47	0.00	0.47
10.00	0.65	0.00	0.65
11.00	1.04	0.00	1.04
12.00	**6.64**	0.00	**6.64**
13.00	**1.54**	0.00	**1.54**
14.00	0.89	0.00	0.89
15.00	0.66	0.00	0.66
16.00	0.54	0.00	0.54
17.00	0.46	0.00	0.46
18.00	0.41	0.00	0.41
19.00	0.37	0.00	0.37
20.00	0.33	0.00	0.33
21.00	0.31	0.00	0.31
22.00	0.29	0.00	0.29
23.00	0.27	0.00	0.27
24.00	0.25	0.00	0.25
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 18.561 ac, 0.00% Impervious, Inflow Depth = 2.56" for 10-yr event
Inflow = 29.36 cfs @ 12.32 hrs, Volume= 3.965 af
Primary = 29.36 cfs @ 12.32 hrs, Volume= 3.965 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.08	0.00	0.08
9.00	0.34	0.00	0.34
10.00	0.77	0.00	0.77
11.00	1.68	0.00	1.68
12.00	**9.58**	0.00	**9.58**
13.00	**8.72**	0.00	**8.72**
14.00	3.79	0.00	3.79
15.00	2.78	0.00	2.78
16.00	2.27	0.00	2.27
17.00	1.95	0.00	1.95
18.00	1.72	0.00	1.72
19.00	1.55	0.00	1.55
20.00	1.42	0.00	1.42
21.00	1.32	0.00	1.32
22.00	1.23	0.00	1.23
23.00	1.16	0.00	1.16
24.00	1.09	0.00	1.09
25.00	0.02	0.00	0.02
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1E: DA-1 Runoff Area=96,956 sf 0.00% Impervious Runoff Depth=6.84"
Flow Length=278' Tc=19.1 min CN=80 Runoff=9.74 cfs 1.269 af

Subcatchment2E: DA-2 Runoff Area=262,088 sf 0.00% Impervious Runoff Depth=7.22"
Flow Length=786' Tc=47.3 min CN=83 Runoff=17.92 cfs 3.618 af

Subcatchment3E: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=8.44"
Flow Length=469' Tc=13.4 min CN=93 Runoff=20.96 cfs 2.542 af

Subcatchment4E: DA-4 Runoff Area=808,501 sf 0.00% Impervious Runoff Depth=6.22"
Flow Length=1,451' Tc=26.4 min CN=75 Runoff=64.64 cfs 9.619 af

Link DP-1: Design Point - 1 Inflow=9.74 cfs 1.269 af
Primary=9.74 cfs 1.269 af

Link DP-2: Design Point - 2 Inflow=17.92 cfs 3.618 af
Primary=17.92 cfs 3.618 af

Link DP-3: Design Point - 3 Inflow=20.96 cfs 2.542 af
Primary=20.96 cfs 2.542 af

Link DP-4: Design Point - 4 Inflow=64.64 cfs 9.619 af
Primary=64.64 cfs 9.619 af

Total Runoff Area = 30.415 ac Runoff Volume = 17.049 af Average Runoff Depth = 6.73"
91.87% Pervious = 27.941 ac 8.13% Impervious = 2.474 ac

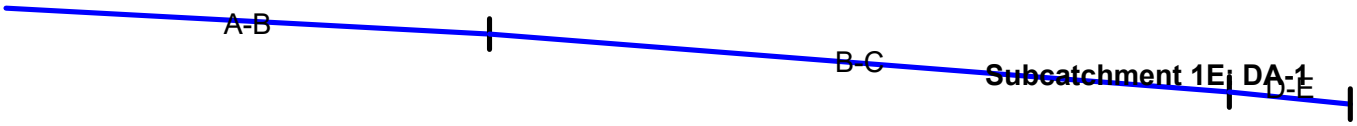
Summary for Subcatchment 1E: DA-1

Runoff = 9.74 cfs @ 12.21 hrs, Volume= 1.269 af, Depth= 6.84"
Routed to Link DP-1 : Design Point - 1

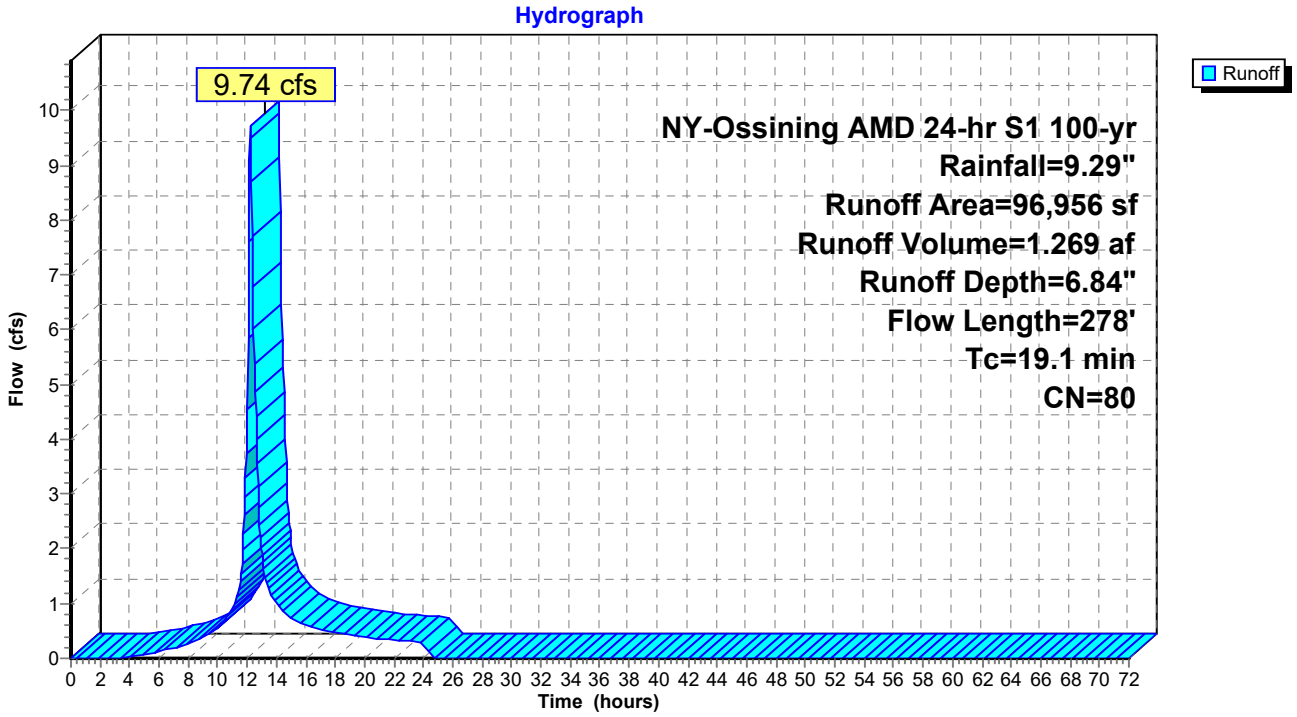
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
83,446	79	Woods, Fair, HSG D
10,983	82	Woods/grass comb., Fair, HSG D
2,527	96	Gravel surface, HSG D
96,956	80	Weighted Average
96,956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0346	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.0651	3.83		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
19.1	278	Total			



Subcatchment 1E: DA-1



Hydrograph for Subcatchment 1E: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.02
5.00	0.80	0.03	0.07
6.00	1.00	0.08	0.13
7.00	1.22	0.16	0.19
8.00	1.48	0.28	0.27
9.00	1.78	0.44	0.38
10.00	2.16	0.67	0.55
11.00	2.70	1.03	0.91
12.00	4.96	2.86	**4.53**
13.00	6.61	4.34	**1.87**
14.00	7.14	4.82	0.99
15.00	7.52	5.17	0.74
16.00	7.82	5.45	0.61
17.00	8.07	5.69	0.52
18.00	8.30	5.90	0.46
19.00	8.50	6.09	0.42
20.00	8.68	6.26	0.38
21.00	8.85	6.42	0.35
22.00	9.00	6.57	0.33
23.00	9.15	6.71	0.31
24.00	**9.29**	**6.84**	0.29
25.00	9.29	6.84	0.00
26.00	9.29	6.84	0.00
27.00	9.29	6.84	0.00
28.00	9.29	6.84	0.00
29.00	9.29	6.84	0.00
30.00	9.29	6.84	0.00
31.00	9.29	6.84	0.00
32.00	9.29	6.84	0.00
33.00	9.29	6.84	0.00
34.00	9.29	6.84	0.00
35.00	9.29	6.84	0.00
36.00	9.29	6.84	0.00
37.00	9.29	6.84	0.00
38.00	9.29	6.84	0.00
39.00	9.29	6.84	0.00
40.00	9.29	6.84	0.00
41.00	9.29	6.84	0.00
42.00	9.29	6.84	0.00
43.00	9.29	6.84	0.00
44.00	9.29	6.84	0.00
45.00	9.29	6.84	0.00
46.00	9.29	6.84	0.00
47.00	9.29	6.84	0.00
48.00	9.29	6.84	0.00
49.00	9.29	6.84	0.00
50.00	9.29	6.84	0.00
51.00	9.29	6.84	0.00
52.00	9.29	6.84	0.00
53.00	9.29	6.84	0.00
54.00	9.29	6.84	0.00
55.00	9.29	6.84	0.00
56.00	9.29	6.84	0.00
57.00	9.29	6.84	0.00
58.00	9.29	6.84	0.00
59.00	9.29	6.84	0.00
60.00	9.29	6.84	0.00
61.00	9.29	6.84	0.00
62.00	9.29	6.84	0.00
63.00	9.29	6.84	0.00
64.00	9.29	6.84	0.00
65.00	9.29	6.84	0.00
66.00	9.29	6.84	0.00
67.00	9.29	6.84	0.00
68.00	9.29	6.84	0.00
69.00	9.29	6.84	0.00
70.00	9.29	6.84	0.00
71.00	9.29	6.84	0.00
72.00	9.29	6.84	0.00

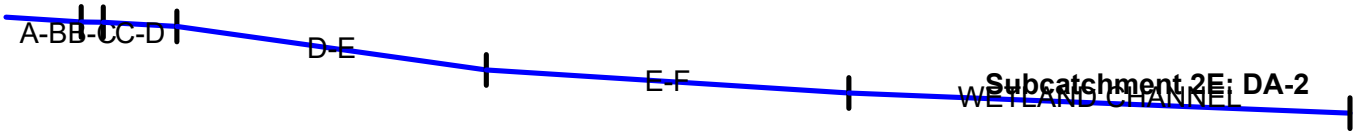
Summary for Subcatchment 2E: DA-2

Runoff = 17.92 cfs @ 12.59 hrs, Volume= 3.618 af, Depth= 7.22"
Routed to Link DP-2 : Design Point - 2

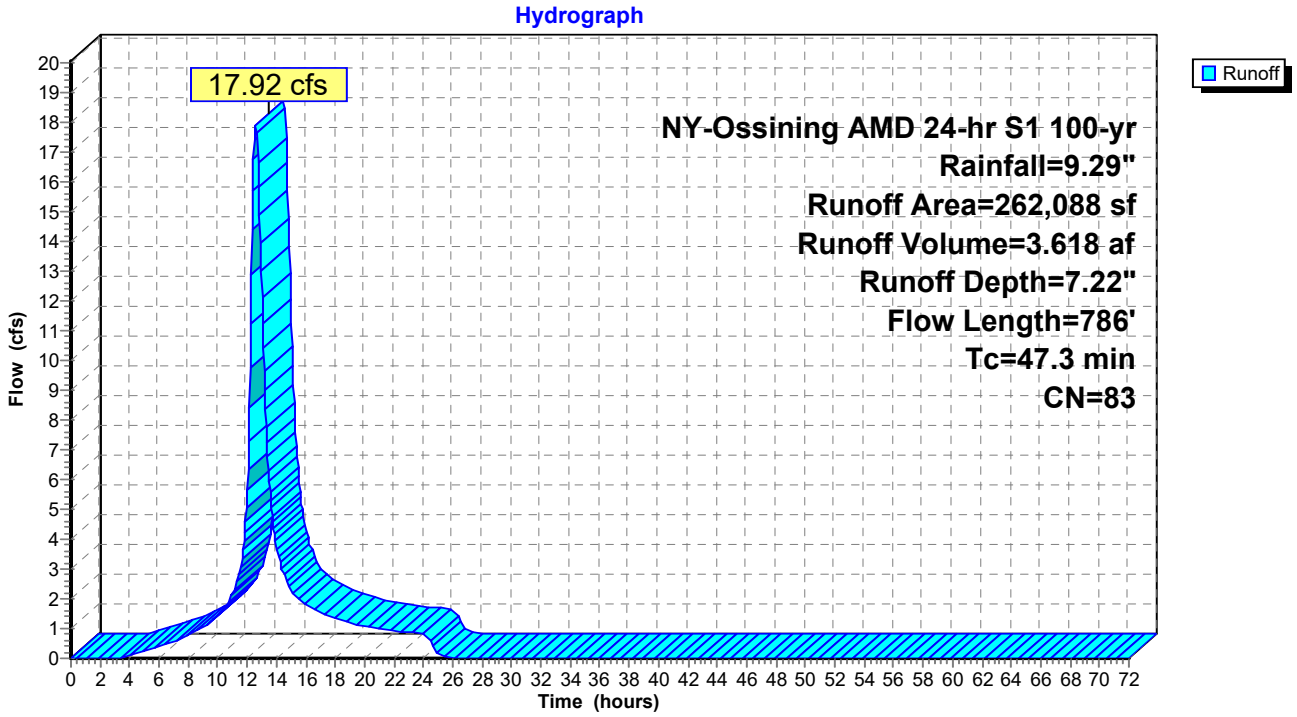
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
230,823	83	Woods, Poor, HSG D
842	96	Gravel surface, HSG D
6,258	96	Gravel surface, HSG D
4,688	96	Gravel surface, HSG D
19,477	79	Woods, Fair, HSG D
262,088	83	Weighted Average
262,088		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	44	0.0230	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.41"
0.3	13	0.0076	0.64		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
18.4	43	0.0202	0.04		**Sheet Flow, C-D** Woods: Dense underbrush n= 0.800 P2= 3.41"
2.7	181	0.0507	1.13		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
4.7	212	0.0229	0.76		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, WETLAND CHANNEL** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
47.3	786	Total			



Subcatchment 2E: DA-2



Hydrograph for Subcatchment 2E: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.02	0.08
5.00	0.80	0.06	0.23
6.00	1.00	0.13	0.39
7.00	1.22	0.23	0.56
8.00	1.48	0.37	0.77
9.00	1.78	0.55	1.04
10.00	2.16	0.81	1.44
11.00	2.70	1.21	2.18
12.00	4.96	3.14	**5.62**
13.00	6.61	4.66	**12.10**
14.00	7.14	5.16	3.72
15.00	7.52	5.52	2.32
16.00	7.82	5.80	1.82
17.00	8.07	6.05	1.53
18.00	8.30	6.26	1.34
19.00	8.50	6.45	1.20
20.00	8.68	6.63	1.09
21.00	8.85	6.79	1.00
22.00	9.00	6.94	0.93
23.00	9.15	7.08	0.87
24.00	**9.29**	**7.22**	0.82
25.00	9.29	7.22	0.14
26.00	9.29	7.22	0.01
27.00	9.29	7.22	0.00
28.00	9.29	7.22	0.00
29.00	9.29	7.22	0.00
30.00	9.29	7.22	0.00
31.00	9.29	7.22	0.00
32.00	9.29	7.22	0.00
33.00	9.29	7.22	0.00
34.00	9.29	7.22	0.00
35.00	9.29	7.22	0.00
36.00	9.29	7.22	0.00
37.00	9.29	7.22	0.00
38.00	9.29	7.22	0.00
39.00	9.29	7.22	0.00
40.00	9.29	7.22	0.00
41.00	9.29	7.22	0.00
42.00	9.29	7.22	0.00
43.00	9.29	7.22	0.00
44.00	9.29	7.22	0.00
45.00	9.29	7.22	0.00
46.00	9.29	7.22	0.00
47.00	9.29	7.22	0.00
48.00	9.29	7.22	0.00
49.00	9.29	7.22	0.00
50.00	9.29	7.22	0.00
51.00	9.29	7.22	0.00
52.00	9.29	7.22	0.00
53.00	9.29	7.22	0.00
54.00	9.29	7.22	0.00
55.00	9.29	7.22	0.00
56.00	9.29	7.22	0.00
57.00	9.29	7.22	0.00
58.00	9.29	7.22	0.00
59.00	9.29	7.22	0.00
60.00	9.29	7.22	0.00
61.00	9.29	7.22	0.00
62.00	9.29	7.22	0.00
63.00	9.29	7.22	0.00
64.00	9.29	7.22	0.00
65.00	9.29	7.22	0.00
66.00	9.29	7.22	0.00
67.00	9.29	7.22	0.00
68.00	9.29	7.22	0.00
69.00	9.29	7.22	0.00
70.00	9.29	7.22	0.00
71.00	9.29	7.22	0.00
72.00	9.29	7.22	0.00

Summary for Subcatchment 3E: DA-3

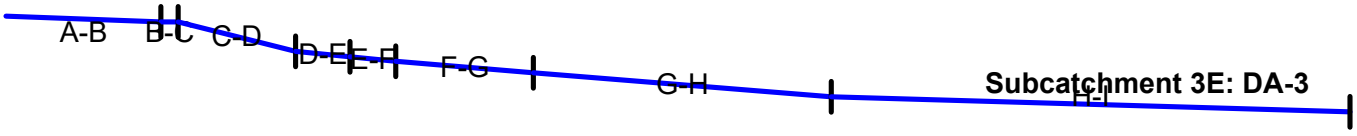
[47] Hint: Peak is 370% of capacity of segment #8

Runoff = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Depth= 8.44"
Routed to Link DP-3 : Design Point - 3

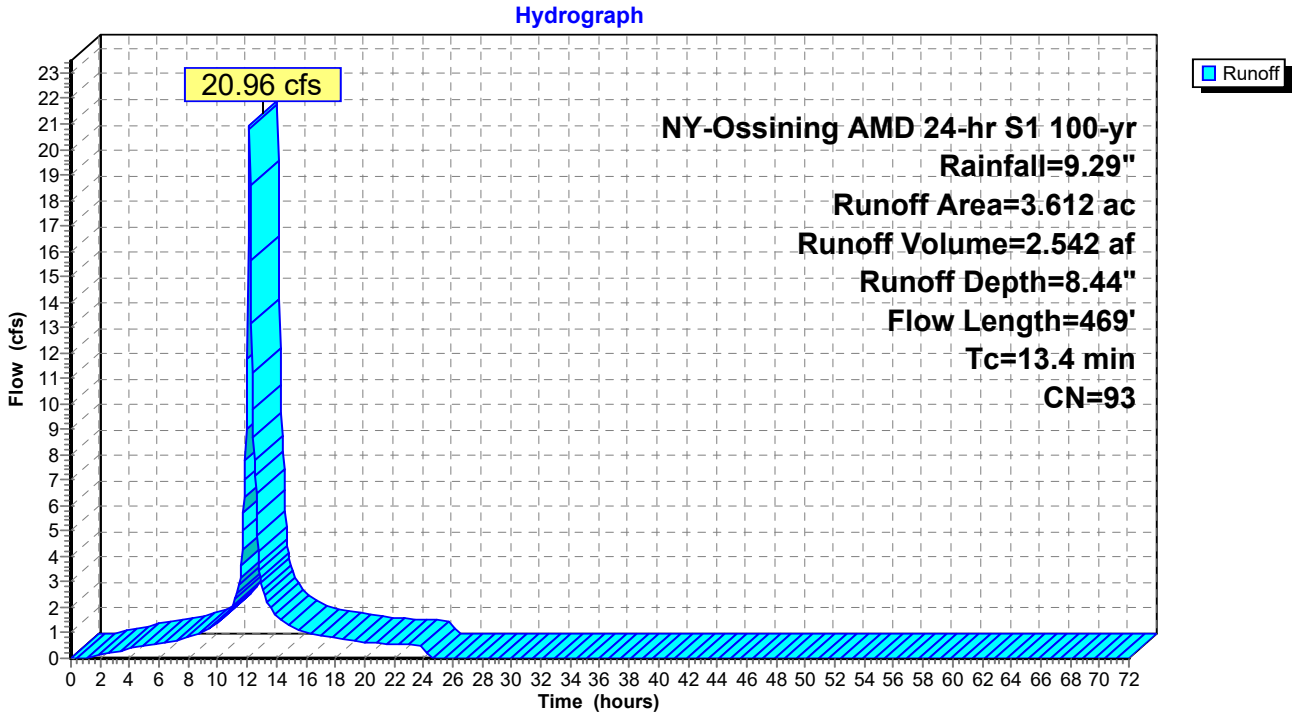
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3E: DA-3



Hydrograph for Subcatchment 3E: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.02	0.12
3.00	0.44	0.08	0.26
4.00	0.61	0.18	0.37
5.00	0.80	0.30	0.48
6.00	1.00	0.45	0.58
7.00	1.22	0.63	0.70
8.00	1.48	0.85	0.84
9.00	1.78	1.12	1.04
10.00	2.16	1.47	1.38
11.00	2.70	1.97	2.11
12.00	4.96	4.16	**11.76**
13.00	6.61	5.79	**2.86**
14.00	7.14	6.31	1.67
15.00	7.52	6.68	1.25
16.00	7.82	6.98	1.03
17.00	8.07	7.23	0.88
18.00	8.30	7.46	0.78
19.00	8.50	7.66	0.71
20.00	8.68	7.84	0.65
21.00	8.85	8.00	0.60
22.00	9.00	8.16	0.56
23.00	9.15	8.31	0.52
24.00	**9.29**	**8.44**	0.49
25.00	9.29	8.44	0.00
26.00	9.29	8.44	0.00
27.00	9.29	8.44	0.00
28.00	9.29	8.44	0.00
29.00	9.29	8.44	0.00
30.00	9.29	8.44	0.00
31.00	9.29	8.44	0.00
32.00	9.29	8.44	0.00
33.00	9.29	8.44	0.00
34.00	9.29	8.44	0.00
35.00	9.29	8.44	0.00
36.00	9.29	8.44	0.00
37.00	9.29	8.44	0.00
38.00	9.29	8.44	0.00
39.00	9.29	8.44	0.00
40.00	9.29	8.44	0.00
41.00	9.29	8.44	0.00
42.00	9.29	8.44	0.00
43.00	9.29	8.44	0.00
44.00	9.29	8.44	0.00
45.00	9.29	8.44	0.00
46.00	9.29	8.44	0.00
47.00	9.29	8.44	0.00
48.00	9.29	8.44	0.00
49.00	9.29	8.44	0.00
50.00	9.29	8.44	0.00
51.00	9.29	8.44	0.00
52.00	9.29	8.44	0.00
53.00	9.29	8.44	0.00
54.00	9.29	8.44	0.00
55.00	9.29	8.44	0.00
56.00	9.29	8.44	0.00
57.00	9.29	8.44	0.00
58.00	9.29	8.44	0.00
59.00	9.29	8.44	0.00
60.00	9.29	8.44	0.00
61.00	9.29	8.44	0.00
62.00	9.29	8.44	0.00
63.00	9.29	8.44	0.00
64.00	9.29	8.44	0.00
65.00	9.29	8.44	0.00
66.00	9.29	8.44	0.00
67.00	9.29	8.44	0.00
68.00	9.29	8.44	0.00
69.00	9.29	8.44	0.00
70.00	9.29	8.44	0.00
71.00	9.29	8.44	0.00
72.00	9.29	8.44	0.00

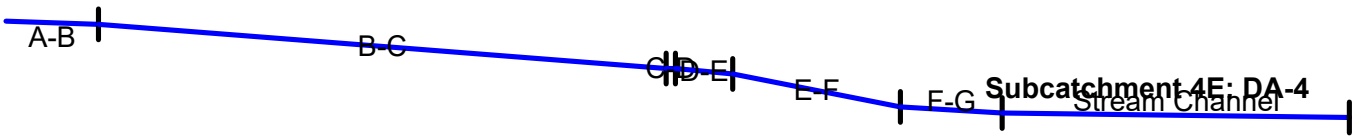
Summary for Subcatchment 4E: DA-4

Runoff = 64.64 cfs @ 12.32 hrs, Volume= 9.619 af, Depth= 6.22"
Routed to Link DP-4 : Design Point - 4

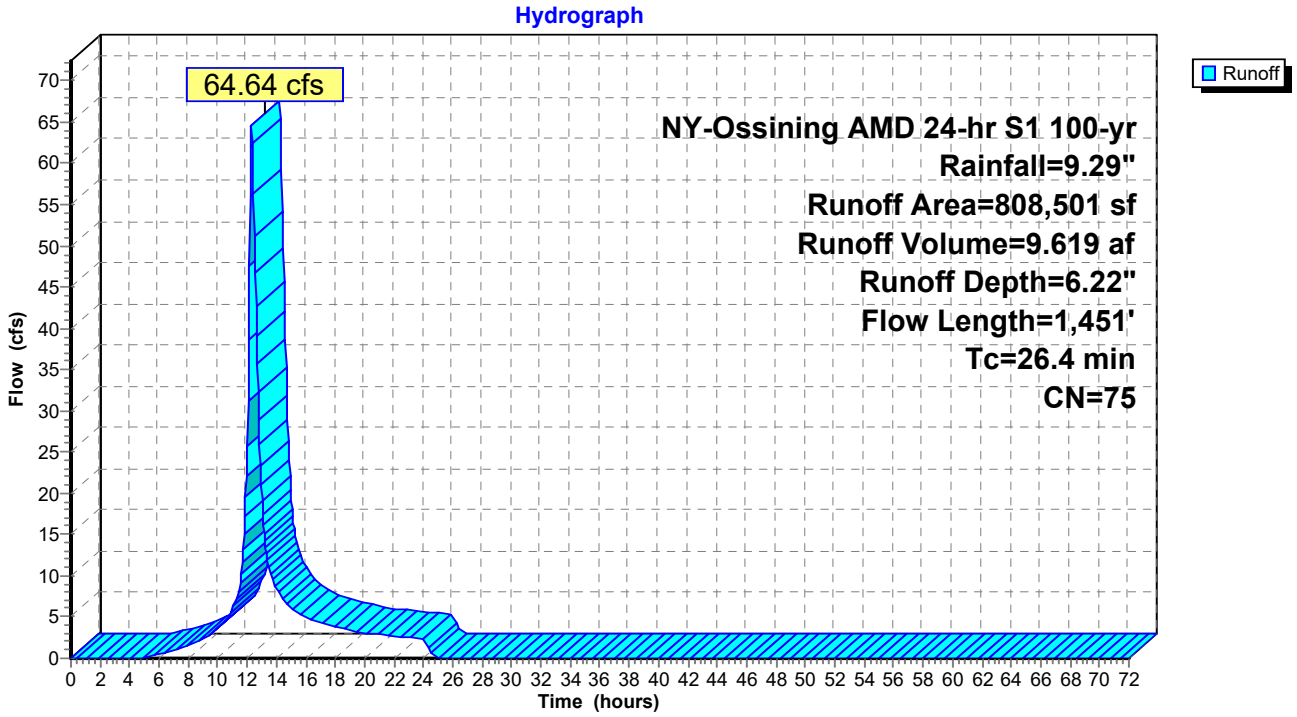
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
4,578	96	Gravel surface, HSG D
6,394	96	Gravel surface, HSG C
104,648	83	Woods, Poor, HSG D
466,246	77	Woods, Poor, HSG C
7,895	61	>75% Grass cover, Good, HSG B
1,011	80	>75% Grass cover, Good, HSG D
209,007	66	Woods, Poor, HSG B
8,722	96	Gravel surface, HSG D
808,501	75	Weighted Average
808,501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0519	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
6.0	613	0.1160	1.70		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
26.4	1,451	Total			



Subcatchment 4E: DA-4



Hydrograph for Subcatchment 4E: DA-4

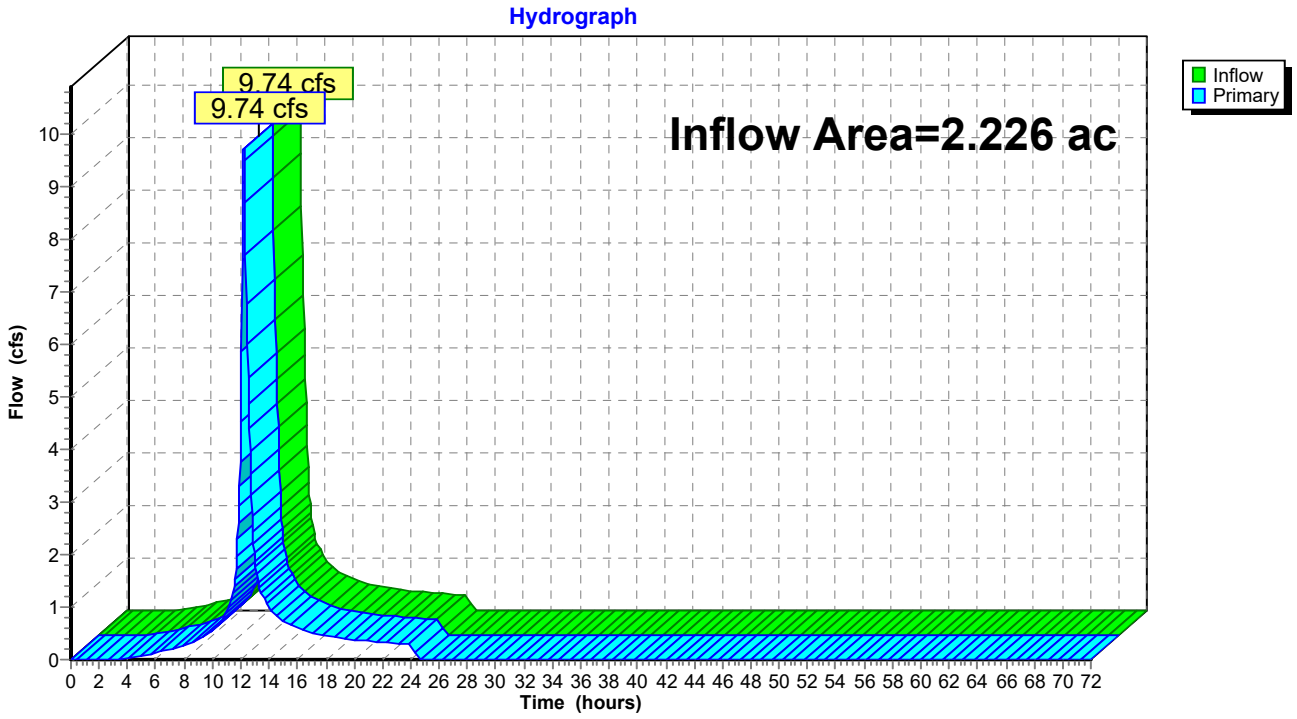
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.00
5.00	0.80	0.00	0.11
6.00	1.00	0.03	0.51
7.00	1.22	0.08	0.97
8.00	1.48	0.16	1.55
9.00	1.78	0.28	2.34
10.00	2.16	0.46	3.56
11.00	2.70	0.77	6.02
12.00	4.96	2.42	**25.73**
13.00	6.61	3.81	**19.07**
14.00	7.14	4.27	8.28
15.00	7.52	4.61	6.08
16.00	7.82	4.88	4.95
17.00	8.07	5.11	4.25
18.00	8.30	5.31	3.75
19.00	8.50	5.49	3.38
20.00	8.68	5.66	3.10
21.00	8.85	5.81	2.87
22.00	9.00	5.96	2.68
23.00	9.15	6.09	2.51
24.00	**9.29**	**6.22**	2.38
25.00	9.29	6.22	0.03
26.00	9.29	6.22	0.00
27.00	9.29	6.22	0.00
28.00	9.29	6.22	0.00
29.00	9.29	6.22	0.00
30.00	9.29	6.22	0.00
31.00	9.29	6.22	0.00
32.00	9.29	6.22	0.00
33.00	9.29	6.22	0.00
34.00	9.29	6.22	0.00
35.00	9.29	6.22	0.00
36.00	9.29	6.22	0.00
37.00	9.29	6.22	0.00
38.00	9.29	6.22	0.00
39.00	9.29	6.22	0.00
40.00	9.29	6.22	0.00
41.00	9.29	6.22	0.00
42.00	9.29	6.22	0.00
43.00	9.29	6.22	0.00
44.00	9.29	6.22	0.00
45.00	9.29	6.22	0.00
46.00	9.29	6.22	0.00
47.00	9.29	6.22	0.00
48.00	9.29	6.22	0.00
49.00	9.29	6.22	0.00
50.00	9.29	6.22	0.00
51.00	9.29	6.22	0.00
52.00	9.29	6.22	0.00
53.00	9.29	6.22	0.00
54.00	9.29	6.22	0.00
55.00	9.29	6.22	0.00
56.00	9.29	6.22	0.00
57.00	9.29	6.22	0.00
58.00	9.29	6.22	0.00
59.00	9.29	6.22	0.00
60.00	9.29	6.22	0.00
61.00	9.29	6.22	0.00
62.00	9.29	6.22	0.00
63.00	9.29	6.22	0.00
64.00	9.29	6.22	0.00
65.00	9.29	6.22	0.00
66.00	9.29	6.22	0.00
67.00	9.29	6.22	0.00
68.00	9.29	6.22	0.00
69.00	9.29	6.22	0.00
70.00	9.29	6.22	0.00
71.00	9.29	6.22	0.00
72.00	9.29	6.22	0.00

Summary for Link DP-1: Design Point - 1

Inflow Area = 2.226 ac, 0.00% Impervious, Inflow Depth = 6.84" for 100-yr event
Inflow = 9.74 cfs @ 12.21 hrs, Volume= 1.269 af
Primary = 9.74 cfs @ 12.21 hrs, Volume= 1.269 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

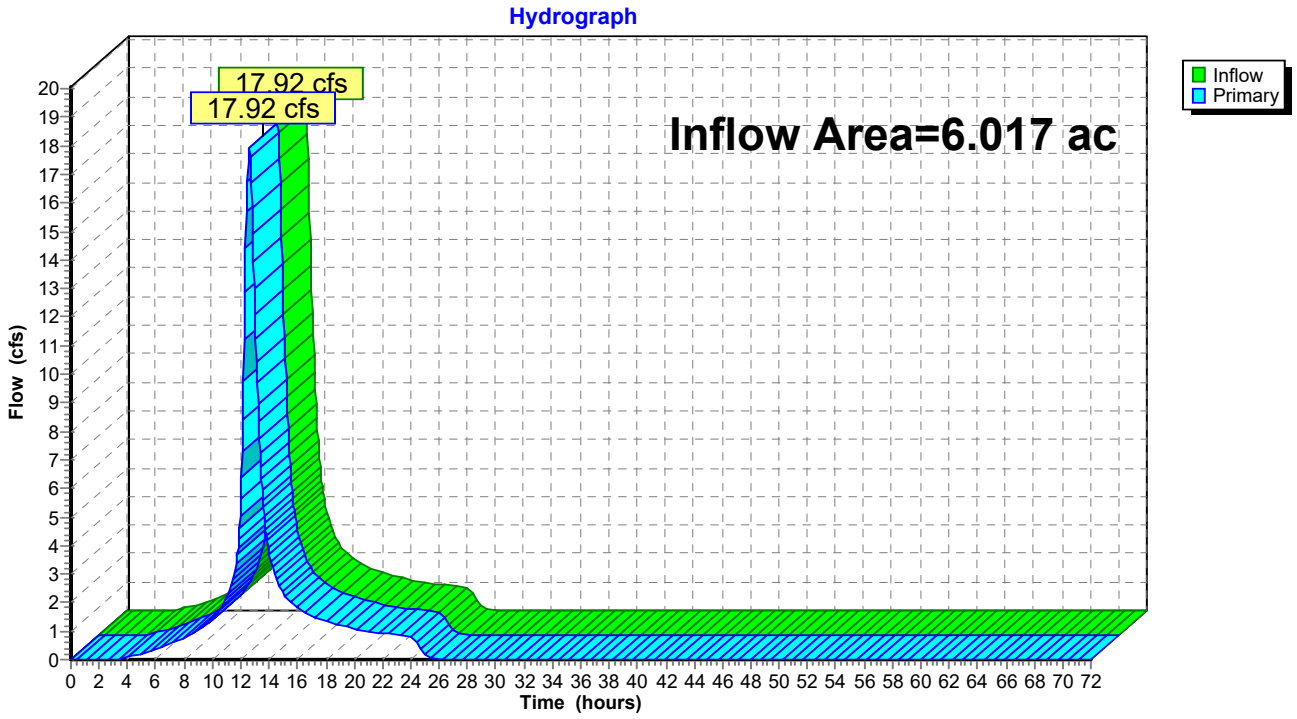
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02
5.00	0.07	0.00	0.07
6.00	0.13	0.00	0.13
7.00	0.19	0.00	0.19
8.00	0.27	0.00	0.27
9.00	0.38	0.00	0.38
10.00	0.55	0.00	0.55
11.00	0.91	0.00	0.91
12.00	**4.53**	0.00	**4.53**
13.00	**1.87**	0.00	**1.87**
14.00	0.99	0.00	0.99
15.00	0.74	0.00	0.74
16.00	0.61	0.00	0.61
17.00	0.52	0.00	0.52
18.00	0.46	0.00	0.46
19.00	0.42	0.00	0.42
20.00	0.38	0.00	0.38
21.00	0.35	0.00	0.35
22.00	0.33	0.00	0.33
23.00	0.31	0.00	0.31
24.00	0.29	0.00	0.29
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 6.017 ac, 0.00% Impervious, Inflow Depth = 7.22" for 100-yr event
Inflow = 17.92 cfs @ 12.59 hrs, Volume= 3.618 af
Primary = 17.92 cfs @ 12.59 hrs, Volume= 3.618 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

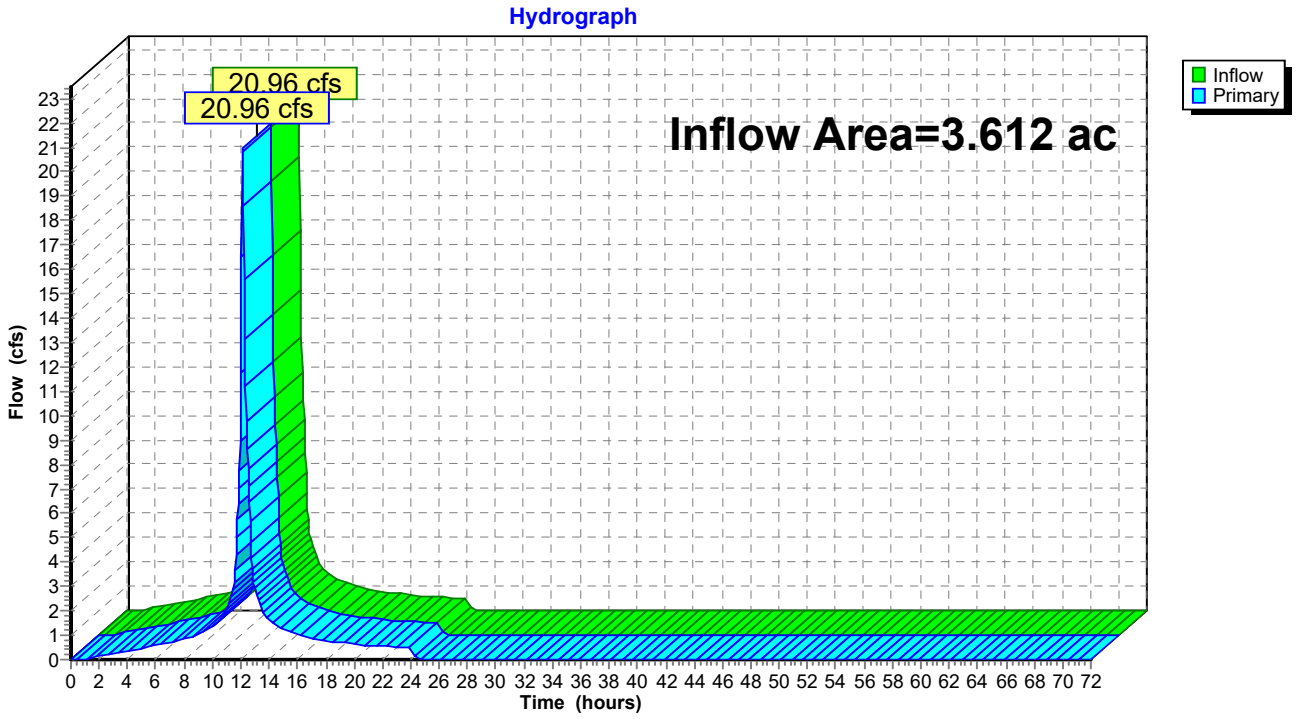
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.08	0.00	0.08
5.00	0.23	0.00	0.23
6.00	0.39	0.00	0.39
7.00	0.56	0.00	0.56
8.00	0.77	0.00	0.77
9.00	1.04	0.00	1.04
10.00	1.44	0.00	1.44
11.00	2.18	0.00	2.18
12.00	**5.62**	0.00	**5.62**
13.00	**12.10**	0.00	**12.10**
14.00	3.72	0.00	3.72
15.00	2.32	0.00	2.32
16.00	1.82	0.00	1.82
17.00	1.53	0.00	1.53
18.00	1.34	0.00	1.34
19.00	1.20	0.00	1.20
20.00	1.09	0.00	1.09
21.00	1.00	0.00	1.00
22.00	0.93	0.00	0.93
23.00	0.87	0.00	0.87
24.00	0.82	0.00	0.82
25.00	0.14	0.00	0.14
26.00	0.01	0.00	0.01
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 8.44" for 100-yr event
Inflow = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af
Primary = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

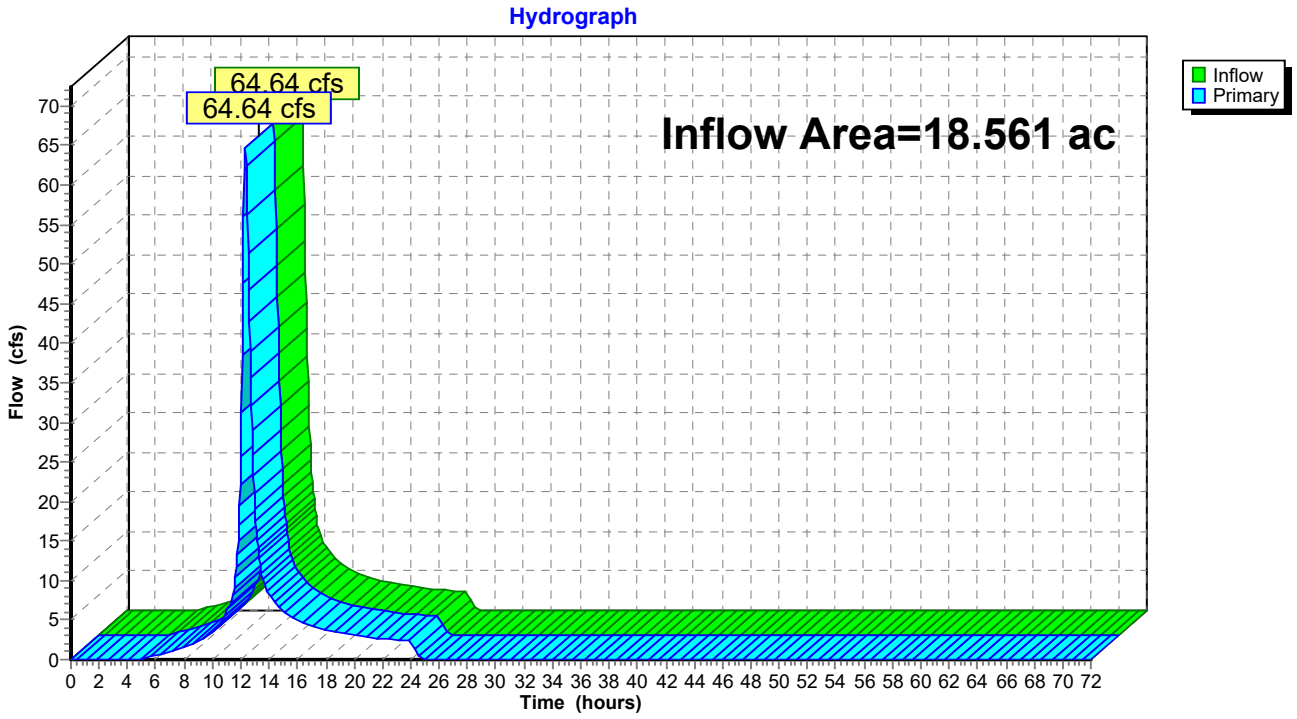
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.12	0.00	0.12
3.00	0.26	0.00	0.26
4.00	0.37	0.00	0.37
5.00	0.48	0.00	0.48
6.00	0.58	0.00	0.58
7.00	0.70	0.00	0.70
8.00	0.84	0.00	0.84
9.00	1.04	0.00	1.04
10.00	1.38	0.00	1.38
11.00	2.11	0.00	2.11
12.00	**11.76**	0.00	**11.76**
13.00	**2.86**	0.00	**2.86**
14.00	1.67	0.00	1.67
15.00	1.25	0.00	1.25
16.00	1.03	0.00	1.03
17.00	0.88	0.00	0.88
18.00	0.78	0.00	0.78
19.00	0.71	0.00	0.71
20.00	0.65	0.00	0.65
21.00	0.60	0.00	0.60
22.00	0.56	0.00	0.56
23.00	0.52	0.00	0.52
24.00	0.49	0.00	0.49
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 18.561 ac, 0.00% Impervious, Inflow Depth = 6.22" for 100-yr event
Inflow = 64.64 cfs @ 12.32 hrs, Volume= 9.619 af
Primary = 64.64 cfs @ 12.32 hrs, Volume= 9.619 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.11	0.00	0.11
6.00	0.51	0.00	0.51
7.00	0.97	0.00	0.97
8.00	1.55	0.00	1.55
9.00	2.34	0.00	2.34
10.00	3.56	0.00	3.56
11.00	6.02	0.00	6.02
12.00	**25.73**	0.00	**25.73**
13.00	**19.07**	0.00	**19.07**
14.00	8.28	0.00	8.28
15.00	6.08	0.00	6.08
16.00	4.95	0.00	4.95
17.00	4.25	0.00	4.25
18.00	3.75	0.00	3.75
19.00	3.38	0.00	3.38
20.00	3.10	0.00	3.10
21.00	2.87	0.00	2.87
22.00	2.68	0.00	2.68
23.00	2.51	0.00	2.51
24.00	2.38	0.00	2.38
25.00	0.03	0.00	0.03
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1E: DA-1 Runoff Area=96,956 sf 0.00% Impervious Runoff Depth=8.61"
Flow Length=278' Tc=19.1 min CN=80 Runoff=11.75 cfs 1.596 af

Subcatchment2E: DA-2 Runoff Area=262,088 sf 0.00% Impervious Runoff Depth=9.00"
Flow Length=786' Tc=47.3 min CN=83 Runoff=21.59 cfs 4.513 af

Subcatchment3E: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=10.28"
Flow Length=469' Tc=13.4 min CN=93 Runoff=24.40 cfs 3.093 af

Subcatchment4E: DA-4 Runoff Area=808,501 sf 0.00% Impervious Runoff Depth=7.94"
Flow Length=1,451' Tc=26.4 min CN=75 Runoff=79.56 cfs 12.274 af

Link DP-1: Design Point - 1 Inflow=11.75 cfs 1.596 af
Primary=11.75 cfs 1.596 af

Link DP-2: Design Point - 2 Inflow=21.59 cfs 4.513 af
Primary=21.59 cfs 4.513 af

Link DP-3: Design Point - 3 Inflow=24.40 cfs 3.093 af
Primary=24.40 cfs 3.093 af

Link DP-4: Design Point - 4 Inflow=79.56 cfs 12.274 af
Primary=79.56 cfs 12.274 af

Total Runoff Area = 30.415 ac Runoff Volume = 21.476 af Average Runoff Depth = 8.47"
91.87% Pervious = 27.941 ac 8.13% Impervious = 2.474 ac

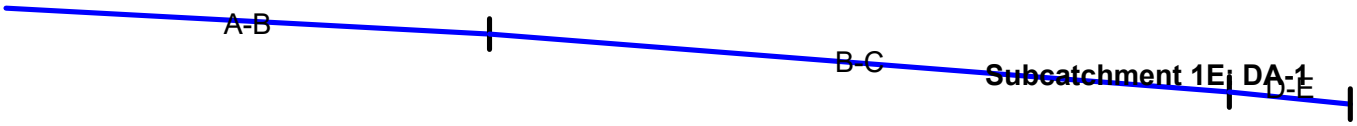
Summary for Subcatchment 1E: DA-1

Runoff = 11.75 cfs @ 12.21 hrs, Volume= 1.596 af, Depth= 8.61"
Routed to Link DP-1 : Design Point - 1

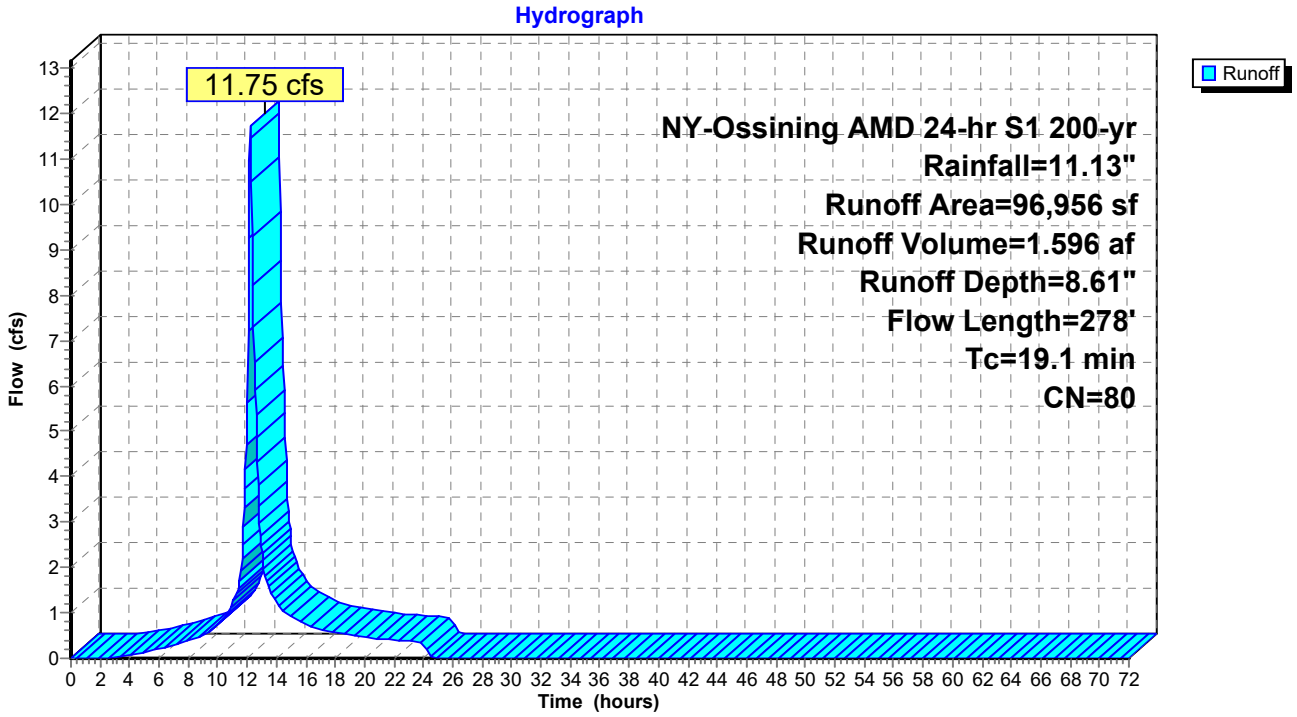
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
83,446	79	Woods, Fair, HSG D
10,983	82	Woods/grass comb., Fair, HSG D
2,527	96	Gravel surface, HSG D
96,956	80	Weighted Average
96,956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0346	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.1	25	0.0651	3.83		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
19.1	278	Total			



Subcatchment 1E: DA-1



Hydrograph for Subcatchment 1E: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.02	0.06
5.00	0.97	0.07	0.13
6.00	1.22	0.16	0.21
7.00	1.49	0.28	0.29
8.00	1.80	0.45	0.39
9.00	2.17	0.67	0.53
10.00	2.63	0.98	0.75
11.00	3.28	1.46	1.20
12.00	5.93	3.72	**5.63**
13.00	7.88	5.52	**2.30**
14.00	8.52	6.11	1.22
15.00	8.97	6.54	0.91
16.00	9.34	6.89	0.75
17.00	9.65	7.18	0.64
18.00	9.92	7.44	0.57
19.00	10.16	7.68	0.51
20.00	10.38	7.89	0.47
21.00	10.59	8.09	0.44
22.00	10.78	8.27	0.41
23.00	10.96	8.44	0.38
24.00	**11.13**	**8.61**	0.36
25.00	11.13	8.61	0.00
26.00	11.13	8.61	0.00
27.00	11.13	8.61	0.00
28.00	11.13	8.61	0.00
29.00	11.13	8.61	0.00
30.00	11.13	8.61	0.00
31.00	11.13	8.61	0.00
32.00	11.13	8.61	0.00
33.00	11.13	8.61	0.00
34.00	11.13	8.61	0.00
35.00	11.13	8.61	0.00
36.00	11.13	8.61	0.00
37.00	11.13	8.61	0.00
38.00	11.13	8.61	0.00
39.00	11.13	8.61	0.00
40.00	11.13	8.61	0.00
41.00	11.13	8.61	0.00
42.00	11.13	8.61	0.00
43.00	11.13	8.61	0.00
44.00	11.13	8.61	0.00
45.00	11.13	8.61	0.00
46.00	11.13	8.61	0.00
47.00	11.13	8.61	0.00
48.00	11.13	8.61	0.00
49.00	11.13	8.61	0.00
50.00	11.13	8.61	0.00
51.00	11.13	8.61	0.00
52.00	11.13	8.61	0.00
53.00	11.13	8.61	0.00
54.00	11.13	8.61	0.00
55.00	11.13	8.61	0.00
56.00	11.13	8.61	0.00
57.00	11.13	8.61	0.00
58.00	11.13	8.61	0.00
59.00	11.13	8.61	0.00
60.00	11.13	8.61	0.00
61.00	11.13	8.61	0.00
62.00	11.13	8.61	0.00
63.00	11.13	8.61	0.00
64.00	11.13	8.61	0.00
65.00	11.13	8.61	0.00
66.00	11.13	8.61	0.00
67.00	11.13	8.61	0.00
68.00	11.13	8.61	0.00
69.00	11.13	8.61	0.00
70.00	11.13	8.61	0.00
71.00	11.13	8.61	0.00
72.00	11.13	8.61	0.00

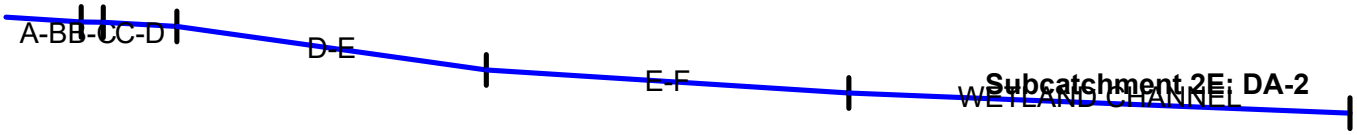
Summary for Subcatchment 2E: DA-2

Runoff = 21.59 cfs @ 12.58 hrs, Volume= 4.513 af, Depth= 9.00"
Routed to Link DP-2 : Design Point - 2

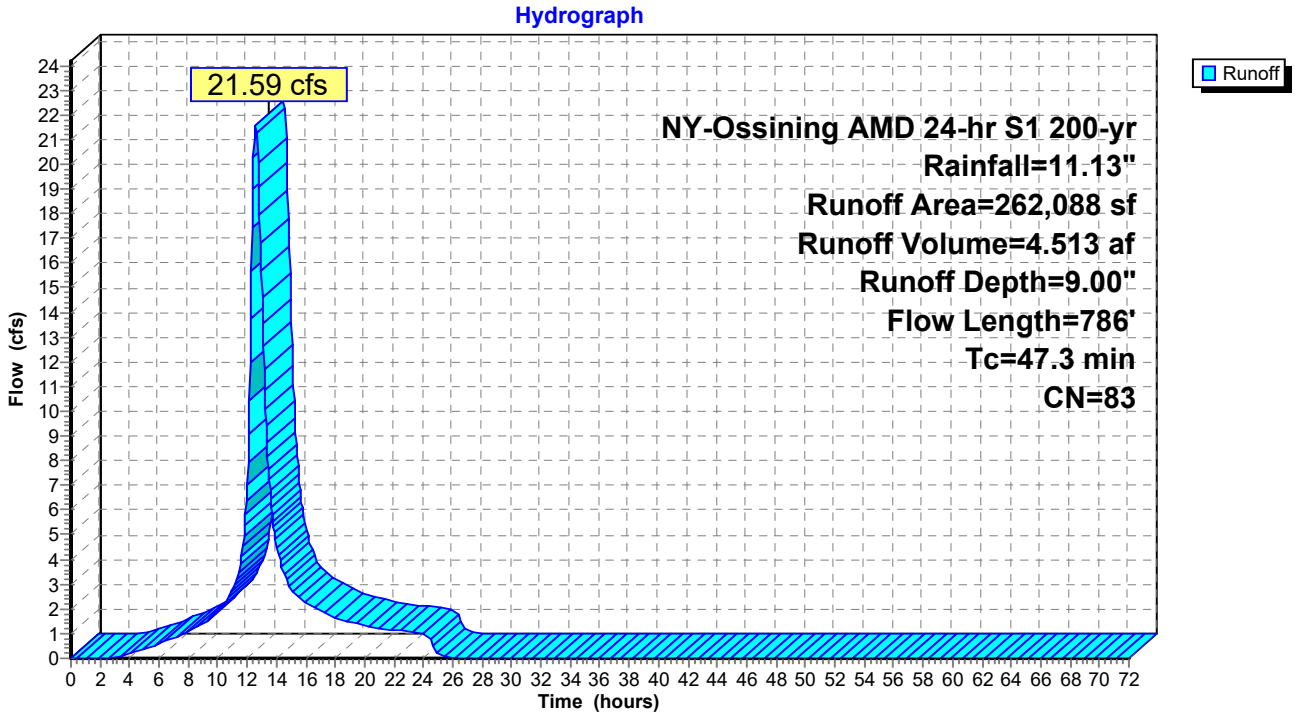
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
230,823	83	Woods, Poor, HSG D
842	96	Gravel surface, HSG D
6,258	96	Gravel surface, HSG D
4,688	96	Gravel surface, HSG D
19,477	79	Woods, Fair, HSG D
262,088	83	Weighted Average
262,088		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	44	0.0230	0.04		**Sheet Flow, A-B** Woods: Dense underbrush n= 0.800 P2= 3.41"
0.3	13	0.0076	0.64		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
18.4	43	0.0202	0.04		**Sheet Flow, C-D** Woods: Dense underbrush n= 0.800 P2= 3.41"
2.7	181	0.0507	1.13		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
4.7	212	0.0229	0.76		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, WETLAND CHANNEL** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
47.3	786	Total			



Subcatchment 2E: DA-2



Hydrograph for Subcatchment 2E: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.01	0.02
4.00	0.75	0.05	0.20
5.00	0.97	0.12	0.40
6.00	1.22	0.23	0.60
7.00	1.49	0.37	0.83
8.00	1.80	0.56	1.09
9.00	2.17	0.81	1.42
10.00	2.63	1.15	1.92
11.00	3.28	1.67	2.82
12.00	5.93	4.02	**7.05**
13.00	7.88	5.87	**14.61**
14.00	8.52	6.47	4.54
15.00	8.97	6.91	2.84
16.00	9.34	7.26	2.23
17.00	9.65	7.56	1.88
18.00	9.92	7.82	1.64
19.00	10.16	8.06	1.47
20.00	10.38	8.28	1.34
21.00	10.59	8.48	1.23
22.00	10.78	8.66	1.15
23.00	10.96	8.84	1.07
24.00	**11.13**	**9.00**	1.01
25.00	11.13	9.00	0.18
26.00	11.13	9.00	0.01
27.00	11.13	9.00	0.00
28.00	11.13	9.00	0.00
29.00	11.13	9.00	0.00
30.00	11.13	9.00	0.00
31.00	11.13	9.00	0.00
32.00	11.13	9.00	0.00
33.00	11.13	9.00	0.00
34.00	11.13	9.00	0.00
35.00	11.13	9.00	0.00
36.00	11.13	9.00	0.00
37.00	11.13	9.00	0.00
38.00	11.13	9.00	0.00
39.00	11.13	9.00	0.00
40.00	11.13	9.00	0.00
41.00	11.13	9.00	0.00
42.00	11.13	9.00	0.00
43.00	11.13	9.00	0.00
44.00	11.13	9.00	0.00
45.00	11.13	9.00	0.00
46.00	11.13	9.00	0.00
47.00	11.13	9.00	0.00
48.00	11.13	9.00	0.00
49.00	11.13	9.00	0.00
50.00	11.13	9.00	0.00
51.00	11.13	9.00	0.00
52.00	11.13	9.00	0.00
53.00	11.13	9.00	0.00
54.00	11.13	9.00	0.00
55.00	11.13	9.00	0.00
56.00	11.13	9.00	0.00
57.00	11.13	9.00	0.00
58.00	11.13	9.00	0.00
59.00	11.13	9.00	0.00
60.00	11.13	9.00	0.00
61.00	11.13	9.00	0.00
62.00	11.13	9.00	0.00
63.00	11.13	9.00	0.00
64.00	11.13	9.00	0.00
65.00	11.13	9.00	0.00
66.00	11.13	9.00	0.00
67.00	11.13	9.00	0.00
68.00	11.13	9.00	0.00
69.00	11.13	9.00	0.00
70.00	11.13	9.00	0.00
71.00	11.13	9.00	0.00
72.00	11.13	9.00	0.00

Summary for Subcatchment 3E: DA-3

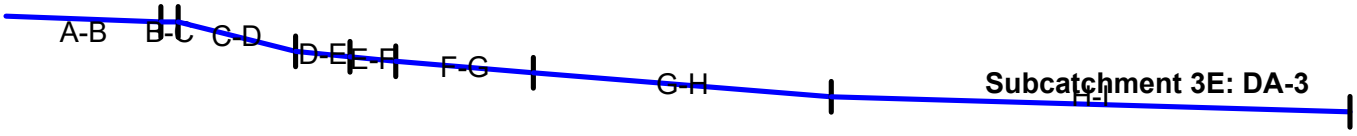
[47] Hint: Peak is 430% of capacity of segment #8

Runoff = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Depth=10.28"
Routed to Link DP-3 : Design Point - 3

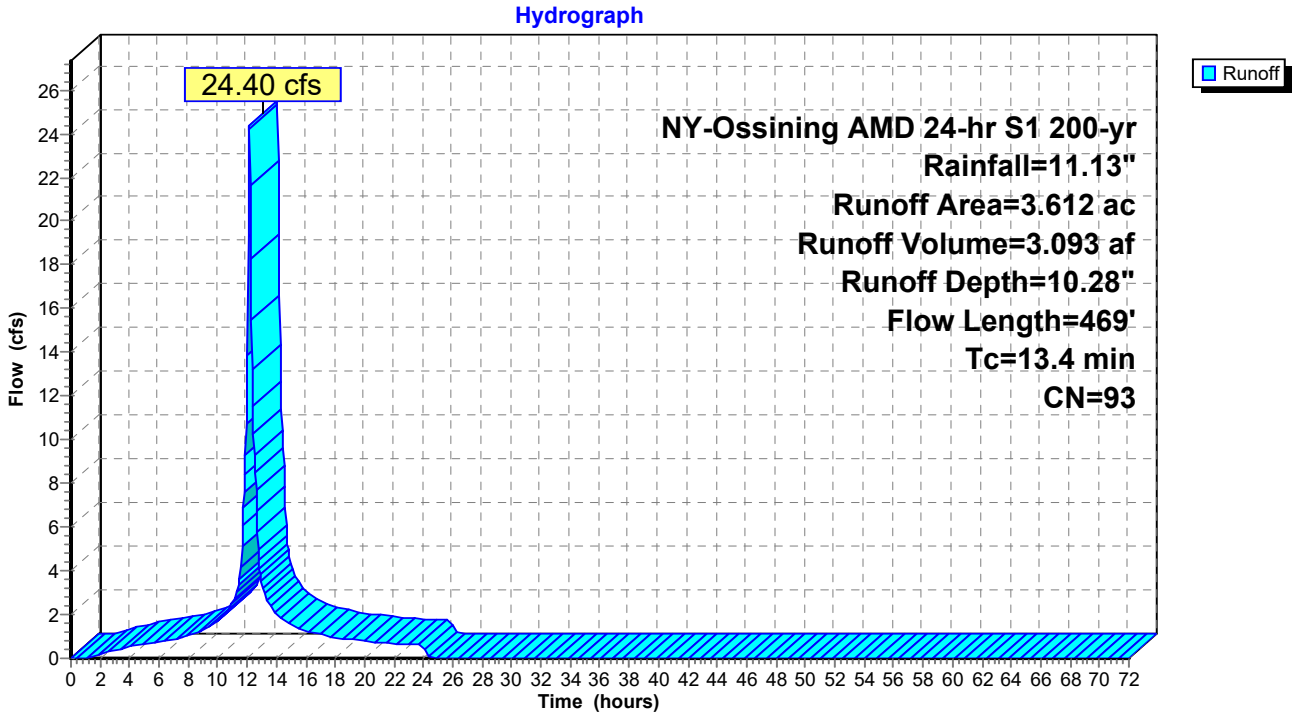
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3E: DA-3



Hydrograph for Subcatchment 3E: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.04	0.21
3.00	0.54	0.13	0.38
4.00	0.75	0.26	0.51
5.00	0.97	0.43	0.63
6.00	1.22	0.62	0.75
7.00	1.49	0.86	0.89
8.00	1.80	1.13	1.06
9.00	2.17	1.47	1.30
10.00	2.63	1.90	1.70
11.00	3.28	2.52	2.57
12.00	5.93	5.11	**13.89**
13.00	7.88	7.05	**3.44**
14.00	8.52	7.68	2.02
15.00	8.97	8.13	1.52
16.00	9.34	8.49	1.25
17.00	9.65	8.80	1.07
18.00	9.92	9.07	0.95
19.00	10.16	9.31	0.86
20.00	10.38	9.53	0.79
21.00	10.59	9.74	0.73
22.00	10.78	9.93	0.68
23.00	10.96	10.11	0.64
24.00	**11.13**	**10.28**	0.60
25.00	11.13	10.28	0.00
26.00	11.13	10.28	0.00
27.00	11.13	10.28	0.00
28.00	11.13	10.28	0.00
29.00	11.13	10.28	0.00
30.00	11.13	10.28	0.00
31.00	11.13	10.28	0.00
32.00	11.13	10.28	0.00
33.00	11.13	10.28	0.00
34.00	11.13	10.28	0.00
35.00	11.13	10.28	0.00
36.00	11.13	10.28	0.00
37.00	11.13	10.28	0.00
38.00	11.13	10.28	0.00
39.00	11.13	10.28	0.00
40.00	11.13	10.28	0.00
41.00	11.13	10.28	0.00
42.00	11.13	10.28	0.00
43.00	11.13	10.28	0.00
44.00	11.13	10.28	0.00
45.00	11.13	10.28	0.00
46.00	11.13	10.28	0.00
47.00	11.13	10.28	0.00
48.00	11.13	10.28	0.00
49.00	11.13	10.28	0.00
50.00	11.13	10.28	0.00
51.00	11.13	10.28	0.00
52.00	11.13	10.28	0.00
53.00	11.13	10.28	0.00
54.00	11.13	10.28	0.00
55.00	11.13	10.28	0.00
56.00	11.13	10.28	0.00
57.00	11.13	10.28	0.00
58.00	11.13	10.28	0.00
59.00	11.13	10.28	0.00
60.00	11.13	10.28	0.00
61.00	11.13	10.28	0.00
62.00	11.13	10.28	0.00
63.00	11.13	10.28	0.00
64.00	11.13	10.28	0.00
65.00	11.13	10.28	0.00
66.00	11.13	10.28	0.00
67.00	11.13	10.28	0.00
68.00	11.13	10.28	0.00
69.00	11.13	10.28	0.00
70.00	11.13	10.28	0.00
71.00	11.13	10.28	0.00
72.00	11.13	10.28	0.00

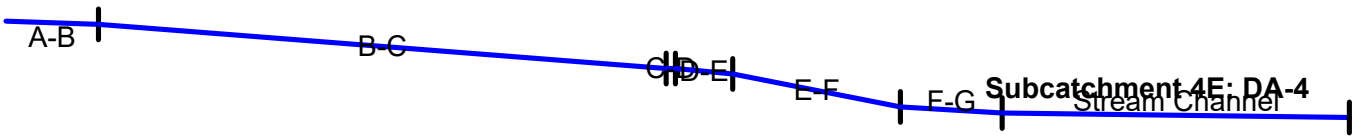
Summary for Subcatchment 4E: DA-4

Runoff = 79.56 cfs @ 12.31 hrs, Volume= 12.274 af, Depth= 7.94"
Routed to Link DP-4 : Design Point - 4

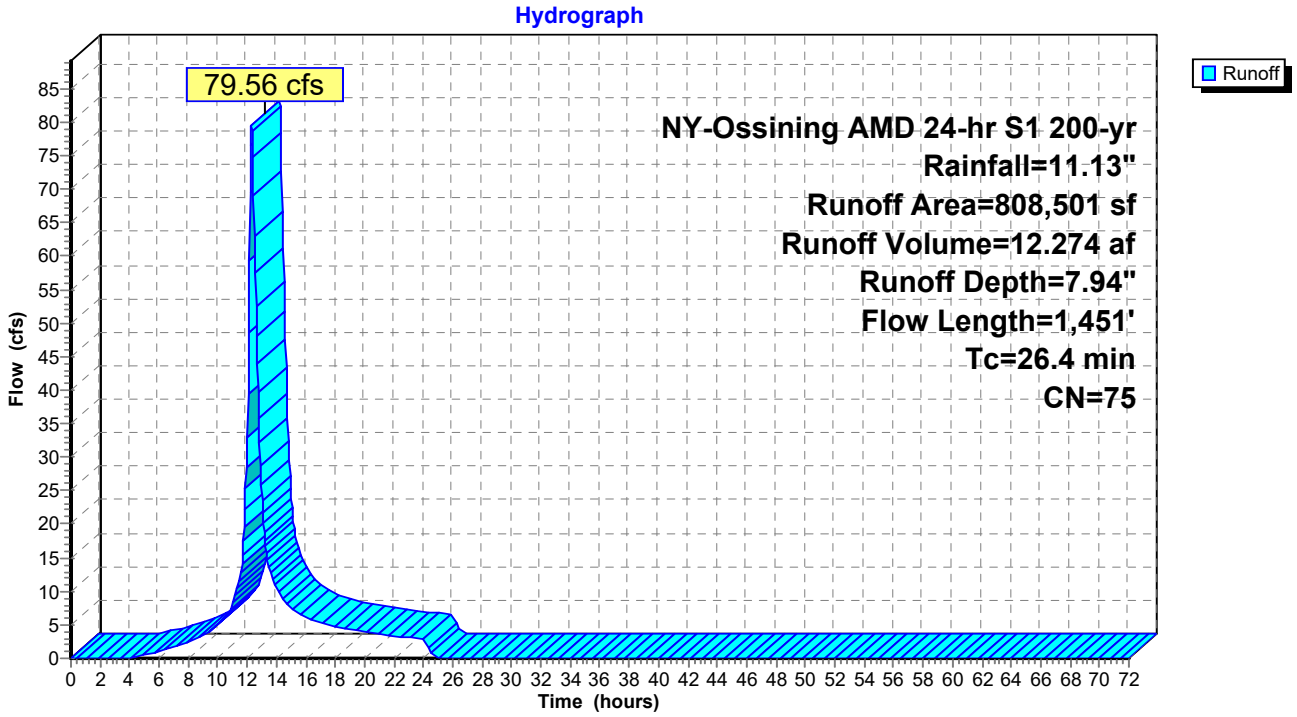
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
4,578	96	Gravel surface, HSG D
6,394	96	Gravel surface, HSG C
104,648	83	Woods, Poor, HSG D
466,246	77	Woods, Poor, HSG C
7,895	61	>75% Grass cover, Good, HSG B
1,011	80	>75% Grass cover, Good, HSG D
209,007	66	Woods, Poor, HSG B
8,722	96	Gravel surface, HSG D
808,501	75	Weighted Average
808,501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0519	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.41"
6.0	613	0.1160	1.70		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
26.4	1,451	Total			



Subcatchment 4E: DA-4



Hydrograph for Subcatchment 4E: DA-4

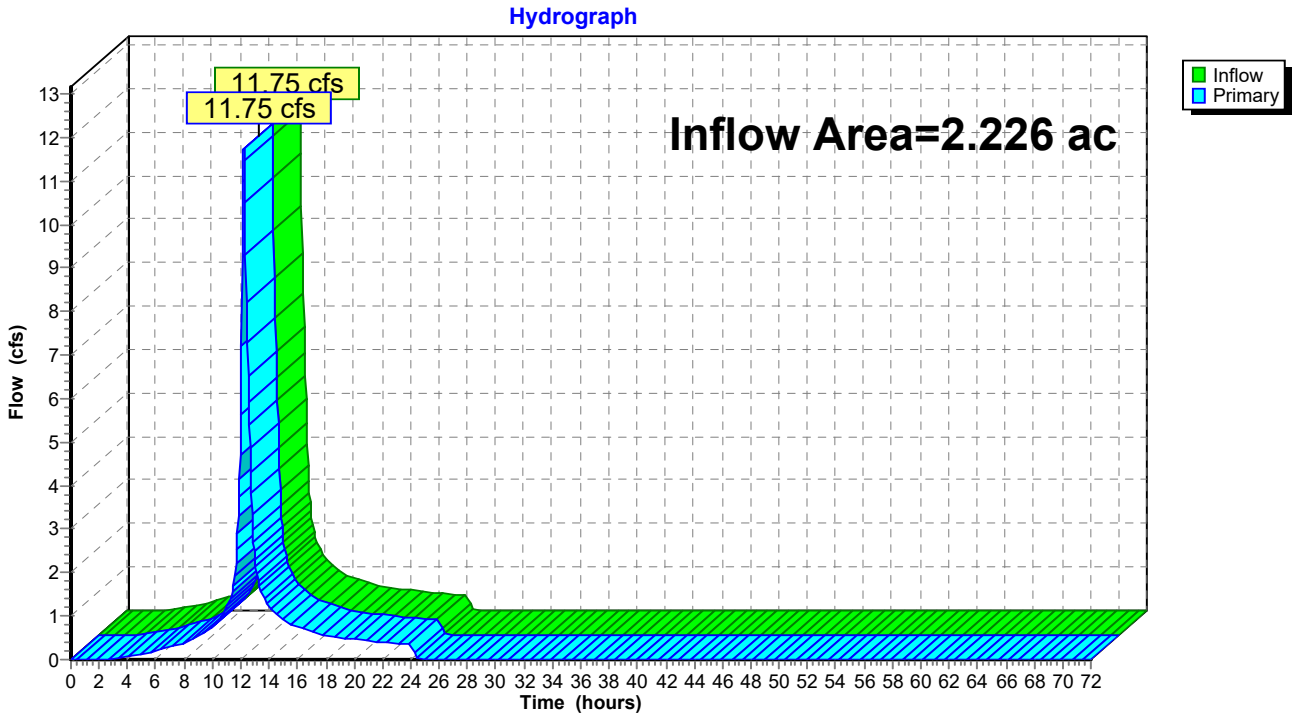
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.00	0.03
5.00	0.97	0.03	0.49
6.00	1.22	0.08	1.03
7.00	1.49	0.16	1.66
8.00	1.80	0.29	2.42
9.00	2.17	0.47	3.44
10.00	2.63	0.73	5.02
11.00	3.28	1.15	8.19
12.00	5.93	3.22	**33.03**
13.00	7.88	4.94	**23.60**
14.00	8.52	5.51	10.28
15.00	8.97	5.93	7.56
16.00	9.34	6.26	6.16
17.00	9.65	6.55	5.29
18.00	9.92	6.80	4.67
19.00	10.16	7.03	4.22
20.00	10.38	7.24	3.86
21.00	10.59	7.43	3.57
22.00	10.78	7.61	3.33
23.00	10.96	7.78	3.13
24.00	**11.13**	**7.94**	2.96
25.00	11.13	7.94	0.04
26.00	11.13	7.94	0.00
27.00	11.13	7.94	0.00
28.00	11.13	7.94	0.00
29.00	11.13	7.94	0.00
30.00	11.13	7.94	0.00
31.00	11.13	7.94	0.00
32.00	11.13	7.94	0.00
33.00	11.13	7.94	0.00
34.00	11.13	7.94	0.00
35.00	11.13	7.94	0.00
36.00	11.13	7.94	0.00
37.00	11.13	7.94	0.00
38.00	11.13	7.94	0.00
39.00	11.13	7.94	0.00
40.00	11.13	7.94	0.00
41.00	11.13	7.94	0.00
42.00	11.13	7.94	0.00
43.00	11.13	7.94	0.00
44.00	11.13	7.94	0.00
45.00	11.13	7.94	0.00
46.00	11.13	7.94	0.00
47.00	11.13	7.94	0.00
48.00	11.13	7.94	0.00
49.00	11.13	7.94	0.00
50.00	11.13	7.94	0.00
51.00	11.13	7.94	0.00
52.00	11.13	7.94	0.00
53.00	11.13	7.94	0.00
54.00	11.13	7.94	0.00
55.00	11.13	7.94	0.00
56.00	11.13	7.94	0.00
57.00	11.13	7.94	0.00
58.00	11.13	7.94	0.00
59.00	11.13	7.94	0.00
60.00	11.13	7.94	0.00
61.00	11.13	7.94	0.00
62.00	11.13	7.94	0.00
63.00	11.13	7.94	0.00
64.00	11.13	7.94	0.00
65.00	11.13	7.94	0.00
66.00	11.13	7.94	0.00
67.00	11.13	7.94	0.00
68.00	11.13	7.94	0.00
69.00	11.13	7.94	0.00
70.00	11.13	7.94	0.00
71.00	11.13	7.94	0.00
72.00	11.13	7.94	0.00

Summary for Link DP-1: Design Point - 1

Inflow Area = 2.226 ac, 0.00% Impervious, Inflow Depth = 8.61" for 200-yr event
Inflow = 11.75 cfs @ 12.21 hrs, Volume= 1.596 af
Primary = 11.75 cfs @ 12.21 hrs, Volume= 1.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

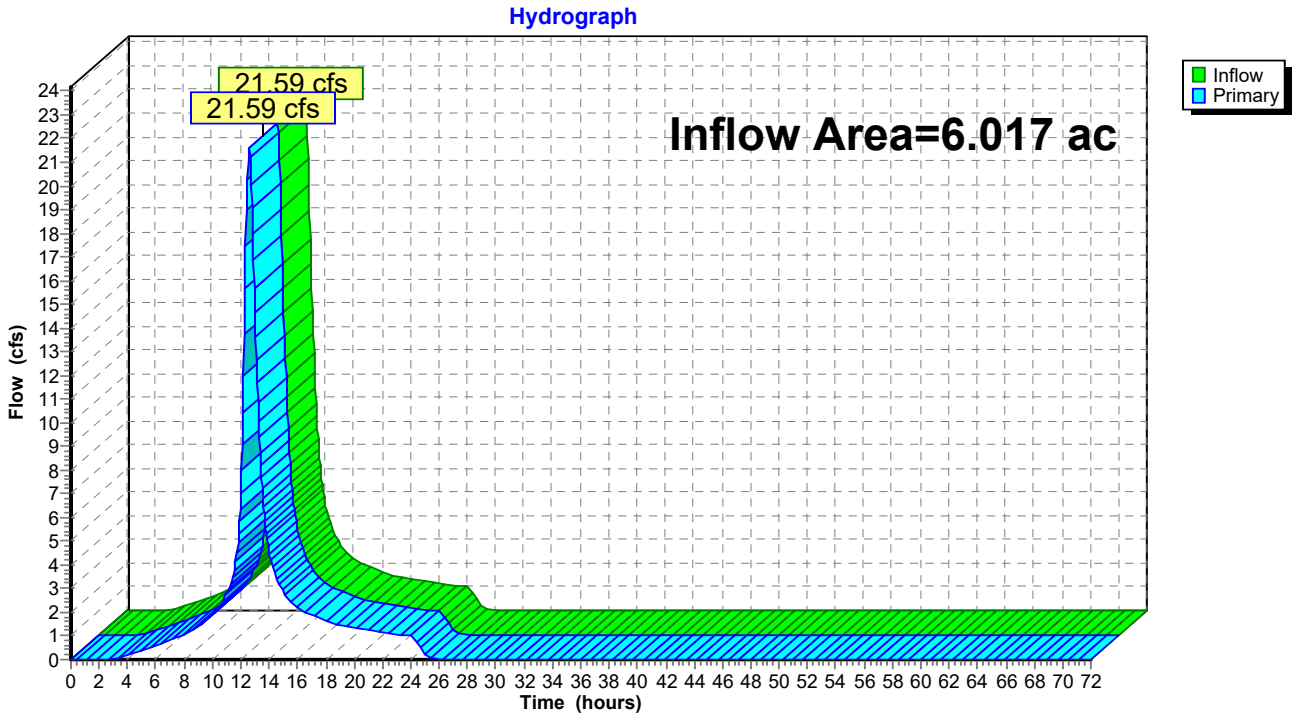
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.06	0.00	0.06	56.00	0.00	0.00	0.00
5.00	0.13	0.00	0.13	57.00	0.00	0.00	0.00
6.00	0.21	0.00	0.21	58.00	0.00	0.00	0.00
7.00	0.29	0.00	0.29	59.00	0.00	0.00	0.00
8.00	0.39	0.00	0.39	60.00	0.00	0.00	0.00
9.00	0.53	0.00	0.53	61.00	0.00	0.00	0.00
10.00	0.75	0.00	0.75	62.00	0.00	0.00	0.00
11.00	1.20	0.00	1.20	63.00	0.00	0.00	0.00
12.00	**5.63**	0.00	**5.63**	64.00	0.00	0.00	0.00
13.00	**2.30**	0.00	**2.30**	65.00	0.00	0.00	0.00
14.00	1.22	0.00	1.22	66.00	0.00	0.00	0.00
15.00	0.91	0.00	0.91	67.00	0.00	0.00	0.00
16.00	0.75	0.00	0.75	68.00	0.00	0.00	0.00
17.00	0.64	0.00	0.64	69.00	0.00	0.00	0.00
18.00	0.57	0.00	0.57	70.00	0.00	0.00	0.00
19.00	0.51	0.00	0.51	71.00	0.00	0.00	0.00
20.00	0.47	0.00	0.47	72.00	0.00	0.00	0.00
21.00	0.44	0.00	0.44				
22.00	0.41	0.00	0.41				
23.00	0.38	0.00	0.38				
24.00	0.36	0.00	0.36				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-2: Design Point - 2

Inflow Area = 6.017 ac, 0.00% Impervious, Inflow Depth = 9.00" for 200-yr event
Inflow = 21.59 cfs @ 12.58 hrs, Volume= 4.513 af
Primary = 21.59 cfs @ 12.58 hrs, Volume= 4.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

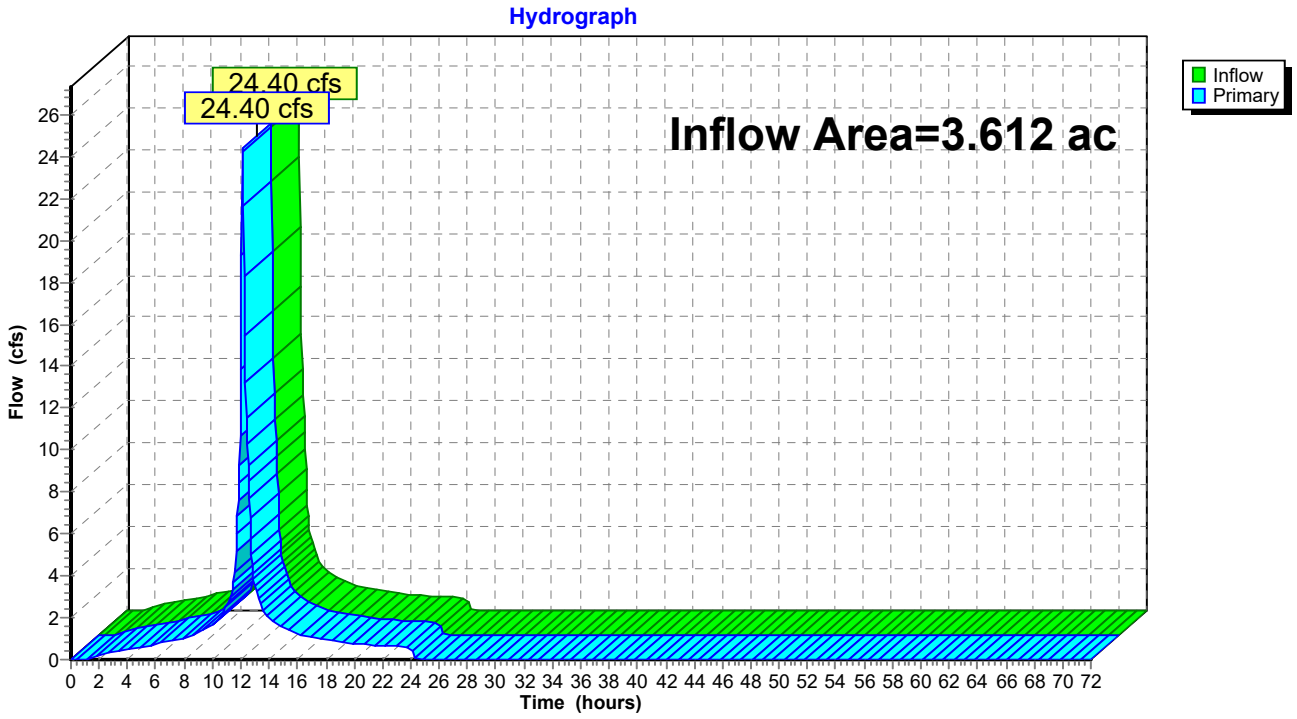
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.02	0.00	0.02
4.00	0.20	0.00	0.20
5.00	0.40	0.00	0.40
6.00	0.60	0.00	0.60
7.00	0.83	0.00	0.83
8.00	1.09	0.00	1.09
9.00	1.42	0.00	1.42
10.00	1.92	0.00	1.92
11.00	2.82	0.00	2.82
12.00	**7.05**	0.00	**7.05**
13.00	**14.61**	0.00	**14.61**
14.00	4.54	0.00	4.54
15.00	2.84	0.00	2.84
16.00	2.23	0.00	2.23
17.00	1.88	0.00	1.88
18.00	1.64	0.00	1.64
19.00	1.47	0.00	1.47
20.00	1.34	0.00	1.34
21.00	1.23	0.00	1.23
22.00	1.15	0.00	1.15
23.00	1.07	0.00	1.07
24.00	1.01	0.00	1.01
25.00	0.18	0.00	0.18
26.00	0.01	0.00	0.01
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 10.28" for 200-yr event
Inflow = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af
Primary = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

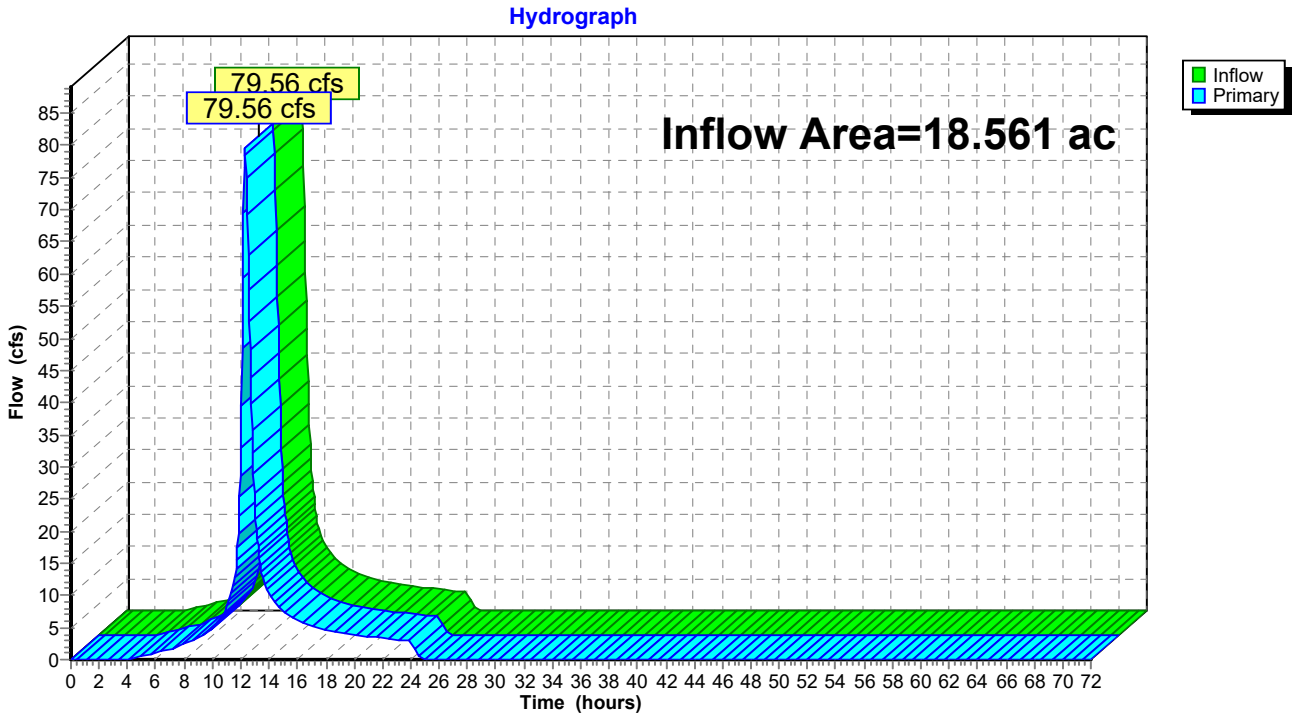
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.21	0.00	0.21
3.00	0.38	0.00	0.38
4.00	0.51	0.00	0.51
5.00	0.63	0.00	0.63
6.00	0.75	0.00	0.75
7.00	0.89	0.00	0.89
8.00	1.06	0.00	1.06
9.00	1.30	0.00	1.30
10.00	1.70	0.00	1.70
11.00	2.57	0.00	2.57
12.00	**13.89**	0.00	**13.89**
13.00	**3.44**	0.00	**3.44**
14.00	2.02	0.00	2.02
15.00	1.52	0.00	1.52
16.00	1.25	0.00	1.25
17.00	1.07	0.00	1.07
18.00	0.95	0.00	0.95
19.00	0.86	0.00	0.86
20.00	0.79	0.00	0.79
21.00	0.73	0.00	0.73
22.00	0.68	0.00	0.68
23.00	0.64	0.00	0.64
24.00	0.60	0.00	0.60
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 18.561 ac, 0.00% Impervious, Inflow Depth = 7.94" for 200-yr event
Inflow = 79.56 cfs @ 12.31 hrs, Volume= 12.274 af
Primary = 79.56 cfs @ 12.31 hrs, Volume= 12.274 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



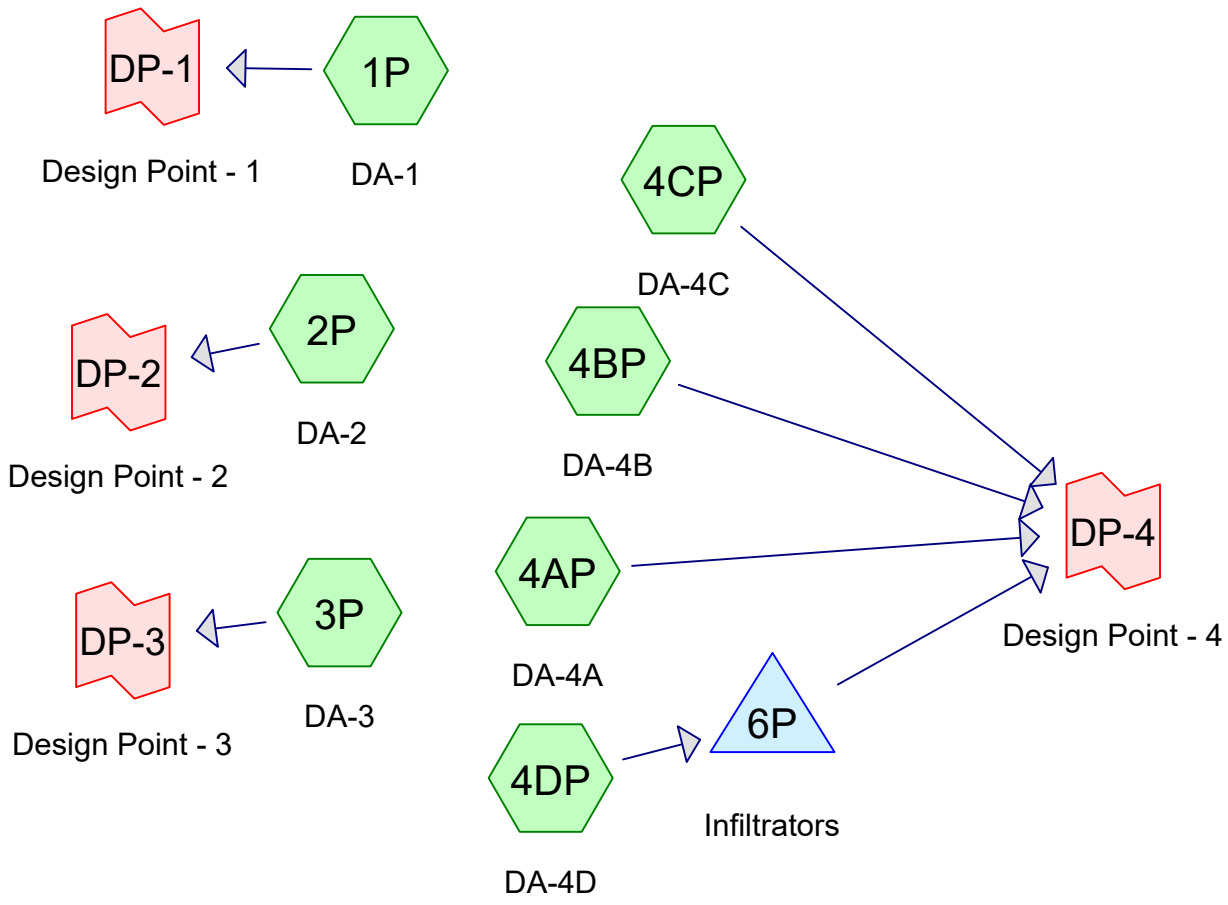
Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.03	0.00	0.03
5.00	0.49	0.00	0.49
6.00	1.03	0.00	1.03
7.00	1.66	0.00	1.66
8.00	2.42	0.00	2.42
9.00	3.44	0.00	3.44
10.00	5.02	0.00	5.02
11.00	8.19	0.00	8.19
12.00	**33.03**	0.00	**33.03**
13.00	**23.60**	0.00	**23.60**
14.00	10.28	0.00	10.28
15.00	7.56	0.00	7.56
16.00	6.16	0.00	6.16
17.00	5.29	0.00	5.29
18.00	4.67	0.00	4.67
19.00	4.22	0.00	4.22
20.00	3.86	0.00	3.86
21.00	3.57	0.00	3.57
22.00	3.33	0.00	3.33
23.00	3.13	0.00	3.13
24.00	2.96	0.00	2.96
25.00	0.04	0.00	0.04
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

APPENDIX D

PROPOSED CONDITIONS – HYDROLOGIC ANALYSIS AND CALCULATION DATA

(Revised to Include Only Phase 2 Calcs)



Subcat Reach Pond Link

Routing Diagram for Post Development Conditions
Prepared by Clark Patterson Lee, Printed 10/21/2026
HydroCAD® 10.20-8a s/n 00475 © 2025 HydroCAD Software Solutions LLC

Project Notes

Defined 9 rainfall events from NY-Ossining AMD IDF
Copied 9 events from NY-Ossining AMD 24-hr S1 storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	NY-Ossining AMD 24-hr S1	1-yr	Default	24.00	1	2.78	2
2	2-yr	NY-Ossining AMD 24-hr S1	2-yr	Default	24.00	1	3.41	2
3	10-yr	NY-Ossining AMD 24-hr S1	10-yr	Default	24.00	1	5.14	2
4	100-yr	NY-Ossining AMD 24-hr S1	100-yr	Default	24.00	1	9.29	2
5	200-yr	NY-Ossining AMD 24-hr S1	200-yr	Default	24.00	1	11.13	2
6	90% WQv	NY-Ossining AMD 24-hr S1	1-yr	Default	24.00	1	1.15	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
12.016	74	>75% Grass cover, Good, HSG C (4AP, 4BP, 4CP)
0.233	80	>75% Grass cover, Good, HSG D (4DP)
0.147	96	Gravel surface, HSG B (4CP)
0.612	71	Meadow, non-grazed, HSG C (4BP)
0.363	80	Pasture/grassland/range, Good, HSG D (2P)
0.615	79	Pasture/grassland/range, Poor, HSG B (3P)
0.030	98	Paved parking, HSG B (3P)
1.130	98	Paved parking, HSG D (4DP)
2.118	98	Paved roads w/curbs & sewers, HSG D (3P)
1.683	98	Roofs, HSG C (4AP)
0.255	98	Roofs, HSG D (3P)
0.071	98	Unconnected pavement, HSG B (3P)
2.862	98	Unconnected pavement, HSG C (4AP, 4BP)
0.741	98	Unconnected pavement, HSG D (4AP)
0.755	79	Woods, Fair, HSG D (1P)
4.583	66	Woods, Poor, HSG B (4CP)
0.561	77	Woods, Poor, HSG C (4CP)
3.244	83	Woods, Poor, HSG D (2P, 3P, 4CP)
0.341	82	Woods/grass comb., Fair, HSG D (1P)
32.360	**81**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.446	HSG B	3P, 4CP
17.734	HSG C	4AP, 4BP, 4CP
9.180	HSG D	1P, 2P, 3P, 4AP, 4CP, 4DP
0.000	Other	
32.360		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	12.016	0.233	0.000	12.249	>75% Grass cover, Good	4AP, 4BP, 4CP, 4DP
0.000	0.147	0.000	0.000	0.000	0.147	Gravel surface	4CP
0.000	0.000	0.612	0.000	0.000	0.612	Meadow, non-grazed	4BP
0.000	0.000	0.000	0.363	0.000	0.363	Pasture/grassland/range, Good	2P
0.000	0.615	0.000	0.000	0.000	0.615	Pasture/grassland/range, Poor	3P
0.000	0.030	0.000	1.130	0.000	1.160	Paved parking	3P, 4DP
0.000	0.000	0.000	2.118	0.000	2.118	Paved roads w/curbs & sewers	3P
0.000	0.000	1.683	0.255	0.000	1.938	Roofs	3P, 4AP
0.000	0.071	2.862	0.741	0.000	3.674	Unconnected pavement	3P, 4AP, 4BP
0.000	0.000	0.000	0.755	0.000	0.755	Woods, Fair	1P
0.000	4.583	0.561	3.244	0.000	8.388	Woods, Poor	2P, 3P, 4CP
0.000	0.000	0.000	0.341	0.000	0.341	Woods/grass comb., Fair	1P
0.000	**5.446**	**17.734**	**9.180**	**0.000**	**32.360**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	3P	0.00	0.00	181.0	0.0077	0.013	0.0	15.0	0.0	
2	4AP	0.00	0.00	263.0	0.0050	0.013	0.0	15.0	0.0	
3	4AP	0.00	0.00	780.0	0.0050	0.013	0.0	18.0	0.0	
4	4BP	0.00	0.00	266.0	0.0050	0.013	0.0	12.0	0.0	
5	4BP	0.00	0.00	615.0	0.0050	0.013	0.0	24.0	0.0	
6	4DP	0.00	0.00	342.0	0.0100	0.013	0.0	15.0	0.0	
7	6P	347.00	346.25	75.0	0.0100	0.013	0.0	15.0	0.0	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=253' Tc=12.2 min CN=80 Runoff=1.15 cfs 0.099 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=1.27"
Flow Length=548' Tc=36.4 min CN=83 Runoff=1.77 cfs 0.260 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.04"
Flow Length=469' Tc=13.4 min CN=93 Runoff=6.99 cfs 0.615 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=2.04"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=13.33 cfs 1.133 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=0.77"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=4.39 cfs 0.481 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=968' Tc=12.4 min CN=71 Runoff=5.04 cfs 0.516 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=2.23"
Flow Length=398' Tc=6.0 min CN=95 Runoff=3.84 cfs 0.254 af

Pond 6P: Infiltrators Peak Elev=347.82' Storage=0.089 af Inflow=3.84 cfs 0.254 af
Discarded=0.07 cfs 0.124 af Primary=0.72 cfs 0.129 af Outflow=0.78 cfs 0.254 af

Link DP-1: Design Point - 1 Inflow=1.15 cfs 0.099 af
Primary=1.15 cfs 0.099 af

Link DP-2: Design Point - 2 Inflow=1.77 cfs 0.260 af
Primary=1.77 cfs 0.260 af

Link DP-3: Design Point - 3 Inflow=6.99 cfs 0.615 af
Primary=6.99 cfs 0.615 af

Link DP-4: Design Point - 4 Inflow=22.70 cfs 2.259 af
Primary=22.70 cfs 2.259 af

Total Runoff Area = 32.360 ac Runoff Volume = 3.358 af Average Runoff Depth = 1.25"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

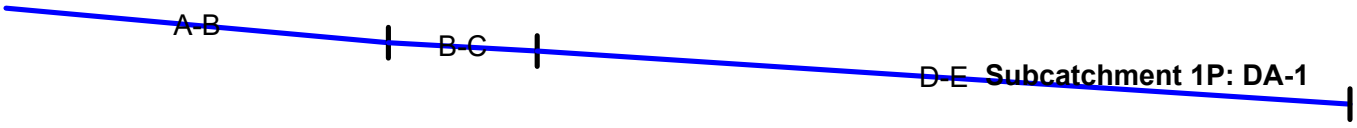
Summary for Subcatchment 1P: DA-1

Runoff = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af, Depth= 1.09"
Routed to Link DP-1 : Design Point - 1

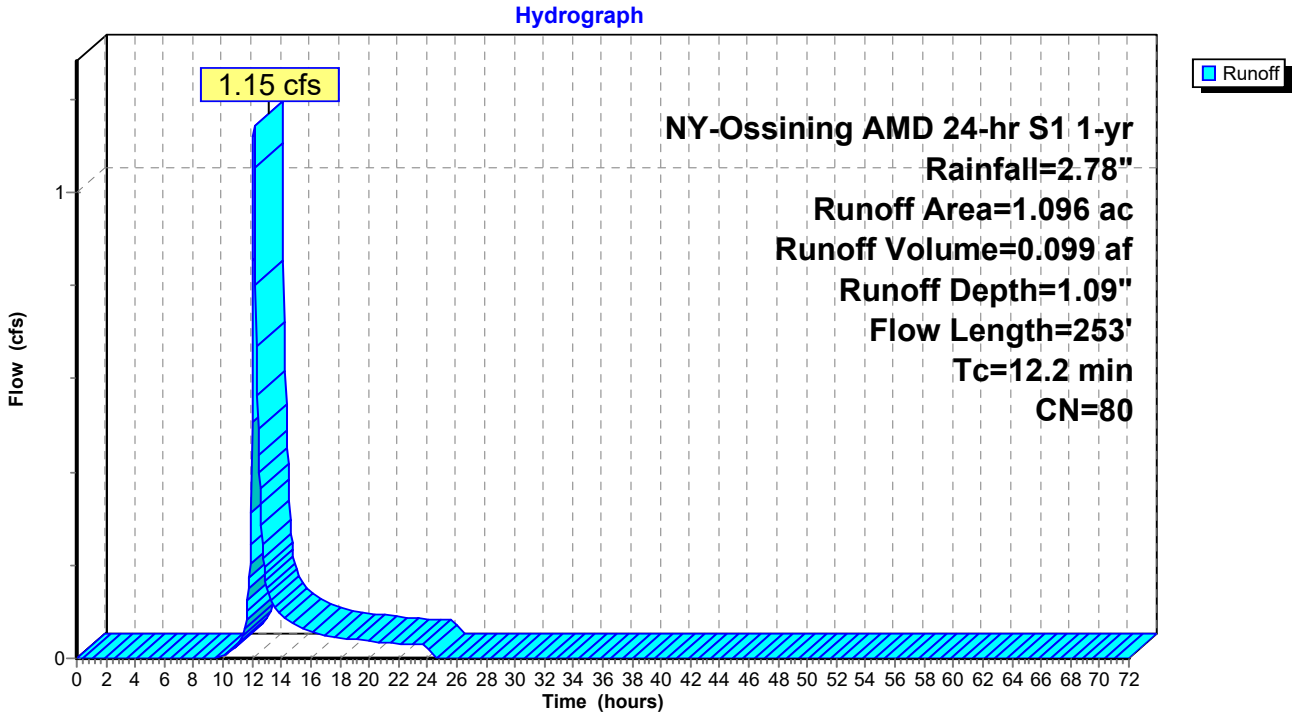
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.01
11.00	0.74	0.02	0.03
12.00	1.53	0.30	**0.51**
13.00	2.04	0.59	**0.15**
14.00	2.19	0.68	0.09
15.00	2.30	0.75	0.07
16.00	2.38	0.81	0.06
17.00	2.45	0.86	0.05
18.00	2.51	0.90	0.04
19.00	2.57	0.94	0.04
20.00	2.62	0.97	0.04
21.00	2.66	1.00	0.03
22.00	2.70	1.03	0.03
23.00	2.74	1.06	0.03
24.00	**2.78**	**1.09**	0.03
25.00	2.78	1.09	0.00
26.00	2.78	1.09	0.00
27.00	2.78	1.09	0.00
28.00	2.78	1.09	0.00
29.00	2.78	1.09	0.00
30.00	2.78	1.09	0.00
31.00	2.78	1.09	0.00
32.00	2.78	1.09	0.00
33.00	2.78	1.09	0.00
34.00	2.78	1.09	0.00
35.00	2.78	1.09	0.00
36.00	2.78	1.09	0.00
37.00	2.78	1.09	0.00
38.00	2.78	1.09	0.00
39.00	2.78	1.09	0.00
40.00	2.78	1.09	0.00
41.00	2.78	1.09	0.00
42.00	2.78	1.09	0.00
43.00	2.78	1.09	0.00
44.00	2.78	1.09	0.00
45.00	2.78	1.09	0.00
46.00	2.78	1.09	0.00
47.00	2.78	1.09	0.00
48.00	2.78	1.09	0.00
49.00	2.78	1.09	0.00
50.00	2.78	1.09	0.00
51.00	2.78	1.09	0.00
52.00	2.78	1.09	0.00
53.00	2.78	1.09	0.00
54.00	2.78	1.09	0.00
55.00	2.78	1.09	0.00
56.00	2.78	1.09	0.00
57.00	2.78	1.09	0.00
58.00	2.78	1.09	0.00
59.00	2.78	1.09	0.00
60.00	2.78	1.09	0.00
61.00	2.78	1.09	0.00
62.00	2.78	1.09	0.00
63.00	2.78	1.09	0.00
64.00	2.78	1.09	0.00
65.00	2.78	1.09	0.00
66.00	2.78	1.09	0.00
67.00	2.78	1.09	0.00
68.00	2.78	1.09	0.00
69.00	2.78	1.09	0.00
70.00	2.78	1.09	0.00
71.00	2.78	1.09	0.00
72.00	2.78	1.09	0.00

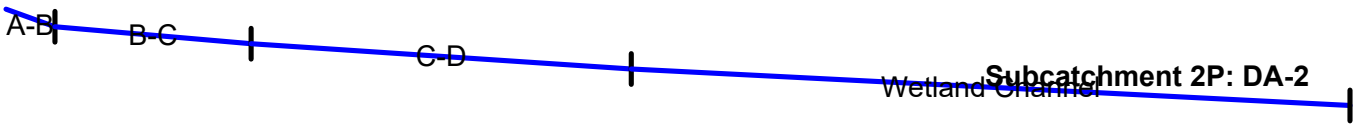
Summary for Subcatchment 2P: DA-2

Runoff = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af, Depth= 1.27"
Routed to Link DP-2 : Design Point - 2

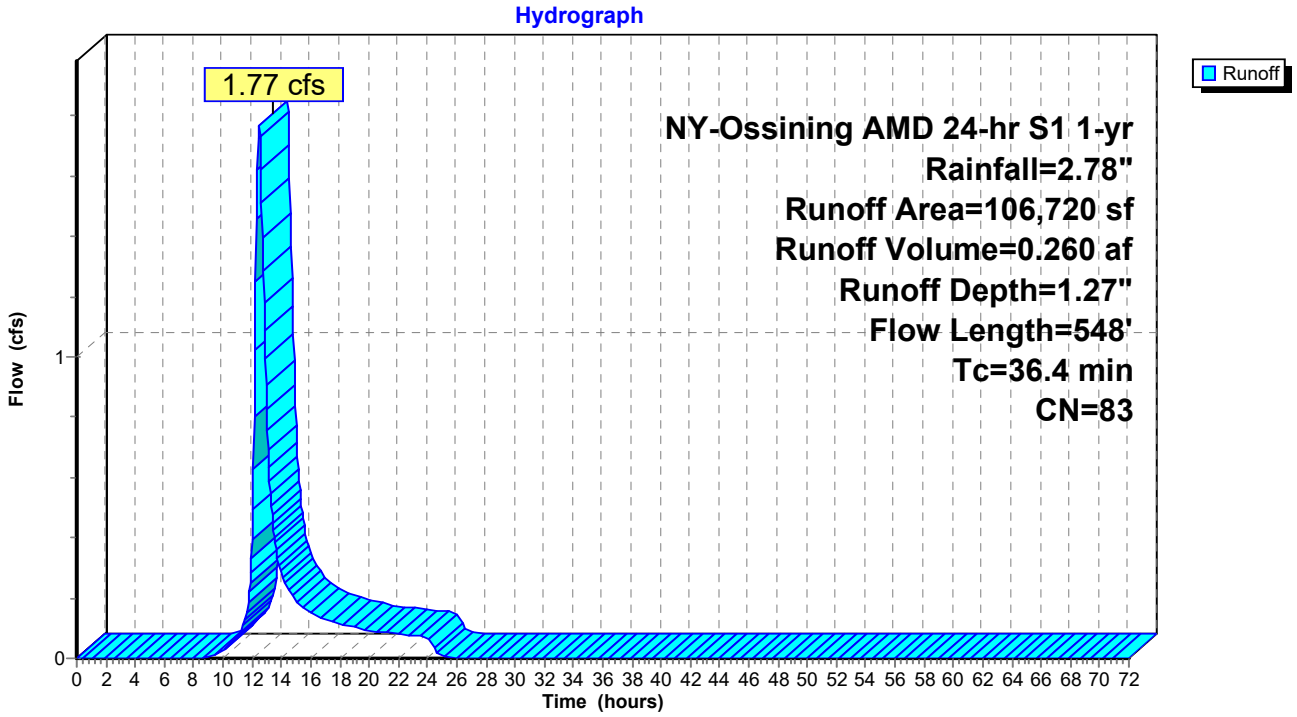
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.01
10.00	0.59	0.01	0.03
11.00	0.74	0.05	0.07
12.00	1.53	0.40	**0.40**
13.00	2.04	0.72	**0.83**
14.00	2.19	0.83	0.28
15.00	2.30	0.91	0.19
16.00	2.38	0.97	0.15
17.00	2.45	1.02	0.13
18.00	2.51	1.07	0.11
19.00	2.57	1.11	0.10
20.00	2.62	1.15	0.09
21.00	2.66	1.18	0.09
22.00	2.70	1.21	0.08
23.00	2.74	1.24	0.08
24.00	**2.78**	**1.27**	0.07
25.00	2.78	1.27	0.00
26.00	2.78	1.27	0.00
27.00	2.78	1.27	0.00
28.00	2.78	1.27	0.00
29.00	2.78	1.27	0.00
30.00	2.78	1.27	0.00
31.00	2.78	1.27	0.00
32.00	2.78	1.27	0.00
33.00	2.78	1.27	0.00
34.00	2.78	1.27	0.00
35.00	2.78	1.27	0.00
36.00	2.78	1.27	0.00
37.00	2.78	1.27	0.00
38.00	2.78	1.27	0.00
39.00	2.78	1.27	0.00
40.00	2.78	1.27	0.00
41.00	2.78	1.27	0.00
42.00	2.78	1.27	0.00
43.00	2.78	1.27	0.00
44.00	2.78	1.27	0.00
45.00	2.78	1.27	0.00
46.00	2.78	1.27	0.00
47.00	2.78	1.27	0.00
48.00	2.78	1.27	0.00
49.00	2.78	1.27	0.00
50.00	2.78	1.27	0.00
51.00	2.78	1.27	0.00
52.00	2.78	1.27	0.00
53.00	2.78	1.27	0.00
54.00	2.78	1.27	0.00
55.00	2.78	1.27	0.00
56.00	2.78	1.27	0.00
57.00	2.78	1.27	0.00
58.00	2.78	1.27	0.00
59.00	2.78	1.27	0.00
60.00	2.78	1.27	0.00
61.00	2.78	1.27	0.00
62.00	2.78	1.27	0.00
63.00	2.78	1.27	0.00
64.00	2.78	1.27	0.00
65.00	2.78	1.27	0.00
66.00	2.78	1.27	0.00
67.00	2.78	1.27	0.00
68.00	2.78	1.27	0.00
69.00	2.78	1.27	0.00
70.00	2.78	1.27	0.00
71.00	2.78	1.27	0.00
72.00	2.78	1.27	0.00

Summary for Subcatchment 3P: DA-3

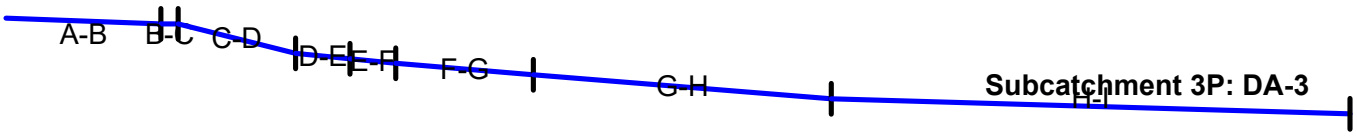
[47] Hint: Peak is 123% of capacity of segment #8

Runoff = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Depth= 2.04"
Routed to Link DP-3 : Design Point - 3

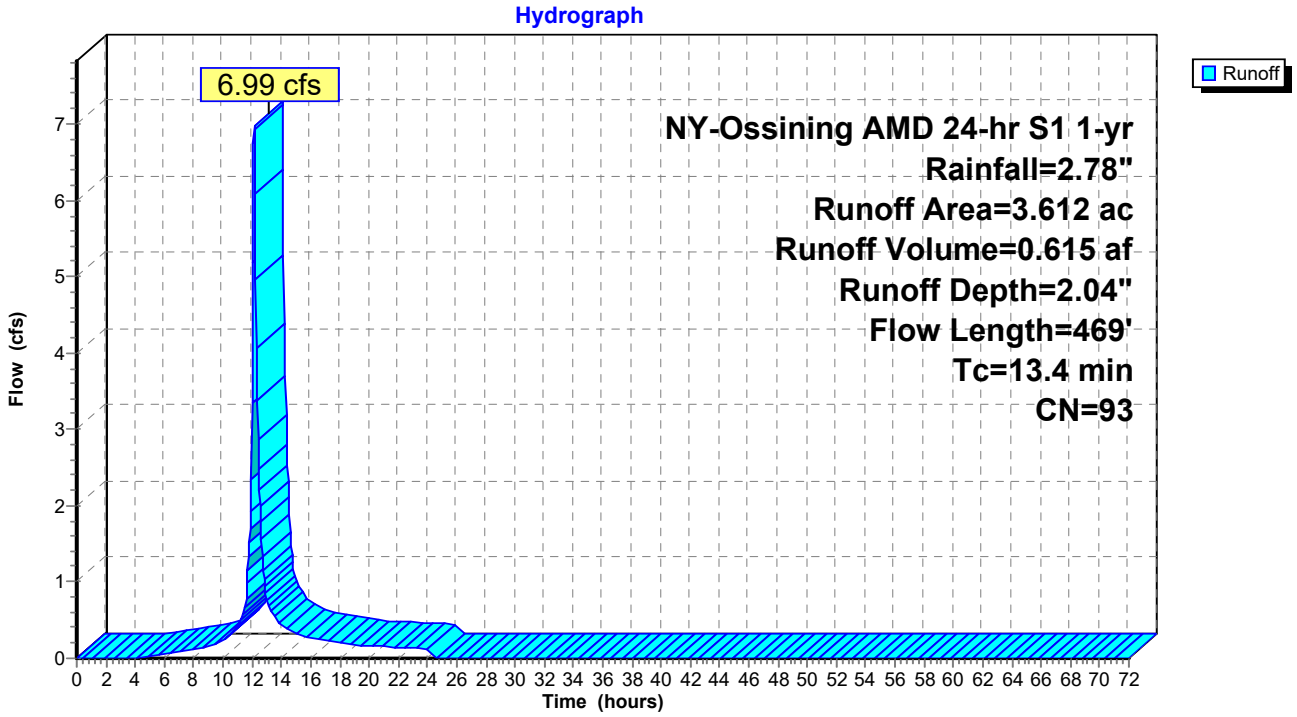
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.02
6.00	0.27	0.02	0.05
7.00	0.33	0.03	0.08
8.00	0.40	0.06	0.11
9.00	0.48	0.10	0.16
10.00	0.59	0.16	0.25
11.00	0.74	0.26	0.43
12.00	1.53	0.89	**3.36**
13.00	2.04	1.35	**0.78**
14.00	2.19	1.49	0.44
15.00	2.30	1.59	0.33
16.00	2.38	1.67	0.27
17.00	2.45	1.74	0.23
18.00	2.51	1.79	0.20
19.00	2.57	1.84	0.18
20.00	2.62	1.89	0.16
21.00	2.66	1.93	0.15
22.00	2.70	1.97	0.14
23.00	2.74	2.01	0.13
24.00	**2.78**	**2.04**	0.12
25.00	2.78	2.04	0.00
26.00	2.78	2.04	0.00
27.00	2.78	2.04	0.00
28.00	2.78	2.04	0.00
29.00	2.78	2.04	0.00
30.00	2.78	2.04	0.00
31.00	2.78	2.04	0.00
32.00	2.78	2.04	0.00
33.00	2.78	2.04	0.00
34.00	2.78	2.04	0.00
35.00	2.78	2.04	0.00
36.00	2.78	2.04	0.00
37.00	2.78	2.04	0.00
38.00	2.78	2.04	0.00
39.00	2.78	2.04	0.00
40.00	2.78	2.04	0.00
41.00	2.78	2.04	0.00
42.00	2.78	2.04	0.00
43.00	2.78	2.04	0.00
44.00	2.78	2.04	0.00
45.00	2.78	2.04	0.00
46.00	2.78	2.04	0.00
47.00	2.78	2.04	0.00
48.00	2.78	2.04	0.00
49.00	2.78	2.04	0.00
50.00	2.78	2.04	0.00
51.00	2.78	2.04	0.00
52.00	2.78	2.04	0.00
53.00	2.78	2.04	0.00
54.00	2.78	2.04	0.00
55.00	2.78	2.04	0.00
56.00	2.78	2.04	0.00
57.00	2.78	2.04	0.00
58.00	2.78	2.04	0.00
59.00	2.78	2.04	0.00
60.00	2.78	2.04	0.00
61.00	2.78	2.04	0.00
62.00	2.78	2.04	0.00
63.00	2.78	2.04	0.00
64.00	2.78	2.04	0.00
65.00	2.78	2.04	0.00
66.00	2.78	2.04	0.00
67.00	2.78	2.04	0.00
68.00	2.78	2.04	0.00
69.00	2.78	2.04	0.00
70.00	2.78	2.04	0.00
71.00	2.78	2.04	0.00
72.00	2.78	2.04	0.00

Summary for Subcatchment 4AP: DA-4A

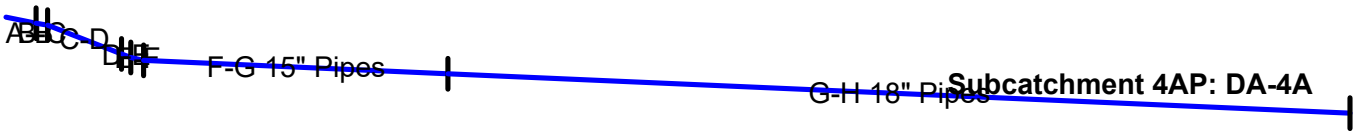
[47] Hint: Peak is 292% of capacity of segment #6
[47] Hint: Peak is 180% of capacity of segment #7

Runoff = 13.33 cfs @ 12.12 hrs, Volume= 1.133 af, Depth= 2.04"
Routed to Link DP-4 : Design Point - 4

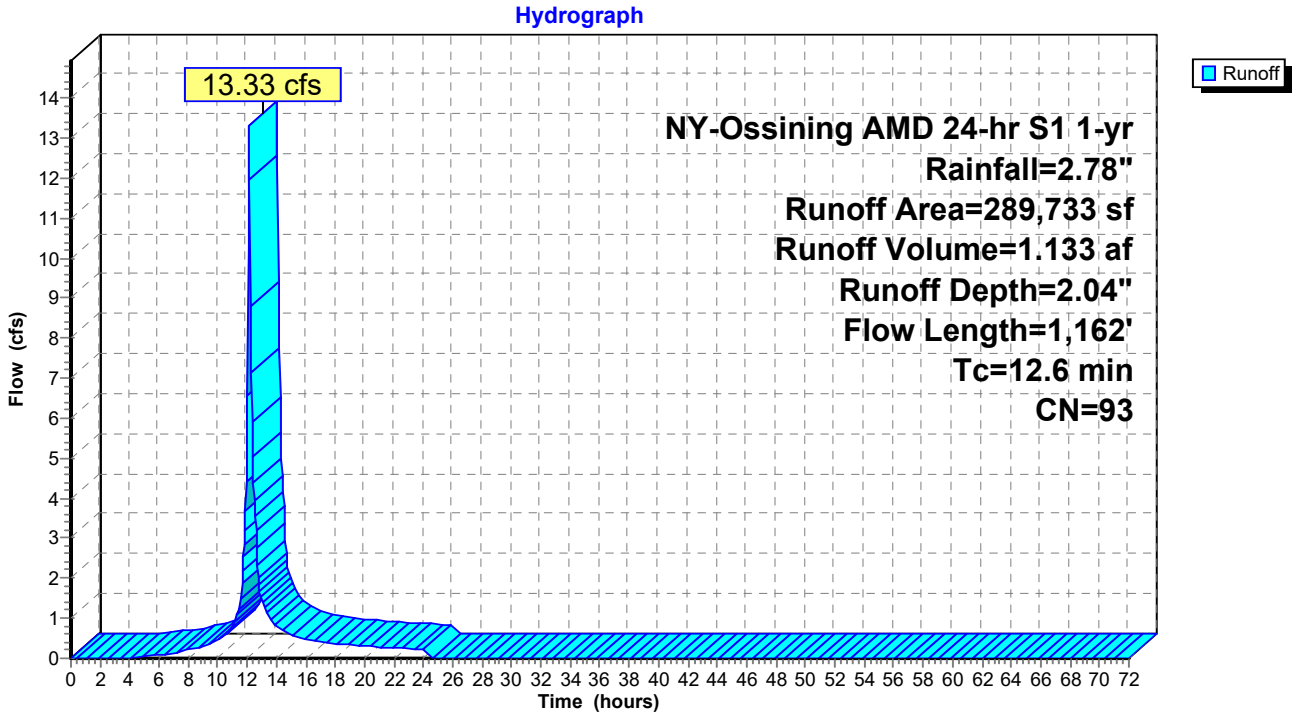
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.04
6.00	0.27	0.02	0.09
7.00	0.33	0.03	0.14
8.00	0.40	0.06	0.21
9.00	0.48	0.10	0.30
10.00	0.59	0.16	0.46
11.00	0.74	0.26	0.81
12.00	1.53	0.89	**6.55**
13.00	2.04	1.35	**1.42**
14.00	2.19	1.49	0.81
15.00	2.30	1.59	0.60
16.00	2.38	1.67	0.49
17.00	2.45	1.74	0.42
18.00	2.51	1.79	0.37
19.00	2.57	1.84	0.33
20.00	2.62	1.89	0.30
21.00	2.66	1.93	0.28
22.00	2.70	1.97	0.26
23.00	2.74	2.01	0.24
24.00	**2.78**	**2.04**	0.23
25.00	2.78	2.04	0.00
26.00	2.78	2.04	0.00
27.00	2.78	2.04	0.00
28.00	2.78	2.04	0.00
29.00	2.78	2.04	0.00
30.00	2.78	2.04	0.00
31.00	2.78	2.04	0.00
32.00	2.78	2.04	0.00
33.00	2.78	2.04	0.00
34.00	2.78	2.04	0.00
35.00	2.78	2.04	0.00
36.00	2.78	2.04	0.00
37.00	2.78	2.04	0.00
38.00	2.78	2.04	0.00
39.00	2.78	2.04	0.00
40.00	2.78	2.04	0.00
41.00	2.78	2.04	0.00
42.00	2.78	2.04	0.00
43.00	2.78	2.04	0.00
44.00	2.78	2.04	0.00
45.00	2.78	2.04	0.00
46.00	2.78	2.04	0.00
47.00	2.78	2.04	0.00
48.00	2.78	2.04	0.00
49.00	2.78	2.04	0.00
50.00	2.78	2.04	0.00
51.00	2.78	2.04	0.00
52.00	2.78	2.04	0.00
53.00	2.78	2.04	0.00
54.00	2.78	2.04	0.00
55.00	2.78	2.04	0.00
56.00	2.78	2.04	0.00
57.00	2.78	2.04	0.00
58.00	2.78	2.04	0.00
59.00	2.78	2.04	0.00
60.00	2.78	2.04	0.00
61.00	2.78	2.04	0.00
62.00	2.78	2.04	0.00
63.00	2.78	2.04	0.00
64.00	2.78	2.04	0.00
65.00	2.78	2.04	0.00
66.00	2.78	2.04	0.00
67.00	2.78	2.04	0.00
68.00	2.78	2.04	0.00
69.00	2.78	2.04	0.00
70.00	2.78	2.04	0.00
71.00	2.78	2.04	0.00
72.00	2.78	2.04	0.00

Summary for Subcatchment 4BP: DA-4B

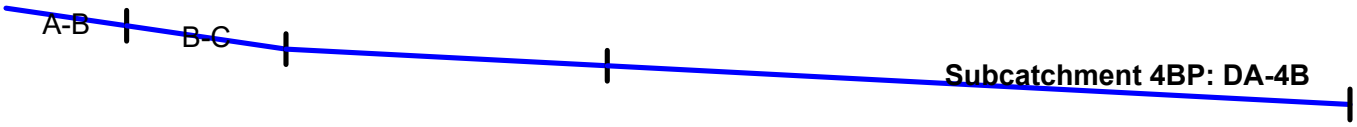
[47] Hint: Peak is 174% of capacity of segment #3

Runoff = 4.39 cfs @ 12.21 hrs, Volume= 0.481 af, Depth= 0.77"
Routed to Link DP-4 : Design Point - 4

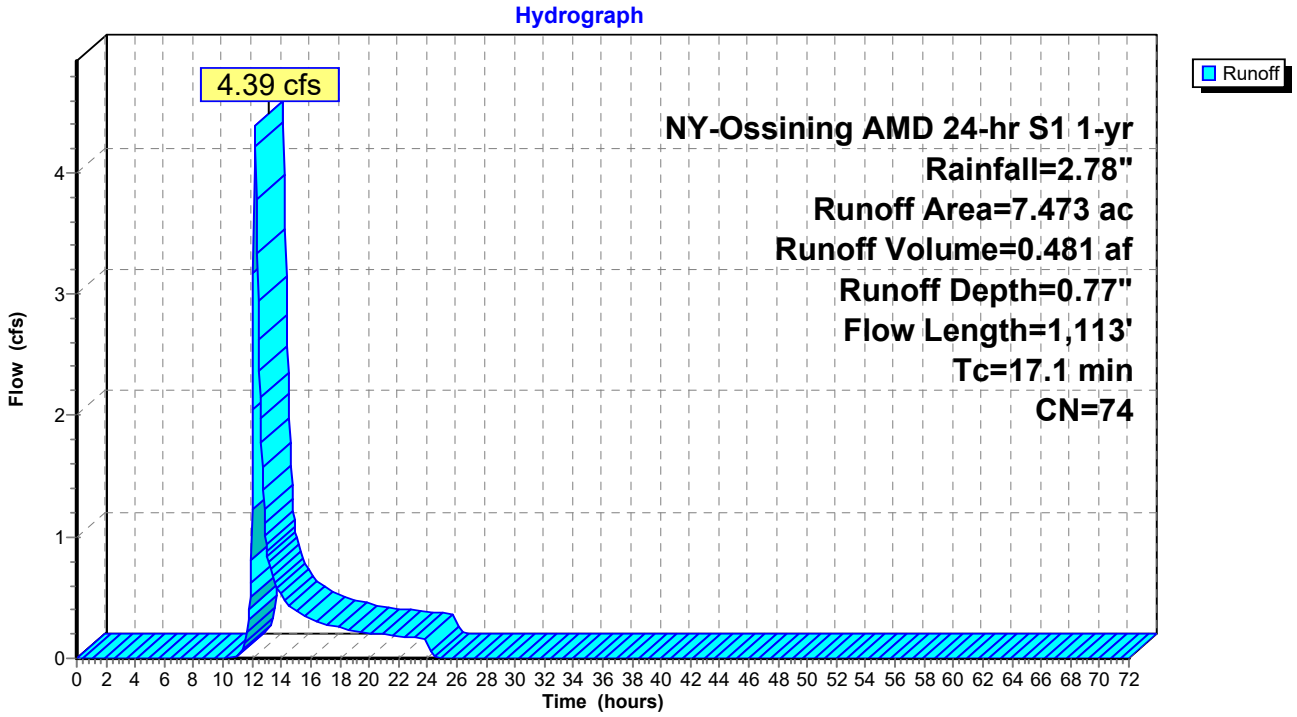
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.00
11.00	0.74	0.00	0.00
12.00	1.53	0.16	**1.22**
13.00	2.04	0.37	**0.89**
14.00	2.19	0.44	0.51
15.00	2.30	0.50	0.39
16.00	2.38	0.54	0.32
17.00	2.45	0.58	0.28
18.00	2.51	0.62	0.25
19.00	2.57	0.65	0.23
20.00	2.62	0.68	0.21
21.00	2.66	0.70	0.20
22.00	2.70	0.73	0.18
23.00	2.74	0.75	0.17
24.00	**2.78**	**0.77**	0.16
25.00	2.78	0.77	0.00
26.00	2.78	0.77	0.00
27.00	2.78	0.77	0.00
28.00	2.78	0.77	0.00
29.00	2.78	0.77	0.00
30.00	2.78	0.77	0.00
31.00	2.78	0.77	0.00
32.00	2.78	0.77	0.00
33.00	2.78	0.77	0.00
34.00	2.78	0.77	0.00
35.00	2.78	0.77	0.00
36.00	2.78	0.77	0.00
37.00	2.78	0.77	0.00
38.00	2.78	0.77	0.00
39.00	2.78	0.77	0.00
40.00	2.78	0.77	0.00
41.00	2.78	0.77	0.00
42.00	2.78	0.77	0.00
43.00	2.78	0.77	0.00
44.00	2.78	0.77	0.00
45.00	2.78	0.77	0.00
46.00	2.78	0.77	0.00
47.00	2.78	0.77	0.00
48.00	2.78	0.77	0.00
49.00	2.78	0.77	0.00
50.00	2.78	0.77	0.00
51.00	2.78	0.77	0.00
52.00	2.78	0.77	0.00
53.00	2.78	0.77	0.00
54.00	2.78	0.77	0.00
55.00	2.78	0.77	0.00
56.00	2.78	0.77	0.00
57.00	2.78	0.77	0.00
58.00	2.78	0.77	0.00
59.00	2.78	0.77	0.00
60.00	2.78	0.77	0.00
61.00	2.78	0.77	0.00
62.00	2.78	0.77	0.00
63.00	2.78	0.77	0.00
64.00	2.78	0.77	0.00
65.00	2.78	0.77	0.00
66.00	2.78	0.77	0.00
67.00	2.78	0.77	0.00
68.00	2.78	0.77	0.00
69.00	2.78	0.77	0.00
70.00	2.78	0.77	0.00
71.00	2.78	0.77	0.00
72.00	2.78	0.77	0.00

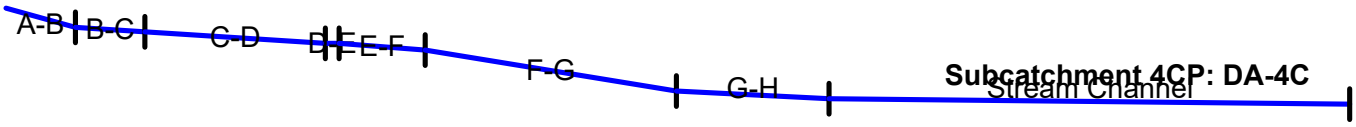
Summary for Subcatchment 4CP: DA-4C

Runoff = 5.04 cfs @ 12.15 hrs, Volume= 0.516 af, Depth= 0.64"
Routed to Link DP-4 : Design Point - 4

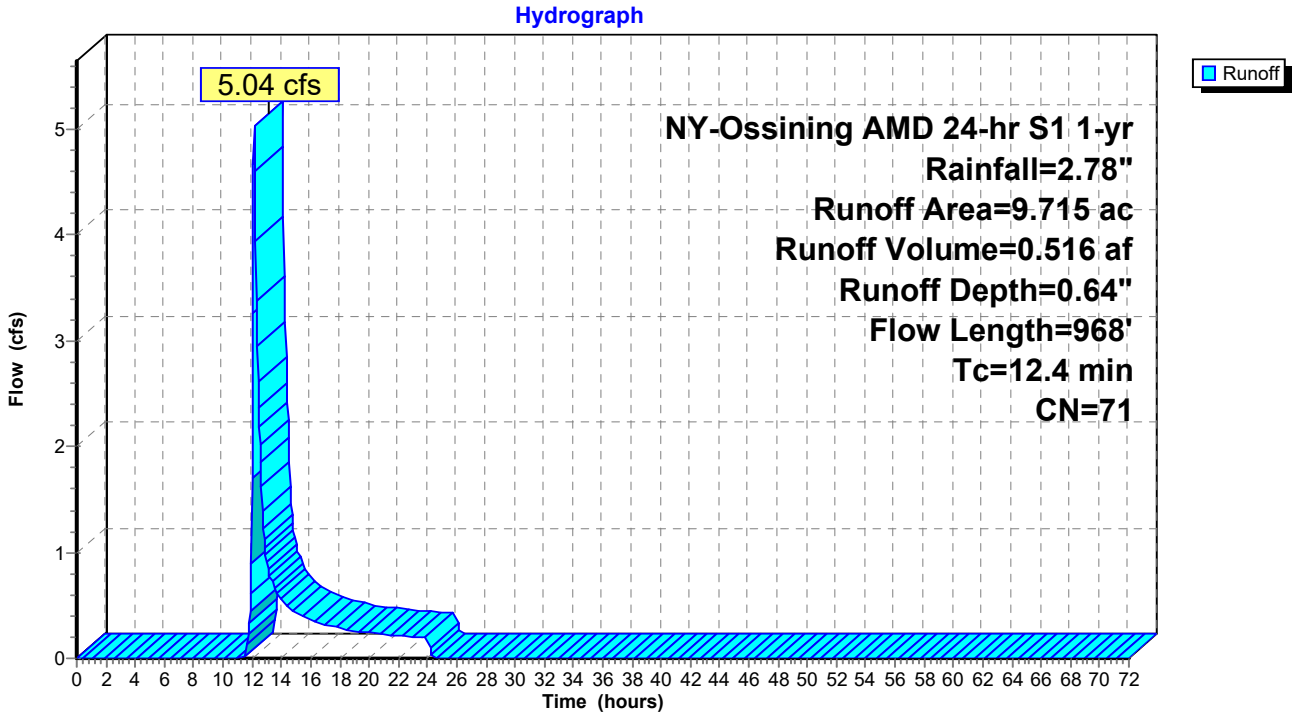
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.00
11.00	0.74	0.00	0.00
12.00	1.53	0.11	**1.70**
13.00	2.04	0.28	**0.90**
14.00	2.19	0.35	0.56
15.00	2.30	0.40	0.43
16.00	2.38	0.43	0.36
17.00	2.45	0.47	0.32
18.00	2.51	0.50	0.29
19.00	2.57	0.53	0.26
20.00	2.62	0.55	0.24
21.00	2.66	0.57	0.23
22.00	2.70	0.60	0.21
23.00	2.74	0.62	0.20
24.00	**2.78**	**0.64**	0.19
25.00	2.78	0.64	0.00
26.00	2.78	0.64	0.00
27.00	2.78	0.64	0.00
28.00	2.78	0.64	0.00
29.00	2.78	0.64	0.00
30.00	2.78	0.64	0.00
31.00	2.78	0.64	0.00
32.00	2.78	0.64	0.00
33.00	2.78	0.64	0.00
34.00	2.78	0.64	0.00
35.00	2.78	0.64	0.00
36.00	2.78	0.64	0.00
37.00	2.78	0.64	0.00
38.00	2.78	0.64	0.00
39.00	2.78	0.64	0.00
40.00	2.78	0.64	0.00
41.00	2.78	0.64	0.00
42.00	2.78	0.64	0.00
43.00	2.78	0.64	0.00
44.00	2.78	0.64	0.00
45.00	2.78	0.64	0.00
46.00	2.78	0.64	0.00
47.00	2.78	0.64	0.00
48.00	2.78	0.64	0.00
49.00	2.78	0.64	0.00
50.00	2.78	0.64	0.00
51.00	2.78	0.64	0.00
52.00	2.78	0.64	0.00
53.00	2.78	0.64	0.00
54.00	2.78	0.64	0.00
55.00	2.78	0.64	0.00
56.00	2.78	0.64	0.00
57.00	2.78	0.64	0.00
58.00	2.78	0.64	0.00
59.00	2.78	0.64	0.00
60.00	2.78	0.64	0.00
61.00	2.78	0.64	0.00
62.00	2.78	0.64	0.00
63.00	2.78	0.64	0.00
64.00	2.78	0.64	0.00
65.00	2.78	0.64	0.00
66.00	2.78	0.64	0.00
67.00	2.78	0.64	0.00
68.00	2.78	0.64	0.00
69.00	2.78	0.64	0.00
70.00	2.78	0.64	0.00
71.00	2.78	0.64	0.00
72.00	2.78	0.64	0.00

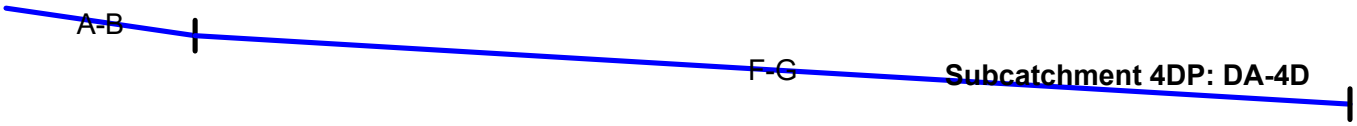
Summary for Subcatchment 4DP: DA-4D

Runoff = 3.84 cfs @ 12.04 hrs, Volume= 0.254 af, Depth= 2.23"
Routed to Pond 6P : Infiltrators

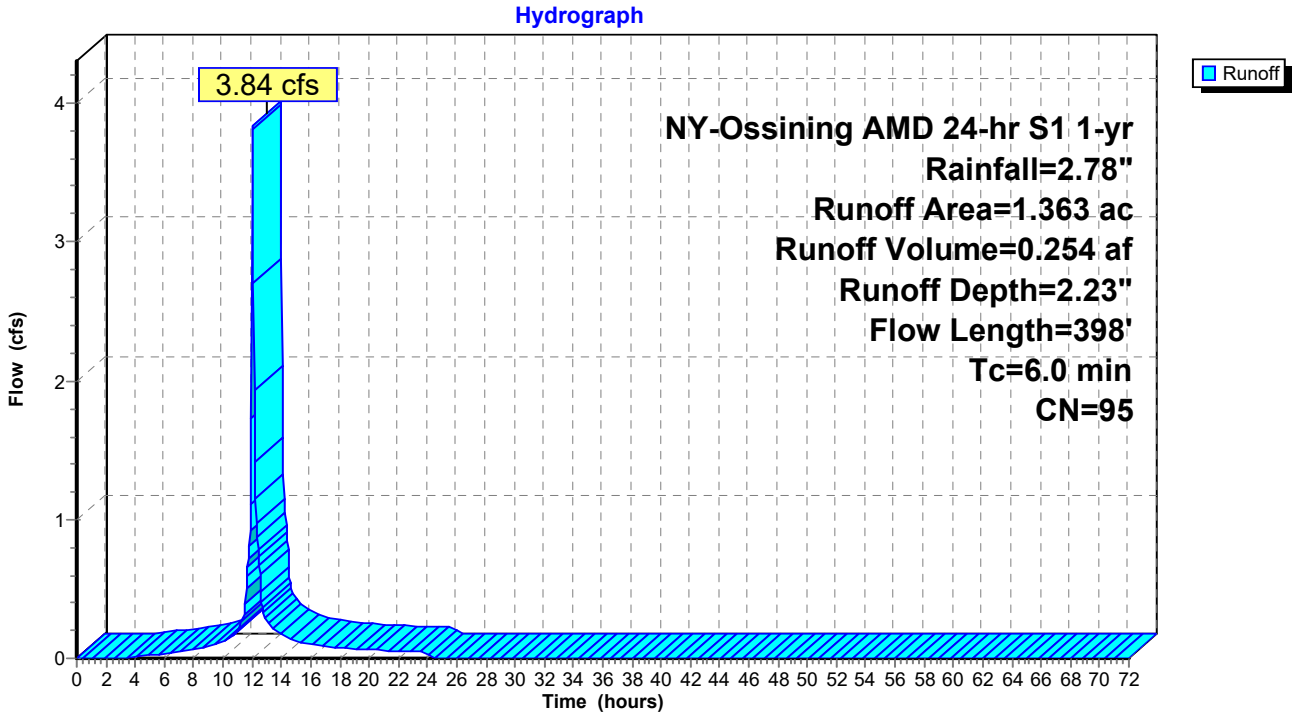
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.01	0.01
5.00	0.21	0.02	0.02
6.00	0.27	0.04	0.03
7.00	0.33	0.07	0.04
8.00	0.40	0.10	0.06
9.00	0.48	0.16	0.08
10.00	0.59	0.23	0.12
11.00	0.74	0.35	0.21
12.00	1.53	1.04	**3.34**
13.00	2.04	1.52	**0.27**
14.00	2.19	1.67	0.17
15.00	2.30	1.77	0.12
16.00	2.38	1.85	0.10
17.00	2.45	1.92	0.09
18.00	2.51	1.98	0.08
19.00	2.57	2.03	0.07
20.00	2.62	2.08	0.06
21.00	2.66	2.12	0.06
22.00	2.70	2.16	0.05
23.00	2.74	2.20	0.05
24.00	**2.78**	**2.23**	0.05
25.00	2.78	2.23	0.00
26.00	2.78	2.23	0.00
27.00	2.78	2.23	0.00
28.00	2.78	2.23	0.00
29.00	2.78	2.23	0.00
30.00	2.78	2.23	0.00
31.00	2.78	2.23	0.00
32.00	2.78	2.23	0.00
33.00	2.78	2.23	0.00
34.00	2.78	2.23	0.00
35.00	2.78	2.23	0.00
36.00	2.78	2.23	0.00
37.00	2.78	2.23	0.00
38.00	2.78	2.23	0.00
39.00	2.78	2.23	0.00
40.00	2.78	2.23	0.00
41.00	2.78	2.23	0.00
42.00	2.78	2.23	0.00
43.00	2.78	2.23	0.00
44.00	2.78	2.23	0.00
45.00	2.78	2.23	0.00
46.00	2.78	2.23	0.00
47.00	2.78	2.23	0.00
48.00	2.78	2.23	0.00
49.00	2.78	2.23	0.00
50.00	2.78	2.23	0.00
51.00	2.78	2.23	0.00
52.00	2.78	2.23	0.00
53.00	2.78	2.23	0.00
54.00	2.78	2.23	0.00
55.00	2.78	2.23	0.00
56.00	2.78	2.23	0.00
57.00	2.78	2.23	0.00
58.00	2.78	2.23	0.00
59.00	2.78	2.23	0.00
60.00	2.78	2.23	0.00
61.00	2.78	2.23	0.00
62.00	2.78	2.23	0.00
63.00	2.78	2.23	0.00
64.00	2.78	2.23	0.00
65.00	2.78	2.23	0.00
66.00	2.78	2.23	0.00
67.00	2.78	2.23	0.00
68.00	2.78	2.23	0.00
69.00	2.78	2.23	0.00
70.00	2.78	2.23	0.00
71.00	2.78	2.23	0.00
72.00	2.78	2.23	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 2.23" for 1-yr event
Inflow = 3.84 cfs @ 12.04 hrs, Volume= 0.254 af
Outflow = 0.78 cfs @ 12.41 hrs, Volume= 0.254 af, Atten= 80%, Lag= 21.9 min
Discarded = 0.07 cfs @ 9.90 hrs, Volume= 0.124 af
Primary = 0.72 cfs @ 12.41 hrs, Volume= 0.129 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 347.82' @ 12.41 hrs Surf.Area= 0.132 ac Storage= 0.089 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 126.5 min (918.9 - 792.4)

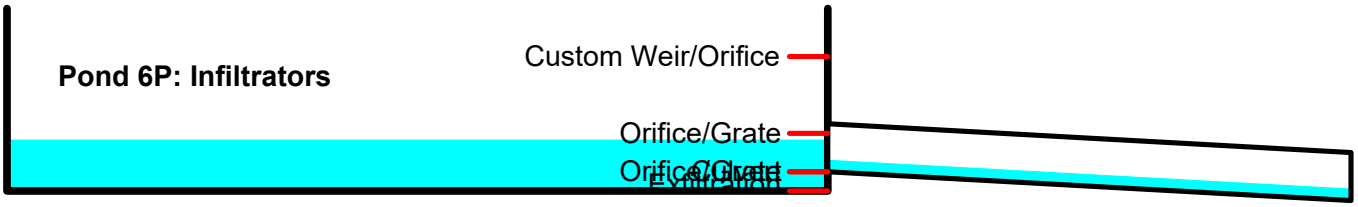
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 9.90 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.72 cfs @ 12.41 hrs HW=347.82' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.72 cfs of 2.09 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.72 cfs @ 3.65 fps)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

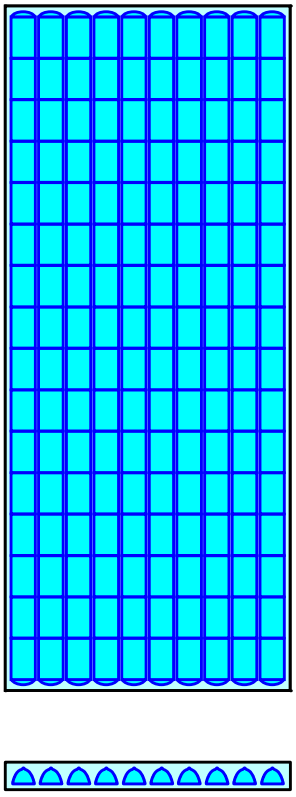
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

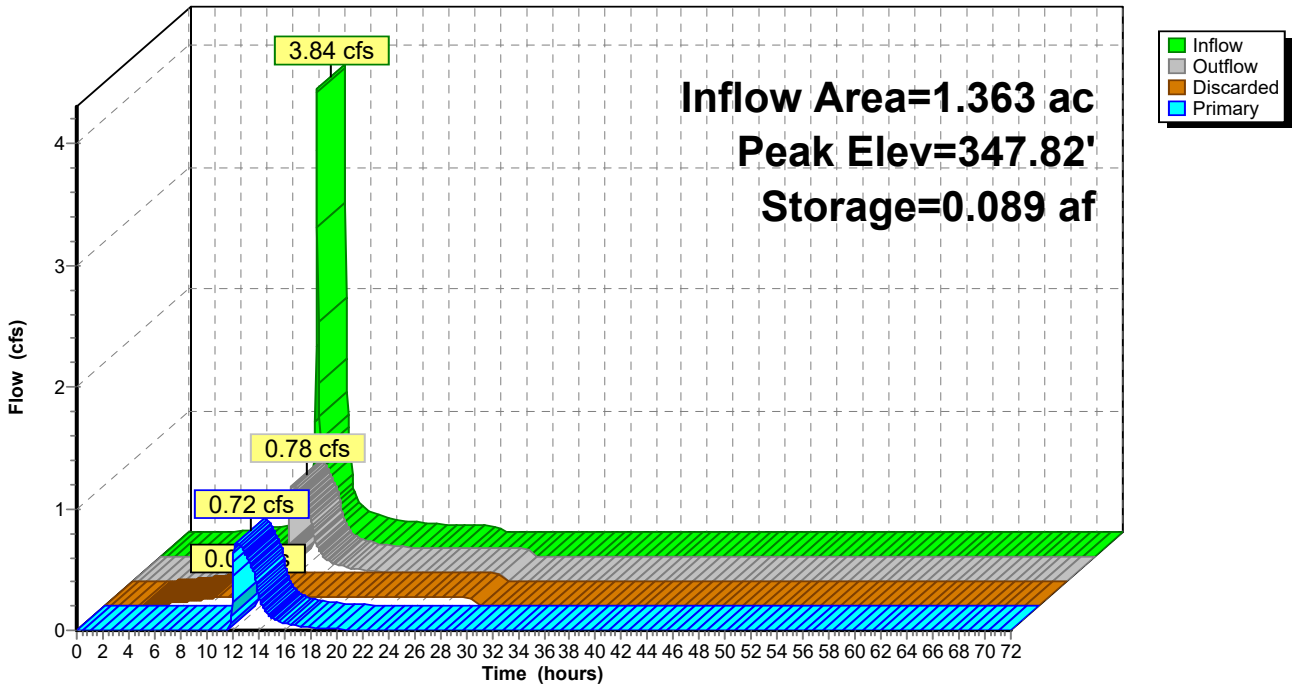
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers
1,014.0 cy Field
711.7 cy Stone



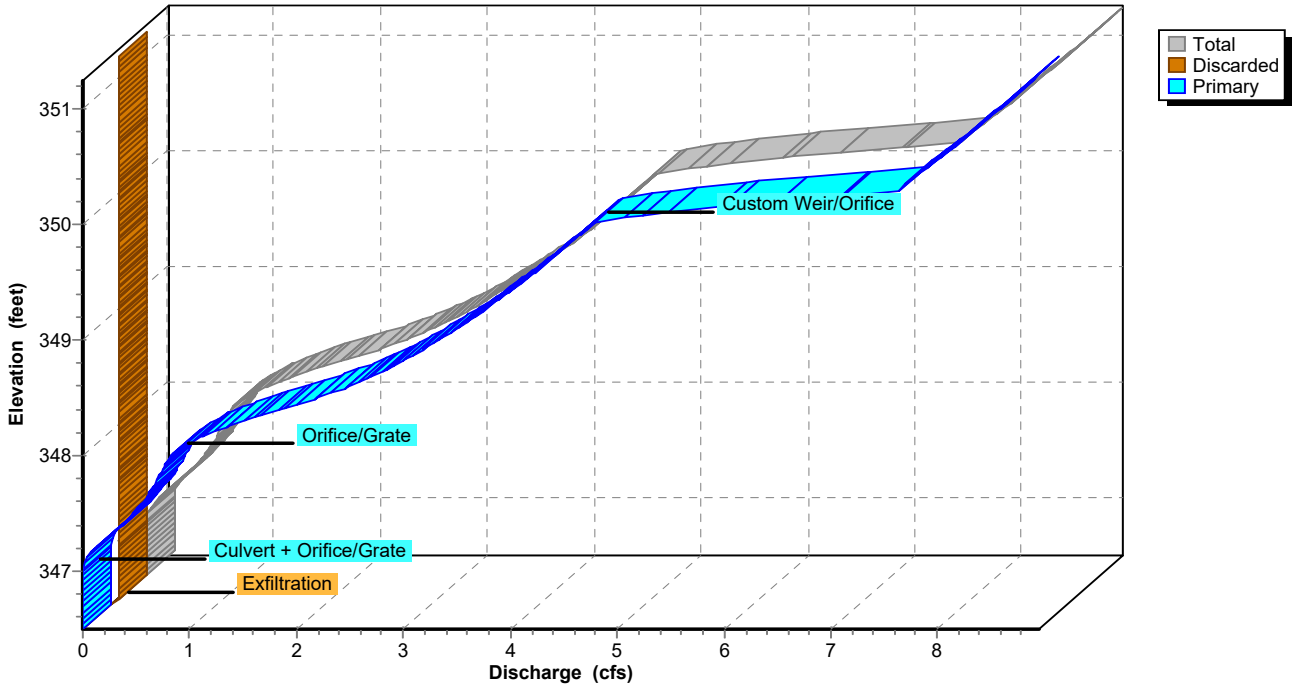
Pond 6P: Infiltrators

Hydrograph

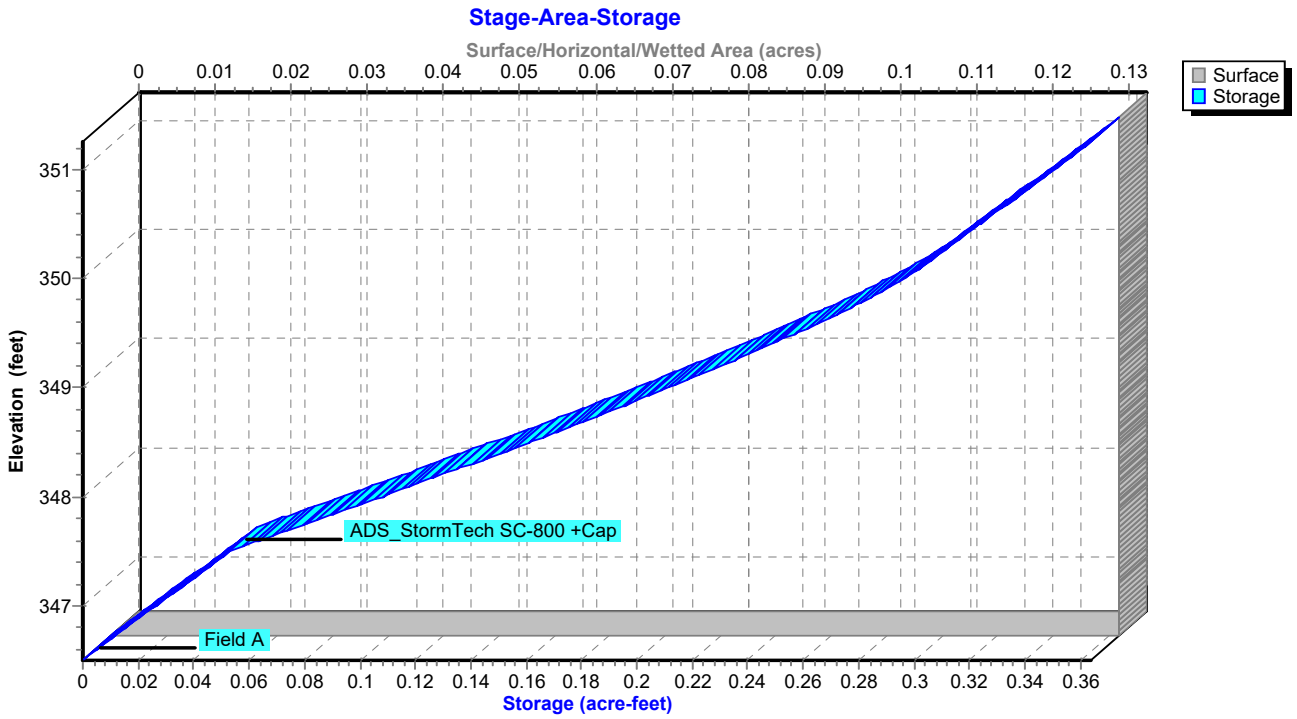


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.02	0.000	346.50	0.02	0.02	0.00
7.50	0.05	0.000	346.50	0.05	**0.05**	0.00
10.00	**0.12**	**0.003**	**346.56**	**0.07**	**0.07**	**0.00**
12.50	**0.67**	**0.088**	**347.82**	**0.78**	0.07	**0.71**
15.00	0.12	0.037	347.20	0.17	0.07	0.11
17.50	0.08	0.032	347.10	0.10	0.07	0.03
20.00	0.06	0.029	347.05	0.07	0.07	0.01
22.50	0.05	0.027	347.00	0.07	0.07	0.00
25.00	0.00	0.019	346.87	0.07	0.07	0.00
27.50	0.00	0.006	346.60	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

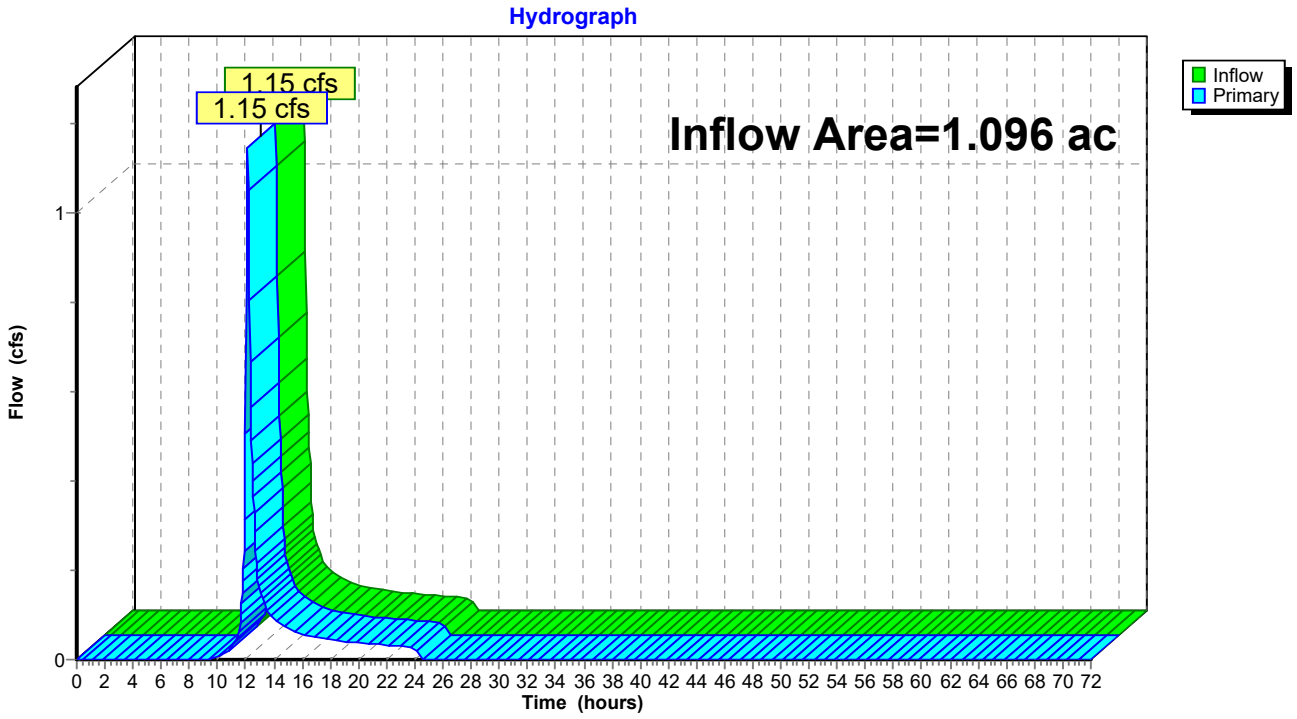
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 1.09" for 1-yr event
Inflow = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af
Primary = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

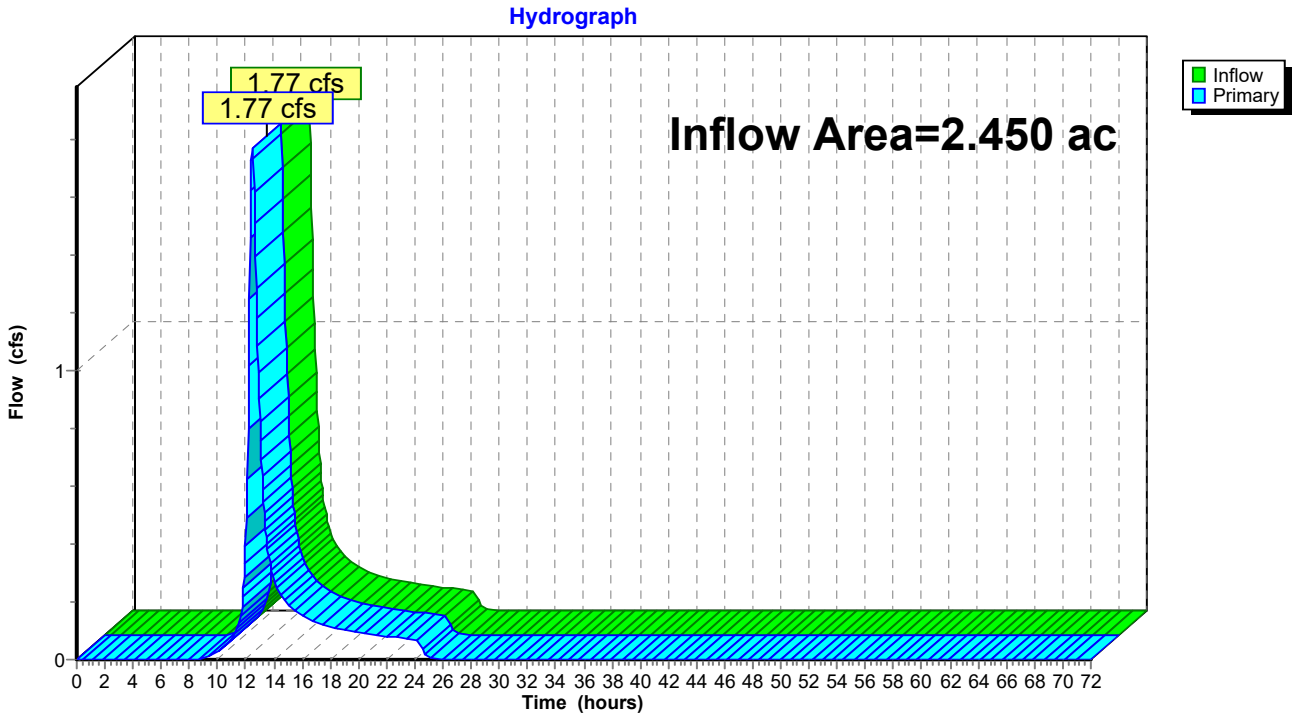
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	62.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	63.00	0.00	0.00	0.00
12.00	**0.51**	0.00	**0.51**	64.00	0.00	0.00	0.00
13.00	**0.15**	0.00	**0.15**	65.00	0.00	0.00	0.00
14.00	0.09	0.00	0.09	66.00	0.00	0.00	0.00
15.00	0.07	0.00	0.07	67.00	0.00	0.00	0.00
16.00	0.06	0.00	0.06	68.00	0.00	0.00	0.00
17.00	0.05	0.00	0.05	69.00	0.00	0.00	0.00
18.00	0.04	0.00	0.04	70.00	0.00	0.00	0.00
19.00	0.04	0.00	0.04	71.00	0.00	0.00	0.00
20.00	0.04	0.00	0.04	72.00	0.00	0.00	0.00
21.00	0.03	0.00	0.03				
22.00	0.03	0.00	0.03				
23.00	0.03	0.00	0.03				
24.00	0.03	0.00	0.03				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 1.27" for 1-yr event
Inflow = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af
Primary = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

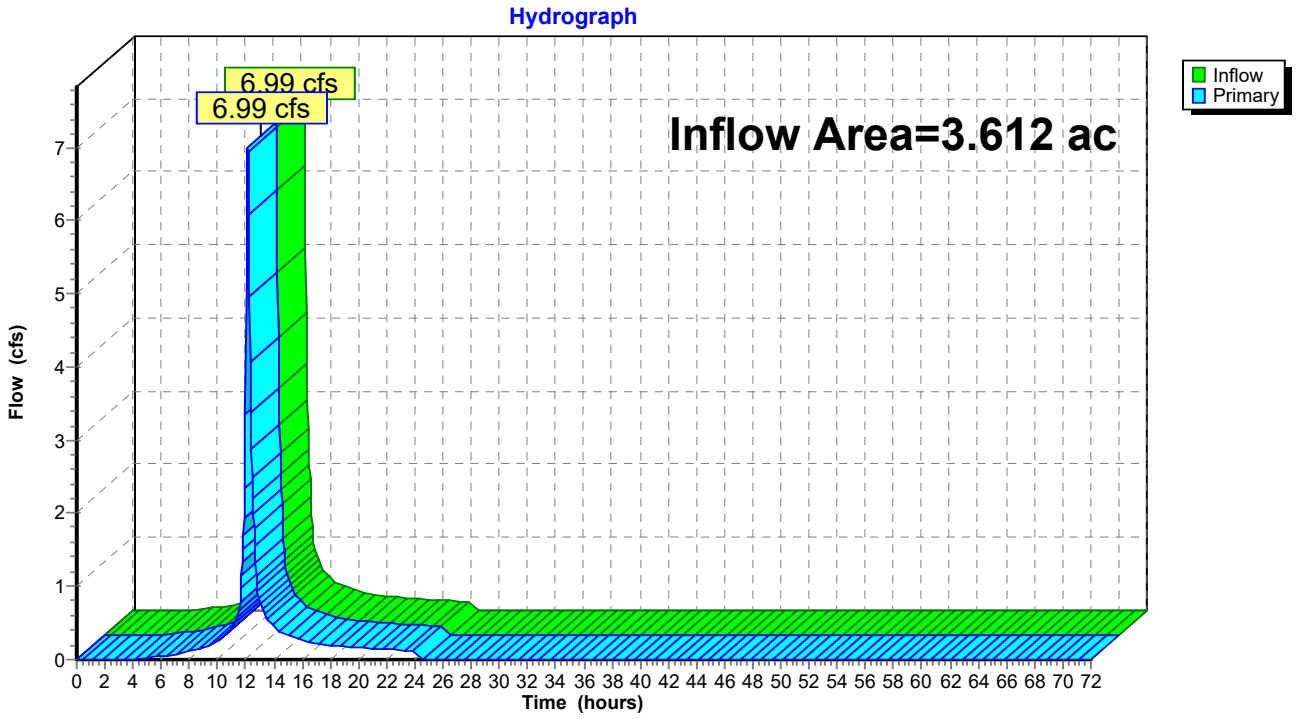
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01	61.00	0.00	0.00	0.00
10.00	0.03	0.00	0.03	62.00	0.00	0.00	0.00
11.00	0.07	0.00	0.07	63.00	0.00	0.00	0.00
12.00	**0.40**	0.00	**0.40**	64.00	0.00	0.00	0.00
13.00	**0.83**	0.00	**0.83**	65.00	0.00	0.00	0.00
14.00	0.28	0.00	0.28	66.00	0.00	0.00	0.00
15.00	0.19	0.00	0.19	67.00	0.00	0.00	0.00
16.00	0.15	0.00	0.15	68.00	0.00	0.00	0.00
17.00	0.13	0.00	0.13	69.00	0.00	0.00	0.00
18.00	0.11	0.00	0.11	70.00	0.00	0.00	0.00
19.00	0.10	0.00	0.10	71.00	0.00	0.00	0.00
20.00	0.09	0.00	0.09	72.00	0.00	0.00	0.00
21.00	0.09	0.00	0.09				
22.00	0.08	0.00	0.08				
23.00	0.08	0.00	0.08				
24.00	0.07	0.00	0.07				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.04" for 1-yr event
Inflow = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af
Primary = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

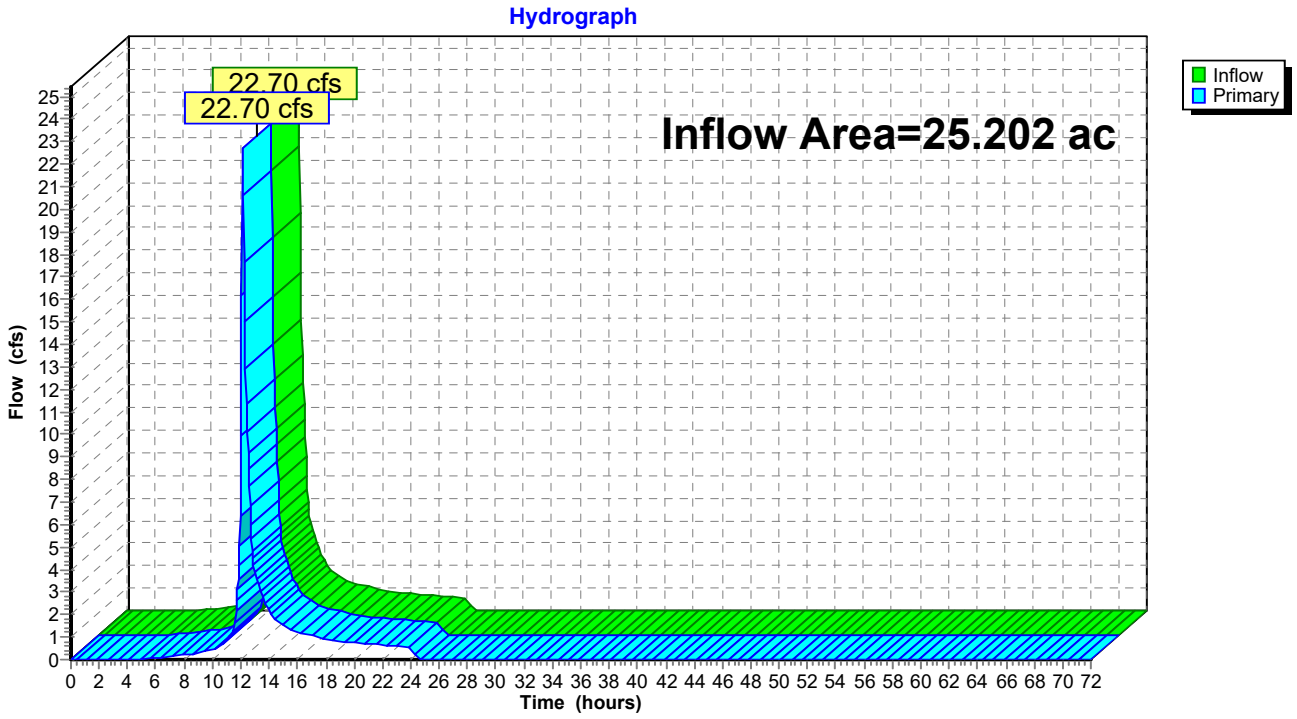
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.02	0.00	0.02
6.00	0.05	0.00	0.05
7.00	0.08	0.00	0.08
8.00	0.11	0.00	0.11
9.00	0.16	0.00	0.16
10.00	0.25	0.00	0.25
11.00	0.43	0.00	0.43
12.00	**3.36**	0.00	**3.36**
13.00	**0.78**	0.00	**0.78**
14.00	0.44	0.00	0.44
15.00	0.33	0.00	0.33
16.00	0.27	0.00	0.27
17.00	0.23	0.00	0.23
18.00	0.20	0.00	0.20
19.00	0.18	0.00	0.18
20.00	0.16	0.00	0.16
21.00	0.15	0.00	0.15
22.00	0.14	0.00	0.14
23.00	0.13	0.00	0.13
24.00	0.12	0.00	0.12
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 1.08" for 1-yr event
Inflow = 22.70 cfs @ 12.14 hrs, Volume= 2.259 af
Primary = 22.70 cfs @ 12.14 hrs, Volume= 2.259 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.04	0.00	0.04
6.00	0.09	0.00	0.09
7.00	0.14	0.00	0.14
8.00	0.21	0.00	0.21
9.00	0.30	0.00	0.30
10.00	0.46	0.00	0.46
11.00	0.81	0.00	0.81
12.00	**9.92**	0.00	**9.92**
13.00	**3.82**	0.00	**3.82**
14.00	2.18	0.00	2.18
15.00	1.53	0.00	1.53
16.00	1.24	0.00	1.24
17.00	1.06	0.00	1.06
18.00	0.93	0.00	0.93
19.00	0.84	0.00	0.84
20.00	0.76	0.00	0.76
21.00	0.70	0.00	0.70
22.00	0.65	0.00	0.65
23.00	0.62	0.00	0.62
24.00	0.58	0.00	0.58
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=1.57"
Flow Length=253' Tc=12.2 min CN=80 Runoff=1.66 cfs 0.143 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=1.78"
Flow Length=548' Tc=36.4 min CN=83 Runoff=2.47 cfs 0.364 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.65"
Flow Length=469' Tc=13.4 min CN=93 Runoff=8.71 cfs 0.797 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=2.65"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=16.60 cfs 1.468 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=1.18"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=6.94 cfs 0.734 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=1.01"
Flow Length=968' Tc=12.4 min CN=71 Runoff=8.51 cfs 0.815 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=2.85"
Flow Length=398' Tc=6.0 min CN=95 Runoff=4.67 cfs 0.324 af

Pond 6P: Infiltrators Peak Elev=348.06' Storage=0.114 af Inflow=4.67 cfs 0.324 af
Discarded=0.07 cfs 0.134 af Primary=0.89 cfs 0.190 af Outflow=0.96 cfs 0.324 af

Link DP-1: Design Point - 1 Inflow=1.66 cfs 0.143 af
Primary=1.66 cfs 0.143 af

Link DP-2: Design Point - 2 Inflow=2.47 cfs 0.364 af
Primary=2.47 cfs 0.364 af

Link DP-3: Design Point - 3 Inflow=8.71 cfs 0.797 af
Primary=8.71 cfs 0.797 af

Link DP-4: Design Point - 4 Inflow=31.93 cfs 3.207 af
Primary=31.93 cfs 3.207 af

Total Runoff Area = 32.360 ac Runoff Volume = 4.645 af Average Runoff Depth = 1.72"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

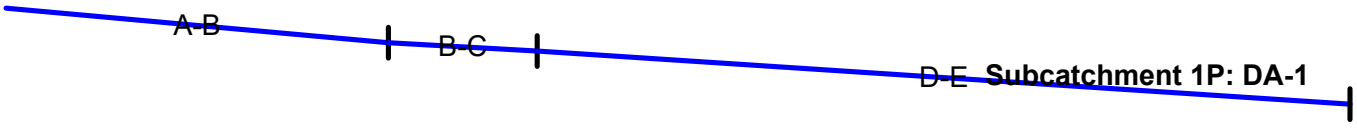
Summary for Subcatchment 1P: DA-1

Runoff = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af, Depth= 1.57"
Routed to Link DP-1 : Design Point - 1

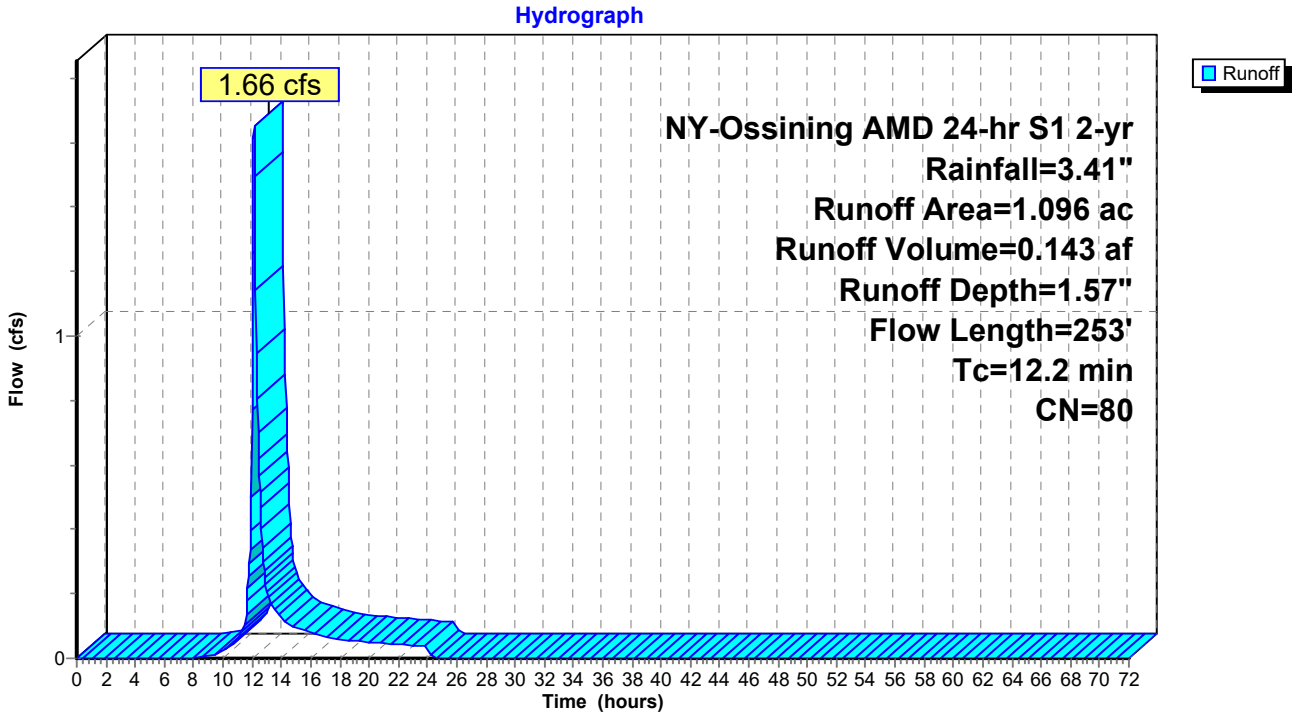
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.01
10.00	0.73	0.02	0.02
11.00	0.92	0.06	0.06
12.00	1.87	0.48	**0.77**
13.00	2.50	0.89	**0.21**
14.00	2.69	1.02	0.13
15.00	2.82	1.12	0.10
16.00	2.92	1.19	0.08
17.00	3.01	1.26	0.07
18.00	3.08	1.31	0.06
19.00	3.15	1.36	0.05
20.00	3.21	1.41	0.05
21.00	3.27	1.45	0.05
22.00	3.32	1.49	0.04
23.00	3.36	1.53	0.04
24.00	**3.41**	**1.57**	0.04
25.00	3.41	1.57	0.00
26.00	3.41	1.57	0.00
27.00	3.41	1.57	0.00
28.00	3.41	1.57	0.00
29.00	3.41	1.57	0.00
30.00	3.41	1.57	0.00
31.00	3.41	1.57	0.00
32.00	3.41	1.57	0.00
33.00	3.41	1.57	0.00
34.00	3.41	1.57	0.00
35.00	3.41	1.57	0.00
36.00	3.41	1.57	0.00
37.00	3.41	1.57	0.00
38.00	3.41	1.57	0.00
39.00	3.41	1.57	0.00
40.00	3.41	1.57	0.00
41.00	3.41	1.57	0.00
42.00	3.41	1.57	0.00
43.00	3.41	1.57	0.00
44.00	3.41	1.57	0.00
45.00	3.41	1.57	0.00
46.00	3.41	1.57	0.00
47.00	3.41	1.57	0.00
48.00	3.41	1.57	0.00
49.00	3.41	1.57	0.00
50.00	3.41	1.57	0.00
51.00	3.41	1.57	0.00
52.00	3.41	1.57	0.00
53.00	3.41	1.57	0.00
54.00	3.41	1.57	0.00
55.00	3.41	1.57	0.00
56.00	3.41	1.57	0.00
57.00	3.41	1.57	0.00
58.00	3.41	1.57	0.00
59.00	3.41	1.57	0.00
60.00	3.41	1.57	0.00
61.00	3.41	1.57	0.00
62.00	3.41	1.57	0.00
63.00	3.41	1.57	0.00
64.00	3.41	1.57	0.00
65.00	3.41	1.57	0.00
66.00	3.41	1.57	0.00
67.00	3.41	1.57	0.00
68.00	3.41	1.57	0.00
69.00	3.41	1.57	0.00
70.00	3.41	1.57	0.00
71.00	3.41	1.57	0.00
72.00	3.41	1.57	0.00

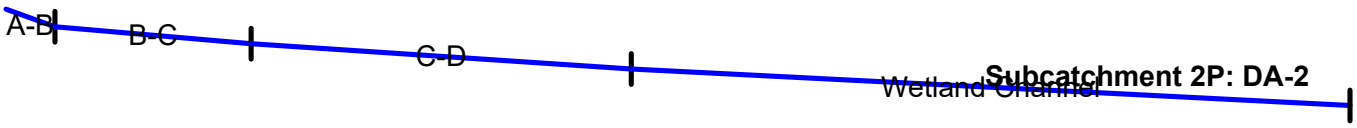
Summary for Subcatchment 2P: DA-2

Runoff = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af, Depth= 1.78"
Routed to Link DP-2 : Design Point - 2

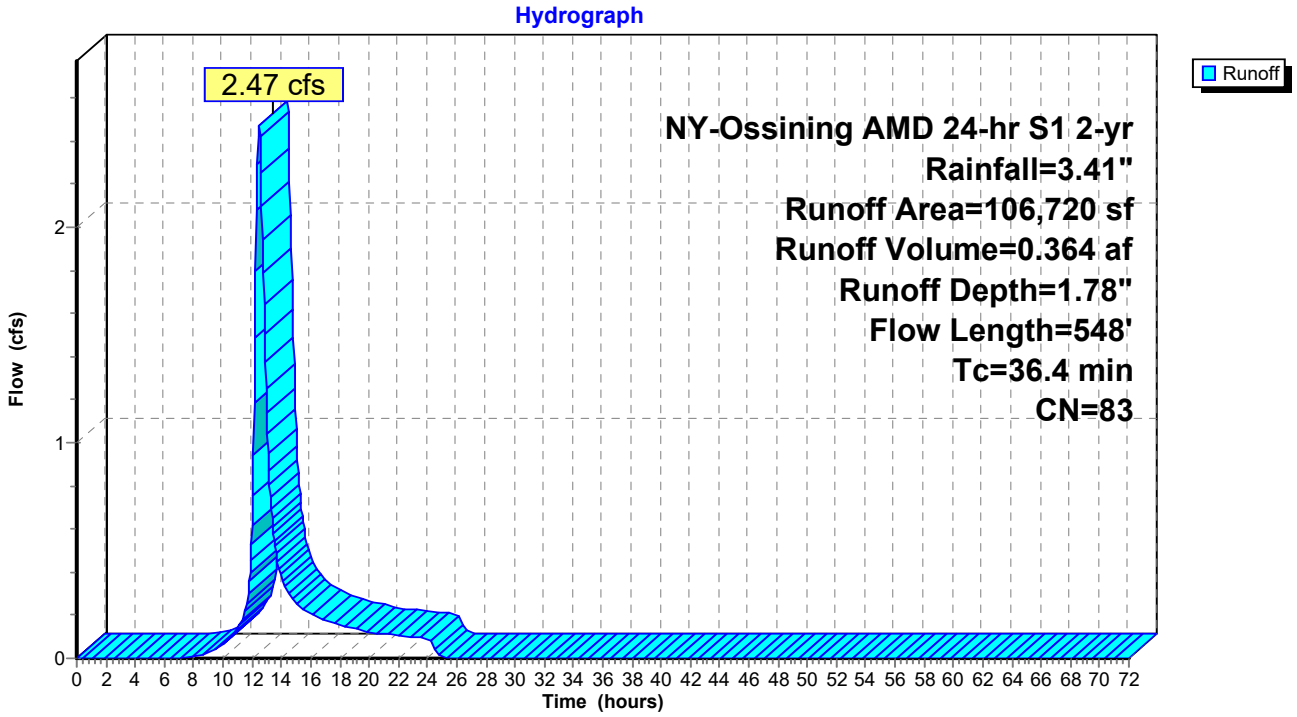
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.01
9.00	0.59	0.02	0.03
10.00	0.73	0.04	0.06
11.00	0.92	0.10	0.14
12.00	1.87	0.61	**0.62**
13.00	2.50	1.06	**1.14**
14.00	2.69	1.20	0.37
15.00	2.82	1.30	0.26
16.00	2.92	1.38	0.20
17.00	3.01	1.45	0.17
18.00	3.08	1.51	0.15
19.00	3.15	1.57	0.14
20.00	3.21	1.62	0.12
21.00	3.27	1.66	0.11
22.00	3.32	1.71	0.11
23.00	3.36	1.75	0.10
24.00	**3.41**	**1.78**	0.09
25.00	3.41	1.78	0.01
26.00	3.41	1.78	0.00
27.00	3.41	1.78	0.00
28.00	3.41	1.78	0.00
29.00	3.41	1.78	0.00
30.00	3.41	1.78	0.00
31.00	3.41	1.78	0.00
32.00	3.41	1.78	0.00
33.00	3.41	1.78	0.00
34.00	3.41	1.78	0.00
35.00	3.41	1.78	0.00
36.00	3.41	1.78	0.00
37.00	3.41	1.78	0.00
38.00	3.41	1.78	0.00
39.00	3.41	1.78	0.00
40.00	3.41	1.78	0.00
41.00	3.41	1.78	0.00
42.00	3.41	1.78	0.00
43.00	3.41	1.78	0.00
44.00	3.41	1.78	0.00
45.00	3.41	1.78	0.00
46.00	3.41	1.78	0.00
47.00	3.41	1.78	0.00
48.00	3.41	1.78	0.00
49.00	3.41	1.78	0.00
50.00	3.41	1.78	0.00
51.00	3.41	1.78	0.00
52.00	3.41	1.78	0.00
53.00	3.41	1.78	0.00
54.00	3.41	1.78	0.00
55.00	3.41	1.78	0.00
56.00	3.41	1.78	0.00
57.00	3.41	1.78	0.00
58.00	3.41	1.78	0.00
59.00	3.41	1.78	0.00
60.00	3.41	1.78	0.00
61.00	3.41	1.78	0.00
62.00	3.41	1.78	0.00
63.00	3.41	1.78	0.00
64.00	3.41	1.78	0.00
65.00	3.41	1.78	0.00
66.00	3.41	1.78	0.00
67.00	3.41	1.78	0.00
68.00	3.41	1.78	0.00
69.00	3.41	1.78	0.00
70.00	3.41	1.78	0.00
71.00	3.41	1.78	0.00
72.00	3.41	1.78	0.00

Summary for Subcatchment 3P: DA-3

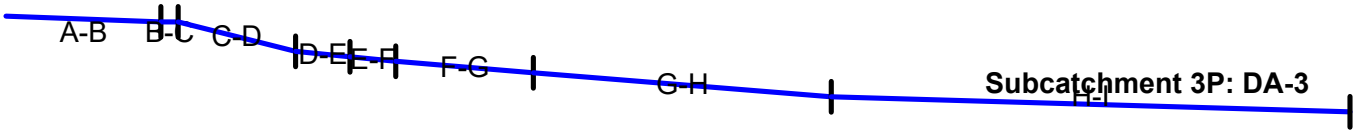
[47] Hint: Peak is 154% of capacity of segment #8

Runoff = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Depth= 2.65"
Routed to Link DP-3 : Design Point - 3

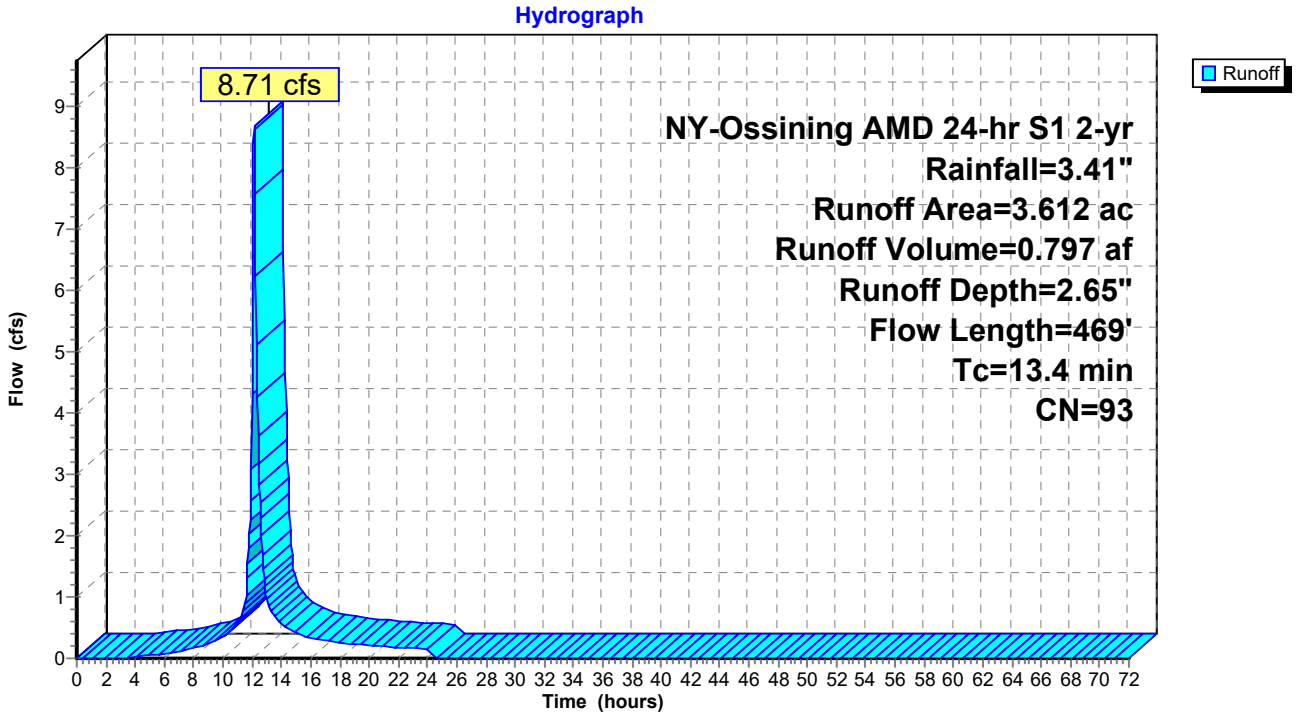
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.02
5.00	0.26	0.01	0.05
6.00	0.33	0.03	0.08
7.00	0.40	0.06	0.12
8.00	0.49	0.11	0.17
9.00	0.59	0.16	0.24
10.00	0.73	0.25	0.34
11.00	0.92	0.39	0.59
12.00	1.87	1.19	**4.33**
13.00	2.50	1.78	**0.98**
14.00	2.69	1.96	0.56
15.00	2.82	2.08	0.41
16.00	2.92	2.18	0.34
17.00	3.01	2.26	0.29
18.00	3.08	2.33	0.25
19.00	3.15	2.40	0.23
20.00	3.21	2.46	0.21
21.00	3.27	2.51	0.19
22.00	3.32	2.56	0.18
23.00	3.36	2.60	0.17
24.00	**3.41**	**2.65**	0.16
25.00	3.41	2.65	0.00
26.00	3.41	2.65	0.00
27.00	3.41	2.65	0.00
28.00	3.41	2.65	0.00
29.00	3.41	2.65	0.00
30.00	3.41	2.65	0.00
31.00	3.41	2.65	0.00
32.00	3.41	2.65	0.00
33.00	3.41	2.65	0.00
34.00	3.41	2.65	0.00
35.00	3.41	2.65	0.00
36.00	3.41	2.65	0.00
37.00	3.41	2.65	0.00
38.00	3.41	2.65	0.00
39.00	3.41	2.65	0.00
40.00	3.41	2.65	0.00
41.00	3.41	2.65	0.00
42.00	3.41	2.65	0.00
43.00	3.41	2.65	0.00
44.00	3.41	2.65	0.00
45.00	3.41	2.65	0.00
46.00	3.41	2.65	0.00
47.00	3.41	2.65	0.00
48.00	3.41	2.65	0.00
49.00	3.41	2.65	0.00
50.00	3.41	2.65	0.00
51.00	3.41	2.65	0.00
52.00	3.41	2.65	0.00
53.00	3.41	2.65	0.00
54.00	3.41	2.65	0.00
55.00	3.41	2.65	0.00
56.00	3.41	2.65	0.00
57.00	3.41	2.65	0.00
58.00	3.41	2.65	0.00
59.00	3.41	2.65	0.00
60.00	3.41	2.65	0.00
61.00	3.41	2.65	0.00
62.00	3.41	2.65	0.00
63.00	3.41	2.65	0.00
64.00	3.41	2.65	0.00
65.00	3.41	2.65	0.00
66.00	3.41	2.65	0.00
67.00	3.41	2.65	0.00
68.00	3.41	2.65	0.00
69.00	3.41	2.65	0.00
70.00	3.41	2.65	0.00
71.00	3.41	2.65	0.00
72.00	3.41	2.65	0.00

Summary for Subcatchment 4AP: DA-4A

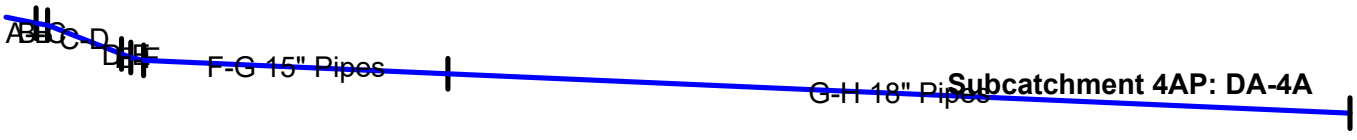
[47] Hint: Peak is 363% of capacity of segment #6
[47] Hint: Peak is 224% of capacity of segment #7

Runoff = 16.60 cfs @ 12.12 hrs, Volume= 1.468 af, Depth= 2.65"
Routed to Link DP-4 : Design Point - 4

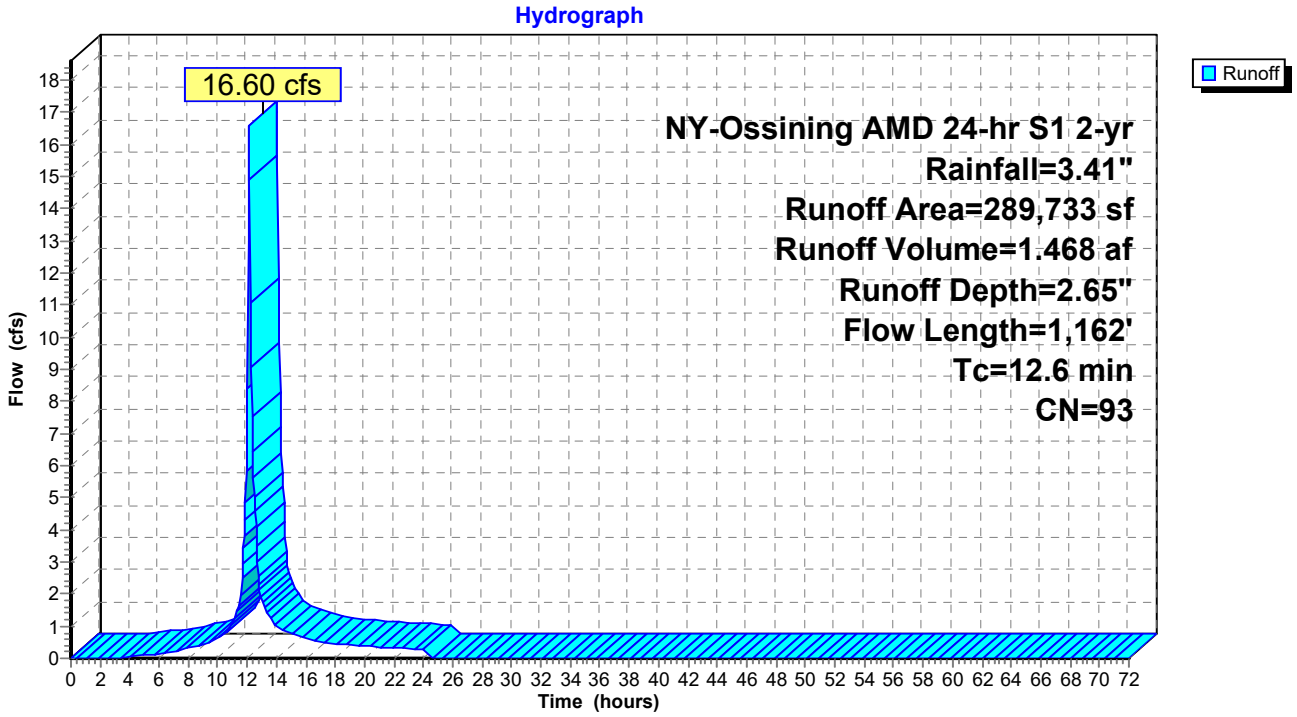
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.04
5.00	0.26	0.01	0.09
6.00	0.33	0.03	0.15
7.00	0.40	0.06	0.22
8.00	0.49	0.11	0.31
9.00	0.59	0.16	0.44
10.00	0.73	0.25	0.64
11.00	0.92	0.39	1.09
12.00	1.87	1.19	**8.42**
13.00	2.50	1.78	**1.78**
14.00	2.69	1.96	1.02
15.00	2.82	2.08	0.76
16.00	2.92	2.18	0.62
17.00	3.01	2.26	0.53
18.00	3.08	2.33	0.46
19.00	3.15	2.40	0.42
20.00	3.21	2.46	0.38
21.00	3.27	2.51	0.35
22.00	3.32	2.56	0.32
23.00	3.36	2.60	0.30
24.00	**3.41**	**2.65**	0.29
25.00	3.41	2.65	0.00
26.00	3.41	2.65	0.00
27.00	3.41	2.65	0.00
28.00	3.41	2.65	0.00
29.00	3.41	2.65	0.00
30.00	3.41	2.65	0.00
31.00	3.41	2.65	0.00
32.00	3.41	2.65	0.00
33.00	3.41	2.65	0.00
34.00	3.41	2.65	0.00
35.00	3.41	2.65	0.00
36.00	3.41	2.65	0.00
37.00	3.41	2.65	0.00
38.00	3.41	2.65	0.00
39.00	3.41	2.65	0.00
40.00	3.41	2.65	0.00
41.00	3.41	2.65	0.00
42.00	3.41	2.65	0.00
43.00	3.41	2.65	0.00
44.00	3.41	2.65	0.00
45.00	3.41	2.65	0.00
46.00	3.41	2.65	0.00
47.00	3.41	2.65	0.00
48.00	3.41	2.65	0.00
49.00	3.41	2.65	0.00
50.00	3.41	2.65	0.00
51.00	3.41	2.65	0.00
52.00	3.41	2.65	0.00
53.00	3.41	2.65	0.00
54.00	3.41	2.65	0.00
55.00	3.41	2.65	0.00
56.00	3.41	2.65	0.00
57.00	3.41	2.65	0.00
58.00	3.41	2.65	0.00
59.00	3.41	2.65	0.00
60.00	3.41	2.65	0.00
61.00	3.41	2.65	0.00
62.00	3.41	2.65	0.00
63.00	3.41	2.65	0.00
64.00	3.41	2.65	0.00
65.00	3.41	2.65	0.00
66.00	3.41	2.65	0.00
67.00	3.41	2.65	0.00
68.00	3.41	2.65	0.00
69.00	3.41	2.65	0.00
70.00	3.41	2.65	0.00
71.00	3.41	2.65	0.00
72.00	3.41	2.65	0.00

Summary for Subcatchment 4BP: DA-4B

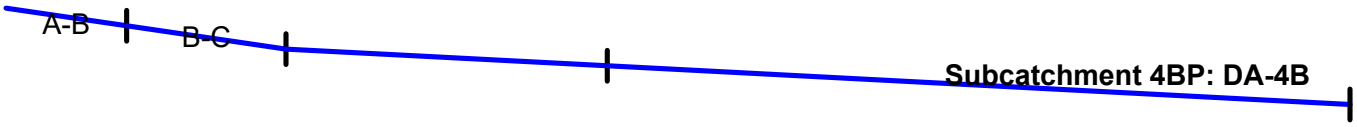
[47] Hint: Peak is 275% of capacity of segment #3

Runoff = 6.94 cfs @ 12.20 hrs, Volume= 0.734 af, Depth= 1.18"
Routed to Link DP-4 : Design Point - 4

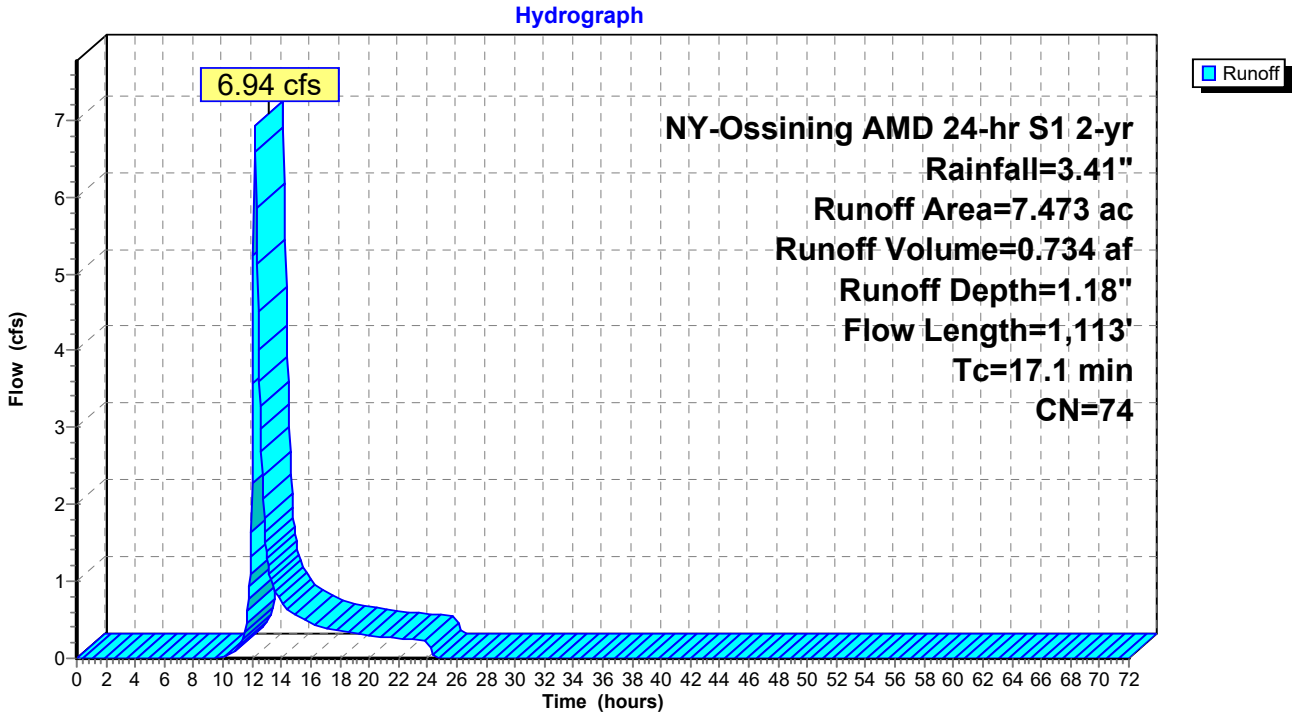
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.00
10.00	0.73	0.00	0.00
11.00	0.92	0.01	0.13
12.00	1.87	0.29	**2.29**
13.00	2.50	0.61	**1.30**
14.00	2.69	0.72	0.73
15.00	2.82	0.80	0.55
16.00	2.92	0.86	0.46
17.00	3.01	0.91	0.40
18.00	3.08	0.96	0.35
19.00	3.15	1.00	0.32
20.00	3.21	1.04	0.29
21.00	3.27	1.08	0.27
22.00	3.32	1.12	0.26
23.00	3.36	1.15	0.24
24.00	**3.41**	**1.18**	0.23
25.00	3.41	1.18	0.00
26.00	3.41	1.18	0.00
27.00	3.41	1.18	0.00
28.00	3.41	1.18	0.00
29.00	3.41	1.18	0.00
30.00	3.41	1.18	0.00
31.00	3.41	1.18	0.00
32.00	3.41	1.18	0.00
33.00	3.41	1.18	0.00
34.00	3.41	1.18	0.00
35.00	3.41	1.18	0.00
36.00	3.41	1.18	0.00
37.00	3.41	1.18	0.00
38.00	3.41	1.18	0.00
39.00	3.41	1.18	0.00
40.00	3.41	1.18	0.00
41.00	3.41	1.18	0.00
42.00	3.41	1.18	0.00
43.00	3.41	1.18	0.00
44.00	3.41	1.18	0.00
45.00	3.41	1.18	0.00
46.00	3.41	1.18	0.00
47.00	3.41	1.18	0.00
48.00	3.41	1.18	0.00
49.00	3.41	1.18	0.00
50.00	3.41	1.18	0.00
51.00	3.41	1.18	0.00
52.00	3.41	1.18	0.00
53.00	3.41	1.18	0.00
54.00	3.41	1.18	0.00
55.00	3.41	1.18	0.00
56.00	3.41	1.18	0.00
57.00	3.41	1.18	0.00
58.00	3.41	1.18	0.00
59.00	3.41	1.18	0.00
60.00	3.41	1.18	0.00
61.00	3.41	1.18	0.00
62.00	3.41	1.18	0.00
63.00	3.41	1.18	0.00
64.00	3.41	1.18	0.00
65.00	3.41	1.18	0.00
66.00	3.41	1.18	0.00
67.00	3.41	1.18	0.00
68.00	3.41	1.18	0.00
69.00	3.41	1.18	0.00
70.00	3.41	1.18	0.00
71.00	3.41	1.18	0.00
72.00	3.41	1.18	0.00

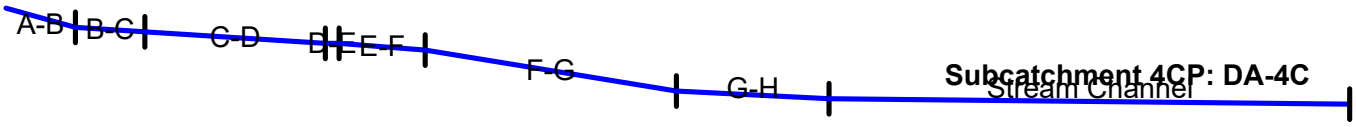
Summary for Subcatchment 4CP: DA-4C

Runoff = 8.51 cfs @ 12.14 hrs, Volume= 0.815 af, Depth= 1.01"
Routed to Link DP-4 : Design Point - 4

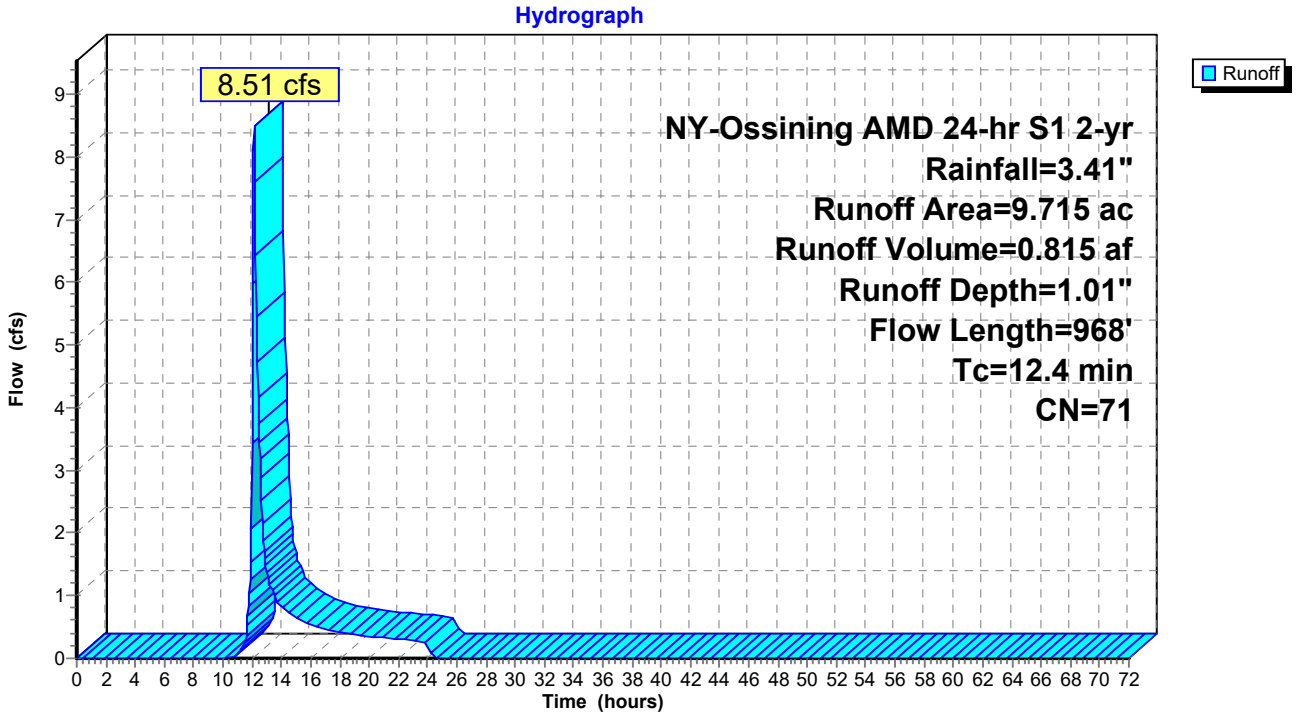
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.00
10.00	0.73	0.00	0.00
11.00	0.92	0.00	0.06
12.00	1.87	0.22	**3.44**
13.00	2.50	0.49	**1.35**
14.00	2.69	0.59	0.83
15.00	2.82	0.66	0.64
16.00	2.92	0.72	0.53
17.00	3.01	0.76	0.46
18.00	3.08	0.81	0.41
19.00	3.15	0.85	0.38
20.00	3.21	0.88	0.35
21.00	3.27	0.92	0.32
22.00	3.32	0.95	0.30
23.00	3.36	0.98	0.29
24.00	**3.41**	**1.01**	0.27
25.00	3.41	1.01	0.00
26.00	3.41	1.01	0.00
27.00	3.41	1.01	0.00
28.00	3.41	1.01	0.00
29.00	3.41	1.01	0.00
30.00	3.41	1.01	0.00
31.00	3.41	1.01	0.00
32.00	3.41	1.01	0.00
33.00	3.41	1.01	0.00
34.00	3.41	1.01	0.00
35.00	3.41	1.01	0.00
36.00	3.41	1.01	0.00
37.00	3.41	1.01	0.00
38.00	3.41	1.01	0.00
39.00	3.41	1.01	0.00
40.00	3.41	1.01	0.00
41.00	3.41	1.01	0.00
42.00	3.41	1.01	0.00
43.00	3.41	1.01	0.00
44.00	3.41	1.01	0.00
45.00	3.41	1.01	0.00
46.00	3.41	1.01	0.00
47.00	3.41	1.01	0.00
48.00	3.41	1.01	0.00
49.00	3.41	1.01	0.00
50.00	3.41	1.01	0.00
51.00	3.41	1.01	0.00
52.00	3.41	1.01	0.00
53.00	3.41	1.01	0.00
54.00	3.41	1.01	0.00
55.00	3.41	1.01	0.00
56.00	3.41	1.01	0.00
57.00	3.41	1.01	0.00
58.00	3.41	1.01	0.00
59.00	3.41	1.01	0.00
60.00	3.41	1.01	0.00
61.00	3.41	1.01	0.00
62.00	3.41	1.01	0.00
63.00	3.41	1.01	0.00
64.00	3.41	1.01	0.00
65.00	3.41	1.01	0.00
66.00	3.41	1.01	0.00
67.00	3.41	1.01	0.00
68.00	3.41	1.01	0.00
69.00	3.41	1.01	0.00
70.00	3.41	1.01	0.00
71.00	3.41	1.01	0.00
72.00	3.41	1.01	0.00

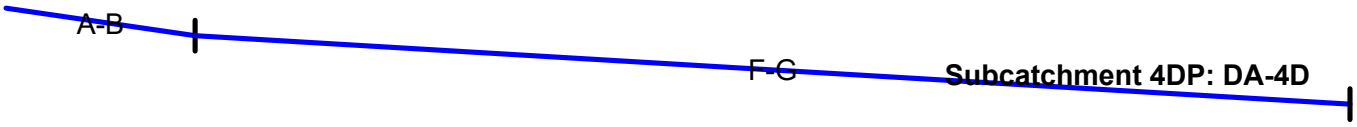
Summary for Subcatchment 4DP: DA-4D

Runoff = 4.67 cfs @ 12.04 hrs, Volume= 0.324 af, Depth= 2.85"
Routed to Pond 6P : Infiltrators

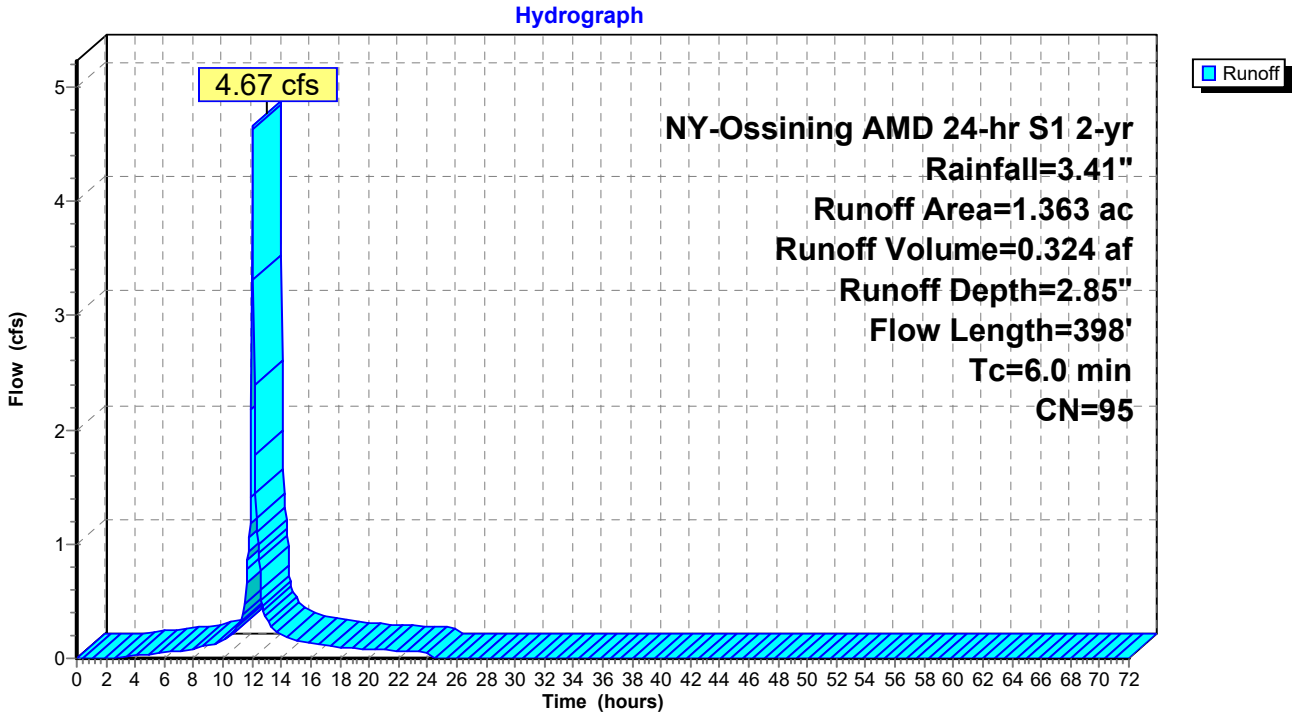
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.01
4.00	0.20	0.01	0.02
5.00	0.26	0.04	0.03
6.00	0.33	0.07	0.05
7.00	0.40	0.11	0.06
8.00	0.49	0.16	0.08
9.00	0.59	0.24	0.11
10.00	0.73	0.34	0.16
11.00	0.92	0.49	0.27
12.00	1.87	1.36	**4.09**
13.00	2.50	1.97	**0.34**
14.00	2.69	2.15	0.21
15.00	2.82	2.27	0.16
16.00	2.92	2.37	0.13
17.00	3.01	2.46	0.11
18.00	3.08	2.53	0.10
19.00	3.15	2.60	0.09
20.00	3.21	2.65	0.08
21.00	3.27	2.71	0.07
22.00	3.32	2.76	0.07
23.00	3.36	2.81	0.06
24.00	**3.41**	**2.85**	0.06
25.00	3.41	2.85	0.00
26.00	3.41	2.85	0.00
27.00	3.41	2.85	0.00
28.00	3.41	2.85	0.00
29.00	3.41	2.85	0.00
30.00	3.41	2.85	0.00
31.00	3.41	2.85	0.00
32.00	3.41	2.85	0.00
33.00	3.41	2.85	0.00
34.00	3.41	2.85	0.00
35.00	3.41	2.85	0.00
36.00	3.41	2.85	0.00
37.00	3.41	2.85	0.00
38.00	3.41	2.85	0.00
39.00	3.41	2.85	0.00
40.00	3.41	2.85	0.00
41.00	3.41	2.85	0.00
42.00	3.41	2.85	0.00
43.00	3.41	2.85	0.00
44.00	3.41	2.85	0.00
45.00	3.41	2.85	0.00
46.00	3.41	2.85	0.00
47.00	3.41	2.85	0.00
48.00	3.41	2.85	0.00
49.00	3.41	2.85	0.00
50.00	3.41	2.85	0.00
51.00	3.41	2.85	0.00
52.00	3.41	2.85	0.00
53.00	3.41	2.85	0.00
54.00	3.41	2.85	0.00
55.00	3.41	2.85	0.00
56.00	3.41	2.85	0.00
57.00	3.41	2.85	0.00
58.00	3.41	2.85	0.00
59.00	3.41	2.85	0.00
60.00	3.41	2.85	0.00
61.00	3.41	2.85	0.00
62.00	3.41	2.85	0.00
63.00	3.41	2.85	0.00
64.00	3.41	2.85	0.00
65.00	3.41	2.85	0.00
66.00	3.41	2.85	0.00
67.00	3.41	2.85	0.00
68.00	3.41	2.85	0.00
69.00	3.41	2.85	0.00
70.00	3.41	2.85	0.00
71.00	3.41	2.85	0.00
72.00	3.41	2.85	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 2.85" for 2-yr event
Inflow = 4.67 cfs @ 12.04 hrs, Volume= 0.324 af
Outflow = 0.96 cfs @ 12.43 hrs, Volume= 0.324 af, Atten= 79%, Lag= 23.2 min
Discarded = 0.07 cfs @ 8.85 hrs, Volume= 0.134 af
Primary = 0.89 cfs @ 12.43 hrs, Volume= 0.190 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 348.06' @ 12.43 hrs Surf.Area= 0.132 ac Storage= 0.114 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 120.0 min (905.0 - 785.0)

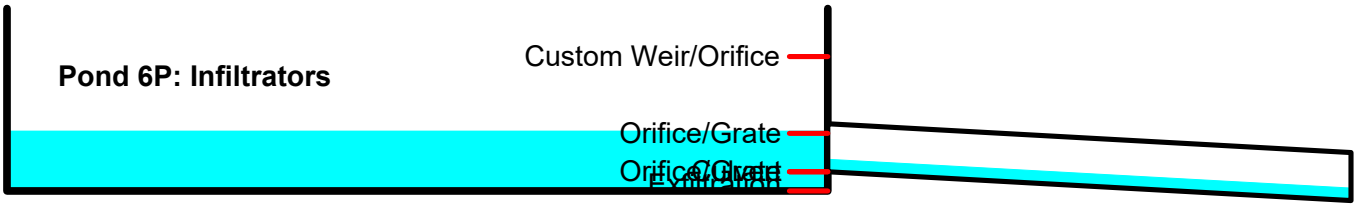
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 8.85 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.89 cfs @ 12.43 hrs HW=348.06' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.89 cfs of 3.06 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.85 cfs @ 4.32 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.76 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

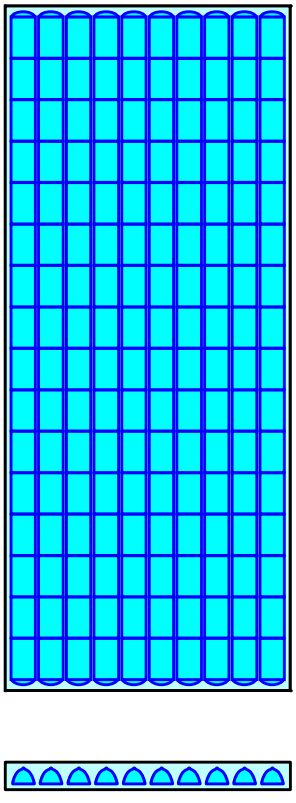
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

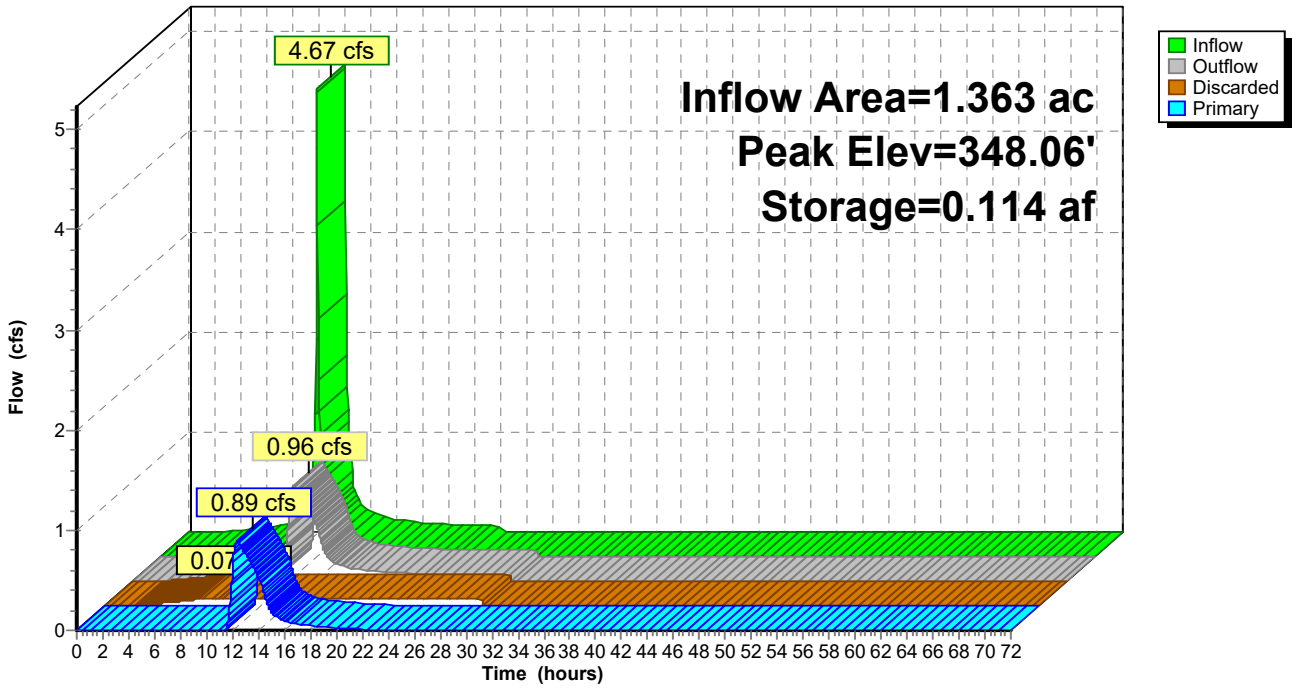
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers
1,014.0 cy Field
711.7 cy Stone



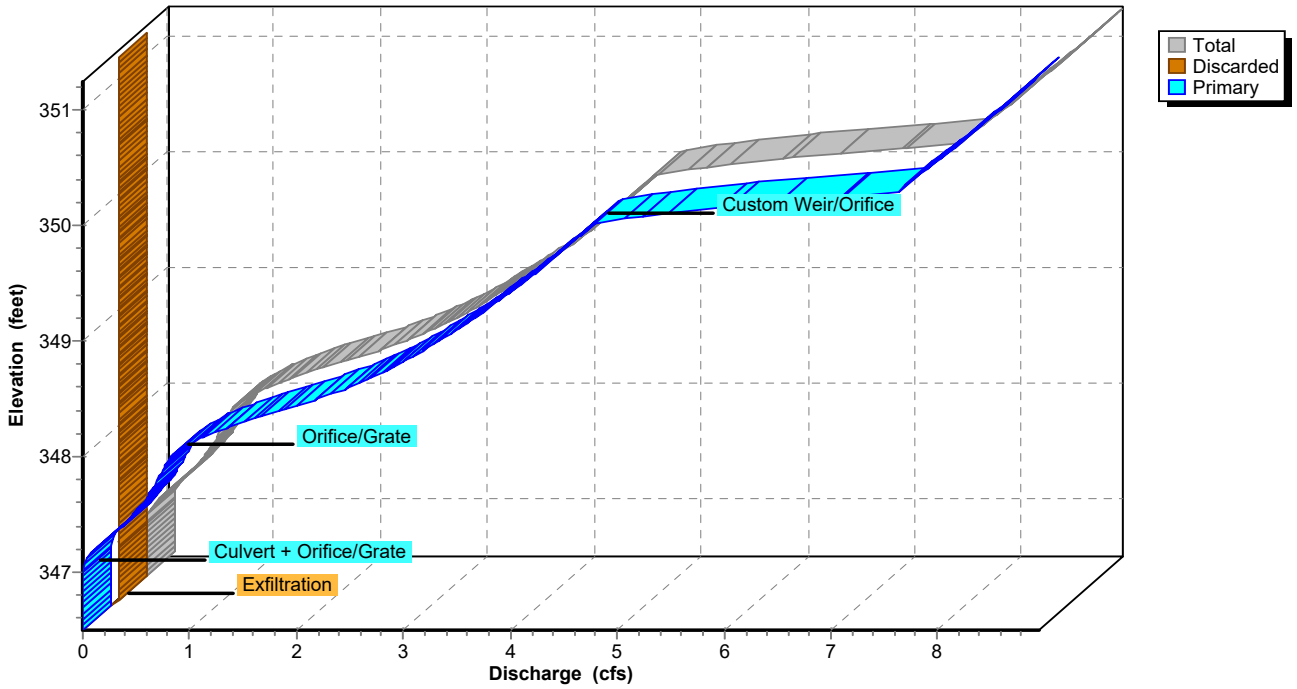
Pond 6P: Infiltrators

Hydrograph

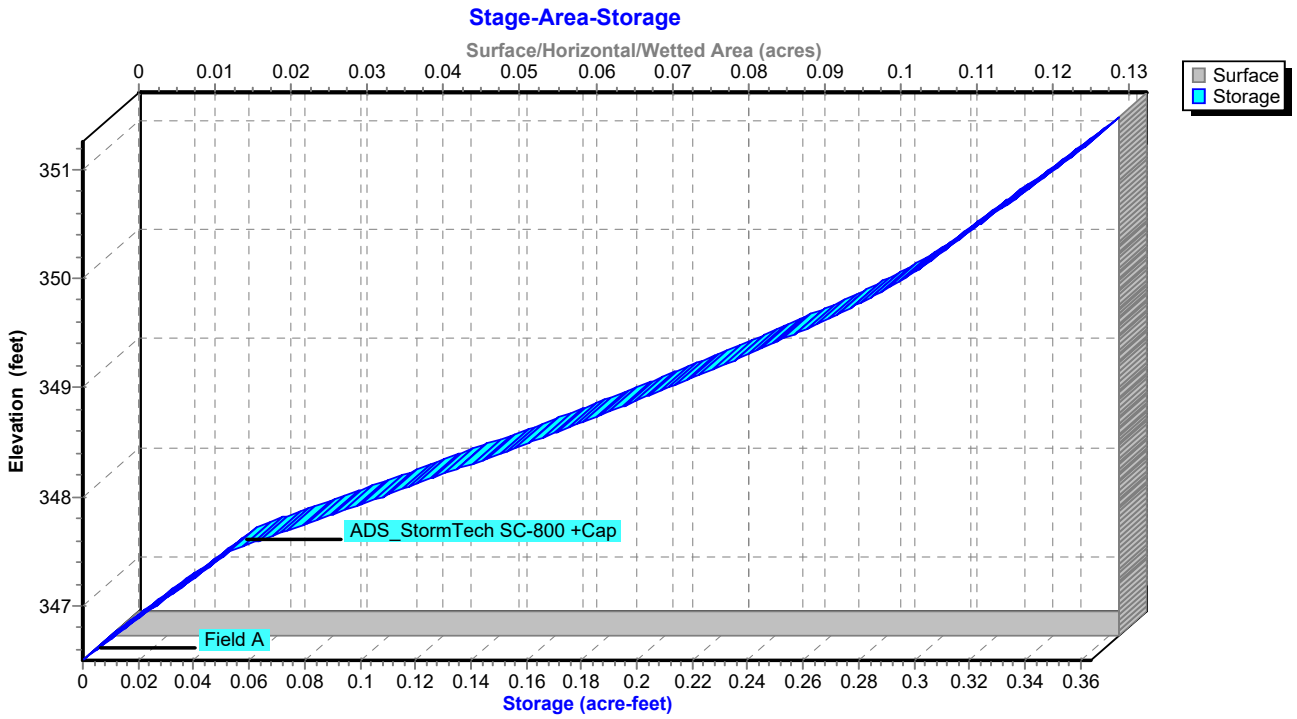


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.03	0.000	346.50	0.03	0.03	0.00
7.50	0.07	0.000	346.50	0.07	**0.07**	0.00
10.00	**0.16**	**0.009**	**346.66**	**0.07**	**0.07**	**0.00**
12.50	**0.86**	**0.114**	**348.05**	**0.95**	0.07	**0.89**
15.00	0.16	0.040	347.26	0.25	0.07	0.18
17.50	0.10	0.033	347.13	0.12	0.07	0.05
20.00	0.08	0.031	347.08	0.09	0.07	0.02
22.50	0.07	0.029	347.05	0.07	0.07	0.01
25.00	0.00	0.023	346.93	0.07	0.07	0.00
27.50	0.00	0.009	346.67	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

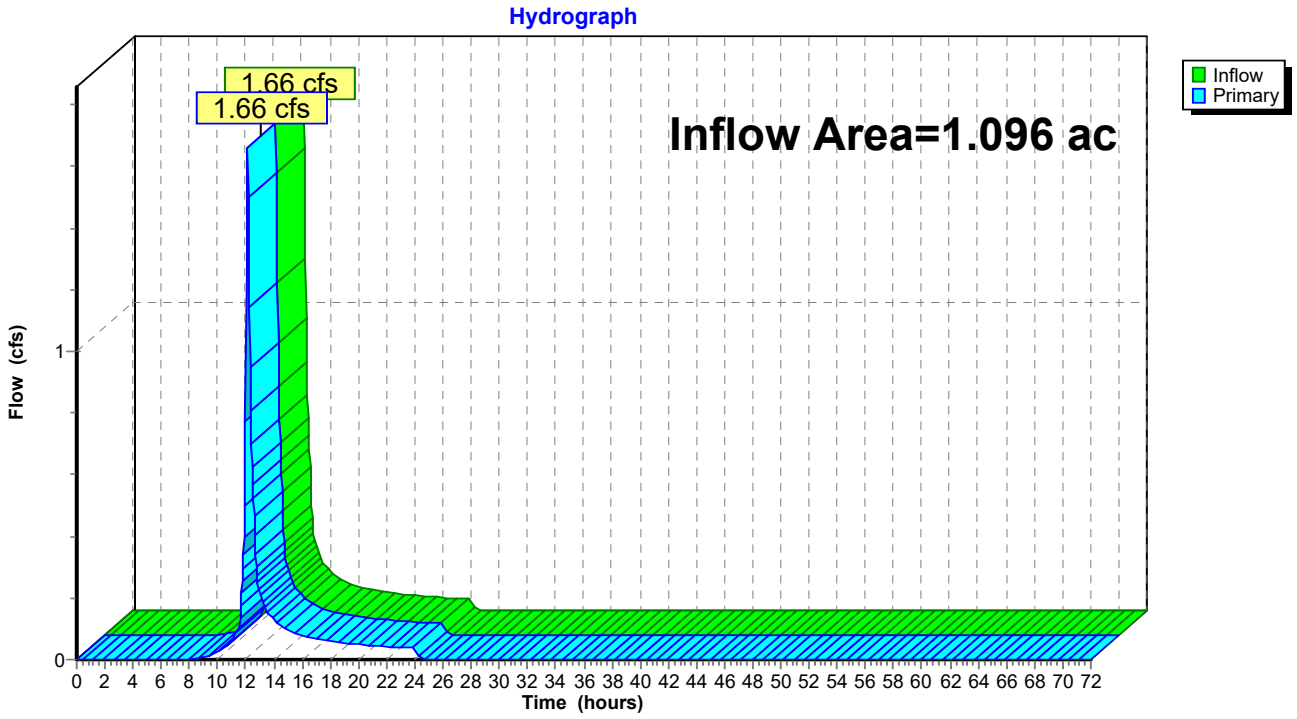
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 1.57" for 2-yr event
Inflow = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af
Primary = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

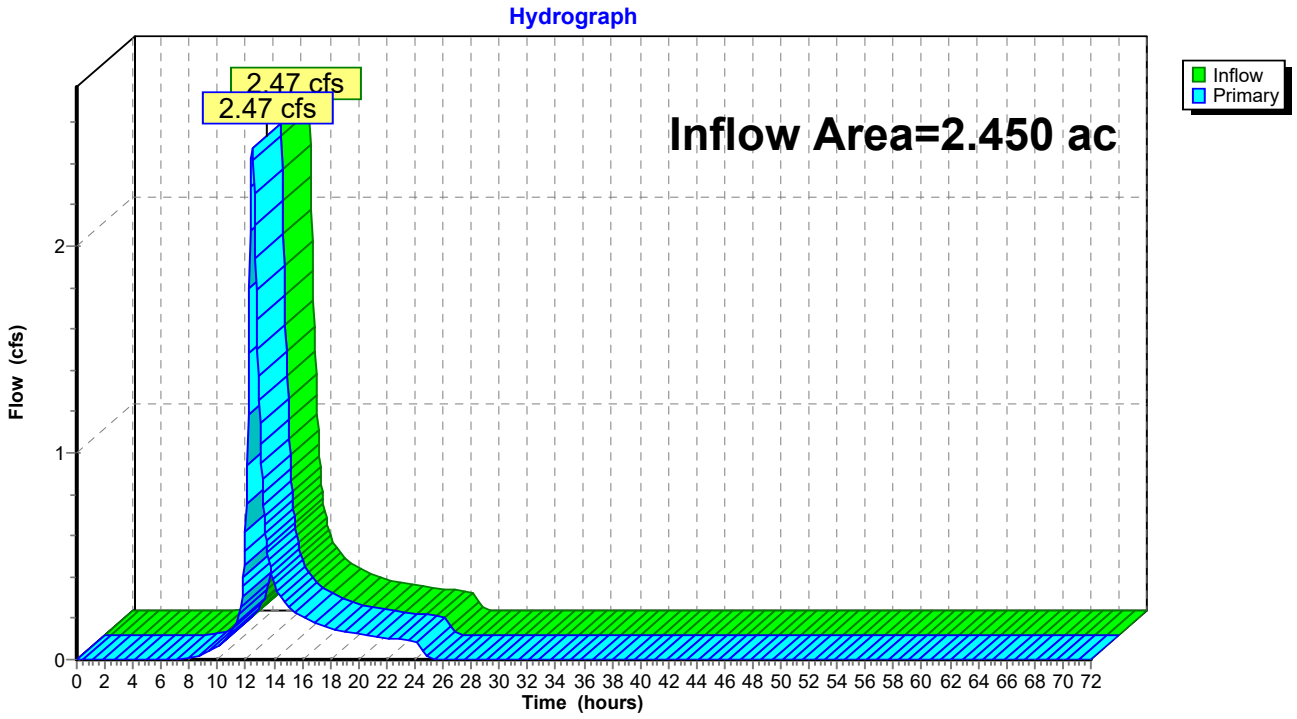
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01
10.00	0.02	0.00	0.02
11.00	0.06	0.00	0.06
12.00	**0.77**	0.00	**0.77**
13.00	**0.21**	0.00	**0.21**
14.00	0.13	0.00	0.13
15.00	0.10	0.00	0.10
16.00	0.08	0.00	0.08
17.00	0.07	0.00	0.07
18.00	0.06	0.00	0.06
19.00	0.05	0.00	0.05
20.00	0.05	0.00	0.05
21.00	0.05	0.00	0.05
22.00	0.04	0.00	0.04
23.00	0.04	0.00	0.04
24.00	0.04	0.00	0.04
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 1.78" for 2-yr event
Inflow = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af
Primary = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

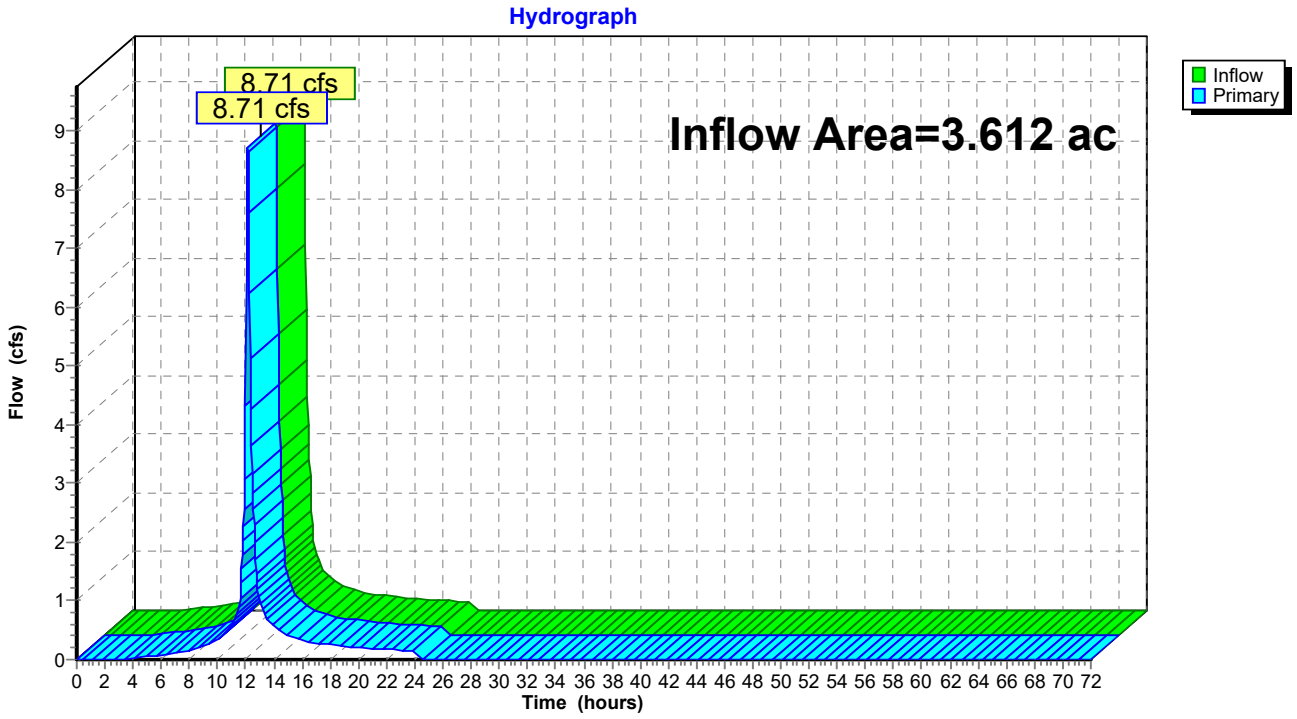
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01
9.00	0.03	0.00	0.03
10.00	0.06	0.00	0.06
11.00	0.14	0.00	0.14
12.00	**0.62**	0.00	**0.62**
13.00	**1.14**	0.00	**1.14**
14.00	0.37	0.00	0.37
15.00	0.26	0.00	0.26
16.00	0.20	0.00	0.20
17.00	0.17	0.00	0.17
18.00	0.15	0.00	0.15
19.00	0.14	0.00	0.14
20.00	0.12	0.00	0.12
21.00	0.11	0.00	0.11
22.00	0.11	0.00	0.11
23.00	0.10	0.00	0.10
24.00	0.09	0.00	0.09
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.65" for 2-yr event
Inflow = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af
Primary = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

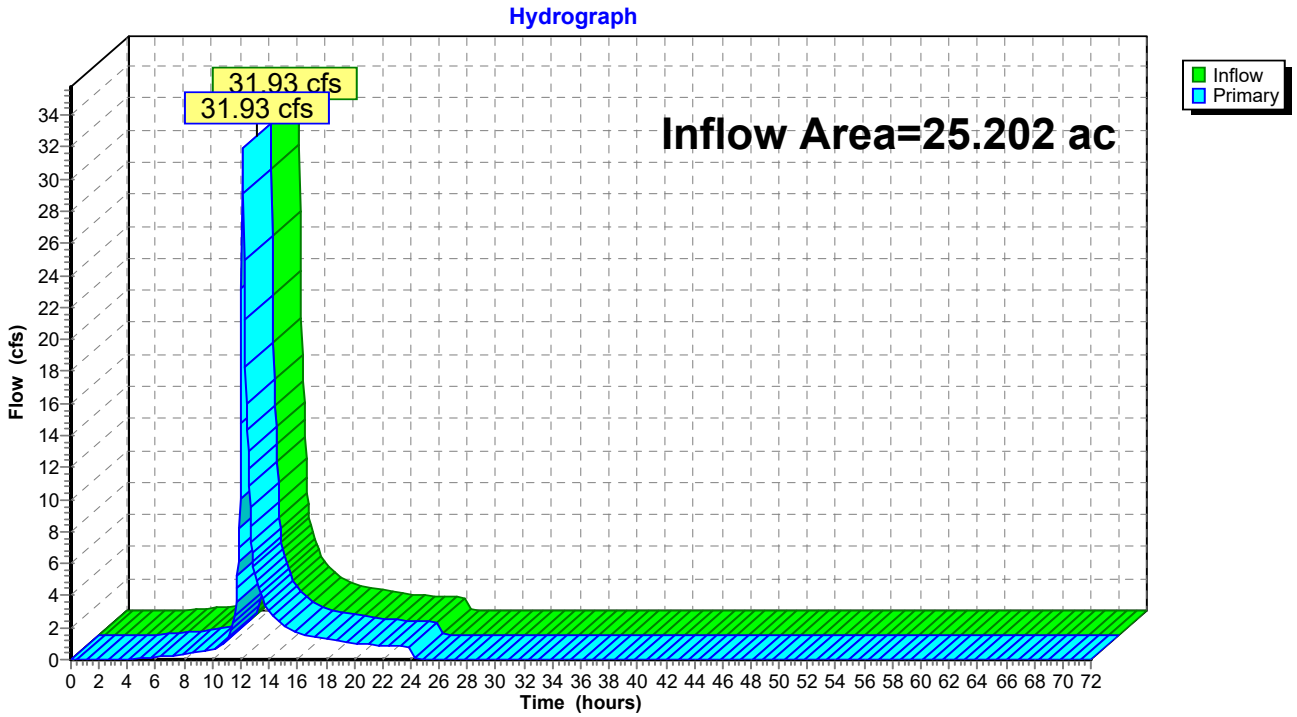
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02
5.00	0.05	0.00	0.05
6.00	0.08	0.00	0.08
7.00	0.12	0.00	0.12
8.00	0.17	0.00	0.17
9.00	0.24	0.00	0.24
10.00	0.34	0.00	0.34
11.00	0.59	0.00	0.59
12.00	**4.33**	0.00	**4.33**
13.00	**0.98**	0.00	**0.98**
14.00	0.56	0.00	0.56
15.00	0.41	0.00	0.41
16.00	0.34	0.00	0.34
17.00	0.29	0.00	0.29
18.00	0.25	0.00	0.25
19.00	0.23	0.00	0.23
20.00	0.21	0.00	0.21
21.00	0.19	0.00	0.19
22.00	0.18	0.00	0.18
23.00	0.17	0.00	0.17
24.00	0.16	0.00	0.16
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 1.53" for 2-yr event
Inflow = 31.93 cfs @ 12.14 hrs, Volume= 3.207 af
Primary = 31.93 cfs @ 12.14 hrs, Volume= 3.207 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.04	0.00	0.04
5.00	0.09	0.00	0.09
6.00	0.15	0.00	0.15
7.00	0.22	0.00	0.22
8.00	0.31	0.00	0.31
9.00	0.44	0.00	0.44
10.00	0.64	0.00	0.64
11.00	1.29	0.00	1.29
12.00	**14.72**	0.00	**14.72**
13.00	**5.20**	0.00	**5.20**
14.00	3.11	0.00	3.11
15.00	2.13	0.00	2.13
16.00	1.70	0.00	1.70
17.00	1.45	0.00	1.45
18.00	1.27	0.00	1.27
19.00	1.14	0.00	1.14
20.00	1.04	0.00	1.04
21.00	0.96	0.00	0.96
22.00	0.89	0.00	0.89
23.00	0.84	0.00	0.84
24.00	0.79	0.00	0.79
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=3.02"
Flow Length=253' Tc=12.2 min CN=80 Runoff=2.93 cfs 0.275 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=3.30"
Flow Length=548' Tc=36.4 min CN=83 Runoff=4.26 cfs 0.674 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=4.34"
Flow Length=469' Tc=13.4 min CN=93 Runoff=12.58 cfs 1.305 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=4.34"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=23.93 cfs 2.403 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=2.48"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=13.97 cfs 1.542 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=2.22"
Flow Length=968' Tc=12.4 min CN=71 Runoff=18.39 cfs 1.800 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=4.56"
Flow Length=398' Tc=6.0 min CN=95 Runoff=6.48 cfs 0.518 af

Pond 6P: Infiltrators Peak Elev=348.43' Storage=0.155 af Inflow=6.48 cfs 0.518 af
Discarded=0.07 cfs 0.149 af Primary=1.94 cfs 0.369 af Outflow=2.01 cfs 0.518 af

Link DP-1: Design Point - 1 Inflow=2.93 cfs 0.275 af
Primary=2.93 cfs 0.275 af

Link DP-2: Design Point - 2 Inflow=4.26 cfs 0.674 af
Primary=4.26 cfs 0.674 af

Link DP-3: Design Point - 3 Inflow=12.58 cfs 1.305 af
Primary=12.58 cfs 1.305 af

Link DP-4: Design Point - 4 Inflow=56.62 cfs 6.114 af
Primary=56.62 cfs 6.114 af

Total Runoff Area = 32.360 ac Runoff Volume = 8.517 af Average Runoff Depth = 3.16"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

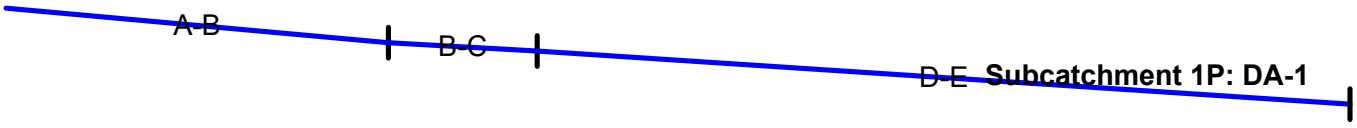
Summary for Subcatchment 1P: DA-1

Runoff = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af, Depth= 3.02"
Routed to Link DP-1 : Design Point - 1

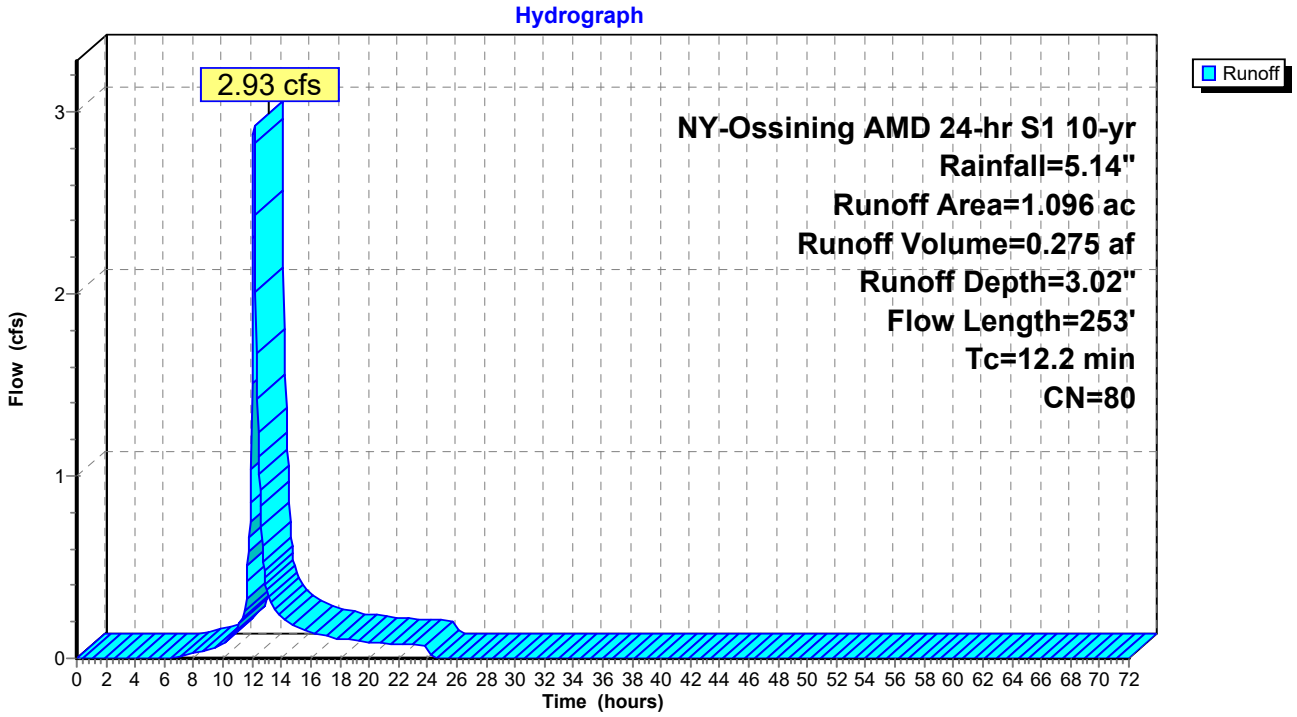
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.01	0.01
8.00	0.78	0.03	0.03
9.00	0.94	0.07	0.05
10.00	1.14	0.13	0.09
11.00	1.44	0.26	0.17
12.00	2.78	1.09	**1.51**
13.00	3.72	1.81	**0.38**
14.00	4.01	2.05	0.23
15.00	4.21	2.21	0.17
16.00	4.37	2.35	0.14
17.00	4.50	2.46	0.12
18.00	4.62	2.56	0.11
19.00	4.73	2.66	0.10
20.00	4.82	2.74	0.09
21.00	4.91	2.81	0.08
22.00	4.99	2.89	0.08
23.00	5.07	2.95	0.07
24.00	**5.14**	**3.02**	0.07
25.00	5.14	3.02	0.00
26.00	5.14	3.02	0.00
27.00	5.14	3.02	0.00
28.00	5.14	3.02	0.00
29.00	5.14	3.02	0.00
30.00	5.14	3.02	0.00
31.00	5.14	3.02	0.00
32.00	5.14	3.02	0.00
33.00	5.14	3.02	0.00
34.00	5.14	3.02	0.00
35.00	5.14	3.02	0.00
36.00	5.14	3.02	0.00
37.00	5.14	3.02	0.00
38.00	5.14	3.02	0.00
39.00	5.14	3.02	0.00
40.00	5.14	3.02	0.00
41.00	5.14	3.02	0.00
42.00	5.14	3.02	0.00
43.00	5.14	3.02	0.00
44.00	5.14	3.02	0.00
45.00	5.14	3.02	0.00
46.00	5.14	3.02	0.00
47.00	5.14	3.02	0.00
48.00	5.14	3.02	0.00
49.00	5.14	3.02	0.00
50.00	5.14	3.02	0.00
51.00	5.14	3.02	0.00
52.00	5.14	3.02	0.00
53.00	5.14	3.02	0.00
54.00	5.14	3.02	0.00
55.00	5.14	3.02	0.00
56.00	5.14	3.02	0.00
57.00	5.14	3.02	0.00
58.00	5.14	3.02	0.00
59.00	5.14	3.02	0.00
60.00	5.14	3.02	0.00
61.00	5.14	3.02	0.00
62.00	5.14	3.02	0.00
63.00	5.14	3.02	0.00
64.00	5.14	3.02	0.00
65.00	5.14	3.02	0.00
66.00	5.14	3.02	0.00
67.00	5.14	3.02	0.00
68.00	5.14	3.02	0.00
69.00	5.14	3.02	0.00
70.00	5.14	3.02	0.00
71.00	5.14	3.02	0.00
72.00	5.14	3.02	0.00

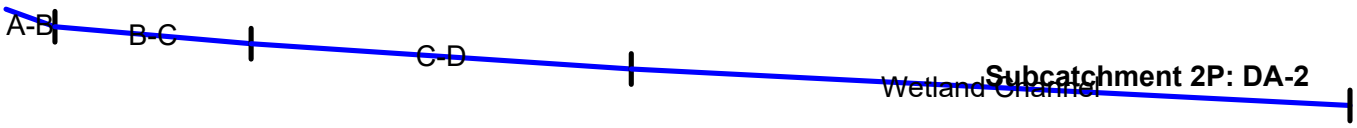
Summary for Subcatchment 2P: DA-2

Runoff = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af, Depth= 3.30"
Routed to Link DP-2 : Design Point - 2

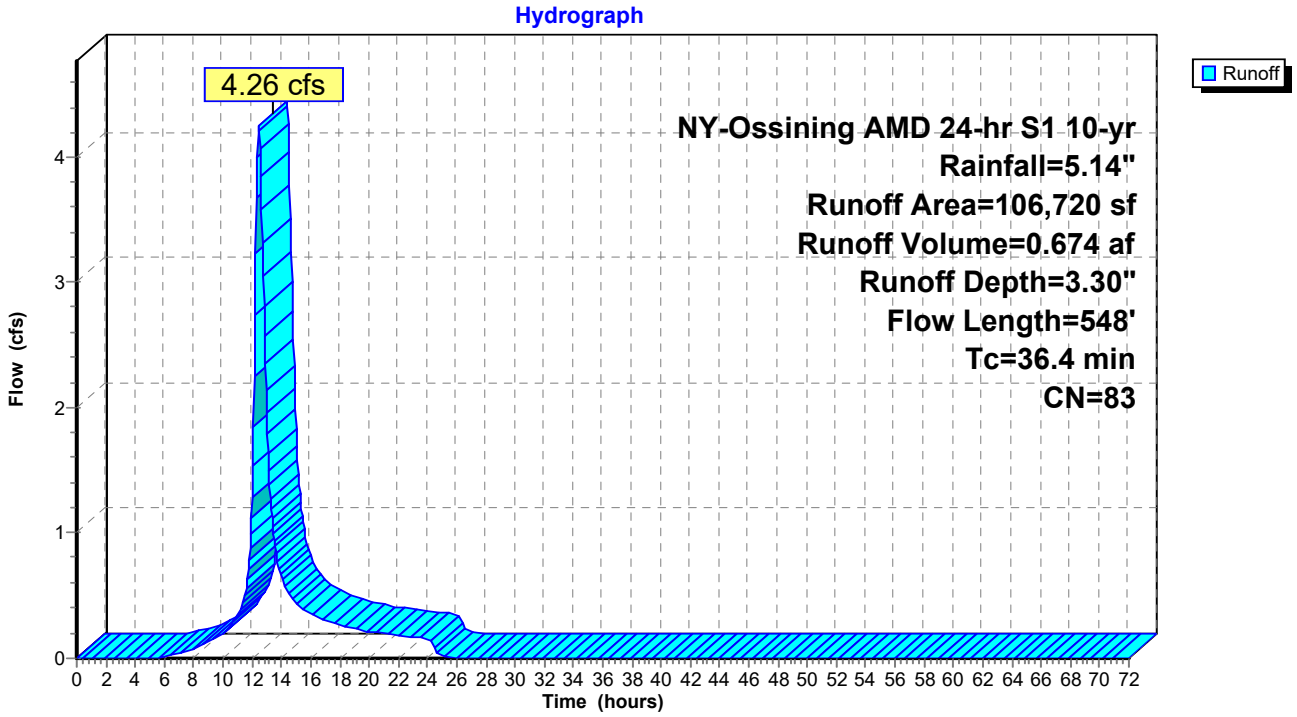
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.01	0.01
7.00	0.64	0.02	0.04
8.00	0.78	0.06	0.08
9.00	0.94	0.11	0.13
10.00	1.14	0.19	0.20
11.00	1.44	0.34	0.35
12.00	2.78	1.27	**1.29**
13.00	3.72	2.04	**1.96**
14.00	4.01	2.29	0.64
15.00	4.21	2.47	0.44
16.00	4.37	2.61	0.35
17.00	4.50	2.73	0.30
18.00	4.62	2.83	0.26
19.00	4.73	2.93	0.23
20.00	4.82	3.01	0.21
21.00	4.91	3.09	0.20
22.00	4.99	3.17	0.18
23.00	5.07	3.24	0.17
24.00	**5.14**	**3.30**	0.16
25.00	5.14	3.30	0.01
26.00	5.14	3.30	0.00
27.00	5.14	3.30	0.00
28.00	5.14	3.30	0.00
29.00	5.14	3.30	0.00
30.00	5.14	3.30	0.00
31.00	5.14	3.30	0.00
32.00	5.14	3.30	0.00
33.00	5.14	3.30	0.00
34.00	5.14	3.30	0.00
35.00	5.14	3.30	0.00
36.00	5.14	3.30	0.00
37.00	5.14	3.30	0.00
38.00	5.14	3.30	0.00
39.00	5.14	3.30	0.00
40.00	5.14	3.30	0.00
41.00	5.14	3.30	0.00
42.00	5.14	3.30	0.00
43.00	5.14	3.30	0.00
44.00	5.14	3.30	0.00
45.00	5.14	3.30	0.00
46.00	5.14	3.30	0.00
47.00	5.14	3.30	0.00
48.00	5.14	3.30	0.00
49.00	5.14	3.30	0.00
50.00	5.14	3.30	0.00
51.00	5.14	3.30	0.00
52.00	5.14	3.30	0.00
53.00	5.14	3.30	0.00
54.00	5.14	3.30	0.00
55.00	5.14	3.30	0.00
56.00	5.14	3.30	0.00
57.00	5.14	3.30	0.00
58.00	5.14	3.30	0.00
59.00	5.14	3.30	0.00
60.00	5.14	3.30	0.00
61.00	5.14	3.30	0.00
62.00	5.14	3.30	0.00
63.00	5.14	3.30	0.00
64.00	5.14	3.30	0.00
65.00	5.14	3.30	0.00
66.00	5.14	3.30	0.00
67.00	5.14	3.30	0.00
68.00	5.14	3.30	0.00
69.00	5.14	3.30	0.00
70.00	5.14	3.30	0.00
71.00	5.14	3.30	0.00
72.00	5.14	3.30	0.00

Summary for Subcatchment 3P: DA-3

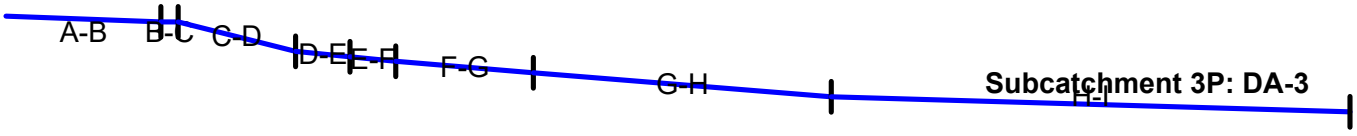
[47] Hint: Peak is 222% of capacity of segment #8

Runoff = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Depth= 4.34"
Routed to Link DP-3 : Design Point - 3

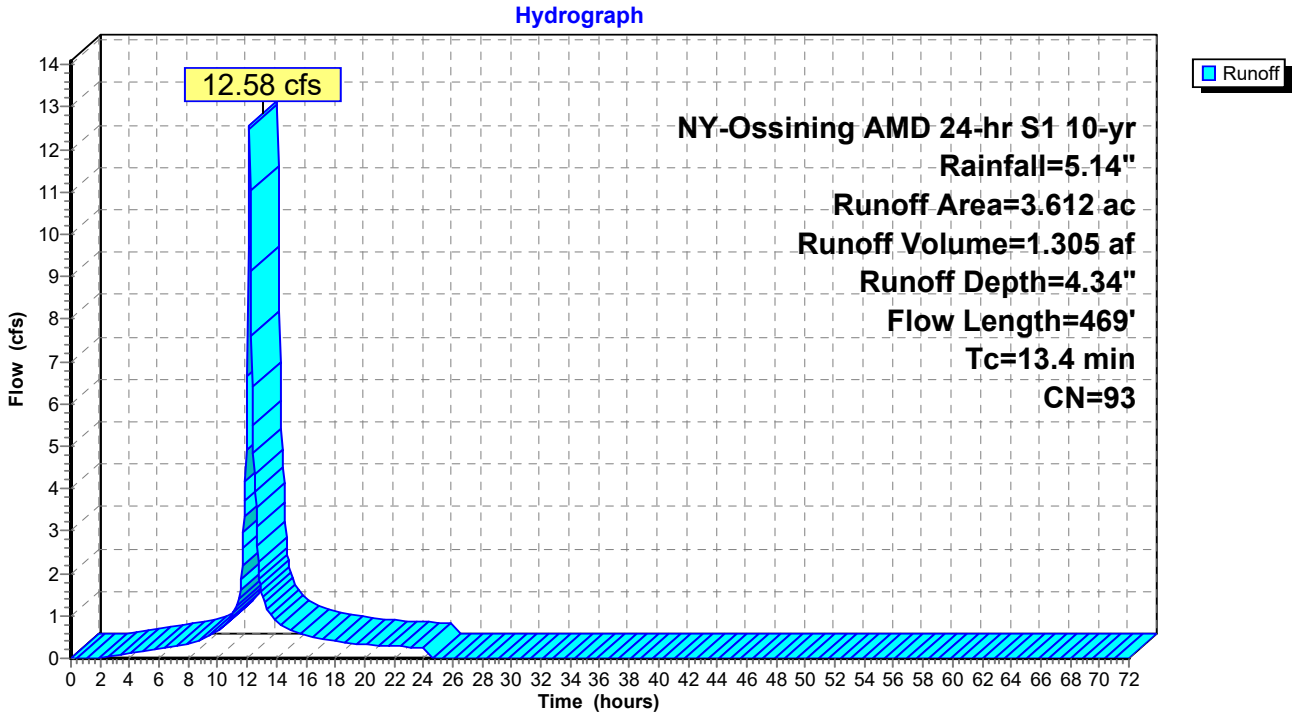
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.01	0.05
4.00	0.32	0.03	0.10
5.00	0.42	0.07	0.15
6.00	0.52	0.12	0.21
7.00	0.64	0.19	0.28
8.00	0.78	0.28	0.36
9.00	0.94	0.40	0.47
10.00	1.14	0.56	0.65
11.00	1.44	0.81	1.04
12.00	2.78	2.05	**6.64**
13.00	3.72	2.95	**1.54**
14.00	4.01	3.23	0.89
15.00	4.21	3.42	0.66
16.00	4.37	3.58	0.54
17.00	4.50	3.71	0.46
18.00	4.62	3.83	0.41
19.00	4.73	3.93	0.37
20.00	4.82	4.02	0.33
21.00	4.91	4.11	0.31
22.00	4.99	4.19	0.29
23.00	5.07	4.26	0.27
24.00	**5.14**	**4.34**	0.25
25.00	5.14	4.34	0.00
26.00	5.14	4.34	0.00
27.00	5.14	4.34	0.00
28.00	5.14	4.34	0.00
29.00	5.14	4.34	0.00
30.00	5.14	4.34	0.00
31.00	5.14	4.34	0.00
32.00	5.14	4.34	0.00
33.00	5.14	4.34	0.00
34.00	5.14	4.34	0.00
35.00	5.14	4.34	0.00
36.00	5.14	4.34	0.00
37.00	5.14	4.34	0.00
38.00	5.14	4.34	0.00
39.00	5.14	4.34	0.00
40.00	5.14	4.34	0.00
41.00	5.14	4.34	0.00
42.00	5.14	4.34	0.00
43.00	5.14	4.34	0.00
44.00	5.14	4.34	0.00
45.00	5.14	4.34	0.00
46.00	5.14	4.34	0.00
47.00	5.14	4.34	0.00
48.00	5.14	4.34	0.00
49.00	5.14	4.34	0.00
50.00	5.14	4.34	0.00
51.00	5.14	4.34	0.00
52.00	5.14	4.34	0.00
53.00	5.14	4.34	0.00
54.00	5.14	4.34	0.00
55.00	5.14	4.34	0.00
56.00	5.14	4.34	0.00
57.00	5.14	4.34	0.00
58.00	5.14	4.34	0.00
59.00	5.14	4.34	0.00
60.00	5.14	4.34	0.00
61.00	5.14	4.34	0.00
62.00	5.14	4.34	0.00
63.00	5.14	4.34	0.00
64.00	5.14	4.34	0.00
65.00	5.14	4.34	0.00
66.00	5.14	4.34	0.00
67.00	5.14	4.34	0.00
68.00	5.14	4.34	0.00
69.00	5.14	4.34	0.00
70.00	5.14	4.34	0.00
71.00	5.14	4.34	0.00
72.00	5.14	4.34	0.00

Summary for Subcatchment 4AP: DA-4A

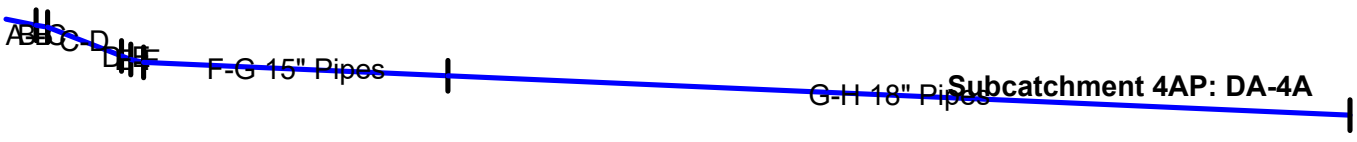
[47] Hint: Peak is 524% of capacity of segment #6
[47] Hint: Peak is 322% of capacity of segment #7

Runoff = 23.93 cfs @ 12.12 hrs, Volume= 2.403 af, Depth= 4.34"
Routed to Link DP-4 : Design Point - 4

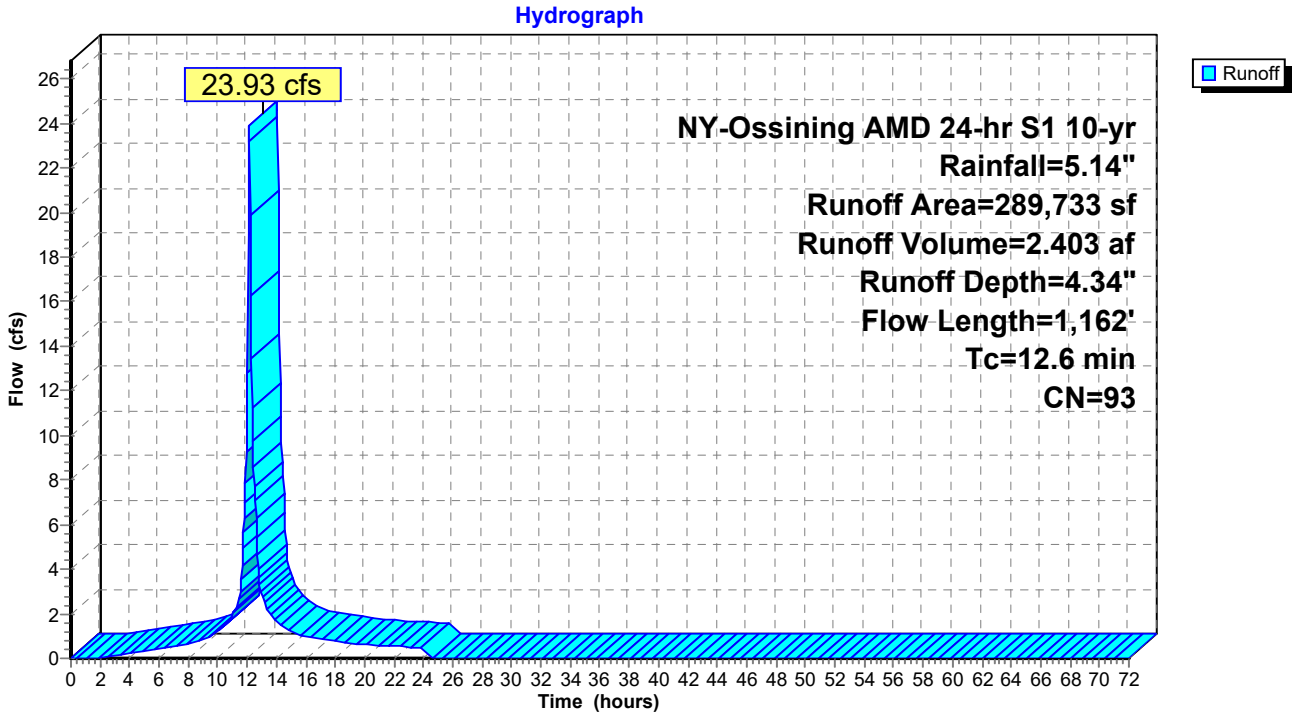
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.01	0.08
4.00	0.32	0.03	0.19
5.00	0.42	0.07	0.29
6.00	0.52	0.12	0.39
7.00	0.64	0.19	0.51
8.00	0.78	0.28	0.66
9.00	0.94	0.40	0.86
10.00	1.14	0.56	1.20
11.00	1.44	0.81	1.93
12.00	2.78	2.05	**12.84**
13.00	3.72	2.95	**2.79**
14.00	4.01	3.23	1.62
15.00	4.21	3.42	1.21
16.00	4.37	3.58	0.99
17.00	4.50	3.71	0.85
18.00	4.62	3.83	0.75
19.00	4.73	3.93	0.67
20.00	4.82	4.02	0.61
21.00	4.91	4.11	0.57
22.00	4.99	4.19	0.53
23.00	5.07	4.26	0.49
24.00	**5.14**	**4.34**	0.47
25.00	5.14	4.34	0.00
26.00	5.14	4.34	0.00
27.00	5.14	4.34	0.00
28.00	5.14	4.34	0.00
29.00	5.14	4.34	0.00
30.00	5.14	4.34	0.00
31.00	5.14	4.34	0.00
32.00	5.14	4.34	0.00
33.00	5.14	4.34	0.00
34.00	5.14	4.34	0.00
35.00	5.14	4.34	0.00
36.00	5.14	4.34	0.00
37.00	5.14	4.34	0.00
38.00	5.14	4.34	0.00
39.00	5.14	4.34	0.00
40.00	5.14	4.34	0.00
41.00	5.14	4.34	0.00
42.00	5.14	4.34	0.00
43.00	5.14	4.34	0.00
44.00	5.14	4.34	0.00
45.00	5.14	4.34	0.00
46.00	5.14	4.34	0.00
47.00	5.14	4.34	0.00
48.00	5.14	4.34	0.00
49.00	5.14	4.34	0.00
50.00	5.14	4.34	0.00
51.00	5.14	4.34	0.00
52.00	5.14	4.34	0.00
53.00	5.14	4.34	0.00
54.00	5.14	4.34	0.00
55.00	5.14	4.34	0.00
56.00	5.14	4.34	0.00
57.00	5.14	4.34	0.00
58.00	5.14	4.34	0.00
59.00	5.14	4.34	0.00
60.00	5.14	4.34	0.00
61.00	5.14	4.34	0.00
62.00	5.14	4.34	0.00
63.00	5.14	4.34	0.00
64.00	5.14	4.34	0.00
65.00	5.14	4.34	0.00
66.00	5.14	4.34	0.00
67.00	5.14	4.34	0.00
68.00	5.14	4.34	0.00
69.00	5.14	4.34	0.00
70.00	5.14	4.34	0.00
71.00	5.14	4.34	0.00
72.00	5.14	4.34	0.00

Summary for Subcatchment 4BP: DA-4B

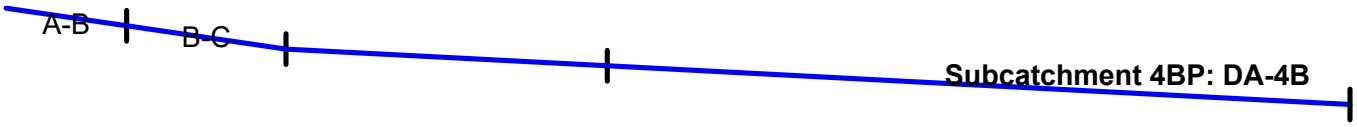
[47] Hint: Peak is 555% of capacity of segment #3

Runoff = 13.97 cfs @ 12.19 hrs, Volume= 1.542 af, Depth= 2.48"
Routed to Link DP-4 : Design Point - 4

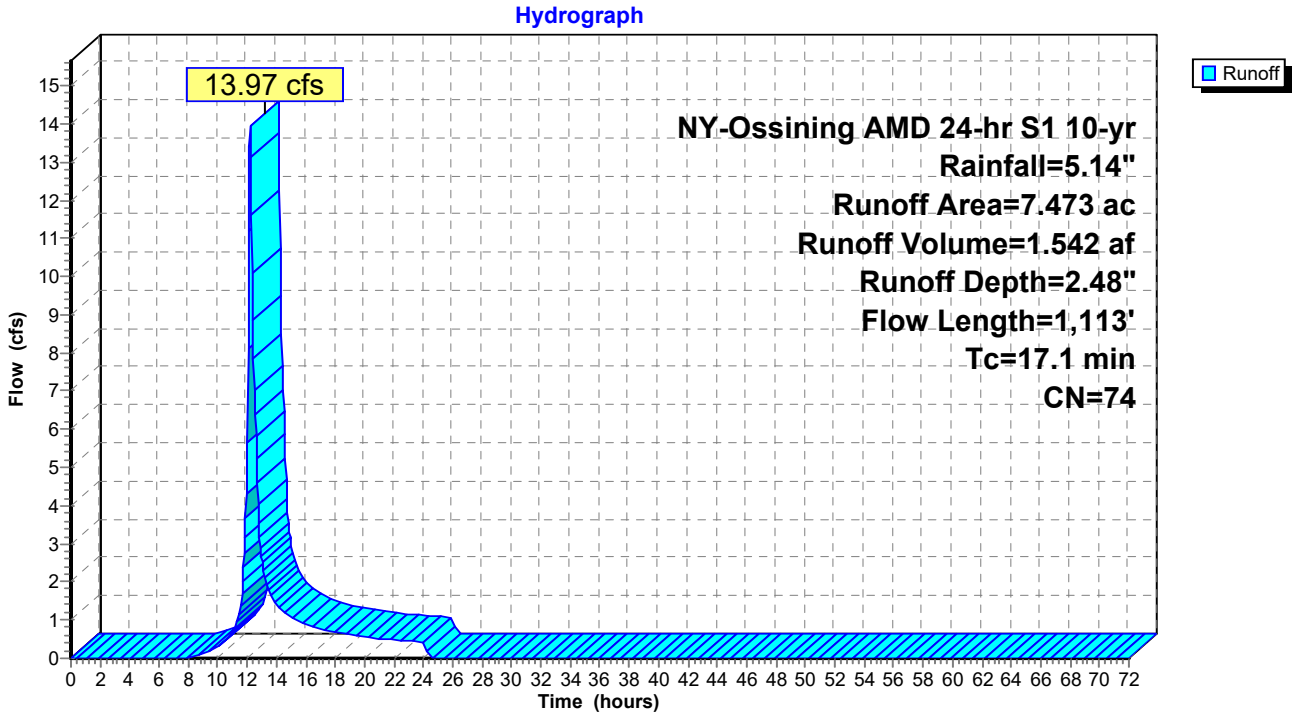
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.00	0.00
8.00	0.78	0.00	0.02
9.00	0.94	0.01	0.13
10.00	1.14	0.05	0.30
11.00	1.44	0.13	0.70
12.00	2.78	0.77	**5.64**
13.00	3.72	1.39	**2.51**
14.00	4.01	1.60	1.40
15.00	4.21	1.75	1.06
16.00	4.37	1.87	0.87
17.00	4.50	1.97	0.75
18.00	4.62	2.07	0.67
19.00	4.73	2.15	0.61
20.00	4.82	2.22	0.56
21.00	4.91	2.29	0.52
22.00	4.99	2.36	0.48
23.00	5.07	2.42	0.45
24.00	**5.14**	**2.48**	0.43
25.00	5.14	2.48	0.00
26.00	5.14	2.48	0.00
27.00	5.14	2.48	0.00
28.00	5.14	2.48	0.00
29.00	5.14	2.48	0.00
30.00	5.14	2.48	0.00
31.00	5.14	2.48	0.00
32.00	5.14	2.48	0.00
33.00	5.14	2.48	0.00
34.00	5.14	2.48	0.00
35.00	5.14	2.48	0.00
36.00	5.14	2.48	0.00
37.00	5.14	2.48	0.00
38.00	5.14	2.48	0.00
39.00	5.14	2.48	0.00
40.00	5.14	2.48	0.00
41.00	5.14	2.48	0.00
42.00	5.14	2.48	0.00
43.00	5.14	2.48	0.00
44.00	5.14	2.48	0.00
45.00	5.14	2.48	0.00
46.00	5.14	2.48	0.00
47.00	5.14	2.48	0.00
48.00	5.14	2.48	0.00
49.00	5.14	2.48	0.00
50.00	5.14	2.48	0.00
51.00	5.14	2.48	0.00
52.00	5.14	2.48	0.00
53.00	5.14	2.48	0.00
54.00	5.14	2.48	0.00
55.00	5.14	2.48	0.00
56.00	5.14	2.48	0.00
57.00	5.14	2.48	0.00
58.00	5.14	2.48	0.00
59.00	5.14	2.48	0.00
60.00	5.14	2.48	0.00
61.00	5.14	2.48	0.00
62.00	5.14	2.48	0.00
63.00	5.14	2.48	0.00
64.00	5.14	2.48	0.00
65.00	5.14	2.48	0.00
66.00	5.14	2.48	0.00
67.00	5.14	2.48	0.00
68.00	5.14	2.48	0.00
69.00	5.14	2.48	0.00
70.00	5.14	2.48	0.00
71.00	5.14	2.48	0.00
72.00	5.14	2.48	0.00

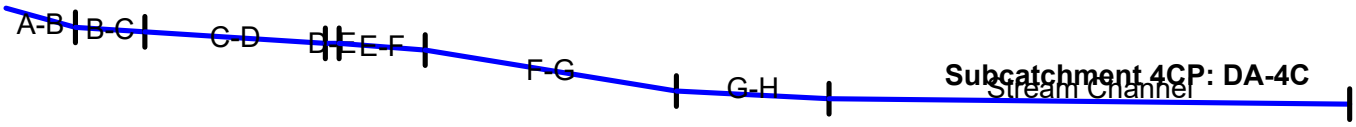
Summary for Subcatchment 4CP: DA-4C

Runoff = 18.39 cfs @ 12.13 hrs, Volume= 1.800 af, Depth= 2.22"
Routed to Link DP-4 : Design Point - 4

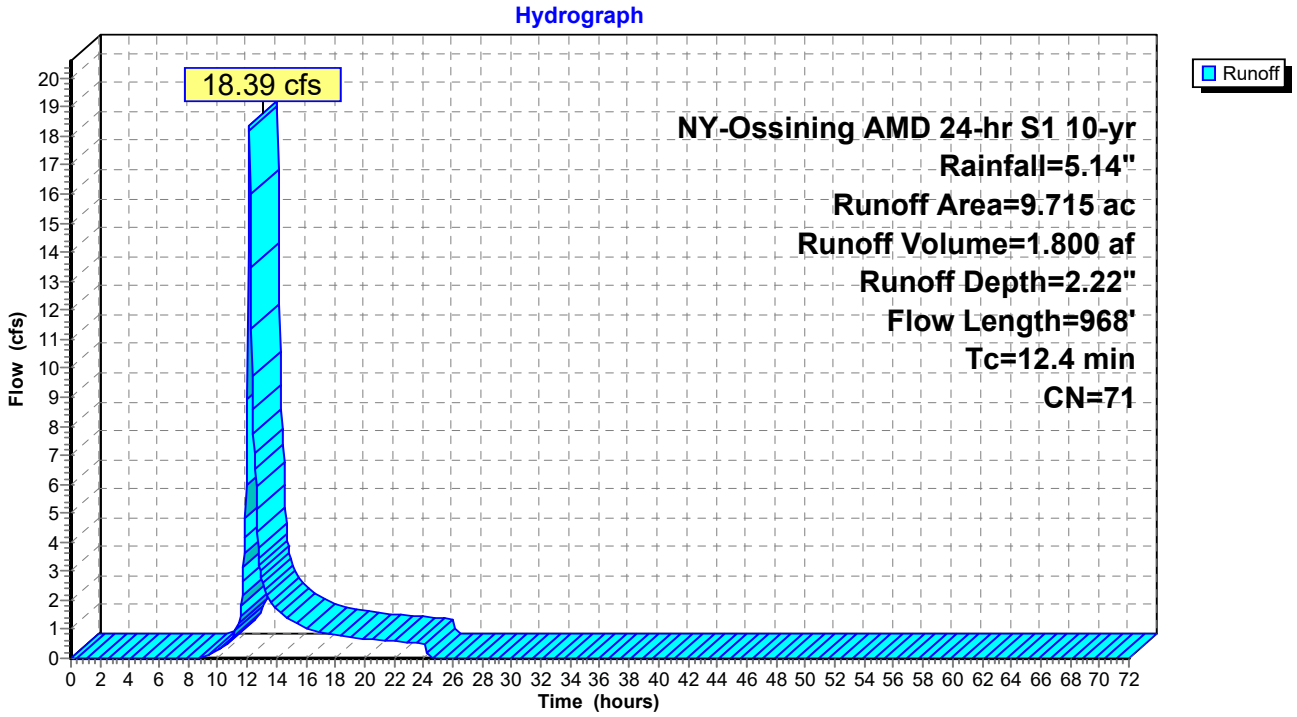
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.00	0.00
8.00	0.78	0.00	0.00
9.00	0.94	0.00	0.07
10.00	1.14	0.02	0.27
11.00	1.44	0.08	0.74
12.00	2.78	0.64	**8.91**
13.00	3.72	1.21	**2.73**
14.00	4.01	1.40	1.66
15.00	4.21	1.54	1.27
16.00	4.37	1.65	1.05
17.00	4.50	1.75	0.91
18.00	4.62	1.83	0.81
19.00	4.73	1.91	0.74
20.00	4.82	1.98	0.68
21.00	4.91	2.05	0.63
22.00	4.99	2.11	0.59
23.00	5.07	2.17	0.56
24.00	**5.14**	**2.22**	0.53
25.00	5.14	2.22	0.00
26.00	5.14	2.22	0.00
27.00	5.14	2.22	0.00
28.00	5.14	2.22	0.00
29.00	5.14	2.22	0.00
30.00	5.14	2.22	0.00
31.00	5.14	2.22	0.00
32.00	5.14	2.22	0.00
33.00	5.14	2.22	0.00
34.00	5.14	2.22	0.00
35.00	5.14	2.22	0.00
36.00	5.14	2.22	0.00
37.00	5.14	2.22	0.00
38.00	5.14	2.22	0.00
39.00	5.14	2.22	0.00
40.00	5.14	2.22	0.00
41.00	5.14	2.22	0.00
42.00	5.14	2.22	0.00
43.00	5.14	2.22	0.00
44.00	5.14	2.22	0.00
45.00	5.14	2.22	0.00
46.00	5.14	2.22	0.00
47.00	5.14	2.22	0.00
48.00	5.14	2.22	0.00
49.00	5.14	2.22	0.00
50.00	5.14	2.22	0.00
51.00	5.14	2.22	0.00
52.00	5.14	2.22	0.00
53.00	5.14	2.22	0.00
54.00	5.14	2.22	0.00
55.00	5.14	2.22	0.00
56.00	5.14	2.22	0.00
57.00	5.14	2.22	0.00
58.00	5.14	2.22	0.00
59.00	5.14	2.22	0.00
60.00	5.14	2.22	0.00
61.00	5.14	2.22	0.00
62.00	5.14	2.22	0.00
63.00	5.14	2.22	0.00
64.00	5.14	2.22	0.00
65.00	5.14	2.22	0.00
66.00	5.14	2.22	0.00
67.00	5.14	2.22	0.00
68.00	5.14	2.22	0.00
69.00	5.14	2.22	0.00
70.00	5.14	2.22	0.00
71.00	5.14	2.22	0.00
72.00	5.14	2.22	0.00

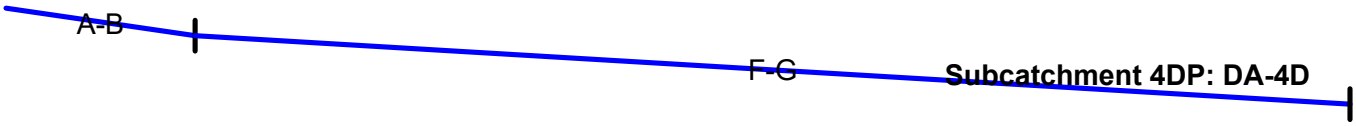
Summary for Subcatchment 4DP: DA-4D

Runoff = 6.48 cfs @ 12.04 hrs, Volume= 0.518 af, Depth= 4.56"
Routed to Pond 6P : Infiltrators

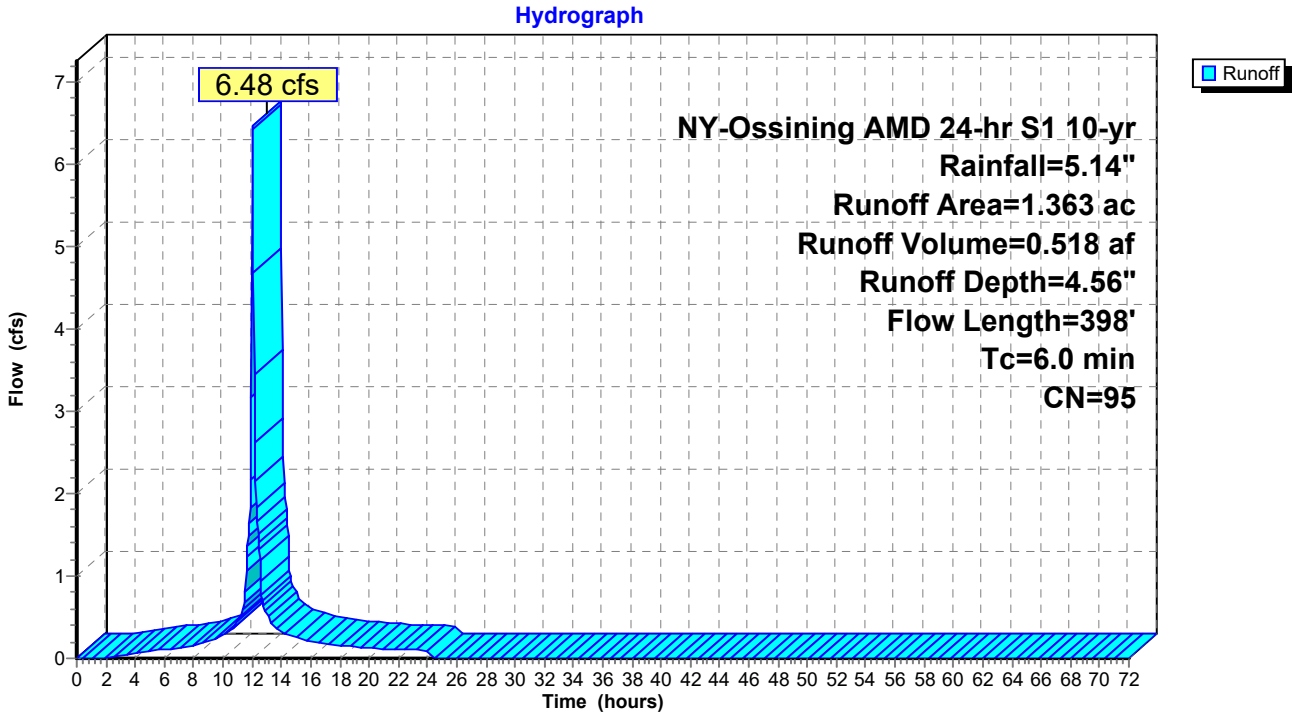
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.01
3.00	0.23	0.02	0.04
4.00	0.32	0.06	0.06
5.00	0.42	0.12	0.08
6.00	0.52	0.18	0.10
7.00	0.64	0.27	0.13
8.00	0.78	0.38	0.16
9.00	0.94	0.51	0.20
10.00	1.14	0.69	0.28
11.00	1.44	0.95	0.45
12.00	2.78	2.24	**5.72**
13.00	3.72	3.15	**0.53**
14.00	4.01	3.44	0.32
15.00	4.21	3.63	0.25
16.00	4.37	3.79	0.20
17.00	4.50	3.93	0.17
18.00	4.62	4.04	0.15
19.00	4.73	4.15	0.14
20.00	4.82	4.24	0.13
21.00	4.91	4.33	0.12
22.00	4.99	4.41	0.11
23.00	5.07	4.49	0.10
24.00	**5.14**	**4.56**	0.10
25.00	5.14	4.56	0.00
26.00	5.14	4.56	0.00
27.00	5.14	4.56	0.00
28.00	5.14	4.56	0.00
29.00	5.14	4.56	0.00
30.00	5.14	4.56	0.00
31.00	5.14	4.56	0.00
32.00	5.14	4.56	0.00
33.00	5.14	4.56	0.00
34.00	5.14	4.56	0.00
35.00	5.14	4.56	0.00
36.00	5.14	4.56	0.00
37.00	5.14	4.56	0.00
38.00	5.14	4.56	0.00
39.00	5.14	4.56	0.00
40.00	5.14	4.56	0.00
41.00	5.14	4.56	0.00
42.00	5.14	4.56	0.00
43.00	5.14	4.56	0.00
44.00	5.14	4.56	0.00
45.00	5.14	4.56	0.00
46.00	5.14	4.56	0.00
47.00	5.14	4.56	0.00
48.00	5.14	4.56	0.00
49.00	5.14	4.56	0.00
50.00	5.14	4.56	0.00
51.00	5.14	4.56	0.00
52.00	5.14	4.56	0.00
53.00	5.14	4.56	0.00
54.00	5.14	4.56	0.00
55.00	5.14	4.56	0.00
56.00	5.14	4.56	0.00
57.00	5.14	4.56	0.00
58.00	5.14	4.56	0.00
59.00	5.14	4.56	0.00
60.00	5.14	4.56	0.00
61.00	5.14	4.56	0.00
62.00	5.14	4.56	0.00
63.00	5.14	4.56	0.00
64.00	5.14	4.56	0.00
65.00	5.14	4.56	0.00
66.00	5.14	4.56	0.00
67.00	5.14	4.56	0.00
68.00	5.14	4.56	0.00
69.00	5.14	4.56	0.00
70.00	5.14	4.56	0.00
71.00	5.14	4.56	0.00
72.00	5.14	4.56	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 4.56" for 10-yr event
Inflow = 6.48 cfs @ 12.04 hrs, Volume= 0.518 af
Outflow = 2.01 cfs @ 12.27 hrs, Volume= 0.518 af, Atten= 69%, Lag= 14.1 min
Discarded = 0.07 cfs @ 6.00 hrs, Volume= 0.149 af
Primary = 1.94 cfs @ 12.27 hrs, Volume= 0.369 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 348.43' @ 12.27 hrs Surf.Area= 0.132 ac Storage= 0.155 af

Plug-Flow detention time= 102.3 min calculated for 0.517 af (100% of inflow)
Center-of-Mass det. time= 102.5 min (874.8 - 772.3)

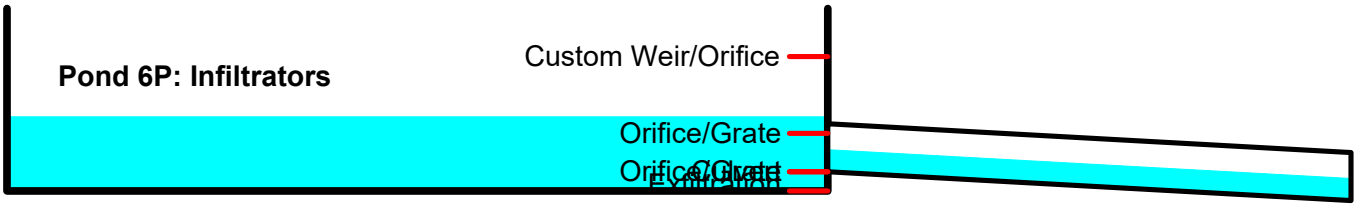
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 6.00 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.94 cfs @ 12.27 hrs HW=348.43' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.94 cfs of 4.19 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.03 cfs @ 5.23 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.91 cfs @ 2.11 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

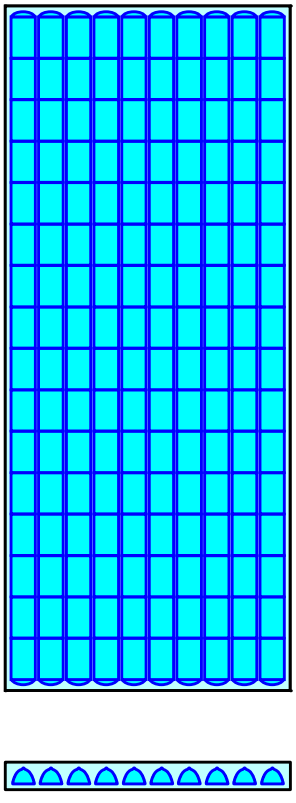
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

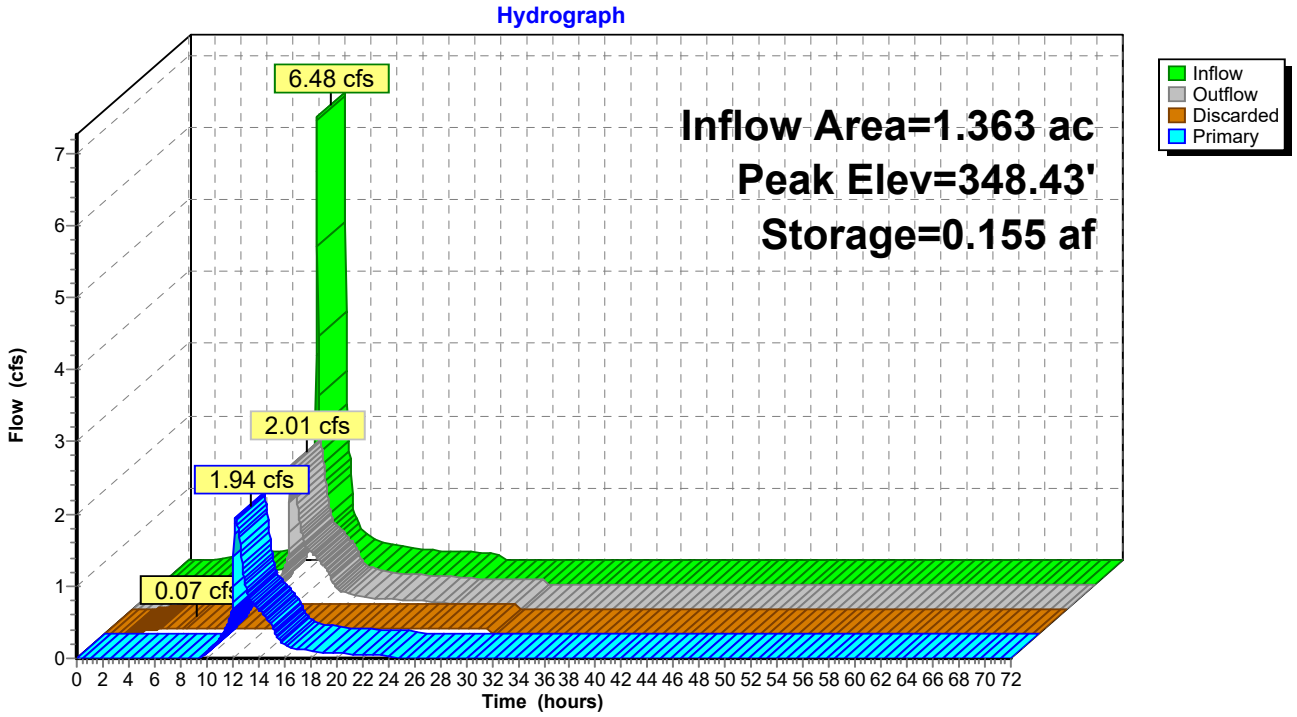
27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

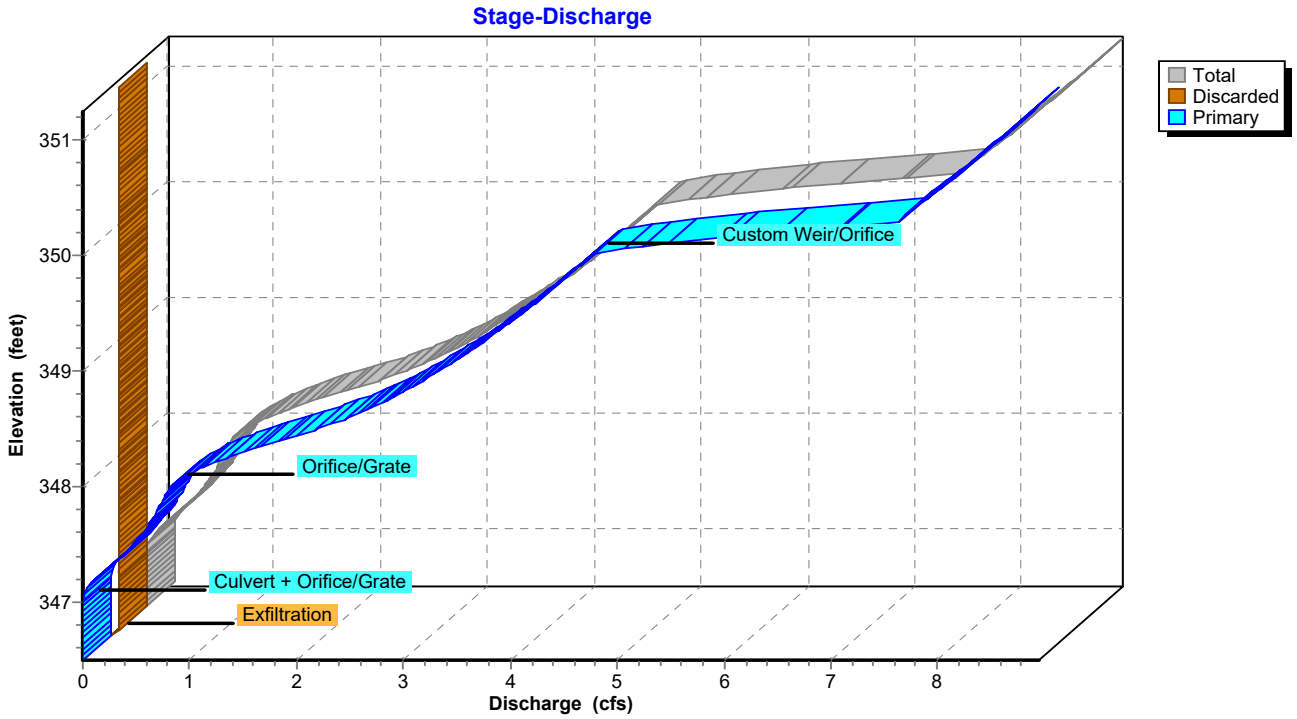
160 Chambers
1,014.0 cy Field
711.7 cy Stone



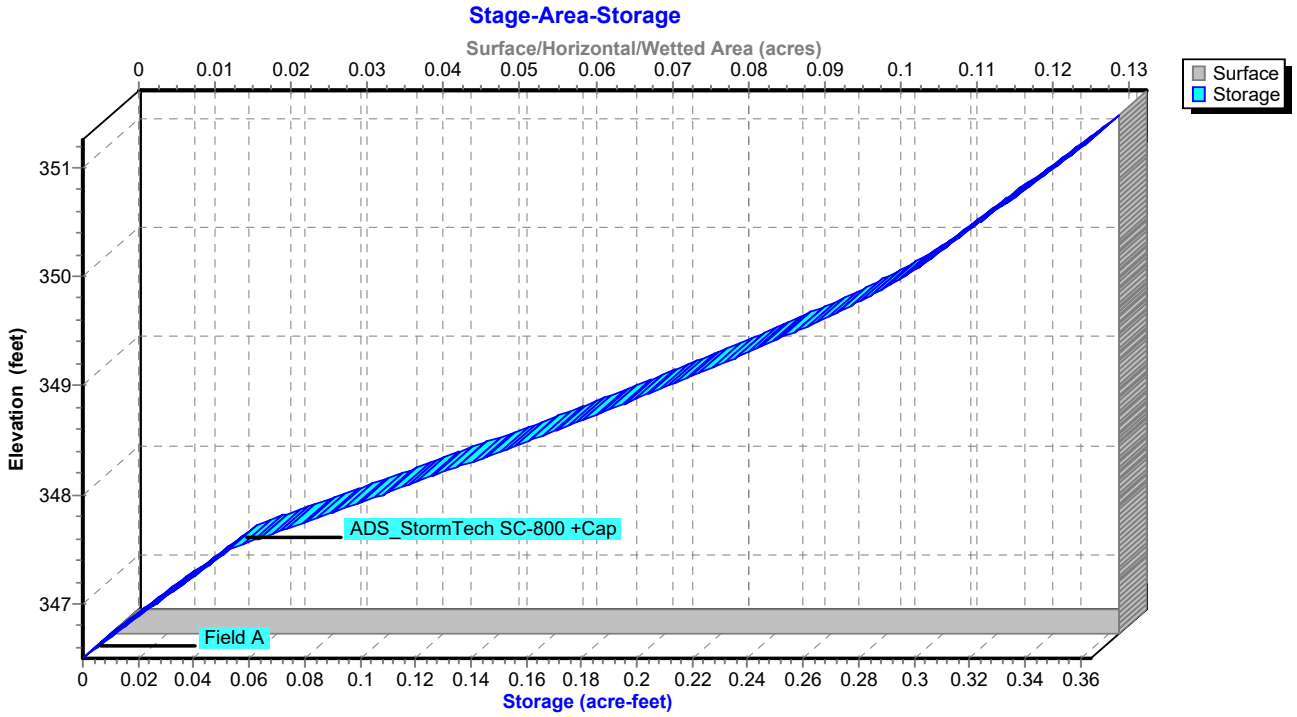
Pond 6P: Infiltrators



Pond 6P: Infiltrators



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.03	0.000	346.50	0.03	0.03	0.00
5.00	0.08	0.000	346.51	0.07	**0.07**	0.00
7.50	0.14	0.010	346.68	0.07	**0.07**	0.00
10.00	**0.28**	**0.035**	**347.16**	**0.14**	0.07	**0.07**
12.50	**1.32**	**0.148**	**348.37**	**1.80**	0.07	**1.73**
15.00	0.25	0.053	347.50	0.54	0.07	0.47
17.50	0.16	0.037	347.20	0.18	0.07	0.11
20.00	0.13	0.035	347.15	0.14	0.07	0.07
22.50	0.10	0.033	347.12	0.11	0.07	0.04
25.00	0.00	0.026	347.00	0.07	0.07	0.00
27.50	0.00	0.013	346.74	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

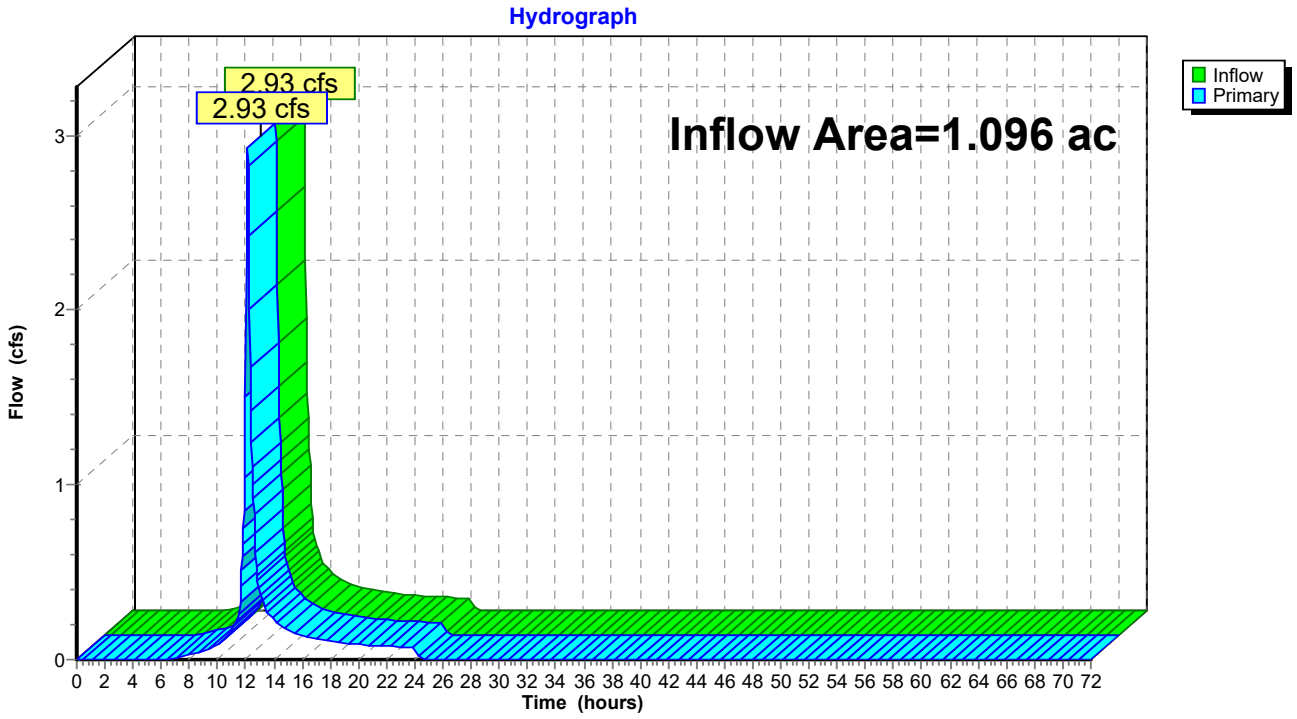
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 3.02" for 10-yr event
Inflow = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af
Primary = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

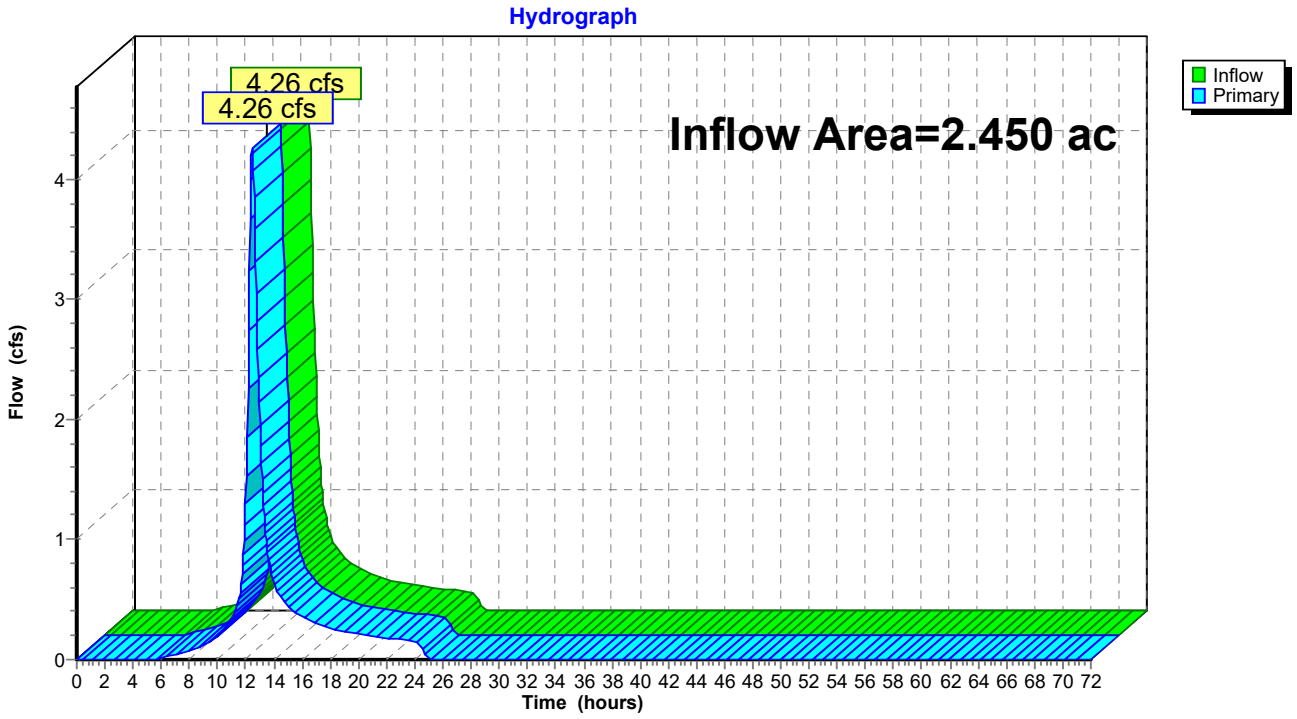
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.01	0.00	0.01
8.00	0.03	0.00	0.03
9.00	0.05	0.00	0.05
10.00	0.09	0.00	0.09
11.00	0.17	0.00	0.17
12.00	**1.51**	0.00	**1.51**
13.00	**0.38**	0.00	**0.38**
14.00	0.23	0.00	0.23
15.00	0.17	0.00	0.17
16.00	0.14	0.00	0.14
17.00	0.12	0.00	0.12
18.00	0.11	0.00	0.11
19.00	0.10	0.00	0.10
20.00	0.09	0.00	0.09
21.00	0.08	0.00	0.08
22.00	0.08	0.00	0.08
23.00	0.07	0.00	0.07
24.00	0.07	0.00	0.07
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 3.30" for 10-yr event
Inflow = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af
Primary = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

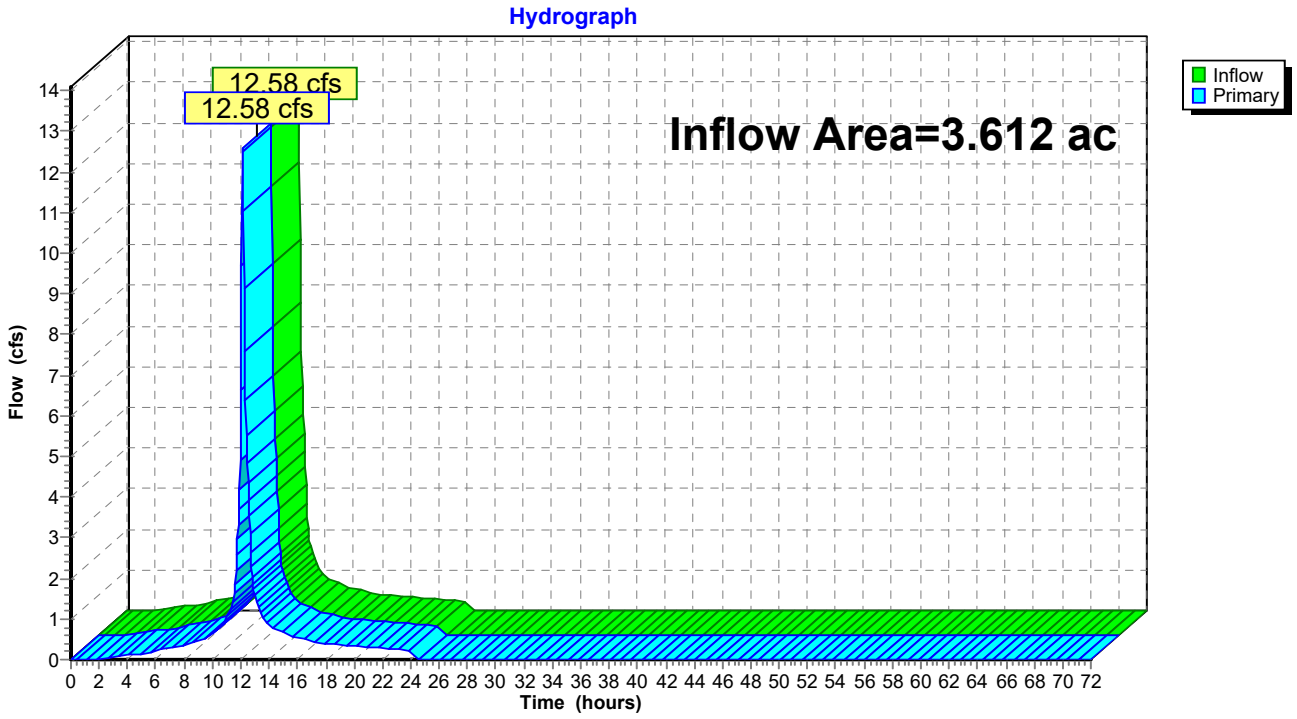
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01
7.00	0.04	0.00	0.04
8.00	0.08	0.00	0.08
9.00	0.13	0.00	0.13
10.00	0.20	0.00	0.20
11.00	0.35	0.00	0.35
12.00	**1.29**	0.00	**1.29**
13.00	**1.96**	0.00	**1.96**
14.00	0.64	0.00	0.64
15.00	0.44	0.00	0.44
16.00	0.35	0.00	0.35
17.00	0.30	0.00	0.30
18.00	0.26	0.00	0.26
19.00	0.23	0.00	0.23
20.00	0.21	0.00	0.21
21.00	0.20	0.00	0.20
22.00	0.18	0.00	0.18
23.00	0.17	0.00	0.17
24.00	0.16	0.00	0.16
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 4.34" for 10-yr event
Inflow = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af
Primary = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

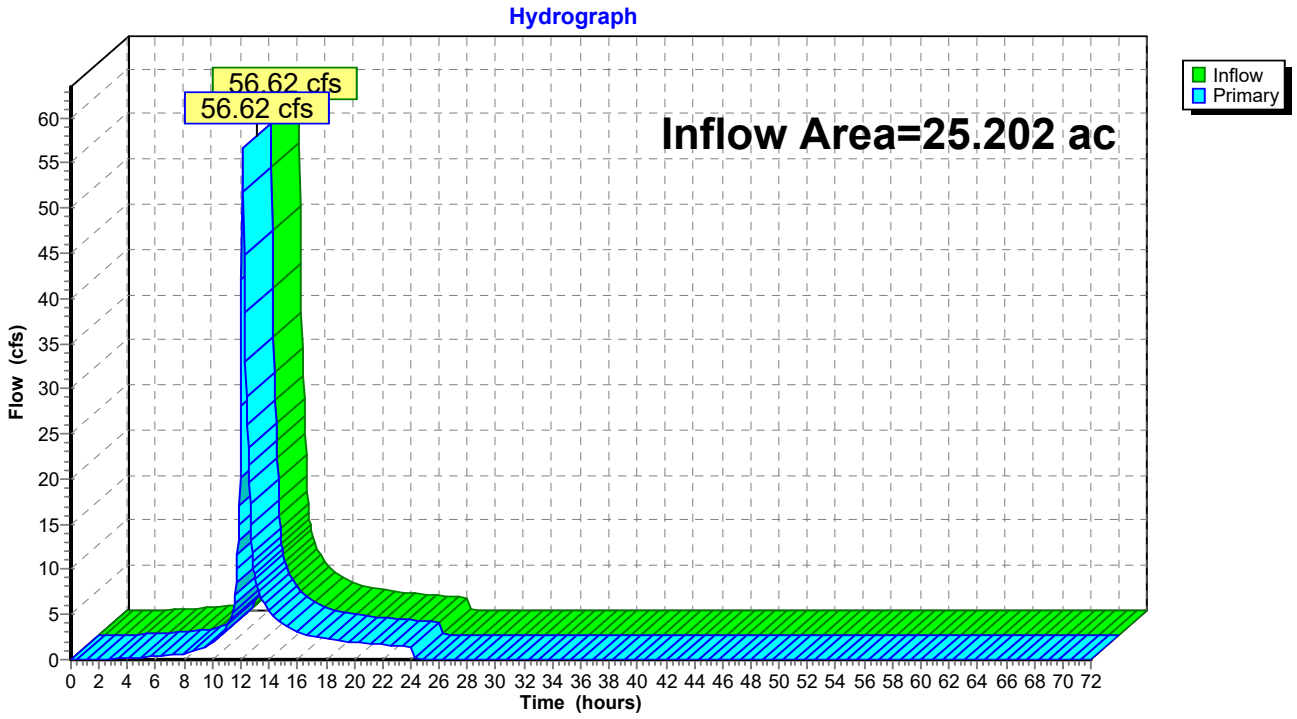
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.05	0.00	0.05
4.00	0.10	0.00	0.10
5.00	0.15	0.00	0.15
6.00	0.21	0.00	0.21
7.00	0.28	0.00	0.28
8.00	0.36	0.00	0.36
9.00	0.47	0.00	0.47
10.00	0.65	0.00	0.65
11.00	1.04	0.00	1.04
12.00	**6.64**	0.00	**6.64**
13.00	**1.54**	0.00	**1.54**
14.00	0.89	0.00	0.89
15.00	0.66	0.00	0.66
16.00	0.54	0.00	0.54
17.00	0.46	0.00	0.46
18.00	0.41	0.00	0.41
19.00	0.37	0.00	0.37
20.00	0.33	0.00	0.33
21.00	0.31	0.00	0.31
22.00	0.29	0.00	0.29
23.00	0.27	0.00	0.27
24.00	0.25	0.00	0.25
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 2.91" for 10-yr event
Inflow = 56.62 cfs @ 12.14 hrs, Volume= 6.114 af
Primary = 56.62 cfs @ 12.14 hrs, Volume= 6.114 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.08	0.00	0.08
4.00	0.19	0.00	0.19
5.00	0.29	0.00	0.29
6.00	0.39	0.00	0.39
7.00	0.51	0.00	0.51
8.00	0.68	0.00	0.68
9.00	1.06	0.00	1.06
10.00	1.85	0.00	1.85
11.00	3.64	0.00	3.64
12.00	**28.15**	0.00	**28.15**
13.00	**9.04**	0.00	**9.04**
14.00	5.36	0.00	5.36
15.00	4.01	0.00	4.01
16.00	3.11	0.00	3.11
17.00	2.64	0.00	2.64
18.00	2.33	0.00	2.33
19.00	2.10	0.00	2.10
20.00	1.92	0.00	1.92
21.00	1.77	0.00	1.77
22.00	1.65	0.00	1.65
23.00	1.55	0.00	1.55
24.00	1.46	0.00	1.46
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=6.84"
Flow Length=253' Tc=12.2 min CN=80 Runoff=5.78 cfs 0.625 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=7.22"
Flow Length=548' Tc=36.4 min CN=83 Runoff=8.31 cfs 1.473 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=8.44"
Flow Length=469' Tc=13.4 min CN=93 Runoff=20.96 cfs 2.542 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=8.44"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=39.79 cfs 4.680 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=6.09"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=30.91 cfs 3.795 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=5.72"
Flow Length=968' Tc=12.4 min CN=71 Runoff=43.12 cfs 4.628 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=8.69"
Flow Length=398' Tc=6.0 min CN=95 Runoff=10.41 cfs 0.987 af

Pond 6P: Infiltrators Peak Elev=349.29' Storage=0.239 af Inflow=10.41 cfs 0.987 af
Discarded=0.07 cfs 0.160 af Primary=3.80 cfs 0.827 af Outflow=3.87 cfs 0.987 af

Link DP-1: Design Point - 1 Inflow=5.78 cfs 0.625 af
Primary=5.78 cfs 0.625 af

Link DP-2: Design Point - 2 Inflow=8.31 cfs 1.473 af
Primary=8.31 cfs 1.473 af

Link DP-3: Design Point - 3 Inflow=20.96 cfs 2.542 af
Primary=20.96 cfs 2.542 af

Link DP-4: Design Point - 4 Inflow=114.75 cfs 13.930 af
Primary=114.75 cfs 13.930 af

Total Runoff Area = 32.360 ac Runoff Volume = 18.730 af Average Runoff Depth = 6.95"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

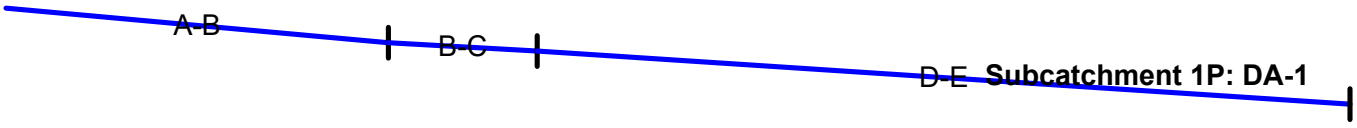
Summary for Subcatchment 1P: DA-1

Runoff = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af, Depth= 6.84"
Routed to Link DP-1 : Design Point - 1

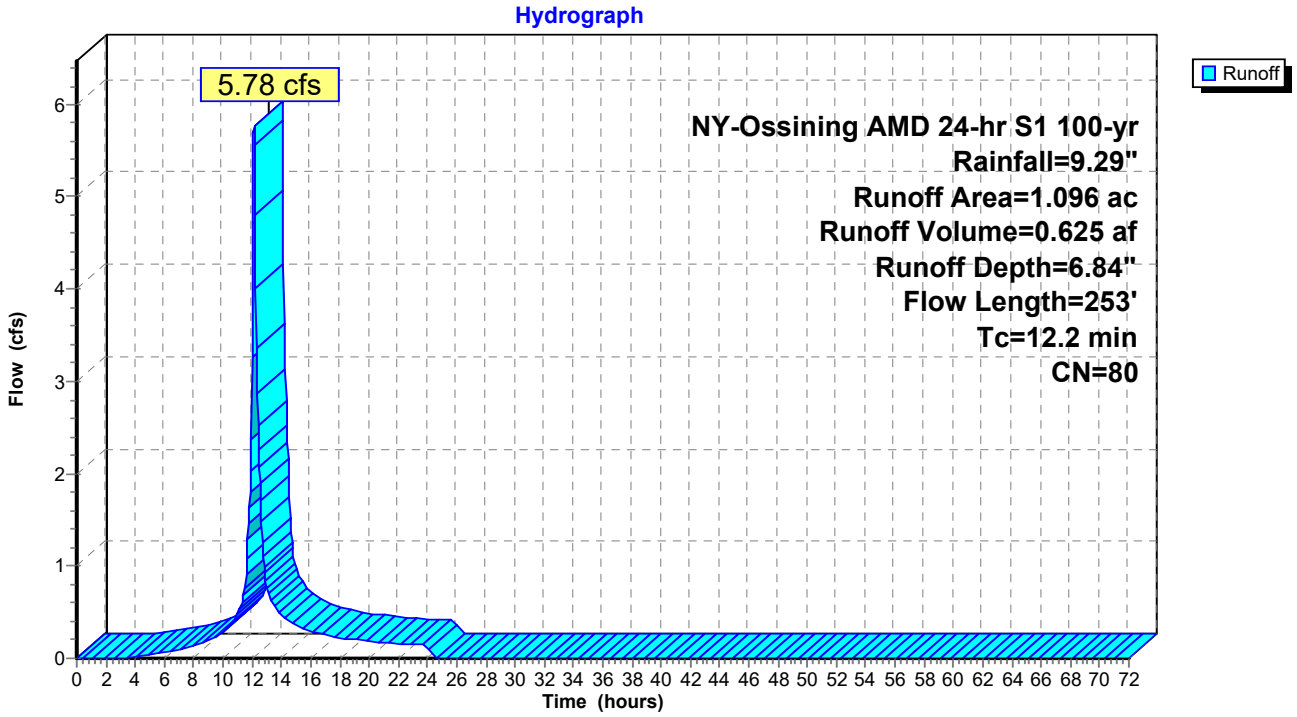
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.01
5.00	0.80	0.03	0.04
6.00	1.00	0.08	0.07
7.00	1.22	0.16	0.10
8.00	1.48	0.28	0.14
9.00	1.78	0.44	0.20
10.00	2.16	0.67	0.28
11.00	2.70	1.03	0.48
12.00	4.96	2.86	**3.26**
13.00	6.61	4.34	**0.78**
14.00	7.14	4.82	0.47
15.00	7.52	5.17	0.36
16.00	7.82	5.45	0.29
17.00	8.07	5.69	0.25
18.00	8.30	5.90	0.22
19.00	8.50	6.09	0.20
20.00	8.68	6.26	0.19
21.00	8.85	6.42	0.17
22.00	9.00	6.57	0.16
23.00	9.15	6.71	0.15
24.00	**9.29**	**6.84**	0.14
25.00	9.29	6.84	0.00
26.00	9.29	6.84	0.00
27.00	9.29	6.84	0.00
28.00	9.29	6.84	0.00
29.00	9.29	6.84	0.00
30.00	9.29	6.84	0.00
31.00	9.29	6.84	0.00
32.00	9.29	6.84	0.00
33.00	9.29	6.84	0.00
34.00	9.29	6.84	0.00
35.00	9.29	6.84	0.00
36.00	9.29	6.84	0.00
37.00	9.29	6.84	0.00
38.00	9.29	6.84	0.00
39.00	9.29	6.84	0.00
40.00	9.29	6.84	0.00
41.00	9.29	6.84	0.00
42.00	9.29	6.84	0.00
43.00	9.29	6.84	0.00
44.00	9.29	6.84	0.00
45.00	9.29	6.84	0.00
46.00	9.29	6.84	0.00
47.00	9.29	6.84	0.00
48.00	9.29	6.84	0.00
49.00	9.29	6.84	0.00
50.00	9.29	6.84	0.00
51.00	9.29	6.84	0.00
52.00	9.29	6.84	0.00
53.00	9.29	6.84	0.00
54.00	9.29	6.84	0.00
55.00	9.29	6.84	0.00
56.00	9.29	6.84	0.00
57.00	9.29	6.84	0.00
58.00	9.29	6.84	0.00
59.00	9.29	6.84	0.00
60.00	9.29	6.84	0.00
61.00	9.29	6.84	0.00
62.00	9.29	6.84	0.00
63.00	9.29	6.84	0.00
64.00	9.29	6.84	0.00
65.00	9.29	6.84	0.00
66.00	9.29	6.84	0.00
67.00	9.29	6.84	0.00
68.00	9.29	6.84	0.00
69.00	9.29	6.84	0.00
70.00	9.29	6.84	0.00
71.00	9.29	6.84	0.00
72.00	9.29	6.84	0.00

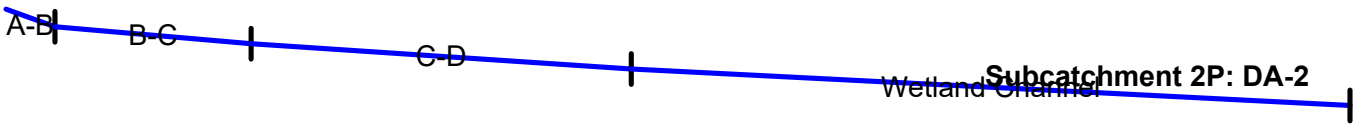
Summary for Subcatchment 2P: DA-2

Runoff = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af, Depth= 7.22"
Routed to Link DP-2 : Design Point - 2

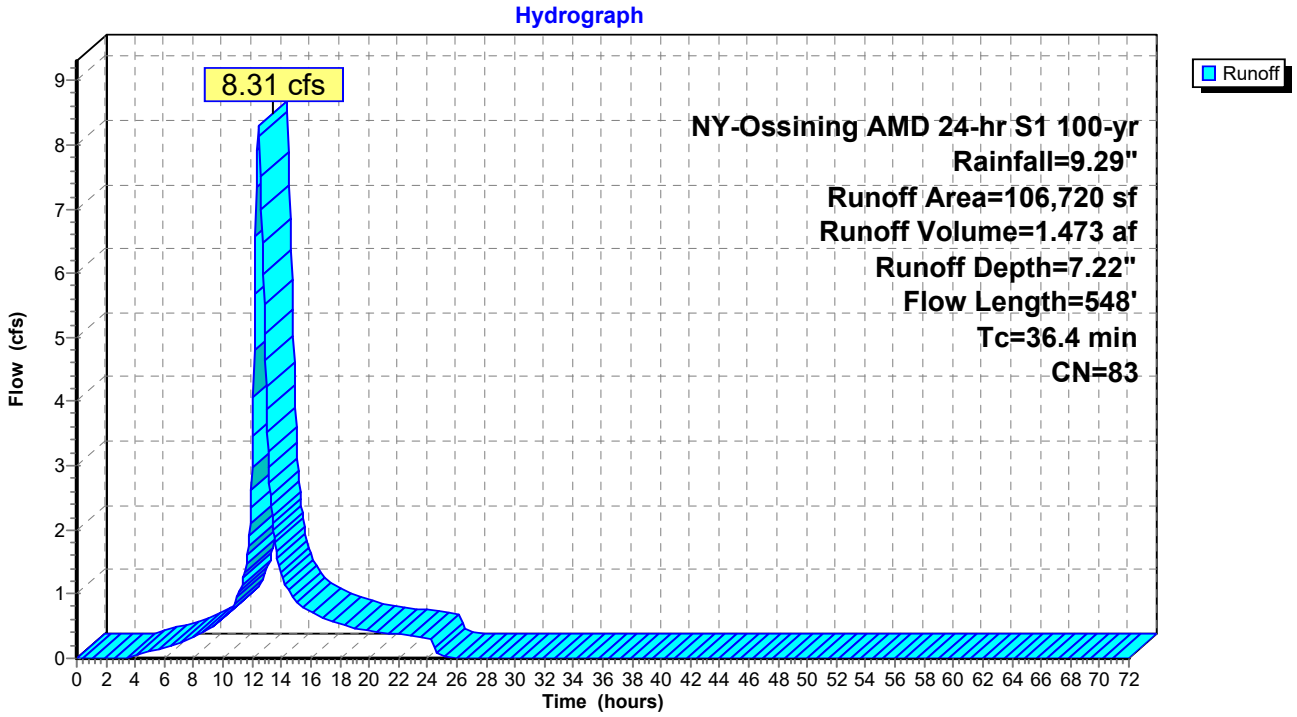
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.02	0.04
5.00	0.80	0.06	0.10
6.00	1.00	0.13	0.17
7.00	1.22	0.23	0.24
8.00	1.48	0.37	0.33
9.00	1.78	0.55	0.45
10.00	2.16	0.81	0.62
11.00	2.70	1.21	0.96
12.00	4.96	3.14	**2.98**
13.00	6.61	4.66	**3.86**
14.00	7.14	5.16	1.29
15.00	7.52	5.52	0.89
16.00	7.82	5.80	0.71
17.00	8.07	6.05	0.61
18.00	8.30	6.26	0.53
19.00	8.50	6.45	0.48
20.00	8.68	6.63	0.44
21.00	8.85	6.79	0.40
22.00	9.00	6.94	0.37
23.00	9.15	7.08	0.35
24.00	**9.29**	**7.22**	0.33
25.00	9.29	7.22	0.02
26.00	9.29	7.22	0.00
27.00	9.29	7.22	0.00
28.00	9.29	7.22	0.00
29.00	9.29	7.22	0.00
30.00	9.29	7.22	0.00
31.00	9.29	7.22	0.00
32.00	9.29	7.22	0.00
33.00	9.29	7.22	0.00
34.00	9.29	7.22	0.00
35.00	9.29	7.22	0.00
36.00	9.29	7.22	0.00
37.00	9.29	7.22	0.00
38.00	9.29	7.22	0.00
39.00	9.29	7.22	0.00
40.00	9.29	7.22	0.00
41.00	9.29	7.22	0.00
42.00	9.29	7.22	0.00
43.00	9.29	7.22	0.00
44.00	9.29	7.22	0.00
45.00	9.29	7.22	0.00
46.00	9.29	7.22	0.00
47.00	9.29	7.22	0.00
48.00	9.29	7.22	0.00
49.00	9.29	7.22	0.00
50.00	9.29	7.22	0.00
51.00	9.29	7.22	0.00
52.00	9.29	7.22	0.00
53.00	9.29	7.22	0.00
54.00	9.29	7.22	0.00
55.00	9.29	7.22	0.00
56.00	9.29	7.22	0.00
57.00	9.29	7.22	0.00
58.00	9.29	7.22	0.00
59.00	9.29	7.22	0.00
60.00	9.29	7.22	0.00
61.00	9.29	7.22	0.00
62.00	9.29	7.22	0.00
63.00	9.29	7.22	0.00
64.00	9.29	7.22	0.00
65.00	9.29	7.22	0.00
66.00	9.29	7.22	0.00
67.00	9.29	7.22	0.00
68.00	9.29	7.22	0.00
69.00	9.29	7.22	0.00
70.00	9.29	7.22	0.00
71.00	9.29	7.22	0.00
72.00	9.29	7.22	0.00

Summary for Subcatchment 3P: DA-3

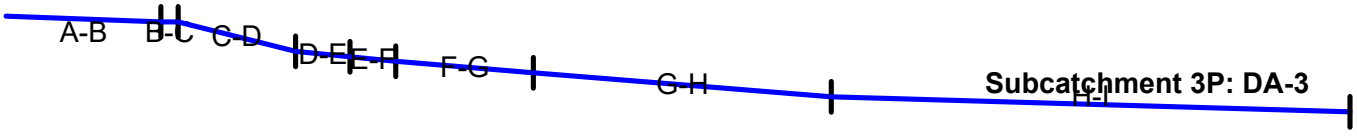
[47] Hint: Peak is 370% of capacity of segment #8

Runoff = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Depth= 8.44"
Routed to Link DP-3 : Design Point - 3

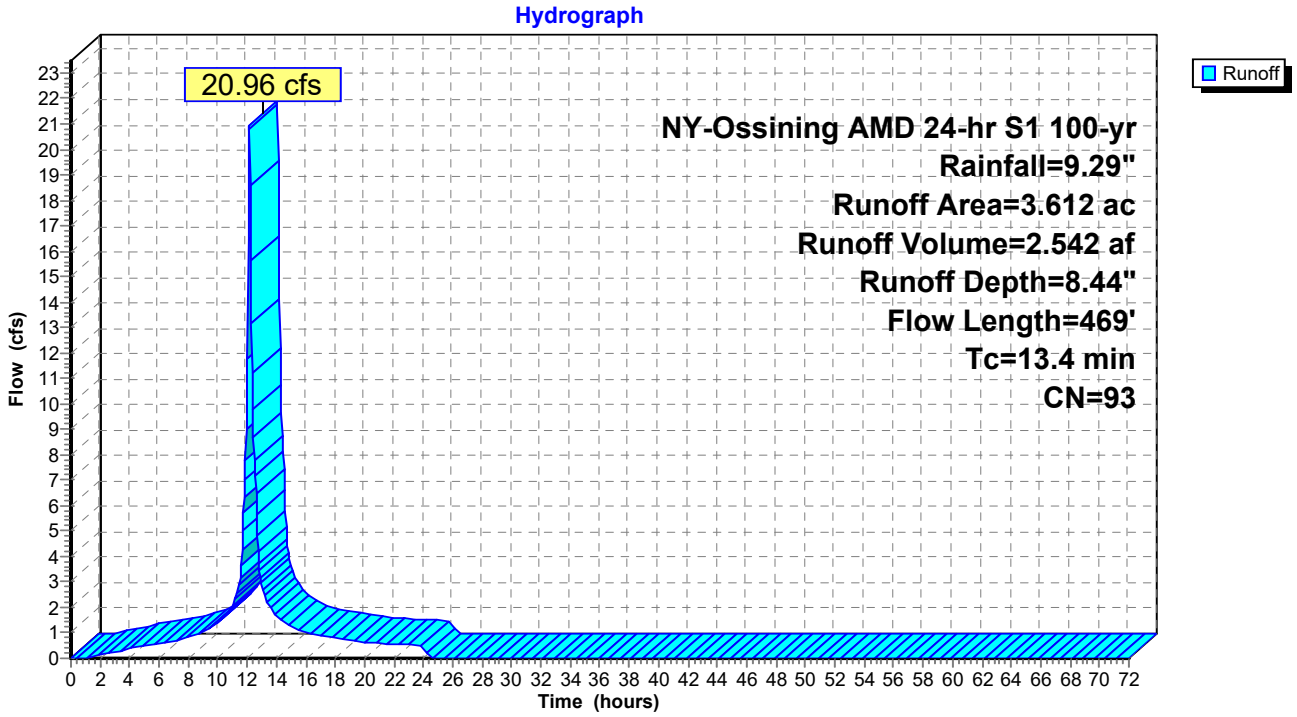
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.02	0.12
3.00	0.44	0.08	0.26
4.00	0.61	0.18	0.37
5.00	0.80	0.30	0.48
6.00	1.00	0.45	0.58
7.00	1.22	0.63	0.70
8.00	1.48	0.85	0.84
9.00	1.78	1.12	1.04
10.00	2.16	1.47	1.38
11.00	2.70	1.97	2.11
12.00	4.96	4.16	**11.76**
13.00	6.61	5.79	**2.86**
14.00	7.14	6.31	1.67
15.00	7.52	6.68	1.25
16.00	7.82	6.98	1.03
17.00	8.07	7.23	0.88
18.00	8.30	7.46	0.78
19.00	8.50	7.66	0.71
20.00	8.68	7.84	0.65
21.00	8.85	8.00	0.60
22.00	9.00	8.16	0.56
23.00	9.15	8.31	0.52
24.00	**9.29**	**8.44**	0.49
25.00	9.29	8.44	0.00
26.00	9.29	8.44	0.00
27.00	9.29	8.44	0.00
28.00	9.29	8.44	0.00
29.00	9.29	8.44	0.00
30.00	9.29	8.44	0.00
31.00	9.29	8.44	0.00
32.00	9.29	8.44	0.00
33.00	9.29	8.44	0.00
34.00	9.29	8.44	0.00
35.00	9.29	8.44	0.00
36.00	9.29	8.44	0.00
37.00	9.29	8.44	0.00
38.00	9.29	8.44	0.00
39.00	9.29	8.44	0.00
40.00	9.29	8.44	0.00
41.00	9.29	8.44	0.00
42.00	9.29	8.44	0.00
43.00	9.29	8.44	0.00
44.00	9.29	8.44	0.00
45.00	9.29	8.44	0.00
46.00	9.29	8.44	0.00
47.00	9.29	8.44	0.00
48.00	9.29	8.44	0.00
49.00	9.29	8.44	0.00
50.00	9.29	8.44	0.00
51.00	9.29	8.44	0.00
52.00	9.29	8.44	0.00
53.00	9.29	8.44	0.00
54.00	9.29	8.44	0.00
55.00	9.29	8.44	0.00
56.00	9.29	8.44	0.00
57.00	9.29	8.44	0.00
58.00	9.29	8.44	0.00
59.00	9.29	8.44	0.00
60.00	9.29	8.44	0.00
61.00	9.29	8.44	0.00
62.00	9.29	8.44	0.00
63.00	9.29	8.44	0.00
64.00	9.29	8.44	0.00
65.00	9.29	8.44	0.00
66.00	9.29	8.44	0.00
67.00	9.29	8.44	0.00
68.00	9.29	8.44	0.00
69.00	9.29	8.44	0.00
70.00	9.29	8.44	0.00
71.00	9.29	8.44	0.00
72.00	9.29	8.44	0.00

Summary for Subcatchment 4AP: DA-4A

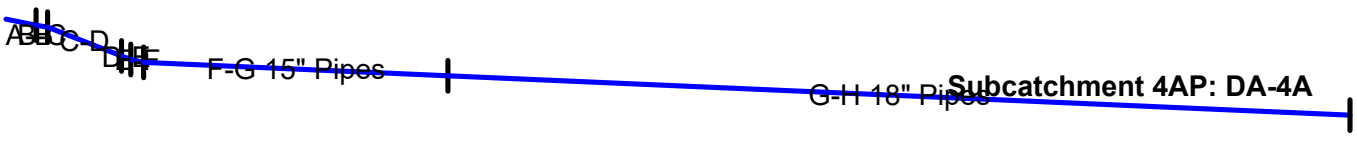
[47] Hint: Peak is 871% of capacity of segment #6
[47] Hint: Peak is 536% of capacity of segment #7

Runoff = 39.79 cfs @ 12.12 hrs, Volume= 4.680 af, Depth= 8.44"
Routed to Link DP-4 : Design Point - 4

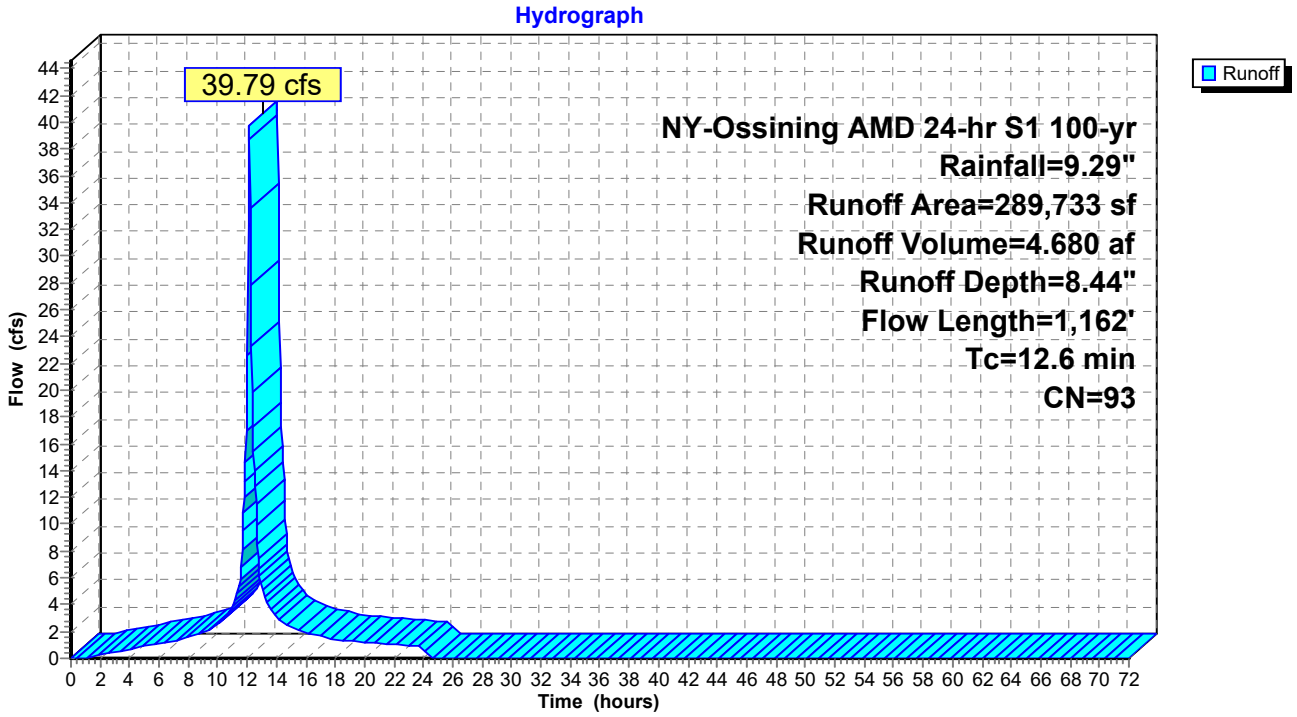
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.02	0.23
3.00	0.44	0.08	0.48
4.00	0.61	0.18	0.69
5.00	0.80	0.30	0.88
6.00	1.00	0.45	1.07
7.00	1.22	0.63	1.29
8.00	1.48	0.85	1.55
9.00	1.78	1.12	1.93
10.00	2.16	1.47	2.54
11.00	2.70	1.97	3.91
12.00	4.96	4.16	**22.63**
13.00	6.61	5.79	**5.19**
14.00	7.14	6.31	3.06
15.00	7.52	6.68	2.30
16.00	7.82	6.98	1.89
17.00	8.07	7.23	1.62
18.00	8.30	7.46	1.44
19.00	8.50	7.66	1.30
20.00	8.68	7.84	1.19
21.00	8.85	8.00	1.10
22.00	9.00	8.16	1.02
23.00	9.15	8.31	0.96
24.00	**9.29**	**8.44**	0.91
25.00	9.29	8.44	0.00
26.00	9.29	8.44	0.00
27.00	9.29	8.44	0.00
28.00	9.29	8.44	0.00
29.00	9.29	8.44	0.00
30.00	9.29	8.44	0.00
31.00	9.29	8.44	0.00
32.00	9.29	8.44	0.00
33.00	9.29	8.44	0.00
34.00	9.29	8.44	0.00
35.00	9.29	8.44	0.00
36.00	9.29	8.44	0.00
37.00	9.29	8.44	0.00
38.00	9.29	8.44	0.00
39.00	9.29	8.44	0.00
40.00	9.29	8.44	0.00
41.00	9.29	8.44	0.00
42.00	9.29	8.44	0.00
43.00	9.29	8.44	0.00
44.00	9.29	8.44	0.00
45.00	9.29	8.44	0.00
46.00	9.29	8.44	0.00
47.00	9.29	8.44	0.00
48.00	9.29	8.44	0.00
49.00	9.29	8.44	0.00
50.00	9.29	8.44	0.00
51.00	9.29	8.44	0.00
52.00	9.29	8.44	0.00
53.00	9.29	8.44	0.00
54.00	9.29	8.44	0.00
55.00	9.29	8.44	0.00
56.00	9.29	8.44	0.00
57.00	9.29	8.44	0.00
58.00	9.29	8.44	0.00
59.00	9.29	8.44	0.00
60.00	9.29	8.44	0.00
61.00	9.29	8.44	0.00
62.00	9.29	8.44	0.00
63.00	9.29	8.44	0.00
64.00	9.29	8.44	0.00
65.00	9.29	8.44	0.00
66.00	9.29	8.44	0.00
67.00	9.29	8.44	0.00
68.00	9.29	8.44	0.00
69.00	9.29	8.44	0.00
70.00	9.29	8.44	0.00
71.00	9.29	8.44	0.00
72.00	9.29	8.44	0.00

Summary for Subcatchment 4BP: DA-4B

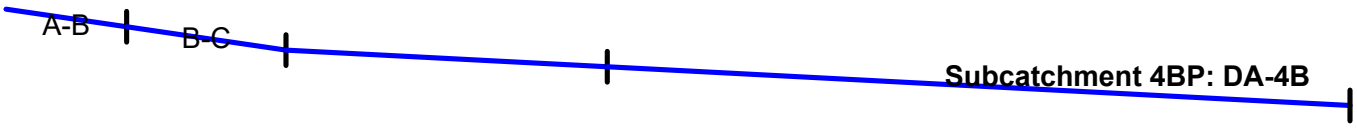
[47] Hint: Peak is 1227% of capacity of segment #3
[47] Hint: Peak is 193% of capacity of segment #4

Runoff = 30.91 cfs @ 12.19 hrs, Volume= 3.795 af, Depth= 6.09"
Routed to Link DP-4 : Design Point - 4

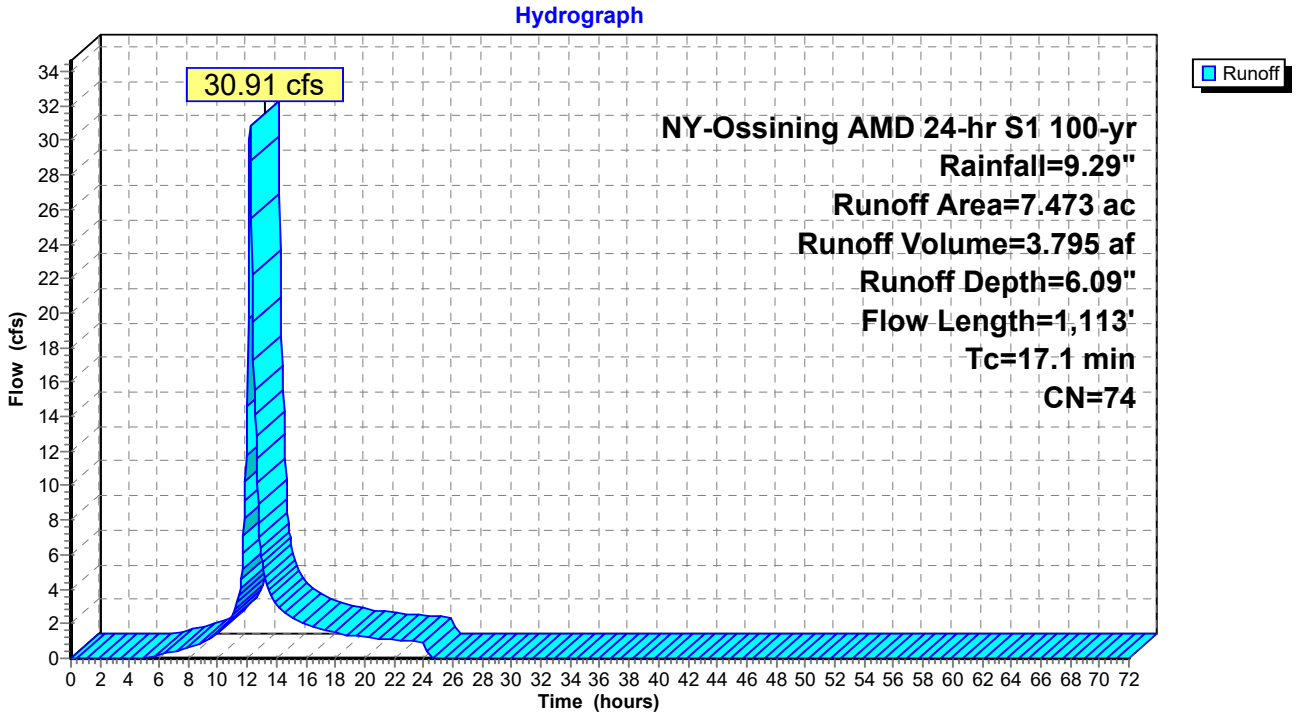
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.00
5.00	0.80	0.00	0.04
6.00	1.00	0.02	0.19
7.00	1.22	0.07	0.38
8.00	1.48	0.14	0.61
9.00	1.78	0.25	0.94
10.00	2.16	0.43	1.46
11.00	2.70	0.73	2.55
12.00	4.96	2.34	**14.57**
13.00	6.61	3.71	**5.56**
14.00	7.14	4.16	3.11
15.00	7.52	4.49	2.34
16.00	7.82	4.76	1.93
17.00	8.07	4.99	1.66
18.00	8.30	5.19	1.47
19.00	8.50	5.37	1.33
20.00	8.68	5.54	1.22
21.00	8.85	5.69	1.13
22.00	9.00	5.83	1.06
23.00	9.15	5.97	1.00
24.00	**9.29**	**6.09**	0.94
25.00	9.29	6.09	0.00
26.00	9.29	6.09	0.00
27.00	9.29	6.09	0.00
28.00	9.29	6.09	0.00
29.00	9.29	6.09	0.00
30.00	9.29	6.09	0.00
31.00	9.29	6.09	0.00
32.00	9.29	6.09	0.00
33.00	9.29	6.09	0.00
34.00	9.29	6.09	0.00
35.00	9.29	6.09	0.00
36.00	9.29	6.09	0.00
37.00	9.29	6.09	0.00
38.00	9.29	6.09	0.00
39.00	9.29	6.09	0.00
40.00	9.29	6.09	0.00
41.00	9.29	6.09	0.00
42.00	9.29	6.09	0.00
43.00	9.29	6.09	0.00
44.00	9.29	6.09	0.00
45.00	9.29	6.09	0.00
46.00	9.29	6.09	0.00
47.00	9.29	6.09	0.00
48.00	9.29	6.09	0.00
49.00	9.29	6.09	0.00
50.00	9.29	6.09	0.00
51.00	9.29	6.09	0.00
52.00	9.29	6.09	0.00
53.00	9.29	6.09	0.00
54.00	9.29	6.09	0.00
55.00	9.29	6.09	0.00
56.00	9.29	6.09	0.00
57.00	9.29	6.09	0.00
58.00	9.29	6.09	0.00
59.00	9.29	6.09	0.00
60.00	9.29	6.09	0.00
61.00	9.29	6.09	0.00
62.00	9.29	6.09	0.00
63.00	9.29	6.09	0.00
64.00	9.29	6.09	0.00
65.00	9.29	6.09	0.00
66.00	9.29	6.09	0.00
67.00	9.29	6.09	0.00
68.00	9.29	6.09	0.00
69.00	9.29	6.09	0.00
70.00	9.29	6.09	0.00
71.00	9.29	6.09	0.00
72.00	9.29	6.09	0.00

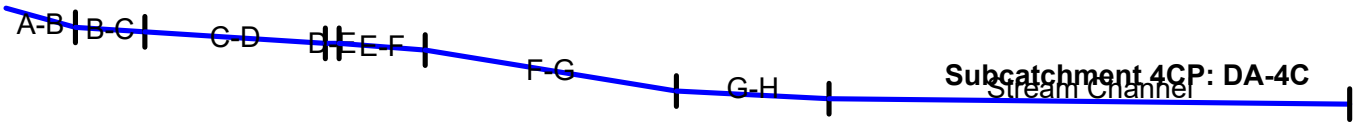
Summary for Subcatchment 4CP: DA-4C

Runoff = 43.12 cfs @ 12.12 hrs, Volume= 4.628 af, Depth= 5.72"
Routed to Link DP-4 : Design Point - 4

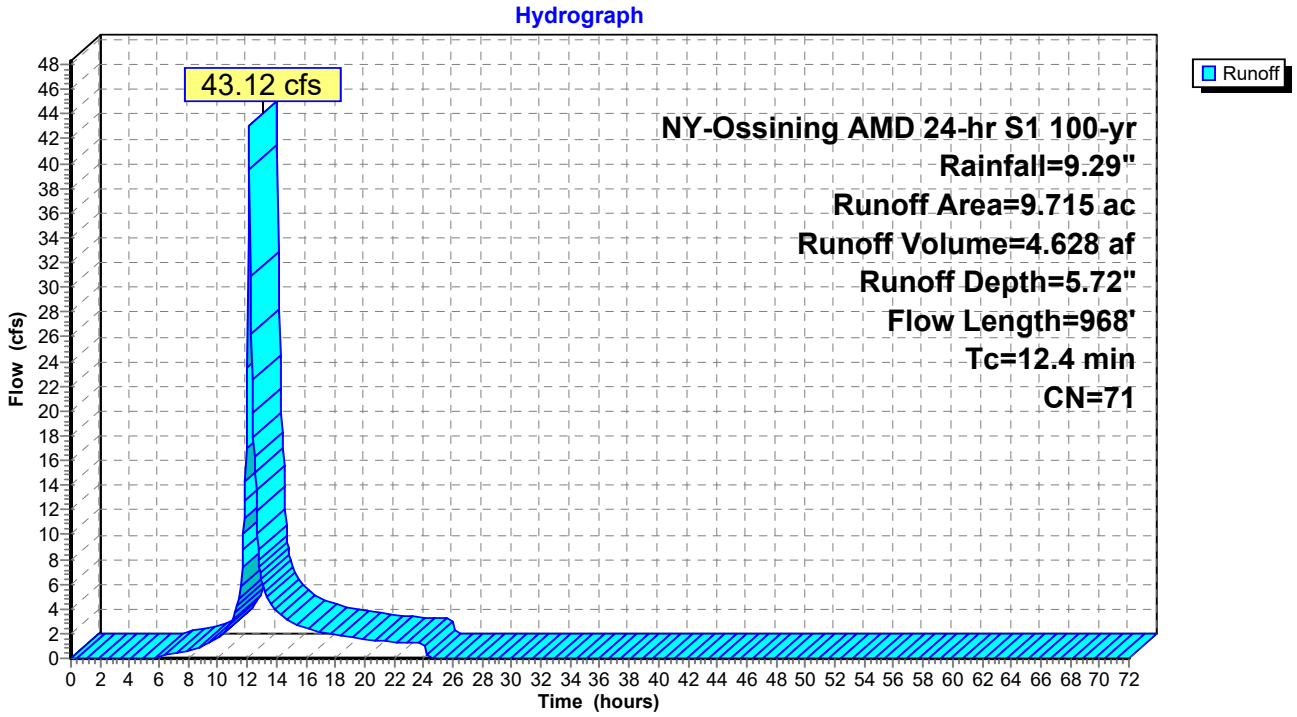
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.00
5.00	0.80	0.00	0.00
6.00	1.00	0.01	0.13
7.00	1.22	0.04	0.36
8.00	1.48	0.09	0.64
9.00	1.78	0.19	1.04
10.00	2.16	0.33	1.68
11.00	2.70	0.60	3.10
12.00	4.96	2.09	**23.50**
13.00	6.61	3.40	**6.29**
14.00	7.14	3.84	3.80
15.00	7.52	4.16	2.89
16.00	7.82	4.42	2.40
17.00	8.07	4.64	2.08
18.00	8.30	4.84	1.85
19.00	8.50	5.01	1.68
20.00	8.68	5.17	1.54
21.00	8.85	5.32	1.43
22.00	9.00	5.46	1.34
23.00	9.15	5.59	1.26
24.00	**9.29**	**5.72**	1.19
25.00	9.29	5.72	0.00
26.00	9.29	5.72	0.00
27.00	9.29	5.72	0.00
28.00	9.29	5.72	0.00
29.00	9.29	5.72	0.00
30.00	9.29	5.72	0.00
31.00	9.29	5.72	0.00
32.00	9.29	5.72	0.00
33.00	9.29	5.72	0.00
34.00	9.29	5.72	0.00
35.00	9.29	5.72	0.00
36.00	9.29	5.72	0.00
37.00	9.29	5.72	0.00
38.00	9.29	5.72	0.00
39.00	9.29	5.72	0.00
40.00	9.29	5.72	0.00
41.00	9.29	5.72	0.00
42.00	9.29	5.72	0.00
43.00	9.29	5.72	0.00
44.00	9.29	5.72	0.00
45.00	9.29	5.72	0.00
46.00	9.29	5.72	0.00
47.00	9.29	5.72	0.00
48.00	9.29	5.72	0.00
49.00	9.29	5.72	0.00
50.00	9.29	5.72	0.00
51.00	9.29	5.72	0.00
52.00	9.29	5.72	0.00
53.00	9.29	5.72	0.00
54.00	9.29	5.72	0.00
55.00	9.29	5.72	0.00
56.00	9.29	5.72	0.00
57.00	9.29	5.72	0.00
58.00	9.29	5.72	0.00
59.00	9.29	5.72	0.00
60.00	9.29	5.72	0.00
61.00	9.29	5.72	0.00
62.00	9.29	5.72	0.00
63.00	9.29	5.72	0.00
64.00	9.29	5.72	0.00
65.00	9.29	5.72	0.00
66.00	9.29	5.72	0.00
67.00	9.29	5.72	0.00
68.00	9.29	5.72	0.00
69.00	9.29	5.72	0.00
70.00	9.29	5.72	0.00
71.00	9.29	5.72	0.00
72.00	9.29	5.72	0.00

Summary for Subcatchment 4DP: DA-4D

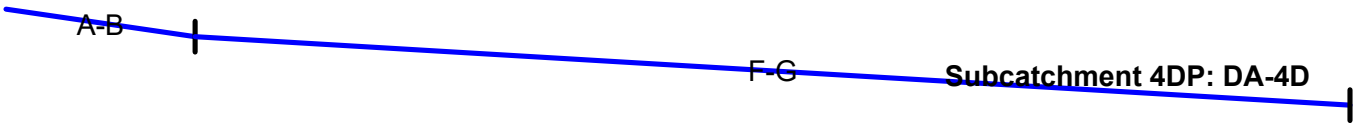
[47] Hint: Peak is 161% of capacity of segment #2

Runoff = 10.41 cfs @ 12.04 hrs, Volume= 0.987 af, Depth= 8.69"
Routed to Pond 6P : Infiltrators

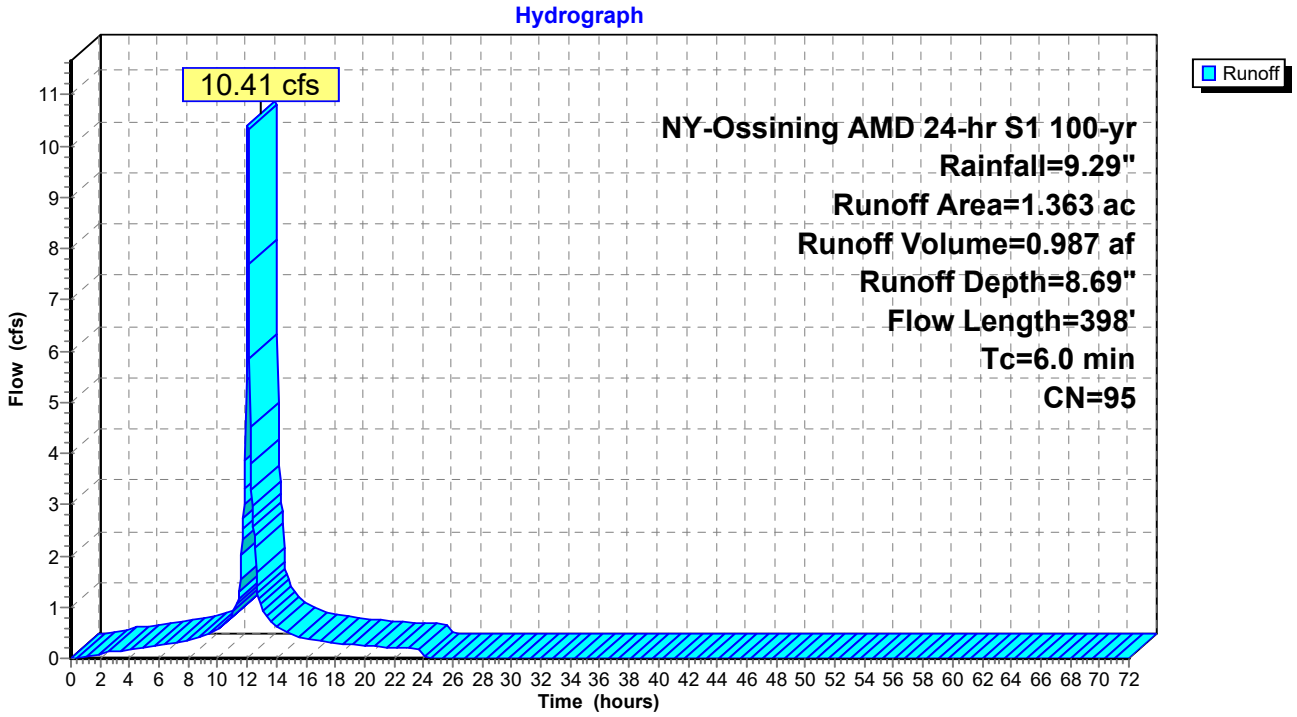
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.01
2.00	0.29	0.05	0.09
3.00	0.44	0.13	0.14
4.00	0.61	0.25	0.18
5.00	0.80	0.39	0.21
6.00	1.00	0.56	0.25
7.00	1.22	0.76	0.29
8.00	1.48	0.99	0.35
9.00	1.78	1.28	0.42
10.00	2.16	1.64	0.56
11.00	2.70	2.16	0.87
12.00	4.96	4.38	**9.27**
13.00	6.61	6.02	**0.97**
14.00	7.14	6.55	0.61
15.00	7.52	6.92	0.46
16.00	7.82	7.22	0.38
17.00	8.07	7.47	0.33
18.00	8.30	7.70	0.29
19.00	8.50	7.90	0.26
20.00	8.68	8.08	0.24
21.00	8.85	8.25	0.22
22.00	9.00	8.40	0.21
23.00	9.15	8.55	0.20
24.00	**9.29**	**8.69**	0.19
25.00	9.29	8.69	0.00
26.00	9.29	8.69	0.00
27.00	9.29	8.69	0.00
28.00	9.29	8.69	0.00
29.00	9.29	8.69	0.00
30.00	9.29	8.69	0.00
31.00	9.29	8.69	0.00
32.00	9.29	8.69	0.00
33.00	9.29	8.69	0.00
34.00	9.29	8.69	0.00
35.00	9.29	8.69	0.00
36.00	9.29	8.69	0.00
37.00	9.29	8.69	0.00
38.00	9.29	8.69	0.00
39.00	9.29	8.69	0.00
40.00	9.29	8.69	0.00
41.00	9.29	8.69	0.00
42.00	9.29	8.69	0.00
43.00	9.29	8.69	0.00
44.00	9.29	8.69	0.00
45.00	9.29	8.69	0.00
46.00	9.29	8.69	0.00
47.00	9.29	8.69	0.00
48.00	9.29	8.69	0.00
49.00	9.29	8.69	0.00
50.00	9.29	8.69	0.00
51.00	9.29	8.69	0.00
52.00	9.29	8.69	0.00
53.00	9.29	8.69	0.00
54.00	9.29	8.69	0.00
55.00	9.29	8.69	0.00
56.00	9.29	8.69	0.00
57.00	9.29	8.69	0.00
58.00	9.29	8.69	0.00
59.00	9.29	8.69	0.00
60.00	9.29	8.69	0.00
61.00	9.29	8.69	0.00
62.00	9.29	8.69	0.00
63.00	9.29	8.69	0.00
64.00	9.29	8.69	0.00
65.00	9.29	8.69	0.00
66.00	9.29	8.69	0.00
67.00	9.29	8.69	0.00
68.00	9.29	8.69	0.00
69.00	9.29	8.69	0.00
70.00	9.29	8.69	0.00
71.00	9.29	8.69	0.00
72.00	9.29	8.69	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 8.69" for 100-yr event
Inflow = 10.41 cfs @ 12.04 hrs, Volume= 0.987 af
Outflow = 3.87 cfs @ 12.25 hrs, Volume= 0.987 af, Atten= 63%, Lag= 12.6 min
Discarded = 0.07 cfs @ 2.70 hrs, Volume= 0.160 af
Primary = 3.80 cfs @ 12.25 hrs, Volume= 0.827 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 349.29' @ 12.25 hrs Surf.Area= 0.132 ac Storage= 0.239 af

Plug-Flow detention time= 80.7 min calculated for 0.986 af (100% of inflow)
Center-of-Mass det. time= 80.9 min (837.6 - 756.7)

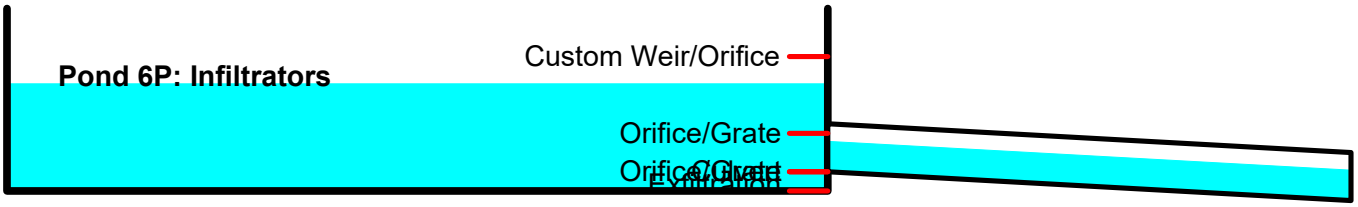
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 2.70 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=3.80 cfs @ 12.25 hrs HW=349.29' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.80 cfs of 6.02 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.35 cfs @ 6.88 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.45 cfs @ 4.90 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

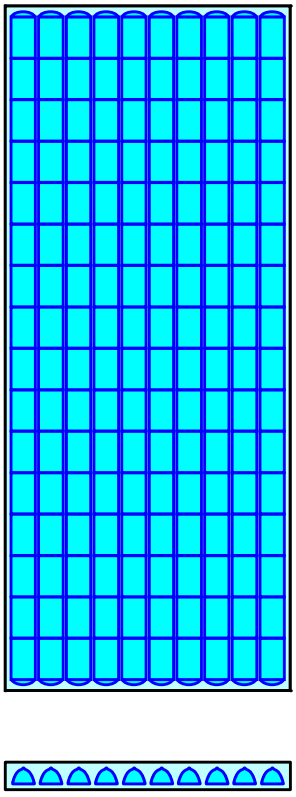
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

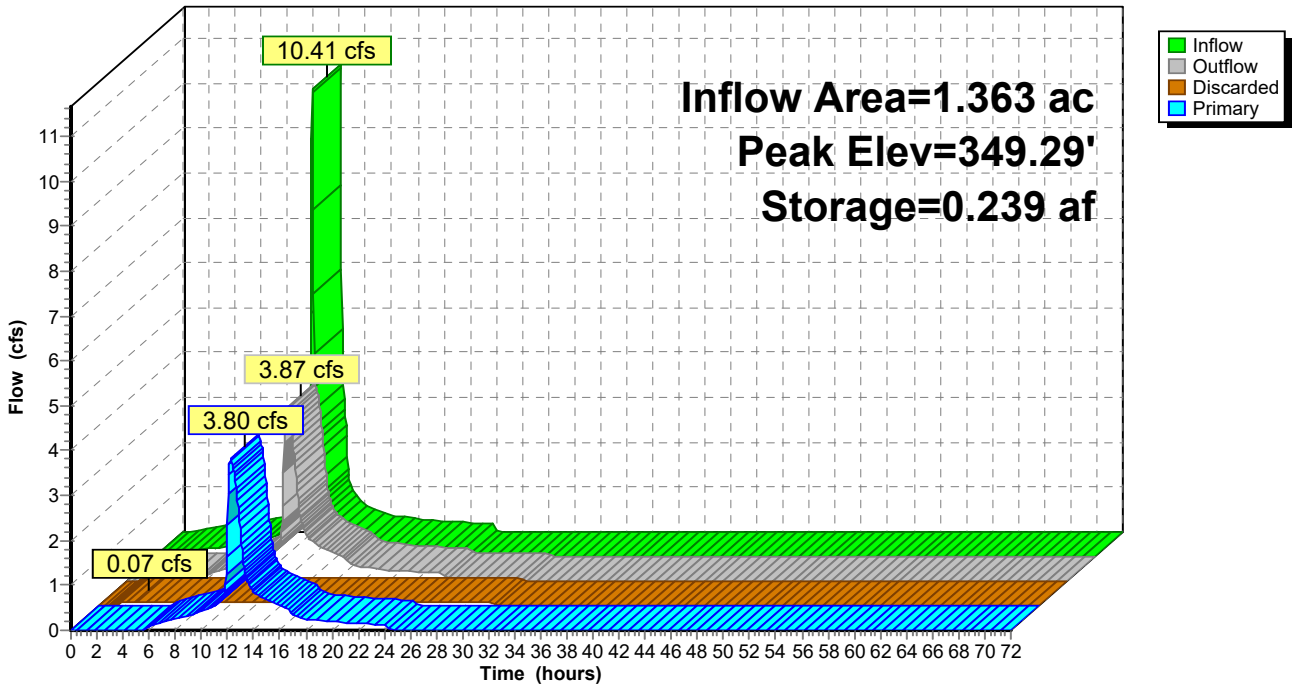
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers
1,014.0 cy Field
711.7 cy Stone



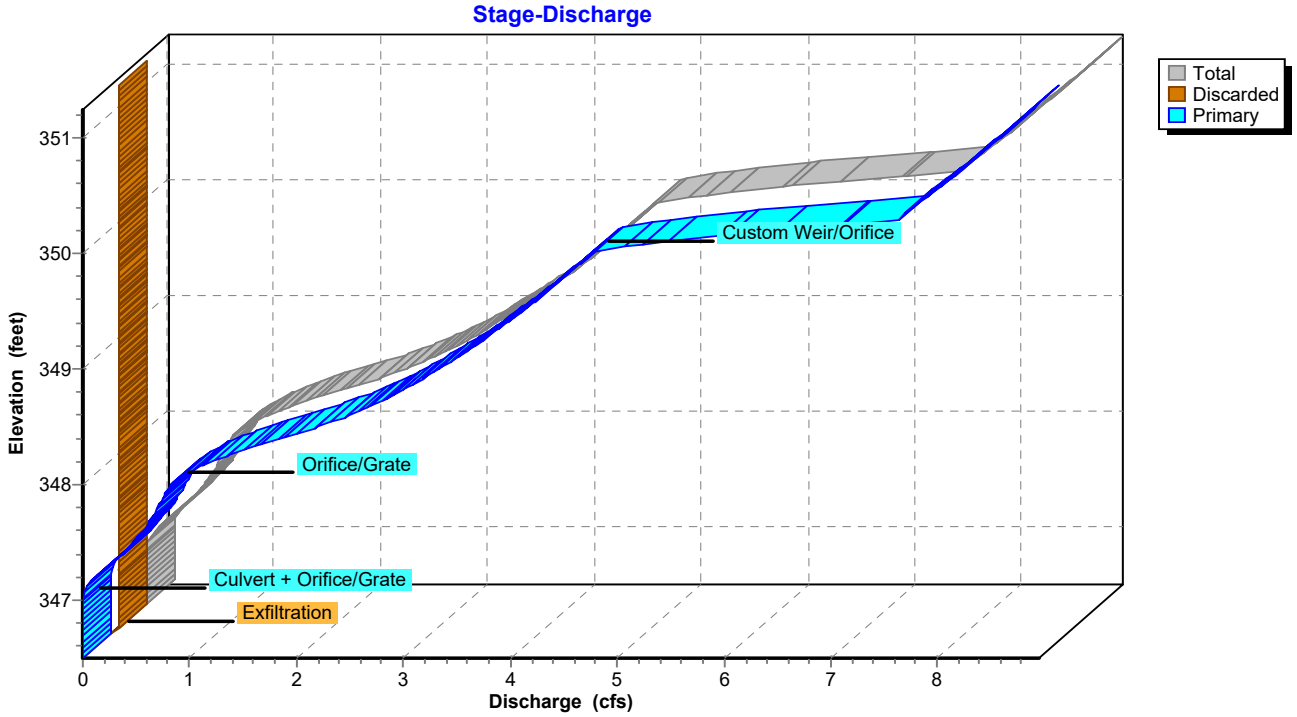
Pond 6P: Infiltrators

Hydrograph

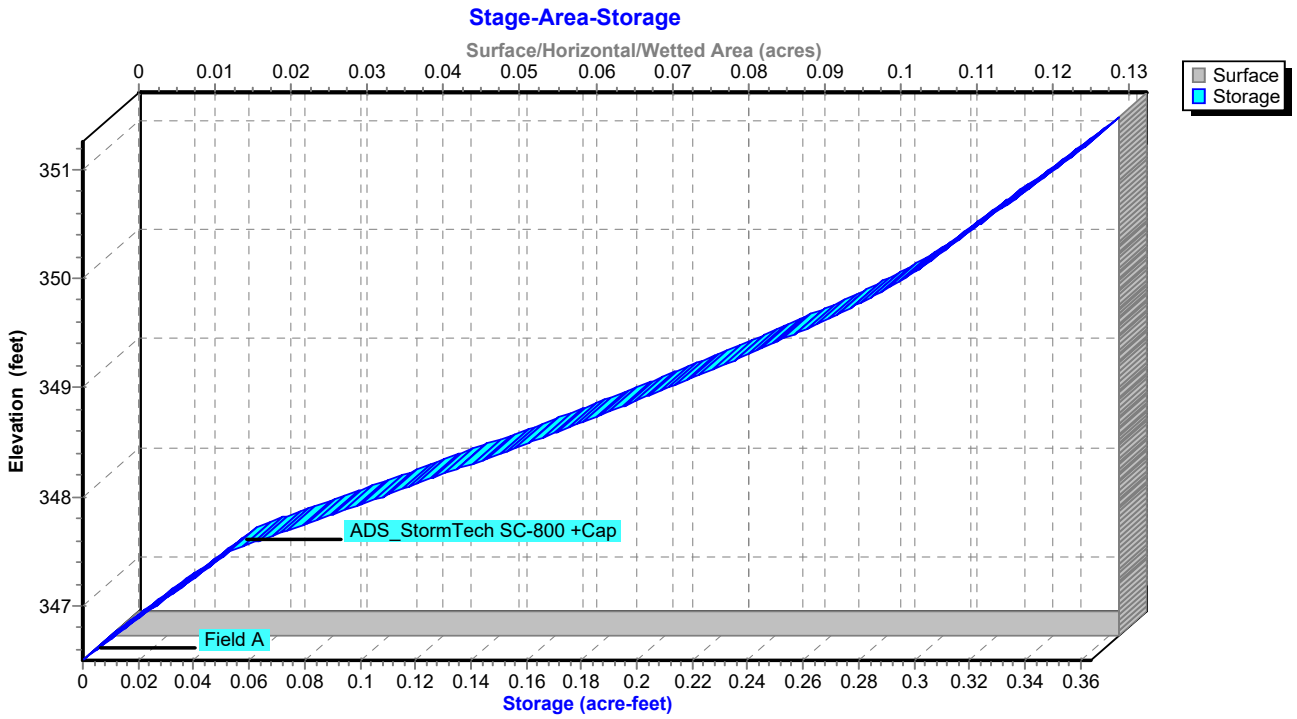


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.11	0.002	346.53	0.07	**0.07**	0.00
5.00	0.21	0.022	346.92	0.07	**0.07**	0.00
7.50	0.32	0.042	347.29	0.28	0.07	0.22
10.00	**0.56**	**0.050**	**347.45**	**0.49**	0.07	**0.42**
12.50	**2.39**	**0.222**	**349.11**	**3.58**	0.07	**3.51**
15.00	0.46	0.086	347.80	0.77	0.07	0.70
17.50	0.31	0.045	347.35	0.36	0.07	0.29
20.00	0.24	0.041	347.27	0.25	0.07	0.19
22.50	0.20	0.039	347.23	0.21	0.07	0.14
25.00	0.00	0.029	347.05	0.07	0.07	0.01
27.50	0.00	0.015	346.79	0.07	0.07	0.00
30.00	0.00	0.002	346.53	0.07	0.07	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

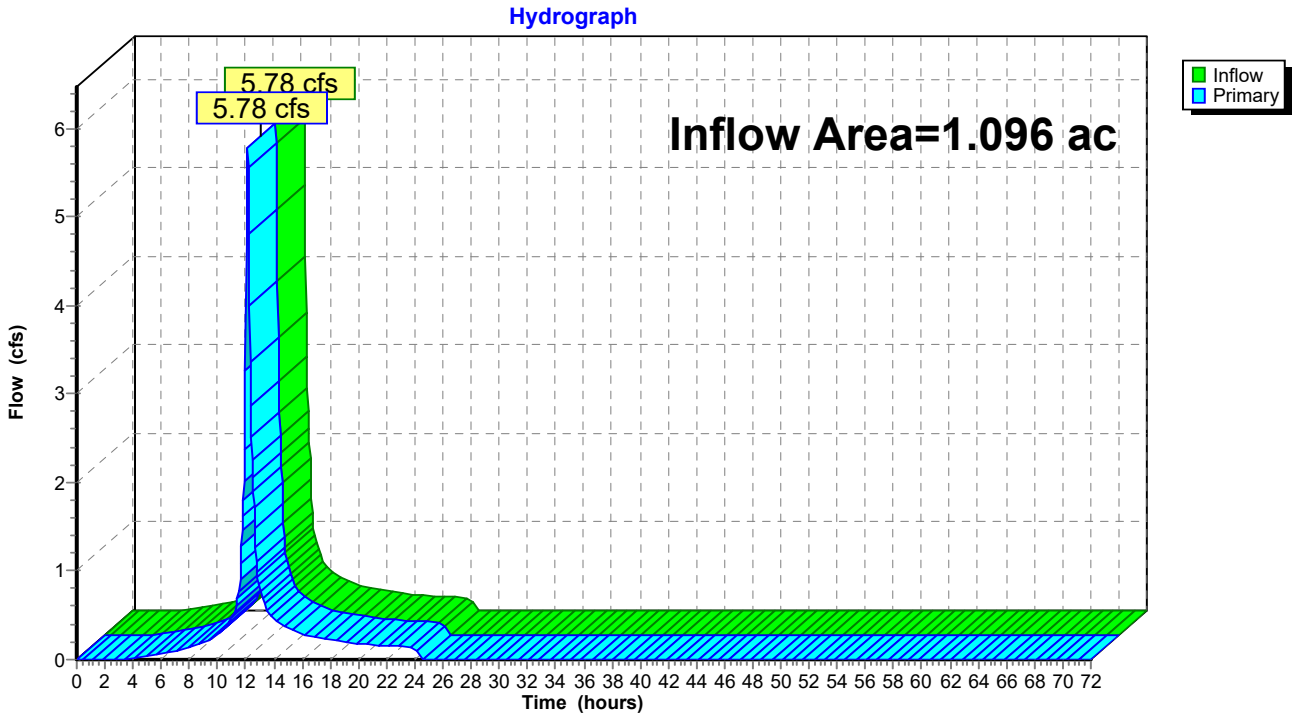
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 6.84" for 100-yr event
Inflow = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af
Primary = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

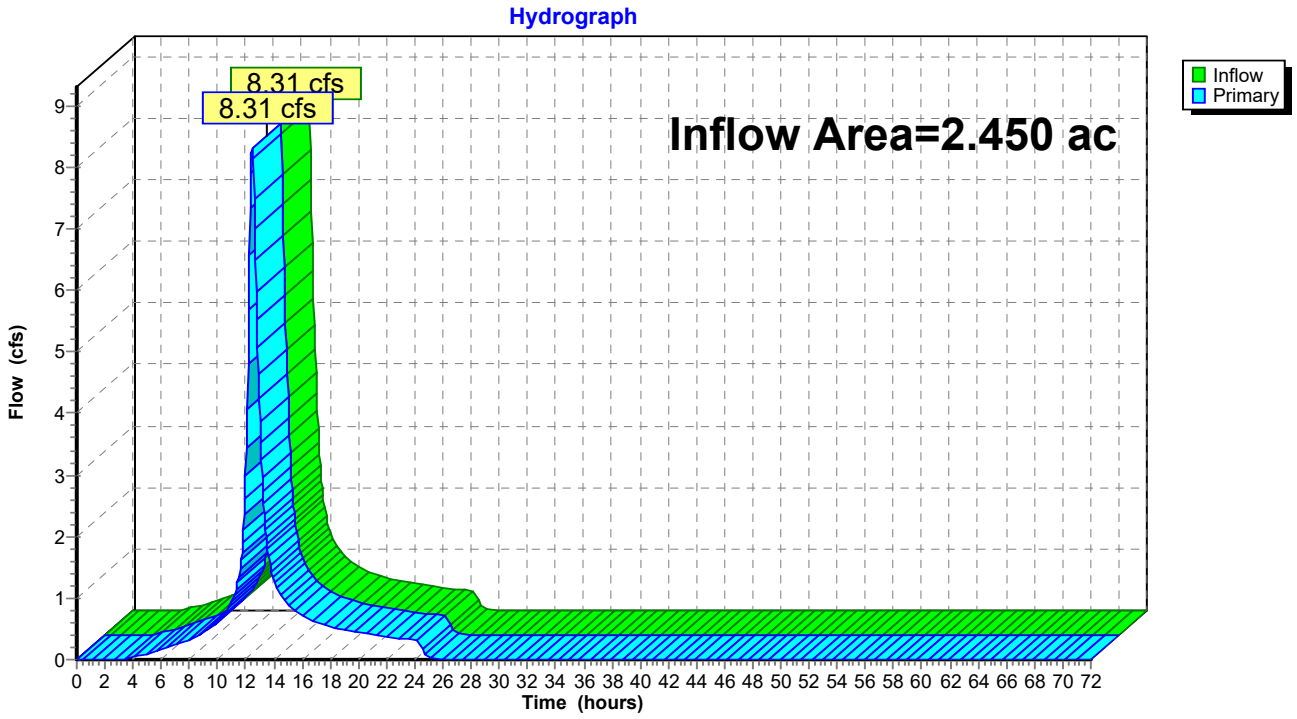
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.01	0.00	0.01
5.00	0.04	0.00	0.04
6.00	0.07	0.00	0.07
7.00	0.10	0.00	0.10
8.00	0.14	0.00	0.14
9.00	0.20	0.00	0.20
10.00	0.28	0.00	0.28
11.00	0.48	0.00	0.48
12.00	**3.26**	0.00	**3.26**
13.00	**0.78**	0.00	**0.78**
14.00	0.47	0.00	0.47
15.00	0.36	0.00	0.36
16.00	0.29	0.00	0.29
17.00	0.25	0.00	0.25
18.00	0.22	0.00	0.22
19.00	0.20	0.00	0.20
20.00	0.19	0.00	0.19
21.00	0.17	0.00	0.17
22.00	0.16	0.00	0.16
23.00	0.15	0.00	0.15
24.00	0.14	0.00	0.14
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 7.22" for 100-yr event
Inflow = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af
Primary = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

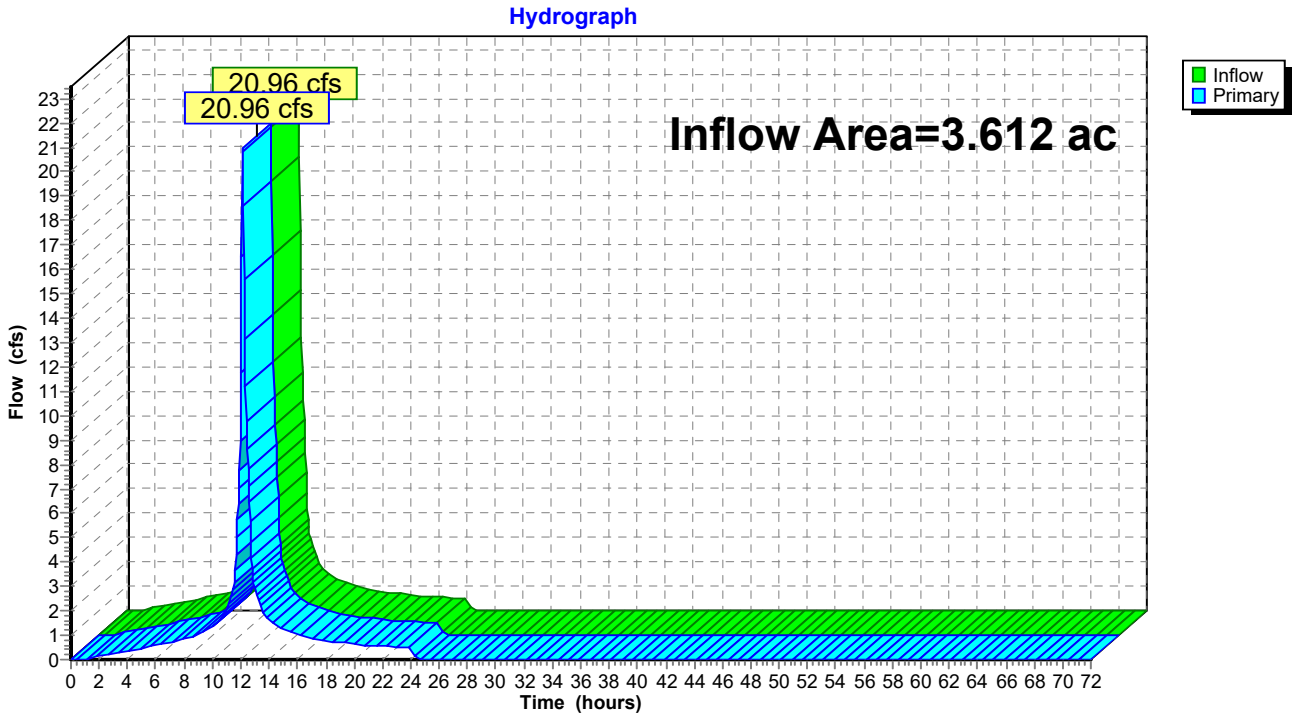
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.04	0.00	0.04
5.00	0.10	0.00	0.10
6.00	0.17	0.00	0.17
7.00	0.24	0.00	0.24
8.00	0.33	0.00	0.33
9.00	0.45	0.00	0.45
10.00	0.62	0.00	0.62
11.00	0.96	0.00	0.96
12.00	**2.98**	0.00	**2.98**
13.00	**3.86**	0.00	**3.86**
14.00	1.29	0.00	1.29
15.00	0.89	0.00	0.89
16.00	0.71	0.00	0.71
17.00	0.61	0.00	0.61
18.00	0.53	0.00	0.53
19.00	0.48	0.00	0.48
20.00	0.44	0.00	0.44
21.00	0.40	0.00	0.40
22.00	0.37	0.00	0.37
23.00	0.35	0.00	0.35
24.00	0.33	0.00	0.33
25.00	0.02	0.00	0.02
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 8.44" for 100-yr event
Inflow = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af
Primary = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

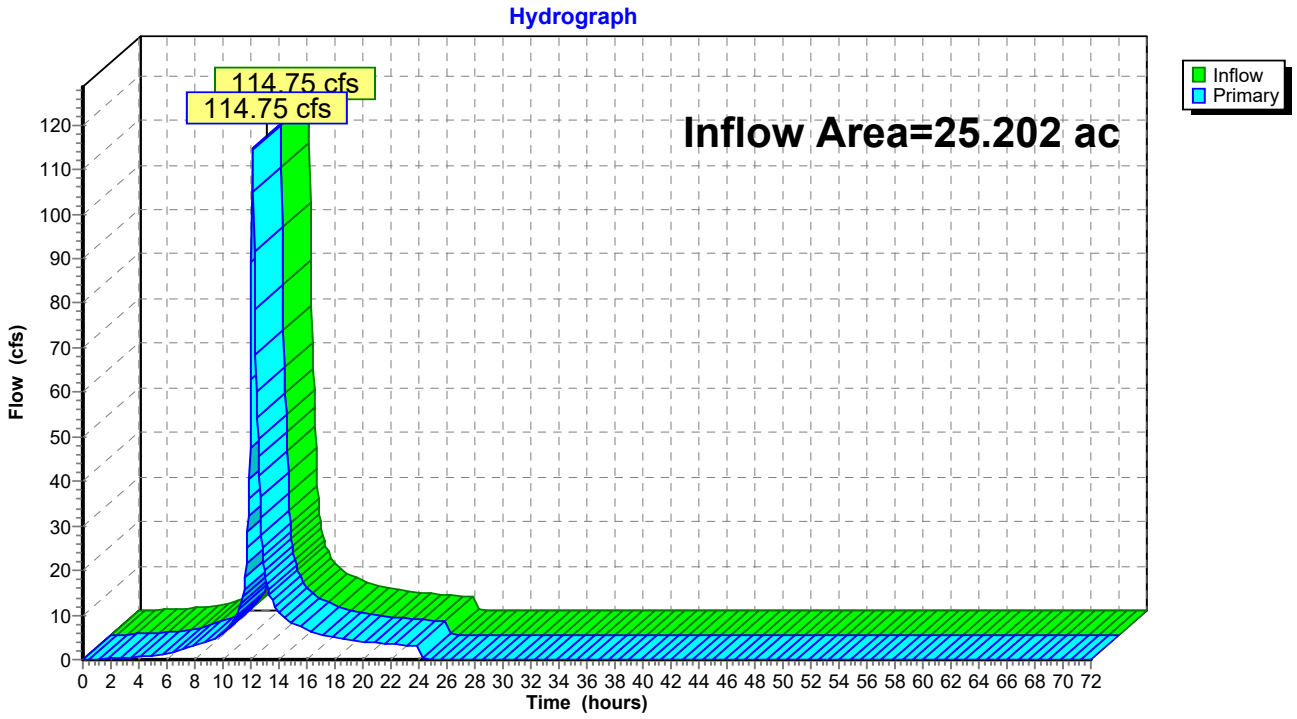
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.12	0.00	0.12
3.00	0.26	0.00	0.26
4.00	0.37	0.00	0.37
5.00	0.48	0.00	0.48
6.00	0.58	0.00	0.58
7.00	0.70	0.00	0.70
8.00	0.84	0.00	0.84
9.00	1.04	0.00	1.04
10.00	1.38	0.00	1.38
11.00	2.11	0.00	2.11
12.00	**11.76**	0.00	**11.76**
13.00	**2.86**	0.00	**2.86**
14.00	1.67	0.00	1.67
15.00	1.25	0.00	1.25
16.00	1.03	0.00	1.03
17.00	0.88	0.00	0.88
18.00	0.78	0.00	0.78
19.00	0.71	0.00	0.71
20.00	0.65	0.00	0.65
21.00	0.60	0.00	0.60
22.00	0.56	0.00	0.56
23.00	0.52	0.00	0.52
24.00	0.49	0.00	0.49
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 6.63" for 100-yr event
Inflow = 114.75 cfs @ 12.14 hrs, Volume= 13.930 af
Primary = 114.75 cfs @ 12.14 hrs, Volume= 13.930 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.23	0.00	0.23
3.00	0.48	0.00	0.48
4.00	0.69	0.00	0.69
5.00	0.91	0.00	0.91
6.00	1.46	0.00	1.46
7.00	2.20	0.00	2.20
8.00	3.06	0.00	3.06
9.00	4.22	0.00	4.22
10.00	6.10	0.00	6.10
11.00	10.10	0.00	10.10
12.00	**63.06**	0.00	**63.06**
13.00	**19.10**	0.00	**19.10**
14.00	10.81	0.00	10.81
15.00	8.23	0.00	8.23
16.00	6.77	0.00	6.77
17.00	5.73	0.00	5.73
18.00	5.01	0.00	5.01
19.00	4.52	0.00	4.52
20.00	4.14	0.00	4.14
21.00	3.83	0.00	3.83
22.00	3.57	0.00	3.57
23.00	3.35	0.00	3.35
24.00	3.17	0.00	3.17
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=8.61"
Flow Length=253' Tc=12.2 min CN=80 Runoff=6.94 cfs 0.786 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=9.00"
Flow Length=548' Tc=36.4 min CN=83 Runoff=9.99 cfs 1.838 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=10.28"
Flow Length=469' Tc=13.4 min CN=93 Runoff=24.40 cfs 3.093 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=10.28"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=46.28 cfs 5.695 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=7.80"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=38.04 cfs 4.857 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=7.39"
Flow Length=968' Tc=12.4 min CN=71 Runoff=53.59 cfs 5.981 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=10.52"
Flow Length=398' Tc=6.0 min CN=95 Runoff=12.03 cfs 1.195 af

Pond 6P: Infiltrators Peak Elev=349.73' Storage=0.277 af Inflow=12.03 cfs 1.195 af
Discarded=0.07 cfs 0.162 af Primary=4.41 cfs 1.033 af Outflow=4.48 cfs 1.195 af

Link DP-1: Design Point - 1 Inflow=6.94 cfs 0.786 af
Primary=6.94 cfs 0.786 af

Link DP-2: Design Point - 2 Inflow=9.99 cfs 1.838 af
Primary=9.99 cfs 1.838 af

Link DP-3: Design Point - 3 Inflow=24.40 cfs 3.093 af
Primary=24.40 cfs 3.093 af

Link DP-4: Design Point - 4 Inflow=138.93 cfs 17.566 af
Primary=138.93 cfs 17.566 af

Total Runoff Area = 32.360 ac Runoff Volume = 23.445 af Average Runoff Depth = 8.69"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

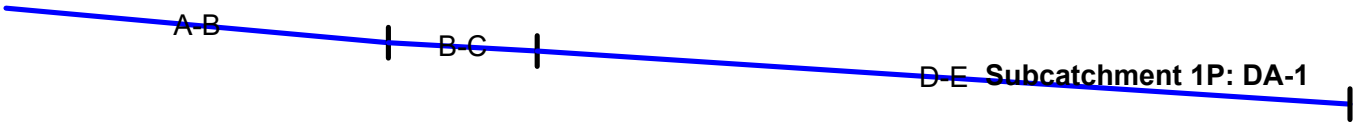
Summary for Subcatchment 1P: DA-1

Runoff = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af, Depth= 8.61"
Routed to Link DP-1 : Design Point - 1

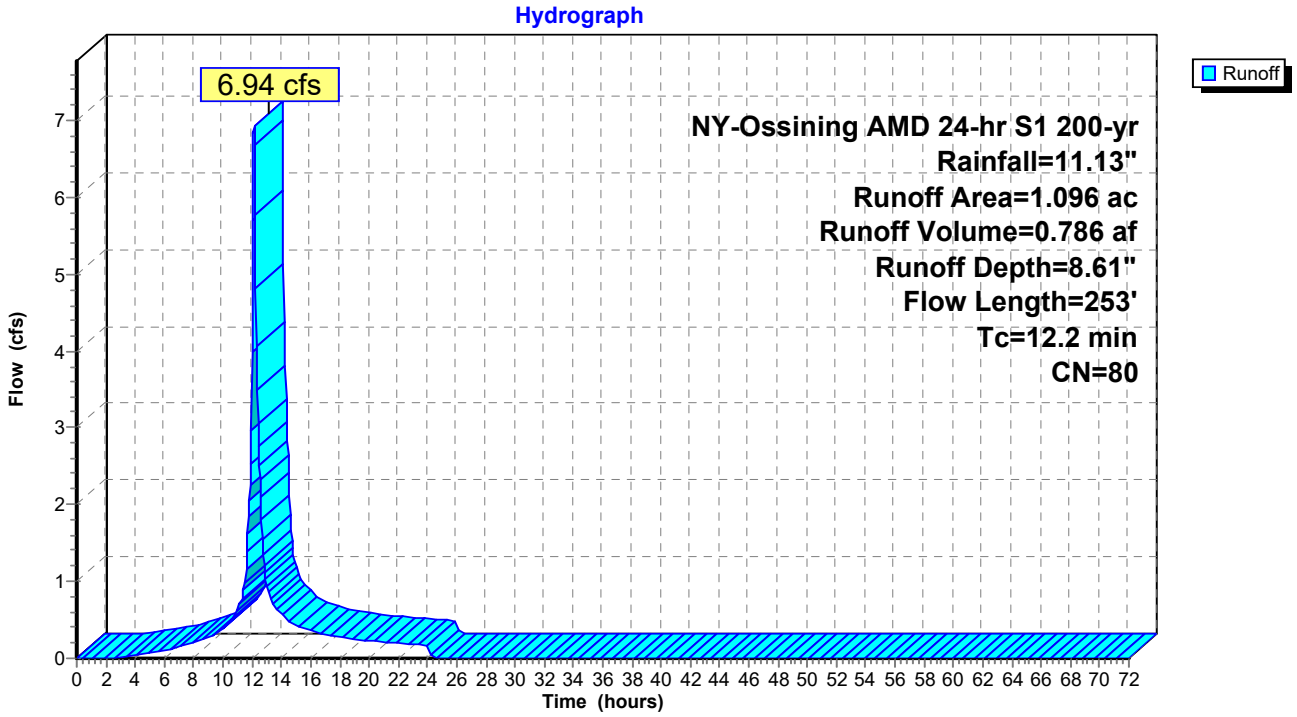
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.02	0.03
5.00	0.97	0.07	0.07
6.00	1.22	0.16	0.11
7.00	1.49	0.28	0.15
8.00	1.80	0.45	0.20
9.00	2.17	0.67	0.27
10.00	2.63	0.98	0.38
11.00	3.28	1.46	0.63
12.00	5.93	3.72	**3.99**
13.00	7.88	5.52	**0.96**
14.00	8.52	6.11	0.58
15.00	8.97	6.54	0.44
16.00	9.34	6.89	0.36
17.00	9.65	7.18	0.31
18.00	9.92	7.44	0.28
19.00	10.16	7.68	0.25
20.00	10.38	7.89	0.23
21.00	10.59	8.09	0.21
22.00	10.78	8.27	0.20
23.00	10.96	8.44	0.19
24.00	**11.13**	**8.61**	0.18
25.00	11.13	8.61	0.00
26.00	11.13	8.61	0.00
27.00	11.13	8.61	0.00
28.00	11.13	8.61	0.00
29.00	11.13	8.61	0.00
30.00	11.13	8.61	0.00
31.00	11.13	8.61	0.00
32.00	11.13	8.61	0.00
33.00	11.13	8.61	0.00
34.00	11.13	8.61	0.00
35.00	11.13	8.61	0.00
36.00	11.13	8.61	0.00
37.00	11.13	8.61	0.00
38.00	11.13	8.61	0.00
39.00	11.13	8.61	0.00
40.00	11.13	8.61	0.00
41.00	11.13	8.61	0.00
42.00	11.13	8.61	0.00
43.00	11.13	8.61	0.00
44.00	11.13	8.61	0.00
45.00	11.13	8.61	0.00
46.00	11.13	8.61	0.00
47.00	11.13	8.61	0.00
48.00	11.13	8.61	0.00
49.00	11.13	8.61	0.00
50.00	11.13	8.61	0.00
51.00	11.13	8.61	0.00
52.00	11.13	8.61	0.00
53.00	11.13	8.61	0.00
54.00	11.13	8.61	0.00
55.00	11.13	8.61	0.00
56.00	11.13	8.61	0.00
57.00	11.13	8.61	0.00
58.00	11.13	8.61	0.00
59.00	11.13	8.61	0.00
60.00	11.13	8.61	0.00
61.00	11.13	8.61	0.00
62.00	11.13	8.61	0.00
63.00	11.13	8.61	0.00
64.00	11.13	8.61	0.00
65.00	11.13	8.61	0.00
66.00	11.13	8.61	0.00
67.00	11.13	8.61	0.00
68.00	11.13	8.61	0.00
69.00	11.13	8.61	0.00
70.00	11.13	8.61	0.00
71.00	11.13	8.61	0.00
72.00	11.13	8.61	0.00

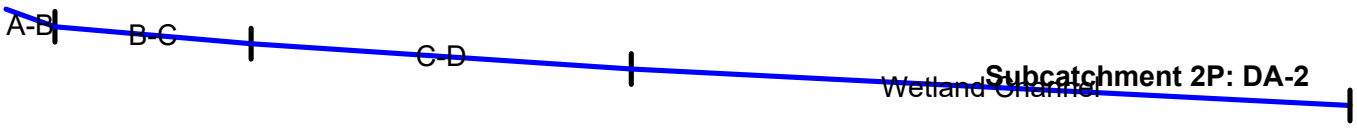
Summary for Subcatchment 2P: DA-2

Runoff = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af, Depth= 9.00"
Routed to Link DP-2 : Design Point - 2

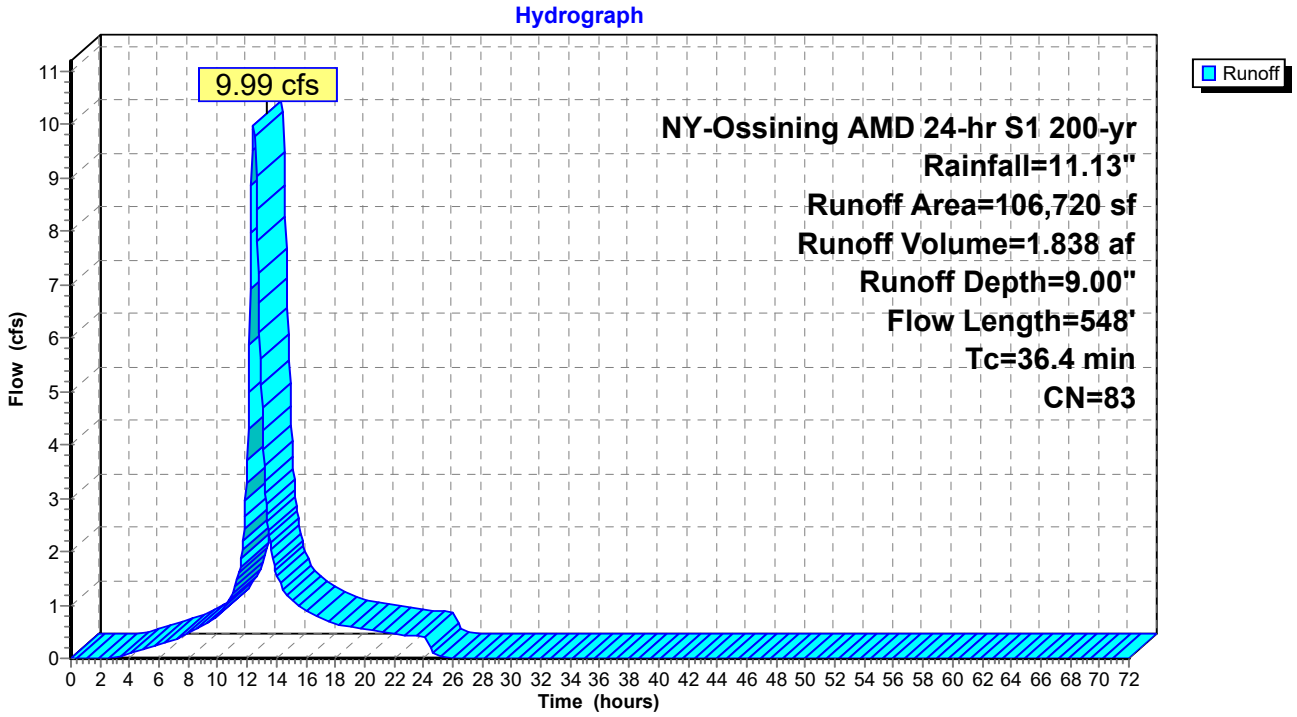
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.01	0.02
4.00	0.75	0.05	0.09
5.00	0.97	0.12	0.18
6.00	1.22	0.23	0.26
7.00	1.49	0.37	0.35
8.00	1.80	0.56	0.46
9.00	2.17	0.81	0.61
10.00	2.63	1.15	0.82
11.00	3.28	1.67	1.24
12.00	5.93	4.02	**3.72**
13.00	7.88	5.87	**4.68**
14.00	8.52	6.47	1.57
15.00	8.97	6.91	1.09
16.00	9.34	7.26	0.88
17.00	9.65	7.56	0.75
18.00	9.92	7.82	0.66
19.00	10.16	8.06	0.59
20.00	10.38	8.28	0.54
21.00	10.59	8.48	0.50
22.00	10.78	8.66	0.46
23.00	10.96	8.84	0.43
24.00	**11.13**	**9.00**	0.41
25.00	11.13	9.00	0.03
26.00	11.13	9.00	0.00
27.00	11.13	9.00	0.00
28.00	11.13	9.00	0.00
29.00	11.13	9.00	0.00
30.00	11.13	9.00	0.00
31.00	11.13	9.00	0.00
32.00	11.13	9.00	0.00
33.00	11.13	9.00	0.00
34.00	11.13	9.00	0.00
35.00	11.13	9.00	0.00
36.00	11.13	9.00	0.00
37.00	11.13	9.00	0.00
38.00	11.13	9.00	0.00
39.00	11.13	9.00	0.00
40.00	11.13	9.00	0.00
41.00	11.13	9.00	0.00
42.00	11.13	9.00	0.00
43.00	11.13	9.00	0.00
44.00	11.13	9.00	0.00
45.00	11.13	9.00	0.00
46.00	11.13	9.00	0.00
47.00	11.13	9.00	0.00
48.00	11.13	9.00	0.00
49.00	11.13	9.00	0.00
50.00	11.13	9.00	0.00
51.00	11.13	9.00	0.00
52.00	11.13	9.00	0.00
53.00	11.13	9.00	0.00
54.00	11.13	9.00	0.00
55.00	11.13	9.00	0.00
56.00	11.13	9.00	0.00
57.00	11.13	9.00	0.00
58.00	11.13	9.00	0.00
59.00	11.13	9.00	0.00
60.00	11.13	9.00	0.00
61.00	11.13	9.00	0.00
62.00	11.13	9.00	0.00
63.00	11.13	9.00	0.00
64.00	11.13	9.00	0.00
65.00	11.13	9.00	0.00
66.00	11.13	9.00	0.00
67.00	11.13	9.00	0.00
68.00	11.13	9.00	0.00
69.00	11.13	9.00	0.00
70.00	11.13	9.00	0.00
71.00	11.13	9.00	0.00
72.00	11.13	9.00	0.00

Summary for Subcatchment 3P: DA-3

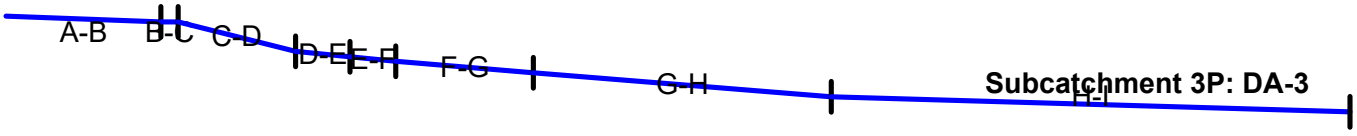
[47] Hint: Peak is 430% of capacity of segment #8

Runoff = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Depth=10.28"
Routed to Link DP-3 : Design Point - 3

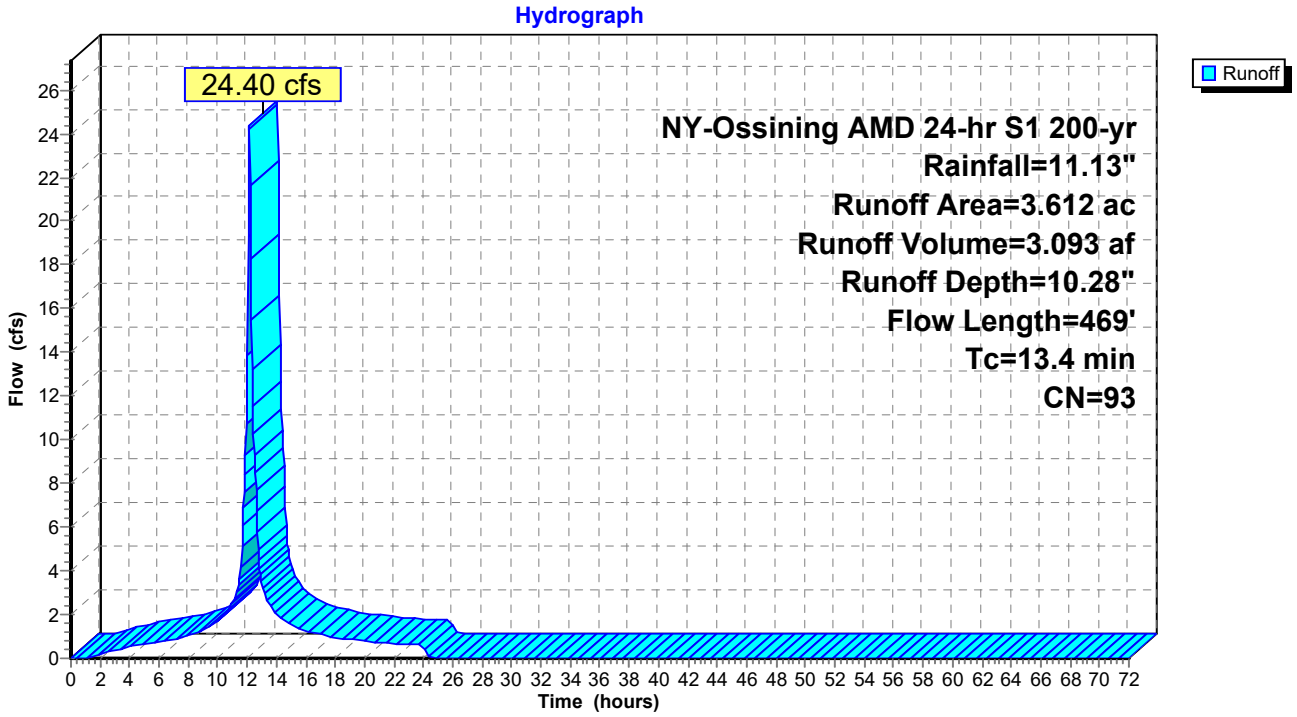
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.04	0.21
3.00	0.54	0.13	0.38
4.00	0.75	0.26	0.51
5.00	0.97	0.43	0.63
6.00	1.22	0.62	0.75
7.00	1.49	0.86	0.89
8.00	1.80	1.13	1.06
9.00	2.17	1.47	1.30
10.00	2.63	1.90	1.70
11.00	3.28	2.52	2.57
12.00	5.93	5.11	**13.89**
13.00	7.88	7.05	**3.44**
14.00	8.52	7.68	2.02
15.00	8.97	8.13	1.52
16.00	9.34	8.49	1.25
17.00	9.65	8.80	1.07
18.00	9.92	9.07	0.95
19.00	10.16	9.31	0.86
20.00	10.38	9.53	0.79
21.00	10.59	9.74	0.73
22.00	10.78	9.93	0.68
23.00	10.96	10.11	0.64
24.00	**11.13**	**10.28**	0.60
25.00	11.13	10.28	0.00
26.00	11.13	10.28	0.00
27.00	11.13	10.28	0.00
28.00	11.13	10.28	0.00
29.00	11.13	10.28	0.00
30.00	11.13	10.28	0.00
31.00	11.13	10.28	0.00
32.00	11.13	10.28	0.00
33.00	11.13	10.28	0.00
34.00	11.13	10.28	0.00
35.00	11.13	10.28	0.00
36.00	11.13	10.28	0.00
37.00	11.13	10.28	0.00
38.00	11.13	10.28	0.00
39.00	11.13	10.28	0.00
40.00	11.13	10.28	0.00
41.00	11.13	10.28	0.00
42.00	11.13	10.28	0.00
43.00	11.13	10.28	0.00
44.00	11.13	10.28	0.00
45.00	11.13	10.28	0.00
46.00	11.13	10.28	0.00
47.00	11.13	10.28	0.00
48.00	11.13	10.28	0.00
49.00	11.13	10.28	0.00
50.00	11.13	10.28	0.00
51.00	11.13	10.28	0.00
52.00	11.13	10.28	0.00
53.00	11.13	10.28	0.00
54.00	11.13	10.28	0.00
55.00	11.13	10.28	0.00
56.00	11.13	10.28	0.00
57.00	11.13	10.28	0.00
58.00	11.13	10.28	0.00
59.00	11.13	10.28	0.00
60.00	11.13	10.28	0.00
61.00	11.13	10.28	0.00
62.00	11.13	10.28	0.00
63.00	11.13	10.28	0.00
64.00	11.13	10.28	0.00
65.00	11.13	10.28	0.00
66.00	11.13	10.28	0.00
67.00	11.13	10.28	0.00
68.00	11.13	10.28	0.00
69.00	11.13	10.28	0.00
70.00	11.13	10.28	0.00
71.00	11.13	10.28	0.00
72.00	11.13	10.28	0.00

Summary for Subcatchment 4AP: DA-4A

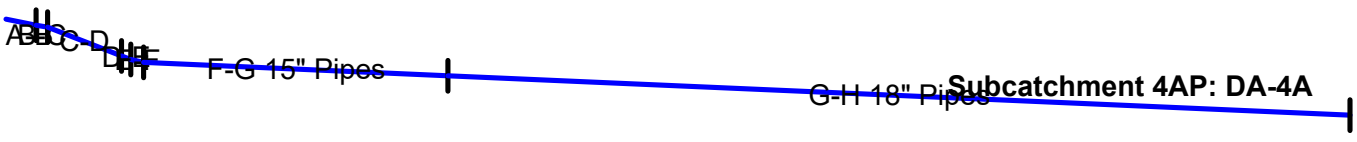
[47] Hint: Peak is 1013% of capacity of segment #6
[47] Hint: Peak is 623% of capacity of segment #7

Runoff = 46.28 cfs @ 12.12 hrs, Volume= 5.695 af, Depth=10.28"
Routed to Link DP-4 : Design Point - 4

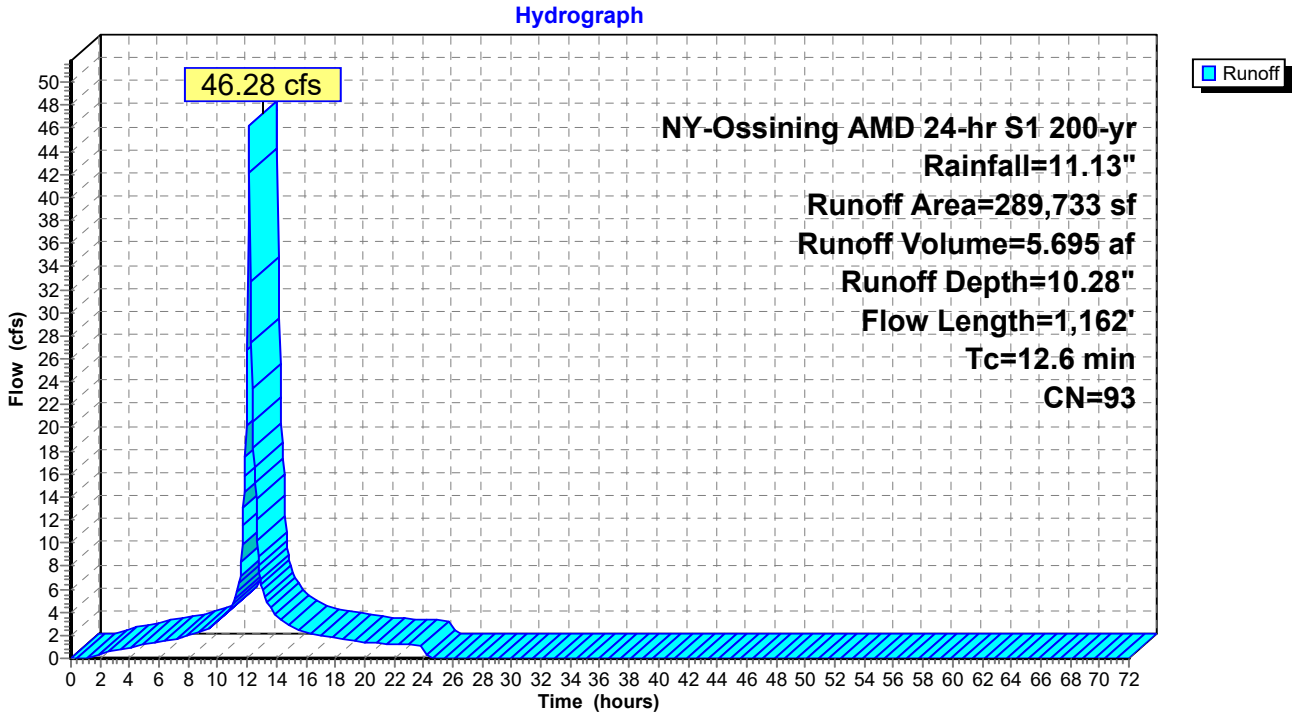
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.04	0.40
3.00	0.54	0.13	0.70
4.00	0.75	0.26	0.95
5.00	0.97	0.43	1.17
6.00	1.22	0.62	1.39
7.00	1.49	0.86	1.64
8.00	1.80	1.13	1.96
9.00	2.17	1.47	2.40
10.00	2.63	1.90	3.14
11.00	3.28	2.52	4.77
12.00	5.93	5.11	**26.70**
13.00	7.88	7.05	**6.24**
14.00	8.52	7.68	3.69
15.00	8.97	8.13	2.79
16.00	9.34	8.49	2.29
17.00	9.65	8.80	1.98
18.00	9.92	9.07	1.75
19.00	10.16	9.31	1.58
20.00	10.38	9.53	1.45
21.00	10.59	9.74	1.34
22.00	10.78	9.93	1.25
23.00	10.96	10.11	1.18
24.00	**11.13**	**10.28**	1.11
25.00	11.13	10.28	0.00
26.00	11.13	10.28	0.00
27.00	11.13	10.28	0.00
28.00	11.13	10.28	0.00
29.00	11.13	10.28	0.00
30.00	11.13	10.28	0.00
31.00	11.13	10.28	0.00
32.00	11.13	10.28	0.00
33.00	11.13	10.28	0.00
34.00	11.13	10.28	0.00
35.00	11.13	10.28	0.00
36.00	11.13	10.28	0.00
37.00	11.13	10.28	0.00
38.00	11.13	10.28	0.00
39.00	11.13	10.28	0.00
40.00	11.13	10.28	0.00
41.00	11.13	10.28	0.00
42.00	11.13	10.28	0.00
43.00	11.13	10.28	0.00
44.00	11.13	10.28	0.00
45.00	11.13	10.28	0.00
46.00	11.13	10.28	0.00
47.00	11.13	10.28	0.00
48.00	11.13	10.28	0.00
49.00	11.13	10.28	0.00
50.00	11.13	10.28	0.00
51.00	11.13	10.28	0.00
52.00	11.13	10.28	0.00
53.00	11.13	10.28	0.00
54.00	11.13	10.28	0.00
55.00	11.13	10.28	0.00
56.00	11.13	10.28	0.00
57.00	11.13	10.28	0.00
58.00	11.13	10.28	0.00
59.00	11.13	10.28	0.00
60.00	11.13	10.28	0.00
61.00	11.13	10.28	0.00
62.00	11.13	10.28	0.00
63.00	11.13	10.28	0.00
64.00	11.13	10.28	0.00
65.00	11.13	10.28	0.00
66.00	11.13	10.28	0.00
67.00	11.13	10.28	0.00
68.00	11.13	10.28	0.00
69.00	11.13	10.28	0.00
70.00	11.13	10.28	0.00
71.00	11.13	10.28	0.00
72.00	11.13	10.28	0.00

Summary for Subcatchment 4BP: DA-4B

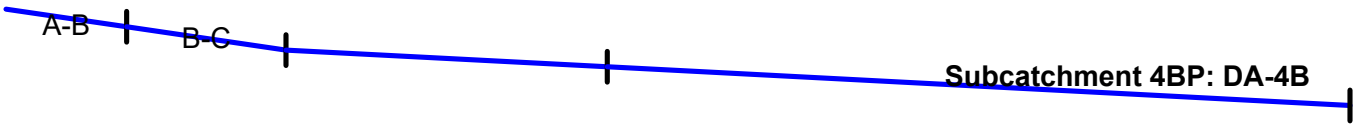
[47] Hint: Peak is 1510% of capacity of segment #3
[47] Hint: Peak is 238% of capacity of segment #4

Runoff = 38.04 cfs @ 12.19 hrs, Volume= 4.857 af, Depth= 7.80"
Routed to Link DP-4 : Design Point - 4

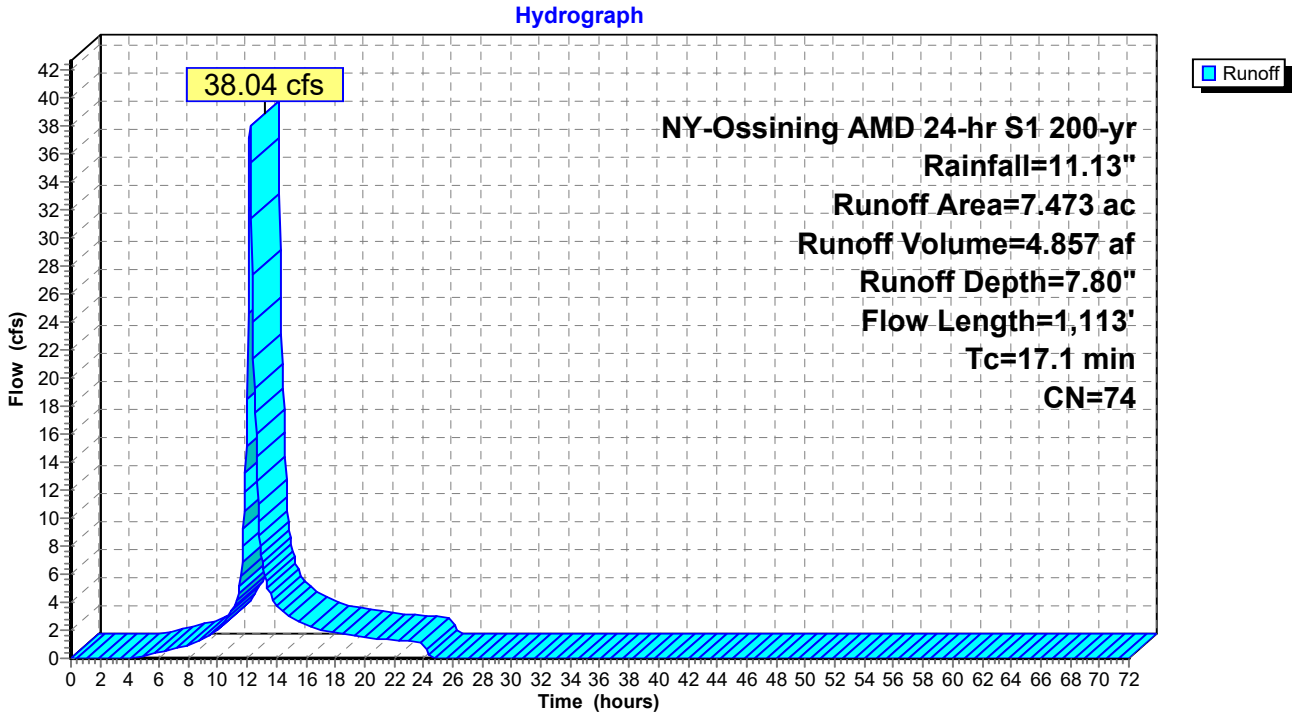
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.00	0.00
5.00	0.97	0.02	0.19
6.00	1.22	0.07	0.40
7.00	1.49	0.14	0.65
8.00	1.80	0.26	0.97
9.00	2.17	0.43	1.39
10.00	2.63	0.68	2.06
11.00	3.28	1.09	3.48
12.00	5.93	3.12	**18.53**
13.00	7.88	4.82	**6.91**
14.00	8.52	5.39	3.87
15.00	8.97	5.80	2.91
16.00	9.34	6.14	2.40
17.00	9.65	6.42	2.07
18.00	9.92	6.67	1.84
19.00	10.16	6.90	1.66
20.00	10.38	7.10	1.53
21.00	10.59	7.30	1.41
22.00	10.78	7.47	1.32
23.00	10.96	7.64	1.24
24.00	**11.13**	**7.80**	1.18
25.00	11.13	7.80	0.00
26.00	11.13	7.80	0.00
27.00	11.13	7.80	0.00
28.00	11.13	7.80	0.00
29.00	11.13	7.80	0.00
30.00	11.13	7.80	0.00
31.00	11.13	7.80	0.00
32.00	11.13	7.80	0.00
33.00	11.13	7.80	0.00
34.00	11.13	7.80	0.00
35.00	11.13	7.80	0.00
36.00	11.13	7.80	0.00
37.00	11.13	7.80	0.00
38.00	11.13	7.80	0.00
39.00	11.13	7.80	0.00
40.00	11.13	7.80	0.00
41.00	11.13	7.80	0.00
42.00	11.13	7.80	0.00
43.00	11.13	7.80	0.00
44.00	11.13	7.80	0.00
45.00	11.13	7.80	0.00
46.00	11.13	7.80	0.00
47.00	11.13	7.80	0.00
48.00	11.13	7.80	0.00
49.00	11.13	7.80	0.00
50.00	11.13	7.80	0.00
51.00	11.13	7.80	0.00
52.00	11.13	7.80	0.00
53.00	11.13	7.80	0.00
54.00	11.13	7.80	0.00
55.00	11.13	7.80	0.00
56.00	11.13	7.80	0.00
57.00	11.13	7.80	0.00
58.00	11.13	7.80	0.00
59.00	11.13	7.80	0.00
60.00	11.13	7.80	0.00
61.00	11.13	7.80	0.00
62.00	11.13	7.80	0.00
63.00	11.13	7.80	0.00
64.00	11.13	7.80	0.00
65.00	11.13	7.80	0.00
66.00	11.13	7.80	0.00
67.00	11.13	7.80	0.00
68.00	11.13	7.80	0.00
69.00	11.13	7.80	0.00
70.00	11.13	7.80	0.00
71.00	11.13	7.80	0.00
72.00	11.13	7.80	0.00

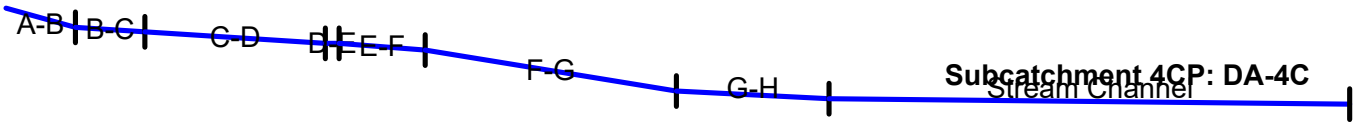
Summary for Subcatchment 4CP: DA-4C

Runoff = 53.59 cfs @ 12.12 hrs, Volume= 5.981 af, Depth= 7.39"
Routed to Link DP-4 : Design Point - 4

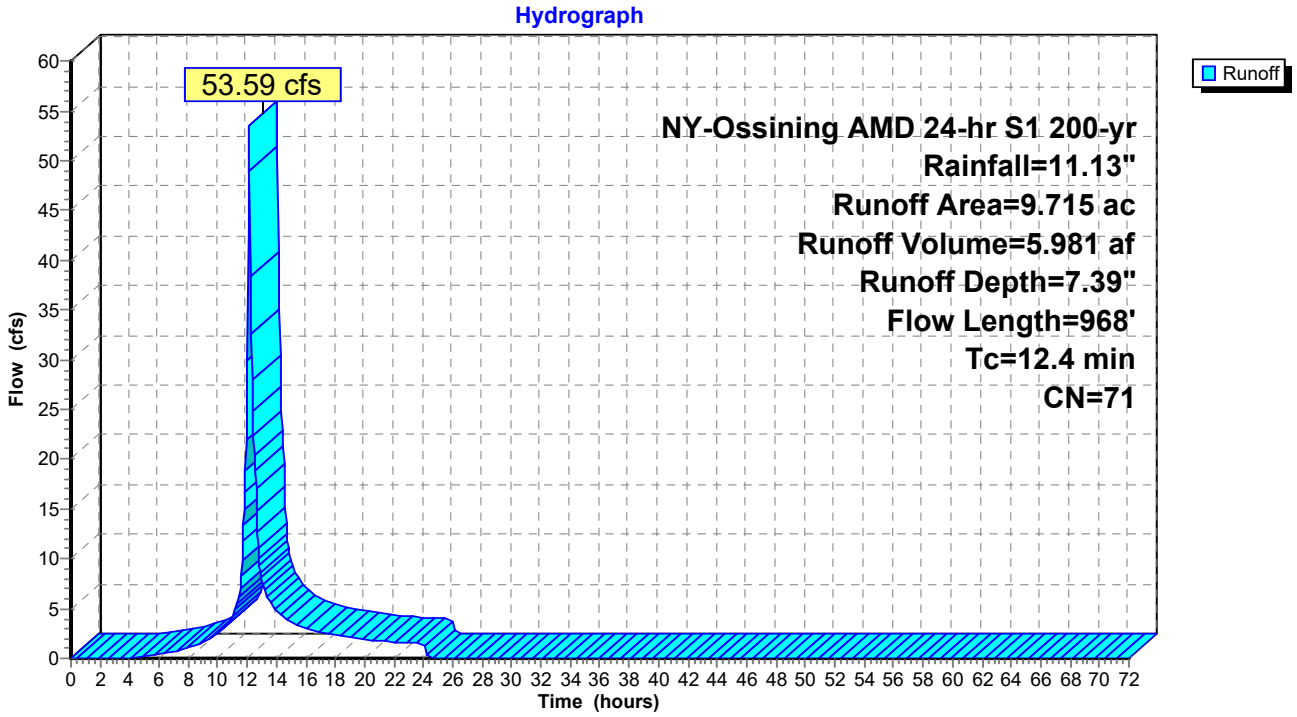
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.00	0.00
5.00	0.97	0.01	0.12
6.00	1.22	0.04	0.38
7.00	1.49	0.10	0.68
8.00	1.80	0.19	1.07
9.00	2.17	0.34	1.60
10.00	2.63	0.56	2.46
11.00	3.28	0.93	4.31
12.00	5.93	2.84	**29.98**
13.00	7.88	4.48	**7.89**
14.00	8.52	5.03	4.76
15.00	8.97	5.43	3.63
16.00	9.34	5.76	3.01
17.00	9.65	6.04	2.61
18.00	9.92	6.28	2.32
19.00	10.16	6.50	2.10
20.00	10.38	6.71	1.93
21.00	10.59	6.89	1.79
22.00	10.78	7.07	1.68
23.00	10.96	7.23	1.58
24.00	**11.13**	**7.39**	1.50
25.00	11.13	7.39	0.00
26.00	11.13	7.39	0.00
27.00	11.13	7.39	0.00
28.00	11.13	7.39	0.00
29.00	11.13	7.39	0.00
30.00	11.13	7.39	0.00
31.00	11.13	7.39	0.00
32.00	11.13	7.39	0.00
33.00	11.13	7.39	0.00
34.00	11.13	7.39	0.00
35.00	11.13	7.39	0.00
36.00	11.13	7.39	0.00
37.00	11.13	7.39	0.00
38.00	11.13	7.39	0.00
39.00	11.13	7.39	0.00
40.00	11.13	7.39	0.00
41.00	11.13	7.39	0.00
42.00	11.13	7.39	0.00
43.00	11.13	7.39	0.00
44.00	11.13	7.39	0.00
45.00	11.13	7.39	0.00
46.00	11.13	7.39	0.00
47.00	11.13	7.39	0.00
48.00	11.13	7.39	0.00
49.00	11.13	7.39	0.00
50.00	11.13	7.39	0.00
51.00	11.13	7.39	0.00
52.00	11.13	7.39	0.00
53.00	11.13	7.39	0.00
54.00	11.13	7.39	0.00
55.00	11.13	7.39	0.00
56.00	11.13	7.39	0.00
57.00	11.13	7.39	0.00
58.00	11.13	7.39	0.00
59.00	11.13	7.39	0.00
60.00	11.13	7.39	0.00
61.00	11.13	7.39	0.00
62.00	11.13	7.39	0.00
63.00	11.13	7.39	0.00
64.00	11.13	7.39	0.00
65.00	11.13	7.39	0.00
66.00	11.13	7.39	0.00
67.00	11.13	7.39	0.00
68.00	11.13	7.39	0.00
69.00	11.13	7.39	0.00
70.00	11.13	7.39	0.00
71.00	11.13	7.39	0.00
72.00	11.13	7.39	0.00

Summary for Subcatchment 4DP: DA-4D

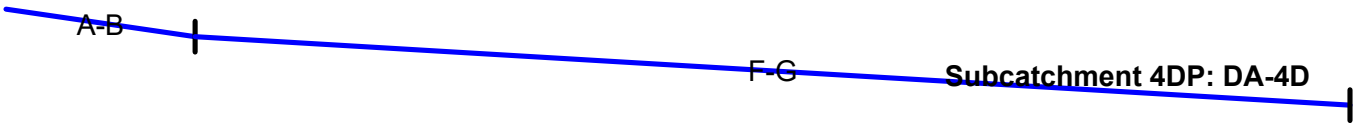
[47] Hint: Peak is 186% of capacity of segment #2

Runoff = 12.03 cfs @ 12.04 hrs, Volume= 1.195 af, Depth=10.52"
Routed to Pond 6P : Infiltrators

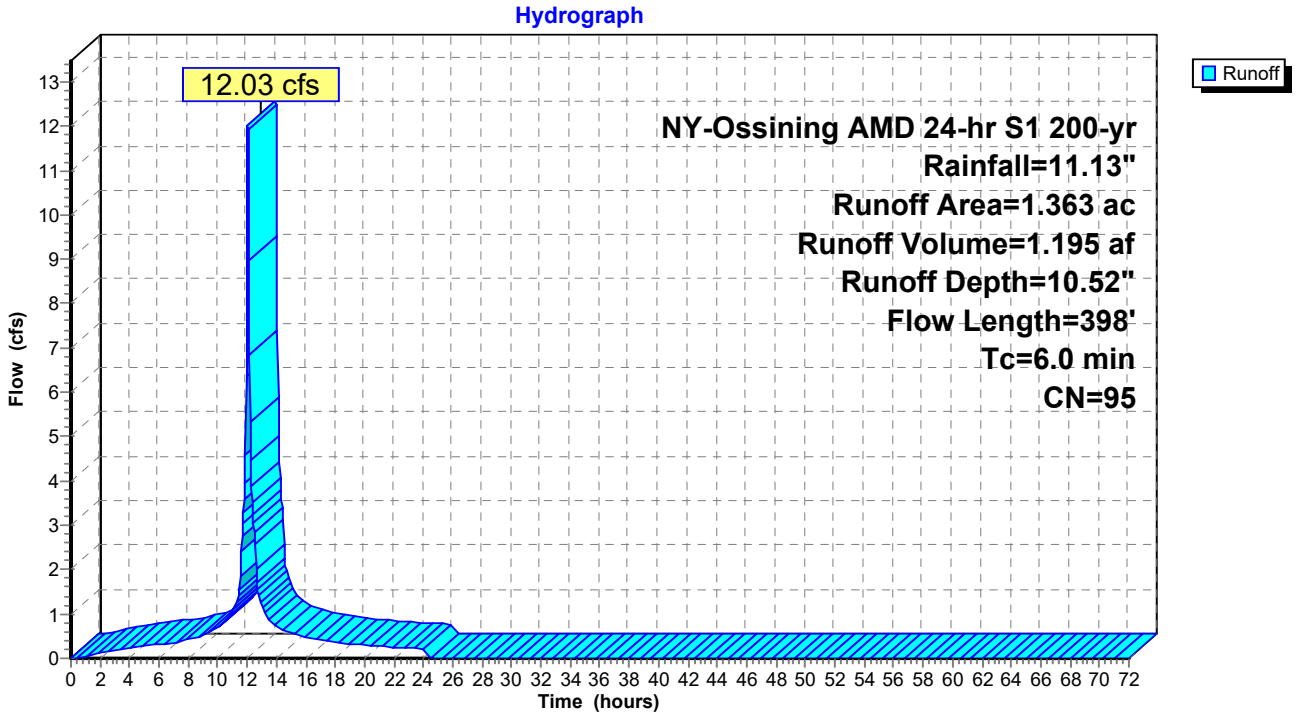
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.01	0.04
2.00	0.35	0.08	0.13
3.00	0.54	0.20	0.19
4.00	0.75	0.35	0.23
5.00	0.97	0.54	0.27
6.00	1.22	0.75	0.31
7.00	1.49	1.00	0.36
8.00	1.80	1.30	0.43
9.00	2.17	1.65	0.52
10.00	2.63	2.09	0.68
11.00	3.28	2.72	1.06
12.00	5.93	5.34	**10.73**
13.00	7.88	7.29	**1.17**
14.00	8.52	7.92	0.73
15.00	8.97	8.37	0.56
16.00	9.34	8.73	0.46
17.00	9.65	9.04	0.40
18.00	9.92	9.31	0.36
19.00	10.16	9.56	0.32
20.00	10.38	9.78	0.29
21.00	10.59	9.98	0.27
22.00	10.78	10.17	0.26
23.00	10.96	10.35	0.24
24.00	**11.13**	**10.52**	0.23
25.00	11.13	10.52	0.00
26.00	11.13	10.52	0.00
27.00	11.13	10.52	0.00
28.00	11.13	10.52	0.00
29.00	11.13	10.52	0.00
30.00	11.13	10.52	0.00
31.00	11.13	10.52	0.00
32.00	11.13	10.52	0.00
33.00	11.13	10.52	0.00
34.00	11.13	10.52	0.00
35.00	11.13	10.52	0.00
36.00	11.13	10.52	0.00
37.00	11.13	10.52	0.00
38.00	11.13	10.52	0.00
39.00	11.13	10.52	0.00
40.00	11.13	10.52	0.00
41.00	11.13	10.52	0.00
42.00	11.13	10.52	0.00
43.00	11.13	10.52	0.00
44.00	11.13	10.52	0.00
45.00	11.13	10.52	0.00
46.00	11.13	10.52	0.00
47.00	11.13	10.52	0.00
48.00	11.13	10.52	0.00
49.00	11.13	10.52	0.00
50.00	11.13	10.52	0.00
51.00	11.13	10.52	0.00
52.00	11.13	10.52	0.00
53.00	11.13	10.52	0.00
54.00	11.13	10.52	0.00
55.00	11.13	10.52	0.00
56.00	11.13	10.52	0.00
57.00	11.13	10.52	0.00
58.00	11.13	10.52	0.00
59.00	11.13	10.52	0.00
60.00	11.13	10.52	0.00
61.00	11.13	10.52	0.00
62.00	11.13	10.52	0.00
63.00	11.13	10.52	0.00
64.00	11.13	10.52	0.00
65.00	11.13	10.52	0.00
66.00	11.13	10.52	0.00
67.00	11.13	10.52	0.00
68.00	11.13	10.52	0.00
69.00	11.13	10.52	0.00
70.00	11.13	10.52	0.00
71.00	11.13	10.52	0.00
72.00	11.13	10.52	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 10.52" for 200-yr event
Inflow = 12.03 cfs @ 12.04 hrs, Volume= 1.195 af
Outflow = 4.48 cfs @ 12.25 hrs, Volume= 1.195 af, Atten= 63%, Lag= 12.9 min
Discarded = 0.07 cfs @ 2.10 hrs, Volume= 0.162 af
Primary = 4.41 cfs @ 12.25 hrs, Volume= 1.033 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 349.73' @ 12.25 hrs Surf.Area= 0.132 ac Storage= 0.277 af

Plug-Flow detention time= 75.7 min calculated for 1.194 af (100% of inflow)
Center-of-Mass det. time= 75.9 min (828.7 - 752.7)

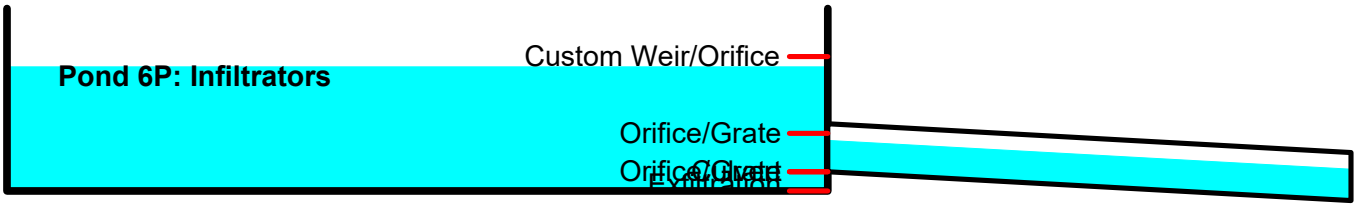
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 2.10 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=4.41 cfs @ 12.25 hrs HW=349.73' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.41 cfs of 6.77 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.49 cfs @ 7.58 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.92 cfs @ 5.85 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

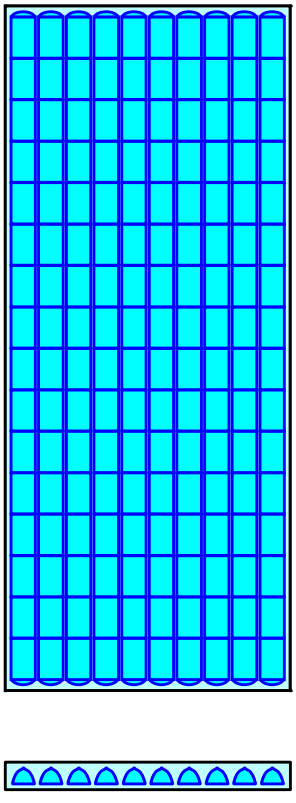
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

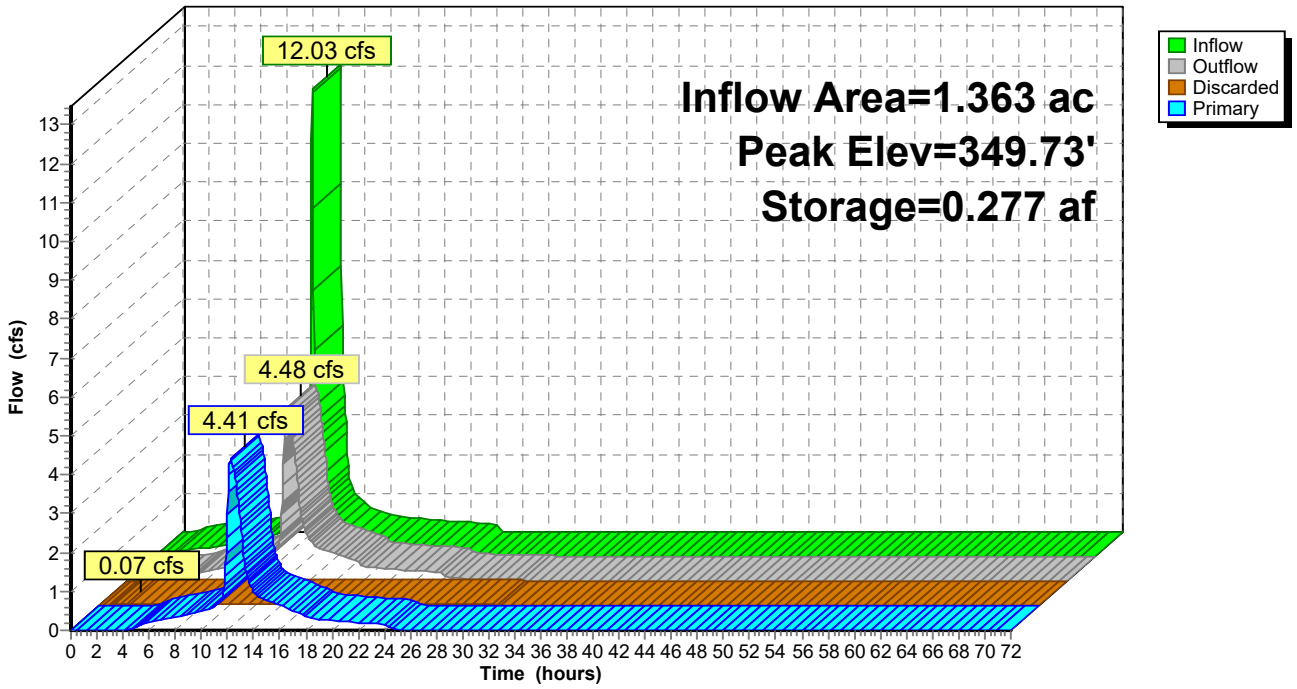
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers
1,014.0 cy Field
711.7 cy Stone



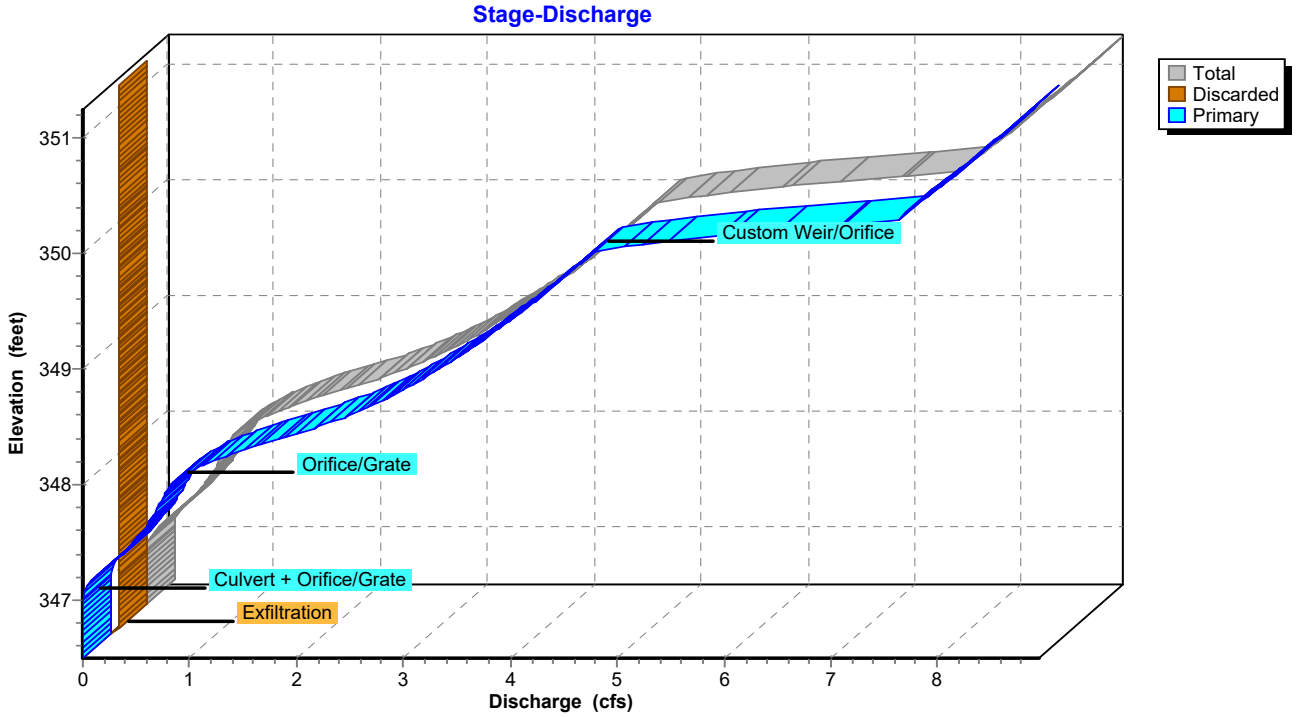
Pond 6P: Infiltrators

Hydrograph

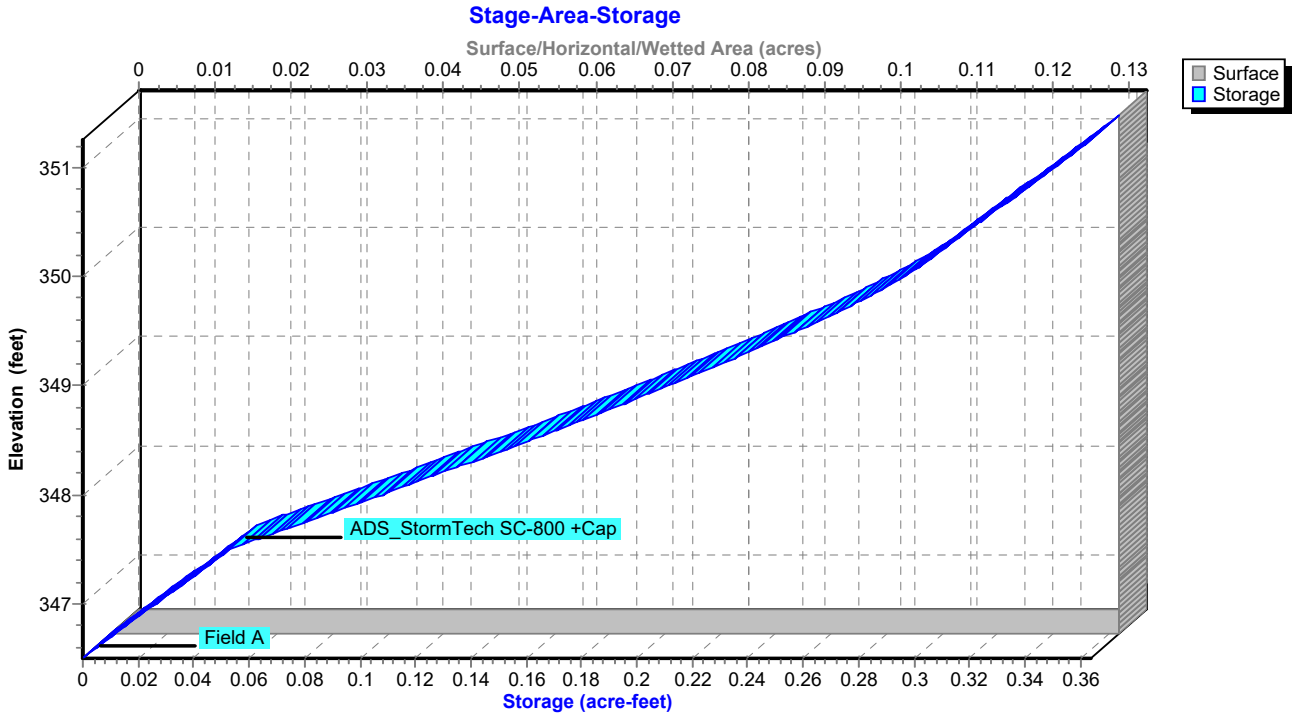


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	**0.00**	0.00
2.50	0.16	0.005	346.60	0.07	**0.07**	0.00
5.00	0.27	0.035	347.17	0.15	0.07	0.08
7.50	0.39	0.045	347.35	0.37	0.07	0.30
10.00	**0.68**	**0.056**	**347.52**	**0.56**	0.07	**0.49**
12.50	**2.85**	**0.258**	**349.51**	**4.18**	0.07	**4.12**
15.00	0.56	0.098	347.90	0.83	0.07	0.76
17.50	0.38	0.052	347.47	0.52	0.07	0.45
20.00	0.29	0.043	347.31	0.31	0.07	0.24
22.50	0.25	0.041	347.27	0.26	0.07	0.19
25.00	0.00	0.030	347.06	0.08	0.07	0.01
27.50	0.00	0.016	346.80	0.07	0.07	0.00
30.00	0.00	0.002	346.54	0.07	0.07	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

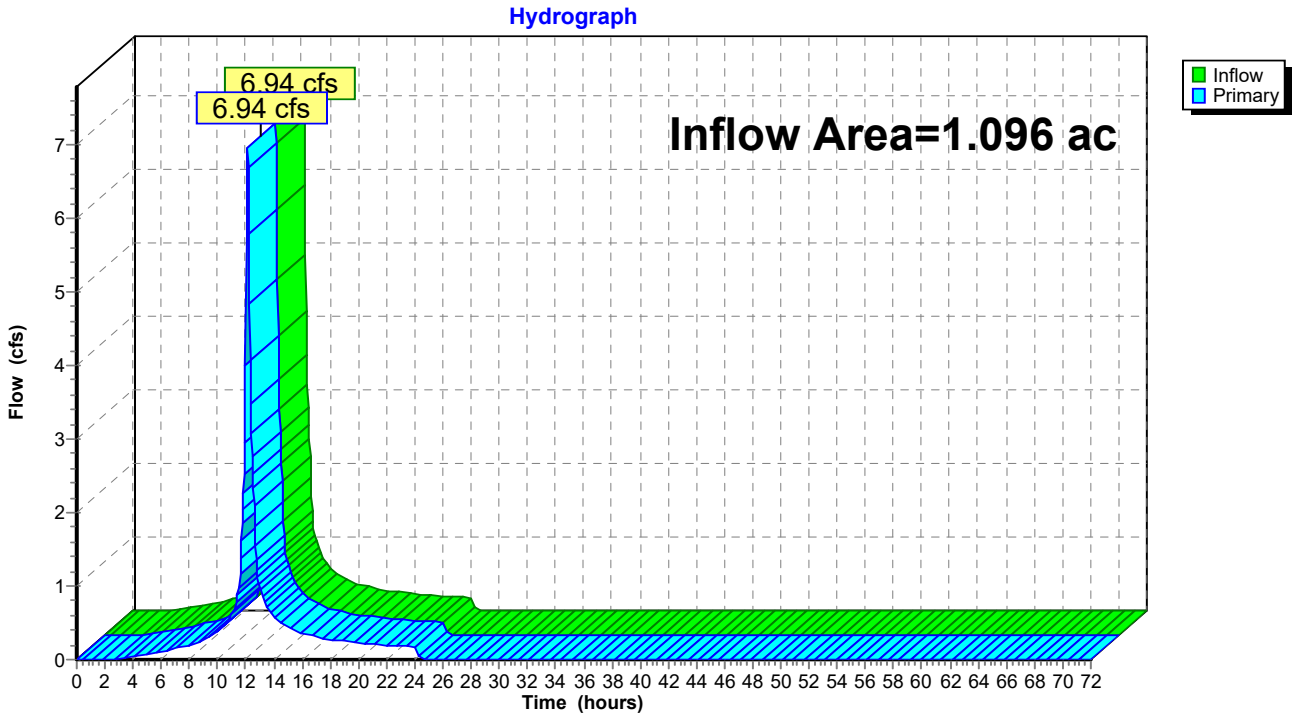
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 8.61" for 200-yr event
Inflow = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af
Primary = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

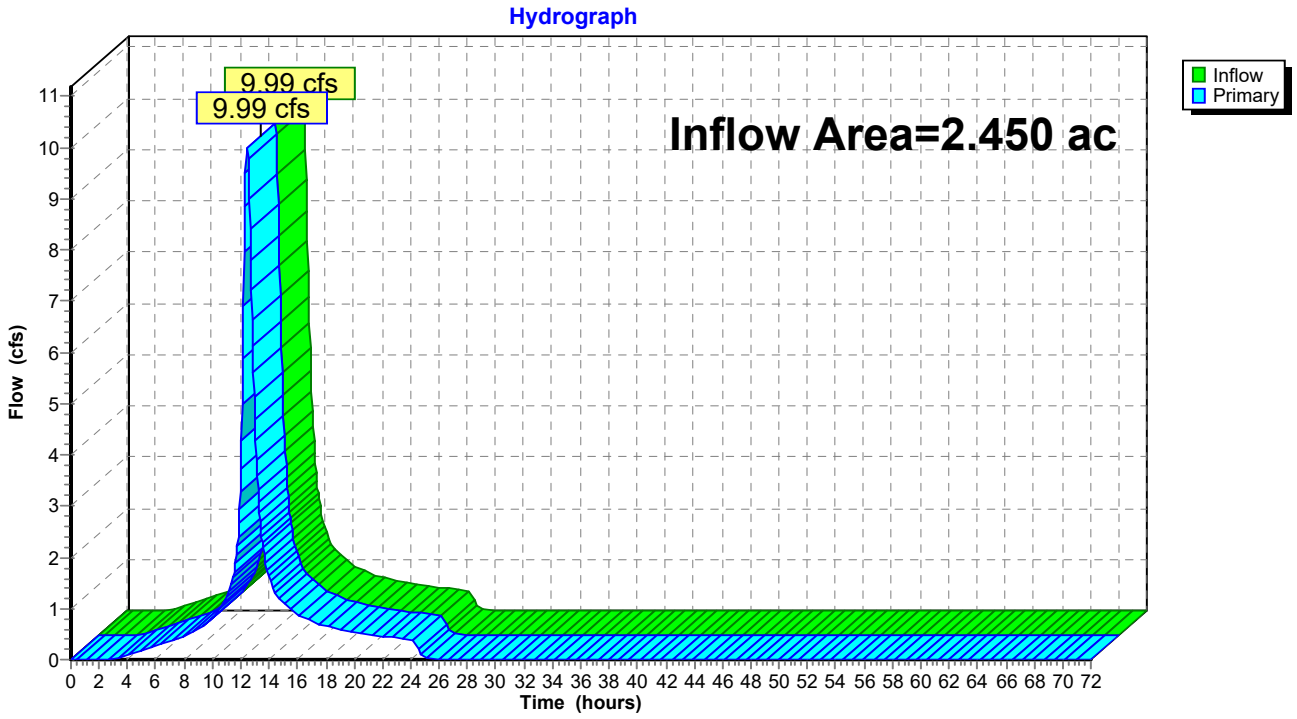
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.03	0.00	0.03
5.00	0.07	0.00	0.07
6.00	0.11	0.00	0.11
7.00	0.15	0.00	0.15
8.00	0.20	0.00	0.20
9.00	0.27	0.00	0.27
10.00	0.38	0.00	0.38
11.00	0.63	0.00	0.63
12.00	**3.99**	0.00	**3.99**
13.00	**0.96**	0.00	**0.96**
14.00	0.58	0.00	0.58
15.00	0.44	0.00	0.44
16.00	0.36	0.00	0.36
17.00	0.31	0.00	0.31
18.00	0.28	0.00	0.28
19.00	0.25	0.00	0.25
20.00	0.23	0.00	0.23
21.00	0.21	0.00	0.21
22.00	0.20	0.00	0.20
23.00	0.19	0.00	0.19
24.00	0.18	0.00	0.18
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 9.00" for 200-yr event
Inflow = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af
Primary = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

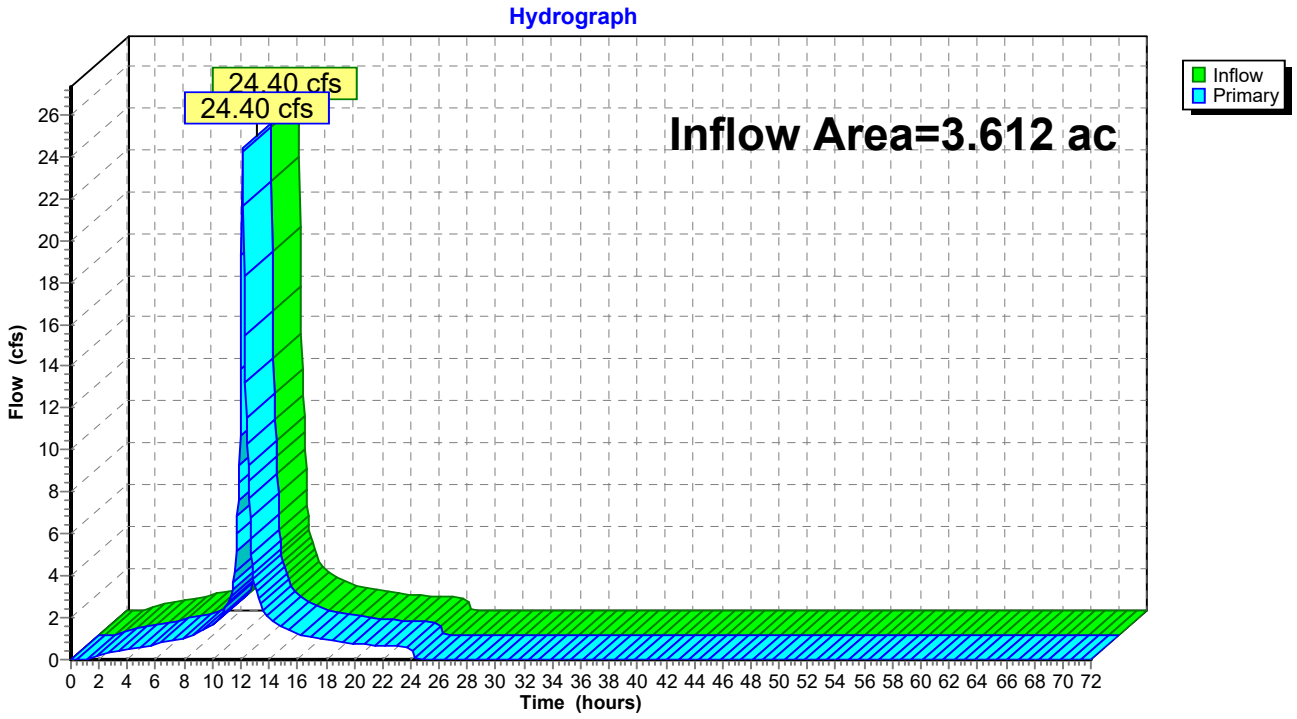
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.02	0.00	0.02
4.00	0.09	0.00	0.09
5.00	0.18	0.00	0.18
6.00	0.26	0.00	0.26
7.00	0.35	0.00	0.35
8.00	0.46	0.00	0.46
9.00	0.61	0.00	0.61
10.00	0.82	0.00	0.82
11.00	1.24	0.00	1.24
12.00	**3.72**	0.00	**3.72**
13.00	**4.68**	0.00	**4.68**
14.00	1.57	0.00	1.57
15.00	1.09	0.00	1.09
16.00	0.88	0.00	0.88
17.00	0.75	0.00	0.75
18.00	0.66	0.00	0.66
19.00	0.59	0.00	0.59
20.00	0.54	0.00	0.54
21.00	0.50	0.00	0.50
22.00	0.46	0.00	0.46
23.00	0.43	0.00	0.43
24.00	0.41	0.00	0.41
25.00	0.03	0.00	0.03
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 10.28" for 200-yr event
Inflow = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af
Primary = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

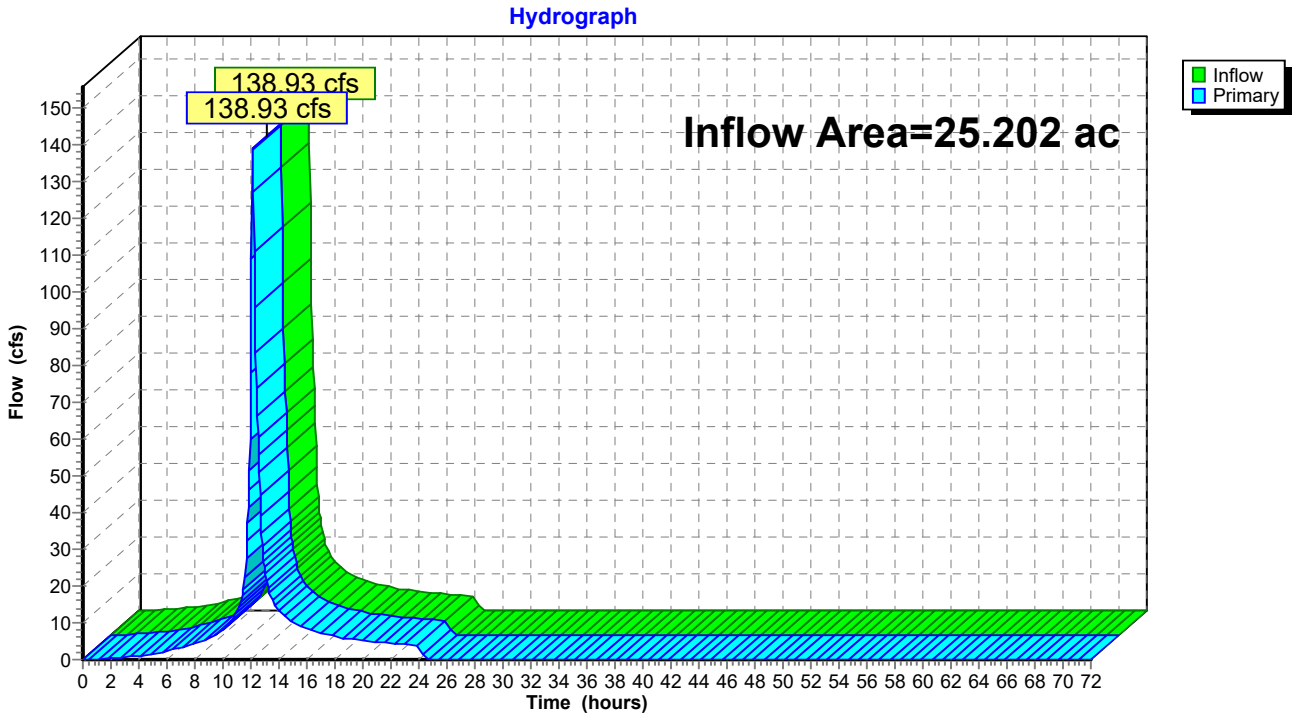
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.21	0.00	0.21
3.00	0.38	0.00	0.38
4.00	0.51	0.00	0.51
5.00	0.63	0.00	0.63
6.00	0.75	0.00	0.75
7.00	0.89	0.00	0.89
8.00	1.06	0.00	1.06
9.00	1.30	0.00	1.30
10.00	1.70	0.00	1.70
11.00	2.57	0.00	2.57
12.00	**13.89**	0.00	**13.89**
13.00	**3.44**	0.00	**3.44**
14.00	2.02	0.00	2.02
15.00	1.52	0.00	1.52
16.00	1.25	0.00	1.25
17.00	1.07	0.00	1.07
18.00	0.95	0.00	0.95
19.00	0.86	0.00	0.86
20.00	0.79	0.00	0.79
21.00	0.73	0.00	0.73
22.00	0.68	0.00	0.68
23.00	0.64	0.00	0.64
24.00	0.60	0.00	0.60
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 8.36" for 200-yr event
Inflow = 138.93 cfs @ 12.14 hrs, Volume= 17.566 af
Primary = 138.93 cfs @ 12.14 hrs, Volume= 17.566 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.40	0.00	0.40
3.00	0.70	0.00	0.70
4.00	0.95	0.00	0.95
5.00	1.55	0.00	1.55
6.00	2.38	0.00	2.38
7.00	3.25	0.00	3.25
8.00	4.32	0.00	4.32
9.00	5.80	0.00	5.80
10.00	8.15	0.00	8.15
11.00	13.19	0.00	13.19
12.00	**78.17**	0.00	**78.17**
13.00	**23.74**	0.00	**23.74**
14.00	13.32	0.00	13.32
15.00	10.10	0.00	10.10
16.00	8.35	0.00	8.35
17.00	7.17	0.00	7.17
18.00	6.27	0.00	6.27
19.00	5.63	0.00	5.63
20.00	5.15	0.00	5.15
21.00	4.77	0.00	4.77
22.00	4.45	0.00	4.45
23.00	4.18	0.00	4.18
24.00	3.95	0.00	3.95
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=0.13"
Flow Length=253' Tc=12.2 min CN=80 Runoff=0.07 cfs 0.012 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=0.20"
Flow Length=548' Tc=36.4 min CN=83 Runoff=0.20 cfs 0.040 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=0.57"
Flow Length=469' Tc=13.4 min CN=93 Runoff=1.97 cfs 0.172 af

Subcatchment4AP: DA-4A Runoff Area=289,733 sf 77.58% Impervious Runoff Depth=0.57"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=3.71 cfs 0.316 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=0.05"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=0.06 cfs 0.031 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=968' Tc=12.4 min CN=71 Runoff=0.02 cfs 0.020 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=0.69"
Flow Length=398' Tc=6.0 min CN=95 Runoff=1.24 cfs 0.079 af

Pond 6P: Infiltrators Peak Elev=347.08' Storage=0.031 af Inflow=1.24 cfs 0.079 af
Discarded=0.07 cfs 0.076 af Primary=0.02 cfs 0.003 af Outflow=0.09 cfs 0.079 af

Link DP-1: Design Point - 1 Inflow=0.07 cfs 0.012 af
Primary=0.07 cfs 0.012 af

Link DP-2: Design Point - 2 Inflow=0.20 cfs 0.040 af
Primary=0.20 cfs 0.040 af

Link DP-3: Design Point - 3 Inflow=1.97 cfs 0.172 af
Primary=1.97 cfs 0.172 af

Link DP-4: Design Point - 4 Inflow=3.71 cfs 0.371 af
Primary=3.71 cfs 0.371 af

Total Runoff Area = 32.360 ac Runoff Volume = 0.671 af Average Runoff Depth = 0.25"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

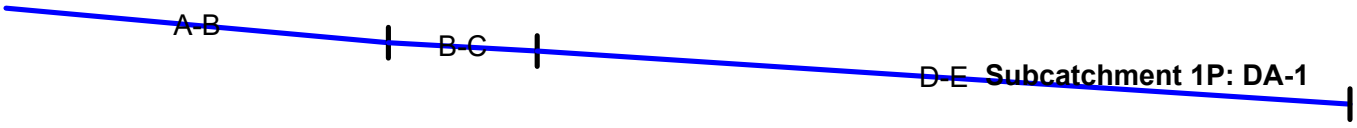
Summary for Subcatchment 1P: DA-1

Runoff = 0.07 cfs @ 12.21 hrs, Volume= 0.012 af, Depth= 0.13"
Routed to Link DP-1 : Design Point - 1

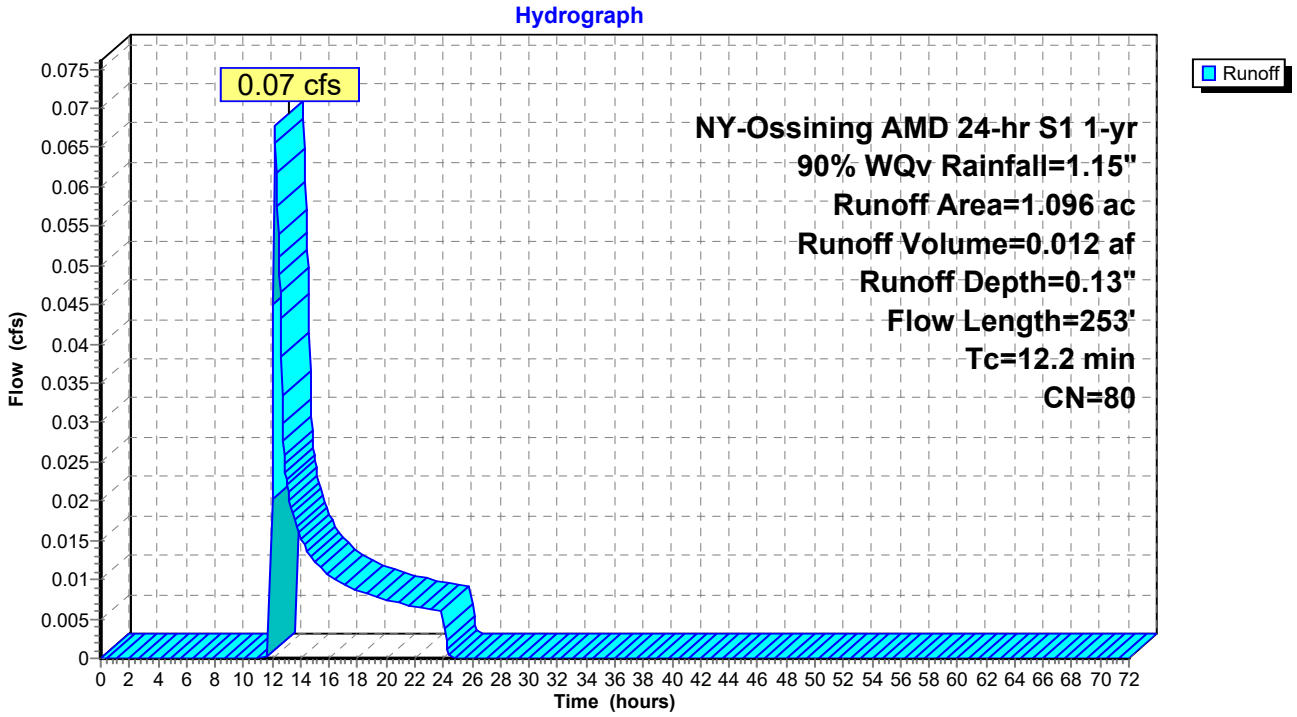
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.00
10.00	0.24	0.00	0.00
11.00	0.31	0.00	0.00
12.00	0.63	0.01	**0.00**
13.00	0.85	0.04	**0.02**
14.00	0.91	0.06	0.02
15.00	0.95	0.07	0.01
16.00	0.99	0.08	0.01
17.00	1.02	0.09	0.01
18.00	1.04	0.10	0.01
19.00	1.06	0.10	0.01
20.00	1.08	0.11	0.01
21.00	1.10	0.12	0.01
22.00	1.12	0.12	0.01
23.00	1.13	0.13	0.01
24.00	**1.15**	**0.13**	0.01
25.00	1.15	0.13	0.00
26.00	1.15	0.13	0.00
27.00	1.15	0.13	0.00
28.00	1.15	0.13	0.00
29.00	1.15	0.13	0.00
30.00	1.15	0.13	0.00
31.00	1.15	0.13	0.00
32.00	1.15	0.13	0.00
33.00	1.15	0.13	0.00
34.00	1.15	0.13	0.00
35.00	1.15	0.13	0.00
36.00	1.15	0.13	0.00
37.00	1.15	0.13	0.00
38.00	1.15	0.13	0.00
39.00	1.15	0.13	0.00
40.00	1.15	0.13	0.00
41.00	1.15	0.13	0.00
42.00	1.15	0.13	0.00
43.00	1.15	0.13	0.00
44.00	1.15	0.13	0.00
45.00	1.15	0.13	0.00
46.00	1.15	0.13	0.00
47.00	1.15	0.13	0.00
48.00	1.15	0.13	0.00
49.00	1.15	0.13	0.00
50.00	1.15	0.13	0.00
51.00	1.15	0.13	0.00
52.00	1.15	0.13	0.00
53.00	1.15	0.13	0.00
54.00	1.15	0.13	0.00
55.00	1.15	0.13	0.00
56.00	1.15	0.13	0.00
57.00	1.15	0.13	0.00
58.00	1.15	0.13	0.00
59.00	1.15	0.13	0.00
60.00	1.15	0.13	0.00
61.00	1.15	0.13	0.00
62.00	1.15	0.13	0.00
63.00	1.15	0.13	0.00
64.00	1.15	0.13	0.00
65.00	1.15	0.13	0.00
66.00	1.15	0.13	0.00
67.00	1.15	0.13	0.00
68.00	1.15	0.13	0.00
69.00	1.15	0.13	0.00
70.00	1.15	0.13	0.00
71.00	1.15	0.13	0.00
72.00	1.15	0.13	0.00

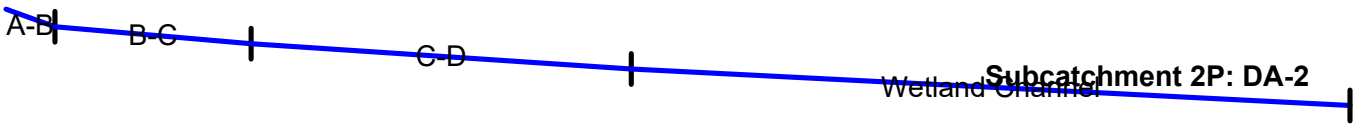
Summary for Subcatchment 2P: DA-2

Runoff = 0.20 cfs @ 12.57 hrs, Volume= 0.040 af, Depth= 0.20"
Routed to Link DP-2 : Design Point - 2

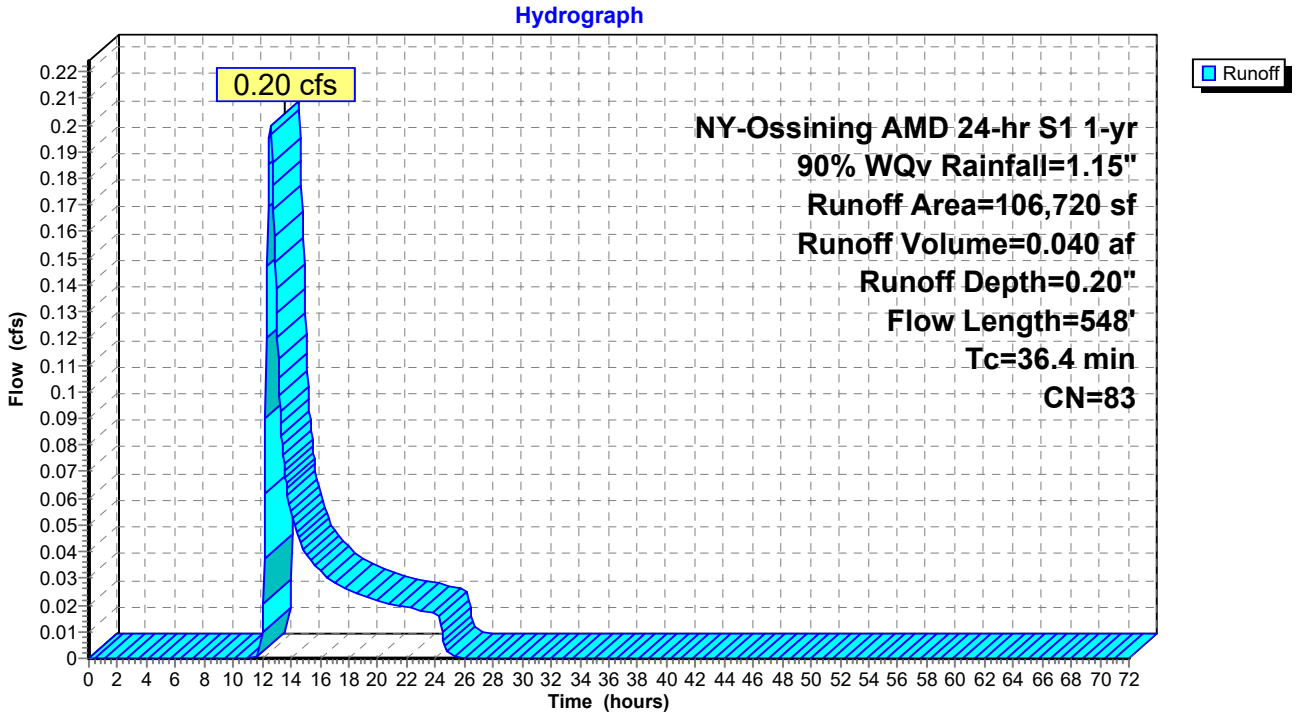
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.00
10.00	0.24	0.00	0.00
11.00	0.31	0.00	0.00
12.00	0.63	0.02	**0.00**
13.00	0.85	0.08	**0.13**
14.00	0.91	0.10	0.05
15.00	0.95	0.11	0.04
16.00	0.99	0.13	0.03
17.00	1.02	0.14	0.03
18.00	1.04	0.15	0.03
19.00	1.06	0.16	0.02
20.00	1.08	0.17	0.02
21.00	1.10	0.17	0.02
22.00	1.12	0.18	0.02
23.00	1.13	0.19	0.02
24.00	**1.15**	**0.20**	0.02
25.00	1.15	0.20	0.00
26.00	1.15	0.20	0.00
27.00	1.15	0.20	0.00
28.00	1.15	0.20	0.00
29.00	1.15	0.20	0.00
30.00	1.15	0.20	0.00
31.00	1.15	0.20	0.00
32.00	1.15	0.20	0.00
33.00	1.15	0.20	0.00
34.00	1.15	0.20	0.00
35.00	1.15	0.20	0.00
36.00	1.15	0.20	0.00
37.00	1.15	0.20	0.00
38.00	1.15	0.20	0.00
39.00	1.15	0.20	0.00
40.00	1.15	0.20	0.00
41.00	1.15	0.20	0.00
42.00	1.15	0.20	0.00
43.00	1.15	0.20	0.00
44.00	1.15	0.20	0.00
45.00	1.15	0.20	0.00
46.00	1.15	0.20	0.00
47.00	1.15	0.20	0.00
48.00	1.15	0.20	0.00
49.00	1.15	0.20	0.00
50.00	1.15	0.20	0.00
51.00	1.15	0.20	0.00
52.00	1.15	0.20	0.00
53.00	1.15	0.20	0.00
54.00	1.15	0.20	0.00
55.00	1.15	0.20	0.00
56.00	1.15	0.20	0.00
57.00	1.15	0.20	0.00
58.00	1.15	0.20	0.00
59.00	1.15	0.20	0.00
60.00	1.15	0.20	0.00
61.00	1.15	0.20	0.00
62.00	1.15	0.20	0.00
63.00	1.15	0.20	0.00
64.00	1.15	0.20	0.00
65.00	1.15	0.20	0.00
66.00	1.15	0.20	0.00
67.00	1.15	0.20	0.00
68.00	1.15	0.20	0.00
69.00	1.15	0.20	0.00
70.00	1.15	0.20	0.00
71.00	1.15	0.20	0.00
72.00	1.15	0.20	0.00

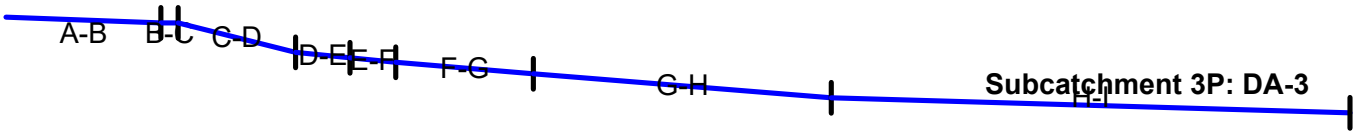
Summary for Subcatchment 3P: DA-3

Runoff = 1.97 cfs @ 12.14 hrs, Volume= 0.172 af, Depth= 0.57"
Routed to Link DP-3 : Design Point - 3

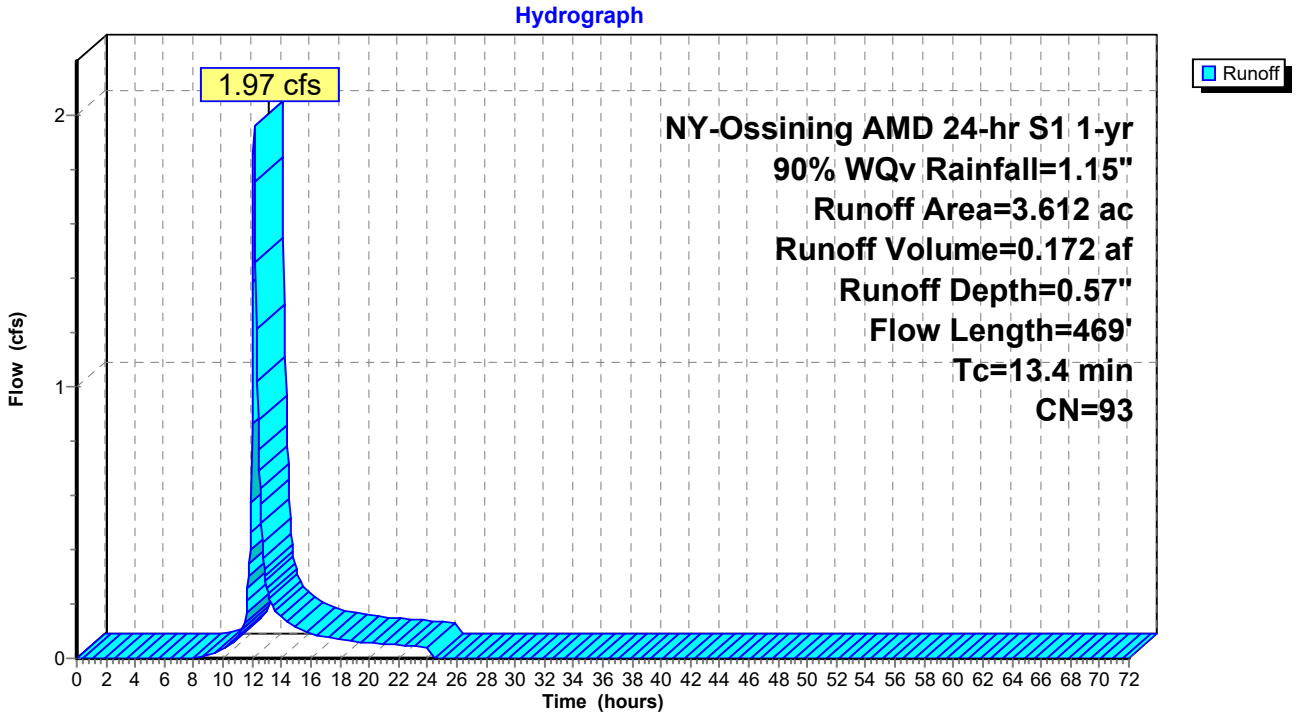
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.01
10.00	0.24	0.01	0.03
11.00	0.31	0.03	0.08
12.00	0.63	0.19	**0.86**
13.00	0.85	0.33	**0.25**
14.00	0.91	0.38	0.15
15.00	0.95	0.41	0.11
16.00	0.99	0.44	0.09
17.00	1.02	0.46	0.08
18.00	1.04	0.48	0.07
19.00	1.06	0.50	0.06
20.00	1.08	0.52	0.06
21.00	1.10	0.53	0.05
22.00	1.12	0.54	0.05
23.00	1.13	0.56	0.05
24.00	**1.15**	**0.57**	0.04
25.00	1.15	0.57	0.00
26.00	1.15	0.57	0.00
27.00	1.15	0.57	0.00
28.00	1.15	0.57	0.00
29.00	1.15	0.57	0.00
30.00	1.15	0.57	0.00
31.00	1.15	0.57	0.00
32.00	1.15	0.57	0.00
33.00	1.15	0.57	0.00
34.00	1.15	0.57	0.00
35.00	1.15	0.57	0.00
36.00	1.15	0.57	0.00
37.00	1.15	0.57	0.00
38.00	1.15	0.57	0.00
39.00	1.15	0.57	0.00
40.00	1.15	0.57	0.00
41.00	1.15	0.57	0.00
42.00	1.15	0.57	0.00
43.00	1.15	0.57	0.00
44.00	1.15	0.57	0.00
45.00	1.15	0.57	0.00
46.00	1.15	0.57	0.00
47.00	1.15	0.57	0.00
48.00	1.15	0.57	0.00
49.00	1.15	0.57	0.00
50.00	1.15	0.57	0.00
51.00	1.15	0.57	0.00
52.00	1.15	0.57	0.00
53.00	1.15	0.57	0.00
54.00	1.15	0.57	0.00
55.00	1.15	0.57	0.00
56.00	1.15	0.57	0.00
57.00	1.15	0.57	0.00
58.00	1.15	0.57	0.00
59.00	1.15	0.57	0.00
60.00	1.15	0.57	0.00
61.00	1.15	0.57	0.00
62.00	1.15	0.57	0.00
63.00	1.15	0.57	0.00
64.00	1.15	0.57	0.00
65.00	1.15	0.57	0.00
66.00	1.15	0.57	0.00
67.00	1.15	0.57	0.00
68.00	1.15	0.57	0.00
69.00	1.15	0.57	0.00
70.00	1.15	0.57	0.00
71.00	1.15	0.57	0.00
72.00	1.15	0.57	0.00

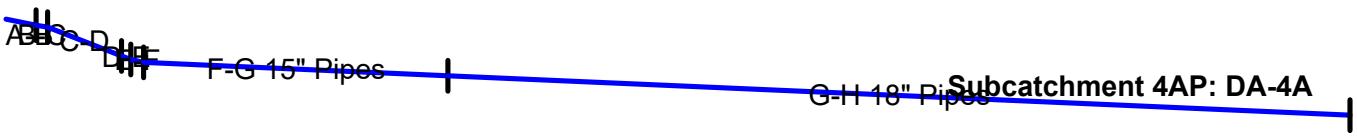
Summary for Subcatchment 4AP: DA-4A

Runoff = 3.71 cfs @ 12.13 hrs, Volume= 0.316 af, Depth= 0.57"
Routed to Link DP-4 : Design Point - 4

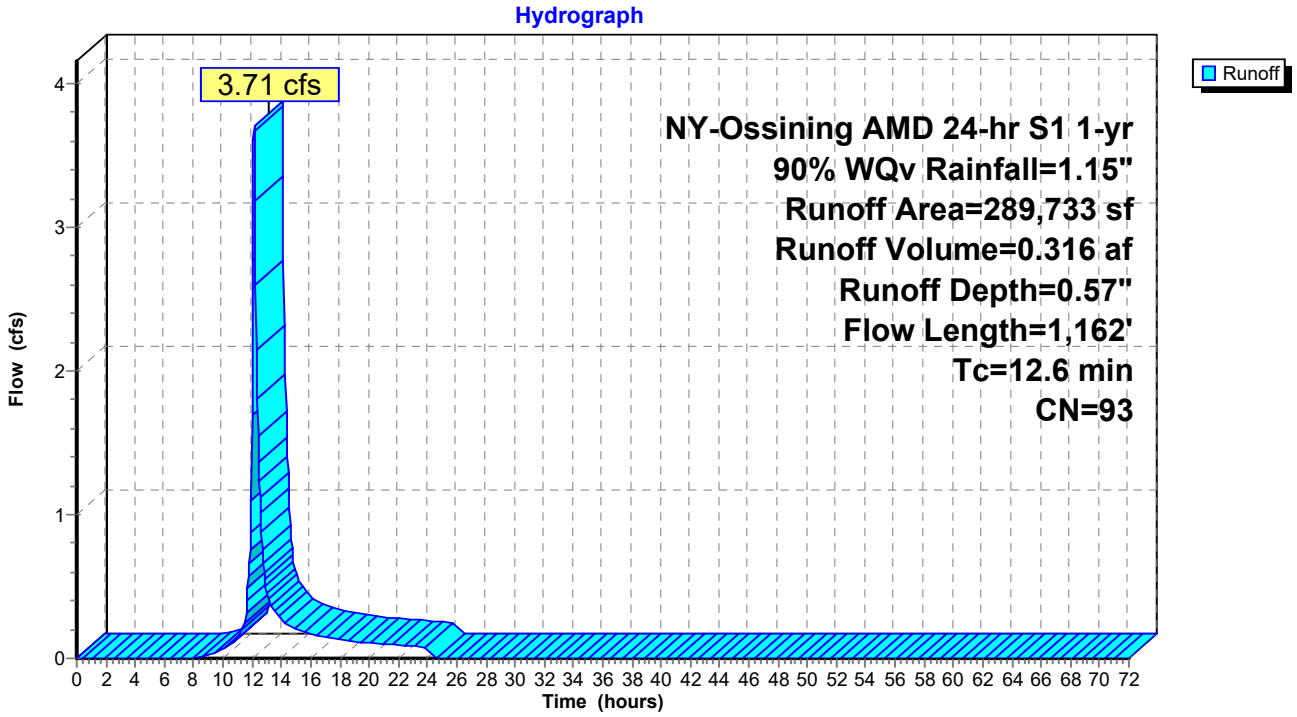
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (sf)	CN	Description
32,278	98	Unconnected pavement, HSG D
64,948	74	>75% Grass cover, Good, HSG C
73,311	98	Roofs, HSG C
119,196	98	Unconnected pavement, HSG C
289,733	93	Weighted Average
64,948		22.42% Pervious Area
224,785		77.58% Impervious Area
151,474		67.39% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.03
10.00	0.24	0.01	0.06
11.00	0.31	0.03	0.15
12.00	0.63	0.19	**1.69**
13.00	0.85	0.33	**0.46**
14.00	0.91	0.38	0.27
15.00	0.95	0.41	0.20
16.00	0.99	0.44	0.17
17.00	1.02	0.46	0.14
18.00	1.04	0.48	0.13
19.00	1.06	0.50	0.12
20.00	1.08	0.52	0.11
21.00	1.10	0.53	0.10
22.00	1.12	0.54	0.09
23.00	1.13	0.56	0.09
24.00	**1.15**	**0.57**	0.08
25.00	1.15	0.57	0.00
26.00	1.15	0.57	0.00
27.00	1.15	0.57	0.00
28.00	1.15	0.57	0.00
29.00	1.15	0.57	0.00
30.00	1.15	0.57	0.00
31.00	1.15	0.57	0.00
32.00	1.15	0.57	0.00
33.00	1.15	0.57	0.00
34.00	1.15	0.57	0.00
35.00	1.15	0.57	0.00
36.00	1.15	0.57	0.00
37.00	1.15	0.57	0.00
38.00	1.15	0.57	0.00
39.00	1.15	0.57	0.00
40.00	1.15	0.57	0.00
41.00	1.15	0.57	0.00
42.00	1.15	0.57	0.00
43.00	1.15	0.57	0.00
44.00	1.15	0.57	0.00
45.00	1.15	0.57	0.00
46.00	1.15	0.57	0.00
47.00	1.15	0.57	0.00
48.00	1.15	0.57	0.00
49.00	1.15	0.57	0.00
50.00	1.15	0.57	0.00
51.00	1.15	0.57	0.00
52.00	1.15	0.57	0.00
53.00	1.15	0.57	0.00
54.00	1.15	0.57	0.00
55.00	1.15	0.57	0.00
56.00	1.15	0.57	0.00
57.00	1.15	0.57	0.00
58.00	1.15	0.57	0.00
59.00	1.15	0.57	0.00
60.00	1.15	0.57	0.00
61.00	1.15	0.57	0.00
62.00	1.15	0.57	0.00
63.00	1.15	0.57	0.00
64.00	1.15	0.57	0.00
65.00	1.15	0.57	0.00
66.00	1.15	0.57	0.00
67.00	1.15	0.57	0.00
68.00	1.15	0.57	0.00
69.00	1.15	0.57	0.00
70.00	1.15	0.57	0.00
71.00	1.15	0.57	0.00
72.00	1.15	0.57	0.00

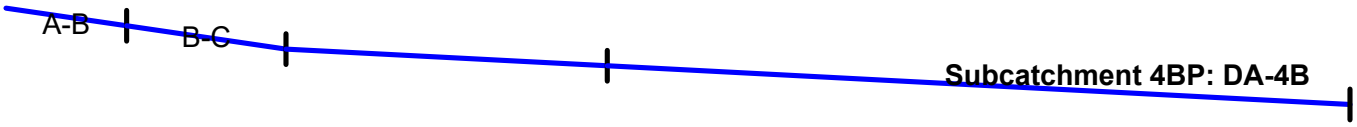
Summary for Subcatchment 4BP: DA-4B

Runoff = 0.06 cfs @ 12.68 hrs, Volume= 0.031 af, Depth= 0.05"
Routed to Link DP-4 : Design Point - 4

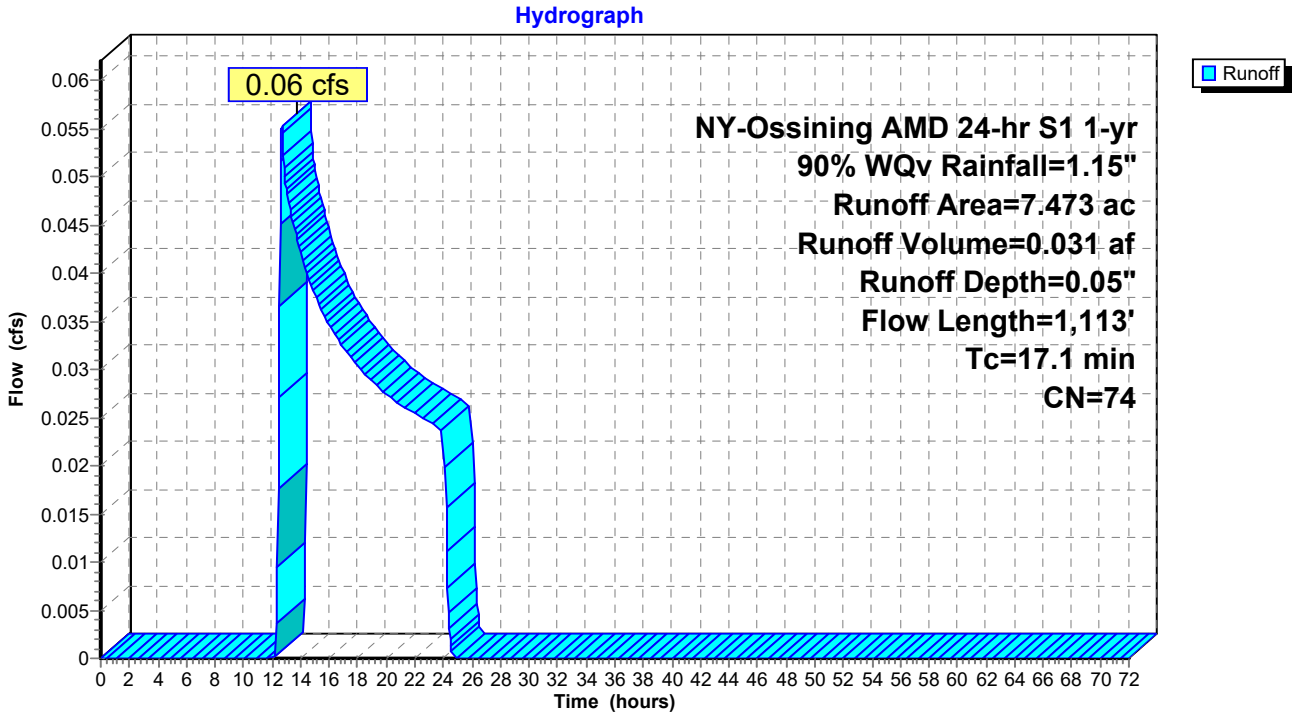
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.00
10.00	0.24	0.00	0.00
11.00	0.31	0.00	0.00
12.00	0.63	0.00	**0.00**
13.00	0.85	0.01	**0.05**
14.00	0.91	0.01	0.04
15.00	0.95	0.02	0.04
16.00	0.99	0.02	0.03
17.00	1.02	0.03	0.03
18.00	1.04	0.03	0.03
19.00	1.06	0.03	0.03
20.00	1.08	0.04	0.03
21.00	1.10	0.04	0.03
22.00	1.12	0.04	0.03
23.00	1.13	0.05	0.02
24.00	**1.15**	**0.05**	0.02
25.00	1.15	0.05	0.00
26.00	1.15	0.05	0.00
27.00	1.15	0.05	0.00
28.00	1.15	0.05	0.00
29.00	1.15	0.05	0.00
30.00	1.15	0.05	0.00
31.00	1.15	0.05	0.00
32.00	1.15	0.05	0.00
33.00	1.15	0.05	0.00
34.00	1.15	0.05	0.00
35.00	1.15	0.05	0.00
36.00	1.15	0.05	0.00
37.00	1.15	0.05	0.00
38.00	1.15	0.05	0.00
39.00	1.15	0.05	0.00
40.00	1.15	0.05	0.00
41.00	1.15	0.05	0.00
42.00	1.15	0.05	0.00
43.00	1.15	0.05	0.00
44.00	1.15	0.05	0.00
45.00	1.15	0.05	0.00
46.00	1.15	0.05	0.00
47.00	1.15	0.05	0.00
48.00	1.15	0.05	0.00
49.00	1.15	0.05	0.00
50.00	1.15	0.05	0.00
51.00	1.15	0.05	0.00
52.00	1.15	0.05	0.00
53.00	1.15	0.05	0.00
54.00	1.15	0.05	0.00
55.00	1.15	0.05	0.00
56.00	1.15	0.05	0.00
57.00	1.15	0.05	0.00
58.00	1.15	0.05	0.00
59.00	1.15	0.05	0.00
60.00	1.15	0.05	0.00
61.00	1.15	0.05	0.00
62.00	1.15	0.05	0.00
63.00	1.15	0.05	0.00
64.00	1.15	0.05	0.00
65.00	1.15	0.05	0.00
66.00	1.15	0.05	0.00
67.00	1.15	0.05	0.00
68.00	1.15	0.05	0.00
69.00	1.15	0.05	0.00
70.00	1.15	0.05	0.00
71.00	1.15	0.05	0.00
72.00	1.15	0.05	0.00

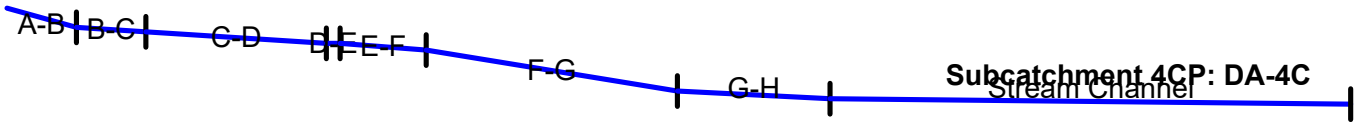
Summary for Subcatchment 4CP: DA-4C

Runoff = 0.02 cfs @ 16.30 hrs, Volume= 0.020 af, Depth= 0.03"
Routed to Link DP-4 : Design Point - 4

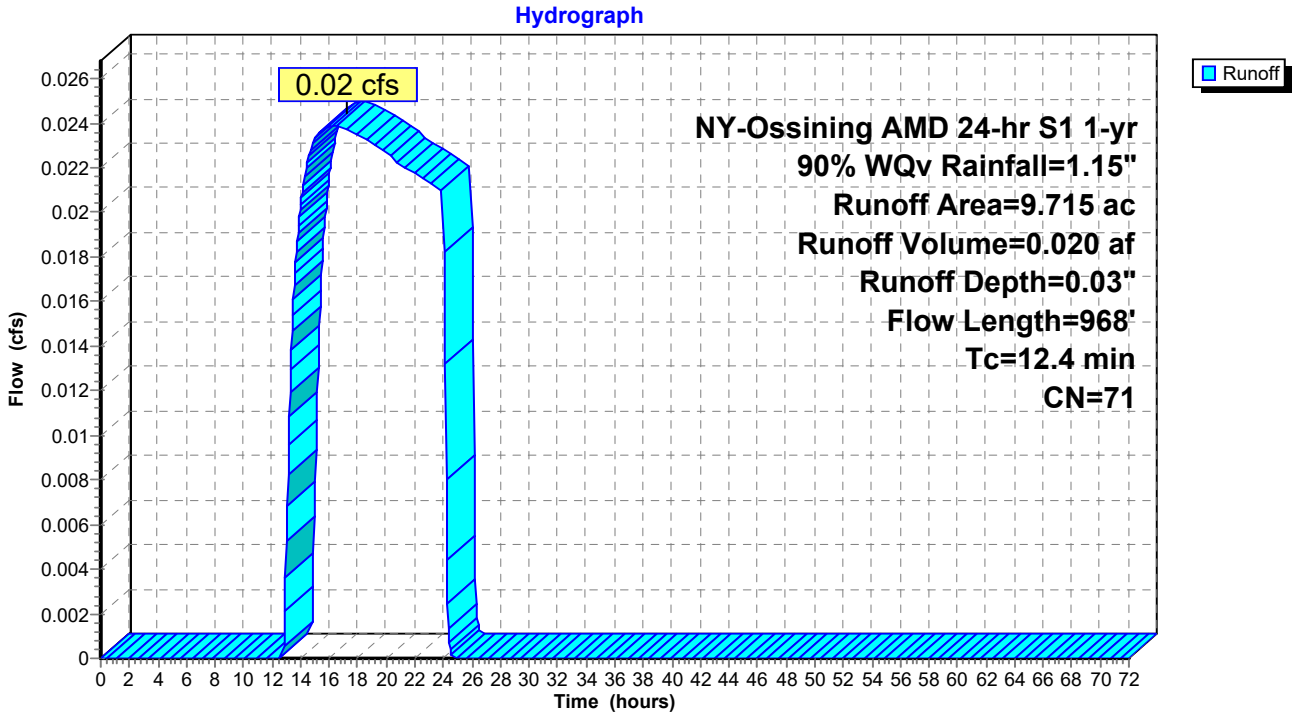
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.00	0.00
9.00	0.20	0.00	0.00
10.00	0.24	0.00	0.00
11.00	0.31	0.00	0.00
12.00	0.63	0.00	0.00
13.00	0.85	0.00	0.01
14.00	0.91	0.00	0.02
15.00	0.95	0.00	0.02
16.00	0.99	0.01	**0.02**
17.00	1.02	0.01	**0.02**
18.00	1.04	0.01	0.02
19.00	1.06	0.01	0.02
20.00	1.08	0.02	0.02
21.00	1.10	0.02	0.02
22.00	1.12	0.02	0.02
23.00	1.13	0.02	0.02
24.00	**1.15**	**0.03**	0.02
25.00	1.15	0.03	0.00
26.00	1.15	0.03	0.00
27.00	1.15	0.03	0.00
28.00	1.15	0.03	0.00
29.00	1.15	0.03	0.00
30.00	1.15	0.03	0.00
31.00	1.15	0.03	0.00
32.00	1.15	0.03	0.00
33.00	1.15	0.03	0.00
34.00	1.15	0.03	0.00
35.00	1.15	0.03	0.00
36.00	1.15	0.03	0.00
37.00	1.15	0.03	0.00
38.00	1.15	0.03	0.00
39.00	1.15	0.03	0.00
40.00	1.15	0.03	0.00
41.00	1.15	0.03	0.00
42.00	1.15	0.03	0.00
43.00	1.15	0.03	0.00
44.00	1.15	0.03	0.00
45.00	1.15	0.03	0.00
46.00	1.15	0.03	0.00
47.00	1.15	0.03	0.00
48.00	1.15	0.03	0.00
49.00	1.15	0.03	0.00
50.00	1.15	0.03	0.00
51.00	1.15	0.03	0.00
52.00	1.15	0.03	0.00
53.00	1.15	0.03	0.00
54.00	1.15	0.03	0.00
55.00	1.15	0.03	0.00
56.00	1.15	0.03	0.00
57.00	1.15	0.03	0.00
58.00	1.15	0.03	0.00
59.00	1.15	0.03	0.00
60.00	1.15	0.03	0.00
61.00	1.15	0.03	0.00
62.00	1.15	0.03	0.00
63.00	1.15	0.03	0.00
64.00	1.15	0.03	0.00
65.00	1.15	0.03	0.00
66.00	1.15	0.03	0.00
67.00	1.15	0.03	0.00
68.00	1.15	0.03	0.00
69.00	1.15	0.03	0.00
70.00	1.15	0.03	0.00
71.00	1.15	0.03	0.00
72.00	1.15	0.03	0.00

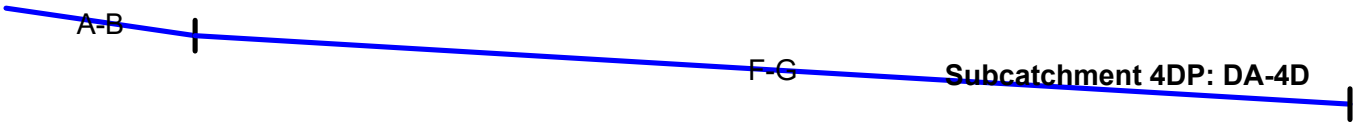
Summary for Subcatchment 4DP: DA-4D

Runoff = 1.24 cfs @ 12.04 hrs, Volume= 0.079 af, Depth= 0.69"
Routed to Pond 6P : Infiltrators

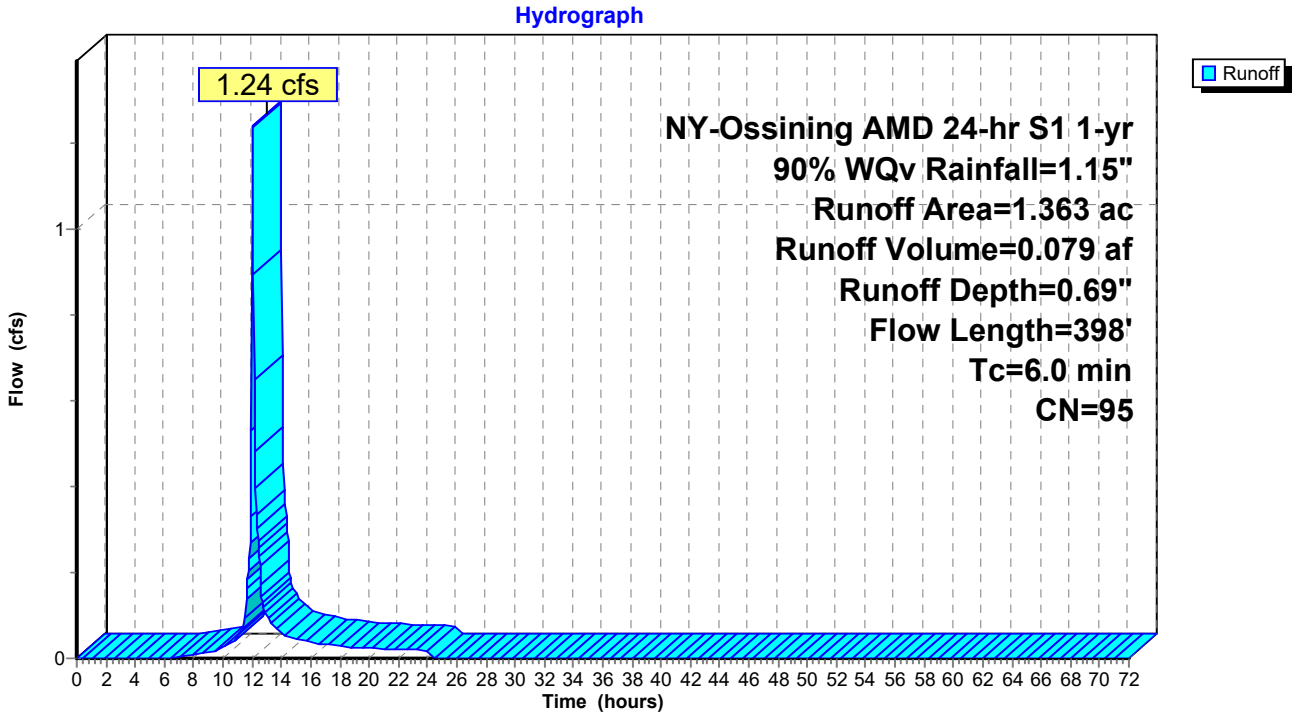
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.15"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.16	0.01	0.01
9.00	0.20	0.01	0.01
10.00	0.24	0.03	0.02
11.00	0.31	0.06	0.05
12.00	0.63	0.26	**1.06**
13.00	0.85	0.43	**0.10**
14.00	0.91	0.48	0.06
15.00	0.95	0.52	0.05
16.00	0.99	0.55	0.04
17.00	1.02	0.58	0.03
18.00	1.04	0.60	0.03
19.00	1.06	0.62	0.03
20.00	1.08	0.64	0.02
21.00	1.10	0.65	0.02
22.00	1.12	0.67	0.02
23.00	1.13	0.68	0.02
24.00	**1.15**	**0.69**	0.02
25.00	1.15	0.69	0.00
26.00	1.15	0.69	0.00
27.00	1.15	0.69	0.00
28.00	1.15	0.69	0.00
29.00	1.15	0.69	0.00
30.00	1.15	0.69	0.00
31.00	1.15	0.69	0.00
32.00	1.15	0.69	0.00
33.00	1.15	0.69	0.00
34.00	1.15	0.69	0.00
35.00	1.15	0.69	0.00
36.00	1.15	0.69	0.00
37.00	1.15	0.69	0.00
38.00	1.15	0.69	0.00
39.00	1.15	0.69	0.00
40.00	1.15	0.69	0.00
41.00	1.15	0.69	0.00
42.00	1.15	0.69	0.00
43.00	1.15	0.69	0.00
44.00	1.15	0.69	0.00
45.00	1.15	0.69	0.00
46.00	1.15	0.69	0.00
47.00	1.15	0.69	0.00
48.00	1.15	0.69	0.00
49.00	1.15	0.69	0.00
50.00	1.15	0.69	0.00
51.00	1.15	0.69	0.00
52.00	1.15	0.69	0.00
53.00	1.15	0.69	0.00
54.00	1.15	0.69	0.00
55.00	1.15	0.69	0.00
56.00	1.15	0.69	0.00
57.00	1.15	0.69	0.00
58.00	1.15	0.69	0.00
59.00	1.15	0.69	0.00
60.00	1.15	0.69	0.00
61.00	1.15	0.69	0.00
62.00	1.15	0.69	0.00
63.00	1.15	0.69	0.00
64.00	1.15	0.69	0.00
65.00	1.15	0.69	0.00
66.00	1.15	0.69	0.00
67.00	1.15	0.69	0.00
68.00	1.15	0.69	0.00
69.00	1.15	0.69	0.00
70.00	1.15	0.69	0.00
71.00	1.15	0.69	0.00
72.00	1.15	0.69	0.00

Summary for Pond 6P: Infiltrators

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 0.69" for 90% WQv event
Inflow = 1.24 cfs @ 12.04 hrs, Volume= 0.079 af
Outflow = 0.09 cfs @ 13.16 hrs, Volume= 0.079 af, Atten= 93%, Lag= 67.0 min
Discarded = 0.07 cfs @ 11.80 hrs, Volume= 0.076 af
Primary = 0.02 cfs @ 13.16 hrs, Volume= 0.003 af
Routed to Link DP-4 : Design Point - 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 347.08' @ 13.16 hrs Surf.Area= 0.132 ac Storage= 0.031 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 167.1 min (998.8 - 831.7)

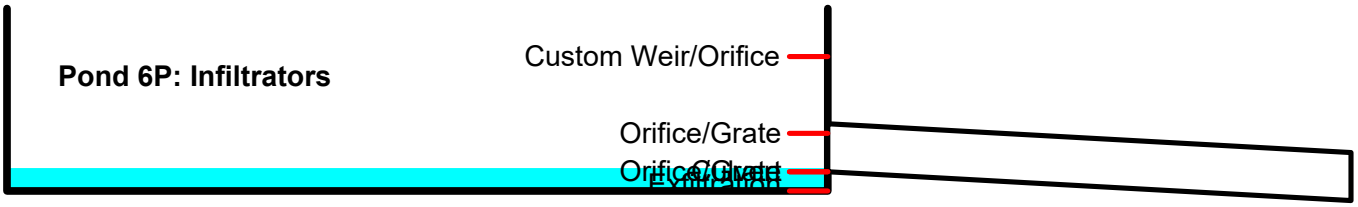
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 11.80 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.02 cfs @ 13.16 hrs HW=347.08' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.02 cfs of 0.03 cfs potential flow)
├**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.99 fps)
├**4=Orifice/Grate** (Controls 0.00 cfs)
└**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

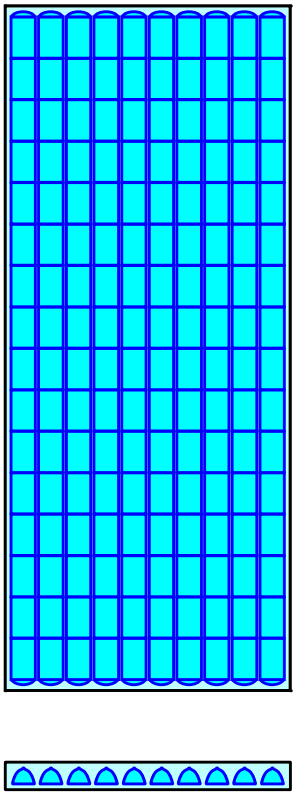
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

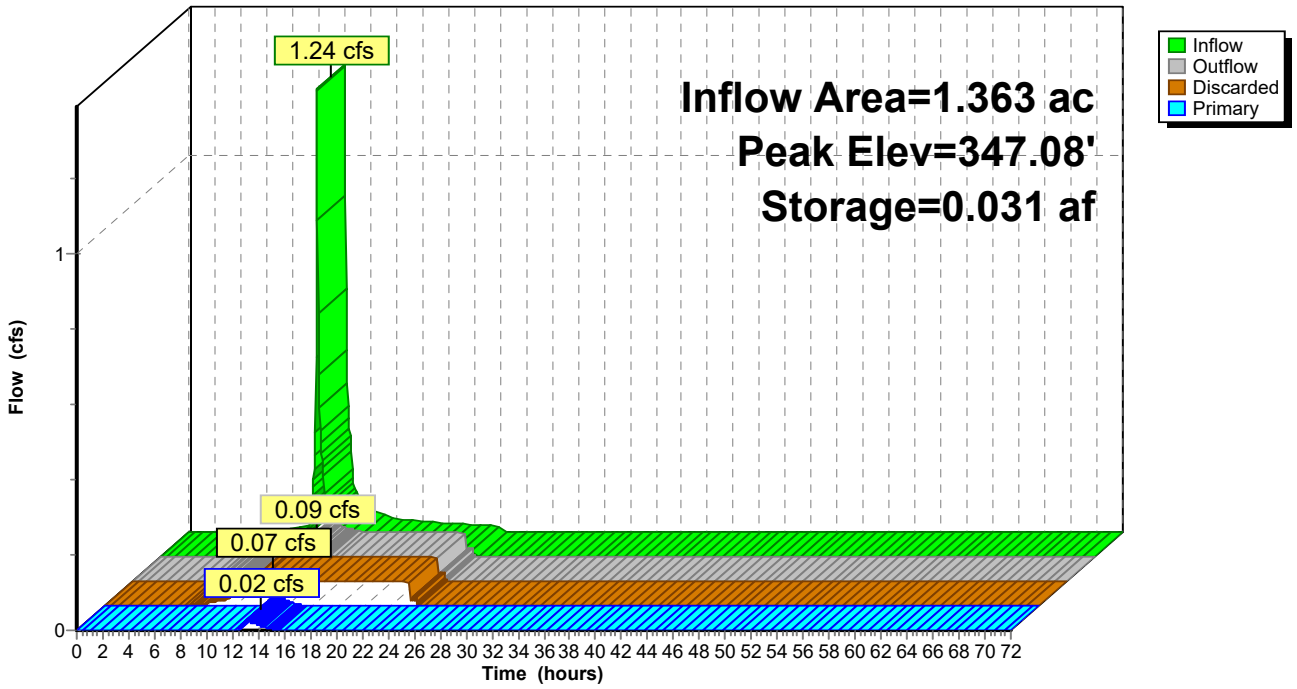
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers
1,014.0 cy Field
711.7 cy Stone



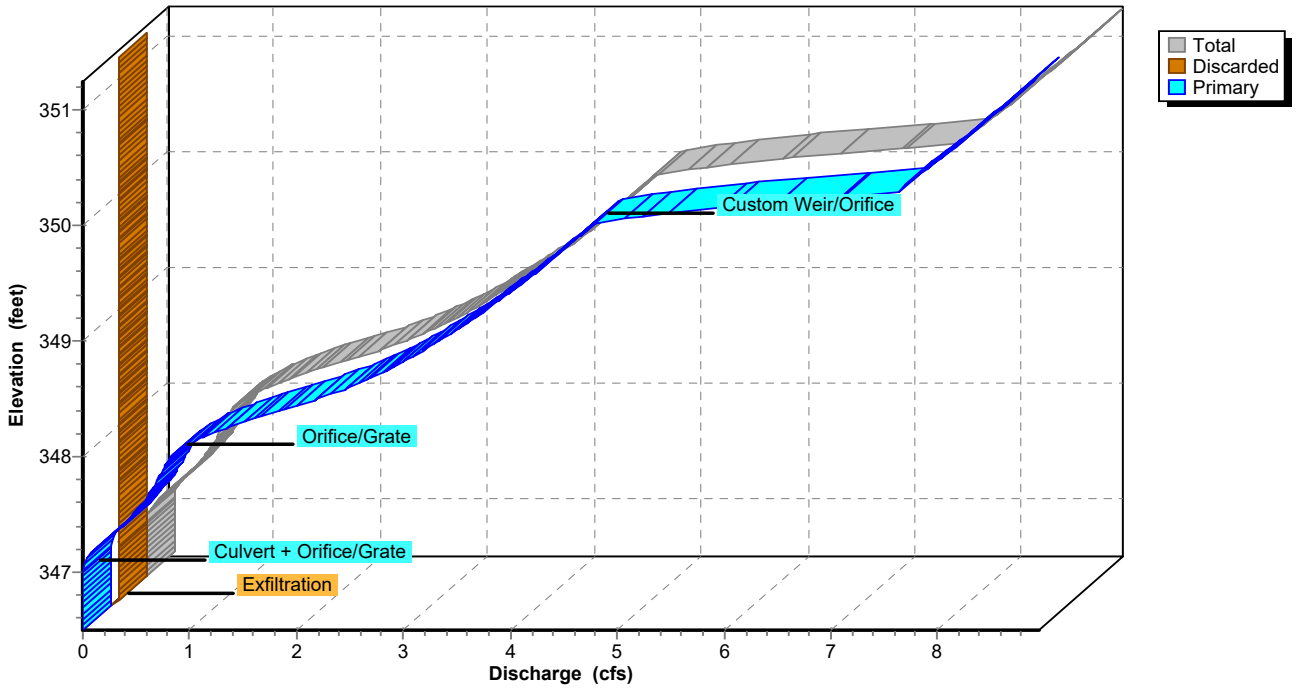
Pond 6P: Infiltrators

Hydrograph

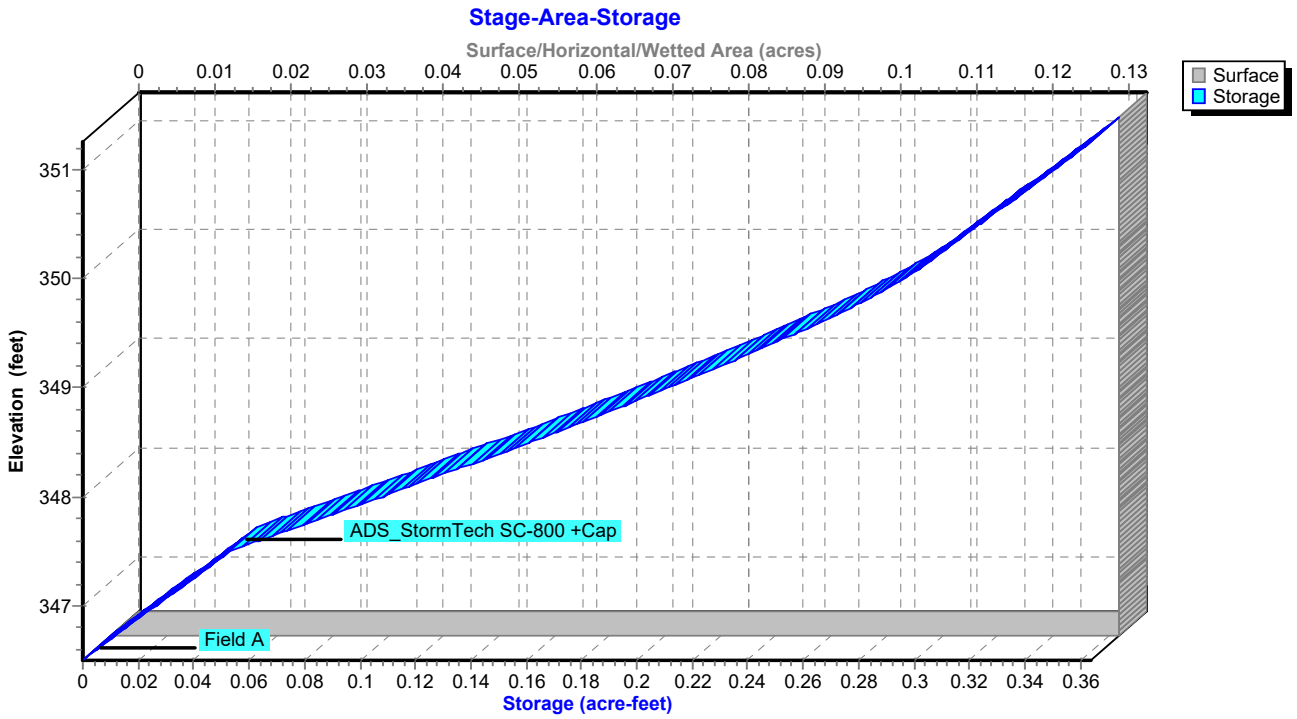


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.00	0.000	346.50	0.00	0.00	0.00
7.50	0.01	0.000	346.50	0.01	0.01	0.00
10.00	**0.02**	0.000	346.50	0.02	**0.02**	0.00
12.50	**0.24**	**0.029**	**347.04**	**0.07**	**0.07**	**0.00**
15.00	0.05	**0.028**	**347.03**	**0.07**	0.07	**0.00**
17.50	0.03	0.022	346.91	0.07	0.07	0.00
20.00	0.02	0.014	346.76	0.07	0.07	0.00
22.50	0.02	0.004	346.58	0.07	0.07	0.00
25.00	0.00	0.000	346.50	0.00	0.00	0.00
27.50	0.00	0.000	346.50	0.00	0.00	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

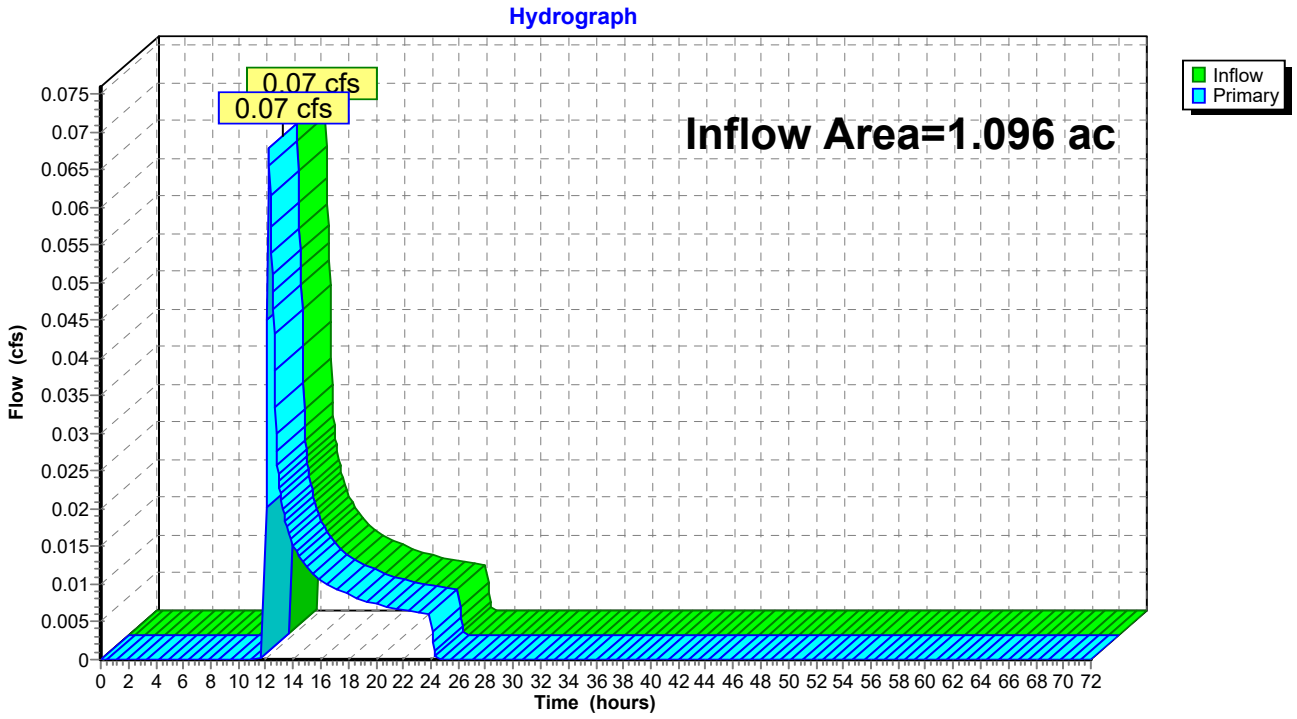
Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 0.13" for 90% WQv event
Inflow = 0.07 cfs @ 12.21 hrs, Volume= 0.012 af
Primary = 0.07 cfs @ 12.21 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

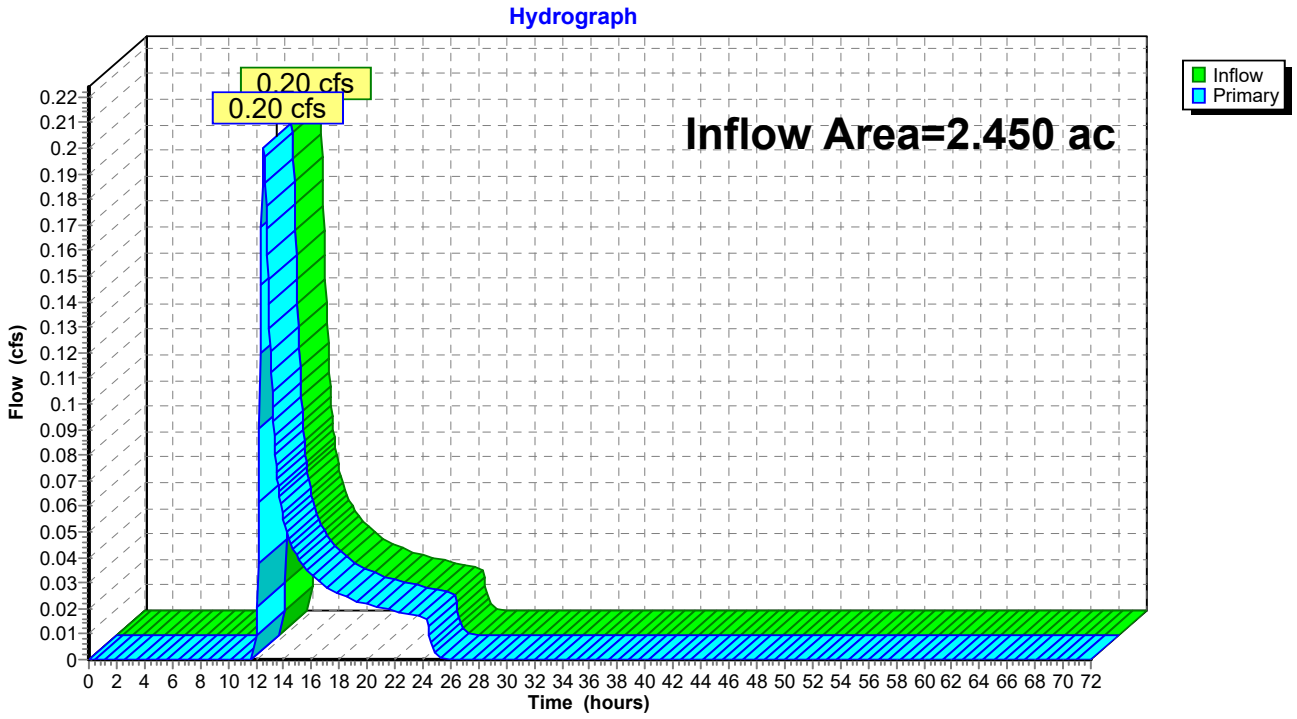
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00
12.00	**0.00**	0.00	**0.00**
13.00	**0.02**	0.00	**0.02**
14.00	0.02	0.00	0.02
15.00	0.01	0.00	0.01
16.00	0.01	0.00	0.01
17.00	0.01	0.00	0.01
18.00	0.01	0.00	0.01
19.00	0.01	0.00	0.01
20.00	0.01	0.00	0.01
21.00	0.01	0.00	0.01
22.00	0.01	0.00	0.01
23.00	0.01	0.00	0.01
24.00	0.01	0.00	0.01
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 0.20" for 90% WQv event
Inflow = 0.20 cfs @ 12.57 hrs, Volume= 0.040 af
Primary = 0.20 cfs @ 12.57 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

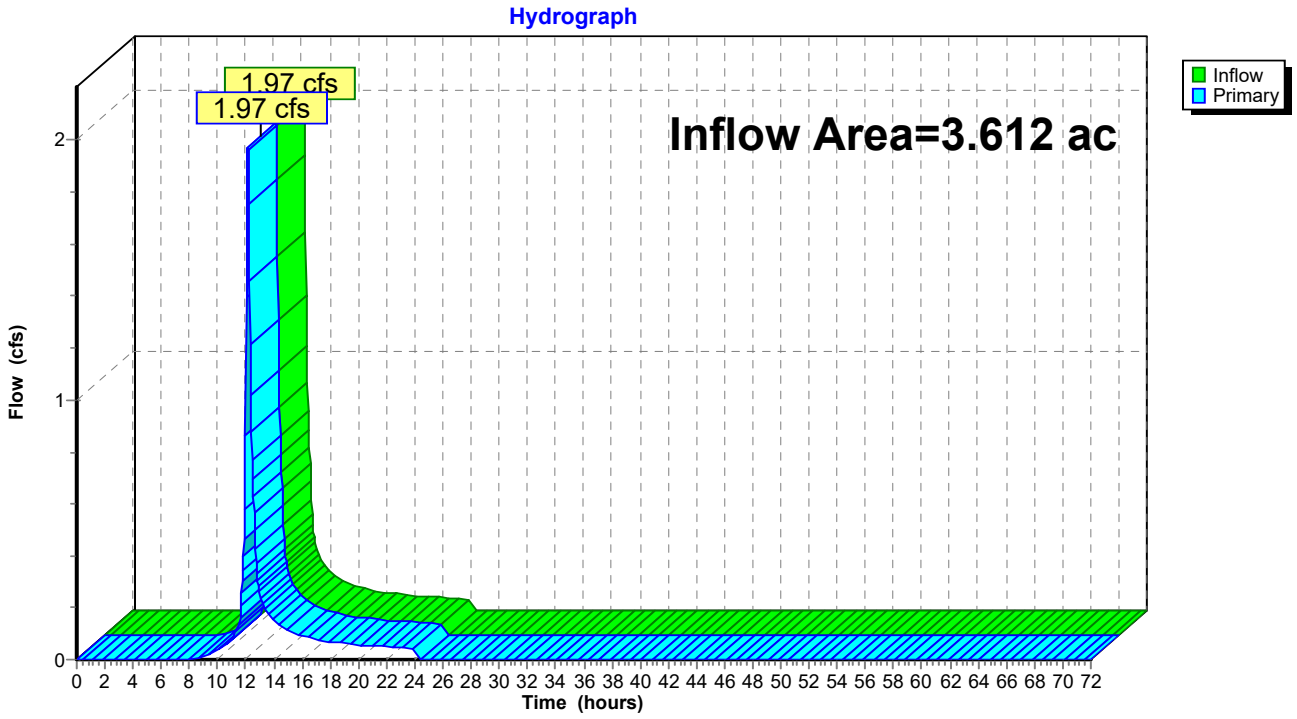
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00
12.00	**0.00**	0.00	**0.00**
13.00	**0.13**	0.00	**0.13**
14.00	0.05	0.00	0.05
15.00	0.04	0.00	0.04
16.00	0.03	0.00	0.03
17.00	0.03	0.00	0.03
18.00	0.03	0.00	0.03
19.00	0.02	0.00	0.02
20.00	0.02	0.00	0.02
21.00	0.02	0.00	0.02
22.00	0.02	0.00	0.02
23.00	0.02	0.00	0.02
24.00	0.02	0.00	0.02
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 0.57" for 90% WQv event
Inflow = 1.97 cfs @ 12.14 hrs, Volume= 0.172 af
Primary = 1.97 cfs @ 12.14 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

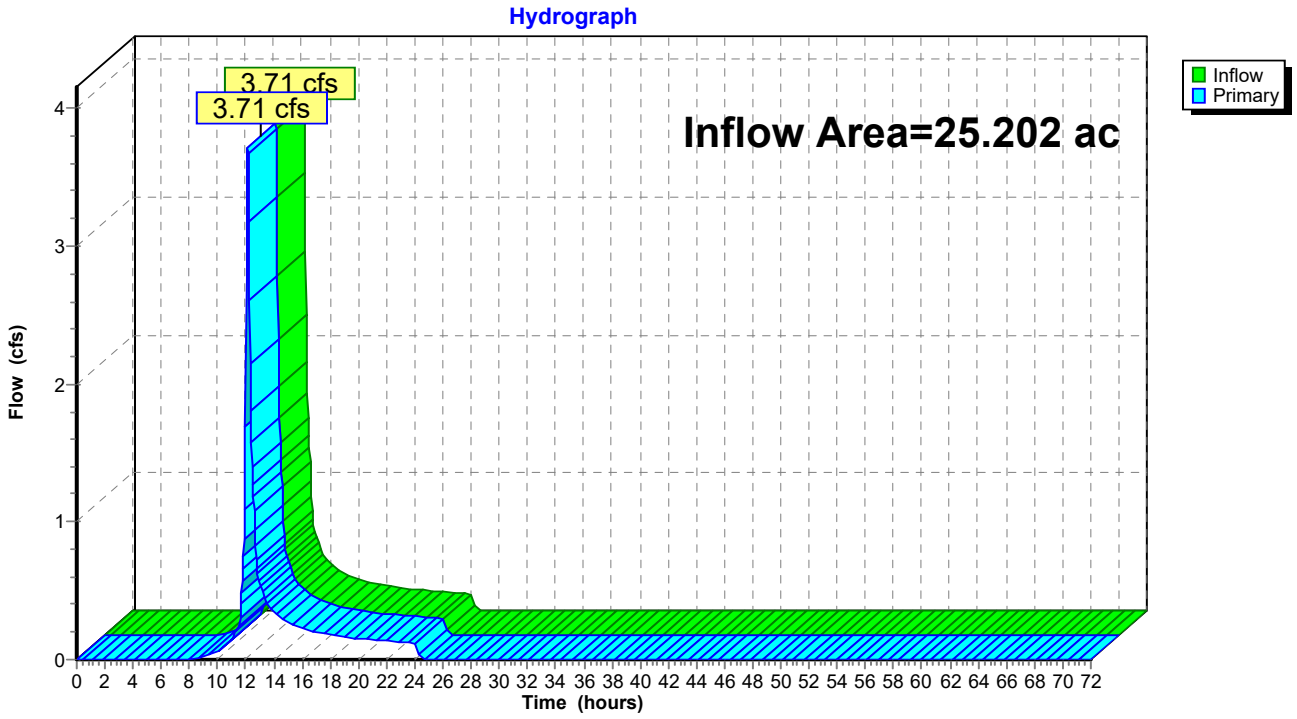
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01
10.00	0.03	0.00	0.03
11.00	0.08	0.00	0.08
12.00	**0.86**	0.00	**0.86**
13.00	**0.25**	0.00	**0.25**
14.00	0.15	0.00	0.15
15.00	0.11	0.00	0.11
16.00	0.09	0.00	0.09
17.00	0.08	0.00	0.08
18.00	0.07	0.00	0.07
19.00	0.06	0.00	0.06
20.00	0.06	0.00	0.06
21.00	0.05	0.00	0.05
22.00	0.05	0.00	0.05
23.00	0.05	0.00	0.05
24.00	0.04	0.00	0.04
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: Design Point - 4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth = 0.18" for 90% WQv event
Inflow = 3.71 cfs @ 12.13 hrs, Volume= 0.371 af
Primary = 3.71 cfs @ 12.13 hrs, Volume= 0.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

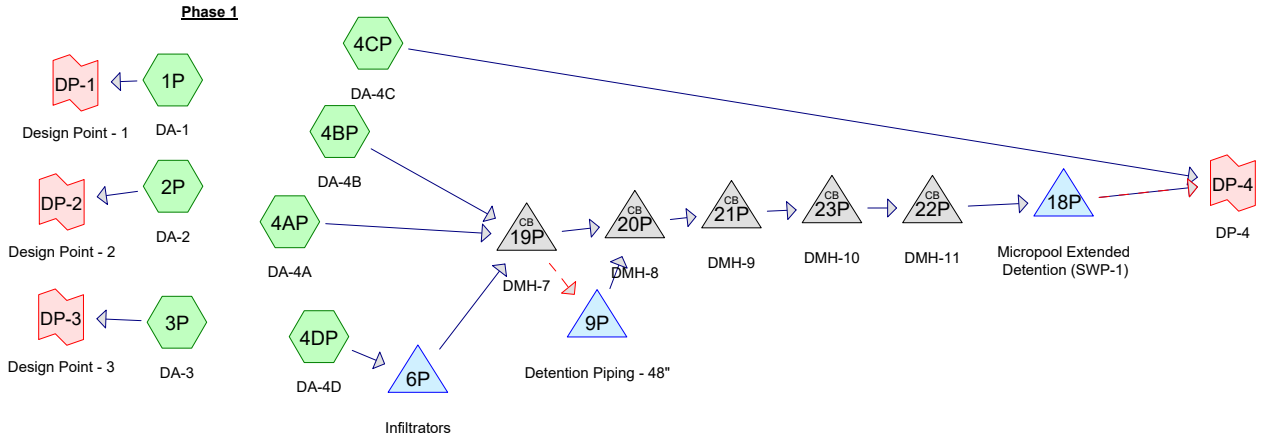
Link DP-4: Design Point - 4



Hydrograph for Link DP-4: Design Point - 4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.03	0.00	0.03
10.00	0.06	0.00	0.06
11.00	0.15	0.00	0.15
12.00	**1.69**	0.00	**1.69**
13.00	**0.54**	0.00	**0.54**
14.00	0.35	0.00	0.35
15.00	0.27	0.00	0.27
16.00	0.23	0.00	0.23
17.00	0.20	0.00	0.20
18.00	0.18	0.00	0.18
19.00	0.17	0.00	0.17
20.00	0.16	0.00	0.16
21.00	0.15	0.00	0.15
22.00	0.14	0.00	0.14
23.00	0.13	0.00	0.13
24.00	0.13	0.00	0.13
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Phase 2 - 7/8 Building Construction



Subcat Reach Pond Link

Routing Diagram for Mitigated Conditions - AMD Campus
Prepared by Clark Patterson Lee, Printed 10/21/2026
HydroCAD® 10.20-8a s/n 00475 © 2025 HydroCAD Software Solutions LLC

Project Notes

Defined 9 rainfall events from NY-Ossining AMD IDF
Copied 9 events from NY-Ossining AMD 24-hr S1 storm

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	NY-Ossining AMD 24-hr S1	1-yr	Default	24.00	1	2.78	2
2	2-yr	NY-Ossining AMD 24-hr S1	2-yr	Default	24.00	1	3.41	2
3	10-yr	NY-Ossining AMD 24-hr S1	10-yr	Default	24.00	1	5.14	2
4	100-yr	NY-Ossining AMD 24-hr S1	100-yr	Default	24.00	1	9.29	2
5	200-yr	NY-Ossining AMD 24-hr S1	200-yr	Default	24.00	1	11.13	2
6	90% WQv	NY-Ossining AMD 24-hr S1	1-yr	Default	24.00	1	1.19	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
12.016	74	>75% Grass cover, Good, HSG C (4AP, 4BP, 4CP)
0.233	80	>75% Grass cover, Good, HSG D (4DP)
0.147	96	Gravel surface, HSG B (4CP)
0.612	71	Meadow, non-grazed, HSG C (4BP)
0.363	80	Pasture/grassland/range, Good, HSG D (2P)
0.615	79	Pasture/grassland/range, Poor, HSG B (3P)
0.030	98	Paved parking, HSG B (3P)
1.130	98	Paved parking, HSG D (4DP)
2.118	98	Paved roads w/curbs & sewers, HSG D (3P)
1.683	98	Roofs, HSG C (4AP)
0.255	98	Roofs, HSG D (3P)
0.071	98	Unconnected pavement, HSG B (3P)
2.862	98	Unconnected pavement, HSG C (4AP, 4BP)
0.741	98	Unconnected pavement, HSG D (4AP)
0.755	79	Woods, Fair, HSG D (1P)
4.583	66	Woods, Poor, HSG B (4CP)
0.561	77	Woods, Poor, HSG C (4CP)
3.244	83	Woods, Poor, HSG D (2P, 3P, 4CP)
0.341	82	Woods/grass comb., Fair, HSG D (1P)
32.360	**81**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.446	HSG B	3P, 4CP
17.734	HSG C	4AP, 4BP, 4CP
9.180	HSG D	1P, 2P, 3P, 4AP, 4CP, 4DP
0.000	Other	
32.360		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	12.016	0.233	0.000	12.249	>75% Grass cover, Good	4AP, 4BP, 4CP, 4DP
0.000	0.147	0.000	0.000	0.000	0.147	Gravel surface	4CP
0.000	0.000	0.612	0.000	0.000	0.612	Meadow, non-grazed	4BP
0.000	0.000	0.000	0.363	0.000	0.363	Pasture/grassland/range, Good	2P
0.000	0.615	0.000	0.000	0.000	0.615	Pasture/grassland/range, Poor	3P
0.000	0.030	0.000	1.130	0.000	1.160	Paved parking	3P, 4DP
0.000	0.000	0.000	2.118	0.000	2.118	Paved roads w/curbs & sewers	3P
0.000	0.000	1.683	0.255	0.000	1.938	Roofs	3P, 4AP
0.000	0.071	2.862	0.741	0.000	3.674	Unconnected pavement	3P, 4AP, 4BP
0.000	0.000	0.000	0.755	0.000	0.755	Woods, Fair	1P
0.000	4.583	0.561	3.244	0.000	8.388	Woods, Poor	2P, 3P, 4CP
0.000	0.000	0.000	0.341	0.000	0.341	Woods/grass comb., Fair	1P
0.000	**5.446**	**17.734**	**9.180**	**0.000**	**32.360**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	3P	0.00	0.00	181.0	0.0077	0.013	0.0	15.0	0.0	
2	4AP	0.00	0.00	263.0	0.0050	0.013	0.0	15.0	0.0	
3	4AP	0.00	0.00	780.0	0.0050	0.013	0.0	18.0	0.0	
4	4BP	0.00	0.00	266.0	0.0050	0.013	0.0	12.0	0.0	
5	4BP	0.00	0.00	615.0	0.0050	0.013	0.0	24.0	0.0	
6	4DP	0.00	0.00	342.0	0.0100	0.013	0.0	15.0	0.0	
7	6P	347.00	346.25	75.0	0.0100	0.013	0.0	15.0	0.0	
8	9P	331.84	331.80	8.0	0.0050	0.013	0.0	18.0	0.0	
9	18P	279.50	275.06	79.4	0.0559	0.013	0.0	18.0	0.0	
10	19P	334.34	333.92	84.0	0.0050	0.013	0.0	36.0	0.0	
11	19P	334.84	334.80	8.0	0.0050	0.013	0.0	18.0	0.0	
12	20P	330.20	329.96	49.0	0.0049	0.013	0.0	36.0	0.0	
13	21P	329.86	302.40	97.0	0.2831	0.013	0.0	36.0	0.0	
14	22P	291.08	291.00	16.0	0.0050	0.013	0.0	36.0	0.0	
15	23P	298.58	292.08	44.0	0.1477	0.013	0.0	36.0	0.0	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=253' Tc=12.2 min CN=80 Runoff=1.15 cfs 0.099 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=1.27"
Flow Length=548' Tc=36.4 min CN=83 Runoff=1.77 cfs 0.260 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.04"
Flow Length=469' Tc=13.4 min CN=93 Runoff=6.99 cfs 0.615 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=2.04"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=13.33 cfs 1.133 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=0.77"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=4.39 cfs 0.481 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=968' Tc=12.4 min CN=71 Runoff=5.04 cfs 0.516 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=2.23"
Flow Length=398' Tc=6.0 min CN=95 Runoff=3.84 cfs 0.254 af

Pond 6P: Infiltrators Peak Elev=347.82' Storage=0.089 af Inflow=3.84 cfs 0.254 af
Discarded=0.07 cfs 0.124 af Primary=0.72 cfs 0.129 af Outflow=0.78 cfs 0.254 af

Pond 9P: Detention Piping - 48" Peak Elev=332.62' Storage=0.049 af Inflow=3.90 cfs 0.135 af
Outflow=1.91 cfs 0.135 af

Pond 18P: Micropool Extended Detention Peak Elev=289.27' Storage=48,975 cf Inflow=15.06 cfs 1.743 af
Primary=0.68 cfs 1.733 af Secondary=0.00 cfs 0.000 af Outflow=0.68 cfs 1.733 af

Pond 19P: DMH-7 Peak Elev=336.09' Inflow=17.67 cfs 1.743 af
Primary=13.76 cfs 1.608 af Secondary=3.90 cfs 0.135 af Outflow=17.67 cfs 1.743 af

Pond 20P: DMH-8 Peak Elev=332.11' Inflow=15.06 cfs 1.743 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=15.06 cfs 1.743 af

Pond 21P: DMH-9 Peak Elev=331.38' Inflow=15.06 cfs 1.743 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=15.06 cfs 1.743 af

Pond 22P: DMH-11 Peak Elev=292.95' Inflow=15.06 cfs 1.743 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=15.06 cfs 1.743 af

Pond 23P: DMH-10 Peak Elev=300.10' Inflow=15.06 cfs 1.743 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=15.06 cfs 1.743 af

Link DP-1: Design Point - 1 Inflow=1.15 cfs 0.099 af
Primary=1.15 cfs 0.099 af

Link DP-2: Design Point - 2 Inflow=1.77 cfs 0.260 af
Primary=1.77 cfs 0.260 af

Link DP-3: Design Point - 3 Inflow=6.99 cfs 0.615 af
Primary=6.99 cfs 0.615 af

Link DP-4: DP-4 Inflow=5.47 cfs 2.249 af
Primary=5.47 cfs 2.249 af

Total Runoff Area = 32.360 ac Runoff Volume = 3.358 af Average Runoff Depth = 1.25"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

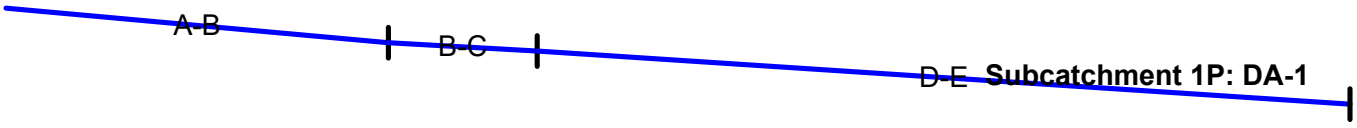
Summary for Subcatchment 1P: DA-1

Runoff = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af, Depth= 1.09"
Routed to Link DP-1 : Design Point - 1

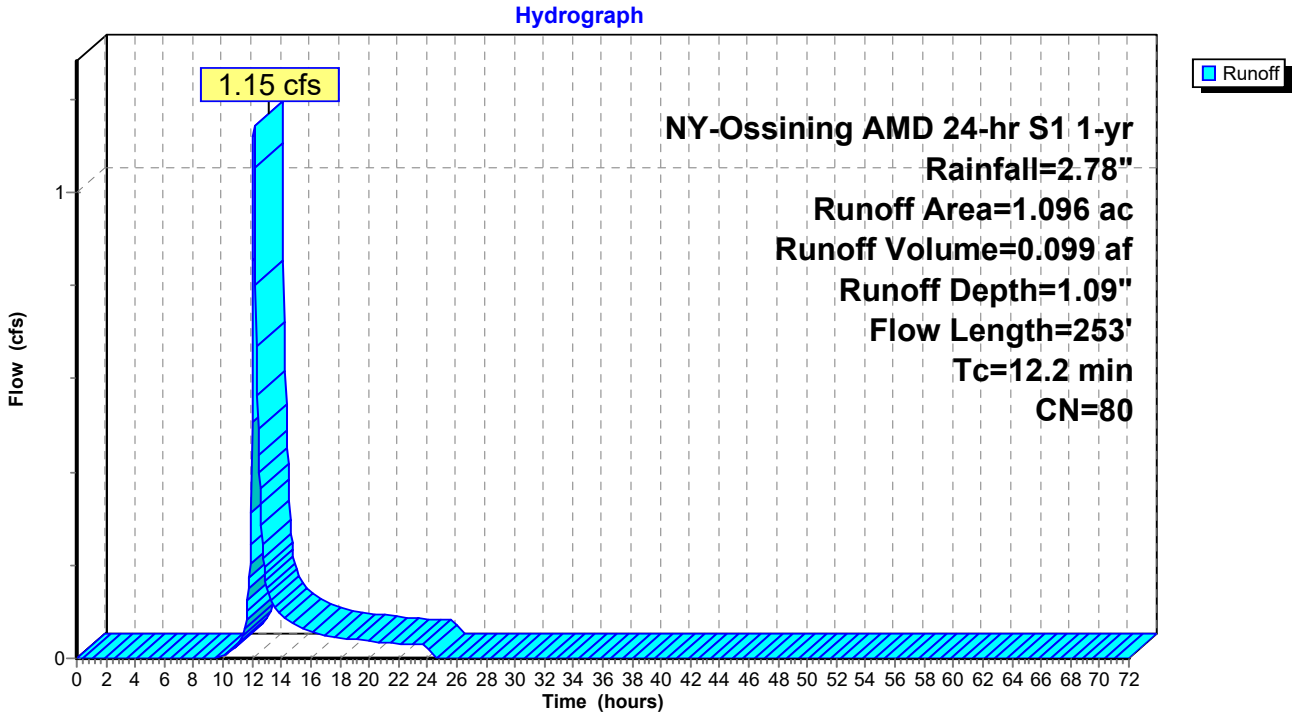
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.01
11.00	0.74	0.02	0.03
12.00	1.53	0.30	**0.51**
13.00	2.04	0.59	**0.15**
14.00	2.19	0.68	0.09
15.00	2.30	0.75	0.07
16.00	2.38	0.81	0.06
17.00	2.45	0.86	0.05
18.00	2.51	0.90	0.04
19.00	2.57	0.94	0.04
20.00	2.62	0.97	0.04
21.00	2.66	1.00	0.03
22.00	2.70	1.03	0.03
23.00	2.74	1.06	0.03
24.00	**2.78**	**1.09**	0.03
25.00	2.78	1.09	0.00
26.00	2.78	1.09	0.00
27.00	2.78	1.09	0.00
28.00	2.78	1.09	0.00
29.00	2.78	1.09	0.00
30.00	2.78	1.09	0.00
31.00	2.78	1.09	0.00
32.00	2.78	1.09	0.00
33.00	2.78	1.09	0.00
34.00	2.78	1.09	0.00
35.00	2.78	1.09	0.00
36.00	2.78	1.09	0.00
37.00	2.78	1.09	0.00
38.00	2.78	1.09	0.00
39.00	2.78	1.09	0.00
40.00	2.78	1.09	0.00
41.00	2.78	1.09	0.00
42.00	2.78	1.09	0.00
43.00	2.78	1.09	0.00
44.00	2.78	1.09	0.00
45.00	2.78	1.09	0.00
46.00	2.78	1.09	0.00
47.00	2.78	1.09	0.00
48.00	2.78	1.09	0.00
49.00	2.78	1.09	0.00
50.00	2.78	1.09	0.00
51.00	2.78	1.09	0.00
52.00	2.78	1.09	0.00
53.00	2.78	1.09	0.00
54.00	2.78	1.09	0.00
55.00	2.78	1.09	0.00
56.00	2.78	1.09	0.00
57.00	2.78	1.09	0.00
58.00	2.78	1.09	0.00
59.00	2.78	1.09	0.00
60.00	2.78	1.09	0.00
61.00	2.78	1.09	0.00
62.00	2.78	1.09	0.00
63.00	2.78	1.09	0.00
64.00	2.78	1.09	0.00
65.00	2.78	1.09	0.00
66.00	2.78	1.09	0.00
67.00	2.78	1.09	0.00
68.00	2.78	1.09	0.00
69.00	2.78	1.09	0.00
70.00	2.78	1.09	0.00
71.00	2.78	1.09	0.00
72.00	2.78	1.09	0.00

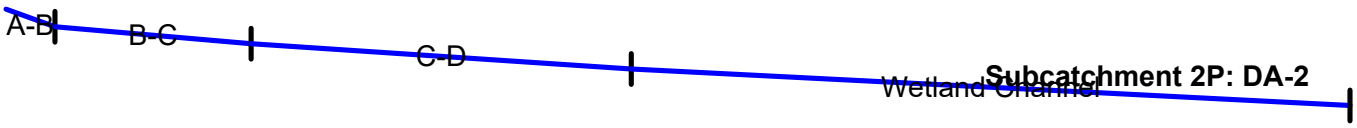
Summary for Subcatchment 2P: DA-2

Runoff = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af, Depth= 1.27"
Routed to Link DP-2 : Design Point - 2

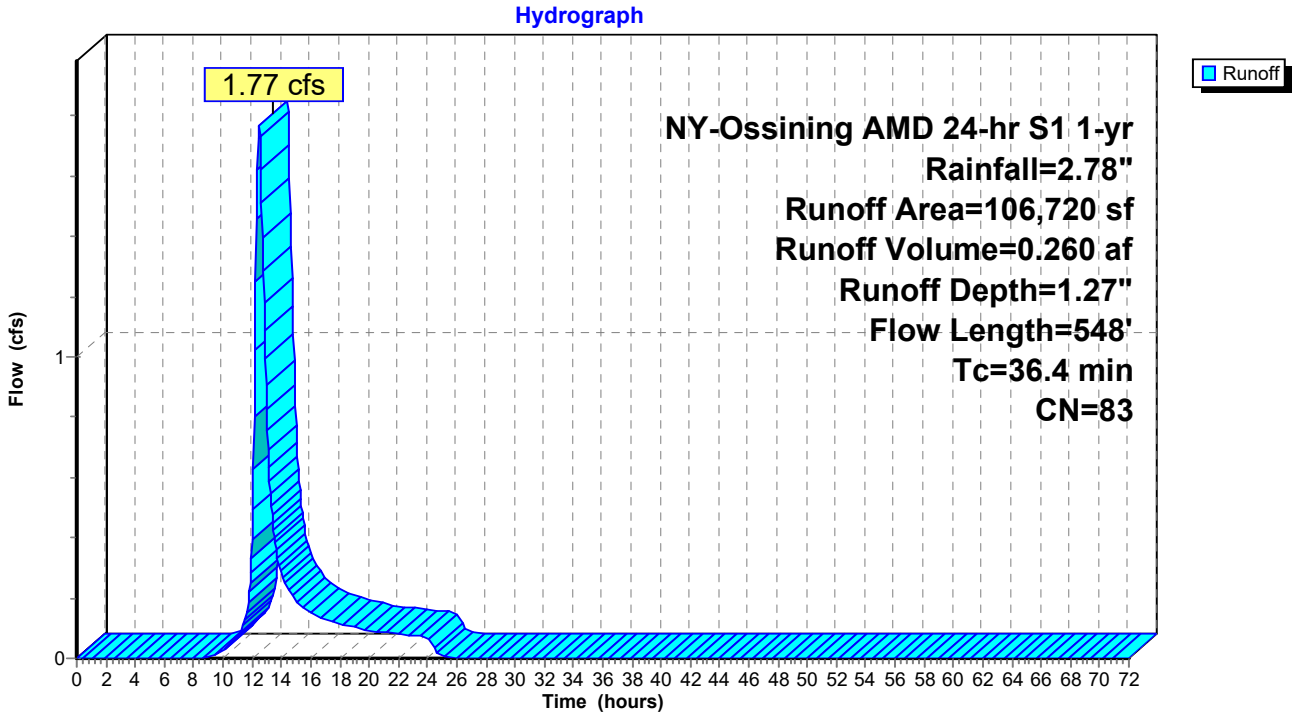
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.01
10.00	0.59	0.01	0.03
11.00	0.74	0.05	0.07
12.00	1.53	0.40	**0.40**
13.00	2.04	0.72	**0.83**
14.00	2.19	0.83	0.28
15.00	2.30	0.91	0.19
16.00	2.38	0.97	0.15
17.00	2.45	1.02	0.13
18.00	2.51	1.07	0.11
19.00	2.57	1.11	0.10
20.00	2.62	1.15	0.09
21.00	2.66	1.18	0.09
22.00	2.70	1.21	0.08
23.00	2.74	1.24	0.08
24.00	**2.78**	**1.27**	0.07
25.00	2.78	1.27	0.00
26.00	2.78	1.27	0.00
27.00	2.78	1.27	0.00
28.00	2.78	1.27	0.00
29.00	2.78	1.27	0.00
30.00	2.78	1.27	0.00
31.00	2.78	1.27	0.00
32.00	2.78	1.27	0.00
33.00	2.78	1.27	0.00
34.00	2.78	1.27	0.00
35.00	2.78	1.27	0.00
36.00	2.78	1.27	0.00
37.00	2.78	1.27	0.00
38.00	2.78	1.27	0.00
39.00	2.78	1.27	0.00
40.00	2.78	1.27	0.00
41.00	2.78	1.27	0.00
42.00	2.78	1.27	0.00
43.00	2.78	1.27	0.00
44.00	2.78	1.27	0.00
45.00	2.78	1.27	0.00
46.00	2.78	1.27	0.00
47.00	2.78	1.27	0.00
48.00	2.78	1.27	0.00
49.00	2.78	1.27	0.00
50.00	2.78	1.27	0.00
51.00	2.78	1.27	0.00
52.00	2.78	1.27	0.00
53.00	2.78	1.27	0.00
54.00	2.78	1.27	0.00
55.00	2.78	1.27	0.00
56.00	2.78	1.27	0.00
57.00	2.78	1.27	0.00
58.00	2.78	1.27	0.00
59.00	2.78	1.27	0.00
60.00	2.78	1.27	0.00
61.00	2.78	1.27	0.00
62.00	2.78	1.27	0.00
63.00	2.78	1.27	0.00
64.00	2.78	1.27	0.00
65.00	2.78	1.27	0.00
66.00	2.78	1.27	0.00
67.00	2.78	1.27	0.00
68.00	2.78	1.27	0.00
69.00	2.78	1.27	0.00
70.00	2.78	1.27	0.00
71.00	2.78	1.27	0.00
72.00	2.78	1.27	0.00

Summary for Subcatchment 3P: DA-3

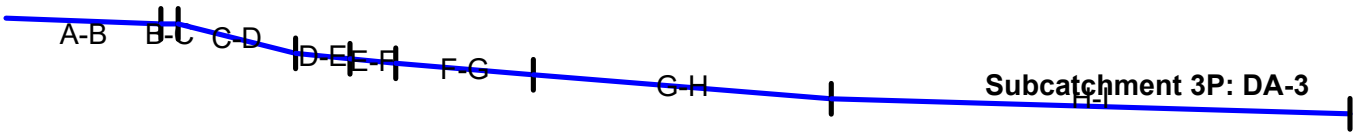
[47] Hint: Peak is 123% of capacity of segment #8

Runoff = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Depth= 2.04"
Routed to Link DP-3 : Design Point - 3

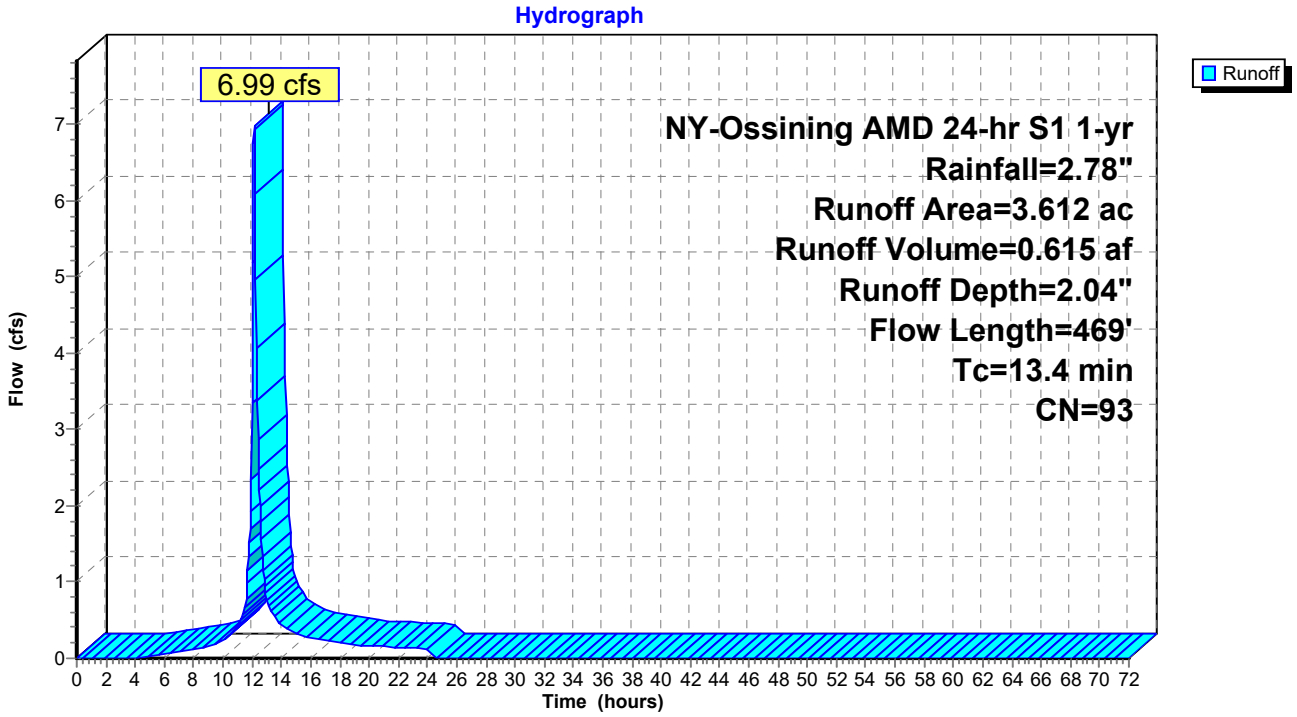
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.02
6.00	0.27	0.02	0.05
7.00	0.33	0.03	0.08
8.00	0.40	0.06	0.11
9.00	0.48	0.10	0.16
10.00	0.59	0.16	0.25
11.00	0.74	0.26	0.43
12.00	1.53	0.89	**3.36**
13.00	2.04	1.35	**0.78**
14.00	2.19	1.49	0.44
15.00	2.30	1.59	0.33
16.00	2.38	1.67	0.27
17.00	2.45	1.74	0.23
18.00	2.51	1.79	0.20
19.00	2.57	1.84	0.18
20.00	2.62	1.89	0.16
21.00	2.66	1.93	0.15
22.00	2.70	1.97	0.14
23.00	2.74	2.01	0.13
24.00	**2.78**	**2.04**	0.12
25.00	2.78	2.04	0.00
26.00	2.78	2.04	0.00
27.00	2.78	2.04	0.00
28.00	2.78	2.04	0.00
29.00	2.78	2.04	0.00
30.00	2.78	2.04	0.00
31.00	2.78	2.04	0.00
32.00	2.78	2.04	0.00
33.00	2.78	2.04	0.00
34.00	2.78	2.04	0.00
35.00	2.78	2.04	0.00
36.00	2.78	2.04	0.00
37.00	2.78	2.04	0.00
38.00	2.78	2.04	0.00
39.00	2.78	2.04	0.00
40.00	2.78	2.04	0.00
41.00	2.78	2.04	0.00
42.00	2.78	2.04	0.00
43.00	2.78	2.04	0.00
44.00	2.78	2.04	0.00
45.00	2.78	2.04	0.00
46.00	2.78	2.04	0.00
47.00	2.78	2.04	0.00
48.00	2.78	2.04	0.00
49.00	2.78	2.04	0.00
50.00	2.78	2.04	0.00
51.00	2.78	2.04	0.00
52.00	2.78	2.04	0.00
53.00	2.78	2.04	0.00
54.00	2.78	2.04	0.00
55.00	2.78	2.04	0.00
56.00	2.78	2.04	0.00
57.00	2.78	2.04	0.00
58.00	2.78	2.04	0.00
59.00	2.78	2.04	0.00
60.00	2.78	2.04	0.00
61.00	2.78	2.04	0.00
62.00	2.78	2.04	0.00
63.00	2.78	2.04	0.00
64.00	2.78	2.04	0.00
65.00	2.78	2.04	0.00
66.00	2.78	2.04	0.00
67.00	2.78	2.04	0.00
68.00	2.78	2.04	0.00
69.00	2.78	2.04	0.00
70.00	2.78	2.04	0.00
71.00	2.78	2.04	0.00
72.00	2.78	2.04	0.00

Summary for Subcatchment 4AP: DA-4A

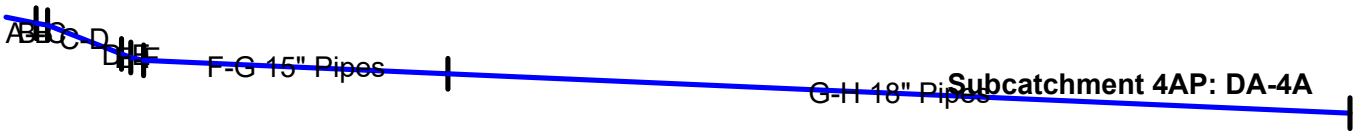
[47] Hint: Peak is 292% of capacity of segment #6
[47] Hint: Peak is 179% of capacity of segment #7

Runoff = 13.33 cfs @ 12.12 hrs, Volume= 1.133 af, Depth= 2.04"
Routed to Pond 19P : DMH-7

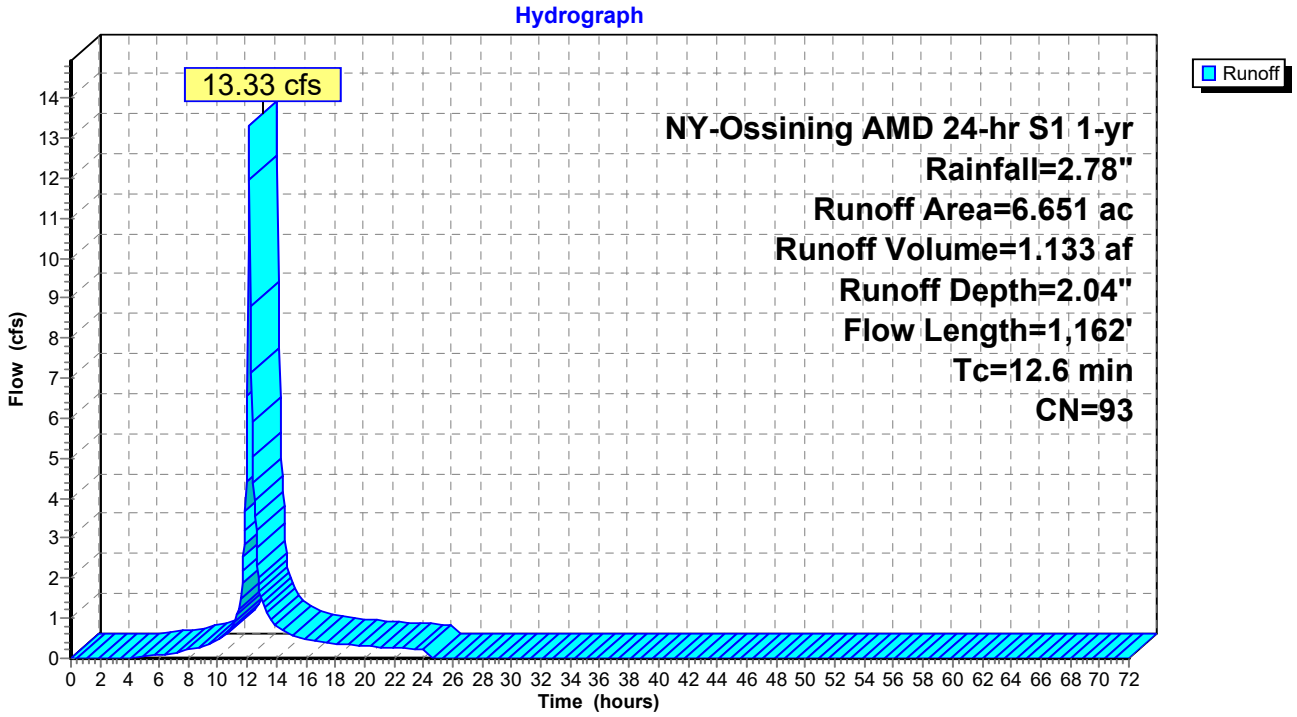
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.04
6.00	0.27	0.02	0.09
7.00	0.33	0.03	0.14
8.00	0.40	0.06	0.21
9.00	0.48	0.10	0.30
10.00	0.59	0.16	0.46
11.00	0.74	0.26	0.81
12.00	1.53	0.89	**6.55**
13.00	2.04	1.35	**1.42**
14.00	2.19	1.49	0.81
15.00	2.30	1.59	0.60
16.00	2.38	1.67	0.49
17.00	2.45	1.74	0.42
18.00	2.51	1.79	0.37
19.00	2.57	1.84	0.33
20.00	2.62	1.89	0.30
21.00	2.66	1.93	0.28
22.00	2.70	1.97	0.26
23.00	2.74	2.01	0.24
24.00	**2.78**	**2.04**	0.23
25.00	2.78	2.04	0.00
26.00	2.78	2.04	0.00
27.00	2.78	2.04	0.00
28.00	2.78	2.04	0.00
29.00	2.78	2.04	0.00
30.00	2.78	2.04	0.00
31.00	2.78	2.04	0.00
32.00	2.78	2.04	0.00
33.00	2.78	2.04	0.00
34.00	2.78	2.04	0.00
35.00	2.78	2.04	0.00
36.00	2.78	2.04	0.00
37.00	2.78	2.04	0.00
38.00	2.78	2.04	0.00
39.00	2.78	2.04	0.00
40.00	2.78	2.04	0.00
41.00	2.78	2.04	0.00
42.00	2.78	2.04	0.00
43.00	2.78	2.04	0.00
44.00	2.78	2.04	0.00
45.00	2.78	2.04	0.00
46.00	2.78	2.04	0.00
47.00	2.78	2.04	0.00
48.00	2.78	2.04	0.00
49.00	2.78	2.04	0.00
50.00	2.78	2.04	0.00
51.00	2.78	2.04	0.00
52.00	2.78	2.04	0.00
53.00	2.78	2.04	0.00
54.00	2.78	2.04	0.00
55.00	2.78	2.04	0.00
56.00	2.78	2.04	0.00
57.00	2.78	2.04	0.00
58.00	2.78	2.04	0.00
59.00	2.78	2.04	0.00
60.00	2.78	2.04	0.00
61.00	2.78	2.04	0.00
62.00	2.78	2.04	0.00
63.00	2.78	2.04	0.00
64.00	2.78	2.04	0.00
65.00	2.78	2.04	0.00
66.00	2.78	2.04	0.00
67.00	2.78	2.04	0.00
68.00	2.78	2.04	0.00
69.00	2.78	2.04	0.00
70.00	2.78	2.04	0.00
71.00	2.78	2.04	0.00
72.00	2.78	2.04	0.00

Summary for Subcatchment 4BP: DA-4B

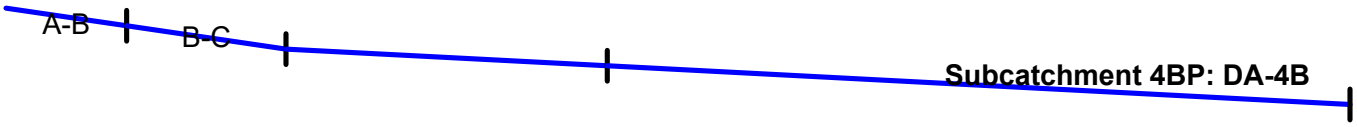
[47] Hint: Peak is 174% of capacity of segment #3

Runoff = 4.39 cfs @ 12.21 hrs, Volume= 0.481 af, Depth= 0.77"
Routed to Pond 19P : DMH-7

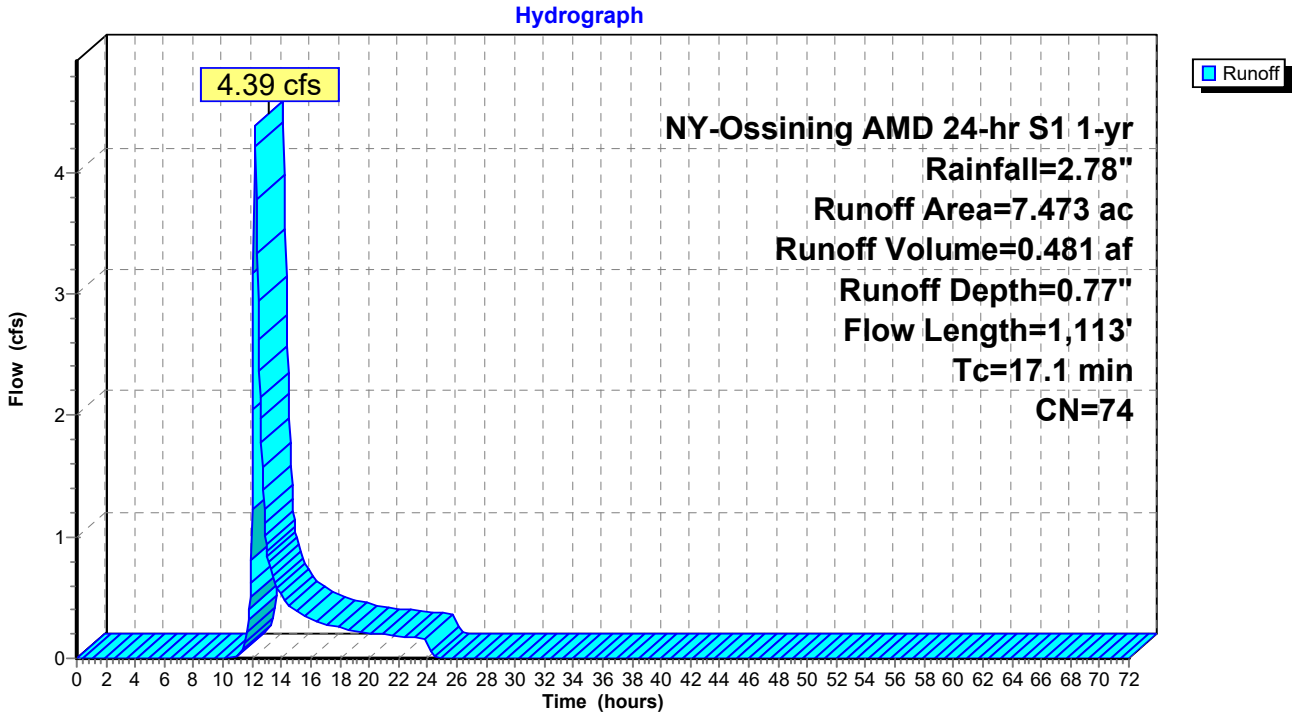
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.00
11.00	0.74	0.00	0.00
12.00	1.53	0.16	**1.22**
13.00	2.04	0.37	**0.89**
14.00	2.19	0.44	0.51
15.00	2.30	0.50	0.39
16.00	2.38	0.54	0.32
17.00	2.45	0.58	0.28
18.00	2.51	0.62	0.25
19.00	2.57	0.65	0.23
20.00	2.62	0.68	0.21
21.00	2.66	0.70	0.20
22.00	2.70	0.73	0.18
23.00	2.74	0.75	0.17
24.00	**2.78**	**0.77**	0.16
25.00	2.78	0.77	0.00
26.00	2.78	0.77	0.00
27.00	2.78	0.77	0.00
28.00	2.78	0.77	0.00
29.00	2.78	0.77	0.00
30.00	2.78	0.77	0.00
31.00	2.78	0.77	0.00
32.00	2.78	0.77	0.00
33.00	2.78	0.77	0.00
34.00	2.78	0.77	0.00
35.00	2.78	0.77	0.00
36.00	2.78	0.77	0.00
37.00	2.78	0.77	0.00
38.00	2.78	0.77	0.00
39.00	2.78	0.77	0.00
40.00	2.78	0.77	0.00
41.00	2.78	0.77	0.00
42.00	2.78	0.77	0.00
43.00	2.78	0.77	0.00
44.00	2.78	0.77	0.00
45.00	2.78	0.77	0.00
46.00	2.78	0.77	0.00
47.00	2.78	0.77	0.00
48.00	2.78	0.77	0.00
49.00	2.78	0.77	0.00
50.00	2.78	0.77	0.00
51.00	2.78	0.77	0.00
52.00	2.78	0.77	0.00
53.00	2.78	0.77	0.00
54.00	2.78	0.77	0.00
55.00	2.78	0.77	0.00
56.00	2.78	0.77	0.00
57.00	2.78	0.77	0.00
58.00	2.78	0.77	0.00
59.00	2.78	0.77	0.00
60.00	2.78	0.77	0.00
61.00	2.78	0.77	0.00
62.00	2.78	0.77	0.00
63.00	2.78	0.77	0.00
64.00	2.78	0.77	0.00
65.00	2.78	0.77	0.00
66.00	2.78	0.77	0.00
67.00	2.78	0.77	0.00
68.00	2.78	0.77	0.00
69.00	2.78	0.77	0.00
70.00	2.78	0.77	0.00
71.00	2.78	0.77	0.00
72.00	2.78	0.77	0.00

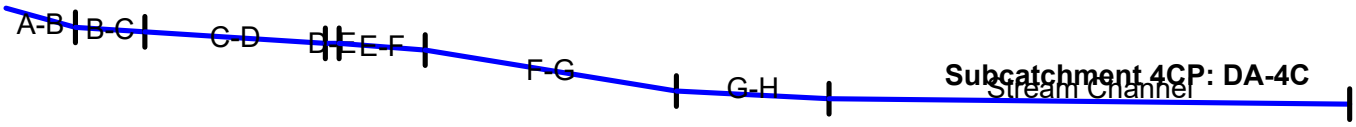
Summary for Subcatchment 4CP: DA-4C

Runoff = 5.04 cfs @ 12.15 hrs, Volume= 0.516 af, Depth= 0.64"
Routed to Link DP-4 : DP-4

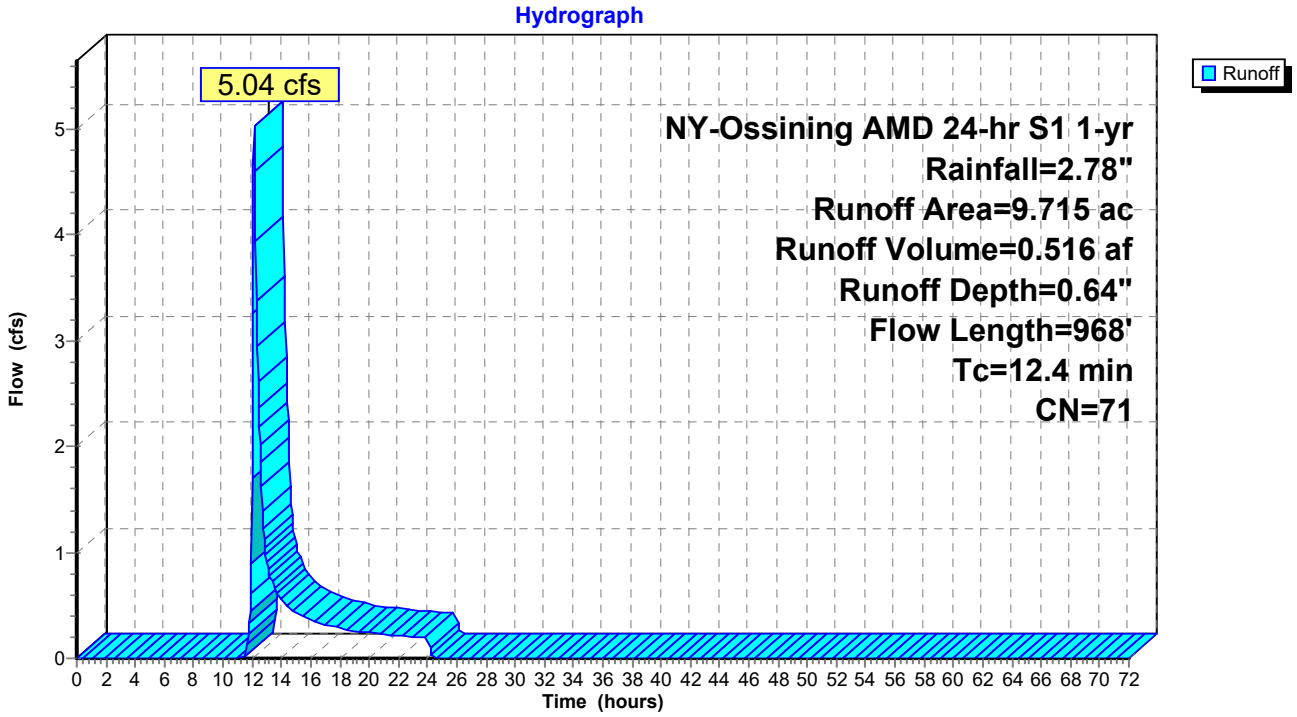
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.00	0.00
5.00	0.21	0.00	0.00
6.00	0.27	0.00	0.00
7.00	0.33	0.00	0.00
8.00	0.40	0.00	0.00
9.00	0.48	0.00	0.00
10.00	0.59	0.00	0.00
11.00	0.74	0.00	0.00
12.00	1.53	0.11	**1.70**
13.00	2.04	0.28	**0.90**
14.00	2.19	0.35	0.56
15.00	2.30	0.40	0.43
16.00	2.38	0.43	0.36
17.00	2.45	0.47	0.32
18.00	2.51	0.50	0.29
19.00	2.57	0.53	0.26
20.00	2.62	0.55	0.24
21.00	2.66	0.57	0.23
22.00	2.70	0.60	0.21
23.00	2.74	0.62	0.20
24.00	**2.78**	**0.64**	0.19
25.00	2.78	0.64	0.00
26.00	2.78	0.64	0.00
27.00	2.78	0.64	0.00
28.00	2.78	0.64	0.00
29.00	2.78	0.64	0.00
30.00	2.78	0.64	0.00
31.00	2.78	0.64	0.00
32.00	2.78	0.64	0.00
33.00	2.78	0.64	0.00
34.00	2.78	0.64	0.00
35.00	2.78	0.64	0.00
36.00	2.78	0.64	0.00
37.00	2.78	0.64	0.00
38.00	2.78	0.64	0.00
39.00	2.78	0.64	0.00
40.00	2.78	0.64	0.00
41.00	2.78	0.64	0.00
42.00	2.78	0.64	0.00
43.00	2.78	0.64	0.00
44.00	2.78	0.64	0.00
45.00	2.78	0.64	0.00
46.00	2.78	0.64	0.00
47.00	2.78	0.64	0.00
48.00	2.78	0.64	0.00
49.00	2.78	0.64	0.00
50.00	2.78	0.64	0.00
51.00	2.78	0.64	0.00
52.00	2.78	0.64	0.00
53.00	2.78	0.64	0.00
54.00	2.78	0.64	0.00
55.00	2.78	0.64	0.00
56.00	2.78	0.64	0.00
57.00	2.78	0.64	0.00
58.00	2.78	0.64	0.00
59.00	2.78	0.64	0.00
60.00	2.78	0.64	0.00
61.00	2.78	0.64	0.00
62.00	2.78	0.64	0.00
63.00	2.78	0.64	0.00
64.00	2.78	0.64	0.00
65.00	2.78	0.64	0.00
66.00	2.78	0.64	0.00
67.00	2.78	0.64	0.00
68.00	2.78	0.64	0.00
69.00	2.78	0.64	0.00
70.00	2.78	0.64	0.00
71.00	2.78	0.64	0.00
72.00	2.78	0.64	0.00

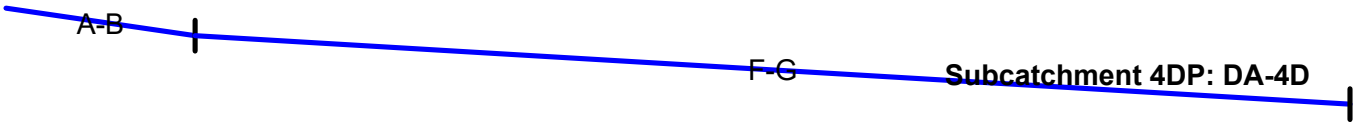
Summary for Subcatchment 4DP: DA-4D

Runoff = 3.84 cfs @ 12.04 hrs, Volume= 0.254 af, Depth= 2.23"
Routed to Pond 6P : Infiltrators

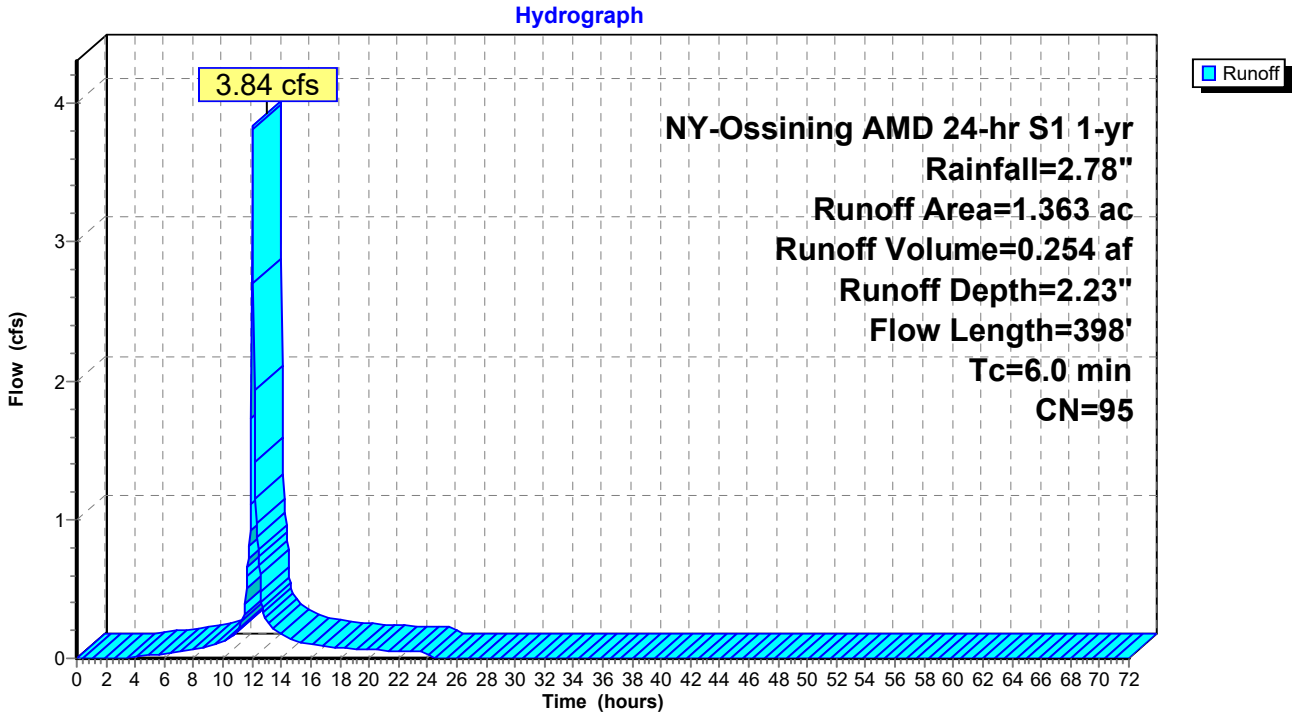
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr Rainfall=2.78"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.04	0.00	0.00
2.00	0.08	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.16	0.01	0.01
5.00	0.21	0.02	0.02
6.00	0.27	0.04	0.03
7.00	0.33	0.07	0.04
8.00	0.40	0.10	0.06
9.00	0.48	0.16	0.08
10.00	0.59	0.23	0.12
11.00	0.74	0.35	0.21
12.00	1.53	1.04	**3.34**
13.00	2.04	1.52	**0.27**
14.00	2.19	1.67	0.17
15.00	2.30	1.77	0.12
16.00	2.38	1.85	0.10
17.00	2.45	1.92	0.09
18.00	2.51	1.98	0.08
19.00	2.57	2.03	0.07
20.00	2.62	2.08	0.06
21.00	2.66	2.12	0.06
22.00	2.70	2.16	0.05
23.00	2.74	2.20	0.05
24.00	**2.78**	**2.23**	0.05
25.00	2.78	2.23	0.00
26.00	2.78	2.23	0.00
27.00	2.78	2.23	0.00
28.00	2.78	2.23	0.00
29.00	2.78	2.23	0.00
30.00	2.78	2.23	0.00
31.00	2.78	2.23	0.00
32.00	2.78	2.23	0.00
33.00	2.78	2.23	0.00
34.00	2.78	2.23	0.00
35.00	2.78	2.23	0.00
36.00	2.78	2.23	0.00
37.00	2.78	2.23	0.00
38.00	2.78	2.23	0.00
39.00	2.78	2.23	0.00
40.00	2.78	2.23	0.00
41.00	2.78	2.23	0.00
42.00	2.78	2.23	0.00
43.00	2.78	2.23	0.00
44.00	2.78	2.23	0.00
45.00	2.78	2.23	0.00
46.00	2.78	2.23	0.00
47.00	2.78	2.23	0.00
48.00	2.78	2.23	0.00
49.00	2.78	2.23	0.00
50.00	2.78	2.23	0.00
51.00	2.78	2.23	0.00
52.00	2.78	2.23	0.00
53.00	2.78	2.23	0.00
54.00	2.78	2.23	0.00
55.00	2.78	2.23	0.00
56.00	2.78	2.23	0.00
57.00	2.78	2.23	0.00
58.00	2.78	2.23	0.00
59.00	2.78	2.23	0.00
60.00	2.78	2.23	0.00
61.00	2.78	2.23	0.00
62.00	2.78	2.23	0.00
63.00	2.78	2.23	0.00
64.00	2.78	2.23	0.00
65.00	2.78	2.23	0.00
66.00	2.78	2.23	0.00
67.00	2.78	2.23	0.00
68.00	2.78	2.23	0.00
69.00	2.78	2.23	0.00
70.00	2.78	2.23	0.00
71.00	2.78	2.23	0.00
72.00	2.78	2.23	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 2.23" for 1-yr event
Inflow = 3.84 cfs @ 12.04 hrs, Volume= 0.254 af
Outflow = 0.78 cfs @ 12.41 hrs, Volume= 0.254 af, Atten= 80%, Lag= 21.9 min
Discarded = 0.07 cfs @ 9.90 hrs, Volume= 0.124 af
Primary = 0.72 cfs @ 12.41 hrs, Volume= 0.129 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 347.82' @ 12.41 hrs Surf.Area= 0.132 ac Storage= 0.089 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 126.5 min (918.9 - 792.4)

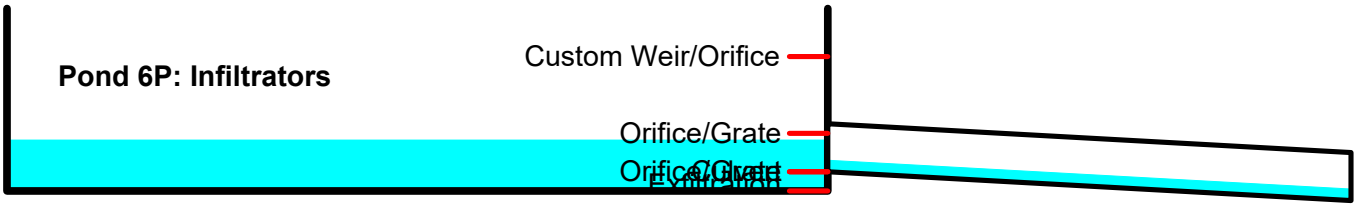
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 9.90 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.72 cfs @ 12.41 hrs HW=347.82' TW=335.54' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.72 cfs of 2.09 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.72 cfs @ 3.65 fps)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

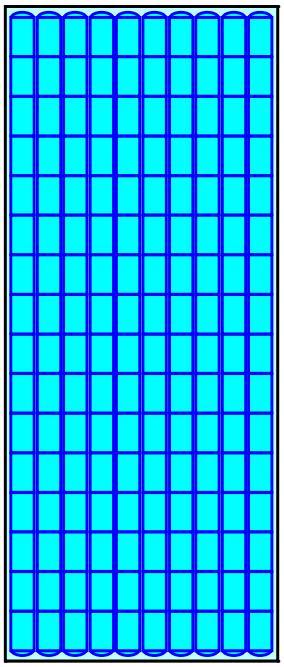
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

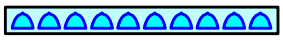
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

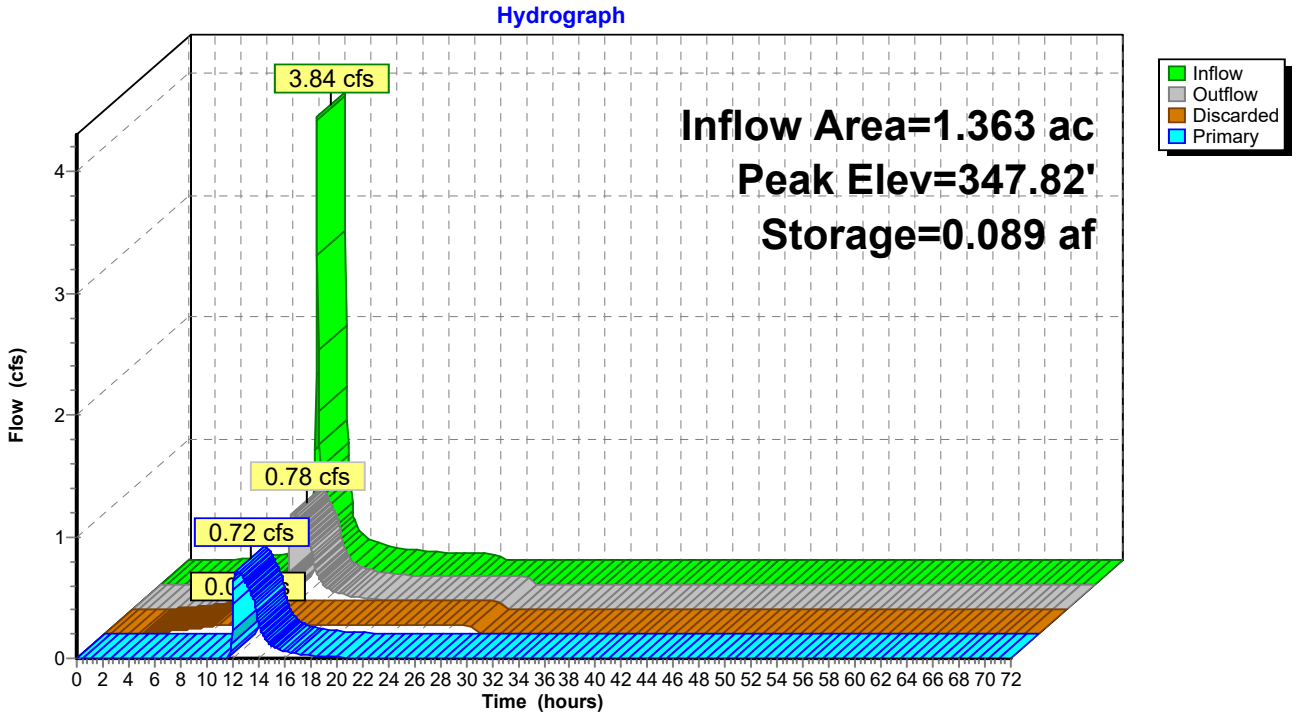
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08

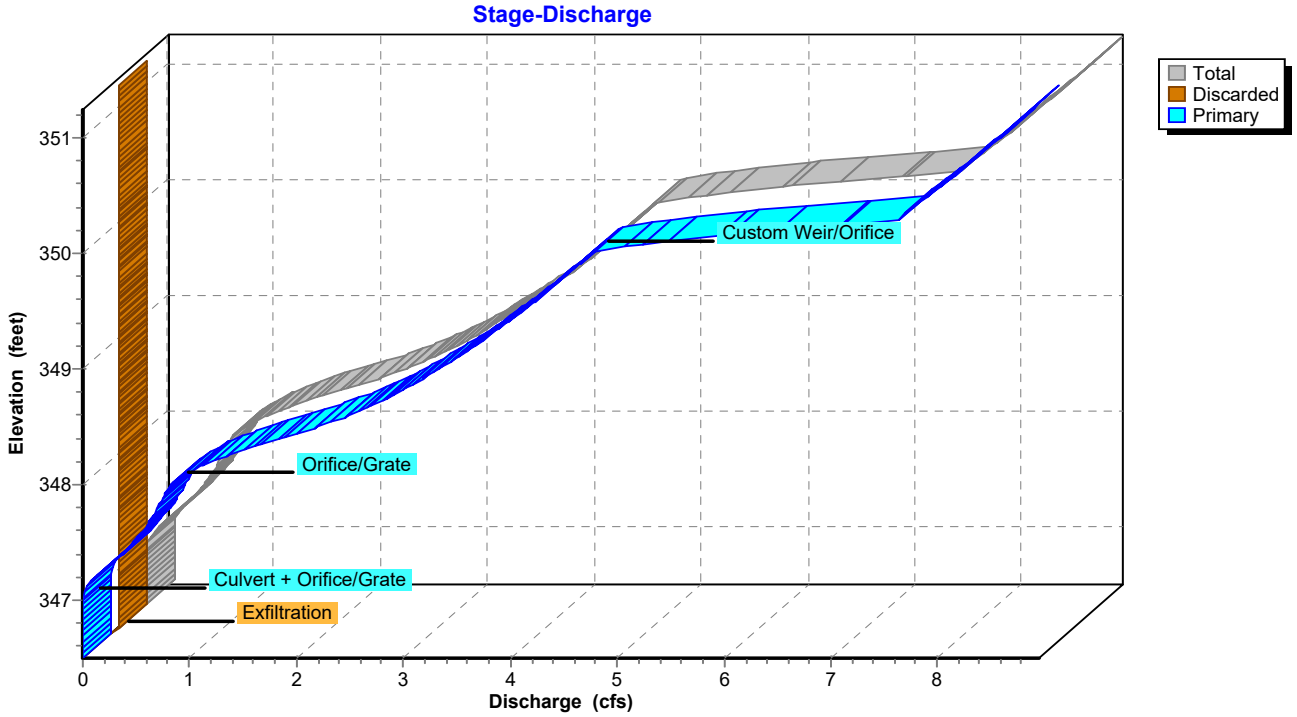




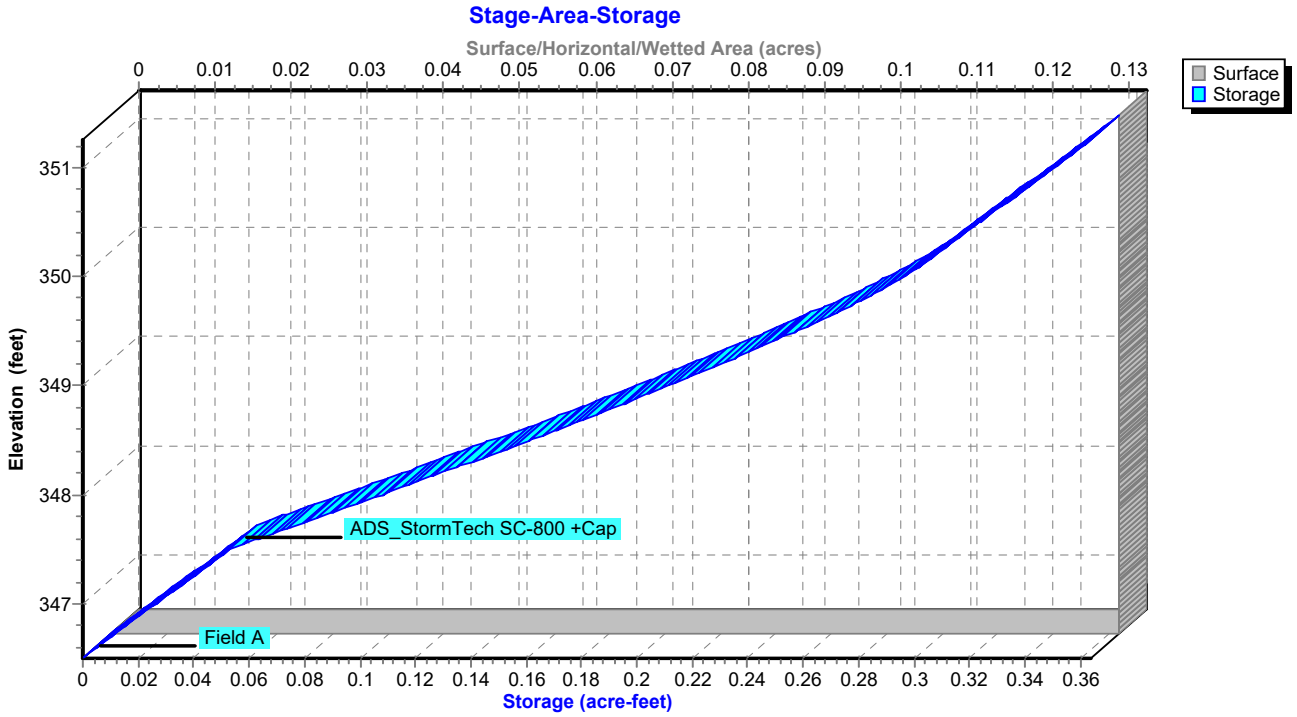
Pond 6P: Infiltrators



Pond 6P: Infiltrators



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.02	0.000	346.50	0.02	0.02	0.00
7.50	0.05	0.000	346.50	0.05	**0.05**	0.00
10.00	**0.12**	**0.003**	**346.56**	**0.07**	**0.07**	**0.00**
12.50	**0.67**	**0.088**	**347.82**	**0.78**	0.07	**0.71**
15.00	0.12	0.037	347.20	0.17	0.07	0.11
17.50	0.08	0.032	347.10	0.10	0.07	0.03
20.00	0.06	0.029	347.05	0.07	0.07	0.01
22.50	0.05	0.027	347.00	0.07	0.07	0.00
25.00	0.00	0.019	346.87	0.07	0.07	0.00
27.50	0.00	0.006	346.60	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow = 3.90 cfs @ 12.14 hrs, Volume= 0.135 af
Outflow = 1.91 cfs @ 12.34 hrs, Volume= 0.135 af, Atten= 51%, Lag= 11.9 min
Primary = 1.91 cfs @ 12.34 hrs, Volume= 0.135 af
Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.62' @ 12.34 hrs Surf.Area= 0.347 ac Storage= 0.049 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.9 min (752.4 - 737.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.90 cfs @ 12.34 hrs HW=332.62' TW=331.76' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.90 cfs @ 2.99 fps)
↑—**2=Orifice/Grate** (Passes 1.90 cfs of 2.78 cfs potential flow)

Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

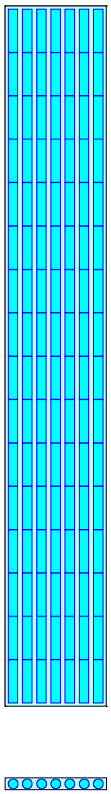
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

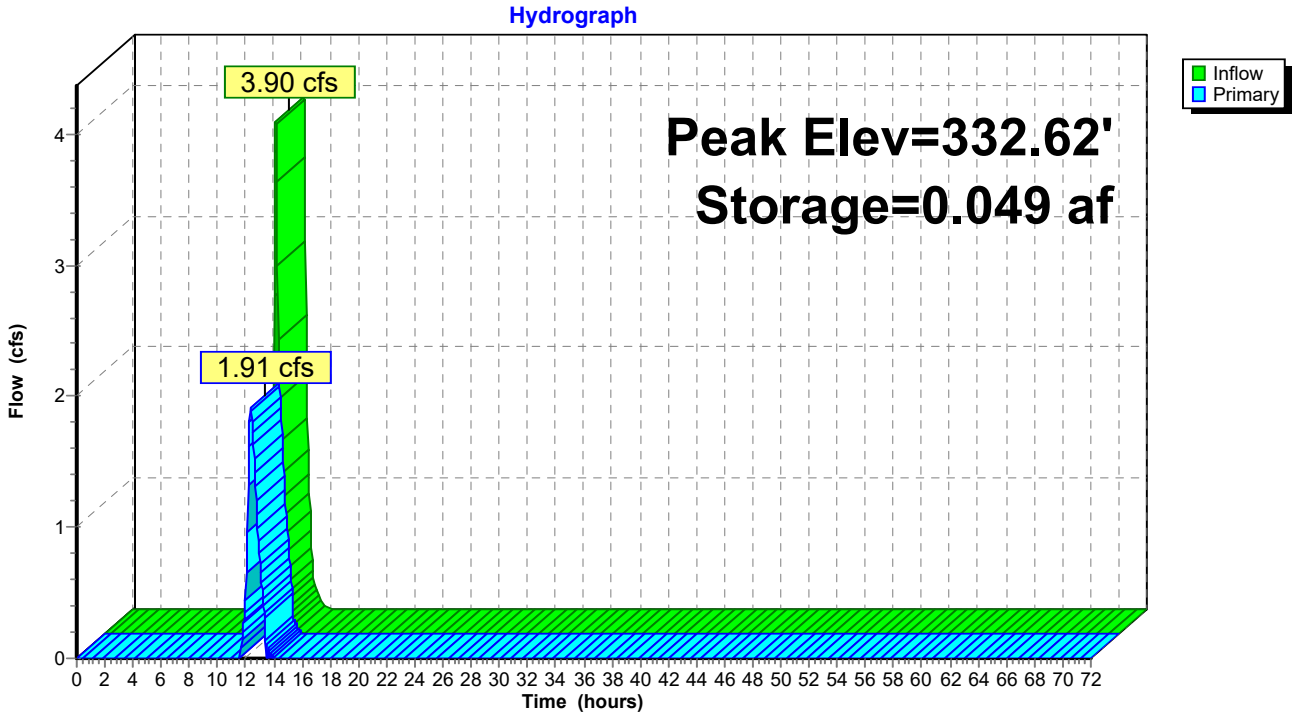
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

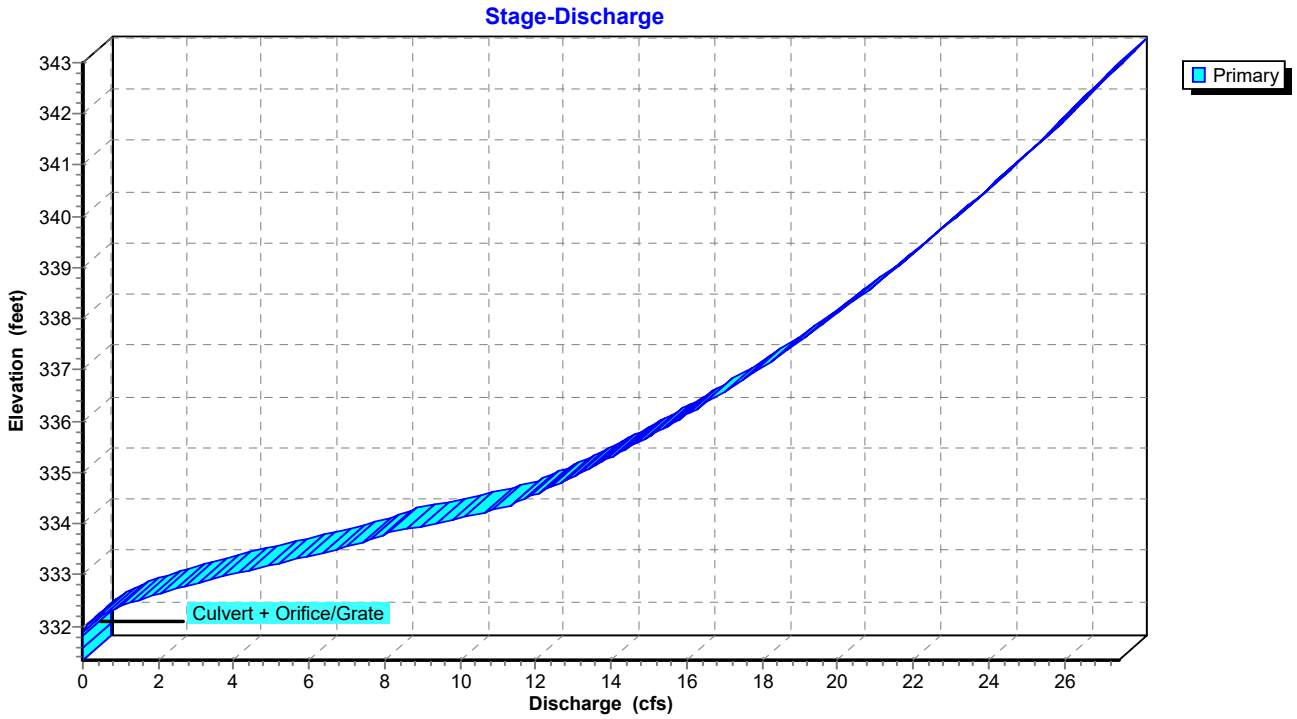
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



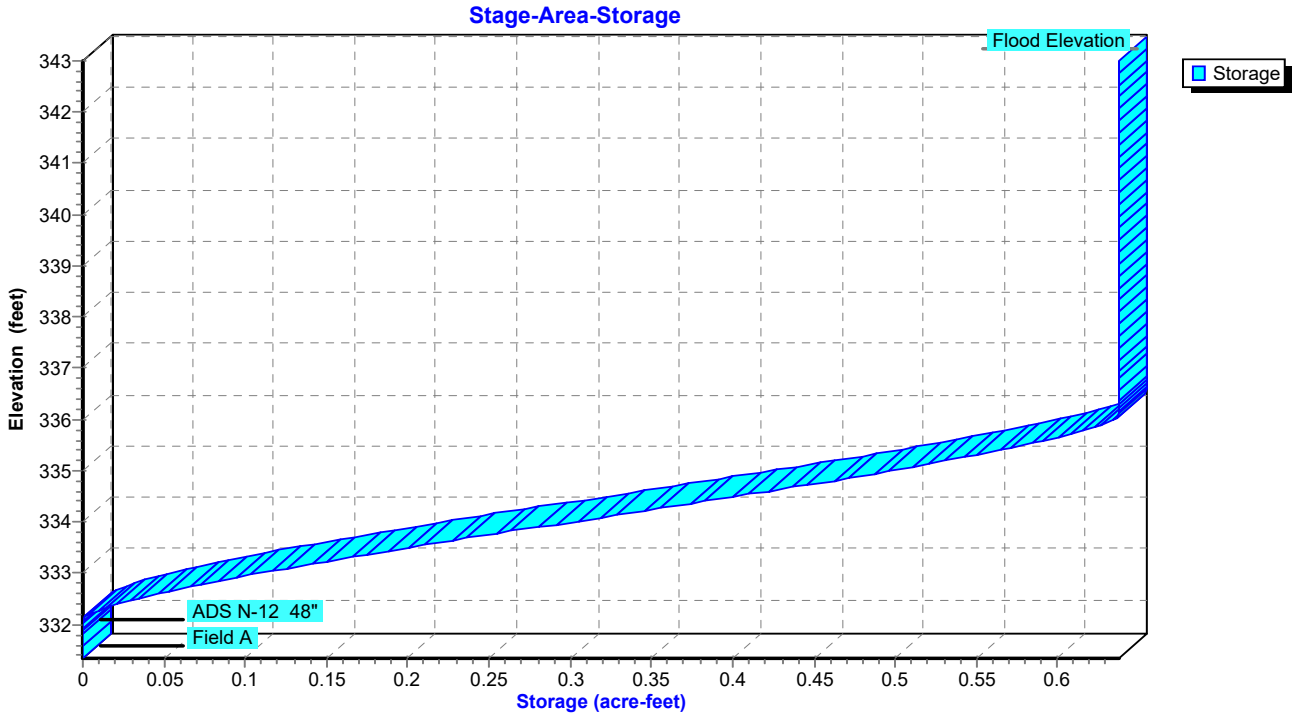
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.84	0.00
7.50	0.00	0.000	331.84	0.00
10.00	**0.00**	**0.000**	**331.84**	**0.00**
12.50	**1.03**	**0.043**	**332.58**	**1.72**
15.00	0.00	0.000	331.84	0.00
17.50	0.00	0.000	331.84	0.00
20.00	0.00	0.000	331.84	0.00
22.50	0.00	0.000	331.84	0.00
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Outflow = 0.68 cfs @ 17.60 hrs, Volume= 1.733 af, Atten= 96%, Lag= 327.1 min
Primary = 0.68 cfs @ 17.60 hrs, Volume= 1.733 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 289.27' @ 17.60 hrs Surf.Area= 48,921 sf Storage= 48,975 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 891.8 min calculated for 1.733 af (99% of inflow)
Center-of-Mass det. time= 888.0 min (1,727.7 - 839.6)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

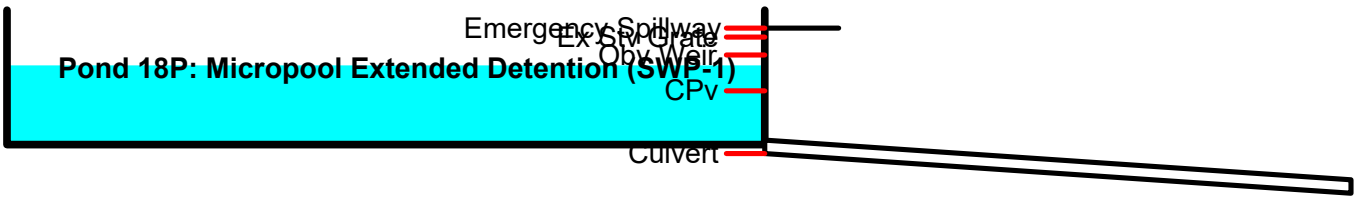
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

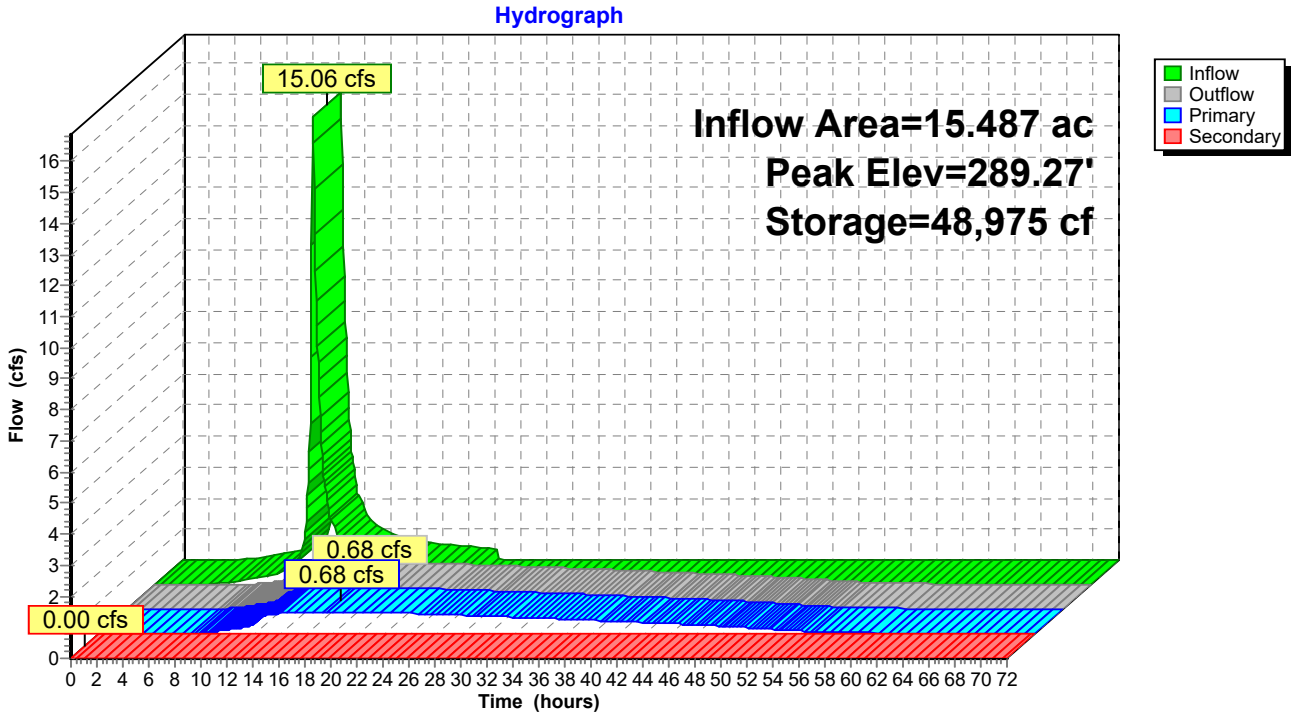
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.68 cfs @ 17.60 hrs HW=289.27' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.68 cfs of 25.55 cfs potential flow)
  ├─**2=CPv** (Orifice Controls 0.68 cfs @ 7.76 fps)
  ├─**3=Obv Weir** (Controls 0.00 cfs)
  └─**4=Ex Stv Grate** (Controls 0.00 cfs)

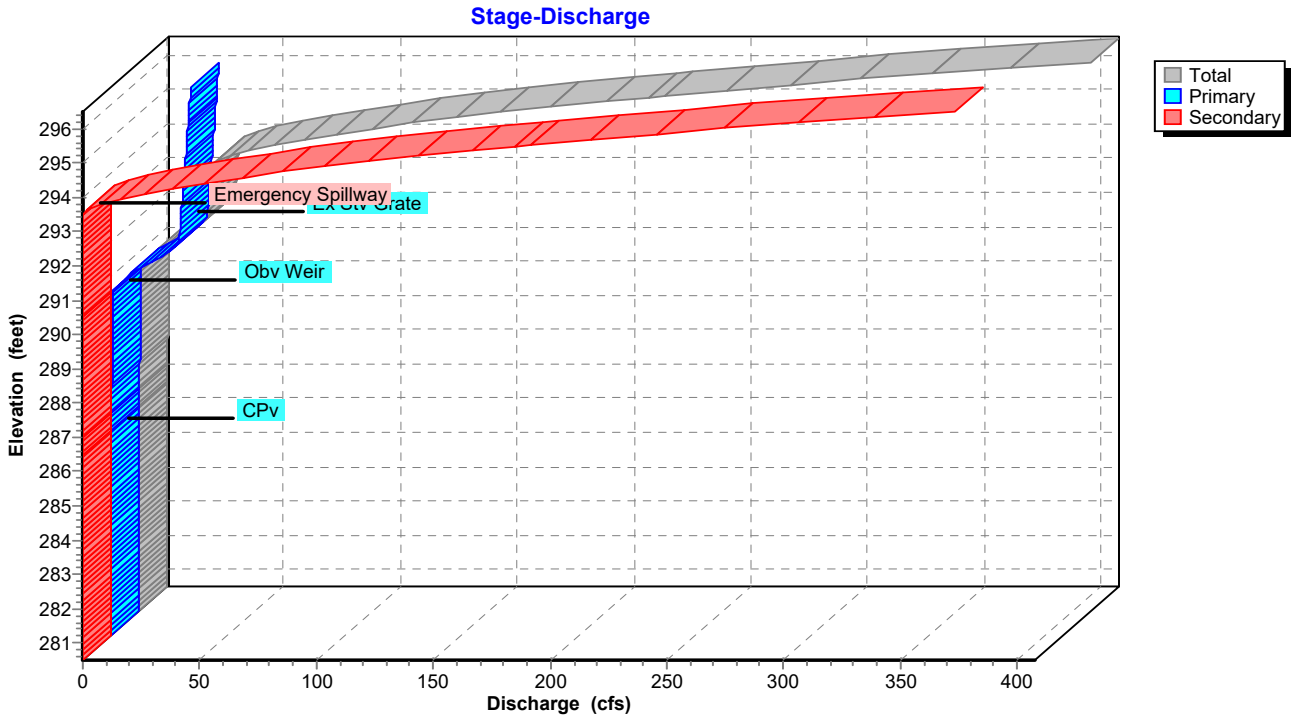
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



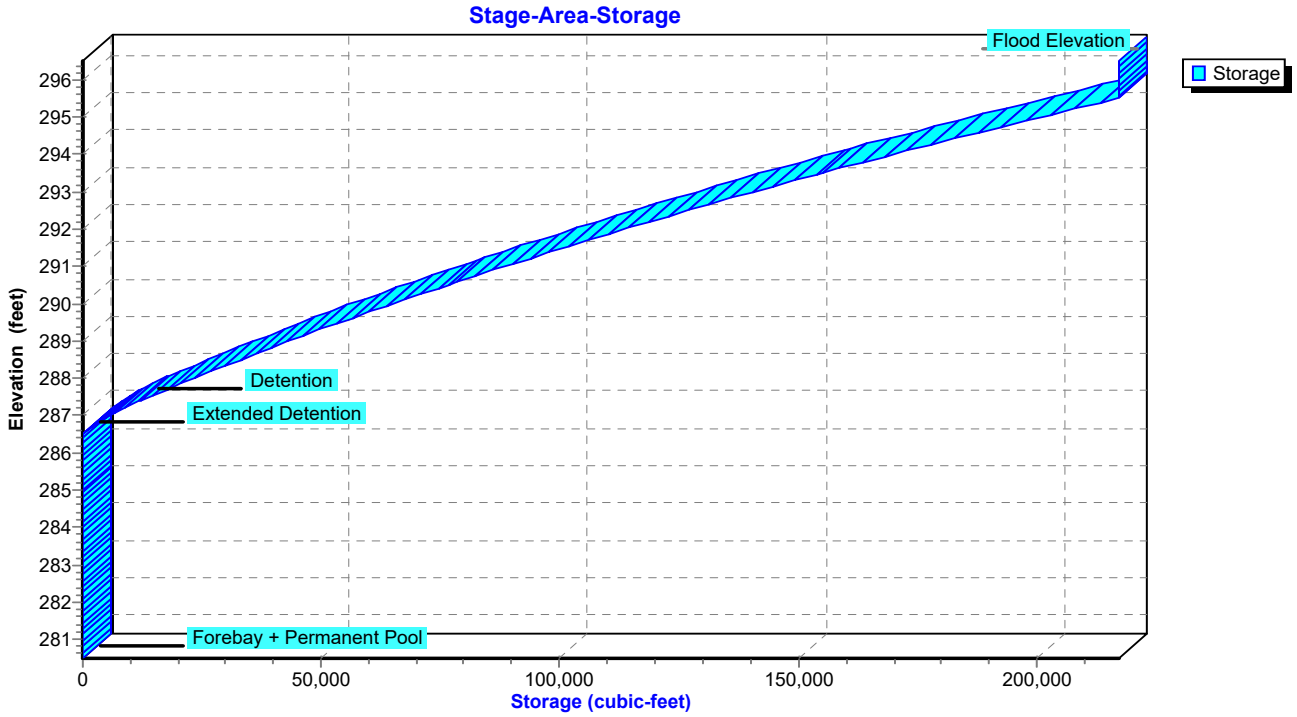
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.00	0	286.50	0.00	0.00	0.00
5.00	0.04	80	286.51	0.00	0.00	0.00
7.50	0.17	934	286.60	0.02	0.02	0.00
10.00	**0.46**	2,877	286.78	0.14	0.14	0.00
12.50	**7.70**	30,614	288.37	0.55	0.55	0.00
15.00	1.10	47,366	289.19	0.67	0.67	0.00
17.50	0.69	**48,974**	**289.27**	**0.68**	**0.68**	0.00
20.00	0.52	**48,238**	**289.23**	**0.67**	**0.67**	0.00
22.50	0.43	46,456	289.15	0.66	0.66	0.00
25.00	0.00	43,100	288.99	0.64	0.64	0.00
27.50	0.00	37,512	288.72	0.60	0.60	0.00
30.00	0.00	32,274	288.46	0.56	0.56	0.00
32.50	0.00	27,393	288.21	0.52	0.52	0.00
35.00	0.00	22,877	287.98	0.48	0.48	0.00
37.50	0.00	18,733	287.76	0.44	0.44	0.00
40.00	0.00	14,968	287.56	0.40	0.40	0.00
42.50	0.00	11,588	287.38	0.35	0.35	0.00
45.00	0.00	8,610	287.20	0.31	0.31	0.00
47.50	0.00	6,084	287.03	0.25	0.25	0.00
50.00	0.00	4,072	286.88	0.19	0.19	0.00
52.50	0.00	2,636	286.76	0.12	0.12	0.00
55.00	0.00	1,792	286.68	0.07	0.07	0.00
57.50	0.00	1,312	286.63	0.04	0.04	0.00
60.00	0.00	1,018	286.61	0.03	0.03	0.00
62.50	0.00	824	286.59	0.02	0.02	0.00
65.00	0.00	689	286.57	0.01	0.01	0.00
67.50	0.00	590	286.56	0.01	0.01	0.00
70.00	0.00	515	286.55	0.01	0.01	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

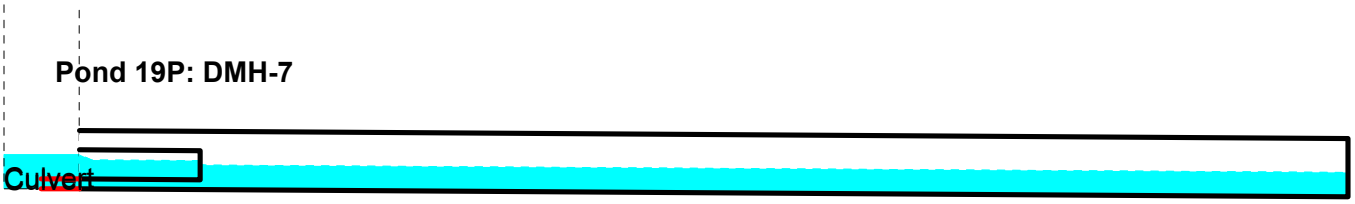
Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 17.67 cfs @ 12.14 hrs, Volume= 1.743 af
Outflow = 17.67 cfs @ 12.14 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min
Primary = 13.76 cfs @ 12.14 hrs, Volume= 1.608 af
Routed to Pond 20P : DMH-8
Secondary = 3.90 cfs @ 12.14 hrs, Volume= 0.135 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 336.09' @ 12.14 hrs
Flood Elev= 343.83'

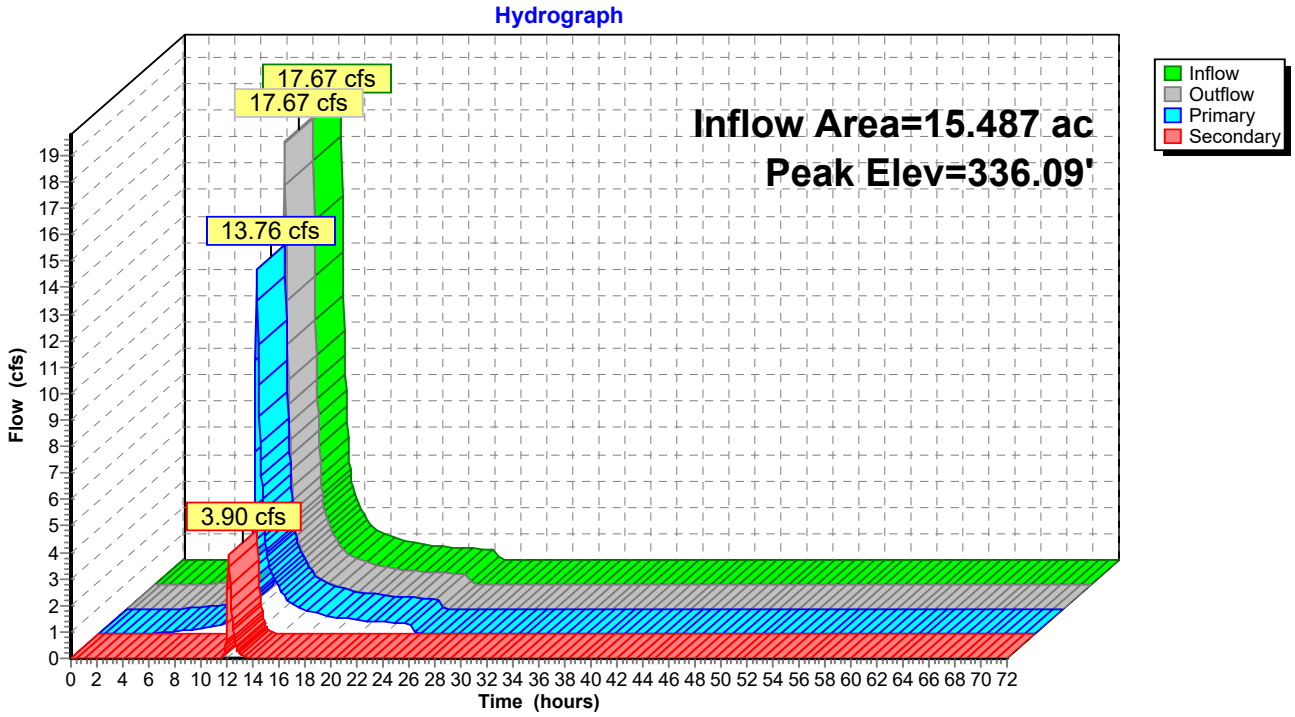
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=13.64 cfs @ 12.14 hrs HW=336.08' TW=332.10' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 13.64 cfs @ 4.61 fps)

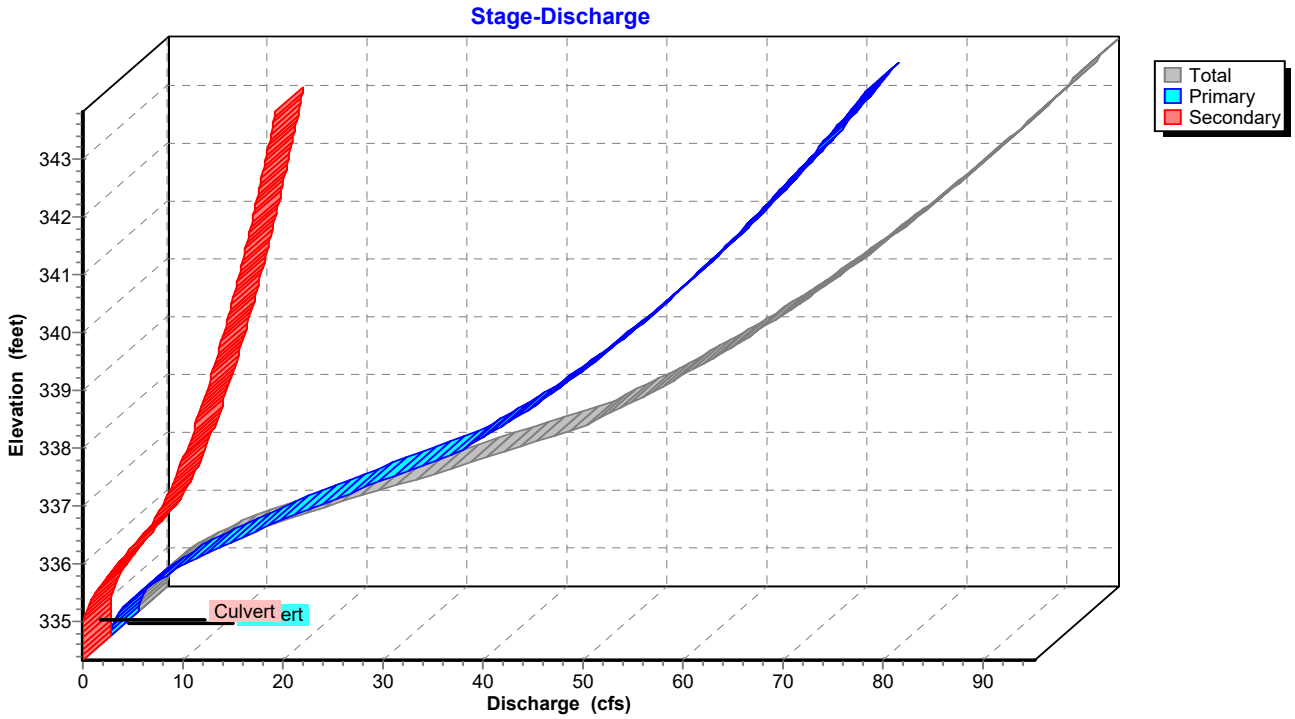
Secondary OutFlow Max=3.86 cfs @ 12.14 hrs HW=336.08' TW=332.46' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 3.86 cfs @ 3.34 fps)



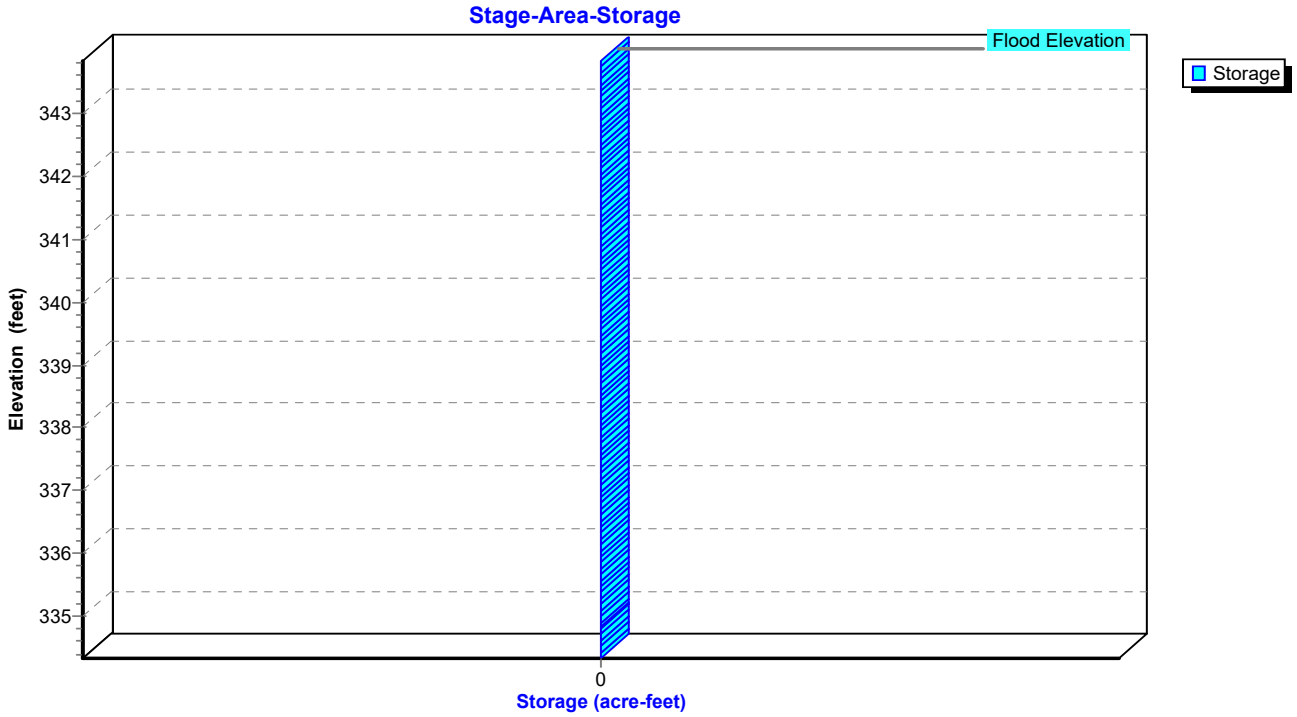
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.00	334.34	0.00	0.00	0.00
5.00	0.04	334.43	0.04	0.04	0.00
7.50	0.17	334.52	0.17	0.17	0.00
10.00	**0.46**	**334.63**	**0.46**	**0.46**	**0.00**
12.50	**7.01**	**335.43**	**7.01**	**5.98**	**1.03**
15.00	1.10	334.78	1.10	1.10	0.00
17.50	0.69	334.69	0.69	0.69	0.00
20.00	0.52	334.65	0.52	0.52	0.00
22.50	0.43	334.62	0.43	0.43	0.00
25.00	0.00	334.34	0.00	0.00	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.44	0.05	0.05	0.00
334.54	0.22	0.22	0.00
334.64	0.50	0.50	0.00
334.74	0.89	0.89	0.00
334.84	1.38	1.38	0.00
334.94	2.00	1.97	0.03
335.04	2.77	2.64	0.13
335.14	3.68	3.39	0.29
335.24	4.72	4.22	0.50
335.34	5.88	5.12	0.76
335.44	7.15	6.09	1.07
335.54	8.53	7.12	1.41
335.64	10.00	8.21	1.80
335.74	11.57	9.35	2.22
335.84	13.21	10.54	2.67
335.94	14.93	11.79	3.14
336.04	16.72	13.08	3.64
336.14	18.55	14.41	4.15
336.24	20.44	15.77	4.66
336.34	22.35	17.17	5.18
336.44	24.29	18.60	5.69
336.54	26.23	20.06	6.17
336.64	28.16	21.53	6.63
336.74	30.05	23.02	7.02
336.84	31.81	24.53	7.28
336.94	33.84	26.04	7.80
337.04	35.64	27.55	8.09
337.14	37.42	29.06	8.36
337.24	39.18	30.55	8.63
337.34	40.92	32.03	8.89
337.44	42.62	33.49	9.14
337.54	44.29	34.91	9.38
337.64	45.67	36.05	9.62
337.74	46.89	37.04	9.85
337.84	48.08	38.00	10.08
337.94	49.24	38.94	10.30
338.04	50.37	39.85	10.51
338.14	51.48	40.75	10.73
338.24	52.56	41.63	10.94
338.34	53.62	42.48	11.14
338.44	54.67	43.33	11.34
338.54	55.69	44.15	11.54
338.64	56.69	44.96	11.73
338.74	57.68	45.76	11.92
338.84	58.65	46.54	12.11
338.94	59.60	47.31	12.29
339.04	60.54	48.07	12.48
339.14	61.47	48.81	12.66
339.24	62.38	49.55	12.83
339.34	63.28	50.27	13.01
339.44	64.16	50.98	13.18
339.54	65.04	51.69	13.35
339.64	65.90	52.38	13.52
339.74	66.75	53.06	13.68
339.84	67.59	53.74	13.85
339.94	68.42	54.41	14.01
340.04	69.24	55.07	14.17
340.14	70.05	55.72	14.33
340.24	70.85	56.36	14.49
340.34	71.64	57.00	14.64
340.44	72.42	57.63	14.79
340.54	73.20	58.25	14.95
340.64	73.96	58.87	15.10
340.74	74.72	59.48	15.24
340.84	75.47	60.08	15.39
340.94	76.22	60.68	15.54
341.04	76.95	61.27	15.68
341.14	77.68	61.86	15.83
341.24	78.41	62.44	15.97
341.34	79.12	63.02	16.11
341.44	79.83	63.59	16.25
341.54	80.54	64.15	16.39
341.64	81.23	64.71	16.52
341.74	81.93	65.27	16.66
341.84	82.61	65.82	16.79
341.94	83.29	66.36	16.93
342.04	83.97	66.91	17.06
342.14	84.63	67.44	17.19
342.24	85.30	67.98	17.32
342.34	85.96	68.50	17.45
342.44	86.61	69.03	17.58
342.54	87.26	69.55	17.71
342.64	87.90	70.07	17.84
342.74	88.54	70.58	17.96
342.84	89.18	71.09	18.09
342.94	89.81	71.60	18.21
343.04	90.43	72.10	18.34
343.14	91.06	72.60	18.46
343.24	91.67	73.09	18.58
343.34	92.29	73.59	18.70
343.44	92.90	74.07	18.82
343.54	93.50	74.56	18.94
343.64	94.10	75.04	19.06
343.74	**94.70**	**75.52**	**19.18**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000
334.44	0.000	339.64	0.000
334.54	0.000	339.74	0.000
334.64	0.000	339.84	0.000
334.74	0.000	339.94	0.000
334.84	0.000	340.04	0.000
334.94	0.000	340.14	0.000
335.04	0.000	340.24	0.000
335.14	0.000	340.34	0.000
335.24	0.000	340.44	0.000
335.34	0.000	340.54	0.000
335.44	0.000	340.64	0.000
335.54	0.000	340.74	0.000
335.64	0.000	340.84	0.000
335.74	0.000	340.94	0.000
335.84	0.000	341.04	0.000
335.94	0.000	341.14	0.000
336.04	0.000	341.24	0.000
336.14	0.000	341.34	0.000
336.24	0.000	341.44	0.000
336.34	0.000	341.54	0.000
336.44	0.000	341.64	0.000
336.54	0.000	341.74	0.000
336.64	0.000	341.84	0.000
336.74	0.000	341.94	0.000
336.84	0.000	342.04	0.000
336.94	0.000	342.14	0.000
337.04	0.000	342.24	0.000
337.14	0.000	342.34	0.000
337.24	0.000	342.44	0.000
337.34	0.000	342.54	0.000
337.44	0.000	342.64	0.000
337.54	0.000	342.74	0.000
337.64	0.000	342.84	0.000
337.74	0.000	342.94	0.000
337.84	0.000	343.04	0.000
337.94	0.000	343.14	0.000
338.04	0.000	343.24	0.000
338.14	0.000	343.34	0.000
338.24	0.000	343.44	0.000
338.34	0.000	343.54	0.000
338.44	0.000	343.64	0.000
338.54	0.000	343.74	0.000
338.64	0.000		
338.74	0.000		
338.84	0.000		
338.94	0.000		
339.04	0.000		
339.14	0.000		
339.24	0.000		
339.34	0.000		
339.44	0.000		

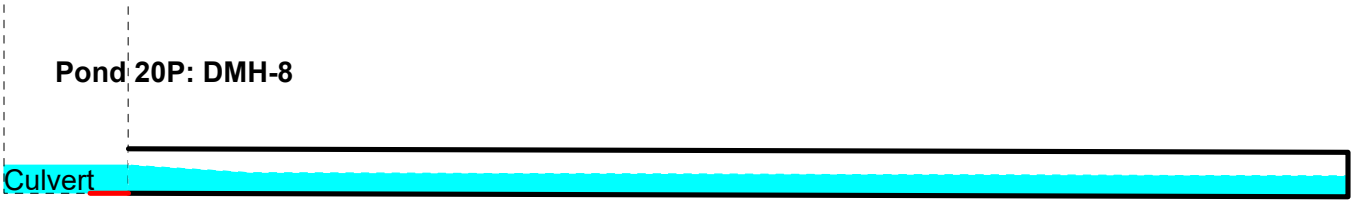
Summary for Pond 20P: DMH-8

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Outflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min
Primary = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Routed to Pond 21P : DMH-9

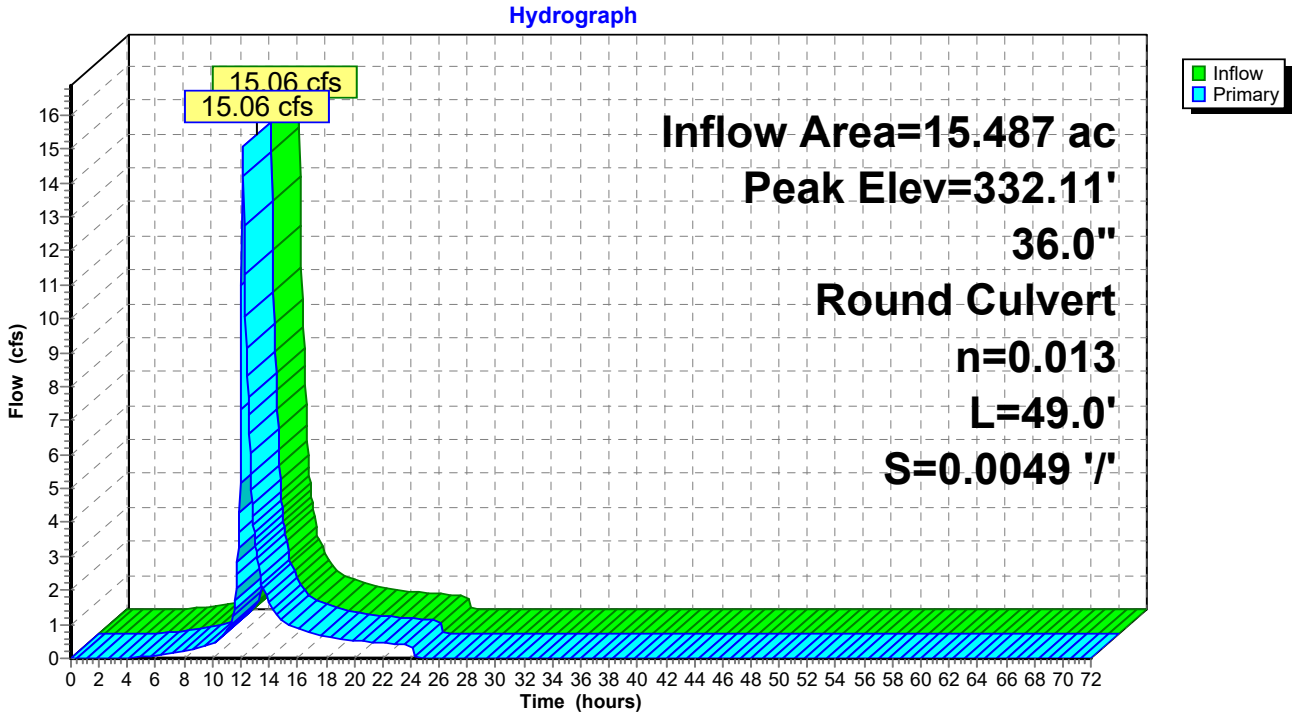
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.11' @ 12.15 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

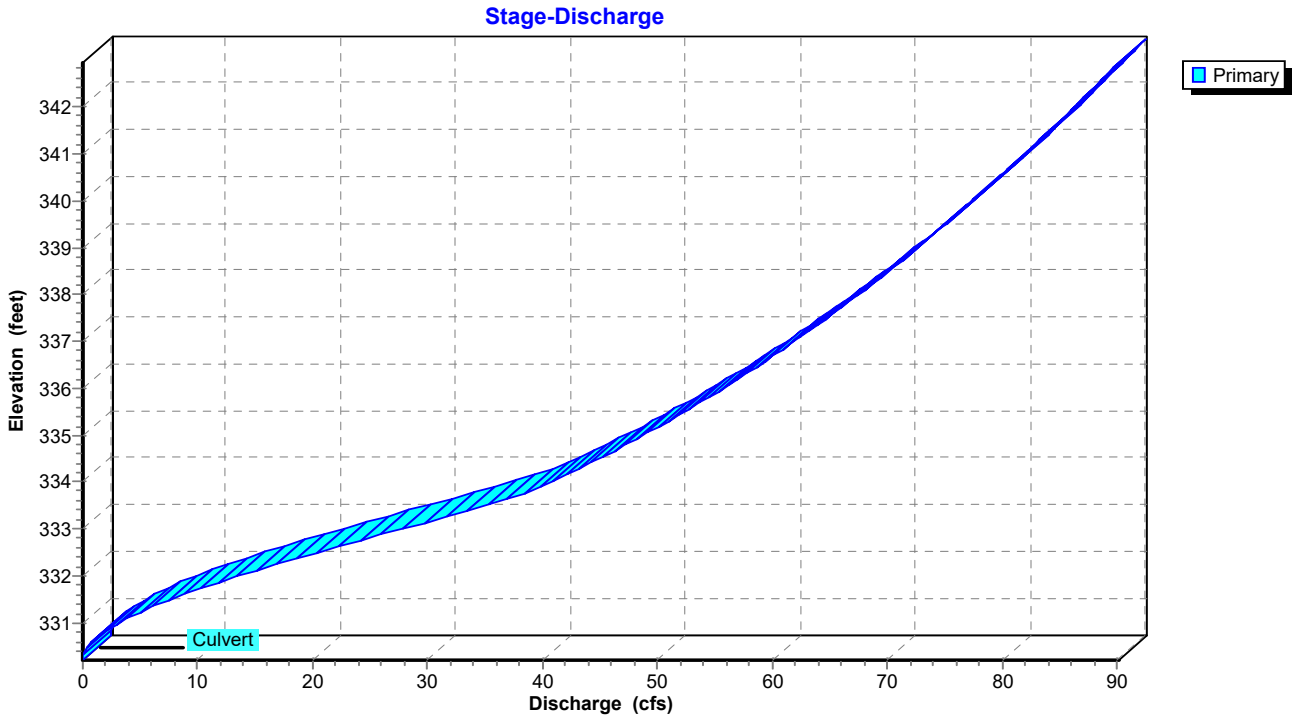
Primary OutFlow Max=15.05 cfs @ 12.15 hrs HW=332.11' TW=331.38' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 15.05 cfs @ 4.51 fps)



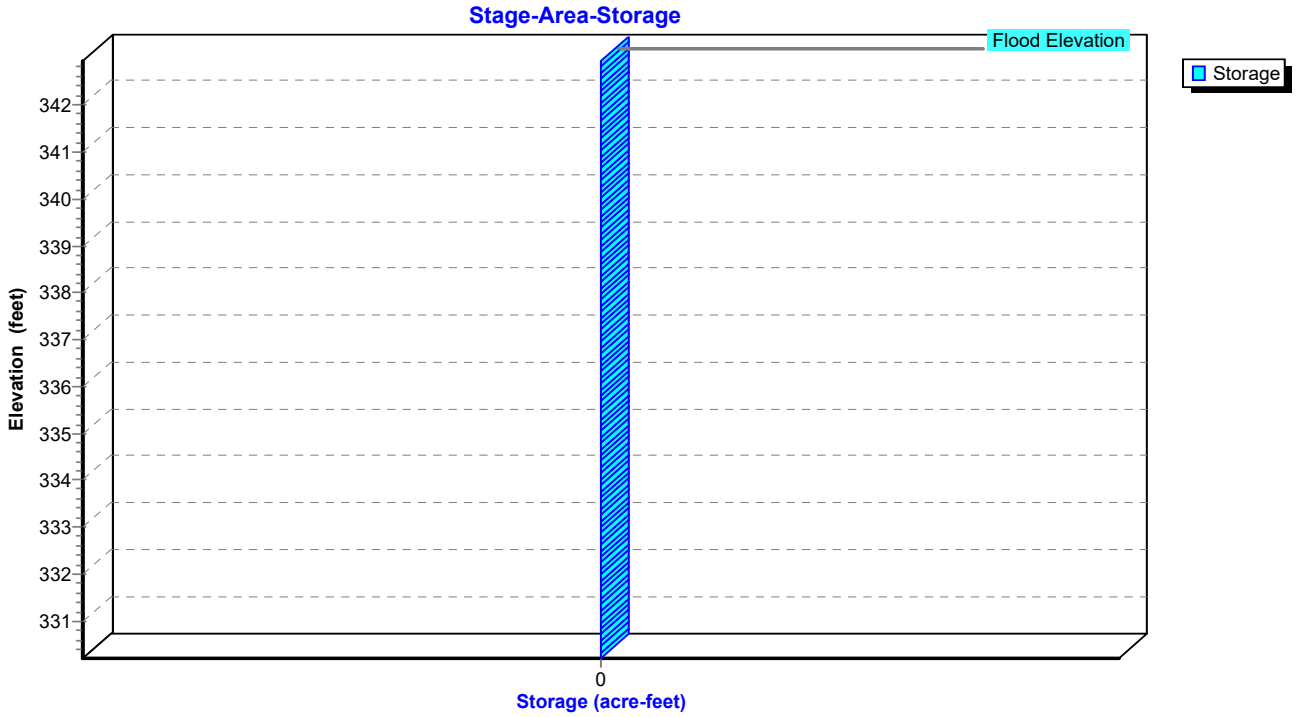
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.20	0.00
2.00	0.00	330.20	0.00
3.00	0.00	330.20	0.00
4.00	0.00	330.23	0.00
5.00	0.04	330.29	0.04
6.00	0.09	330.33	0.09
7.00	0.14	330.36	0.14
8.00	0.21	330.40	0.21
9.00	0.30	330.44	0.30
10.00	0.46	330.49	0.46
11.00	0.81	330.59	0.81
12.00	**7.33**	**331.47**	**7.33**
13.00	**3.49**	**331.04**	**3.49**
14.00	1.63	330.76	1.63
15.00	1.10	330.66	1.10
16.00	0.87	330.61	0.87
17.00	0.74	330.57	0.74
18.00	0.64	330.55	0.64
19.00	0.57	330.53	0.57
20.00	0.52	330.51	0.52
21.00	0.48	330.50	0.48
22.00	0.44	330.49	0.44
23.00	0.42	330.48	0.42
24.00	0.39	330.47	0.39
25.00	0.00	330.20	0.00
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

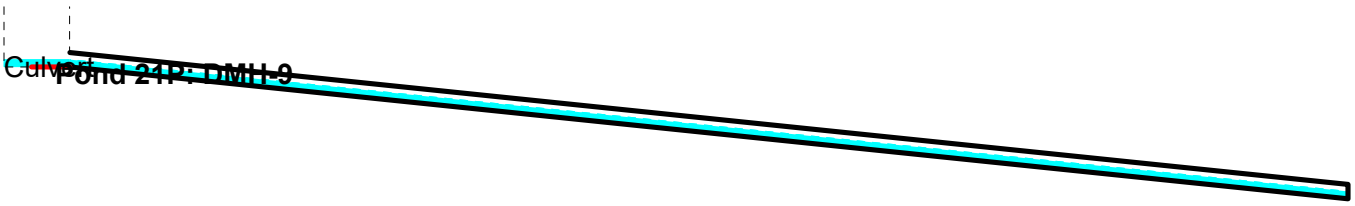
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Outflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min
Primary = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Routed to Pond 23P : DMH-10

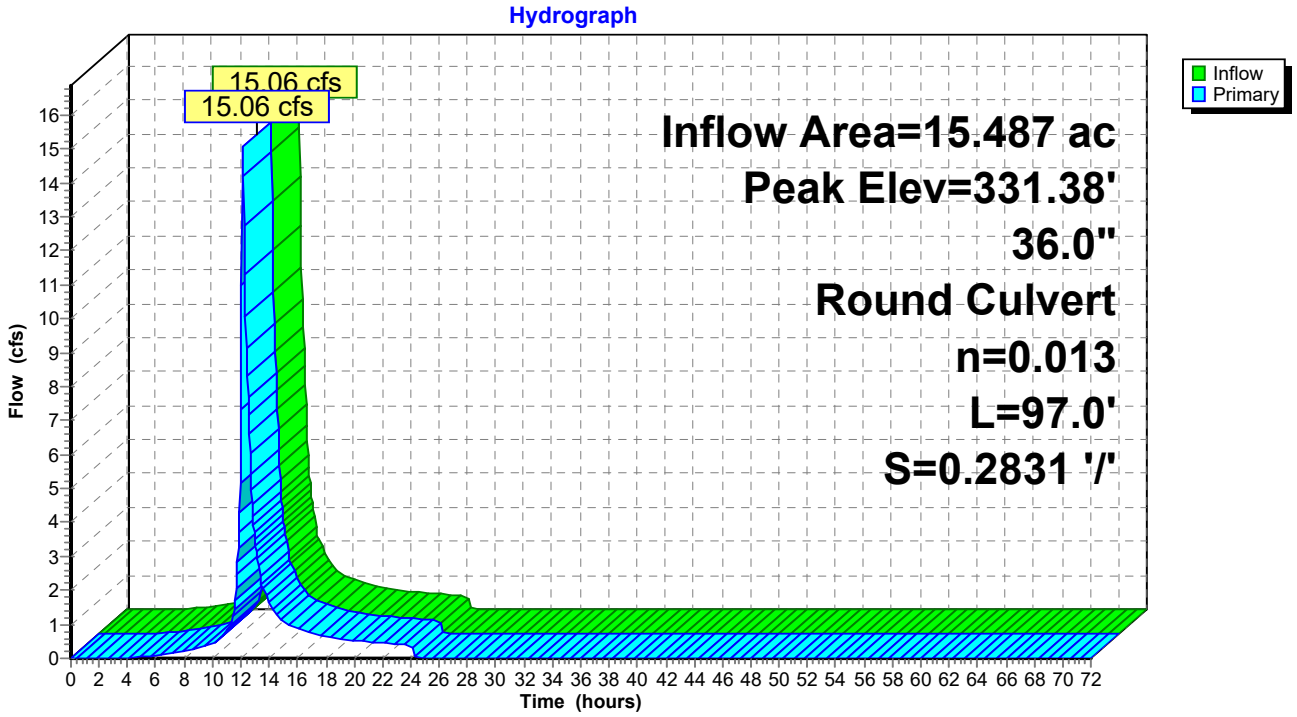
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 331.38' @ 12.15 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

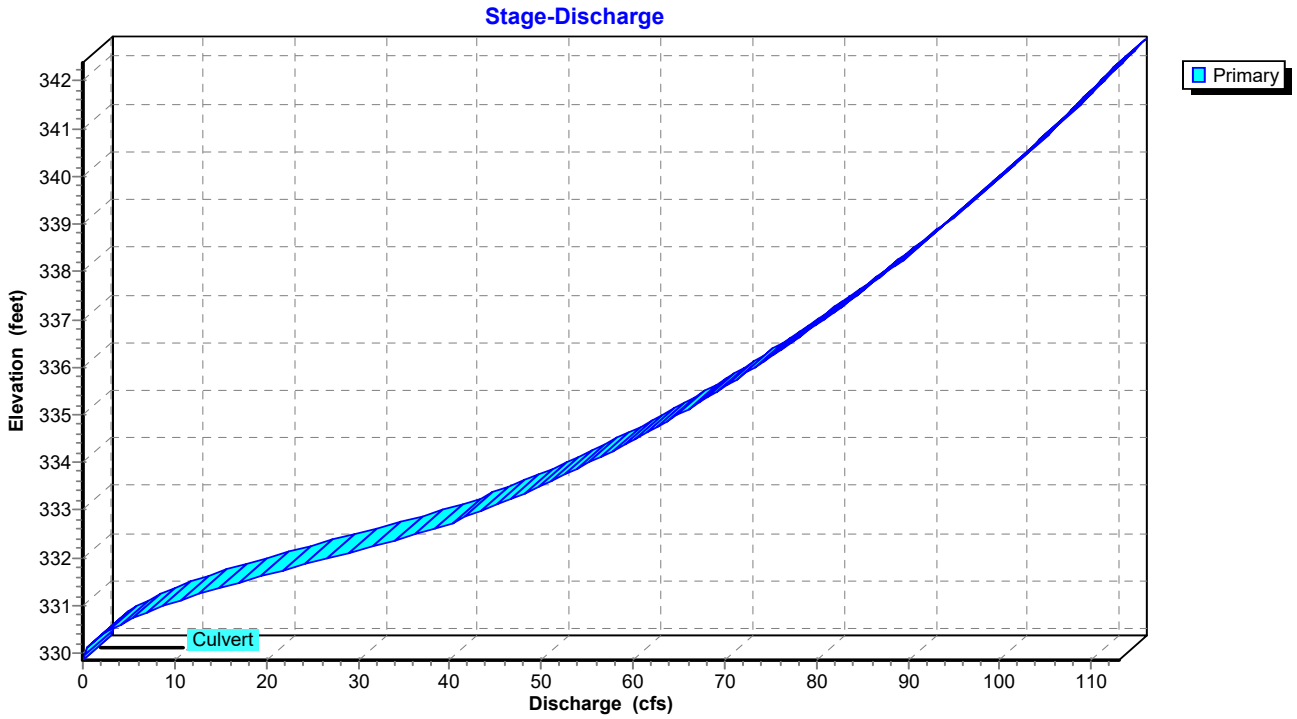
Primary OutFlow Max=15.04 cfs @ 12.15 hrs HW=331.38' TW=300.10' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 15.04 cfs @ 4.19 fps)



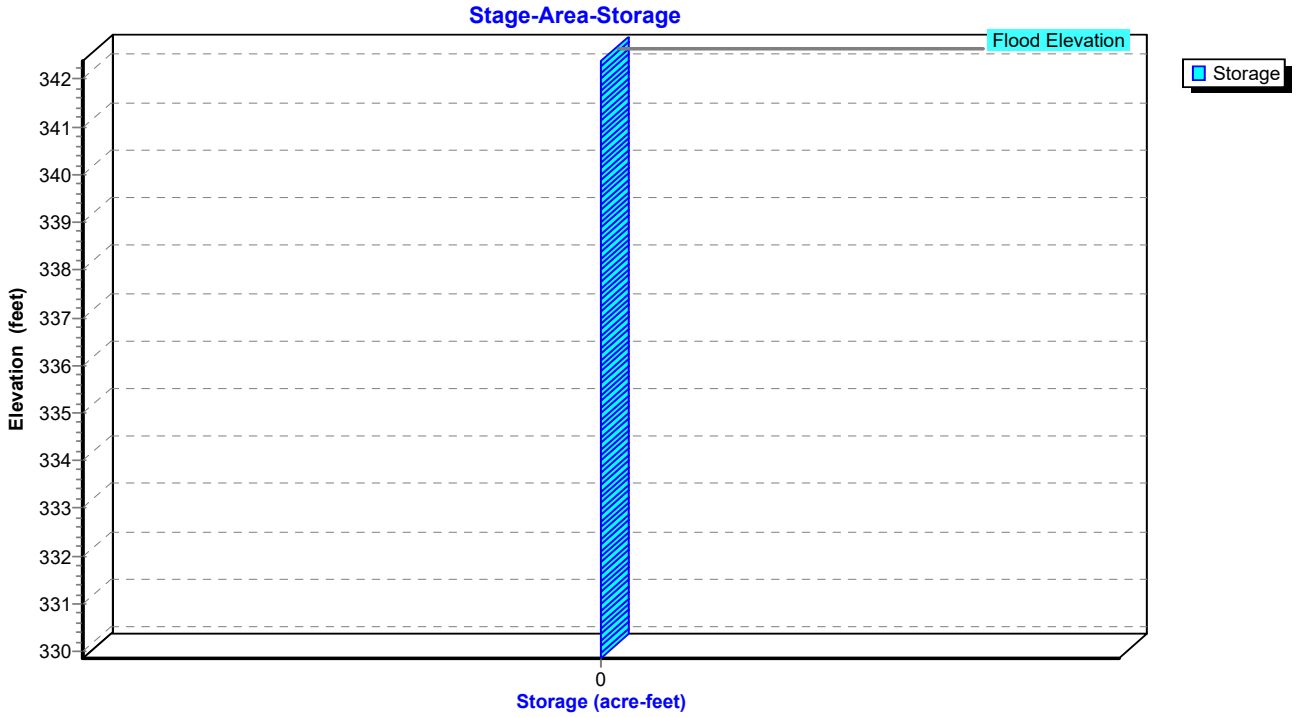
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.86	0.00
2.00	0.00	329.86	0.00
3.00	0.00	329.86	0.00
4.00	0.00	329.88	0.00
5.00	0.04	329.93	0.04
6.00	0.09	329.97	0.09
7.00	0.14	329.99	0.14
8.00	0.21	330.02	0.21
9.00	0.30	330.06	0.30
10.00	0.46	330.10	0.46
11.00	0.81	330.19	0.81
12.00	**7.33**	**330.88**	**7.33**
13.00	**3.49**	**330.55**	**3.49**
14.00	1.63	330.33	1.63
15.00	1.10	330.24	1.10
16.00	0.87	330.20	0.87
17.00	0.74	330.17	0.74
18.00	0.64	330.15	0.64
19.00	0.57	330.13	0.57
20.00	0.52	330.12	0.52
21.00	0.48	330.11	0.48
22.00	0.44	330.10	0.44
23.00	0.42	330.09	0.42
24.00	0.39	330.09	0.39
25.00	0.00	329.86	0.00
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

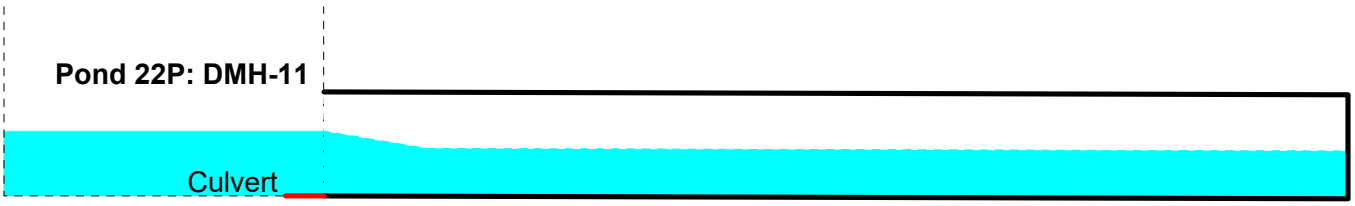
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Outflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min
Primary = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

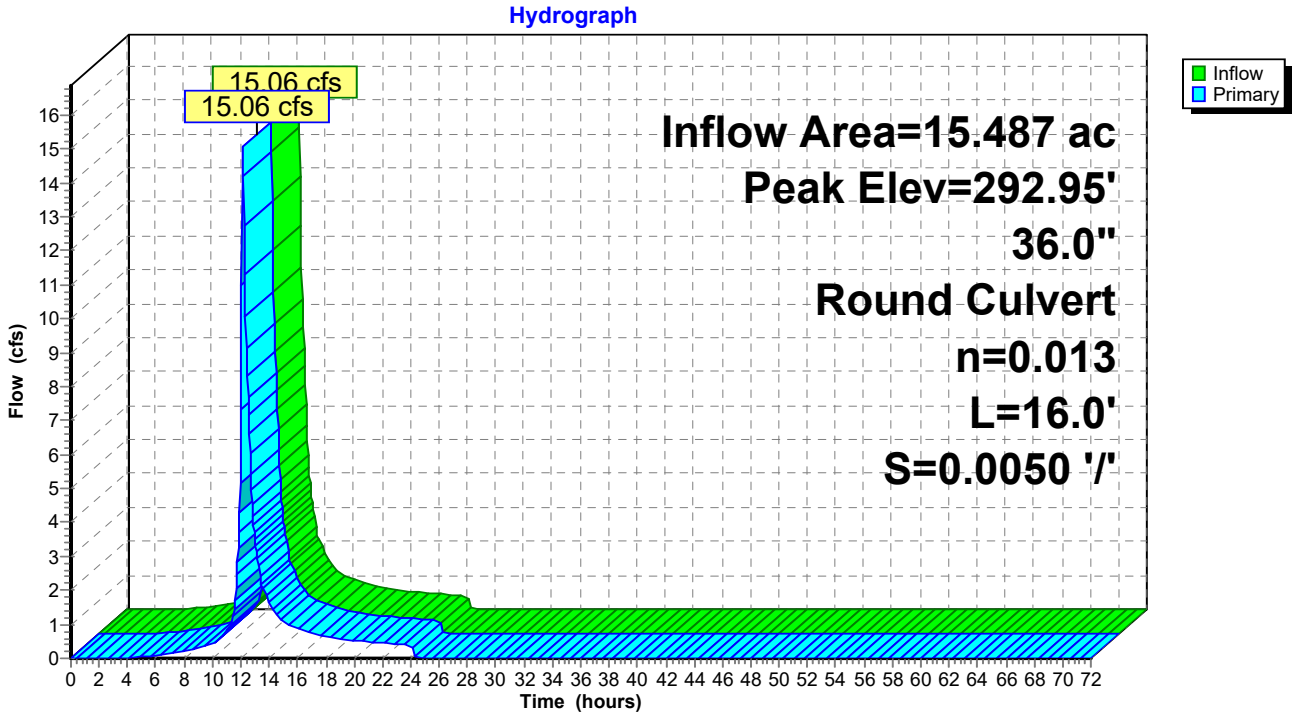
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 292.95' @ 12.15 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

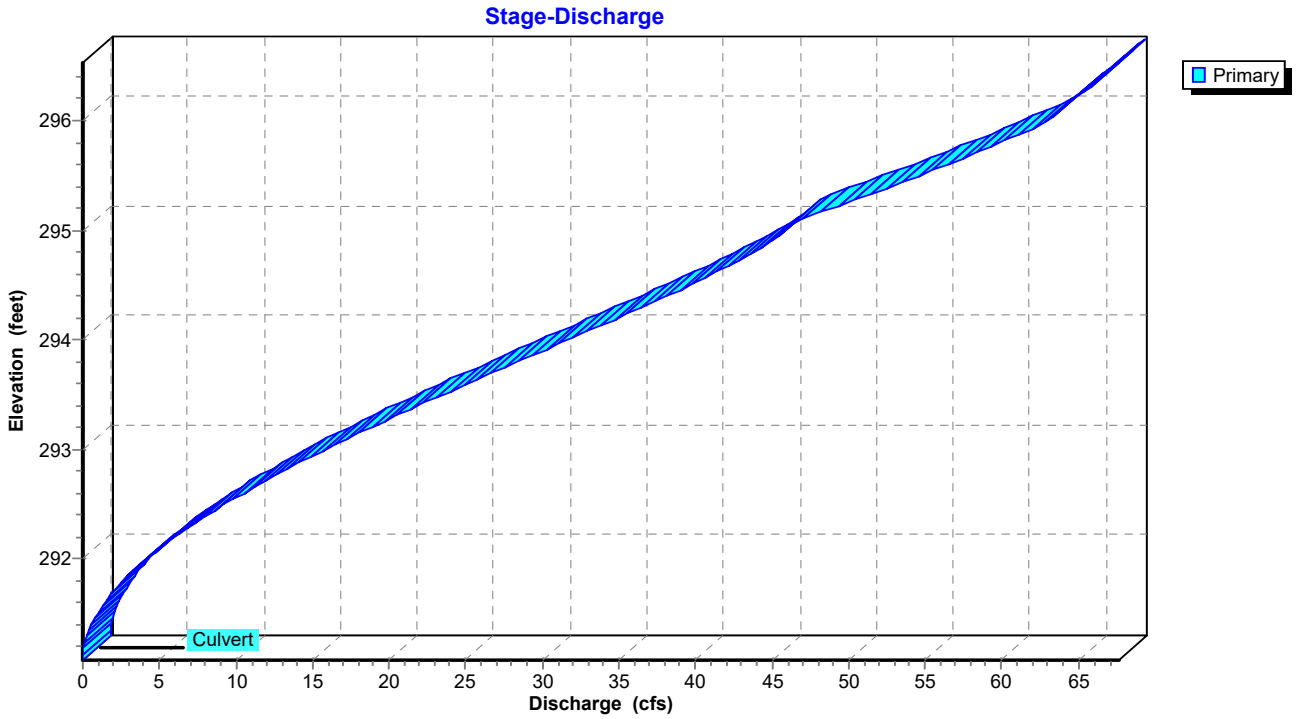
Primary OutFlow Max=15.04 cfs @ 12.15 hrs HW=292.95' TW=287.69' (Dynamic Tailwater)
1=Culvert (Barrel Controls 15.04 cfs @ 4.66 fps)



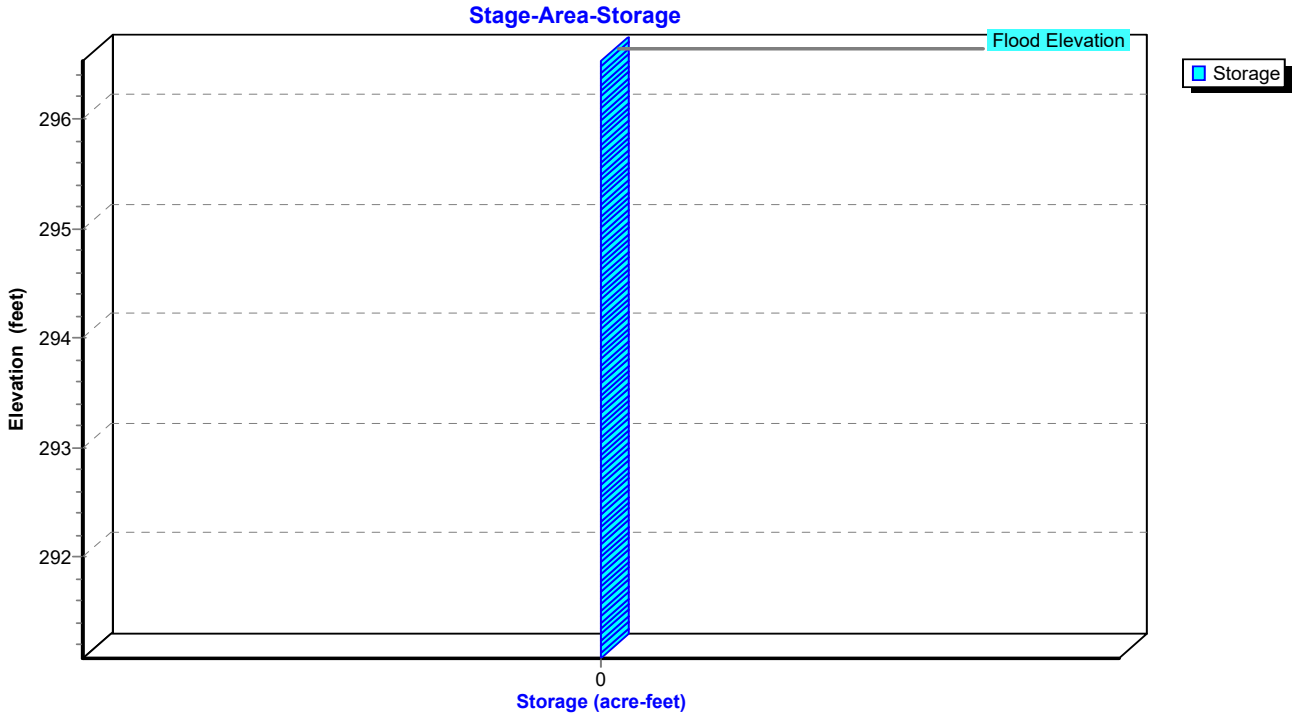
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.08	0.00
2.00	0.00	291.08	0.00
3.00	0.00	291.08	0.00
4.00	0.00	291.11	0.00
5.00	0.04	291.17	0.04
6.00	0.09	291.21	0.09
7.00	0.14	291.24	0.14
8.00	0.21	291.28	0.21
9.00	0.30	291.32	0.30
10.00	0.46	291.37	0.46
11.00	0.81	291.47	0.81
12.00	**7.33**	**292.33**	**7.33**
13.00	**3.49**	**291.92**	**3.49**
14.00	1.63	291.64	1.63
15.00	1.10	291.54	1.10
16.00	0.87	291.49	0.87
17.00	0.74	291.45	0.74
18.00	0.64	291.43	0.64
19.00	0.57	291.41	0.57
20.00	0.52	291.39	0.52
21.00	0.48	291.38	0.48
22.00	0.44	291.37	0.44
23.00	0.42	291.36	0.42
24.00	0.39	291.35	0.39
25.00	0.00	291.08	0.00
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

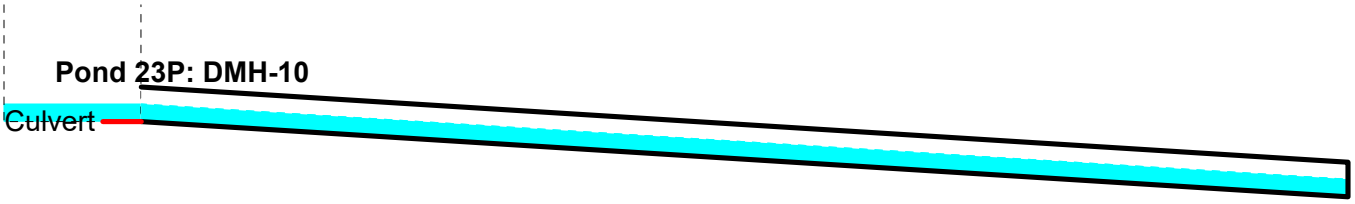
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.35" for 1-yr event
Inflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Outflow = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af, Atten= 0%, Lag= 0.0 min
Primary = 15.06 cfs @ 12.15 hrs, Volume= 1.743 af
Routed to Pond 22P : DMH-11

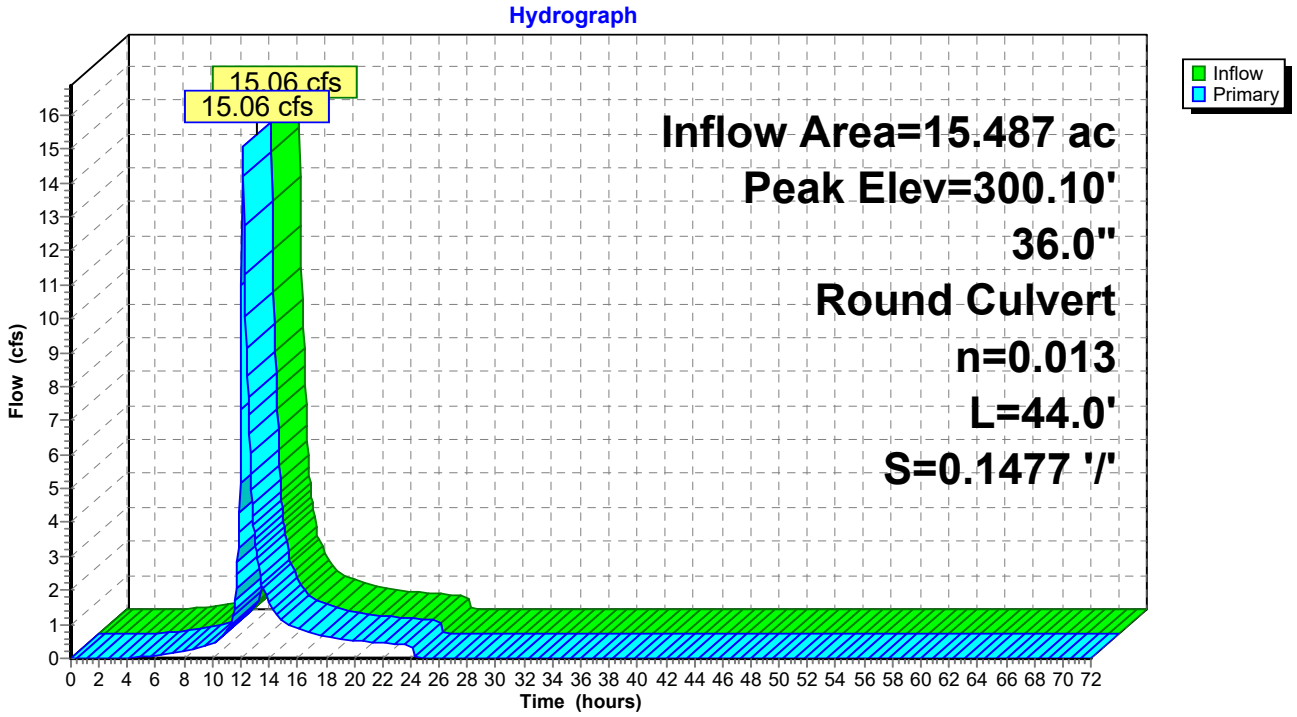
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 300.10' @ 12.15 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

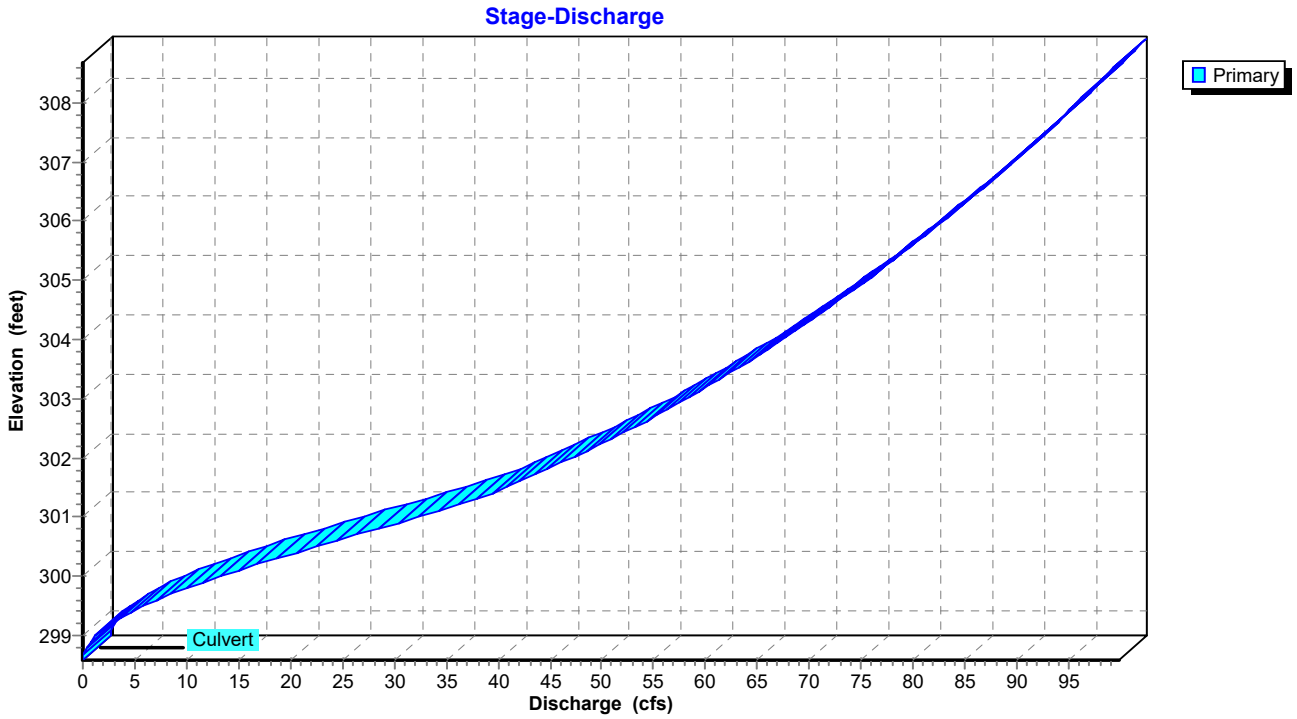
Primary OutFlow Max=15.04 cfs @ 12.15 hrs HW=300.10' TW=292.95' (Dynamic Tailwater)
1=Culvert (Inlet Controls 15.04 cfs @ 4.19 fps)



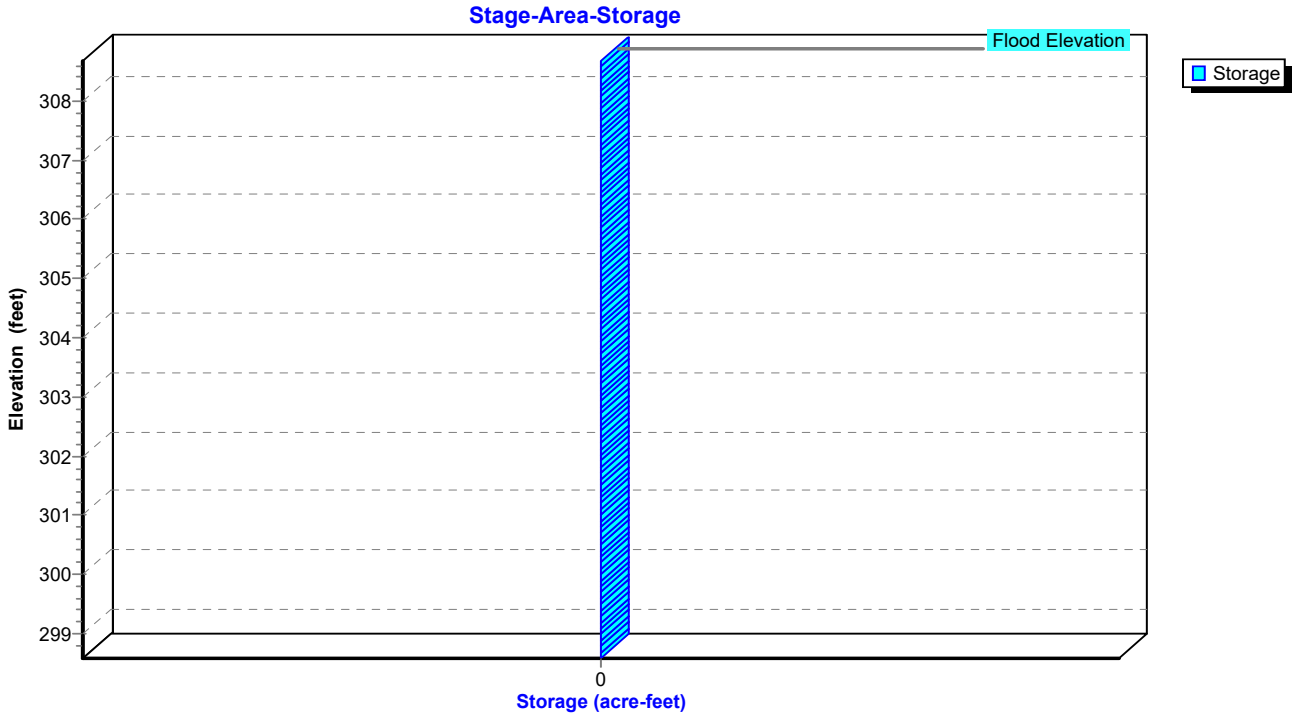
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00	52.00	0.00	298.58	0.00
1.00	0.00	298.58	0.00	53.00	0.00	298.58	0.00
2.00	0.00	298.58	0.00	54.00	0.00	298.58	0.00
3.00	0.00	298.58	0.00	55.00	0.00	298.58	0.00
4.00	0.00	298.60	0.00	56.00	0.00	298.58	0.00
5.00	0.04	298.65	0.04	57.00	0.00	298.58	0.00
6.00	0.09	298.69	0.09	58.00	0.00	298.58	0.00
7.00	0.14	298.71	0.14	59.00	0.00	298.58	0.00
8.00	0.21	298.74	0.21	60.00	0.00	298.58	0.00
9.00	0.30	298.78	0.30	61.00	0.00	298.58	0.00
10.00	0.46	298.82	0.46	62.00	0.00	298.58	0.00
11.00	0.81	298.91	0.81	63.00	0.00	298.58	0.00
12.00	**7.33**	**299.60**	**7.33**	64.00	0.00	298.58	0.00
13.00	**3.49**	**299.27**	**3.49**	65.00	0.00	298.58	0.00
14.00	1.63	299.05	1.63	66.00	0.00	298.58	0.00
15.00	1.10	298.96	1.10	67.00	0.00	298.58	0.00
16.00	0.87	298.92	0.87	68.00	0.00	298.58	0.00
17.00	0.74	298.89	0.74	69.00	0.00	298.58	0.00
18.00	0.64	298.87	0.64	70.00	0.00	298.58	0.00
19.00	0.57	298.85	0.57	71.00	0.00	298.58	0.00
20.00	0.52	298.84	0.52	72.00	0.00	298.58	0.00
21.00	0.48	298.83	0.48				
22.00	0.44	298.82	0.44				
23.00	0.42	298.81	0.42				
24.00	0.39	298.81	0.39				
25.00	0.00	298.58	0.00				
26.00	0.00	298.58	0.00				
27.00	0.00	298.58	0.00				
28.00	0.00	298.58	0.00				
29.00	0.00	298.58	0.00				
30.00	0.00	298.58	0.00				
31.00	0.00	298.58	0.00				
32.00	0.00	298.58	0.00				
33.00	0.00	298.58	0.00				
34.00	0.00	298.58	0.00				
35.00	0.00	298.58	0.00				
36.00	0.00	298.58	0.00				
37.00	0.00	298.58	0.00				
38.00	0.00	298.58	0.00				
39.00	0.00	298.58	0.00				
40.00	0.00	298.58	0.00				
41.00	0.00	298.58	0.00				
42.00	0.00	298.58	0.00				
43.00	0.00	298.58	0.00				
44.00	0.00	298.58	0.00				
45.00	0.00	298.58	0.00				
46.00	0.00	298.58	0.00				
47.00	0.00	298.58	0.00				
48.00	0.00	298.58	0.00				
49.00	0.00	298.58	0.00				
50.00	0.00	298.58	0.00				
51.00	0.00	298.58	0.00				

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

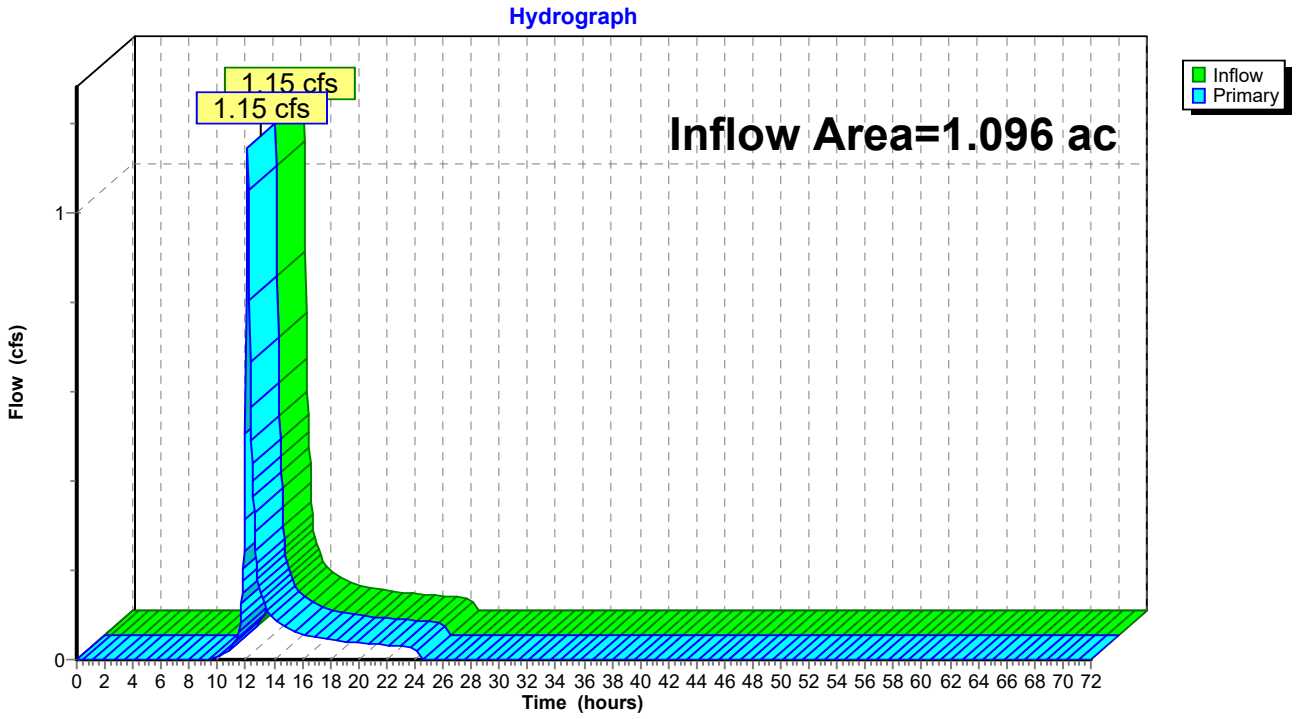
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 1.09" for 1-yr event
Inflow = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af
Primary = 1.15 cfs @ 12.13 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

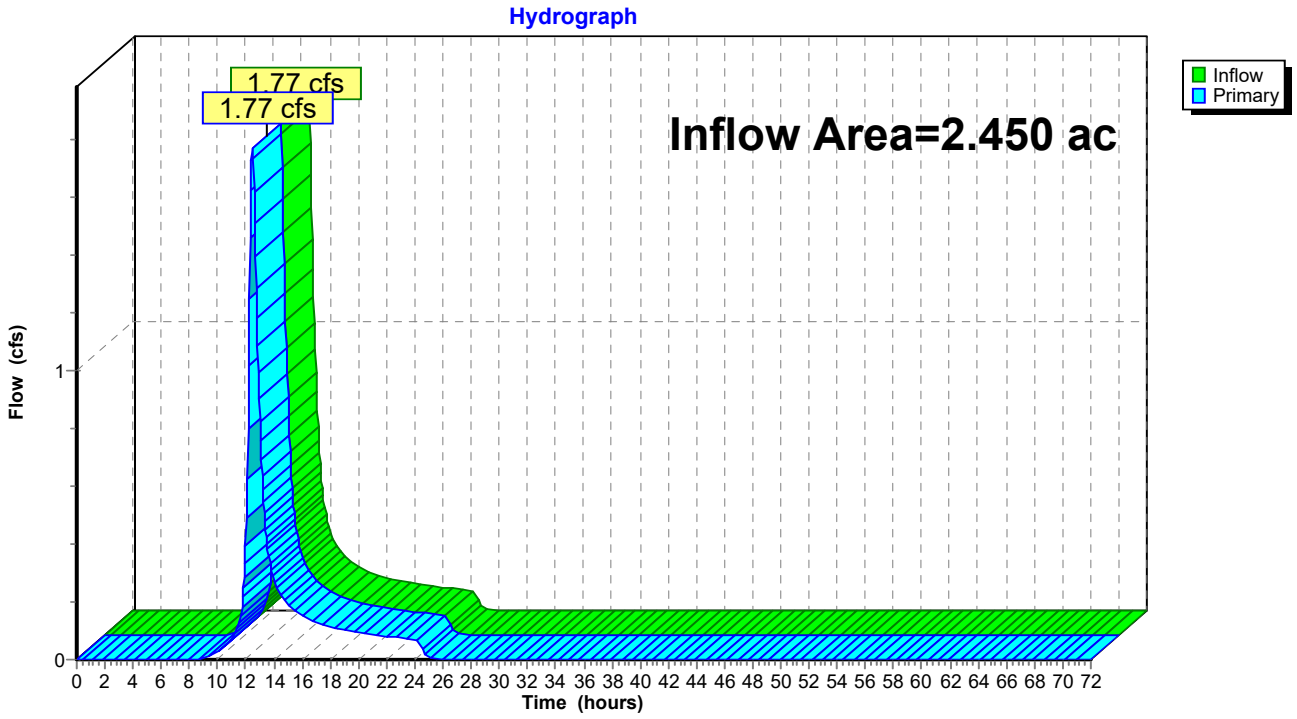
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	62.00	0.00	0.00	0.00
11.00	0.03	0.00	0.03	63.00	0.00	0.00	0.00
12.00	**0.51**	0.00	**0.51**	64.00	0.00	0.00	0.00
13.00	**0.15**	0.00	**0.15**	65.00	0.00	0.00	0.00
14.00	0.09	0.00	0.09	66.00	0.00	0.00	0.00
15.00	0.07	0.00	0.07	67.00	0.00	0.00	0.00
16.00	0.06	0.00	0.06	68.00	0.00	0.00	0.00
17.00	0.05	0.00	0.05	69.00	0.00	0.00	0.00
18.00	0.04	0.00	0.04	70.00	0.00	0.00	0.00
19.00	0.04	0.00	0.04	71.00	0.00	0.00	0.00
20.00	0.04	0.00	0.04	72.00	0.00	0.00	0.00
21.00	0.03	0.00	0.03				
22.00	0.03	0.00	0.03				
23.00	0.03	0.00	0.03				
24.00	0.03	0.00	0.03				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 1.27" for 1-yr event
Inflow = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af
Primary = 1.77 cfs @ 12.47 hrs, Volume= 0.260 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

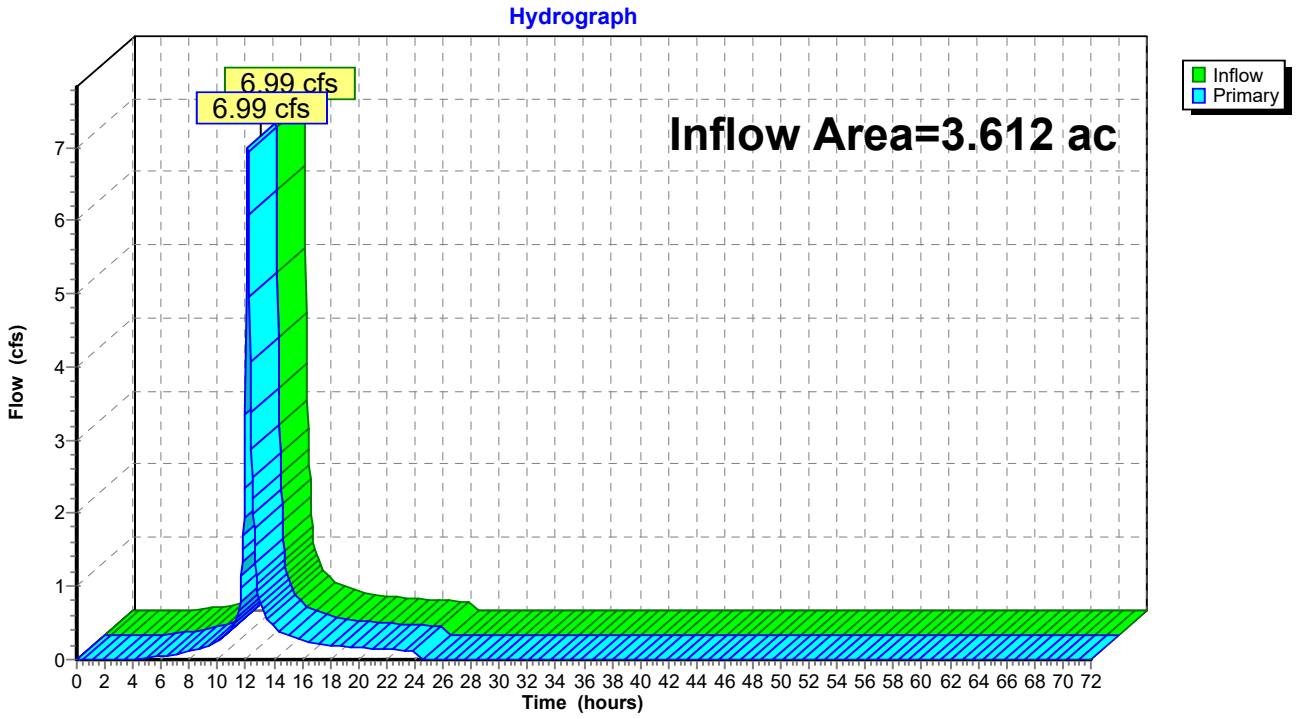
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01
10.00	0.03	0.00	0.03
11.00	0.07	0.00	0.07
12.00	**0.40**	0.00	**0.40**
13.00	**0.83**	0.00	**0.83**
14.00	0.28	0.00	0.28
15.00	0.19	0.00	0.19
16.00	0.15	0.00	0.15
17.00	0.13	0.00	0.13
18.00	0.11	0.00	0.11
19.00	0.10	0.00	0.10
20.00	0.09	0.00	0.09
21.00	0.09	0.00	0.09
22.00	0.08	0.00	0.08
23.00	0.08	0.00	0.08
24.00	0.07	0.00	0.07
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.04" for 1-yr event
Inflow = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af
Primary = 6.99 cfs @ 12.13 hrs, Volume= 0.615 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

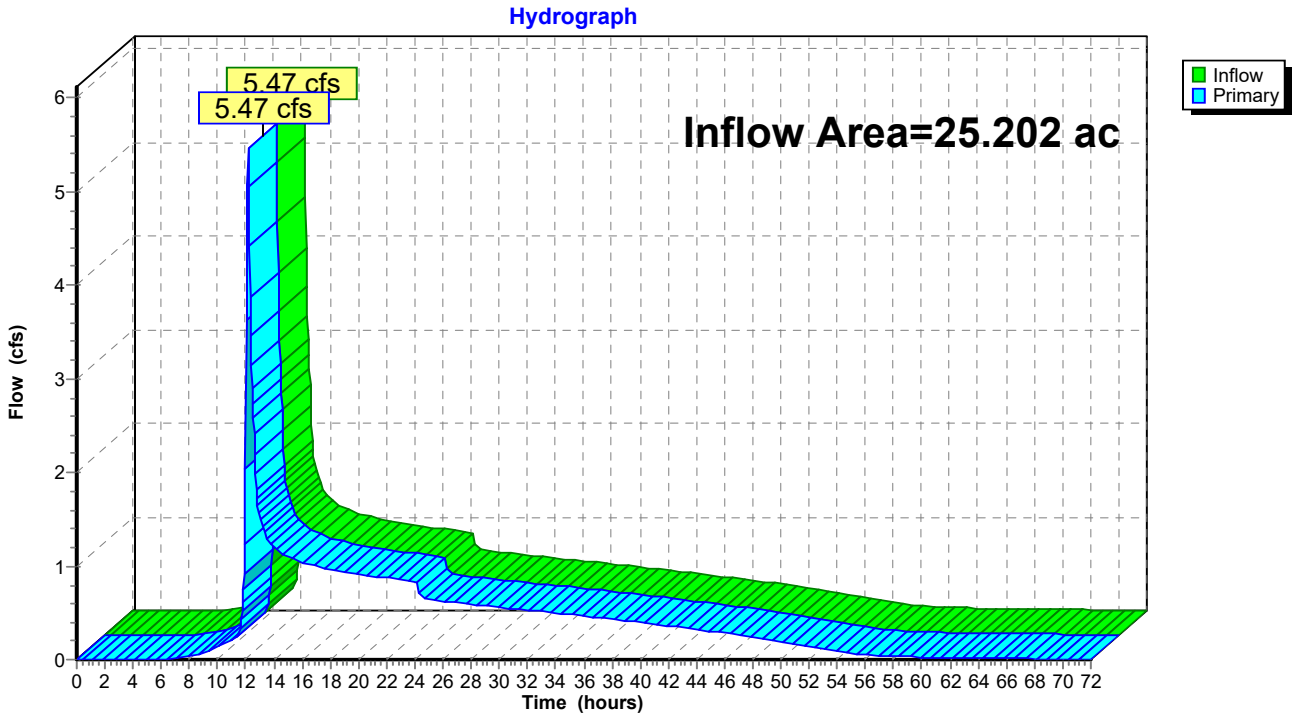
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.02	0.00	0.02
6.00	0.05	0.00	0.05
7.00	0.08	0.00	0.08
8.00	0.11	0.00	0.11
9.00	0.16	0.00	0.16
10.00	0.25	0.00	0.25
11.00	0.43	0.00	0.43
12.00	**3.36**	0.00	**3.36**
13.00	**0.78**	0.00	**0.78**
14.00	0.44	0.00	0.44
15.00	0.33	0.00	0.33
16.00	0.27	0.00	0.27
17.00	0.23	0.00	0.23
18.00	0.20	0.00	0.20
19.00	0.18	0.00	0.18
20.00	0.16	0.00	0.16
21.00	0.15	0.00	0.15
22.00	0.14	0.00	0.14
23.00	0.13	0.00	0.13
24.00	0.12	0.00	0.12
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 1.07" for 1-yr event
Inflow = 5.47 cfs @ 12.15 hrs, Volume= 2.249 af
Primary = 5.47 cfs @ 12.15 hrs, Volume= 2.249 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.01	0.00	0.01
8.00	0.04	0.00	0.04
9.00	0.08	0.00	0.08
10.00	0.14	0.00	0.14
11.00	0.21	0.00	0.21
12.00	**2.05**	0.00	**2.05**
13.00	**1.51**	0.00	**1.51**
14.00	1.21	0.00	1.21
15.00	1.10	0.00	1.10
16.00	1.04	0.00	1.04
17.00	1.00	0.00	1.00
18.00	0.96	0.00	0.96
19.00	0.94	0.00	0.94
20.00	0.91	0.00	0.91
21.00	0.89	0.00	0.89
22.00	0.88	0.00	0.88
23.00	0.86	0.00	0.86
24.00	0.84	0.00	0.84
25.00	0.64	0.00	0.64
26.00	0.62	0.00	0.62
27.00	0.61	0.00	0.61
28.00	0.59	0.00	0.59
29.00	0.58	0.00	0.58
30.00	0.56	0.00	0.56
31.00	0.55	0.00	0.55
32.00	0.53	0.00	0.53
33.00	0.51	0.00	0.51
34.00	0.50	0.00	0.50
35.00	0.48	0.00	0.48
36.00	0.46	0.00	0.46
37.00	0.45	0.00	0.45
38.00	0.43	0.00	0.43
39.00	0.41	0.00	0.41
40.00	0.40	0.00	0.40
41.00	0.38	0.00	0.38
42.00	0.36	0.00	0.36
43.00	0.34	0.00	0.34
44.00	0.33	0.00	0.33
45.00	0.31	0.00	0.31
46.00	0.29	0.00	0.29
47.00	0.26	0.00	0.26
48.00	0.24	0.00	0.24
49.00	0.22	0.00	0.22
50.00	0.19	0.00	0.19
51.00	0.17	0.00	0.17
52.00	0.14	0.00	0.14
53.00	0.11	0.00	0.11
54.00	0.09	0.00	0.09
55.00	0.07	0.00	0.07
56.00	0.06	0.00	0.06
57.00	0.05	0.00	0.05
58.00	0.04	0.00	0.04
59.00	0.03	0.00	0.03
60.00	0.03	0.00	0.03
61.00	0.02	0.00	0.02
62.00	0.02	0.00	0.02
63.00	0.02	0.00	0.02
64.00	0.01	0.00	0.01
65.00	0.01	0.00	0.01
66.00	0.01	0.00	0.01
67.00	0.01	0.00	0.01
68.00	0.01	0.00	0.01
69.00	0.01	0.00	0.01
70.00	0.01	0.00	0.01
71.00	0.01	0.00	0.01
72.00	0.01	0.00	0.01

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=1.57"
Flow Length=253' Tc=12.2 min CN=80 Runoff=1.66 cfs 0.143 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=1.78"
Flow Length=548' Tc=36.4 min CN=83 Runoff=2.47 cfs 0.364 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=2.65"
Flow Length=469' Tc=13.4 min CN=93 Runoff=8.71 cfs 0.797 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=2.65"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=16.60 cfs 1.468 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=1.18"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=6.94 cfs 0.734 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=1.01"
Flow Length=968' Tc=12.4 min CN=71 Runoff=8.51 cfs 0.815 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=2.85"
Flow Length=398' Tc=6.0 min CN=95 Runoff=4.67 cfs 0.324 af

Pond 6P: Infiltrators Peak Elev=348.06' Storage=0.114 af Inflow=4.67 cfs 0.324 af
Discarded=0.07 cfs 0.134 af Primary=0.89 cfs 0.190 af Outflow=0.96 cfs 0.324 af

Pond 9P: Detention Piping - 48" Peak Elev=332.80' Storage=0.076 af Inflow=5.46 cfs 0.219 af
Outflow=2.79 cfs 0.220 af

Pond 18P: Micropool Extended Detention Peak Elev=290.23' Storage=70,302 cf Inflow=19.85 cfs 2.392 af
Primary=0.79 cfs 2.374 af Secondary=0.00 cfs 0.000 af Outflow=0.79 cfs 2.374 af

Pond 19P: DMH-7 Peak Elev=336.40' Inflow=23.43 cfs 2.391 af
Primary=17.96 cfs 2.172 af Secondary=5.46 cfs 0.219 af Outflow=23.43 cfs 2.391 af

Pond 20P: DMH-8 Peak Elev=332.46' Inflow=19.85 cfs 2.392 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=19.85 cfs 2.392 af

Pond 21P: DMH-9 Peak Elev=331.64' Inflow=19.85 cfs 2.392 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=19.85 cfs 2.392 af

Pond 22P: DMH-11 Peak Elev=293.27' Inflow=19.85 cfs 2.392 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=19.85 cfs 2.392 af

Pond 23P: DMH-10 Peak Elev=300.36' Inflow=19.85 cfs 2.392 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=19.85 cfs 2.392 af

Link DP-1: Design Point - 1 Inflow=1.66 cfs 0.143 af
Primary=1.66 cfs 0.143 af

Link DP-2: Design Point - 2 Inflow=2.47 cfs 0.364 af
Primary=2.47 cfs 0.364 af

Link DP-3: Design Point - 3 Inflow=8.71 cfs 0.797 af
Primary=8.71 cfs 0.797 af

Link DP-4: DP-4 Inflow=9.00 cfs 3.189 af
Primary=9.00 cfs 3.189 af

Total Runoff Area = 32.360 ac Runoff Volume = 4.644 af Average Runoff Depth = 1.72"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

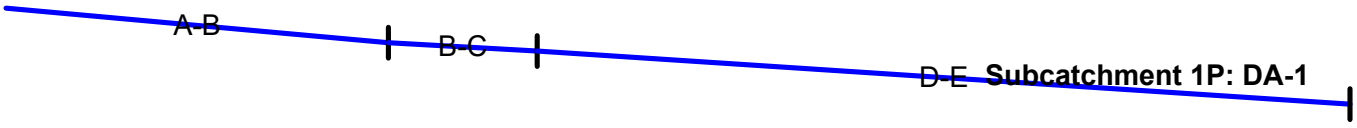
Summary for Subcatchment 1P: DA-1

Runoff = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af, Depth= 1.57"
Routed to Link DP-1 : Design Point - 1

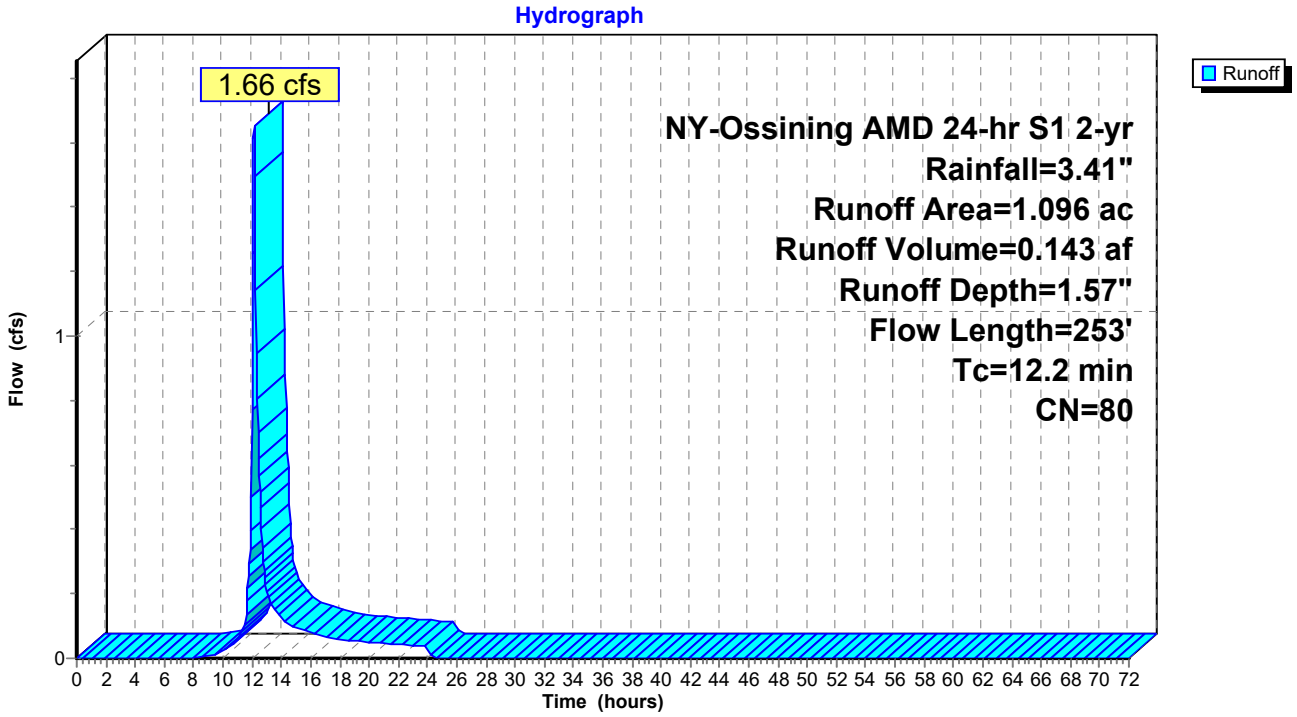
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.01
10.00	0.73	0.02	0.02
11.00	0.92	0.06	0.06
12.00	1.87	0.48	**0.77**
13.00	2.50	0.89	**0.21**
14.00	2.69	1.02	0.13
15.00	2.82	1.12	0.10
16.00	2.92	1.19	0.08
17.00	3.01	1.26	0.07
18.00	3.08	1.31	0.06
19.00	3.15	1.36	0.05
20.00	3.21	1.41	0.05
21.00	3.27	1.45	0.05
22.00	3.32	1.49	0.04
23.00	3.36	1.53	0.04
24.00	**3.41**	**1.57**	0.04
25.00	3.41	1.57	0.00
26.00	3.41	1.57	0.00
27.00	3.41	1.57	0.00
28.00	3.41	1.57	0.00
29.00	3.41	1.57	0.00
30.00	3.41	1.57	0.00
31.00	3.41	1.57	0.00
32.00	3.41	1.57	0.00
33.00	3.41	1.57	0.00
34.00	3.41	1.57	0.00
35.00	3.41	1.57	0.00
36.00	3.41	1.57	0.00
37.00	3.41	1.57	0.00
38.00	3.41	1.57	0.00
39.00	3.41	1.57	0.00
40.00	3.41	1.57	0.00
41.00	3.41	1.57	0.00
42.00	3.41	1.57	0.00
43.00	3.41	1.57	0.00
44.00	3.41	1.57	0.00
45.00	3.41	1.57	0.00
46.00	3.41	1.57	0.00
47.00	3.41	1.57	0.00
48.00	3.41	1.57	0.00
49.00	3.41	1.57	0.00
50.00	3.41	1.57	0.00
51.00	3.41	1.57	0.00
52.00	3.41	1.57	0.00
53.00	3.41	1.57	0.00
54.00	3.41	1.57	0.00
55.00	3.41	1.57	0.00
56.00	3.41	1.57	0.00
57.00	3.41	1.57	0.00
58.00	3.41	1.57	0.00
59.00	3.41	1.57	0.00
60.00	3.41	1.57	0.00
61.00	3.41	1.57	0.00
62.00	3.41	1.57	0.00
63.00	3.41	1.57	0.00
64.00	3.41	1.57	0.00
65.00	3.41	1.57	0.00
66.00	3.41	1.57	0.00
67.00	3.41	1.57	0.00
68.00	3.41	1.57	0.00
69.00	3.41	1.57	0.00
70.00	3.41	1.57	0.00
71.00	3.41	1.57	0.00
72.00	3.41	1.57	0.00

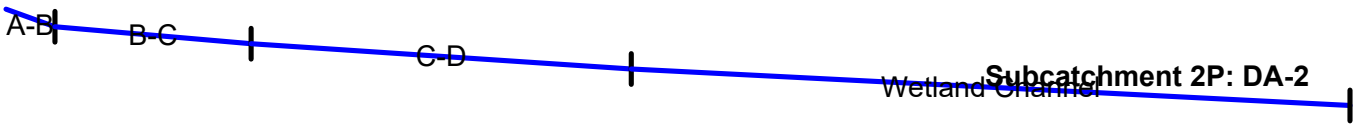
Summary for Subcatchment 2P: DA-2

Runoff = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af, Depth= 1.78"
Routed to Link DP-2 : Design Point - 2

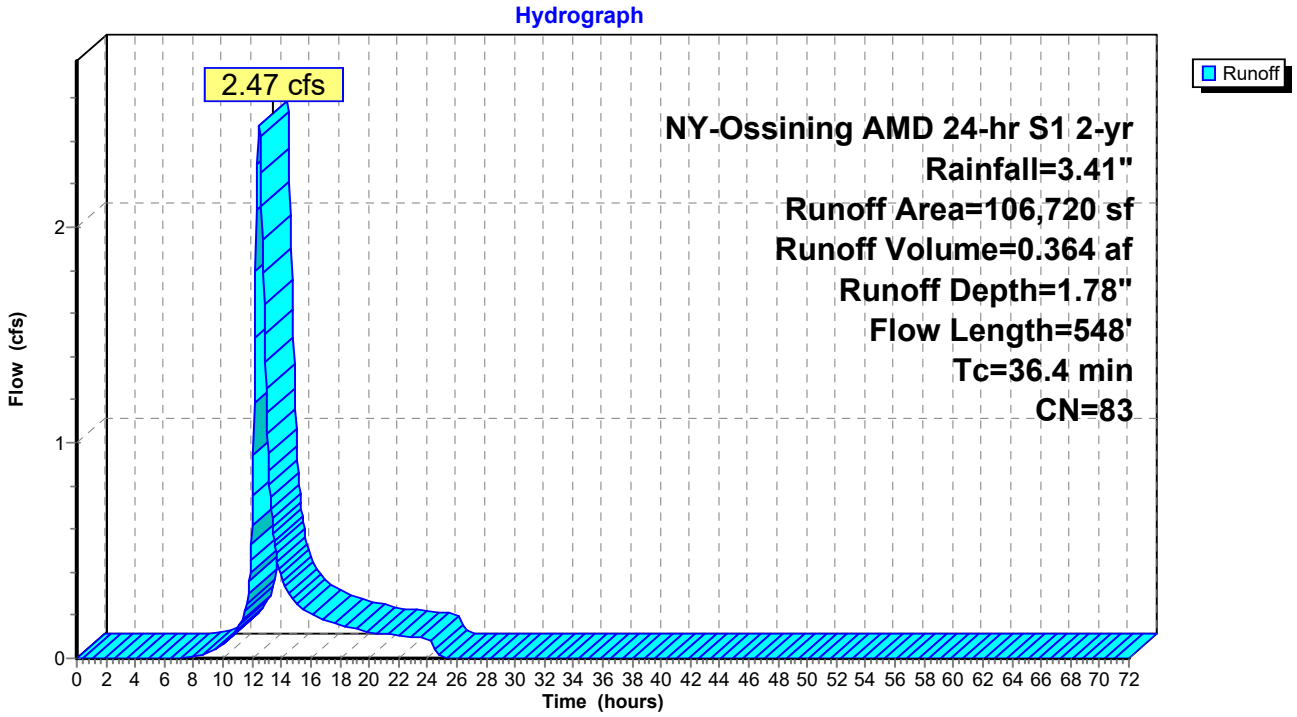
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.01
9.00	0.59	0.02	0.03
10.00	0.73	0.04	0.06
11.00	0.92	0.10	0.14
12.00	1.87	0.61	**0.62**
13.00	2.50	1.06	**1.14**
14.00	2.69	1.20	0.37
15.00	2.82	1.30	0.26
16.00	2.92	1.38	0.20
17.00	3.01	1.45	0.17
18.00	3.08	1.51	0.15
19.00	3.15	1.57	0.14
20.00	3.21	1.62	0.12
21.00	3.27	1.66	0.11
22.00	3.32	1.71	0.11
23.00	3.36	1.75	0.10
24.00	**3.41**	**1.78**	0.09
25.00	3.41	1.78	0.01
26.00	3.41	1.78	0.00
27.00	3.41	1.78	0.00
28.00	3.41	1.78	0.00
29.00	3.41	1.78	0.00
30.00	3.41	1.78	0.00
31.00	3.41	1.78	0.00
32.00	3.41	1.78	0.00
33.00	3.41	1.78	0.00
34.00	3.41	1.78	0.00
35.00	3.41	1.78	0.00
36.00	3.41	1.78	0.00
37.00	3.41	1.78	0.00
38.00	3.41	1.78	0.00
39.00	3.41	1.78	0.00
40.00	3.41	1.78	0.00
41.00	3.41	1.78	0.00
42.00	3.41	1.78	0.00
43.00	3.41	1.78	0.00
44.00	3.41	1.78	0.00
45.00	3.41	1.78	0.00
46.00	3.41	1.78	0.00
47.00	3.41	1.78	0.00
48.00	3.41	1.78	0.00
49.00	3.41	1.78	0.00
50.00	3.41	1.78	0.00
51.00	3.41	1.78	0.00
52.00	3.41	1.78	0.00
53.00	3.41	1.78	0.00
54.00	3.41	1.78	0.00
55.00	3.41	1.78	0.00
56.00	3.41	1.78	0.00
57.00	3.41	1.78	0.00
58.00	3.41	1.78	0.00
59.00	3.41	1.78	0.00
60.00	3.41	1.78	0.00
61.00	3.41	1.78	0.00
62.00	3.41	1.78	0.00
63.00	3.41	1.78	0.00
64.00	3.41	1.78	0.00
65.00	3.41	1.78	0.00
66.00	3.41	1.78	0.00
67.00	3.41	1.78	0.00
68.00	3.41	1.78	0.00
69.00	3.41	1.78	0.00
70.00	3.41	1.78	0.00
71.00	3.41	1.78	0.00
72.00	3.41	1.78	0.00

Summary for Subcatchment 3P: DA-3

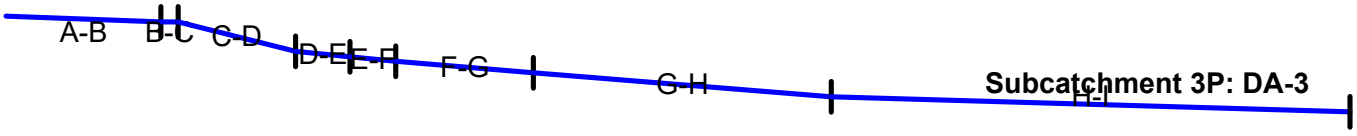
[47] Hint: Peak is 154% of capacity of segment #8

Runoff = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Depth= 2.65"
Routed to Link DP-3 : Design Point - 3

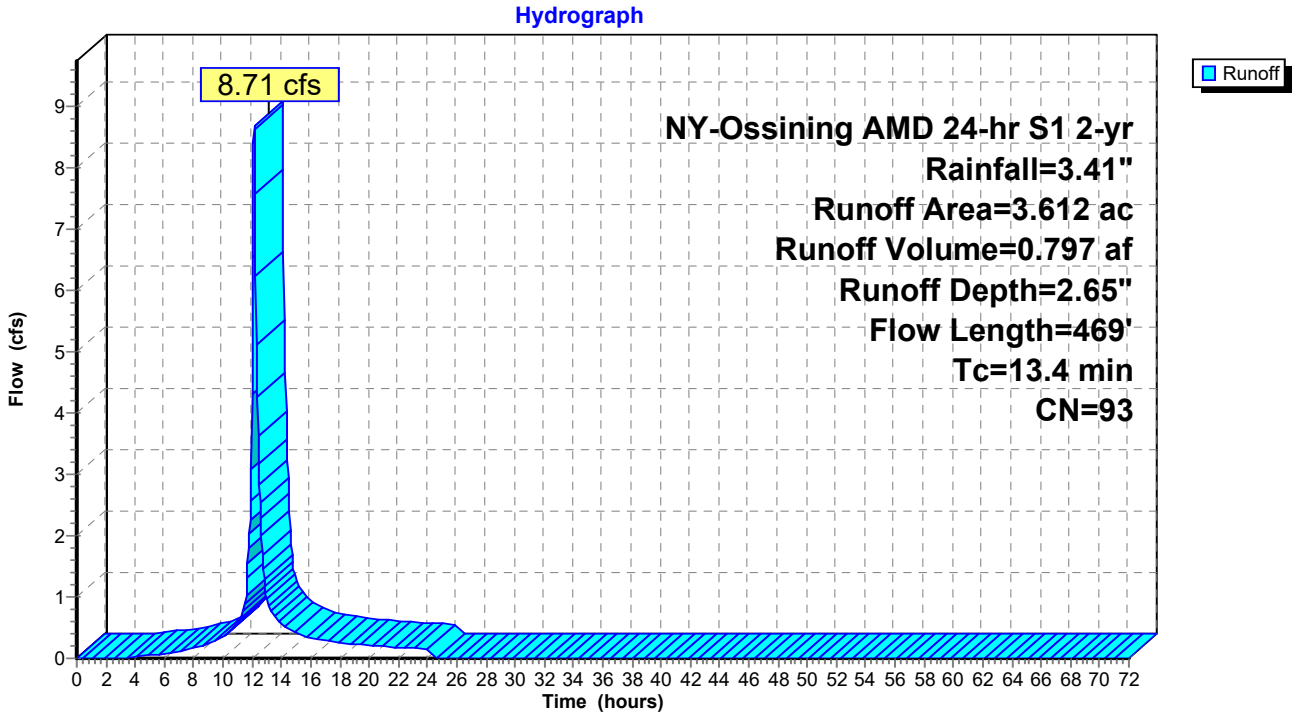
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.02
5.00	0.26	0.01	0.05
6.00	0.33	0.03	0.08
7.00	0.40	0.06	0.12
8.00	0.49	0.11	0.17
9.00	0.59	0.16	0.24
10.00	0.73	0.25	0.34
11.00	0.92	0.39	0.59
12.00	1.87	1.19	**4.33**
13.00	2.50	1.78	**0.98**
14.00	2.69	1.96	0.56
15.00	2.82	2.08	0.41
16.00	2.92	2.18	0.34
17.00	3.01	2.26	0.29
18.00	3.08	2.33	0.25
19.00	3.15	2.40	0.23
20.00	3.21	2.46	0.21
21.00	3.27	2.51	0.19
22.00	3.32	2.56	0.18
23.00	3.36	2.60	0.17
24.00	**3.41**	**2.65**	0.16
25.00	3.41	2.65	0.00
26.00	3.41	2.65	0.00
27.00	3.41	2.65	0.00
28.00	3.41	2.65	0.00
29.00	3.41	2.65	0.00
30.00	3.41	2.65	0.00
31.00	3.41	2.65	0.00
32.00	3.41	2.65	0.00
33.00	3.41	2.65	0.00
34.00	3.41	2.65	0.00
35.00	3.41	2.65	0.00
36.00	3.41	2.65	0.00
37.00	3.41	2.65	0.00
38.00	3.41	2.65	0.00
39.00	3.41	2.65	0.00
40.00	3.41	2.65	0.00
41.00	3.41	2.65	0.00
42.00	3.41	2.65	0.00
43.00	3.41	2.65	0.00
44.00	3.41	2.65	0.00
45.00	3.41	2.65	0.00
46.00	3.41	2.65	0.00
47.00	3.41	2.65	0.00
48.00	3.41	2.65	0.00
49.00	3.41	2.65	0.00
50.00	3.41	2.65	0.00
51.00	3.41	2.65	0.00
52.00	3.41	2.65	0.00
53.00	3.41	2.65	0.00
54.00	3.41	2.65	0.00
55.00	3.41	2.65	0.00
56.00	3.41	2.65	0.00
57.00	3.41	2.65	0.00
58.00	3.41	2.65	0.00
59.00	3.41	2.65	0.00
60.00	3.41	2.65	0.00
61.00	3.41	2.65	0.00
62.00	3.41	2.65	0.00
63.00	3.41	2.65	0.00
64.00	3.41	2.65	0.00
65.00	3.41	2.65	0.00
66.00	3.41	2.65	0.00
67.00	3.41	2.65	0.00
68.00	3.41	2.65	0.00
69.00	3.41	2.65	0.00
70.00	3.41	2.65	0.00
71.00	3.41	2.65	0.00
72.00	3.41	2.65	0.00

Summary for Subcatchment 4AP: DA-4A

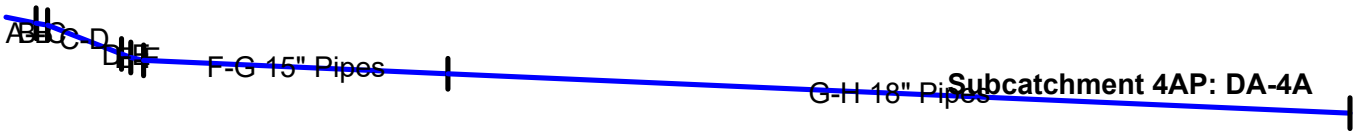
[47] Hint: Peak is 363% of capacity of segment #6
[47] Hint: Peak is 224% of capacity of segment #7

Runoff = 16.60 cfs @ 12.12 hrs, Volume= 1.468 af, Depth= 2.65"
Routed to Pond 19P : DMH-7

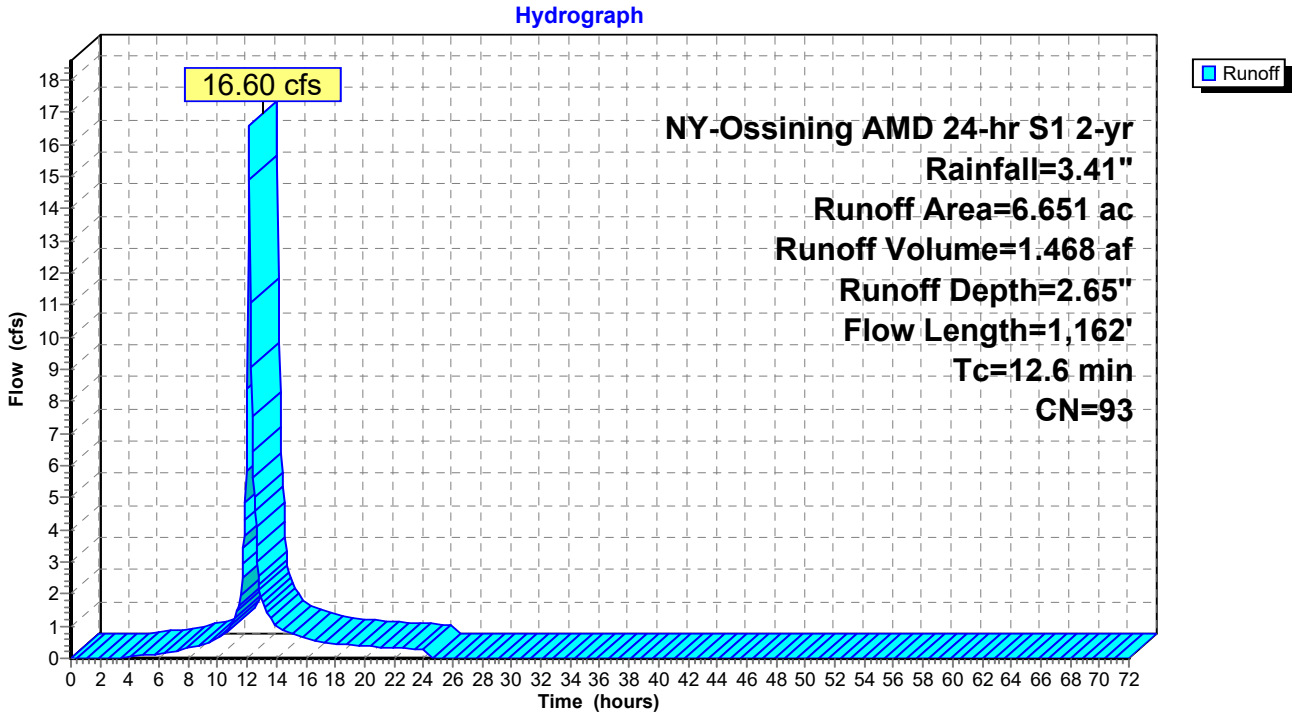
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.04
5.00	0.26	0.01	0.09
6.00	0.33	0.03	0.15
7.00	0.40	0.06	0.22
8.00	0.49	0.11	0.31
9.00	0.59	0.16	0.44
10.00	0.73	0.25	0.64
11.00	0.92	0.39	1.09
12.00	1.87	1.19	**8.42**
13.00	2.50	1.78	**1.78**
14.00	2.69	1.96	1.02
15.00	2.82	2.08	0.76
16.00	2.92	2.18	0.62
17.00	3.01	2.26	0.53
18.00	3.08	2.33	0.46
19.00	3.15	2.40	0.42
20.00	3.21	2.46	0.38
21.00	3.27	2.51	0.35
22.00	3.32	2.56	0.32
23.00	3.36	2.60	0.30
24.00	**3.41**	**2.65**	0.29
25.00	3.41	2.65	0.00
26.00	3.41	2.65	0.00
27.00	3.41	2.65	0.00
28.00	3.41	2.65	0.00
29.00	3.41	2.65	0.00
30.00	3.41	2.65	0.00
31.00	3.41	2.65	0.00
32.00	3.41	2.65	0.00
33.00	3.41	2.65	0.00
34.00	3.41	2.65	0.00
35.00	3.41	2.65	0.00
36.00	3.41	2.65	0.00
37.00	3.41	2.65	0.00
38.00	3.41	2.65	0.00
39.00	3.41	2.65	0.00
40.00	3.41	2.65	0.00
41.00	3.41	2.65	0.00
42.00	3.41	2.65	0.00
43.00	3.41	2.65	0.00
44.00	3.41	2.65	0.00
45.00	3.41	2.65	0.00
46.00	3.41	2.65	0.00
47.00	3.41	2.65	0.00
48.00	3.41	2.65	0.00
49.00	3.41	2.65	0.00
50.00	3.41	2.65	0.00
51.00	3.41	2.65	0.00
52.00	3.41	2.65	0.00
53.00	3.41	2.65	0.00
54.00	3.41	2.65	0.00
55.00	3.41	2.65	0.00
56.00	3.41	2.65	0.00
57.00	3.41	2.65	0.00
58.00	3.41	2.65	0.00
59.00	3.41	2.65	0.00
60.00	3.41	2.65	0.00
61.00	3.41	2.65	0.00
62.00	3.41	2.65	0.00
63.00	3.41	2.65	0.00
64.00	3.41	2.65	0.00
65.00	3.41	2.65	0.00
66.00	3.41	2.65	0.00
67.00	3.41	2.65	0.00
68.00	3.41	2.65	0.00
69.00	3.41	2.65	0.00
70.00	3.41	2.65	0.00
71.00	3.41	2.65	0.00
72.00	3.41	2.65	0.00

Summary for Subcatchment 4BP: DA-4B

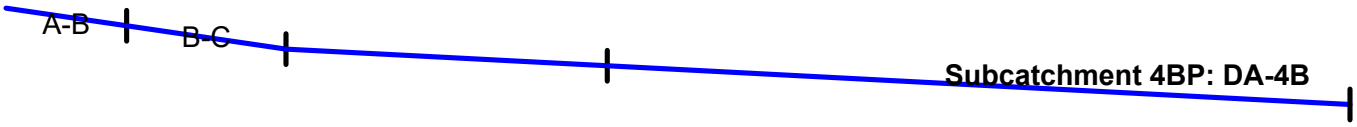
[47] Hint: Peak is 275% of capacity of segment #3

Runoff = 6.94 cfs @ 12.20 hrs, Volume= 0.734 af, Depth= 1.18"
Routed to Pond 19P : DMH-7

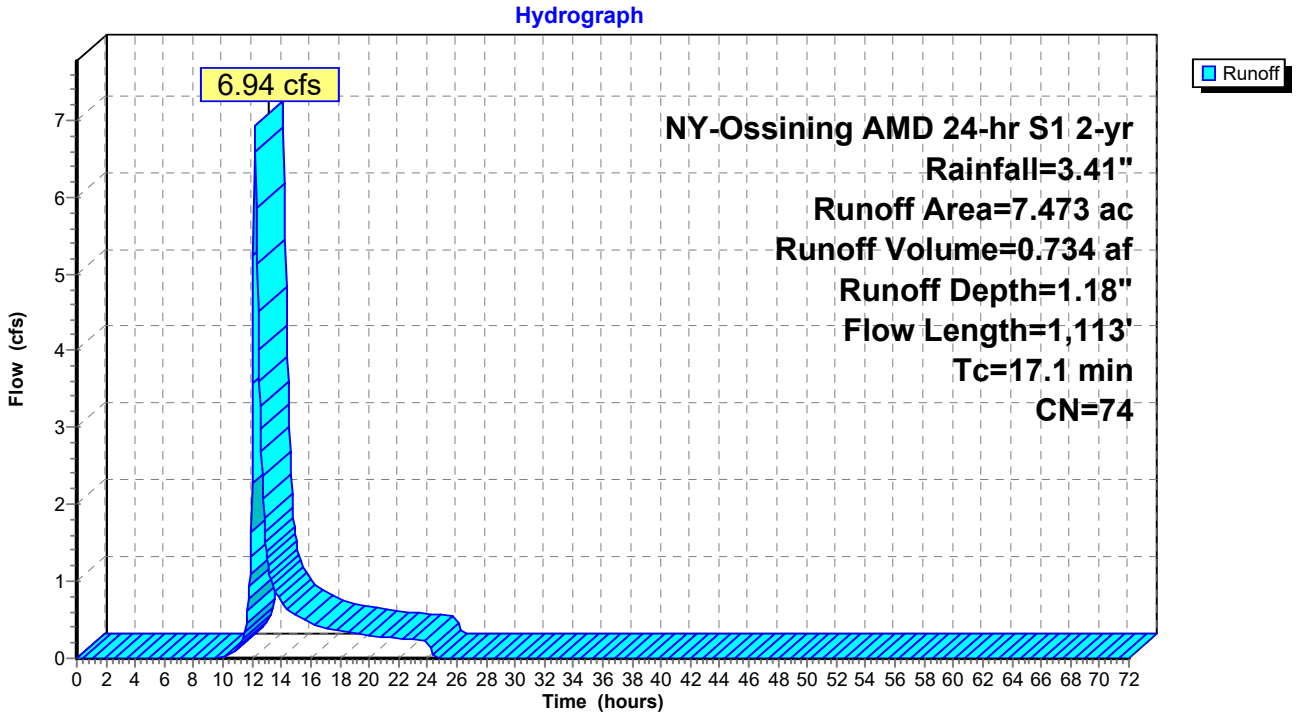
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.00
10.00	0.73	0.00	0.00
11.00	0.92	0.01	0.13
12.00	1.87	0.29	**2.29**
13.00	2.50	0.61	**1.30**
14.00	2.69	0.72	0.73
15.00	2.82	0.80	0.55
16.00	2.92	0.86	0.46
17.00	3.01	0.91	0.40
18.00	3.08	0.96	0.35
19.00	3.15	1.00	0.32
20.00	3.21	1.04	0.29
21.00	3.27	1.08	0.27
22.00	3.32	1.12	0.26
23.00	3.36	1.15	0.24
24.00	**3.41**	**1.18**	0.23
25.00	3.41	1.18	0.00
26.00	3.41	1.18	0.00
27.00	3.41	1.18	0.00
28.00	3.41	1.18	0.00
29.00	3.41	1.18	0.00
30.00	3.41	1.18	0.00
31.00	3.41	1.18	0.00
32.00	3.41	1.18	0.00
33.00	3.41	1.18	0.00
34.00	3.41	1.18	0.00
35.00	3.41	1.18	0.00
36.00	3.41	1.18	0.00
37.00	3.41	1.18	0.00
38.00	3.41	1.18	0.00
39.00	3.41	1.18	0.00
40.00	3.41	1.18	0.00
41.00	3.41	1.18	0.00
42.00	3.41	1.18	0.00
43.00	3.41	1.18	0.00
44.00	3.41	1.18	0.00
45.00	3.41	1.18	0.00
46.00	3.41	1.18	0.00
47.00	3.41	1.18	0.00
48.00	3.41	1.18	0.00
49.00	3.41	1.18	0.00
50.00	3.41	1.18	0.00
51.00	3.41	1.18	0.00
52.00	3.41	1.18	0.00
53.00	3.41	1.18	0.00
54.00	3.41	1.18	0.00
55.00	3.41	1.18	0.00
56.00	3.41	1.18	0.00
57.00	3.41	1.18	0.00
58.00	3.41	1.18	0.00
59.00	3.41	1.18	0.00
60.00	3.41	1.18	0.00
61.00	3.41	1.18	0.00
62.00	3.41	1.18	0.00
63.00	3.41	1.18	0.00
64.00	3.41	1.18	0.00
65.00	3.41	1.18	0.00
66.00	3.41	1.18	0.00
67.00	3.41	1.18	0.00
68.00	3.41	1.18	0.00
69.00	3.41	1.18	0.00
70.00	3.41	1.18	0.00
71.00	3.41	1.18	0.00
72.00	3.41	1.18	0.00

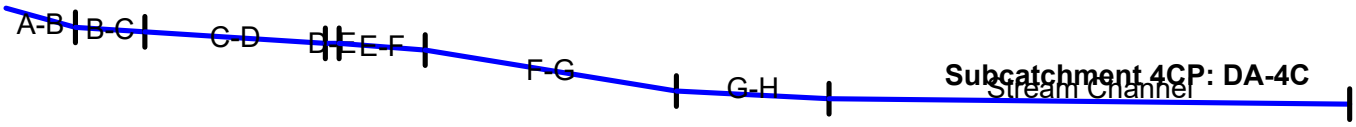
Summary for Subcatchment 4CP: DA-4C

Runoff = 8.51 cfs @ 12.14 hrs, Volume= 0.815 af, Depth= 1.01"
Routed to Link DP-4 : DP-4

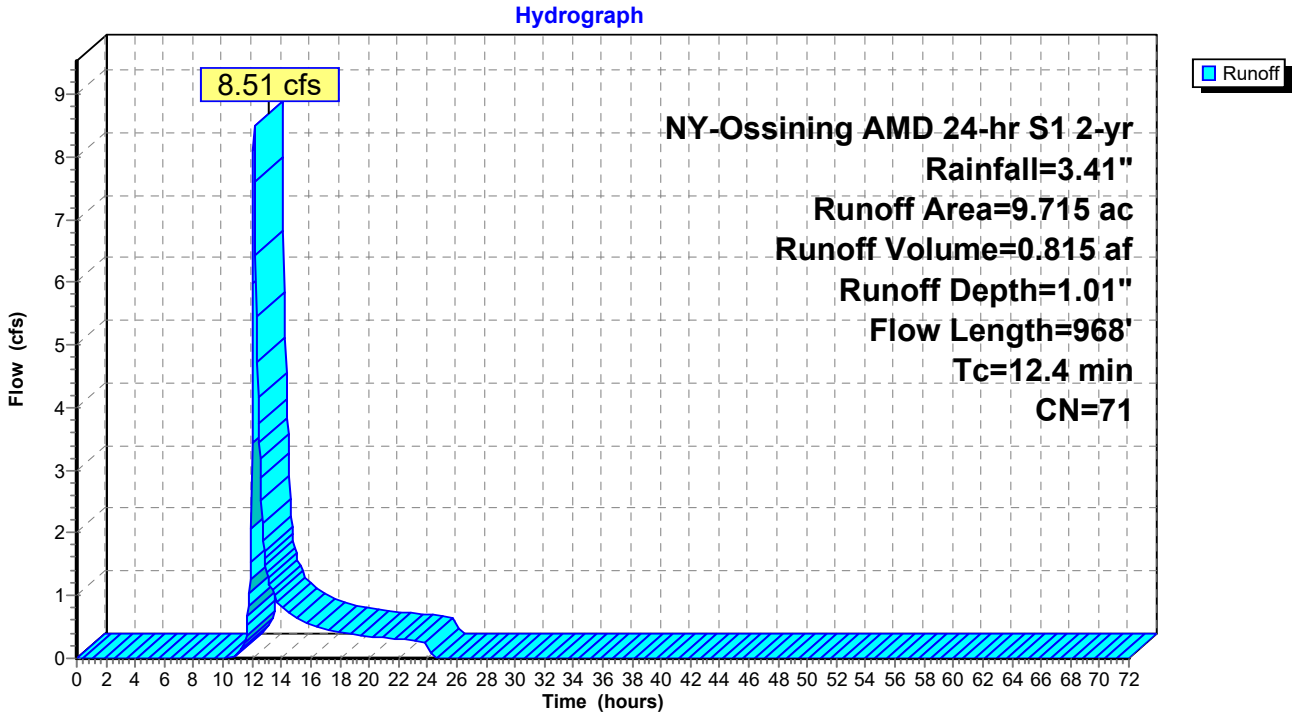
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.00
4.00	0.20	0.00	0.00
5.00	0.26	0.00	0.00
6.00	0.33	0.00	0.00
7.00	0.40	0.00	0.00
8.00	0.49	0.00	0.00
9.00	0.59	0.00	0.00
10.00	0.73	0.00	0.00
11.00	0.92	0.00	0.06
12.00	1.87	0.22	**3.44**
13.00	2.50	0.49	**1.35**
14.00	2.69	0.59	0.83
15.00	2.82	0.66	0.64
16.00	2.92	0.72	0.53
17.00	3.01	0.76	0.46
18.00	3.08	0.81	0.41
19.00	3.15	0.85	0.38
20.00	3.21	0.88	0.35
21.00	3.27	0.92	0.32
22.00	3.32	0.95	0.30
23.00	3.36	0.98	0.29
24.00	**3.41**	**1.01**	0.27
25.00	3.41	1.01	0.00
26.00	3.41	1.01	0.00
27.00	3.41	1.01	0.00
28.00	3.41	1.01	0.00
29.00	3.41	1.01	0.00
30.00	3.41	1.01	0.00
31.00	3.41	1.01	0.00
32.00	3.41	1.01	0.00
33.00	3.41	1.01	0.00
34.00	3.41	1.01	0.00
35.00	3.41	1.01	0.00
36.00	3.41	1.01	0.00
37.00	3.41	1.01	0.00
38.00	3.41	1.01	0.00
39.00	3.41	1.01	0.00
40.00	3.41	1.01	0.00
41.00	3.41	1.01	0.00
42.00	3.41	1.01	0.00
43.00	3.41	1.01	0.00
44.00	3.41	1.01	0.00
45.00	3.41	1.01	0.00
46.00	3.41	1.01	0.00
47.00	3.41	1.01	0.00
48.00	3.41	1.01	0.00
49.00	3.41	1.01	0.00
50.00	3.41	1.01	0.00
51.00	3.41	1.01	0.00
52.00	3.41	1.01	0.00
53.00	3.41	1.01	0.00
54.00	3.41	1.01	0.00
55.00	3.41	1.01	0.00
56.00	3.41	1.01	0.00
57.00	3.41	1.01	0.00
58.00	3.41	1.01	0.00
59.00	3.41	1.01	0.00
60.00	3.41	1.01	0.00
61.00	3.41	1.01	0.00
62.00	3.41	1.01	0.00
63.00	3.41	1.01	0.00
64.00	3.41	1.01	0.00
65.00	3.41	1.01	0.00
66.00	3.41	1.01	0.00
67.00	3.41	1.01	0.00
68.00	3.41	1.01	0.00
69.00	3.41	1.01	0.00
70.00	3.41	1.01	0.00
71.00	3.41	1.01	0.00
72.00	3.41	1.01	0.00

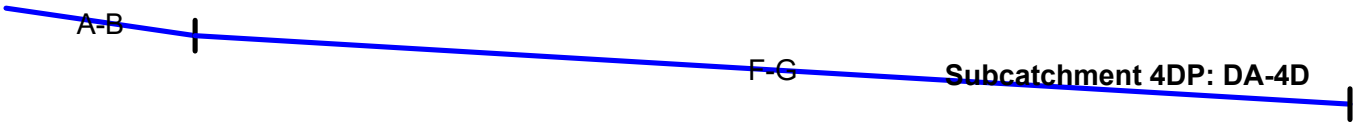
Summary for Subcatchment 4DP: DA-4D

Runoff = 4.67 cfs @ 12.04 hrs, Volume= 0.324 af, Depth= 2.85"
Routed to Pond 6P : Infiltrators

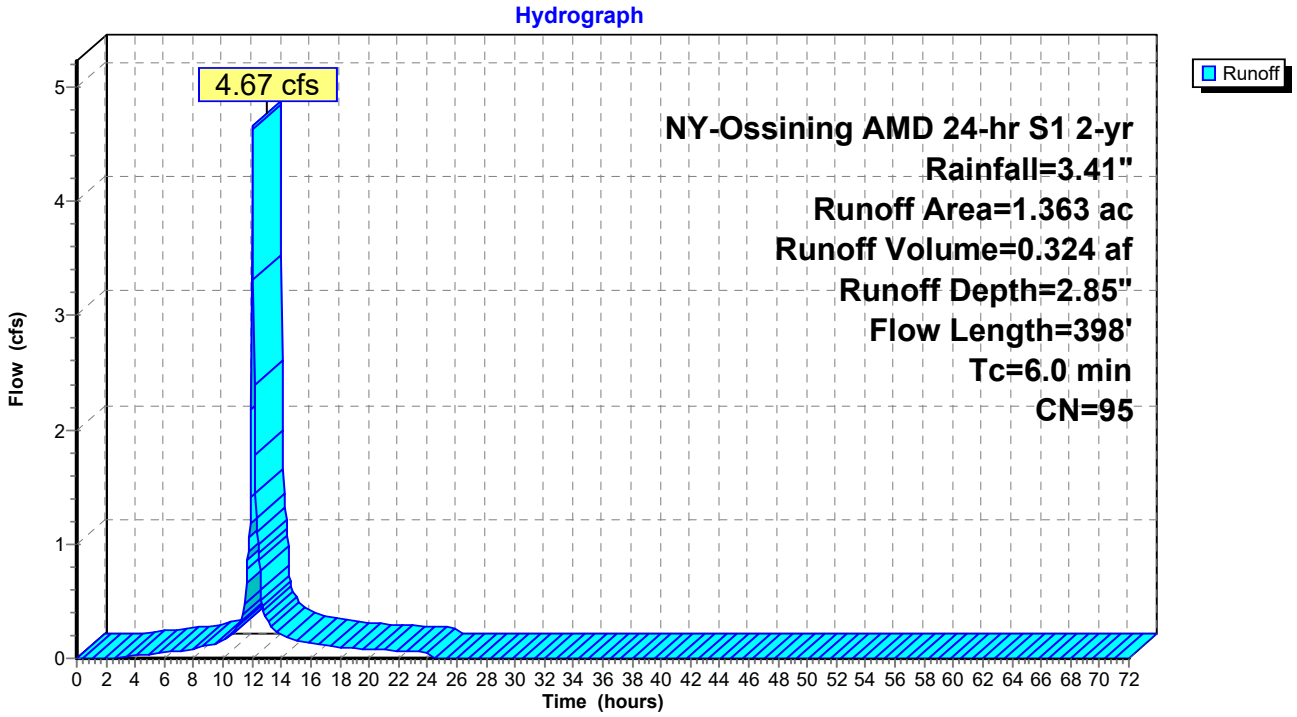
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 2-yr Rainfall=3.41"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.05	0.00	0.00
2.00	0.09	0.00	0.00
3.00	0.14	0.00	0.01
4.00	0.20	0.01	0.02
5.00	0.26	0.04	0.03
6.00	0.33	0.07	0.05
7.00	0.40	0.11	0.06
8.00	0.49	0.16	0.08
9.00	0.59	0.24	0.11
10.00	0.73	0.34	0.16
11.00	0.92	0.49	0.27
12.00	1.87	1.36	**4.09**
13.00	2.50	1.97	**0.34**
14.00	2.69	2.15	0.21
15.00	2.82	2.27	0.16
16.00	2.92	2.37	0.13
17.00	3.01	2.46	0.11
18.00	3.08	2.53	0.10
19.00	3.15	2.60	0.09
20.00	3.21	2.65	0.08
21.00	3.27	2.71	0.07
22.00	3.32	2.76	0.07
23.00	3.36	2.81	0.06
24.00	**3.41**	**2.85**	0.06
25.00	3.41	2.85	0.00
26.00	3.41	2.85	0.00
27.00	3.41	2.85	0.00
28.00	3.41	2.85	0.00
29.00	3.41	2.85	0.00
30.00	3.41	2.85	0.00
31.00	3.41	2.85	0.00
32.00	3.41	2.85	0.00
33.00	3.41	2.85	0.00
34.00	3.41	2.85	0.00
35.00	3.41	2.85	0.00
36.00	3.41	2.85	0.00
37.00	3.41	2.85	0.00
38.00	3.41	2.85	0.00
39.00	3.41	2.85	0.00
40.00	3.41	2.85	0.00
41.00	3.41	2.85	0.00
42.00	3.41	2.85	0.00
43.00	3.41	2.85	0.00
44.00	3.41	2.85	0.00
45.00	3.41	2.85	0.00
46.00	3.41	2.85	0.00
47.00	3.41	2.85	0.00
48.00	3.41	2.85	0.00
49.00	3.41	2.85	0.00
50.00	3.41	2.85	0.00
51.00	3.41	2.85	0.00
52.00	3.41	2.85	0.00
53.00	3.41	2.85	0.00
54.00	3.41	2.85	0.00
55.00	3.41	2.85	0.00
56.00	3.41	2.85	0.00
57.00	3.41	2.85	0.00
58.00	3.41	2.85	0.00
59.00	3.41	2.85	0.00
60.00	3.41	2.85	0.00
61.00	3.41	2.85	0.00
62.00	3.41	2.85	0.00
63.00	3.41	2.85	0.00
64.00	3.41	2.85	0.00
65.00	3.41	2.85	0.00
66.00	3.41	2.85	0.00
67.00	3.41	2.85	0.00
68.00	3.41	2.85	0.00
69.00	3.41	2.85	0.00
70.00	3.41	2.85	0.00
71.00	3.41	2.85	0.00
72.00	3.41	2.85	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 2.85" for 2-yr event
Inflow = 4.67 cfs @ 12.04 hrs, Volume= 0.324 af
Outflow = 0.96 cfs @ 12.43 hrs, Volume= 0.324 af, Atten= 79%, Lag= 23.2 min
Discarded = 0.07 cfs @ 8.85 hrs, Volume= 0.134 af
Primary = 0.89 cfs @ 12.43 hrs, Volume= 0.190 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.06' @ 12.43 hrs Surf.Area= 0.132 ac Storage= 0.114 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 120.0 min (905.0 - 785.0)

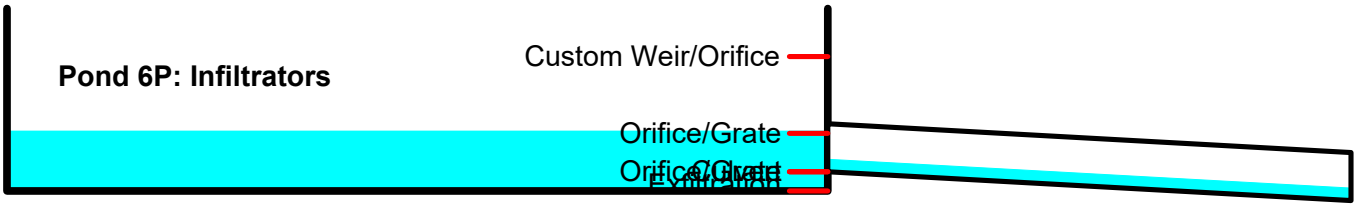
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 8.85 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.89 cfs @ 12.43 hrs HW=348.06' TW=335.71' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.89 cfs of 3.06 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.85 cfs @ 4.32 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.76 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

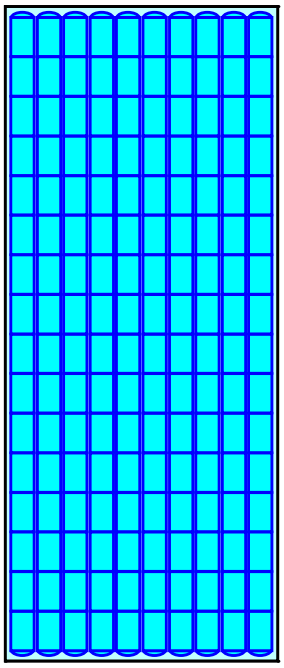
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

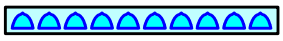
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

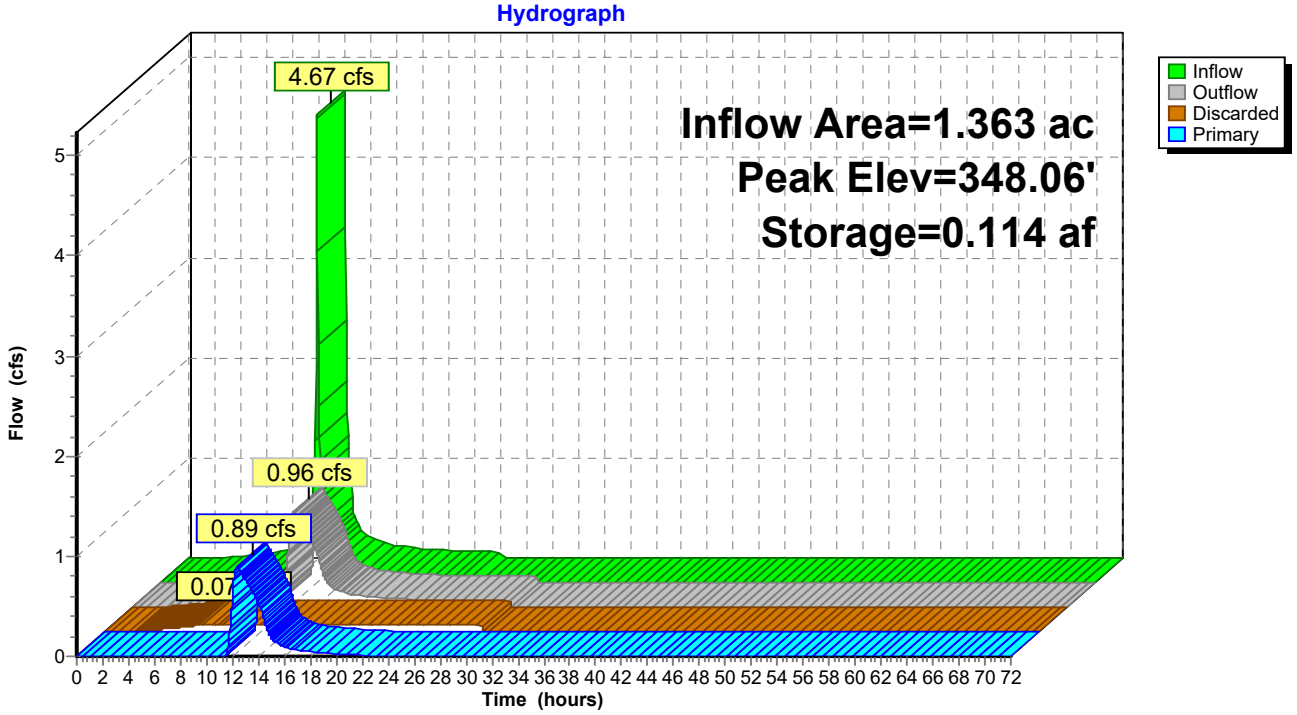
160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08





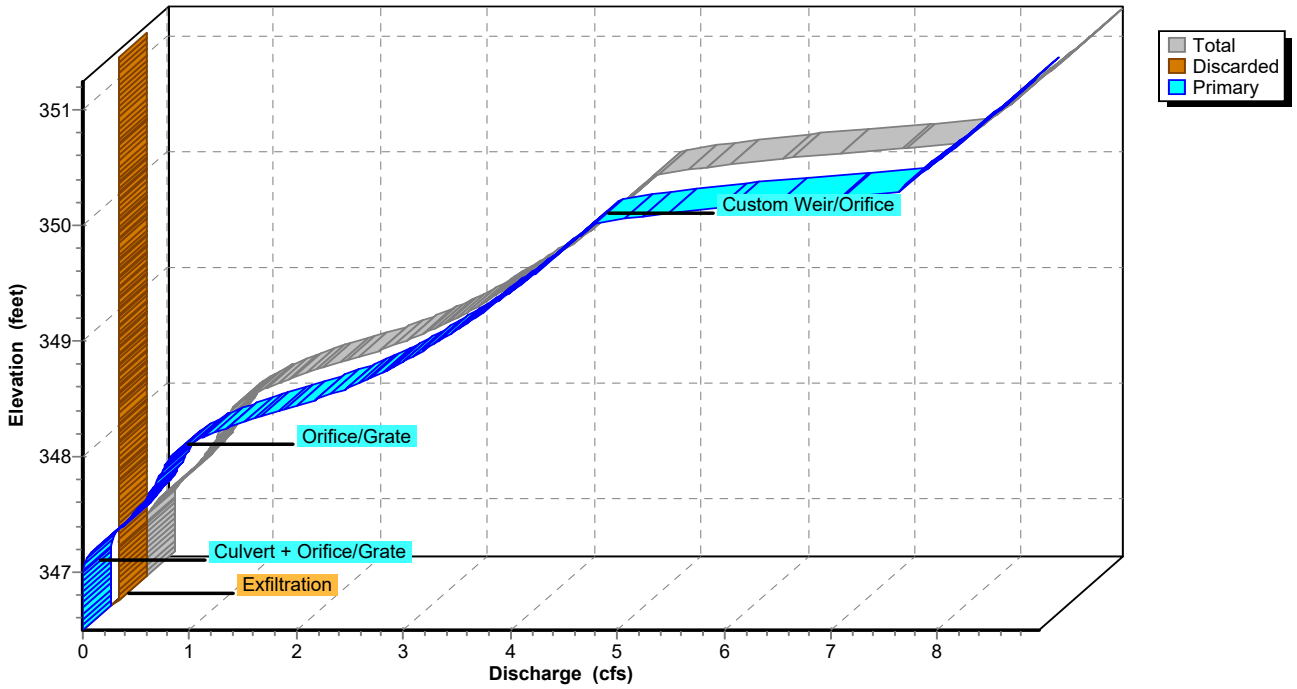
Pond 6P: Infiltrators

Hydrograph

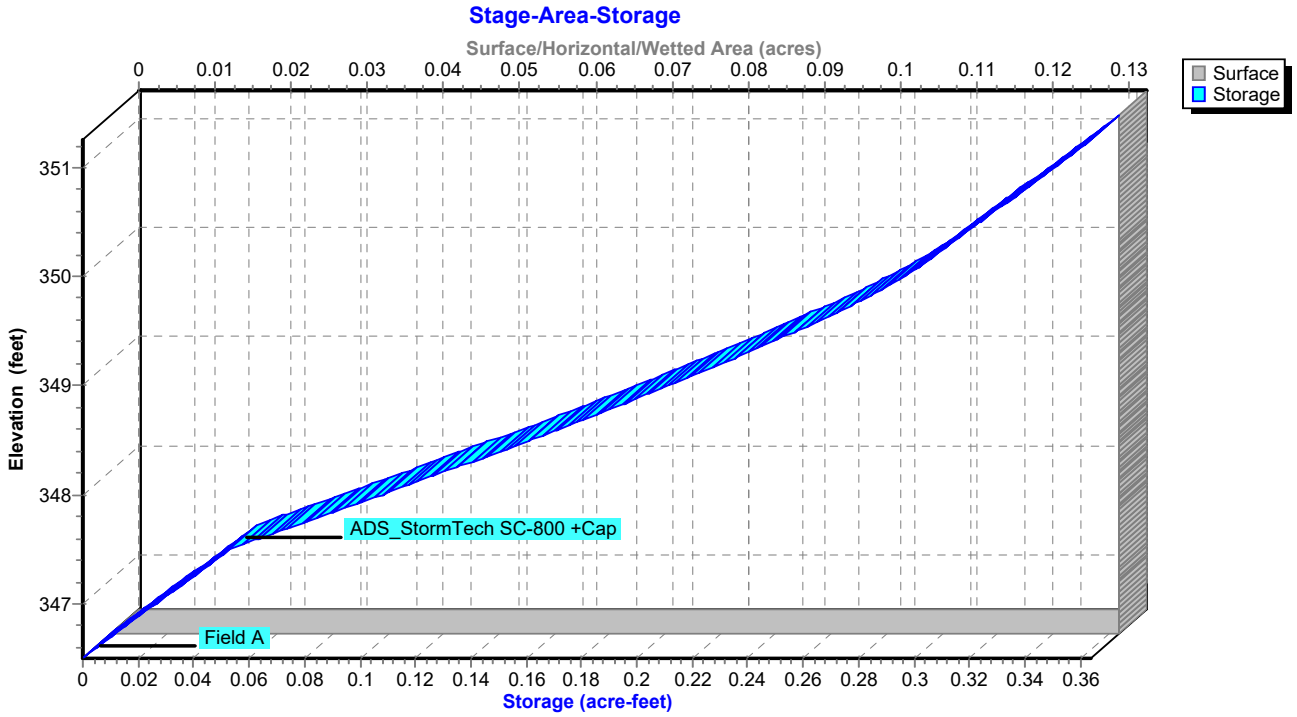


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.03	0.000	346.50	0.03	0.03	0.00
7.50	0.07	0.000	346.50	0.07	**0.07**	0.00
10.00	**0.16**	**0.009**	**346.66**	**0.07**	**0.07**	**0.00**
12.50	**0.86**	**0.114**	**348.05**	**0.95**	0.07	**0.89**
15.00	0.16	0.040	347.26	0.25	0.07	0.18
17.50	0.10	0.033	347.13	0.12	0.07	0.05
20.00	0.08	0.031	347.08	0.09	0.07	0.02
22.50	0.07	0.029	347.05	0.07	0.07	0.01
25.00	0.00	0.023	346.93	0.07	0.07	0.00
27.50	0.00	0.009	346.67	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

Inflow = 5.46 cfs @ 12.14 hrs, Volume= 0.219 af
Outflow = 2.79 cfs @ 12.35 hrs, Volume= 0.220 af, Atten= 49%, Lag= 12.5 min
Primary = 2.79 cfs @ 12.35 hrs, Volume= 0.220 af
Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.80' @ 12.35 hrs Surf.Area= 0.347 ac Storage= 0.076 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.4 min (756.4 - 740.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.78 cfs @ 12.35 hrs HW=332.80' TW=332.03' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.78 cfs @ 3.31 fps)
↑—**2=Orifice/Grate** (Passes 2.78 cfs of 4.00 cfs potential flow)

Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

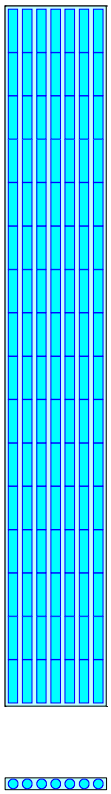
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

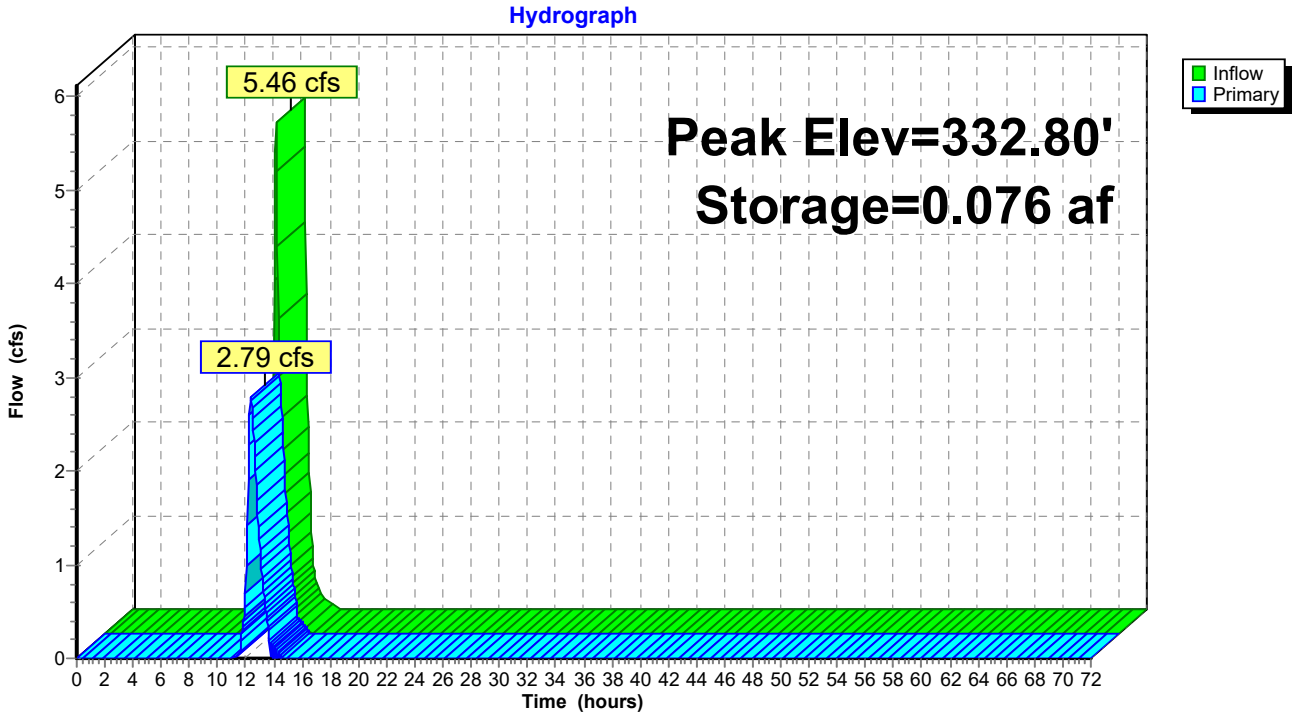
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

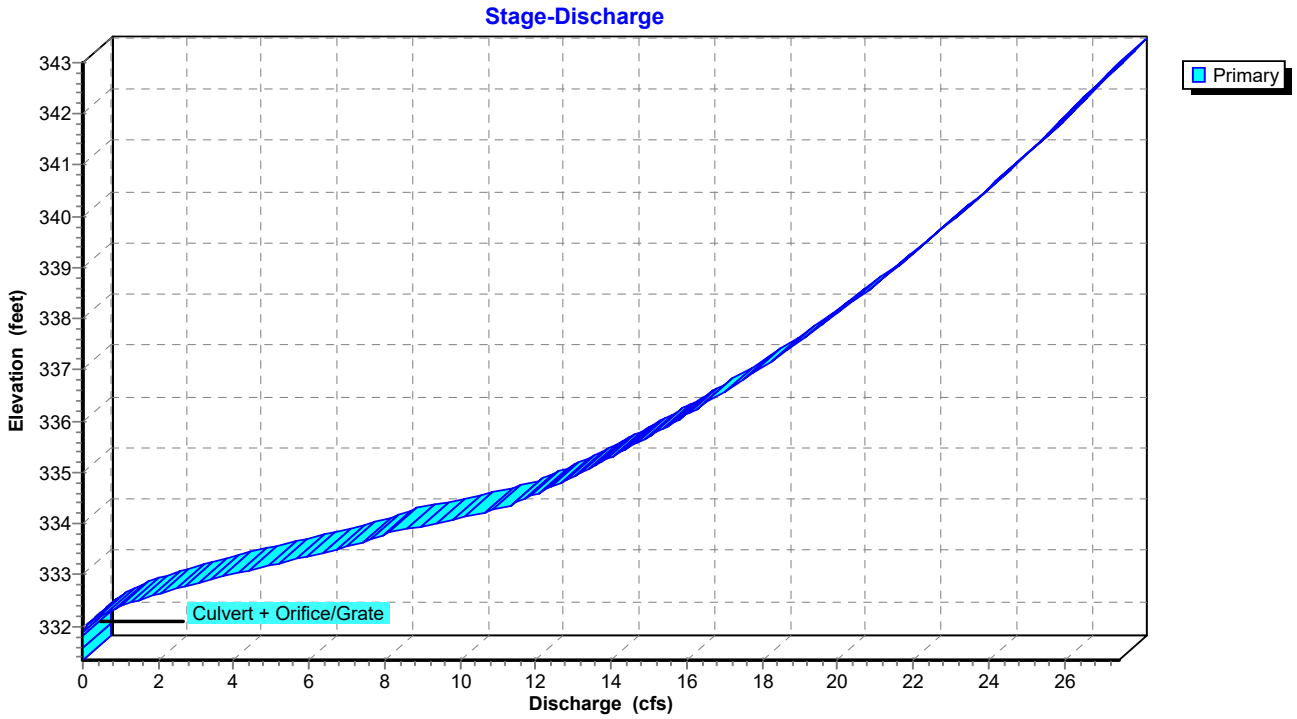
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



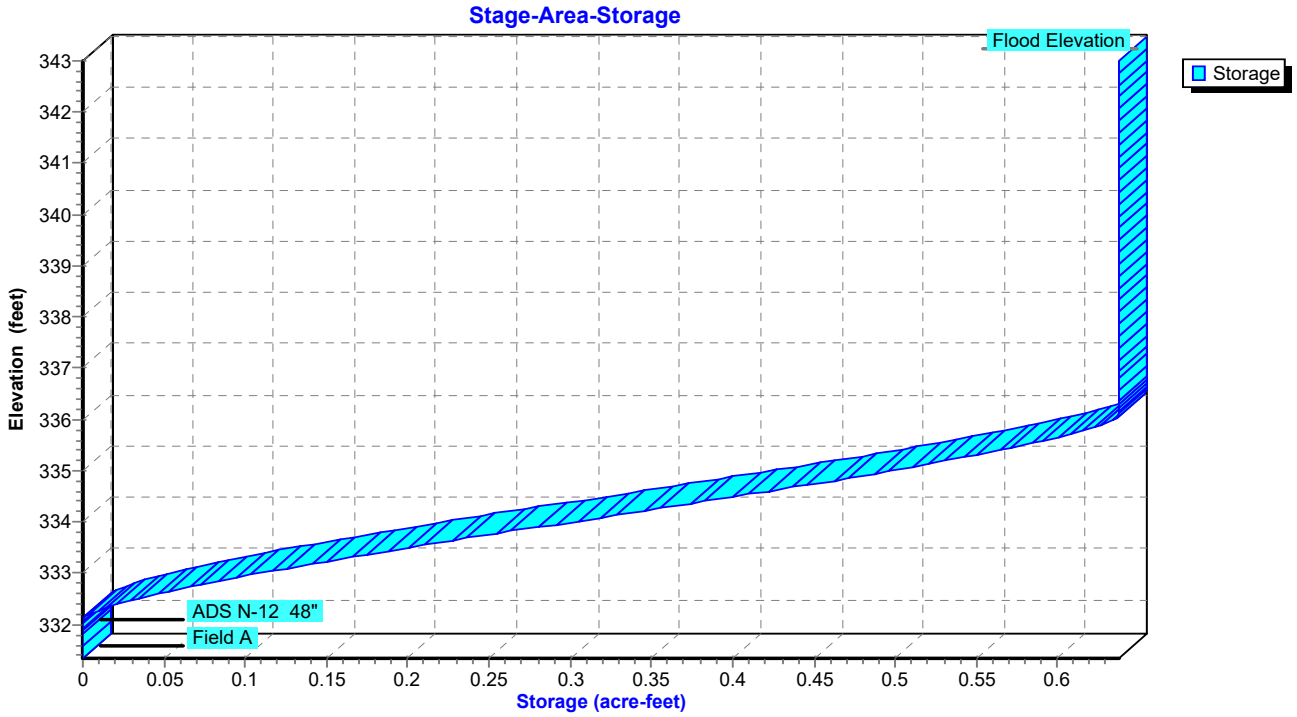
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.84	0.00
7.50	0.00	0.000	331.84	0.00
10.00	**0.00**	**0.000**	**331.84**	**0.00**
12.50	**1.67**	**0.069**	**332.76**	**2.56**
15.00	0.00	0.000	331.87	0.00
17.50	0.00	0.000	331.84	0.00
20.00	0.00	0.000	331.84	0.00
22.50	0.00	0.000	331.84	0.00
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Outflow = 0.79 cfs @ 18.68 hrs, Volume= 2.374 af, Atten= 96%, Lag= 391.7 min
Primary = 0.79 cfs @ 18.68 hrs, Volume= 2.374 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 290.23' @ 18.68 hrs Surf.Area= 50,569 sf Storage= 70,302 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 1,063.5 min calculated for 2.372 af (99% of inflow)
Center-of-Mass det. time= 1,060.2 min (1,894.5 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

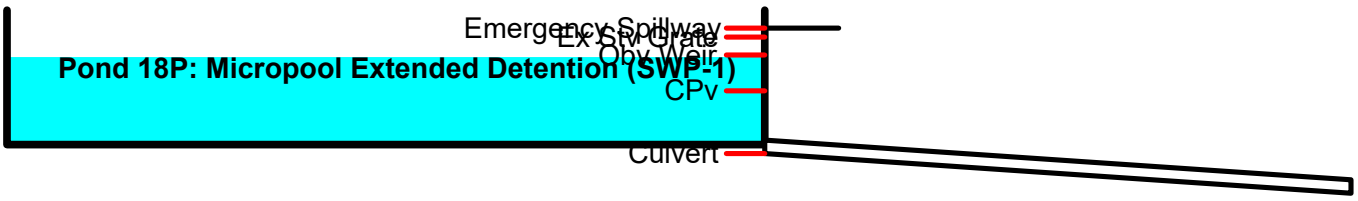
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

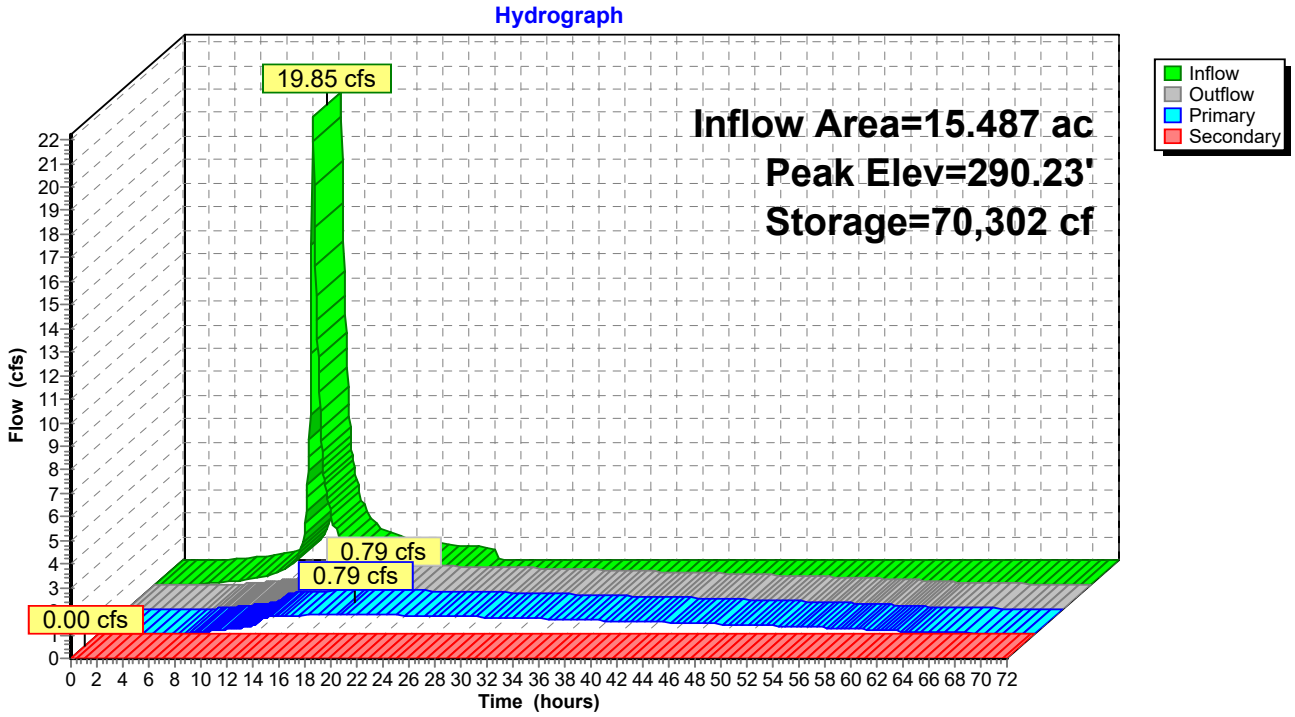
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.79 cfs @ 18.68 hrs HW=290.23' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.79 cfs of 26.88 cfs potential flow)
  ├─**2=CPv** (Orifice Controls 0.79 cfs @ 9.09 fps)
  ├─**3=Obv Weir** (Controls 0.00 cfs)
  └─**4=Ex Stv Grate** (Controls 0.00 cfs)

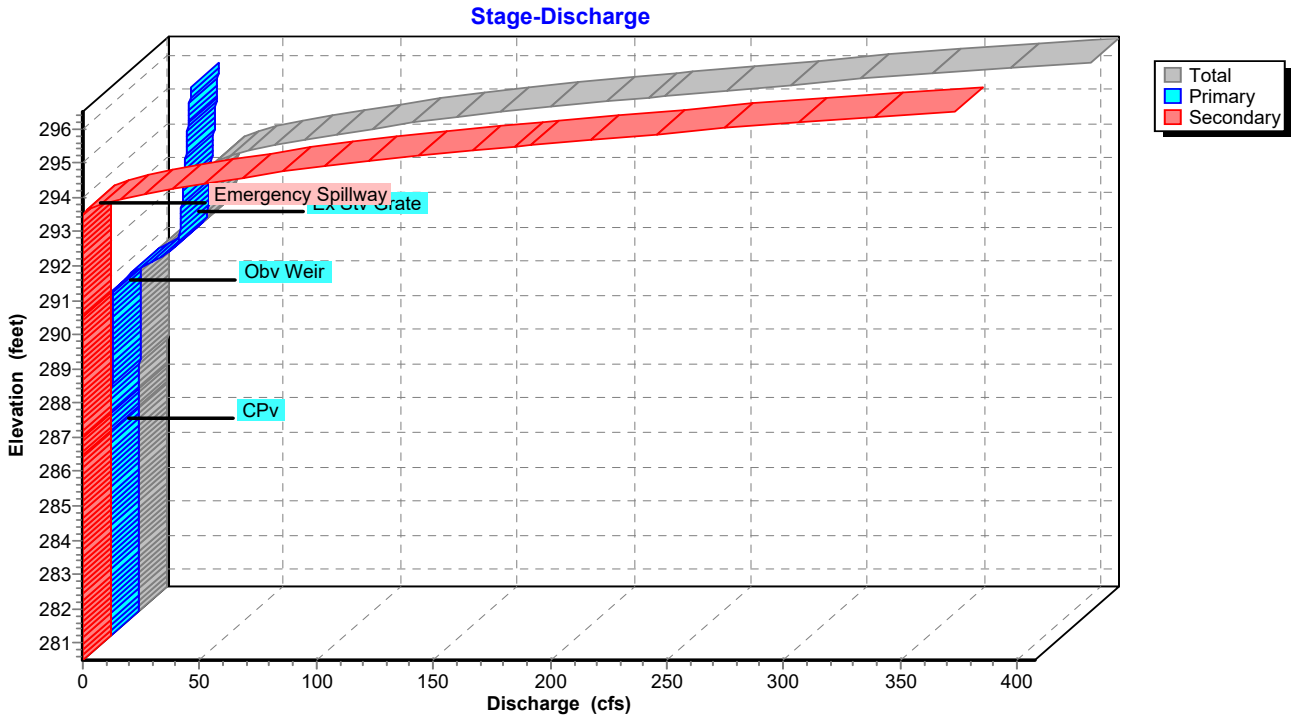
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



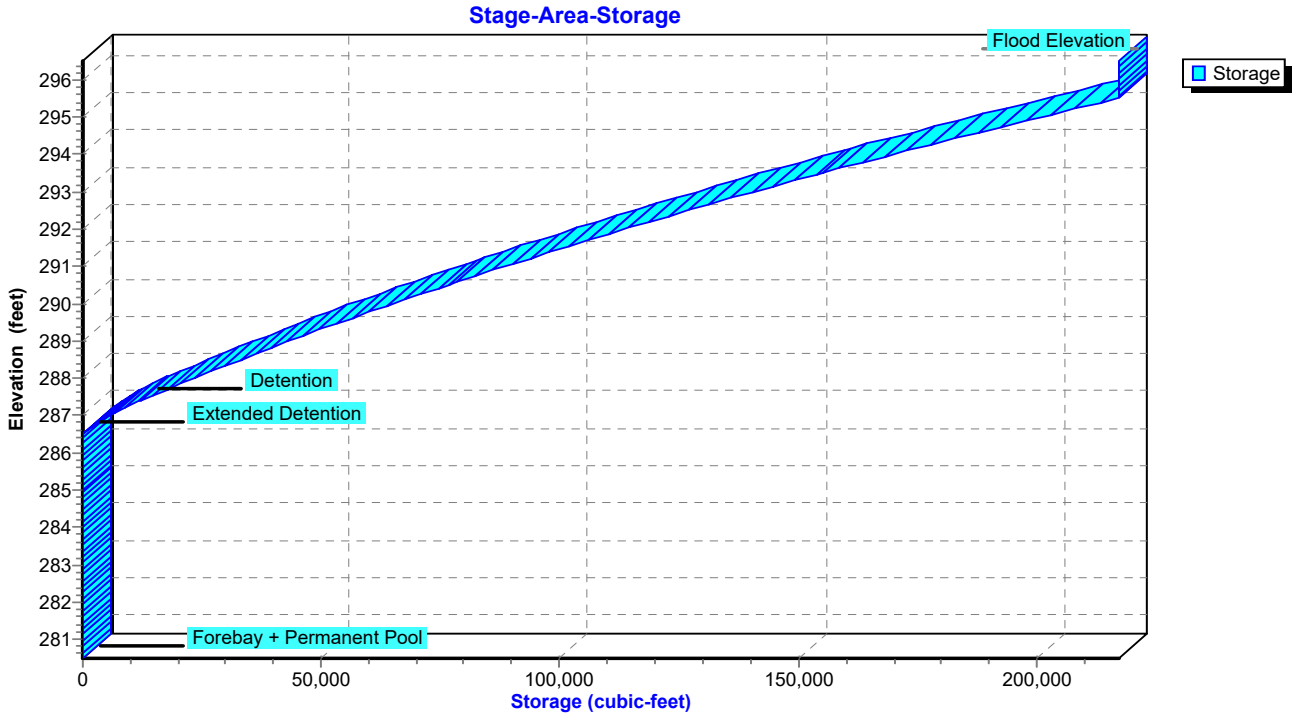
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.00	0	286.50	0.00	0.00	0.00
5.00	0.09	275	286.53	0.00	0.00	0.00
7.50	0.26	1,622	286.66	0.06	0.06	0.00
10.00	**0.64**	4,220	286.89	0.20	0.20	0.00
12.50	**10.42**	42,611	288.96	0.64	0.64	0.00
15.00	1.50	66,856	290.08	0.78	0.78	0.00
17.50	0.92	**70,055**	**290.22**	**0.79**	**0.79**	0.00
20.00	0.69	**70,058**	**290.22**	**0.79**	**0.79**	0.00
22.50	0.57	68,599	290.15	0.78	0.78	0.00
25.00	0.00	64,935	289.99	0.77	0.77	0.00
27.50	0.00	58,198	289.69	0.73	0.73	0.00
30.00	0.00	51,785	289.40	0.69	0.69	0.00
32.50	0.00	45,704	289.11	0.66	0.66	0.00
35.00	0.00	39,962	288.84	0.62	0.62	0.00
37.50	0.00	34,566	288.57	0.58	0.58	0.00
40.00	0.00	29,525	288.32	0.54	0.54	0.00
42.50	0.00	24,846	288.08	0.50	0.50	0.00
45.00	0.00	20,535	287.86	0.46	0.46	0.00
47.50	0.00	16,600	287.65	0.42	0.42	0.00
50.00	0.00	13,048	287.46	0.37	0.37	0.00
52.50	0.00	9,886	287.28	0.33	0.33	0.00
55.00	0.00	7,151	287.10	0.28	0.28	0.00
57.50	0.00	4,902	286.94	0.22	0.22	0.00
60.00	0.00	3,200	286.80	0.16	0.16	0.00
62.50	0.00	2,109	286.71	0.09	0.09	0.00
65.00	0.00	1,495	286.65	0.05	0.05	0.00
67.50	0.00	1,133	286.62	0.03	0.03	0.00
70.00	0.00	901	286.59	0.02	0.02	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

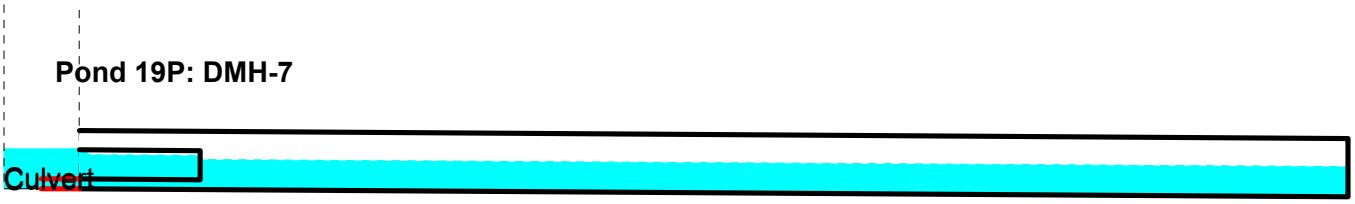
Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 23.43 cfs @ 12.14 hrs, Volume= 2.391 af
Outflow = 23.43 cfs @ 12.14 hrs, Volume= 2.391 af, Atten= 0%, Lag= 0.0 min
Primary = 17.96 cfs @ 12.14 hrs, Volume= 2.172 af
Routed to Pond 20P : DMH-8
Secondary = 5.46 cfs @ 12.14 hrs, Volume= 0.219 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 336.40' @ 12.14 hrs
Flood Elev= 343.83'

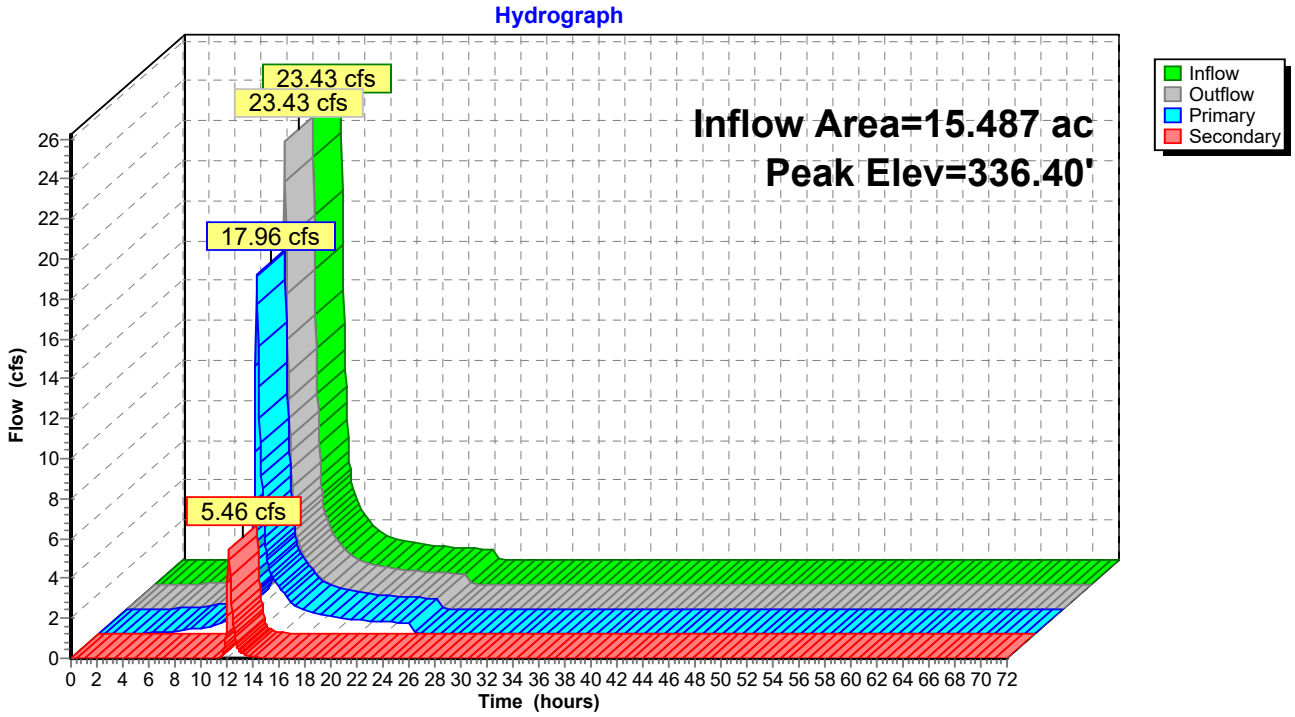
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=17.83 cfs @ 12.14 hrs HW=336.39' TW=332.45' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 17.83 cfs @ 4.90 fps)

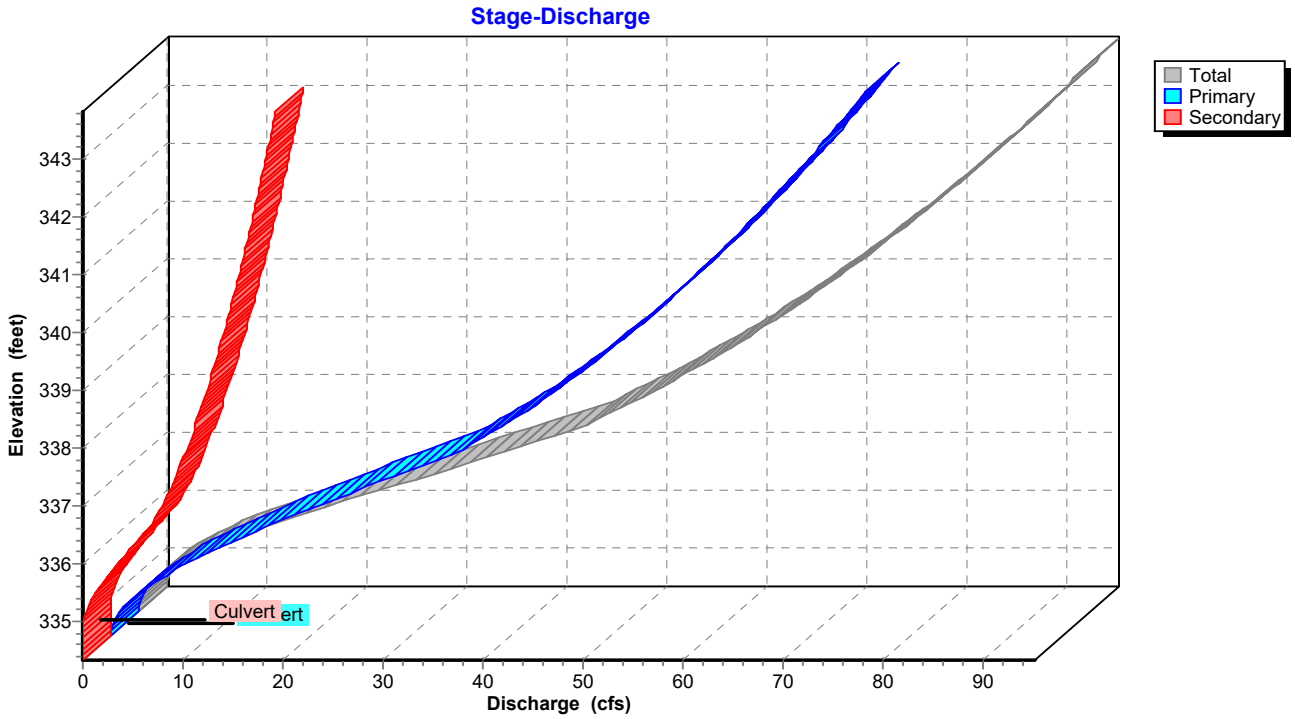
Secondary OutFlow Max=5.42 cfs @ 12.14 hrs HW=336.39' TW=332.60' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 5.42 cfs @ 3.69 fps)



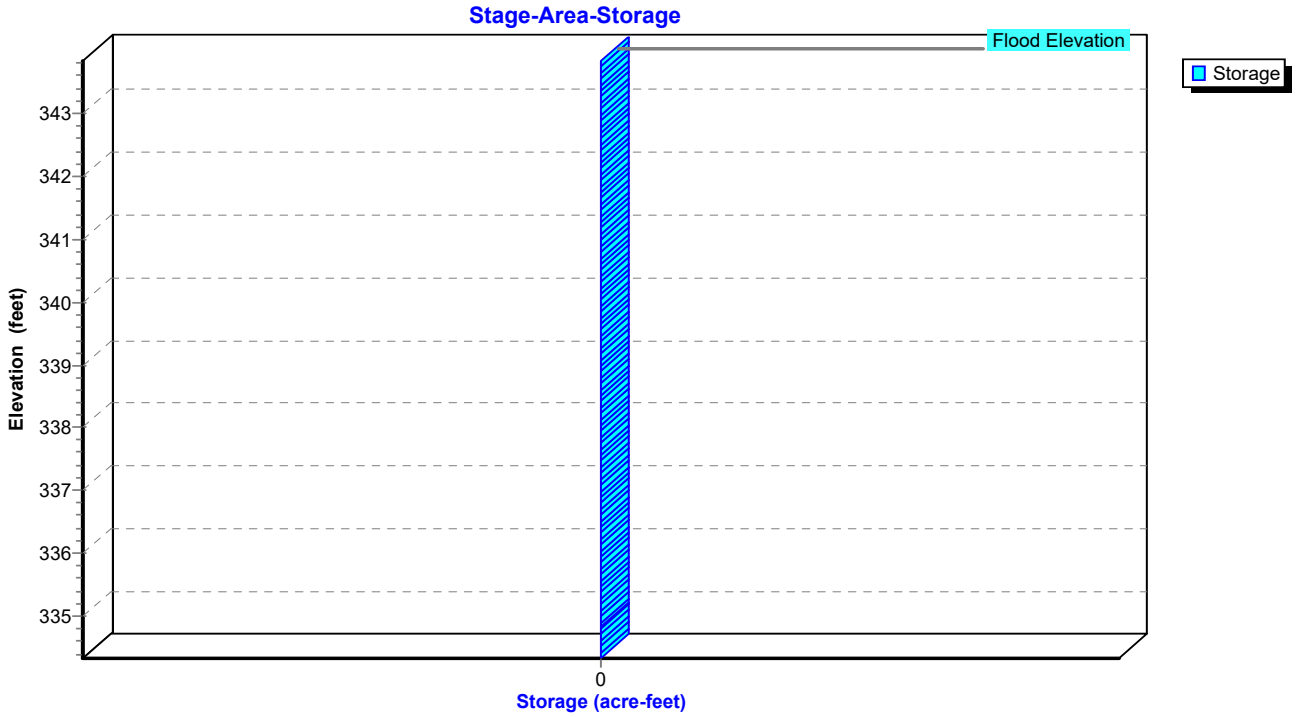
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.00	334.34	0.00	0.00	0.00
5.00	0.09	334.47	0.09	0.09	0.00
7.50	0.26	334.56	0.26	0.26	0.00
10.00	**0.64**	**334.68**	**0.64**	**0.64**	**0.00**
12.50	**9.53**	**335.61**	**9.53**	**7.85**	**1.67**
15.00	1.50	334.86	1.50	1.50	0.00
17.50	0.92	334.75	0.92	0.92	0.00
20.00	0.69	334.69	0.69	0.69	0.00
22.50	0.57	334.66	0.57	0.57	0.00
25.00	0.00	334.34	0.00	0.00	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.44	0.05	0.05	0.00
334.54	0.22	0.22	0.00
334.64	0.50	0.50	0.00
334.74	0.89	0.89	0.00
334.84	1.38	1.38	0.00
334.94	2.00	1.97	0.03
335.04	2.77	2.64	0.13
335.14	3.68	3.39	0.29
335.24	4.72	4.22	0.50
335.34	5.88	5.12	0.76
335.44	7.15	6.09	1.07
335.54	8.53	7.12	1.41
335.64	10.00	8.21	1.80
335.74	11.57	9.35	2.22
335.84	13.21	10.54	2.67
335.94	14.93	11.79	3.14
336.04	16.72	13.08	3.64
336.14	18.55	14.41	4.15
336.24	20.44	15.77	4.66
336.34	22.35	17.17	5.18
336.44	24.29	18.60	5.69
336.54	26.23	20.06	6.17
336.64	28.16	21.53	6.63
336.74	30.05	23.02	7.02
336.84	31.81	24.53	7.28
336.94	33.84	26.04	7.80
337.04	35.64	27.55	8.09
337.14	37.42	29.06	8.36
337.24	39.18	30.55	8.63
337.34	40.92	32.03	8.89
337.44	42.62	33.49	9.14
337.54	44.29	34.91	9.38
337.64	45.67	36.05	9.62
337.74	46.89	37.04	9.85
337.84	48.08	38.00	10.08
337.94	49.24	38.94	10.30
338.04	50.37	39.85	10.51
338.14	51.48	40.75	10.73
338.24	52.56	41.63	10.94
338.34	53.62	42.48	11.14
338.44	54.67	43.33	11.34
338.54	55.69	44.15	11.54
338.64	56.69	44.96	11.73
338.74	57.68	45.76	11.92
338.84	58.65	46.54	12.11
338.94	59.60	47.31	12.29
339.04	60.54	48.07	12.48
339.14	61.47	48.81	12.66
339.24	62.38	49.55	12.83
339.34	63.28	50.27	13.01
339.44	64.16	50.98	13.18
339.54	65.04	51.69	13.35
339.64	65.90	52.38	13.52
339.74	66.75	53.06	13.68
339.84	67.59	53.74	13.85
339.94	68.42	54.41	14.01
340.04	69.24	55.07	14.17
340.14	70.05	55.72	14.33
340.24	70.85	56.36	14.49
340.34	71.64	57.00	14.64
340.44	72.42	57.63	14.79
340.54	73.20	58.25	14.95
340.64	73.96	58.87	15.10
340.74	74.72	59.48	15.24
340.84	75.47	60.08	15.39
340.94	76.22	60.68	15.54
341.04	76.95	61.27	15.68
341.14	77.68	61.86	15.83
341.24	78.41	62.44	15.97
341.34	79.12	63.02	16.11
341.44	79.83	63.59	16.25
341.54	80.54	64.15	16.39
341.64	81.23	64.71	16.52
341.74	81.93	65.27	16.66
341.84	82.61	65.82	16.79
341.94	83.29	66.36	16.93
342.04	83.97	66.91	17.06
342.14	84.63	67.44	17.19
342.24	85.30	67.98	17.32
342.34	85.96	68.50	17.45
342.44	86.61	69.03	17.58
342.54	87.26	69.55	17.71
342.64	87.90	70.07	17.84
342.74	88.54	70.58	17.96
342.84	89.18	71.09	18.09
342.94	89.81	71.60	18.21
343.04	90.43	72.10	18.34
343.14	91.06	72.60	18.46
343.24	91.67	73.09	18.58
343.34	92.29	73.59	18.70
343.44	92.90	74.07	18.82
343.54	93.50	74.56	18.94
343.64	94.10	75.04	19.06
343.74	**94.70**	**75.52**	**19.18**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000
334.44	0.000	339.64	0.000
334.54	0.000	339.74	0.000
334.64	0.000	339.84	0.000
334.74	0.000	339.94	0.000
334.84	0.000	340.04	0.000
334.94	0.000	340.14	0.000
335.04	0.000	340.24	0.000
335.14	0.000	340.34	0.000
335.24	0.000	340.44	0.000
335.34	0.000	340.54	0.000
335.44	0.000	340.64	0.000
335.54	0.000	340.74	0.000
335.64	0.000	340.84	0.000
335.74	0.000	340.94	0.000
335.84	0.000	341.04	0.000
335.94	0.000	341.14	0.000
336.04	0.000	341.24	0.000
336.14	0.000	341.34	0.000
336.24	0.000	341.44	0.000
336.34	0.000	341.54	0.000
336.44	0.000	341.64	0.000
336.54	0.000	341.74	0.000
336.64	0.000	341.84	0.000
336.74	0.000	341.94	0.000
336.84	0.000	342.04	0.000
336.94	0.000	342.14	0.000
337.04	0.000	342.24	0.000
337.14	0.000	342.34	0.000
337.24	0.000	342.44	0.000
337.34	0.000	342.54	0.000
337.44	0.000	342.64	0.000
337.54	0.000	342.74	0.000
337.64	0.000	342.84	0.000
337.74	0.000	342.94	0.000
337.84	0.000	343.04	0.000
337.94	0.000	343.14	0.000
338.04	0.000	343.24	0.000
338.14	0.000	343.34	0.000
338.24	0.000	343.44	0.000
338.34	0.000	343.54	0.000
338.44	0.000	343.64	0.000
338.54	0.000	343.74	0.000
338.64	0.000		
338.74	0.000		
338.84	0.000		
338.94	0.000		
339.04	0.000		
339.14	0.000		
339.24	0.000		
339.34	0.000		
339.44	0.000		

Summary for Pond 20P: DMH-8

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Outflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af, Atten= 0%, Lag= 0.0 min
Primary = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Routed to Pond 21P : DMH-9

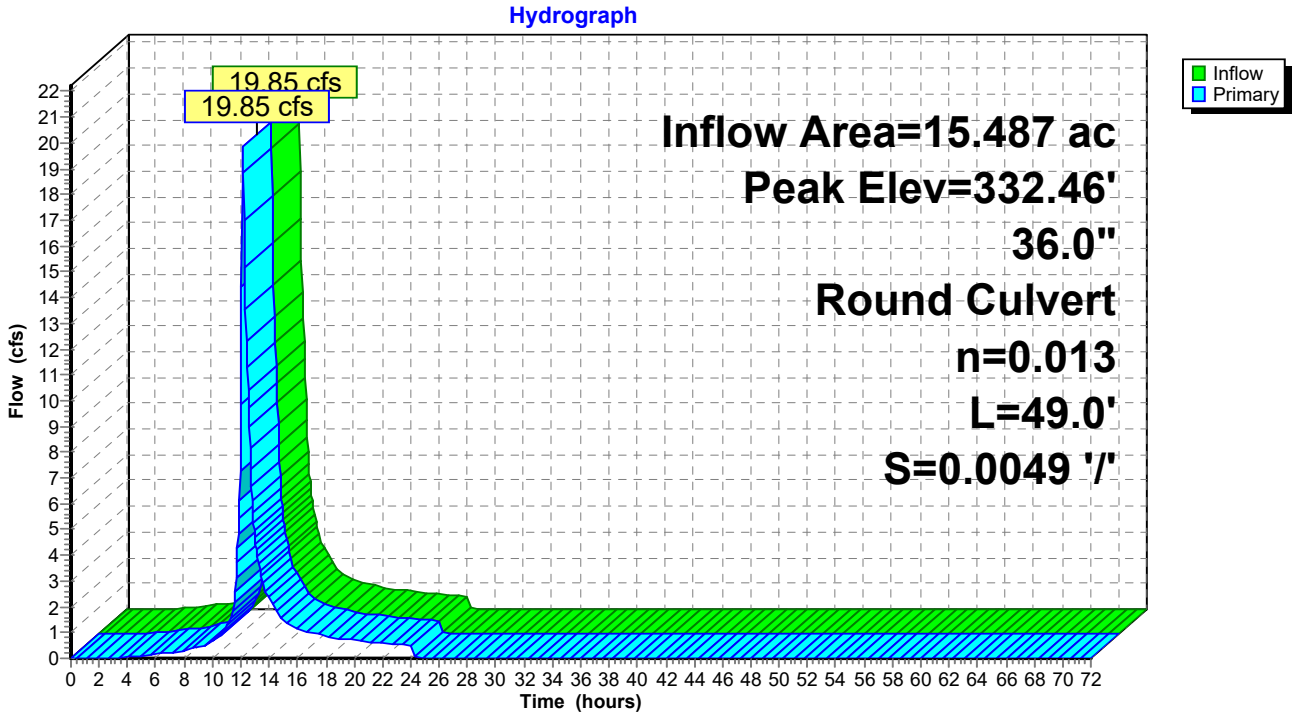
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.46' @ 12.16 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

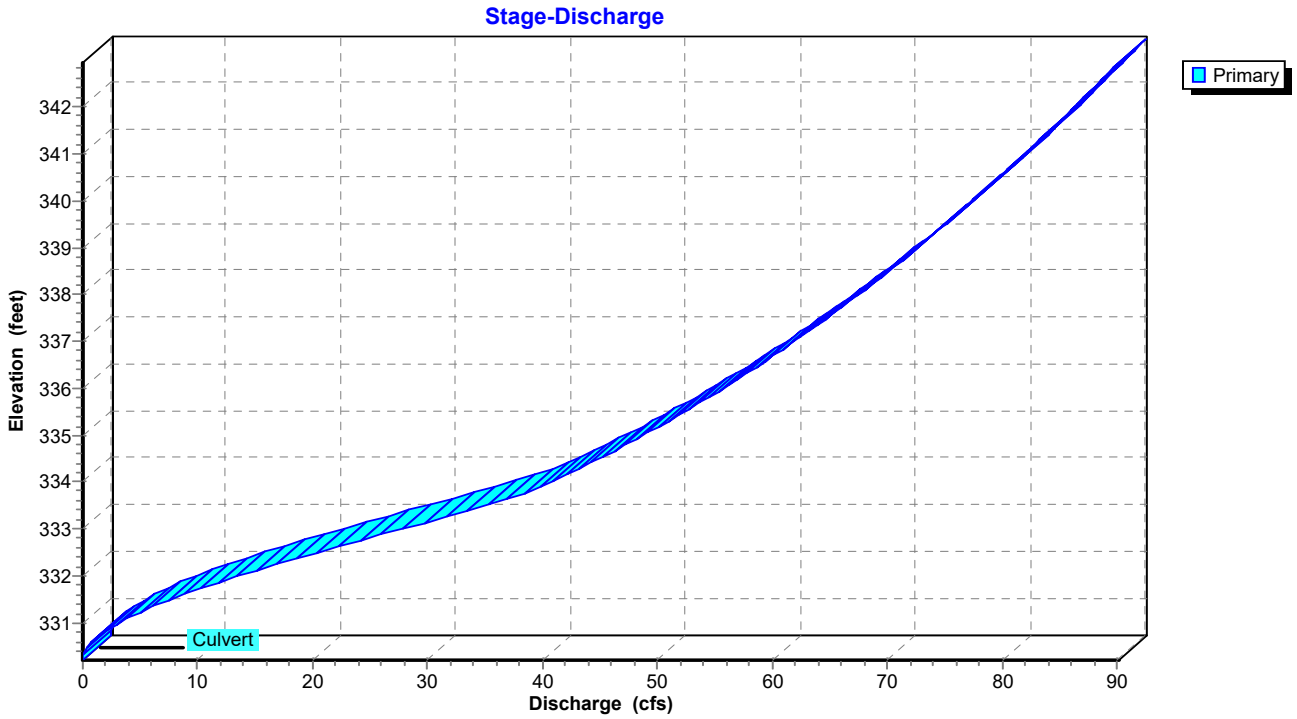
Primary OutFlow Max=19.60 cfs @ 12.15 hrs HW=332.45' TW=331.64' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 19.60 cfs @ 3.44 fps)



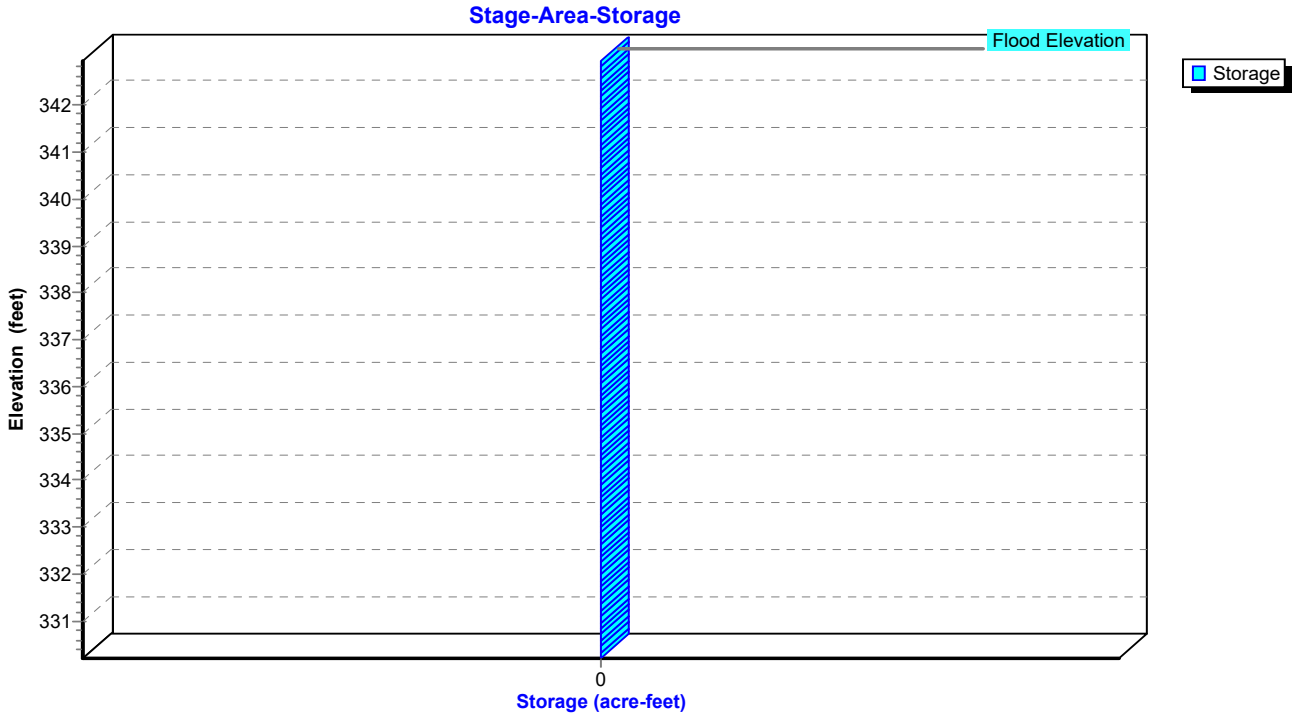
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.20	0.00
2.00	0.00	330.20	0.00
3.00	0.00	330.20	0.00
4.00	0.04	330.29	0.04
5.00	0.09	330.33	0.09
6.00	0.15	330.37	0.15
7.00	0.22	330.41	0.22
8.00	0.31	330.44	0.31
9.00	0.44	330.49	0.44
10.00	0.64	330.55	0.64
11.00	1.23	330.68	1.23
12.00	**9.84**	**331.69**	**9.84**
13.00	**4.68**	**331.19**	**4.68**
14.00	2.35	330.88	2.35
15.00	1.50	330.74	1.50
16.00	1.17	330.67	1.17
17.00	0.98	330.63	0.98
18.00	0.86	330.60	0.86
19.00	0.77	330.58	0.77
20.00	0.69	330.56	0.69
21.00	0.64	330.55	0.64
22.00	0.59	330.53	0.59
23.00	0.55	330.52	0.55
24.00	0.52	330.51	0.52
25.00	0.00	330.20	0.00
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

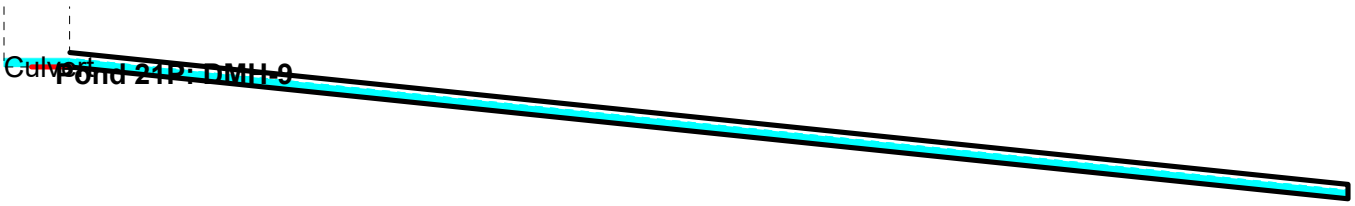
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Outflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af, Atten= 0%, Lag= 0.0 min
Primary = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Routed to Pond 23P : DMH-10

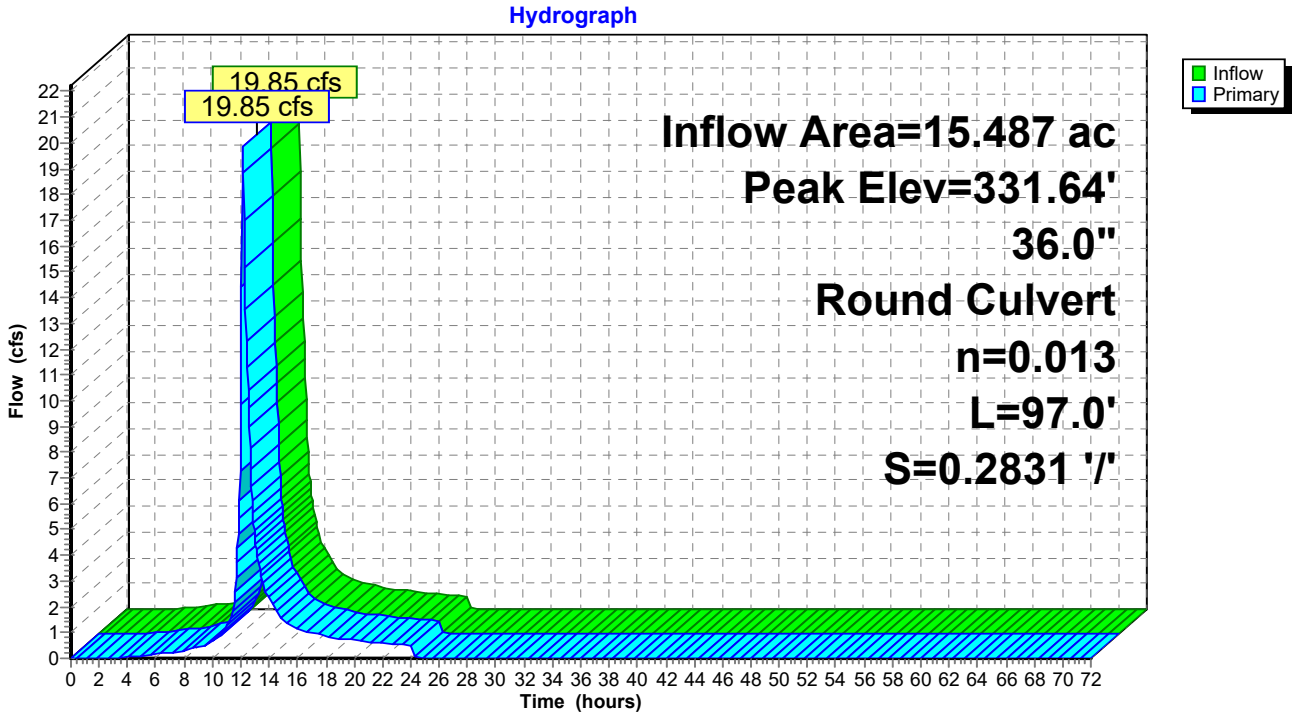
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 331.64' @ 12.15 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

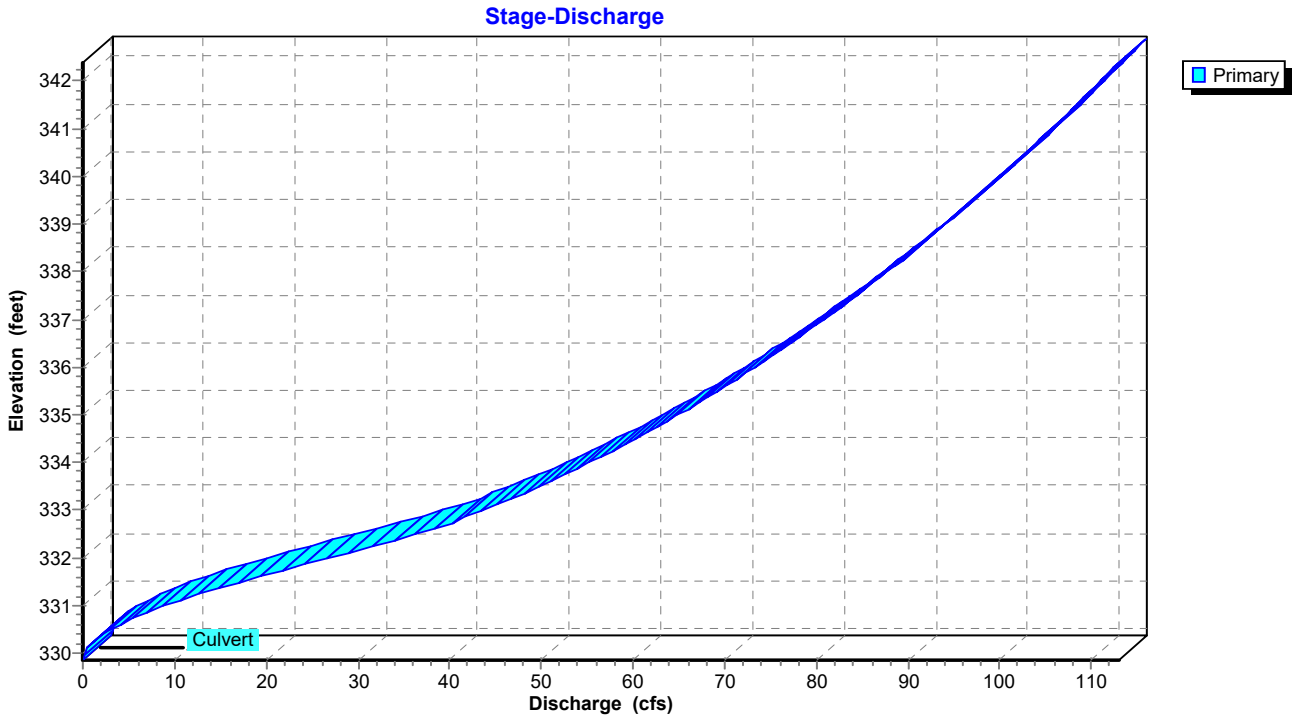
Primary OutFlow Max=19.78 cfs @ 12.15 hrs HW=331.64' TW=300.36' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 19.78 cfs @ 4.54 fps)



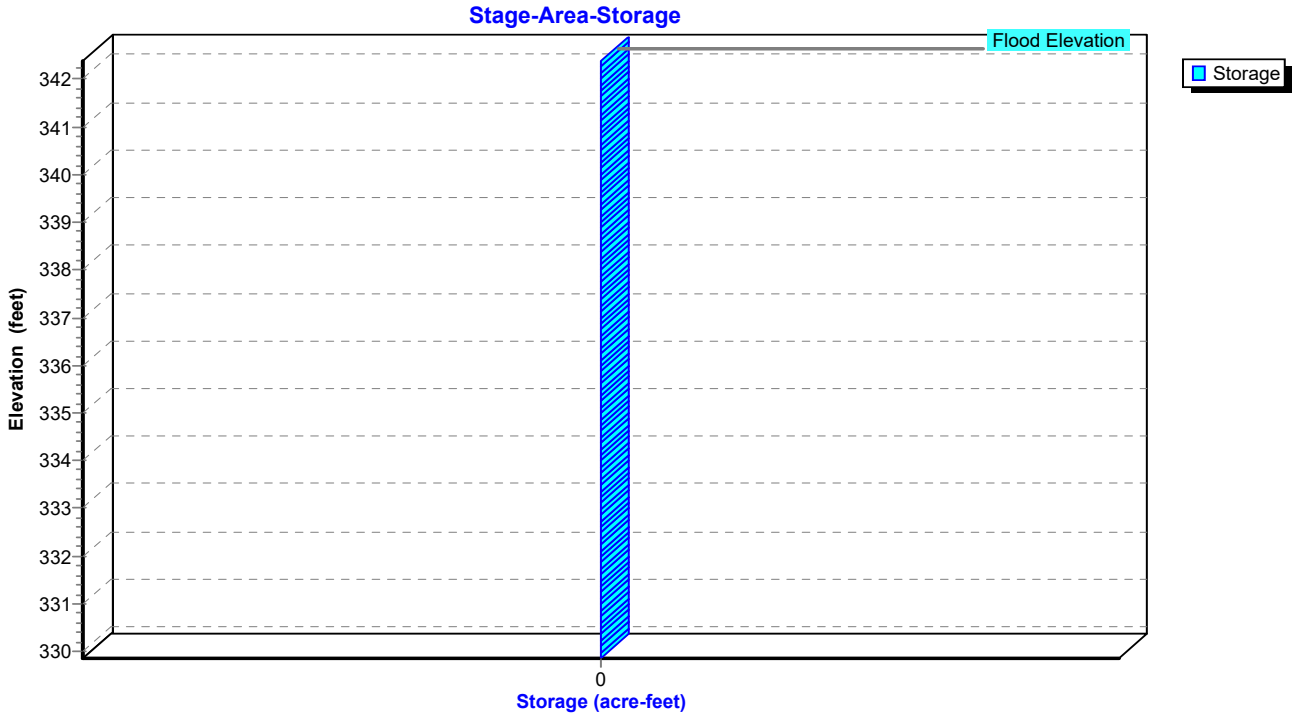
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.86	0.00
2.00	0.00	329.86	0.00
3.00	0.00	329.86	0.00
4.00	0.04	329.93	0.04
5.00	0.09	329.97	0.09
6.00	0.15	330.00	0.15
7.00	0.22	330.03	0.22
8.00	0.31	330.06	0.31
9.00	0.44	330.10	0.44
10.00	0.64	330.15	0.64
11.00	1.23	330.26	1.23
12.00	**9.84**	**331.06**	**9.84**
13.00	**4.68**	**330.67**	**4.68**
14.00	2.35	330.42	2.35
15.00	1.50	330.31	1.50
16.00	1.17	330.25	1.17
17.00	0.98	330.22	0.98
18.00	0.86	330.20	0.86
19.00	0.77	330.18	0.77
20.00	0.69	330.16	0.69
21.00	0.64	330.15	0.64
22.00	0.59	330.14	0.59
23.00	0.55	330.13	0.55
24.00	0.52	330.12	0.52
25.00	0.00	329.86	0.00
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

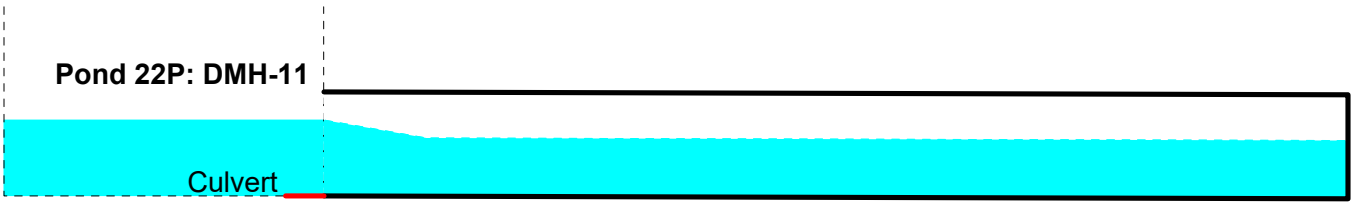
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Outflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af, Atten= 0%, Lag= 0.0 min
Primary = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

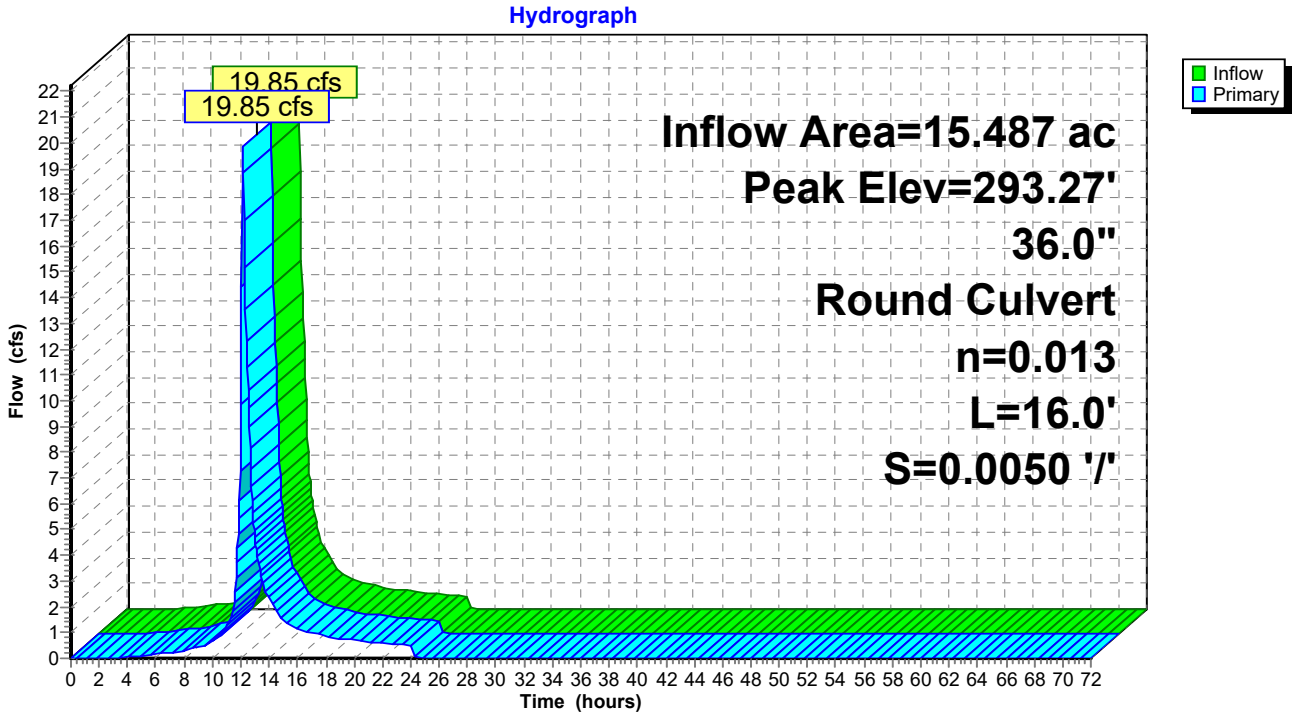
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 293.27' @ 12.15 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

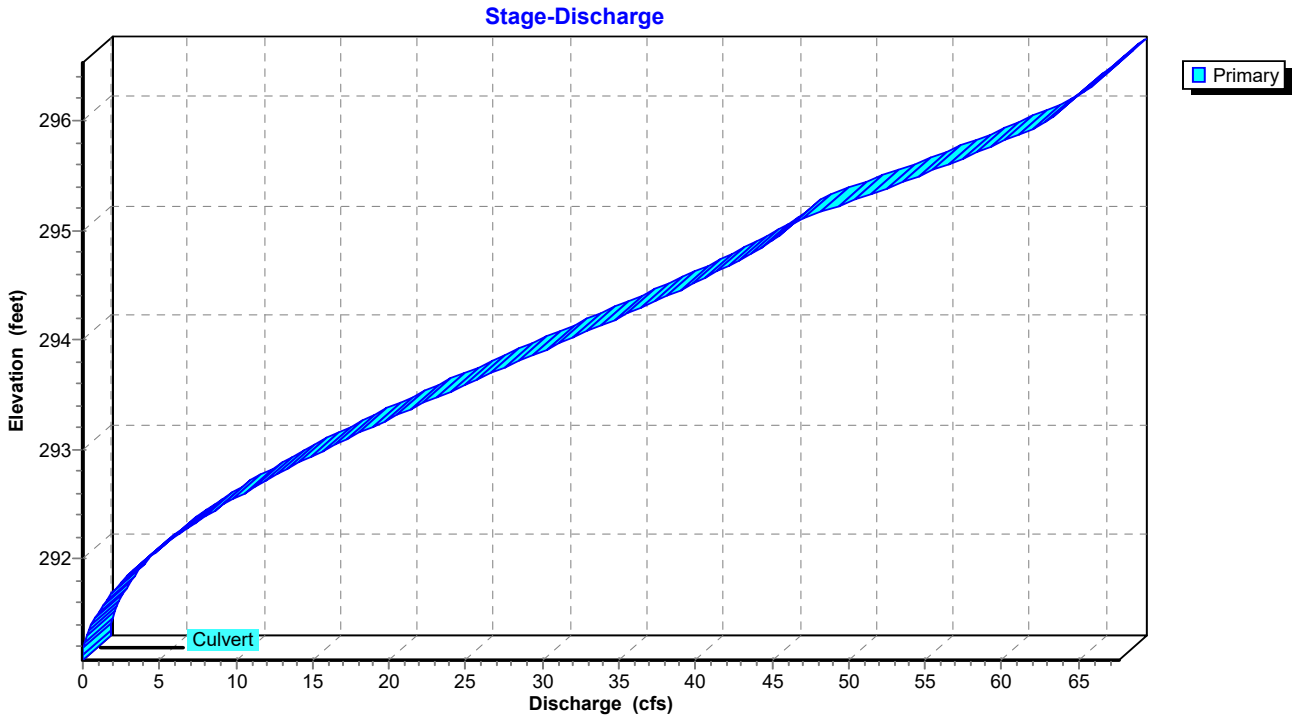
Primary OutFlow Max=19.78 cfs @ 12.15 hrs HW=293.27' TW=288.09' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 19.78 cfs @ 5.01 fps)



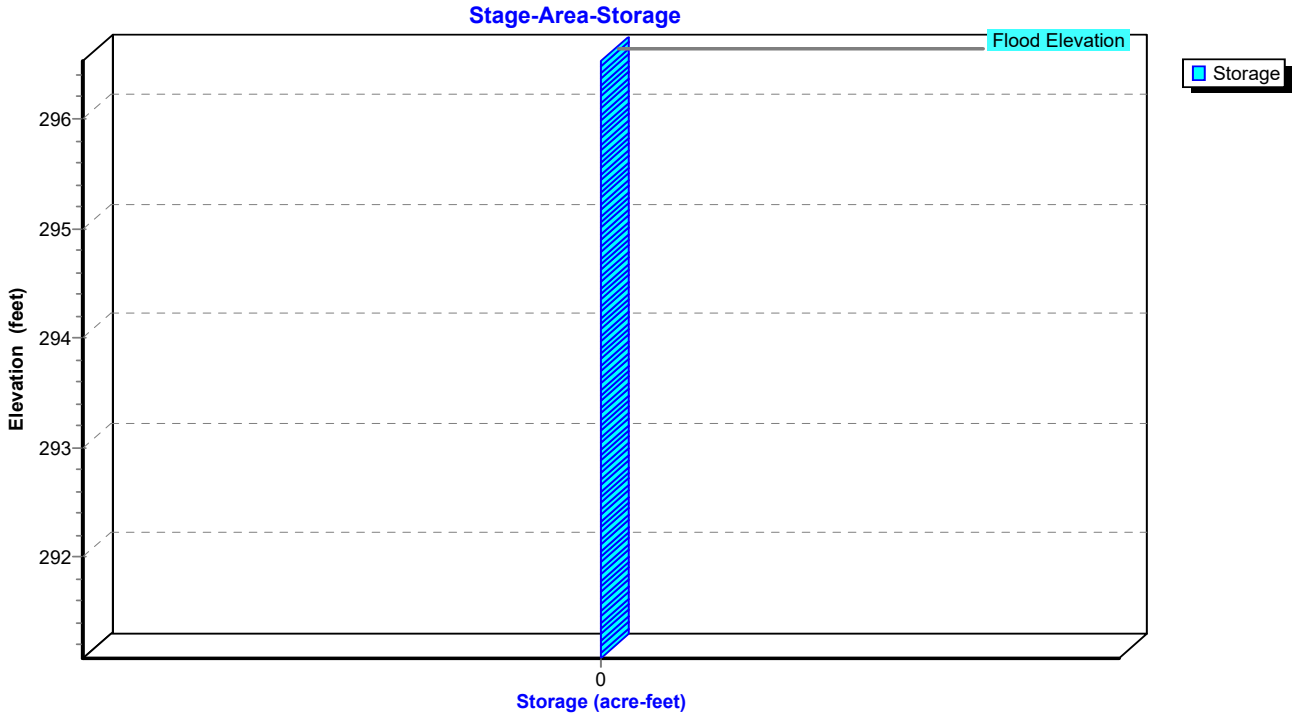
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.08	0.00
2.00	0.00	291.08	0.00
3.00	0.00	291.08	0.00
4.00	0.04	291.17	0.04
5.00	0.09	291.21	0.09
6.00	0.15	291.25	0.15
7.00	0.22	291.28	0.22
8.00	0.31	291.32	0.31
9.00	0.44	291.37	0.44
10.00	0.64	291.43	0.64
11.00	1.23	291.57	1.23
12.00	**9.84**	**292.55**	**9.84**
13.00	**4.68**	**292.06**	**4.68**
14.00	2.35	291.76	2.35
15.00	1.50	291.62	1.50
16.00	1.17	291.55	1.17
17.00	0.98	291.51	0.98
18.00	0.86	291.48	0.86
19.00	0.77	291.46	0.77
20.00	0.69	291.44	0.69
21.00	0.64	291.43	0.64
22.00	0.59	291.41	0.59
23.00	0.55	291.40	0.55
24.00	0.52	291.39	0.52
25.00	0.00	291.08	0.00
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

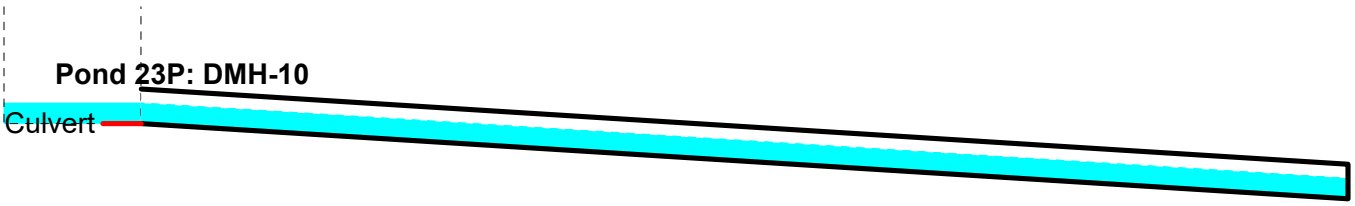
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 1.85" for 2-yr event
Inflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Outflow = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af, Atten= 0%, Lag= 0.0 min
Primary = 19.85 cfs @ 12.15 hrs, Volume= 2.392 af
Routed to Pond 22P : DMH-11

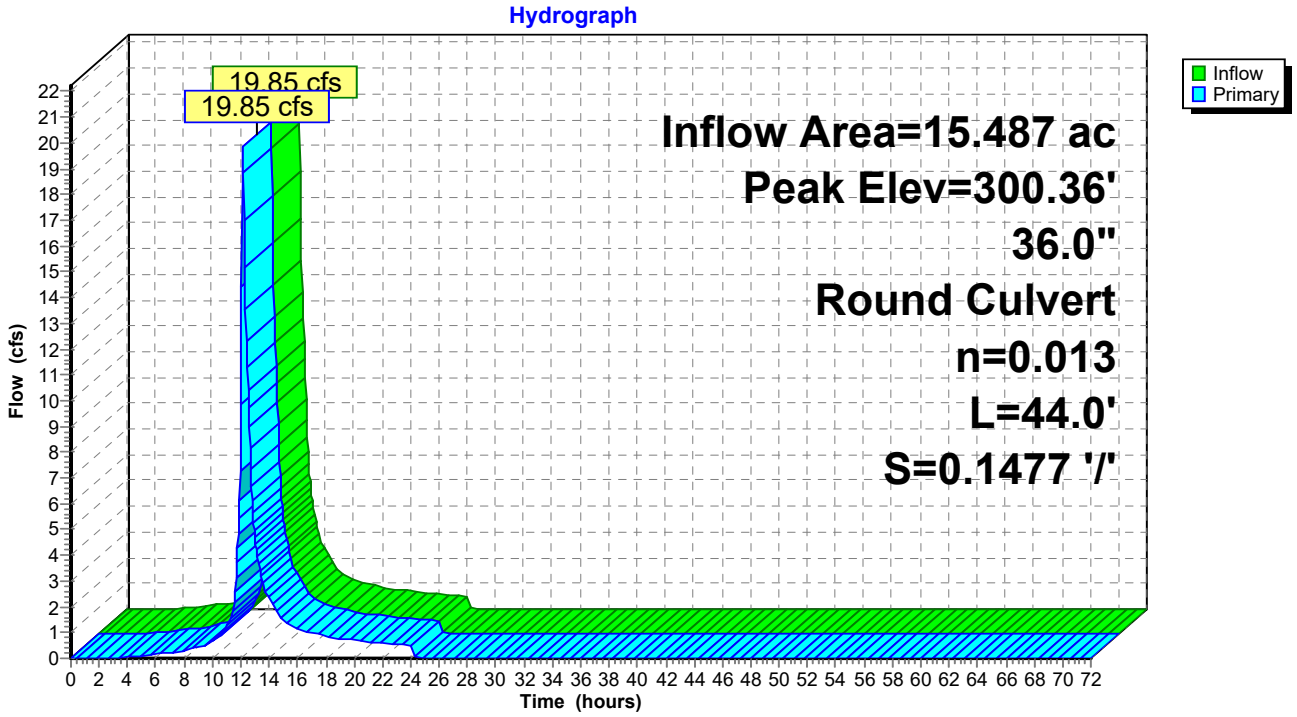
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 300.36' @ 12.15 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

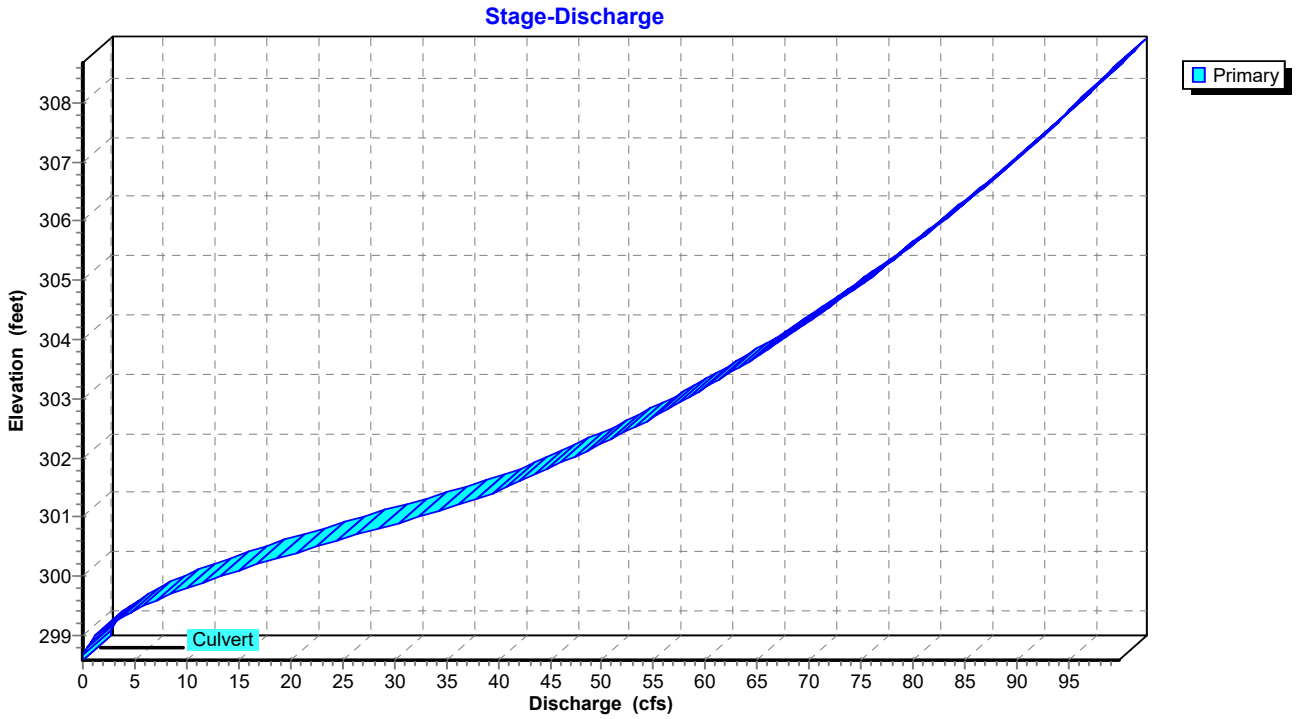
Primary OutFlow Max=19.78 cfs @ 12.15 hrs HW=300.36' TW=293.27' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 19.78 cfs @ 4.54 fps)



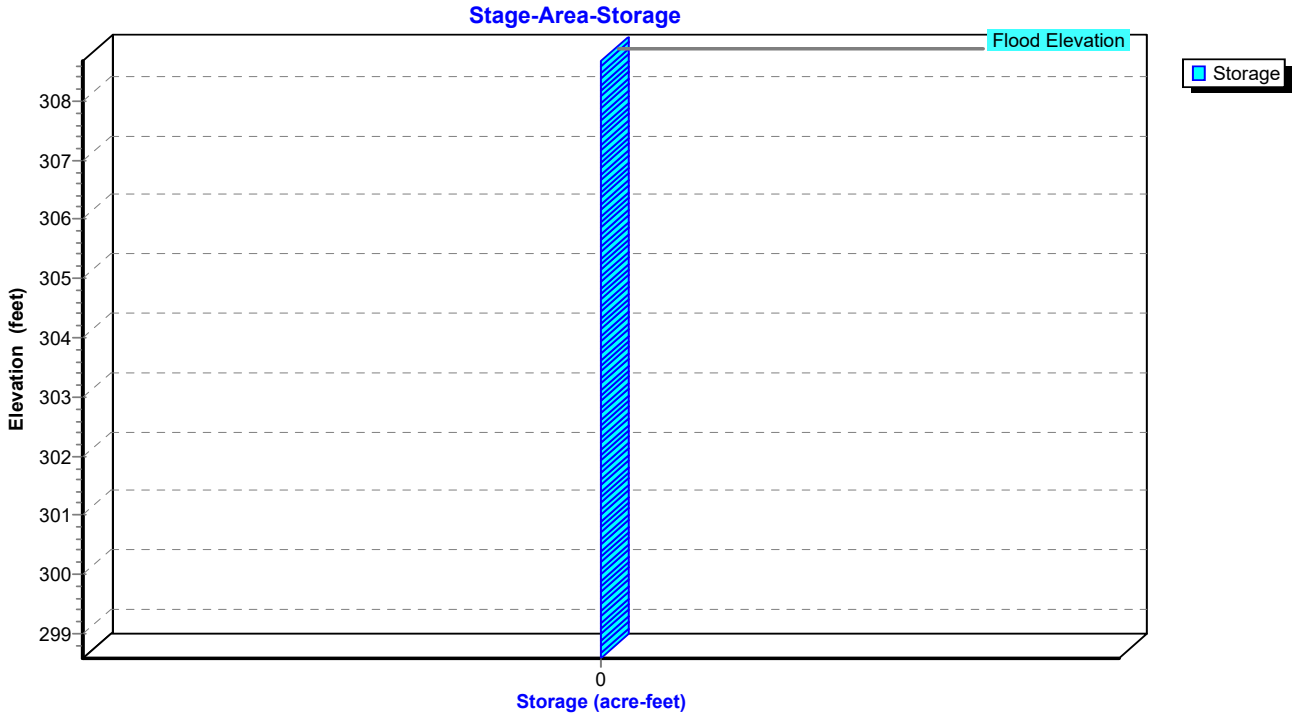
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00
1.00	0.00	298.58	0.00
2.00	0.00	298.58	0.00
3.00	0.00	298.58	0.00
4.00	0.04	298.65	0.04
5.00	0.09	298.69	0.09
6.00	0.15	298.72	0.15
7.00	0.22	298.75	0.22
8.00	0.31	298.78	0.31
9.00	0.44	298.82	0.44
10.00	0.64	298.87	0.64
11.00	1.23	298.98	1.23
12.00	**9.84**	**299.78**	**9.84**
13.00	**4.68**	**299.39**	**4.68**
14.00	2.35	299.14	2.35
15.00	1.50	299.03	1.50
16.00	1.17	298.97	1.17
17.00	0.98	298.94	0.98
18.00	0.86	298.92	0.86
19.00	0.77	298.90	0.77
20.00	0.69	298.88	0.69
21.00	0.64	298.87	0.64
22.00	0.59	298.86	0.59
23.00	0.55	298.85	0.55
24.00	0.52	298.84	0.52
25.00	0.00	298.58	0.00
26.00	0.00	298.58	0.00
27.00	0.00	298.58	0.00
28.00	0.00	298.58	0.00
29.00	0.00	298.58	0.00
30.00	0.00	298.58	0.00
31.00	0.00	298.58	0.00
32.00	0.00	298.58	0.00
33.00	0.00	298.58	0.00
34.00	0.00	298.58	0.00
35.00	0.00	298.58	0.00
36.00	0.00	298.58	0.00
37.00	0.00	298.58	0.00
38.00	0.00	298.58	0.00
39.00	0.00	298.58	0.00
40.00	0.00	298.58	0.00
41.00	0.00	298.58	0.00
42.00	0.00	298.58	0.00
43.00	0.00	298.58	0.00
44.00	0.00	298.58	0.00
45.00	0.00	298.58	0.00
46.00	0.00	298.58	0.00
47.00	0.00	298.58	0.00
48.00	0.00	298.58	0.00
49.00	0.00	298.58	0.00
50.00	0.00	298.58	0.00
51.00	0.00	298.58	0.00
52.00	0.00	298.58	0.00
53.00	0.00	298.58	0.00
54.00	0.00	298.58	0.00
55.00	0.00	298.58	0.00
56.00	0.00	298.58	0.00
57.00	0.00	298.58	0.00
58.00	0.00	298.58	0.00
59.00	0.00	298.58	0.00
60.00	0.00	298.58	0.00
61.00	0.00	298.58	0.00
62.00	0.00	298.58	0.00
63.00	0.00	298.58	0.00
64.00	0.00	298.58	0.00
65.00	0.00	298.58	0.00
66.00	0.00	298.58	0.00
67.00	0.00	298.58	0.00
68.00	0.00	298.58	0.00
69.00	0.00	298.58	0.00
70.00	0.00	298.58	0.00
71.00	0.00	298.58	0.00
72.00	0.00	298.58	0.00

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

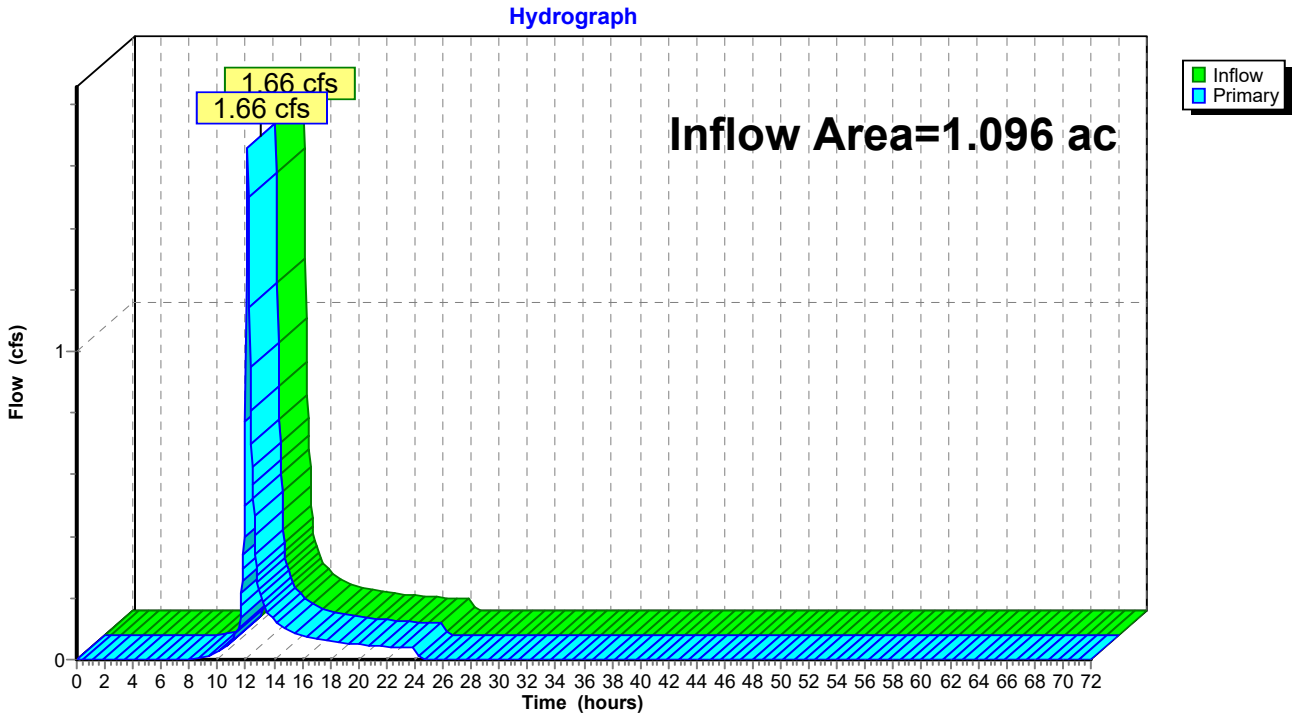
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 1.57" for 2-yr event
Inflow = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af
Primary = 1.66 cfs @ 12.12 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

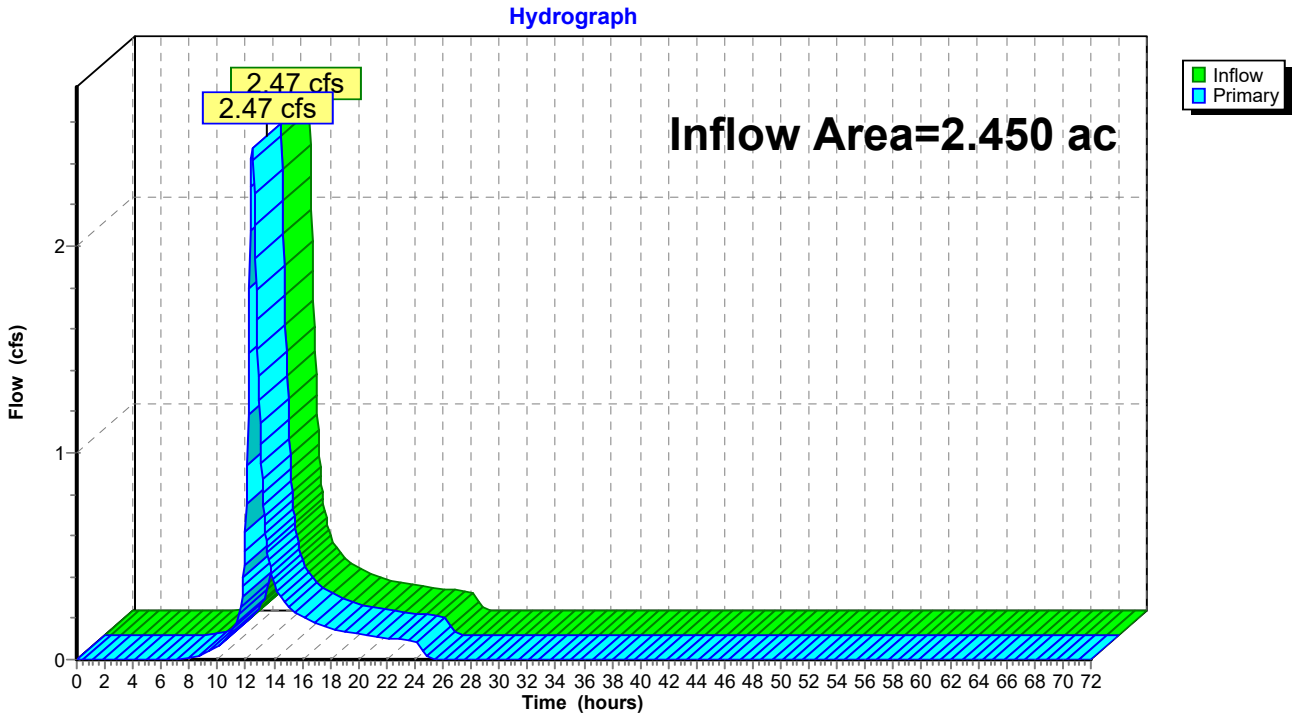
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.01	0.00	0.01
10.00	0.02	0.00	0.02
11.00	0.06	0.00	0.06
12.00	**0.77**	0.00	**0.77**
13.00	**0.21**	0.00	**0.21**
14.00	0.13	0.00	0.13
15.00	0.10	0.00	0.10
16.00	0.08	0.00	0.08
17.00	0.07	0.00	0.07
18.00	0.06	0.00	0.06
19.00	0.05	0.00	0.05
20.00	0.05	0.00	0.05
21.00	0.05	0.00	0.05
22.00	0.04	0.00	0.04
23.00	0.04	0.00	0.04
24.00	0.04	0.00	0.04
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 1.78" for 2-yr event
Inflow = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af
Primary = 2.47 cfs @ 12.46 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

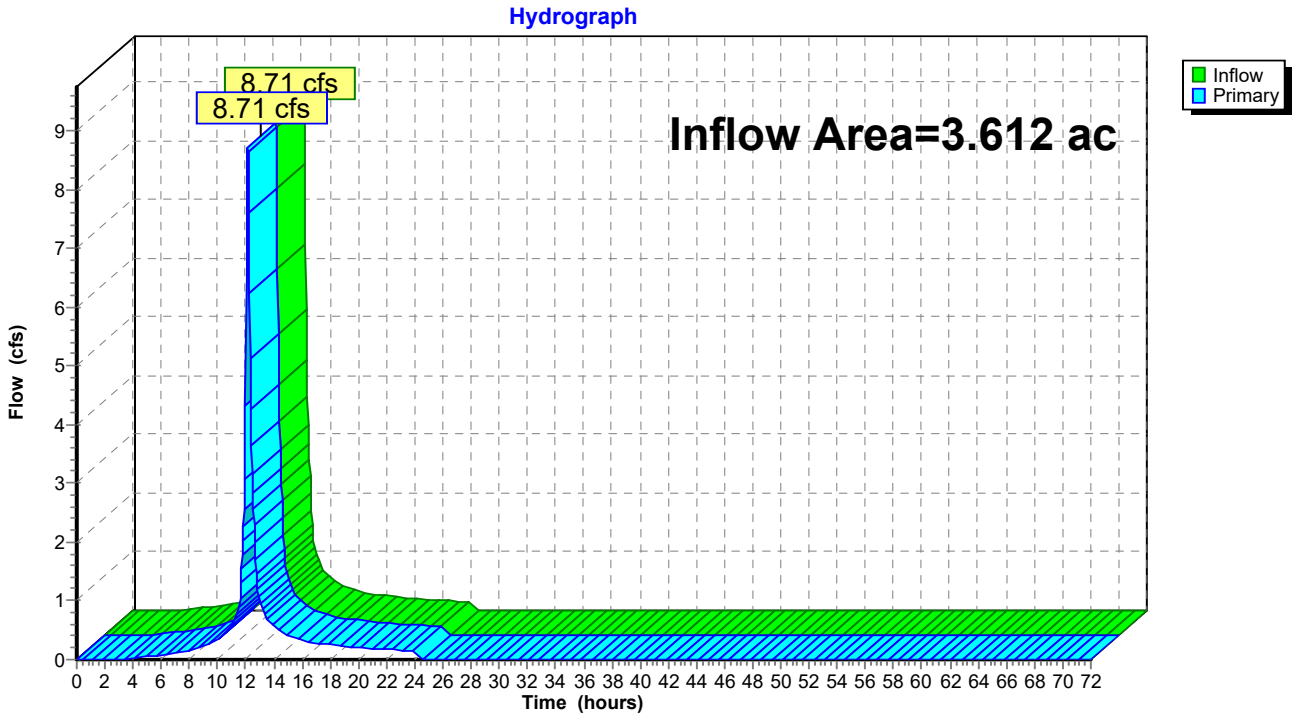
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.01	0.00	0.01
9.00	0.03	0.00	0.03
10.00	0.06	0.00	0.06
11.00	0.14	0.00	0.14
12.00	**0.62**	0.00	**0.62**
13.00	**1.14**	0.00	**1.14**
14.00	0.37	0.00	0.37
15.00	0.26	0.00	0.26
16.00	0.20	0.00	0.20
17.00	0.17	0.00	0.17
18.00	0.15	0.00	0.15
19.00	0.14	0.00	0.14
20.00	0.12	0.00	0.12
21.00	0.11	0.00	0.11
22.00	0.11	0.00	0.11
23.00	0.10	0.00	0.10
24.00	0.09	0.00	0.09
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 2.65" for 2-yr event
Inflow = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af
Primary = 8.71 cfs @ 12.13 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

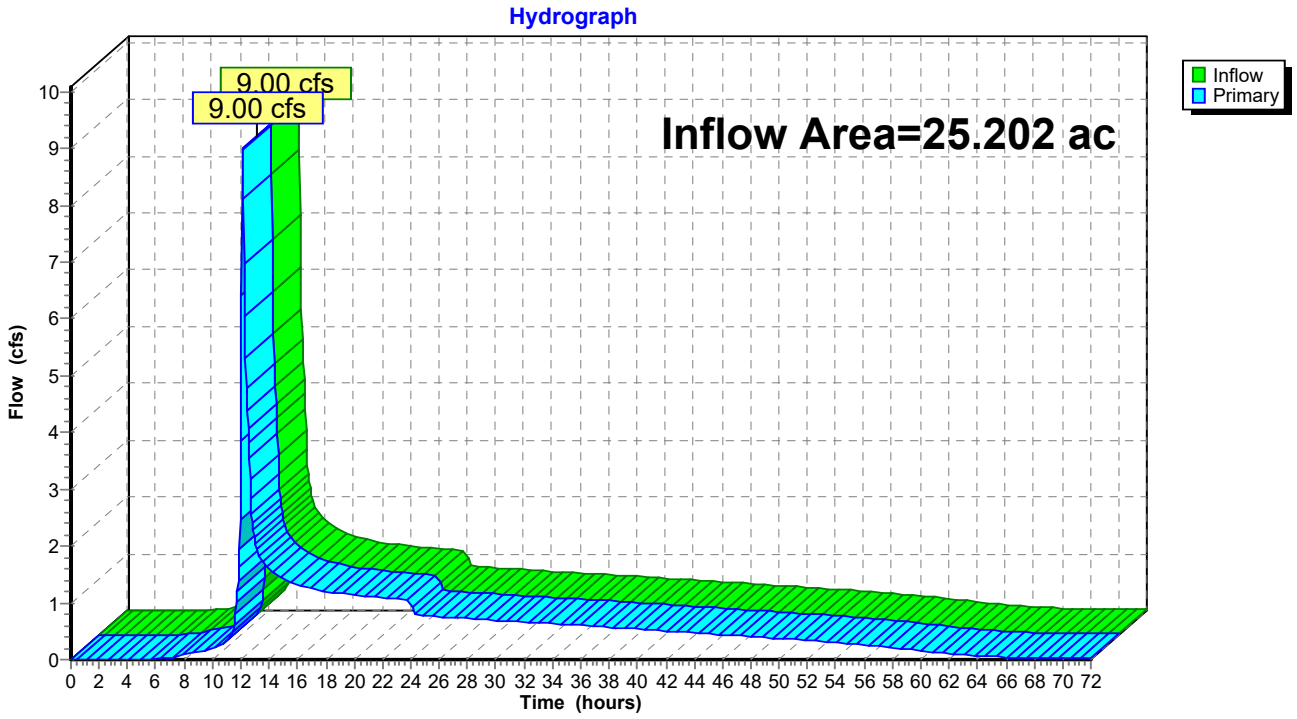
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02
5.00	0.05	0.00	0.05
6.00	0.08	0.00	0.08
7.00	0.12	0.00	0.12
8.00	0.17	0.00	0.17
9.00	0.24	0.00	0.24
10.00	0.34	0.00	0.34
11.00	0.59	0.00	0.59
12.00	**4.33**	0.00	**4.33**
13.00	**0.98**	0.00	**0.98**
14.00	0.56	0.00	0.56
15.00	0.41	0.00	0.41
16.00	0.34	0.00	0.34
17.00	0.29	0.00	0.29
18.00	0.25	0.00	0.25
19.00	0.23	0.00	0.23
20.00	0.21	0.00	0.21
21.00	0.19	0.00	0.19
22.00	0.18	0.00	0.18
23.00	0.17	0.00	0.17
24.00	0.16	0.00	0.16
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 1.52" for 2-yr event
Inflow = 9.00 cfs @ 12.14 hrs, Volume= 3.189 af
Primary = 9.00 cfs @ 12.14 hrs, Volume= 3.189 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01
7.00	0.04	0.00	0.04
8.00	0.08	0.00	0.08
9.00	0.14	0.00	0.14
10.00	0.20	0.00	0.20
11.00	0.32	0.00	0.32
12.00	**3.86**	0.00	**3.86**
13.00	**2.06**	0.00	**2.06**
14.00	1.58	0.00	1.58
15.00	1.41	0.00	1.41
16.00	1.32	0.00	1.32
17.00	1.25	0.00	1.25
18.00	1.21	0.00	1.21
19.00	1.17	0.00	1.17
20.00	1.14	0.00	1.14
21.00	1.11	0.00	1.11
22.00	1.09	0.00	1.09
23.00	1.07	0.00	1.07
24.00	1.05	0.00	1.05
25.00	0.77	0.00	0.77
26.00	0.75	0.00	0.75
27.00	0.74	0.00	0.74
28.00	0.72	0.00	0.72
29.00	0.71	0.00	0.71
30.00	0.69	0.00	0.69
31.00	0.68	0.00	0.68
32.00	0.66	0.00	0.66
33.00	0.65	0.00	0.65
34.00	0.63	0.00	0.63
35.00	0.62	0.00	0.62
36.00	0.60	0.00	0.60
37.00	0.59	0.00	0.59
38.00	0.57	0.00	0.57
39.00	0.56	0.00	0.56
40.00	0.54	0.00	0.54
41.00	0.52	0.00	0.52
42.00	0.51	0.00	0.51
43.00	0.49	0.00	0.49
44.00	0.47	0.00	0.47
45.00	0.46	0.00	0.46
46.00	0.44	0.00	0.44
47.00	0.42	0.00	0.42
48.00	0.41	0.00	0.41
49.00	0.39	0.00	0.39
50.00	0.37	0.00	0.37
51.00	0.36	0.00	0.36
52.00	0.34	0.00	0.34
53.00	0.32	0.00	0.32
54.00	0.30	0.00	0.30
55.00	0.28	0.00	0.28
56.00	0.26	0.00	0.26
57.00	0.23	0.00	0.23
58.00	0.21	0.00	0.21
59.00	0.18	0.00	0.18
60.00	0.16	0.00	0.16
61.00	0.13	0.00	0.13
62.00	0.10	0.00	0.10
63.00	0.08	0.00	0.08
64.00	0.06	0.00	0.06
65.00	0.05	0.00	0.05
66.00	0.04	0.00	0.04
67.00	0.03	0.00	0.03
68.00	0.03	0.00	0.03
69.00	0.02	0.00	0.02
70.00	0.02	0.00	0.02
71.00	0.02	0.00	0.02
72.00	0.02	0.00	0.02

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=3.02"
Flow Length=253' Tc=12.2 min CN=80 Runoff=2.93 cfs 0.275 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=3.30"
Flow Length=548' Tc=36.4 min CN=83 Runoff=4.26 cfs 0.674 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=4.34"
Flow Length=469' Tc=13.4 min CN=93 Runoff=12.58 cfs 1.305 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=4.34"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=23.93 cfs 2.403 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=2.48"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=13.97 cfs 1.542 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=2.22"
Flow Length=968' Tc=12.4 min CN=71 Runoff=18.39 cfs 1.800 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=4.56"
Flow Length=398' Tc=6.0 min CN=95 Runoff=6.48 cfs 0.518 af

Pond 6P: Infiltrators Peak Elev=348.43' Storage=0.155 af Inflow=6.48 cfs 0.518 af
Discarded=0.07 cfs 0.149 af Primary=1.94 cfs 0.369 af Outflow=2.01 cfs 0.518 af

Pond 9P: Detention Piping - 48" Peak Elev=333.41' Storage=0.182 af Inflow=8.50 cfs 0.486 af
Outflow=6.07 cfs 0.486 af

Pond 18P: Micropool Extended Detention Peak Elev=291.05' Storage=89,681 cf Inflow=30.01 cfs 4.314 af
Primary=8.65 cfs 4.290 af Secondary=0.00 cfs 0.000 af Outflow=8.65 cfs 4.290 af

Pond 19P: DMH-7 Peak Elev=337.19' Inflow=38.33 cfs 4.314 af
Primary=29.83 cfs 3.828 af Secondary=8.50 cfs 0.486 af Outflow=38.33 cfs 4.314 af

Pond 20P: DMH-8 Peak Elev=333.37' Inflow=30.01 cfs 4.314 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=30.01 cfs 4.314 af

Pond 21P: DMH-9 Peak Elev=332.16' Inflow=30.01 cfs 4.314 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=30.01 cfs 4.314 af

Pond 22P: DMH-11 Peak Elev=293.90' Inflow=30.01 cfs 4.314 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=30.01 cfs 4.314 af

Pond 23P: DMH-10 Peak Elev=300.88' Inflow=30.01 cfs 4.314 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=30.01 cfs 4.314 af

Link DP-1: Design Point - 1 Inflow=2.93 cfs 0.275 af
Primary=2.93 cfs 0.275 af

Link DP-2: Design Point - 2 Inflow=4.26 cfs 0.674 af
Primary=4.26 cfs 0.674 af

Link DP-3: Design Point - 3 Inflow=12.58 cfs 1.305 af
Primary=12.58 cfs 1.305 af

Link DP-4: DP-4 Inflow=19.05 cfs 6.090 af
Primary=19.05 cfs 6.090 af

Total Runoff Area = 32.360 ac Runoff Volume = 8.517 af Average Runoff Depth = 3.16"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

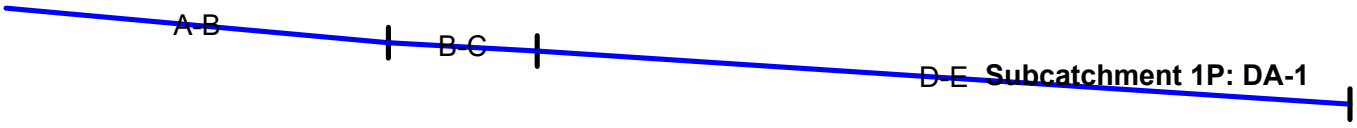
Summary for Subcatchment 1P: DA-1

Runoff = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af, Depth= 3.02"
Routed to Link DP-1 : Design Point - 1

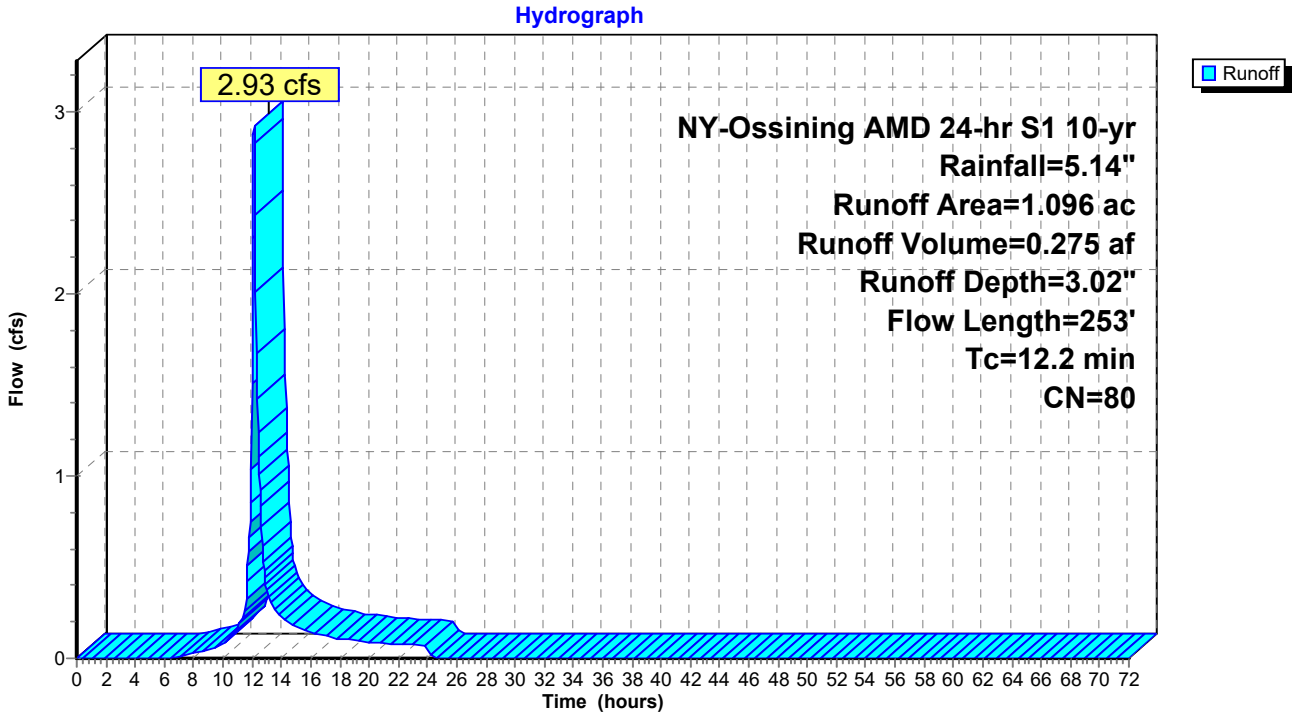
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.01	0.01
8.00	0.78	0.03	0.03
9.00	0.94	0.07	0.05
10.00	1.14	0.13	0.09
11.00	1.44	0.26	0.17
12.00	2.78	1.09	**1.51**
13.00	3.72	1.81	**0.38**
14.00	4.01	2.05	0.23
15.00	4.21	2.21	0.17
16.00	4.37	2.35	0.14
17.00	4.50	2.46	0.12
18.00	4.62	2.56	0.11
19.00	4.73	2.66	0.10
20.00	4.82	2.74	0.09
21.00	4.91	2.81	0.08
22.00	4.99	2.89	0.08
23.00	5.07	2.95	0.07
24.00	**5.14**	**3.02**	0.07
25.00	5.14	3.02	0.00
26.00	5.14	3.02	0.00
27.00	5.14	3.02	0.00
28.00	5.14	3.02	0.00
29.00	5.14	3.02	0.00
30.00	5.14	3.02	0.00
31.00	5.14	3.02	0.00
32.00	5.14	3.02	0.00
33.00	5.14	3.02	0.00
34.00	5.14	3.02	0.00
35.00	5.14	3.02	0.00
36.00	5.14	3.02	0.00
37.00	5.14	3.02	0.00
38.00	5.14	3.02	0.00
39.00	5.14	3.02	0.00
40.00	5.14	3.02	0.00
41.00	5.14	3.02	0.00
42.00	5.14	3.02	0.00
43.00	5.14	3.02	0.00
44.00	5.14	3.02	0.00
45.00	5.14	3.02	0.00
46.00	5.14	3.02	0.00
47.00	5.14	3.02	0.00
48.00	5.14	3.02	0.00
49.00	5.14	3.02	0.00
50.00	5.14	3.02	0.00
51.00	5.14	3.02	0.00
52.00	5.14	3.02	0.00
53.00	5.14	3.02	0.00
54.00	5.14	3.02	0.00
55.00	5.14	3.02	0.00
56.00	5.14	3.02	0.00
57.00	5.14	3.02	0.00
58.00	5.14	3.02	0.00
59.00	5.14	3.02	0.00
60.00	5.14	3.02	0.00
61.00	5.14	3.02	0.00
62.00	5.14	3.02	0.00
63.00	5.14	3.02	0.00
64.00	5.14	3.02	0.00
65.00	5.14	3.02	0.00
66.00	5.14	3.02	0.00
67.00	5.14	3.02	0.00
68.00	5.14	3.02	0.00
69.00	5.14	3.02	0.00
70.00	5.14	3.02	0.00
71.00	5.14	3.02	0.00
72.00	5.14	3.02	0.00

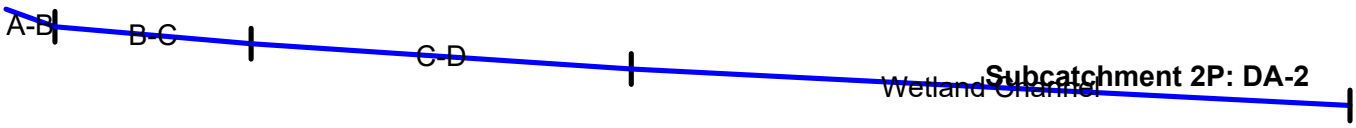
Summary for Subcatchment 2P: DA-2

Runoff = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af, Depth= 3.30"
Routed to Link DP-2 : Design Point - 2

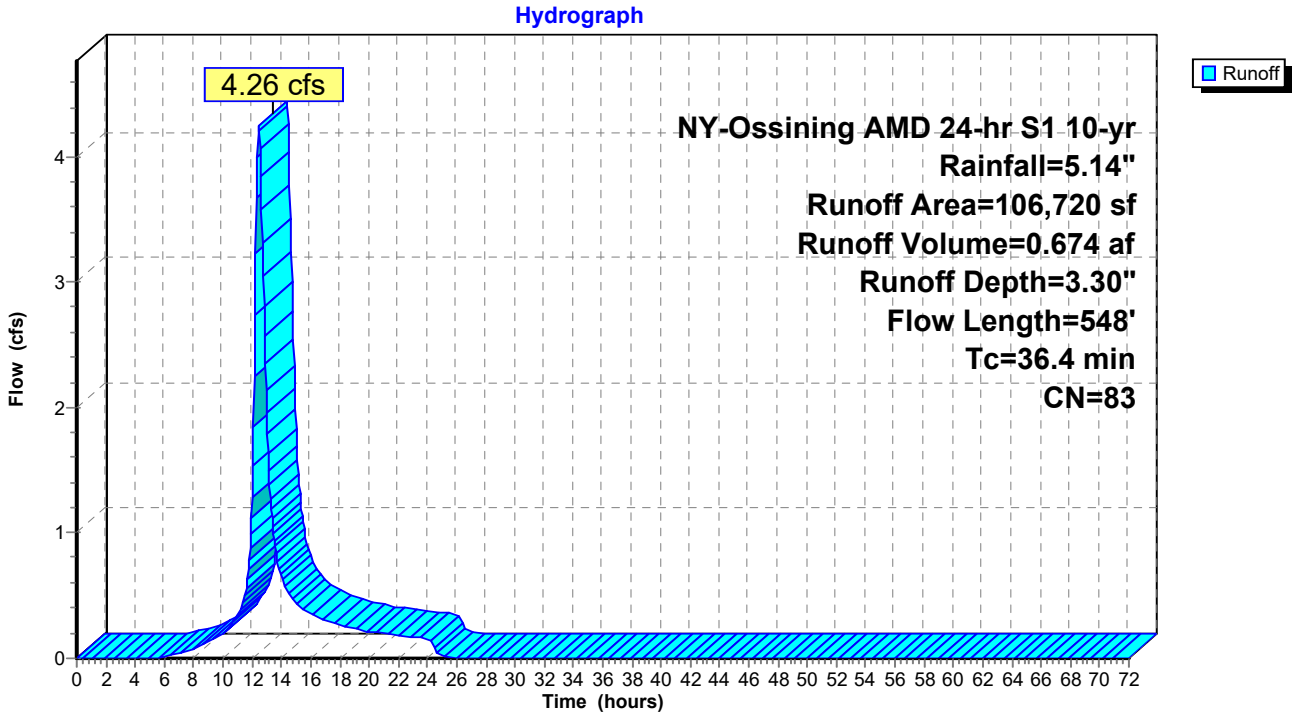
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.01	0.01
7.00	0.64	0.02	0.04
8.00	0.78	0.06	0.08
9.00	0.94	0.11	0.13
10.00	1.14	0.19	0.20
11.00	1.44	0.34	0.35
12.00	2.78	1.27	**1.29**
13.00	3.72	2.04	**1.96**
14.00	4.01	2.29	0.64
15.00	4.21	2.47	0.44
16.00	4.37	2.61	0.35
17.00	4.50	2.73	0.30
18.00	4.62	2.83	0.26
19.00	4.73	2.93	0.23
20.00	4.82	3.01	0.21
21.00	4.91	3.09	0.20
22.00	4.99	3.17	0.18
23.00	5.07	3.24	0.17
24.00	**5.14**	**3.30**	0.16
25.00	5.14	3.30	0.01
26.00	5.14	3.30	0.00
27.00	5.14	3.30	0.00
28.00	5.14	3.30	0.00
29.00	5.14	3.30	0.00
30.00	5.14	3.30	0.00
31.00	5.14	3.30	0.00
32.00	5.14	3.30	0.00
33.00	5.14	3.30	0.00
34.00	5.14	3.30	0.00
35.00	5.14	3.30	0.00
36.00	5.14	3.30	0.00
37.00	5.14	3.30	0.00
38.00	5.14	3.30	0.00
39.00	5.14	3.30	0.00
40.00	5.14	3.30	0.00
41.00	5.14	3.30	0.00
42.00	5.14	3.30	0.00
43.00	5.14	3.30	0.00
44.00	5.14	3.30	0.00
45.00	5.14	3.30	0.00
46.00	5.14	3.30	0.00
47.00	5.14	3.30	0.00
48.00	5.14	3.30	0.00
49.00	5.14	3.30	0.00
50.00	5.14	3.30	0.00
51.00	5.14	3.30	0.00
52.00	5.14	3.30	0.00
53.00	5.14	3.30	0.00
54.00	5.14	3.30	0.00
55.00	5.14	3.30	0.00
56.00	5.14	3.30	0.00
57.00	5.14	3.30	0.00
58.00	5.14	3.30	0.00
59.00	5.14	3.30	0.00
60.00	5.14	3.30	0.00
61.00	5.14	3.30	0.00
62.00	5.14	3.30	0.00
63.00	5.14	3.30	0.00
64.00	5.14	3.30	0.00
65.00	5.14	3.30	0.00
66.00	5.14	3.30	0.00
67.00	5.14	3.30	0.00
68.00	5.14	3.30	0.00
69.00	5.14	3.30	0.00
70.00	5.14	3.30	0.00
71.00	5.14	3.30	0.00
72.00	5.14	3.30	0.00

Summary for Subcatchment 3P: DA-3

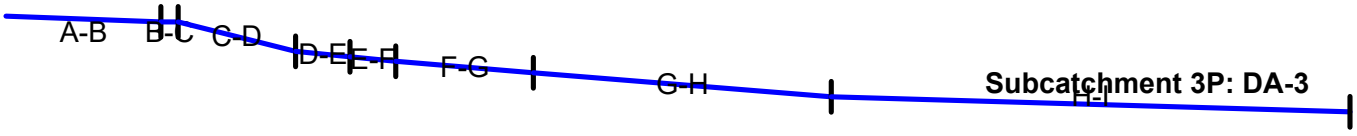
[47] Hint: Peak is 222% of capacity of segment #8

Runoff = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Depth= 4.34"
Routed to Link DP-3 : Design Point - 3

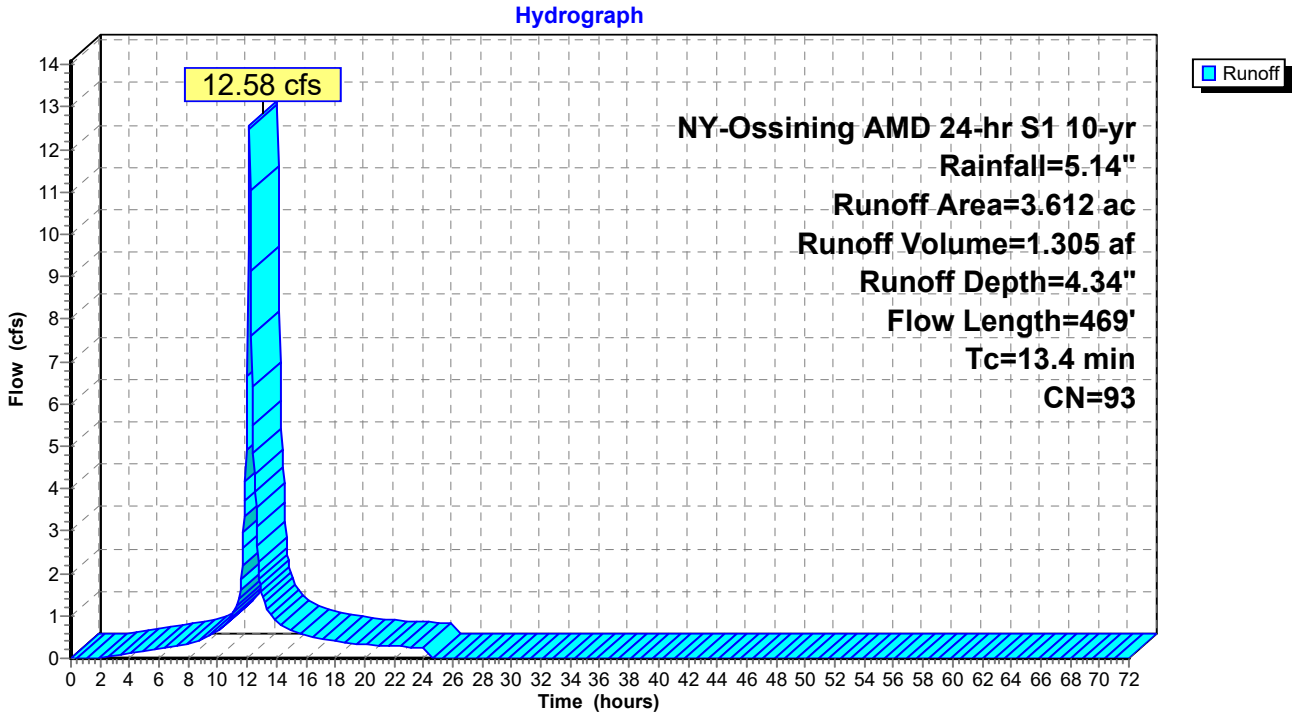
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.01	0.05
4.00	0.32	0.03	0.10
5.00	0.42	0.07	0.15
6.00	0.52	0.12	0.21
7.00	0.64	0.19	0.28
8.00	0.78	0.28	0.36
9.00	0.94	0.40	0.47
10.00	1.14	0.56	0.65
11.00	1.44	0.81	1.04
12.00	2.78	2.05	**6.64**
13.00	3.72	2.95	**1.54**
14.00	4.01	3.23	0.89
15.00	4.21	3.42	0.66
16.00	4.37	3.58	0.54
17.00	4.50	3.71	0.46
18.00	4.62	3.83	0.41
19.00	4.73	3.93	0.37
20.00	4.82	4.02	0.33
21.00	4.91	4.11	0.31
22.00	4.99	4.19	0.29
23.00	5.07	4.26	0.27
24.00	**5.14**	**4.34**	0.25
25.00	5.14	4.34	0.00
26.00	5.14	4.34	0.00
27.00	5.14	4.34	0.00
28.00	5.14	4.34	0.00
29.00	5.14	4.34	0.00
30.00	5.14	4.34	0.00
31.00	5.14	4.34	0.00
32.00	5.14	4.34	0.00
33.00	5.14	4.34	0.00
34.00	5.14	4.34	0.00
35.00	5.14	4.34	0.00
36.00	5.14	4.34	0.00
37.00	5.14	4.34	0.00
38.00	5.14	4.34	0.00
39.00	5.14	4.34	0.00
40.00	5.14	4.34	0.00
41.00	5.14	4.34	0.00
42.00	5.14	4.34	0.00
43.00	5.14	4.34	0.00
44.00	5.14	4.34	0.00
45.00	5.14	4.34	0.00
46.00	5.14	4.34	0.00
47.00	5.14	4.34	0.00
48.00	5.14	4.34	0.00
49.00	5.14	4.34	0.00
50.00	5.14	4.34	0.00
51.00	5.14	4.34	0.00
52.00	5.14	4.34	0.00
53.00	5.14	4.34	0.00
54.00	5.14	4.34	0.00
55.00	5.14	4.34	0.00
56.00	5.14	4.34	0.00
57.00	5.14	4.34	0.00
58.00	5.14	4.34	0.00
59.00	5.14	4.34	0.00
60.00	5.14	4.34	0.00
61.00	5.14	4.34	0.00
62.00	5.14	4.34	0.00
63.00	5.14	4.34	0.00
64.00	5.14	4.34	0.00
65.00	5.14	4.34	0.00
66.00	5.14	4.34	0.00
67.00	5.14	4.34	0.00
68.00	5.14	4.34	0.00
69.00	5.14	4.34	0.00
70.00	5.14	4.34	0.00
71.00	5.14	4.34	0.00
72.00	5.14	4.34	0.00

Summary for Subcatchment 4AP: DA-4A

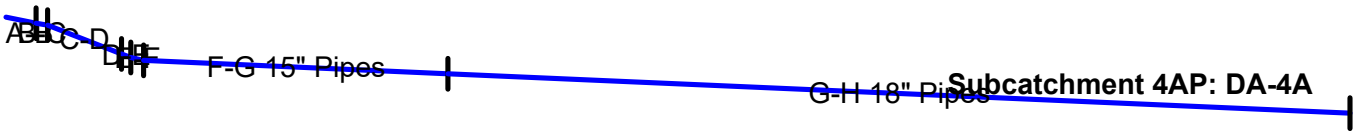
[47] Hint: Peak is 524% of capacity of segment #6
[47] Hint: Peak is 322% of capacity of segment #7

Runoff = 23.93 cfs @ 12.12 hrs, Volume= 2.403 af, Depth= 4.34"
Routed to Pond 19P : DMH-7

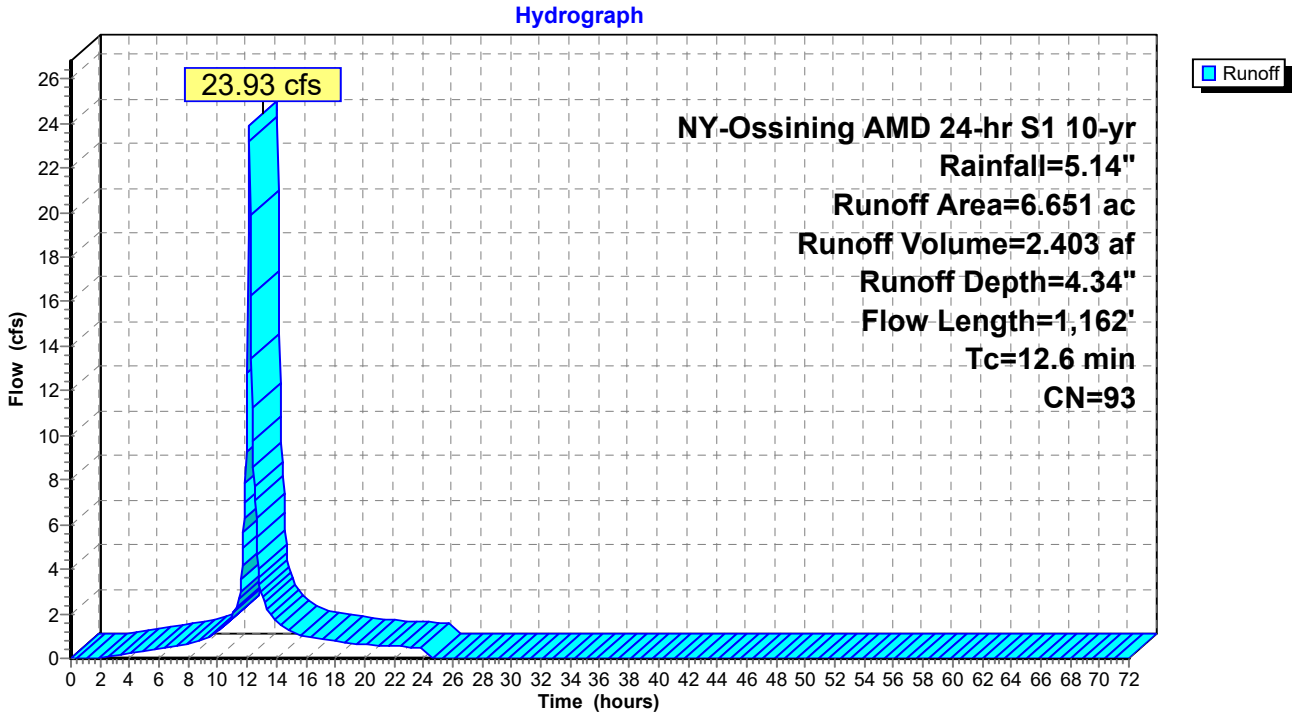
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.01	0.08
4.00	0.32	0.03	0.19
5.00	0.42	0.07	0.29
6.00	0.52	0.12	0.39
7.00	0.64	0.19	0.51
8.00	0.78	0.28	0.66
9.00	0.94	0.40	0.86
10.00	1.14	0.56	1.20
11.00	1.44	0.81	1.93
12.00	2.78	2.05	**12.83**
13.00	3.72	2.95	**2.79**
14.00	4.01	3.23	1.62
15.00	4.21	3.42	1.21
16.00	4.37	3.58	0.99
17.00	4.50	3.71	0.85
18.00	4.62	3.83	0.75
19.00	4.73	3.93	0.67
20.00	4.82	4.02	0.61
21.00	4.91	4.11	0.57
22.00	4.99	4.19	0.53
23.00	5.07	4.26	0.49
24.00	**5.14**	**4.34**	0.47
25.00	5.14	4.34	0.00
26.00	5.14	4.34	0.00
27.00	5.14	4.34	0.00
28.00	5.14	4.34	0.00
29.00	5.14	4.34	0.00
30.00	5.14	4.34	0.00
31.00	5.14	4.34	0.00
32.00	5.14	4.34	0.00
33.00	5.14	4.34	0.00
34.00	5.14	4.34	0.00
35.00	5.14	4.34	0.00
36.00	5.14	4.34	0.00
37.00	5.14	4.34	0.00
38.00	5.14	4.34	0.00
39.00	5.14	4.34	0.00
40.00	5.14	4.34	0.00
41.00	5.14	4.34	0.00
42.00	5.14	4.34	0.00
43.00	5.14	4.34	0.00
44.00	5.14	4.34	0.00
45.00	5.14	4.34	0.00
46.00	5.14	4.34	0.00
47.00	5.14	4.34	0.00
48.00	5.14	4.34	0.00
49.00	5.14	4.34	0.00
50.00	5.14	4.34	0.00
51.00	5.14	4.34	0.00
52.00	5.14	4.34	0.00
53.00	5.14	4.34	0.00
54.00	5.14	4.34	0.00
55.00	5.14	4.34	0.00
56.00	5.14	4.34	0.00
57.00	5.14	4.34	0.00
58.00	5.14	4.34	0.00
59.00	5.14	4.34	0.00
60.00	5.14	4.34	0.00
61.00	5.14	4.34	0.00
62.00	5.14	4.34	0.00
63.00	5.14	4.34	0.00
64.00	5.14	4.34	0.00
65.00	5.14	4.34	0.00
66.00	5.14	4.34	0.00
67.00	5.14	4.34	0.00
68.00	5.14	4.34	0.00
69.00	5.14	4.34	0.00
70.00	5.14	4.34	0.00
71.00	5.14	4.34	0.00
72.00	5.14	4.34	0.00

Summary for Subcatchment 4BP: DA-4B

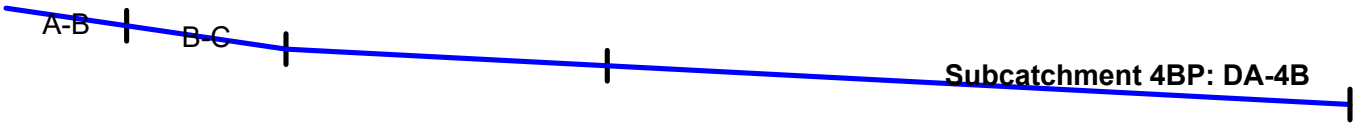
[47] Hint: Peak is 555% of capacity of segment #3

Runoff = 13.97 cfs @ 12.19 hrs, Volume= 1.542 af, Depth= 2.48"
Routed to Pond 19P : DMH-7

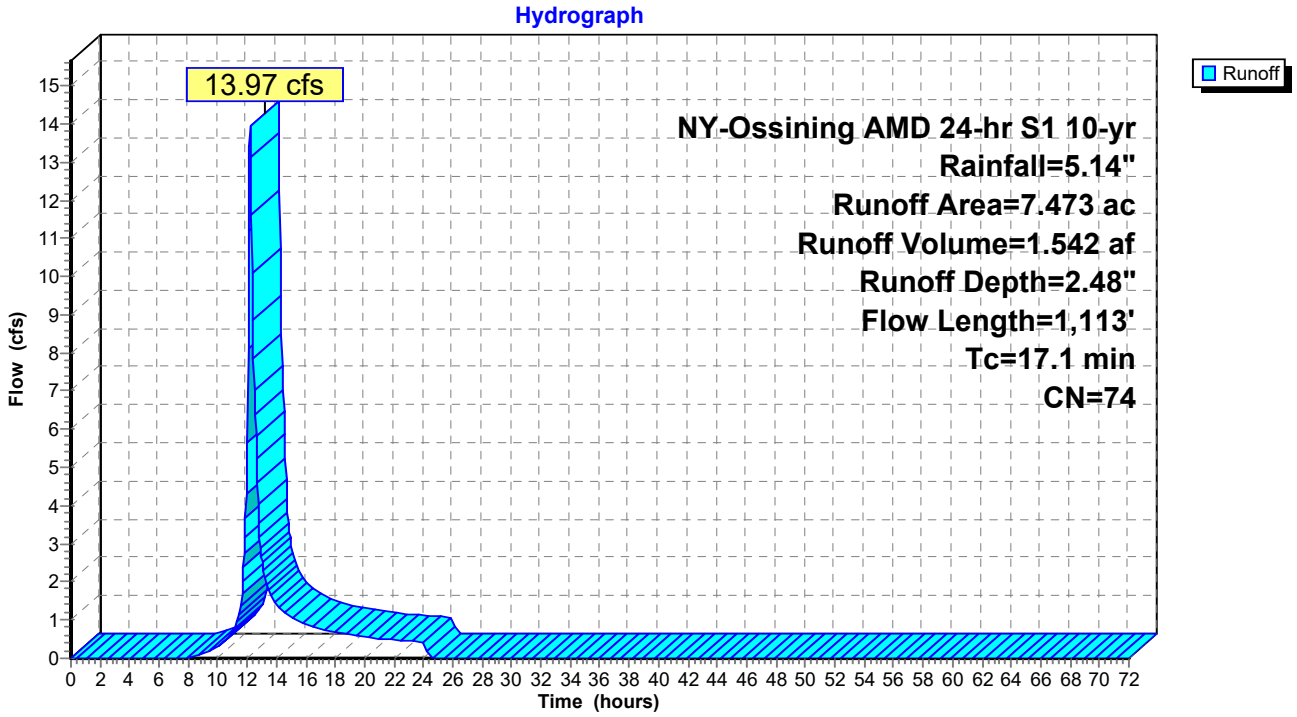
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.00	0.00
8.00	0.78	0.00	0.02
9.00	0.94	0.01	0.13
10.00	1.14	0.05	0.30
11.00	1.44	0.13	0.70
12.00	2.78	0.77	**5.64**
13.00	3.72	1.39	**2.51**
14.00	4.01	1.60	1.40
15.00	4.21	1.75	1.06
16.00	4.37	1.87	0.87
17.00	4.50	1.97	0.75
18.00	4.62	2.07	0.67
19.00	4.73	2.15	0.61
20.00	4.82	2.22	0.56
21.00	4.91	2.29	0.52
22.00	4.99	2.36	0.48
23.00	5.07	2.42	0.45
24.00	**5.14**	**2.48**	0.43
25.00	5.14	2.48	0.00
26.00	5.14	2.48	0.00
27.00	5.14	2.48	0.00
28.00	5.14	2.48	0.00
29.00	5.14	2.48	0.00
30.00	5.14	2.48	0.00
31.00	5.14	2.48	0.00
32.00	5.14	2.48	0.00
33.00	5.14	2.48	0.00
34.00	5.14	2.48	0.00
35.00	5.14	2.48	0.00
36.00	5.14	2.48	0.00
37.00	5.14	2.48	0.00
38.00	5.14	2.48	0.00
39.00	5.14	2.48	0.00
40.00	5.14	2.48	0.00
41.00	5.14	2.48	0.00
42.00	5.14	2.48	0.00
43.00	5.14	2.48	0.00
44.00	5.14	2.48	0.00
45.00	5.14	2.48	0.00
46.00	5.14	2.48	0.00
47.00	5.14	2.48	0.00
48.00	5.14	2.48	0.00
49.00	5.14	2.48	0.00
50.00	5.14	2.48	0.00
51.00	5.14	2.48	0.00
52.00	5.14	2.48	0.00
53.00	5.14	2.48	0.00
54.00	5.14	2.48	0.00
55.00	5.14	2.48	0.00
56.00	5.14	2.48	0.00
57.00	5.14	2.48	0.00
58.00	5.14	2.48	0.00
59.00	5.14	2.48	0.00
60.00	5.14	2.48	0.00
61.00	5.14	2.48	0.00
62.00	5.14	2.48	0.00
63.00	5.14	2.48	0.00
64.00	5.14	2.48	0.00
65.00	5.14	2.48	0.00
66.00	5.14	2.48	0.00
67.00	5.14	2.48	0.00
68.00	5.14	2.48	0.00
69.00	5.14	2.48	0.00
70.00	5.14	2.48	0.00
71.00	5.14	2.48	0.00
72.00	5.14	2.48	0.00

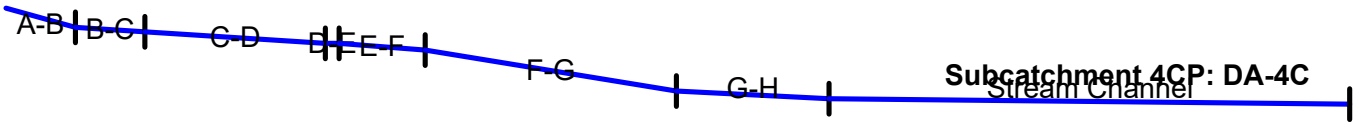
Summary for Subcatchment 4CP: DA-4C

Runoff = 18.39 cfs @ 12.13 hrs, Volume= 1.800 af, Depth= 2.22"
Routed to Link DP-4 : DP-4

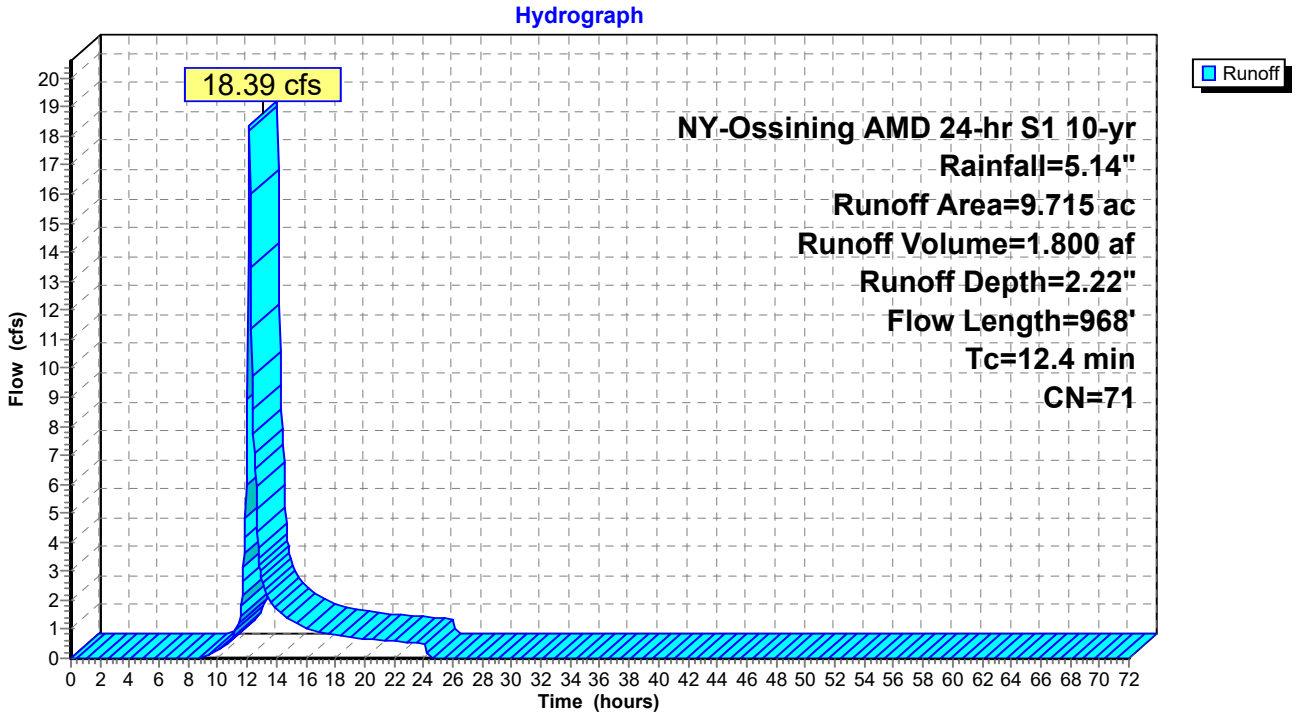
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.00
3.00	0.23	0.00	0.00
4.00	0.32	0.00	0.00
5.00	0.42	0.00	0.00
6.00	0.52	0.00	0.00
7.00	0.64	0.00	0.00
8.00	0.78	0.00	0.00
9.00	0.94	0.00	0.07
10.00	1.14	0.02	0.27
11.00	1.44	0.08	0.74
12.00	2.78	0.64	**8.91**
13.00	3.72	1.21	**2.73**
14.00	4.01	1.40	1.66
15.00	4.21	1.54	1.27
16.00	4.37	1.65	1.05
17.00	4.50	1.75	0.91
18.00	4.62	1.83	0.81
19.00	4.73	1.91	0.74
20.00	4.82	1.98	0.68
21.00	4.91	2.05	0.63
22.00	4.99	2.11	0.59
23.00	5.07	2.17	0.56
24.00	**5.14**	**2.22**	0.53
25.00	5.14	2.22	0.00
26.00	5.14	2.22	0.00
27.00	5.14	2.22	0.00
28.00	5.14	2.22	0.00
29.00	5.14	2.22	0.00
30.00	5.14	2.22	0.00
31.00	5.14	2.22	0.00
32.00	5.14	2.22	0.00
33.00	5.14	2.22	0.00
34.00	5.14	2.22	0.00
35.00	5.14	2.22	0.00
36.00	5.14	2.22	0.00
37.00	5.14	2.22	0.00
38.00	5.14	2.22	0.00
39.00	5.14	2.22	0.00
40.00	5.14	2.22	0.00
41.00	5.14	2.22	0.00
42.00	5.14	2.22	0.00
43.00	5.14	2.22	0.00
44.00	5.14	2.22	0.00
45.00	5.14	2.22	0.00
46.00	5.14	2.22	0.00
47.00	5.14	2.22	0.00
48.00	5.14	2.22	0.00
49.00	5.14	2.22	0.00
50.00	5.14	2.22	0.00
51.00	5.14	2.22	0.00
52.00	5.14	2.22	0.00
53.00	5.14	2.22	0.00
54.00	5.14	2.22	0.00
55.00	5.14	2.22	0.00
56.00	5.14	2.22	0.00
57.00	5.14	2.22	0.00
58.00	5.14	2.22	0.00
59.00	5.14	2.22	0.00
60.00	5.14	2.22	0.00
61.00	5.14	2.22	0.00
62.00	5.14	2.22	0.00
63.00	5.14	2.22	0.00
64.00	5.14	2.22	0.00
65.00	5.14	2.22	0.00
66.00	5.14	2.22	0.00
67.00	5.14	2.22	0.00
68.00	5.14	2.22	0.00
69.00	5.14	2.22	0.00
70.00	5.14	2.22	0.00
71.00	5.14	2.22	0.00
72.00	5.14	2.22	0.00

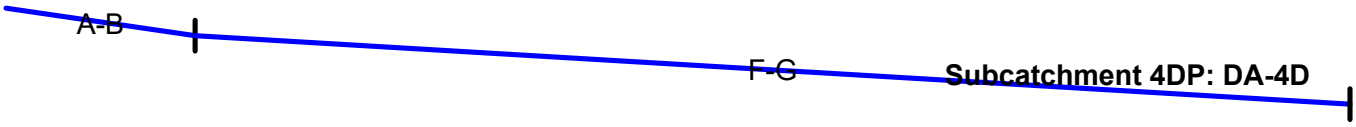
Summary for Subcatchment 4DP: DA-4D

Runoff = 6.48 cfs @ 12.04 hrs, Volume= 0.518 af, Depth= 4.56"
Routed to Pond 6P : Infiltrators

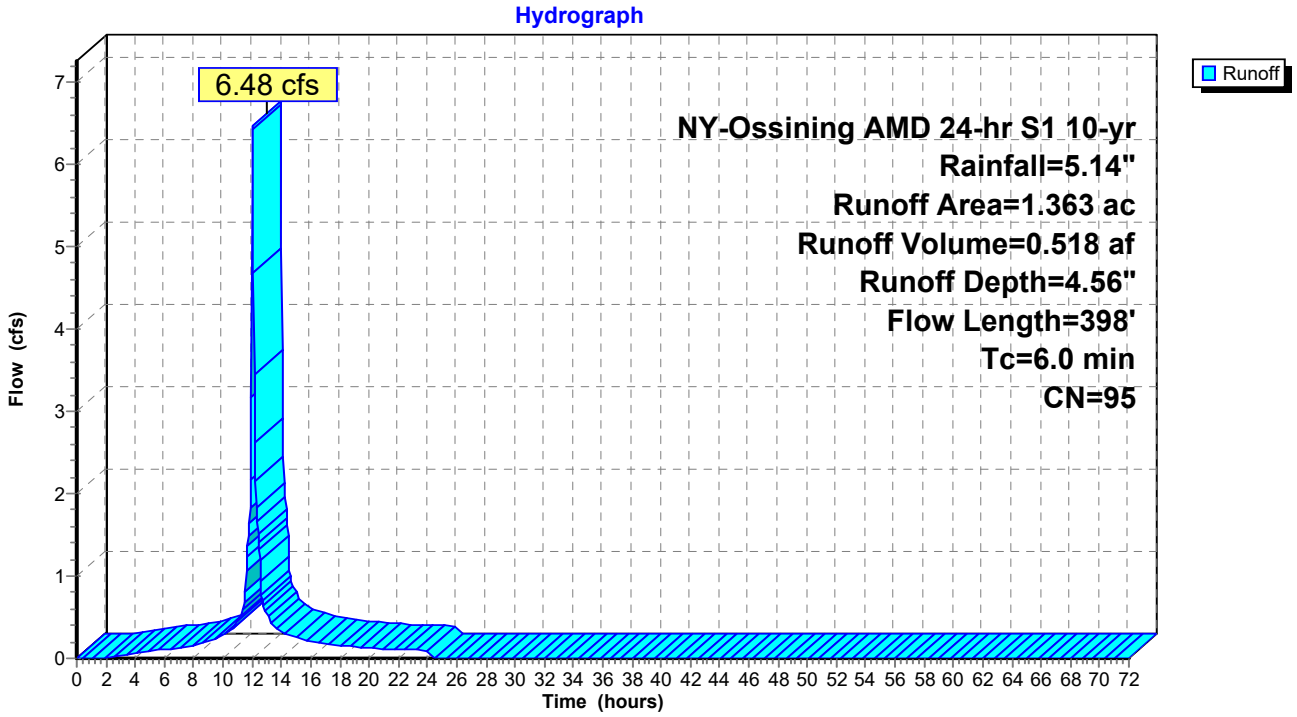
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 10-yr Rainfall=5.14"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.07	0.00	0.00
2.00	0.15	0.00	0.01
3.00	0.23	0.02	0.04
4.00	0.32	0.06	0.06
5.00	0.42	0.12	0.08
6.00	0.52	0.18	0.10
7.00	0.64	0.27	0.13
8.00	0.78	0.38	0.16
9.00	0.94	0.51	0.20
10.00	1.14	0.69	0.28
11.00	1.44	0.95	0.45
12.00	2.78	2.24	**5.72**
13.00	3.72	3.15	**0.53**
14.00	4.01	3.44	0.32
15.00	4.21	3.63	0.25
16.00	4.37	3.79	0.20
17.00	4.50	3.93	0.17
18.00	4.62	4.04	0.15
19.00	4.73	4.15	0.14
20.00	4.82	4.24	0.13
21.00	4.91	4.33	0.12
22.00	4.99	4.41	0.11
23.00	5.07	4.49	0.10
24.00	**5.14**	**4.56**	0.10
25.00	5.14	4.56	0.00
26.00	5.14	4.56	0.00
27.00	5.14	4.56	0.00
28.00	5.14	4.56	0.00
29.00	5.14	4.56	0.00
30.00	5.14	4.56	0.00
31.00	5.14	4.56	0.00
32.00	5.14	4.56	0.00
33.00	5.14	4.56	0.00
34.00	5.14	4.56	0.00
35.00	5.14	4.56	0.00
36.00	5.14	4.56	0.00
37.00	5.14	4.56	0.00
38.00	5.14	4.56	0.00
39.00	5.14	4.56	0.00
40.00	5.14	4.56	0.00
41.00	5.14	4.56	0.00
42.00	5.14	4.56	0.00
43.00	5.14	4.56	0.00
44.00	5.14	4.56	0.00
45.00	5.14	4.56	0.00
46.00	5.14	4.56	0.00
47.00	5.14	4.56	0.00
48.00	5.14	4.56	0.00
49.00	5.14	4.56	0.00
50.00	5.14	4.56	0.00
51.00	5.14	4.56	0.00
52.00	5.14	4.56	0.00
53.00	5.14	4.56	0.00
54.00	5.14	4.56	0.00
55.00	5.14	4.56	0.00
56.00	5.14	4.56	0.00
57.00	5.14	4.56	0.00
58.00	5.14	4.56	0.00
59.00	5.14	4.56	0.00
60.00	5.14	4.56	0.00
61.00	5.14	4.56	0.00
62.00	5.14	4.56	0.00
63.00	5.14	4.56	0.00
64.00	5.14	4.56	0.00
65.00	5.14	4.56	0.00
66.00	5.14	4.56	0.00
67.00	5.14	4.56	0.00
68.00	5.14	4.56	0.00
69.00	5.14	4.56	0.00
70.00	5.14	4.56	0.00
71.00	5.14	4.56	0.00
72.00	5.14	4.56	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 4.56" for 10-yr event
Inflow = 6.48 cfs @ 12.04 hrs, Volume= 0.518 af
Outflow = 2.01 cfs @ 12.27 hrs, Volume= 0.518 af, Atten= 69%, Lag= 14.1 min
Discarded = 0.07 cfs @ 6.00 hrs, Volume= 0.149 af
Primary = 1.94 cfs @ 12.27 hrs, Volume= 0.369 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.43' @ 12.27 hrs Surf.Area= 0.132 ac Storage= 0.155 af

Plug-Flow detention time= 102.3 min calculated for 0.517 af (100% of inflow)
Center-of-Mass det. time= 102.5 min (874.8 - 772.3)

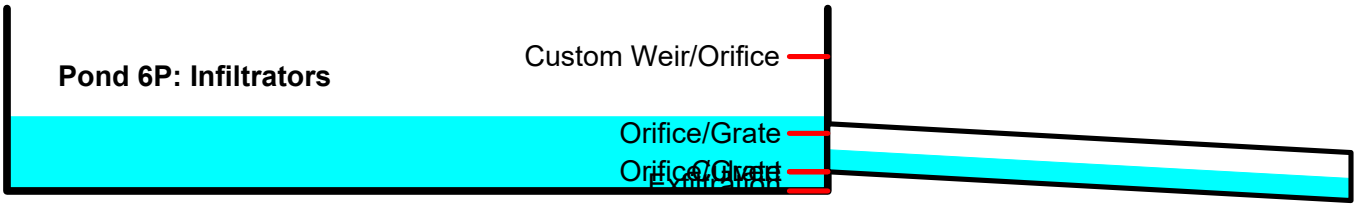
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 6.00 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.94 cfs @ 12.27 hrs HW=348.43' TW=336.70' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.94 cfs of 4.19 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.03 cfs @ 5.23 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.91 cfs @ 2.11 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Weir

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

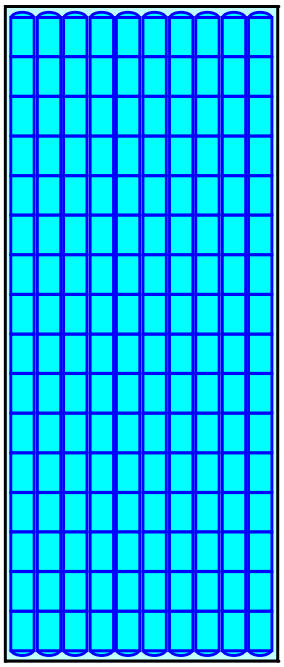
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

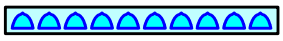
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

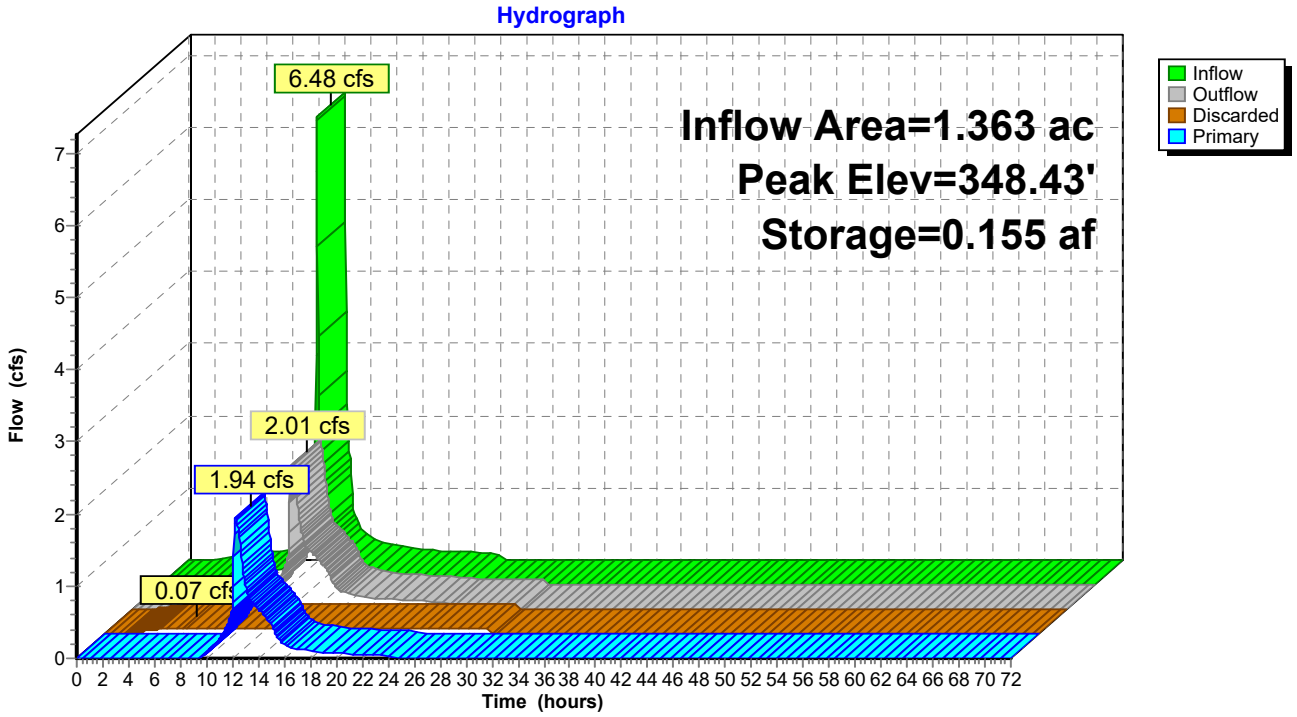
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08

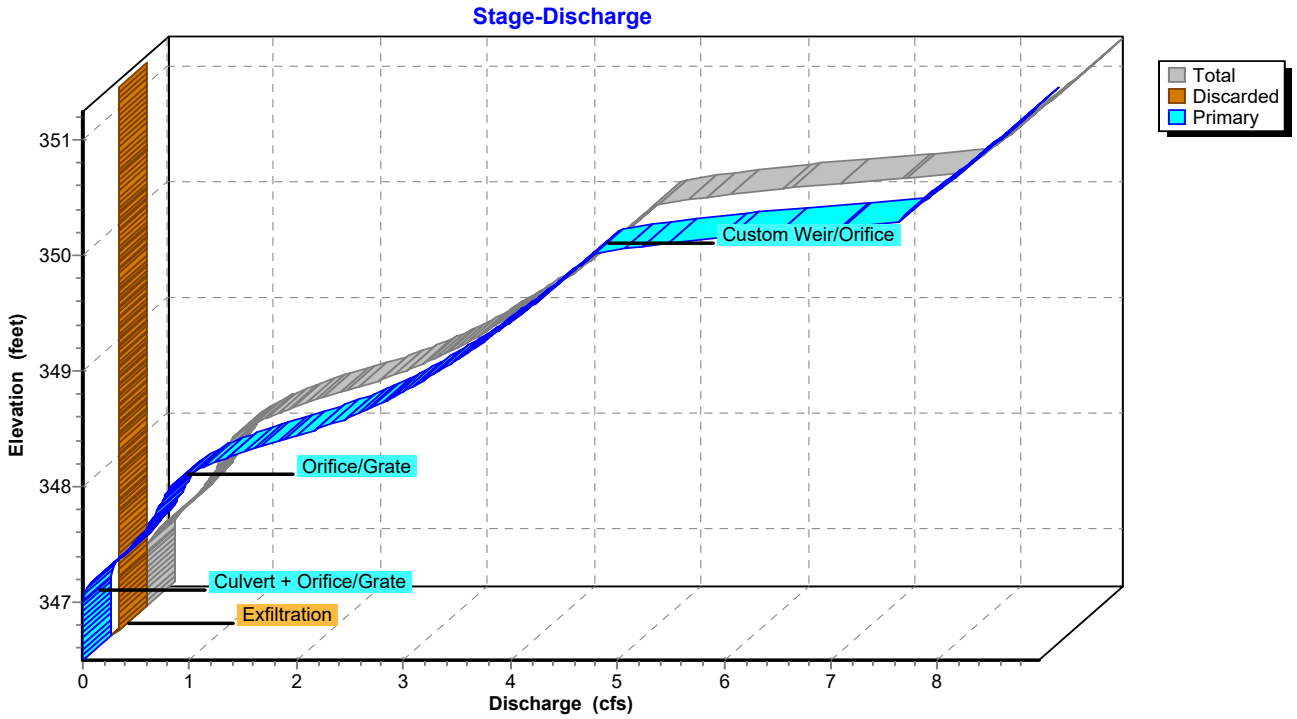




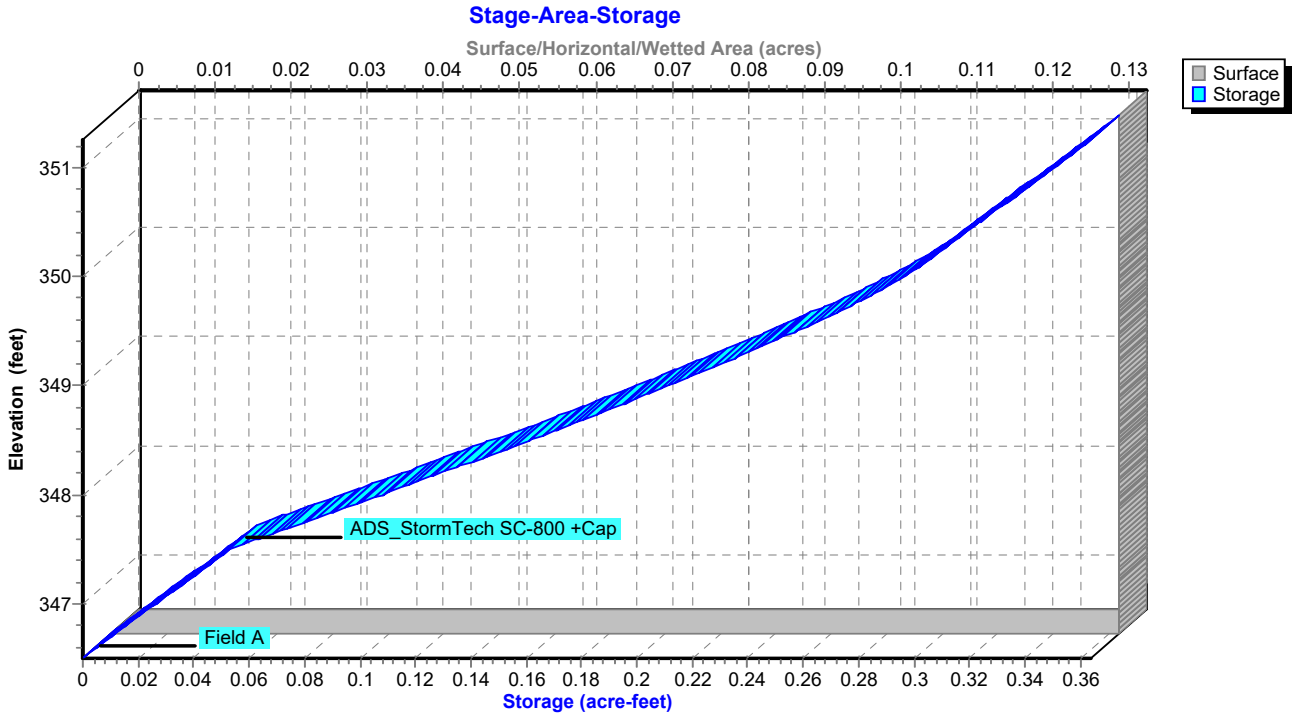
Pond 6P: Infiltrators



Pond 6P: Infiltrators



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.03	0.000	346.50	0.03	0.03	0.00
5.00	0.08	0.000	346.51	0.07	**0.07**	0.00
7.50	0.14	0.010	346.68	0.07	**0.07**	0.00
10.00	**0.28**	**0.035**	**347.16**	**0.14**	0.07	**0.07**
12.50	**1.32**	**0.148**	**348.37**	**1.80**	0.07	**1.73**
15.00	0.25	0.053	347.50	0.54	0.07	0.47
17.50	0.16	0.037	347.20	0.18	0.07	0.11
20.00	0.13	0.035	347.15	0.14	0.07	0.07
22.50	0.10	0.033	347.12	0.11	0.07	0.04
25.00	0.00	0.026	347.00	0.07	0.07	0.00
27.50	0.00	0.013	346.74	0.07	0.07	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

Inflow = 8.50 cfs @ 12.15 hrs, Volume= 0.486 af
Outflow = 6.07 cfs @ 12.41 hrs, Volume= 0.486 af, Atten= 29%, Lag= 15.6 min
Primary = 6.07 cfs @ 12.41 hrs, Volume= 0.486 af
Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 333.41' @ 12.35 hrs Surf.Area= 0.347 ac Storage= 0.182 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.1 min (766.8 - 746.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.03 cfs @ 12.41 hrs HW=333.38' TW=332.65' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 6.03 cfs @ 4.12 fps)
↑**2=Orifice/Grate** (Passes 6.03 cfs of 7.28 cfs potential flow)

Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

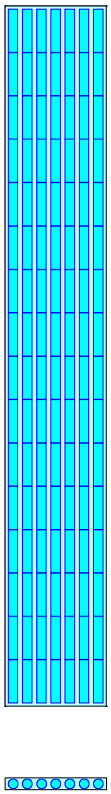
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

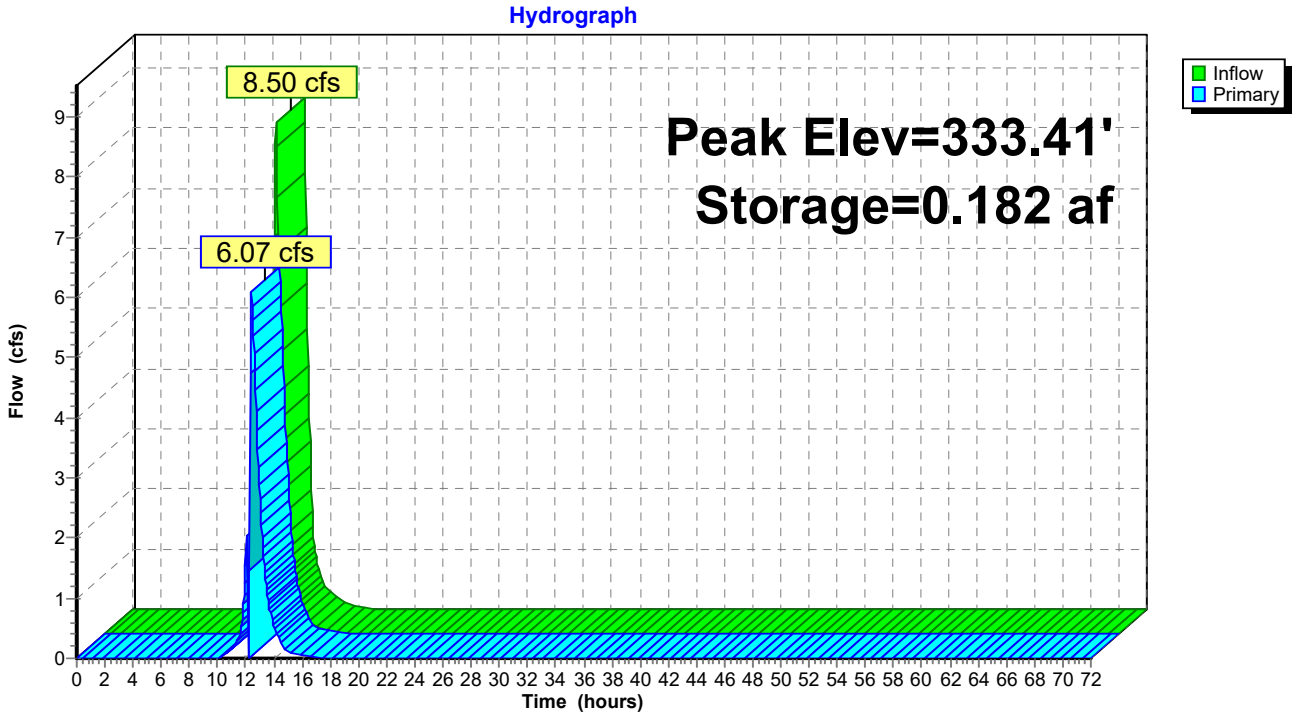
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

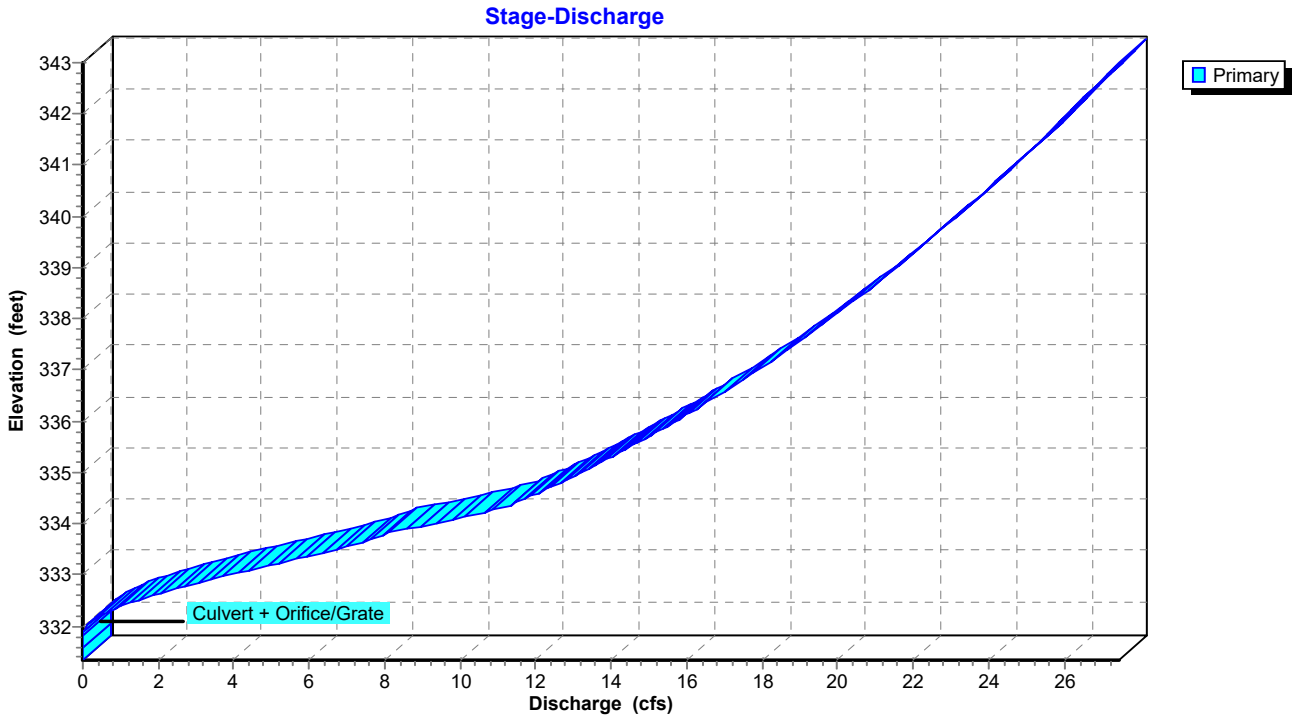
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



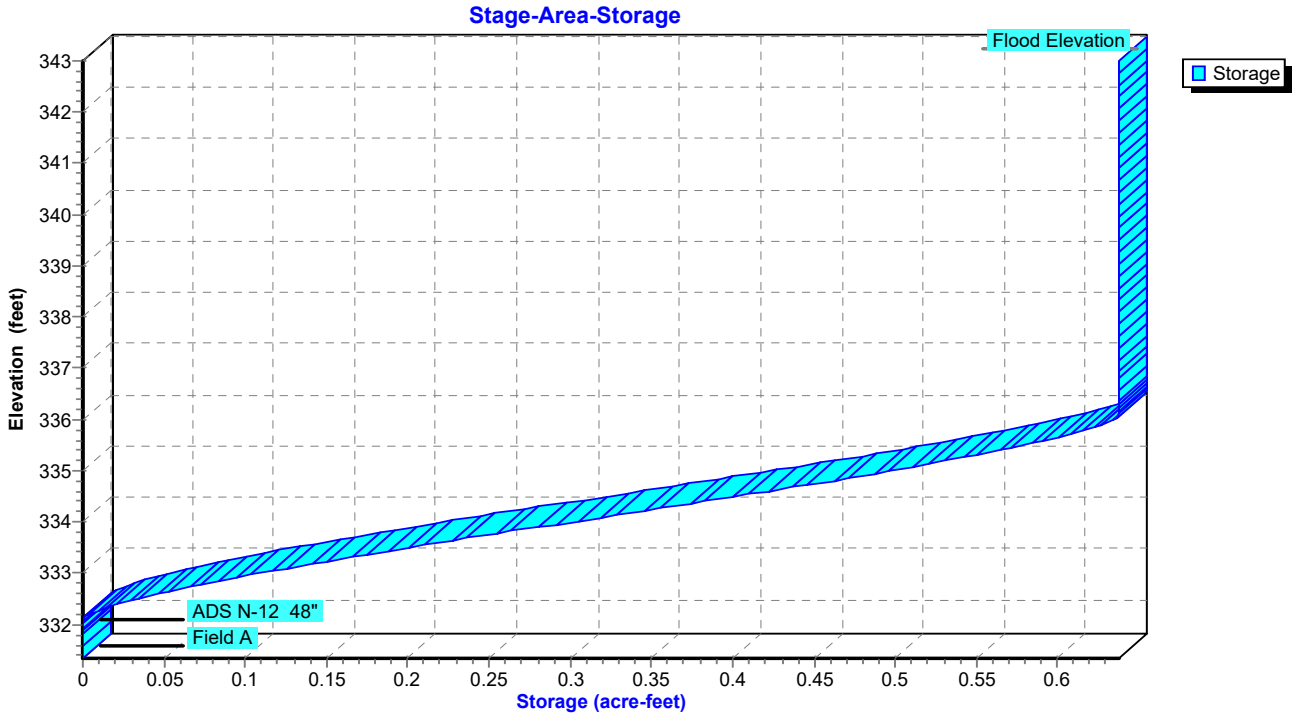
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.84	0.00
7.50	0.00	0.000	331.84	0.00
10.00	**0.00**	**0.000**	**331.87**	**0.00**
12.50	**3.58**	**0.164**	**333.31**	**5.62**
15.00	0.13	0.000	332.03	0.13
17.50	0.01	0.000	331.88	0.00
20.00	0.00	0.000	331.84	0.00
22.50	0.00	0.000	331.84	0.00
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Outflow = 8.65 cfs @ 12.95 hrs, Volume= 4.290 af, Atten= 71%, Lag= 49.2 min
Primary = 8.65 cfs @ 12.95 hrs, Volume= 4.290 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 291.05' @ 12.95 hrs Surf.Area= 52,016 sf Storage= 89,681 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 734.6 min calculated for 4.290 af (99% of inflow)
Center-of-Mass det. time= 731.2 min (1,555.9 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

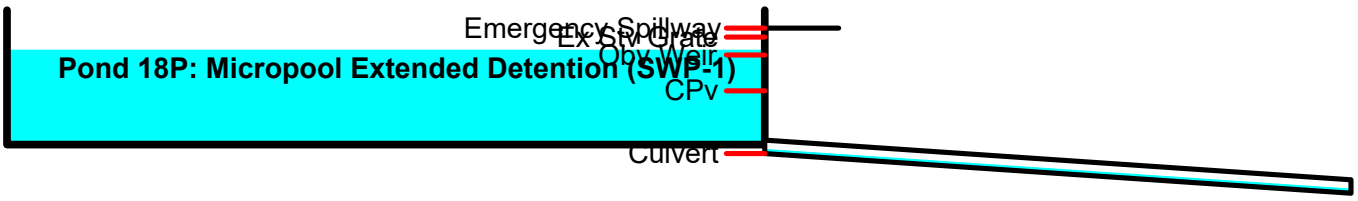
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

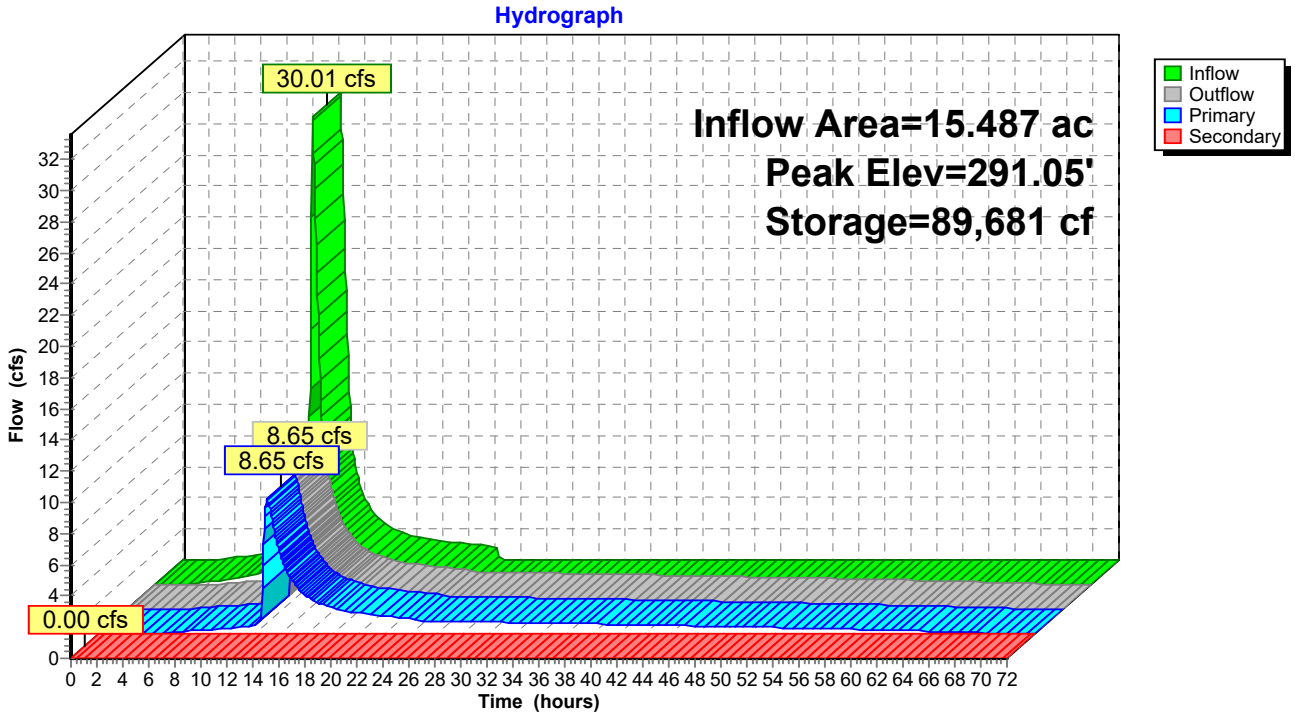
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.65 cfs @ 12.95 hrs HW=291.05' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 8.65 cfs of 27.96 cfs potential flow)
  ├─**2=CPv** (Orifice Controls 0.88 cfs @ 10.08 fps)
  ├─**3=Obv Weir** (Orifice Controls 7.77 cfs @ 2.37 fps)
  └─**4=Ex Stv Grate** (Controls 0.00 cfs)

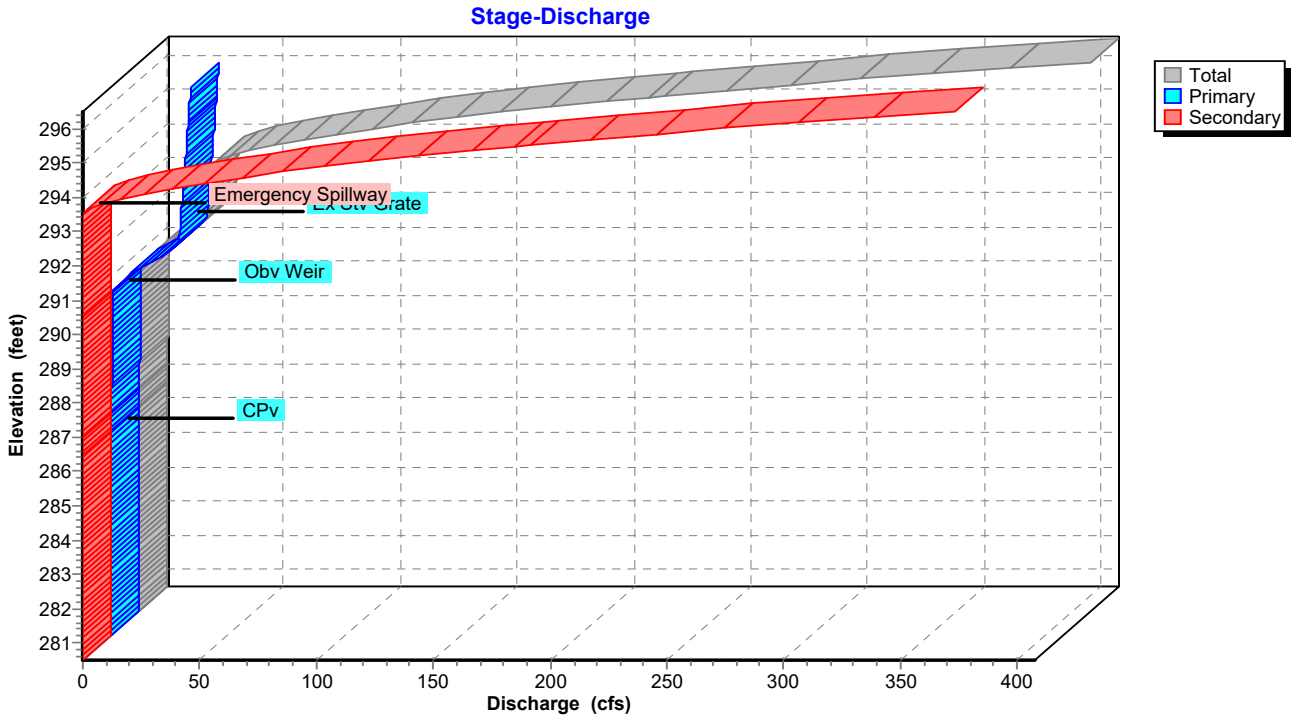
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



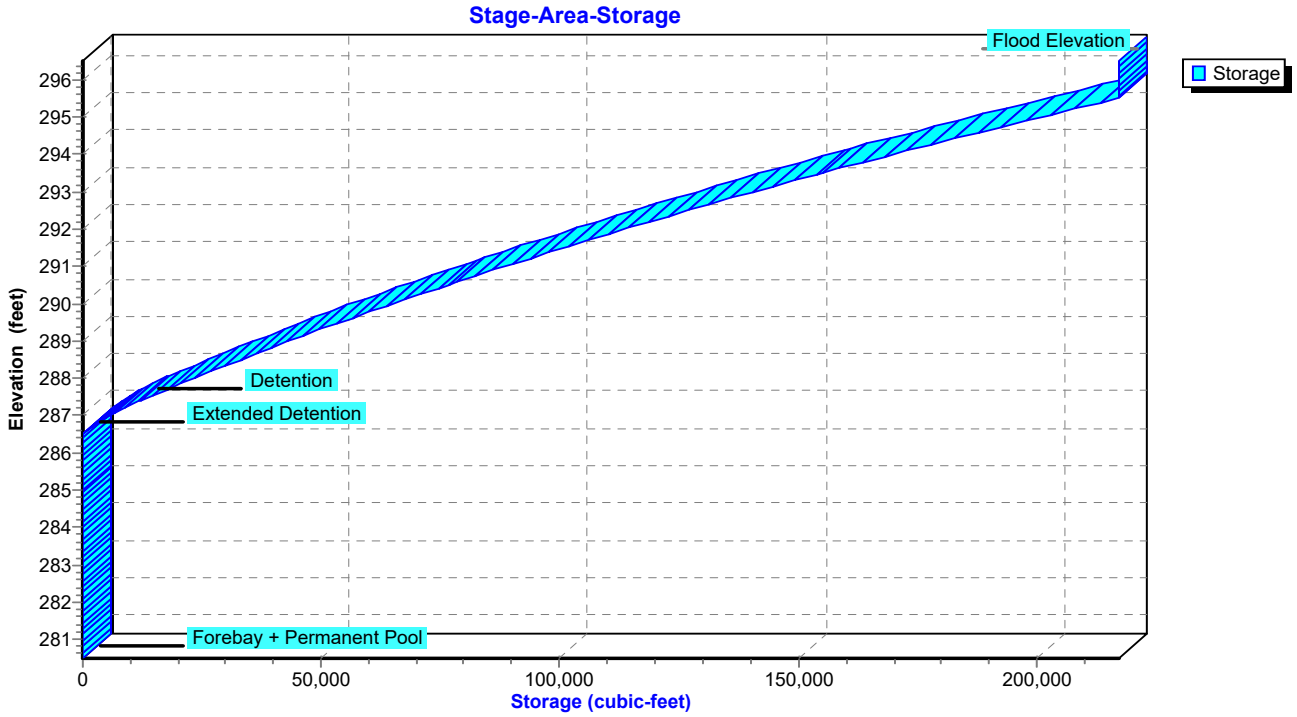
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.03	18	286.50	0.00	0.00	0.00
5.00	0.29	1,361	286.64	0.04	0.04	0.00
7.50	0.58	4,104	286.88	0.19	0.19	0.00
10.00	**1.57**	10,314	287.30	0.34	0.34	0.00
12.50	**18.54**	**79,129**	**290.61**	**1.51**	**1.51**	0.00
15.00	2.74	**82,497**	**290.75**	**3.24**	**3.24**	0.00
17.50	1.61	79,761	290.63	1.78	1.78	0.00
20.00	1.24	78,672	290.59	1.33	1.33	0.00
22.50	1.02	77,953	290.56	1.09	1.09	0.00
25.00	0.00	75,232	290.44	0.82	0.82	0.00
27.50	0.00	68,039	290.13	0.78	0.78	0.00
30.00	0.00	61,160	289.82	0.75	0.75	0.00
32.50	0.00	54,602	289.53	0.71	0.71	0.00
35.00	0.00	48,372	289.24	0.67	0.67	0.00
37.50	0.00	42,478	288.96	0.64	0.64	0.00
40.00	0.00	36,927	288.69	0.60	0.60	0.00
42.50	0.00	31,727	288.43	0.56	0.56	0.00
45.00	0.00	26,886	288.18	0.52	0.52	0.00
47.50	0.00	22,410	287.95	0.48	0.48	0.00
50.00	0.00	18,307	287.74	0.43	0.43	0.00
52.50	0.00	14,583	287.54	0.39	0.39	0.00
55.00	0.00	11,245	287.36	0.35	0.35	0.00
57.50	0.00	8,313	287.18	0.30	0.30	0.00
60.00	0.00	5,840	287.01	0.25	0.25	0.00
62.50	0.00	3,888	286.86	0.19	0.19	0.00
65.00	0.00	2,519	286.75	0.12	0.12	0.00
67.50	0.00	1,727	286.67	0.07	0.07	0.00
70.00	0.00	1,273	286.63	0.04	0.04	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

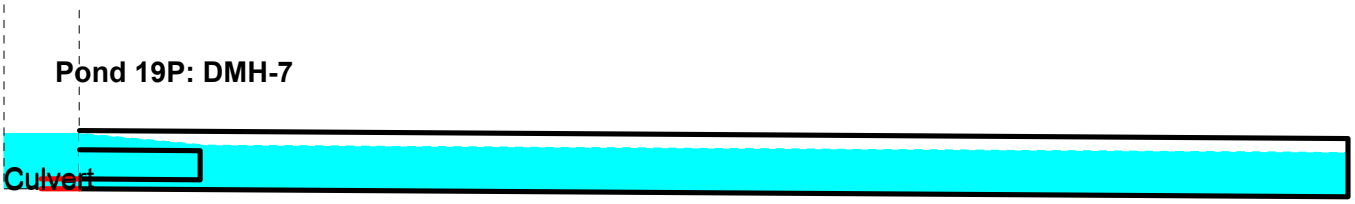
Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 38.33 cfs @ 12.15 hrs, Volume= 4.314 af
Outflow = 38.33 cfs @ 12.15 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.0 min
Primary = 29.83 cfs @ 12.15 hrs, Volume= 3.828 af
Routed to Pond 20P : DMH-8
Secondary = 8.50 cfs @ 12.15 hrs, Volume= 0.486 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 337.19' @ 12.15 hrs
Flood Elev= 343.83'

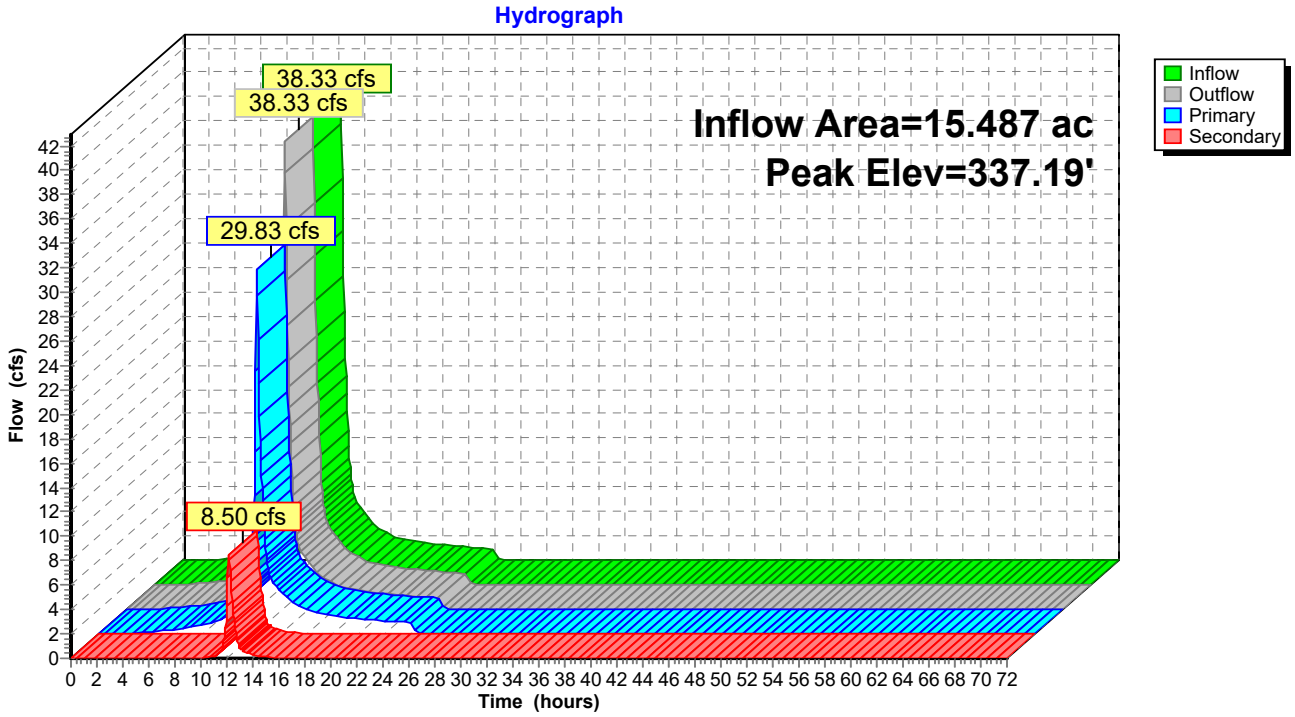
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=29.77 cfs @ 12.15 hrs HW=337.19' TW=333.36' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 29.77 cfs @ 5.53 fps)

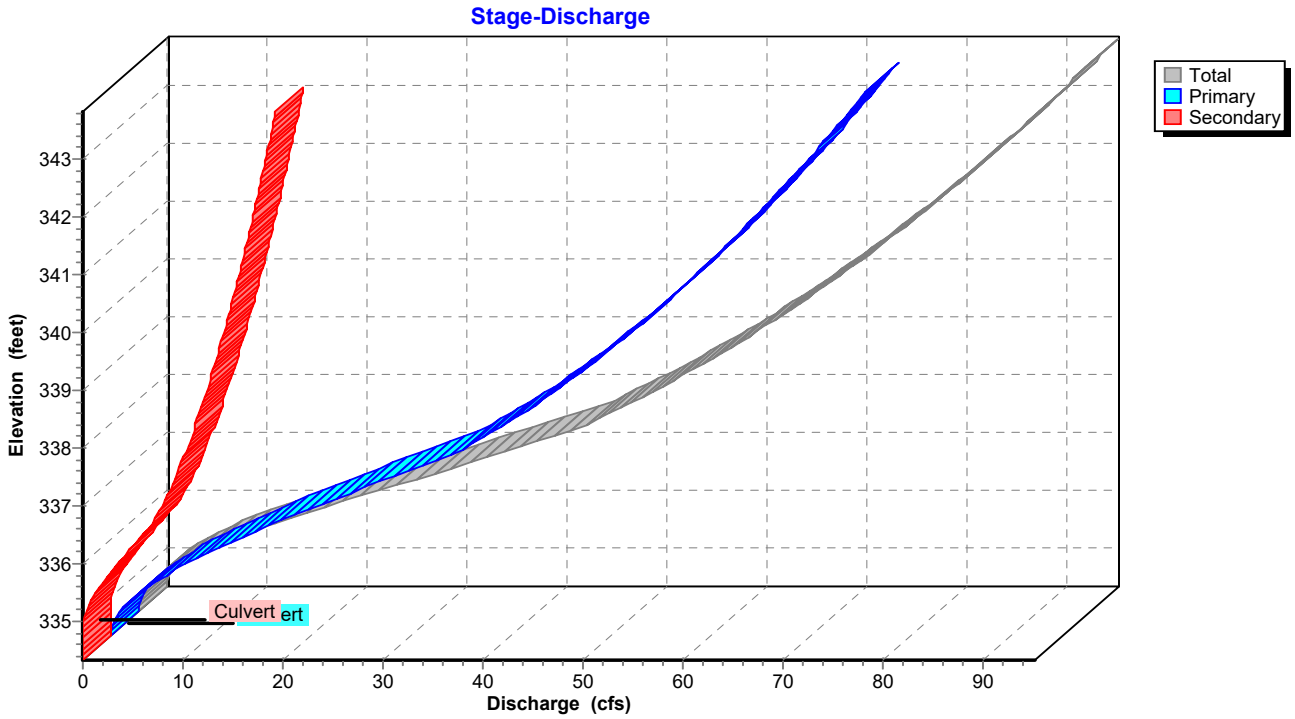
Secondary OutFlow Max=8.49 cfs @ 12.15 hrs HW=337.19' TW=332.99' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 8.49 cfs @ 4.80 fps)



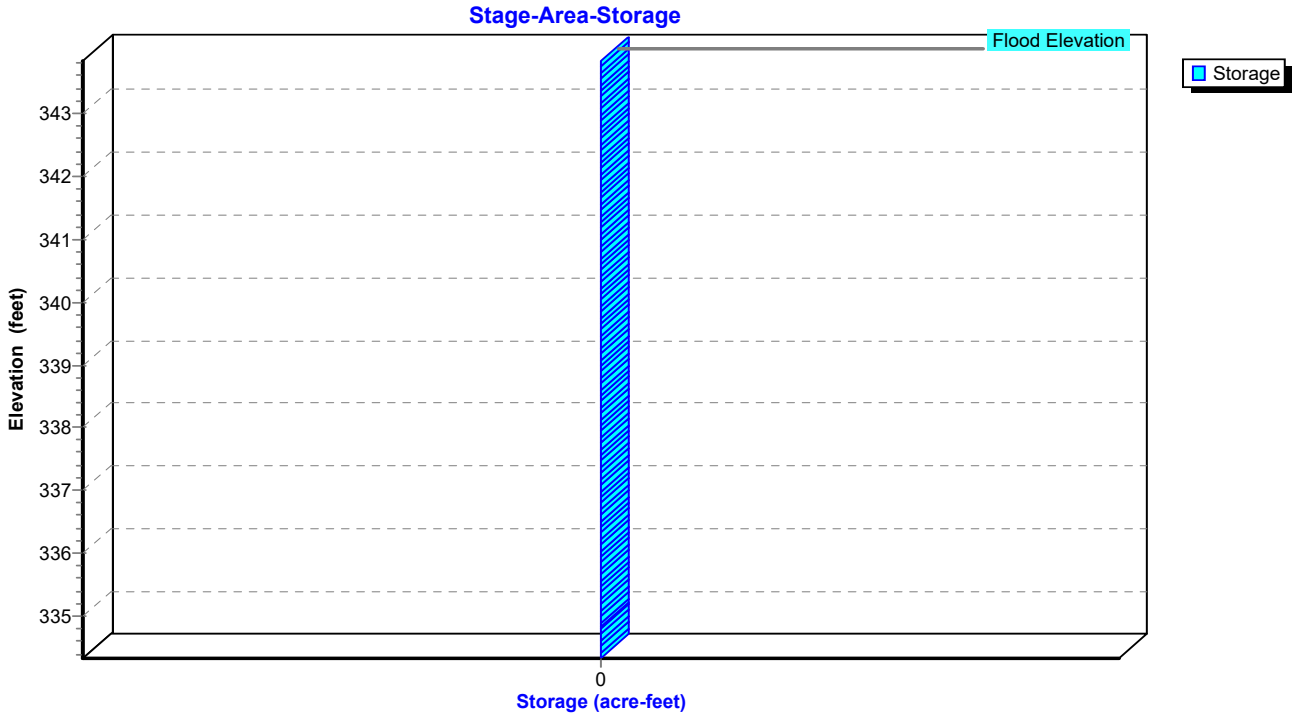
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.03	334.42	0.03	0.03	0.00
5.00	0.29	334.57	0.29	0.29	0.00
7.50	0.58	334.66	0.58	0.58	0.00
10.00	**1.57**	**334.87**	**1.57**	**1.57**	**0.00**
12.50	**16.50**	**336.03**	**16.50**	**12.92**	**3.58**
15.00	2.74	335.04	2.74	2.62	0.13
17.50	1.61	334.88	1.61	1.61	0.01
20.00	1.24	334.81	1.24	1.24	0.00
22.50	1.02	334.77	1.02	1.02	0.00
25.00	0.00	334.34	0.00	0.00	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.44	0.05	0.05	0.00
334.54	0.22	0.22	0.00
334.64	0.50	0.50	0.00
334.74	0.89	0.89	0.00
334.84	1.38	1.38	0.00
334.94	2.00	1.97	0.03
335.04	2.77	2.64	0.13
335.14	3.68	3.39	0.29
335.24	4.72	4.22	0.50
335.34	5.88	5.12	0.76
335.44	7.15	6.09	1.07
335.54	8.53	7.12	1.41
335.64	10.00	8.21	1.80
335.74	11.57	9.35	2.22
335.84	13.21	10.54	2.67
335.94	14.93	11.79	3.14
336.04	16.72	13.08	3.64
336.14	18.55	14.41	4.15
336.24	20.44	15.77	4.66
336.34	22.35	17.17	5.18
336.44	24.29	18.60	5.69
336.54	26.23	20.06	6.17
336.64	28.16	21.53	6.63
336.74	30.05	23.02	7.02
336.84	31.81	24.53	7.28
336.94	33.84	26.04	7.80
337.04	35.64	27.55	8.09
337.14	37.42	29.06	8.36
337.24	39.18	30.55	8.63
337.34	40.92	32.03	8.89
337.44	42.62	33.49	9.14
337.54	44.29	34.91	9.38
337.64	45.67	36.05	9.62
337.74	46.89	37.04	9.85
337.84	48.08	38.00	10.08
337.94	49.24	38.94	10.30
338.04	50.37	39.85	10.51
338.14	51.48	40.75	10.73
338.24	52.56	41.63	10.94
338.34	53.62	42.48	11.14
338.44	54.67	43.33	11.34
338.54	55.69	44.15	11.54
338.64	56.69	44.96	11.73
338.74	57.68	45.76	11.92
338.84	58.65	46.54	12.11
338.94	59.60	47.31	12.29
339.04	60.54	48.07	12.48
339.14	61.47	48.81	12.66
339.24	62.38	49.55	12.83
339.34	63.28	50.27	13.01
339.44	64.16	50.98	13.18
339.54	65.04	51.69	13.35
339.64	65.90	52.38	13.52
339.74	66.75	53.06	13.68
339.84	67.59	53.74	13.85
339.94	68.42	54.41	14.01
340.04	69.24	55.07	14.17
340.14	70.05	55.72	14.33
340.24	70.85	56.36	14.49
340.34	71.64	57.00	14.64
340.44	72.42	57.63	14.79
340.54	73.20	58.25	14.95
340.64	73.96	58.87	15.10
340.74	74.72	59.48	15.24
340.84	75.47	60.08	15.39
340.94	76.22	60.68	15.54
341.04	76.95	61.27	15.68
341.14	77.68	61.86	15.83
341.24	78.41	62.44	15.97
341.34	79.12	63.02	16.11
341.44	79.83	63.59	16.25
341.54	80.54	64.15	16.39
341.64	81.23	64.71	16.52
341.74	81.93	65.27	16.66
341.84	82.61	65.82	16.79
341.94	83.29	66.36	16.93
342.04	83.97	66.91	17.06
342.14	84.63	67.44	17.19
342.24	85.30	67.98	17.32
342.34	85.96	68.50	17.45
342.44	86.61	69.03	17.58
342.54	87.26	69.55	17.71
342.64	87.90	70.07	17.84
342.74	88.54	70.58	17.96
342.84	89.18	71.09	18.09
342.94	89.81	71.60	18.21
343.04	90.43	72.10	18.34
343.14	91.06	72.60	18.46
343.24	91.67	73.09	18.58
343.34	92.29	73.59	18.70
343.44	92.90	74.07	18.82
343.54	93.50	74.56	18.94
343.64	94.10	75.04	19.06
343.74	**94.70**	**75.52**	**19.18**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000
334.44	0.000	339.64	0.000
334.54	0.000	339.74	0.000
334.64	0.000	339.84	0.000
334.74	0.000	339.94	0.000
334.84	0.000	340.04	0.000
334.94	0.000	340.14	0.000
335.04	0.000	340.24	0.000
335.14	0.000	340.34	0.000
335.24	0.000	340.44	0.000
335.34	0.000	340.54	0.000
335.44	0.000	340.64	0.000
335.54	0.000	340.74	0.000
335.64	0.000	340.84	0.000
335.74	0.000	340.94	0.000
335.84	0.000	341.04	0.000
335.94	0.000	341.14	0.000
336.04	0.000	341.24	0.000
336.14	0.000	341.34	0.000
336.24	0.000	341.44	0.000
336.34	0.000	341.54	0.000
336.44	0.000	341.64	0.000
336.54	0.000	341.74	0.000
336.64	0.000	341.84	0.000
336.74	0.000	341.94	0.000
336.84	0.000	342.04	0.000
336.94	0.000	342.14	0.000
337.04	0.000	342.24	0.000
337.14	0.000	342.34	0.000
337.24	0.000	342.44	0.000
337.34	0.000	342.54	0.000
337.44	0.000	342.64	0.000
337.54	0.000	342.74	0.000
337.64	0.000	342.84	0.000
337.74	0.000	342.94	0.000
337.84	0.000	343.04	0.000
337.94	0.000	343.14	0.000
338.04	0.000	343.24	0.000
338.14	0.000	343.34	0.000
338.24	0.000	343.44	0.000
338.34	0.000	343.54	0.000
338.44	0.000	343.64	0.000
338.54	0.000	343.74	0.000
338.64	0.000		
338.74	0.000		
338.84	0.000		
338.94	0.000		
339.04	0.000		
339.14	0.000		
339.24	0.000		
339.34	0.000		
339.44	0.000		

Summary for Pond 20P: DMH-8

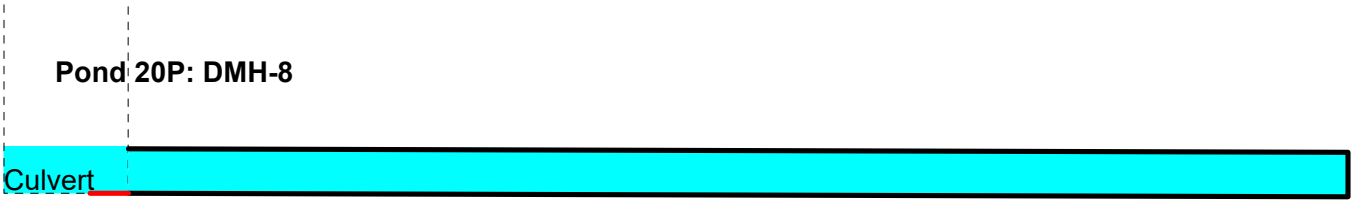
[80] Warning: Exceeded Pond 9P by 0.37' @ 12.15 hrs (5.19 cfs 0.048 af)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Outflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.0 min
Primary = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Routed to Pond 21P : DMH-9

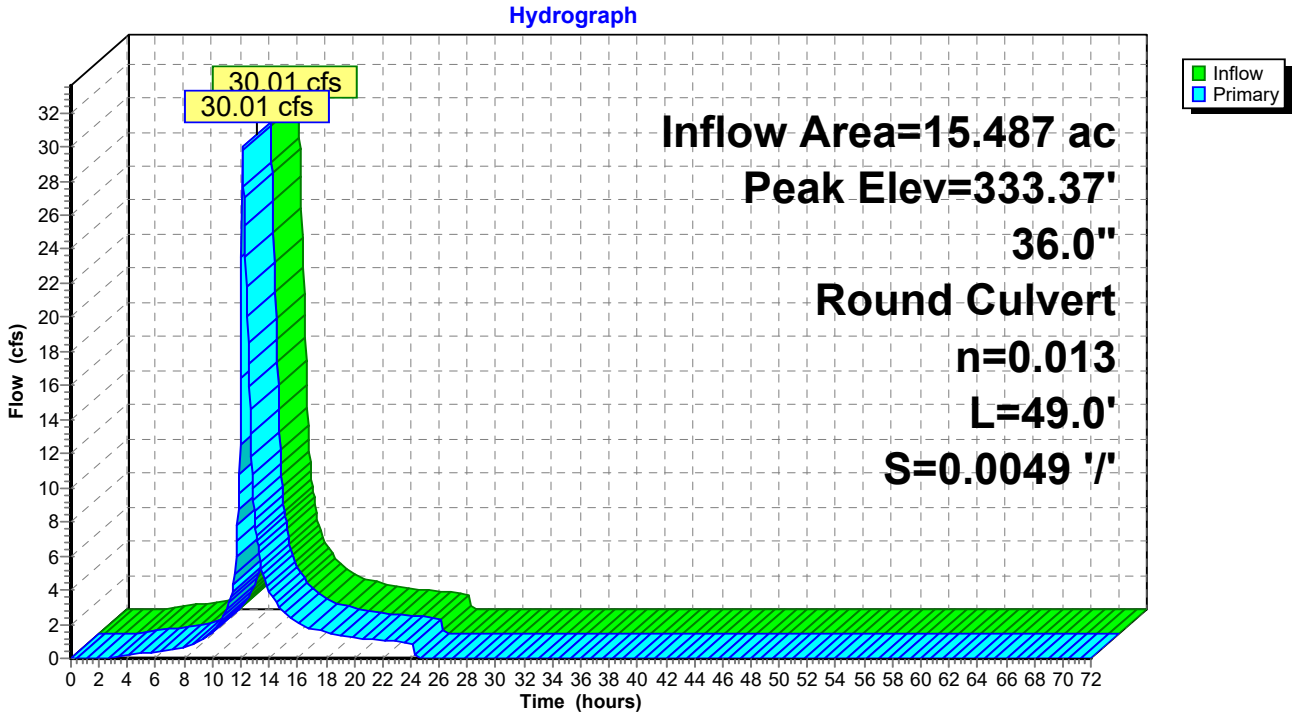
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 333.37' @ 12.16 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

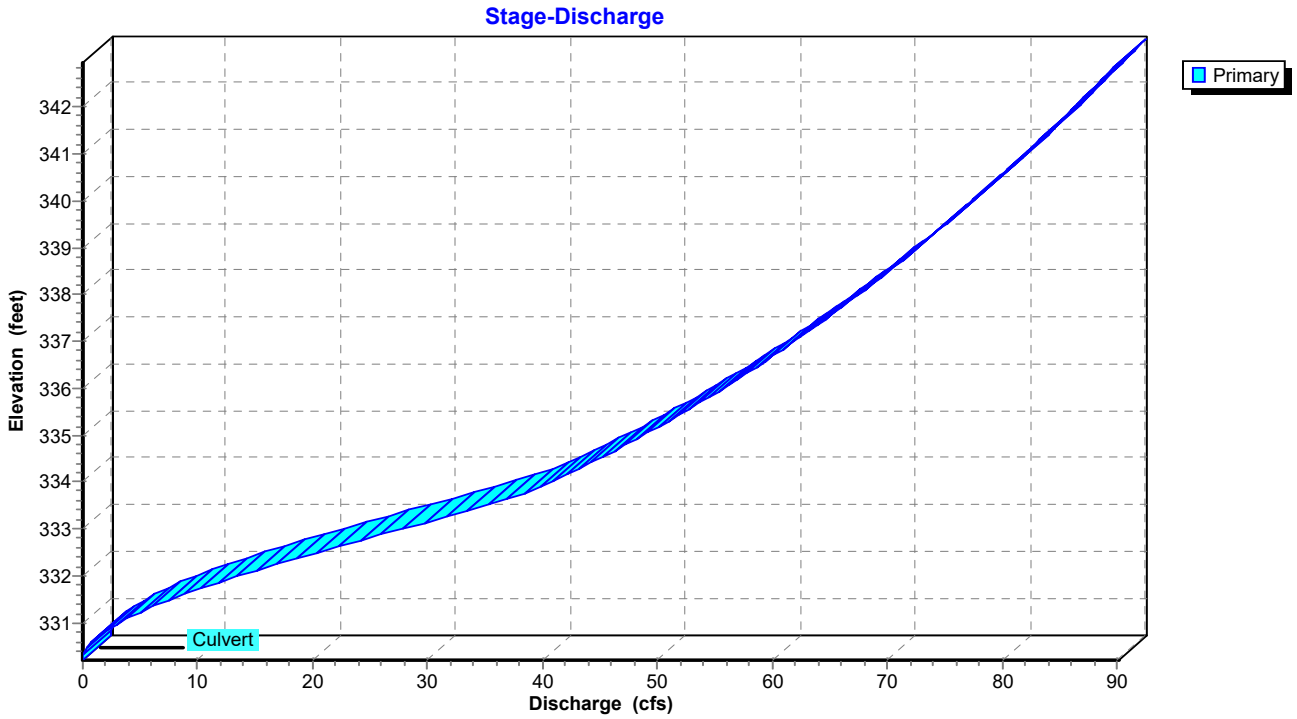
Primary OutFlow Max=28.53 cfs @ 12.13 hrs HW=333.27' TW=332.14' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 28.53 cfs @ 4.04 fps)



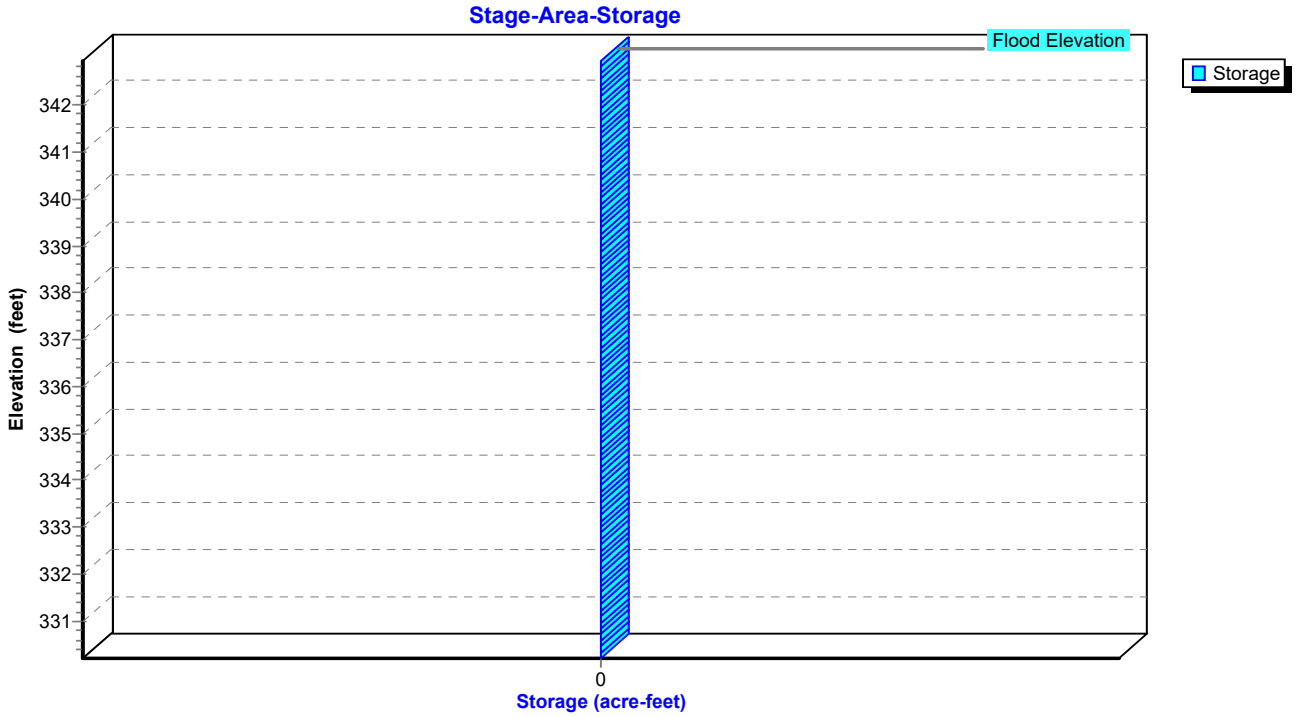
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.20	0.00
2.00	0.00	330.20	0.00
3.00	0.08	330.33	0.08
4.00	0.19	330.39	0.19
5.00	0.29	330.43	0.29
6.00	0.39	330.47	0.39
7.00	0.51	330.51	0.51
8.00	0.68	330.56	0.68
9.00	0.99	330.63	0.99
10.00	1.57	330.75	1.57
11.00	2.90	330.96	2.90
12.00	**16.46**	**332.22**	**16.46**
13.00	**8.10**	**331.54**	**8.10**
14.00	3.96	331.10	3.96
15.00	2.74	330.94	2.74
16.00	2.06	330.83	2.06
17.00	1.73	330.78	1.73
18.00	1.52	330.74	1.52
19.00	1.36	330.71	1.36
20.00	1.24	330.69	1.24
21.00	1.14	330.67	1.14
22.00	1.06	330.65	1.06
23.00	0.99	330.63	0.99
24.00	0.93	330.62	0.93
25.00	0.00	330.20	0.00
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

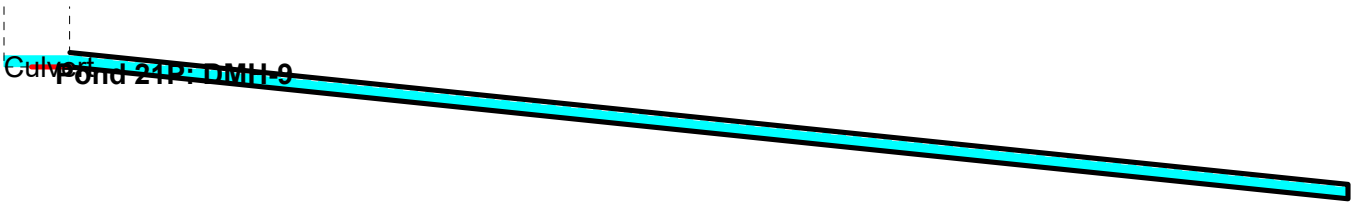
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Outflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.0 min
Primary = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Routed to Pond 23P : DMH-10

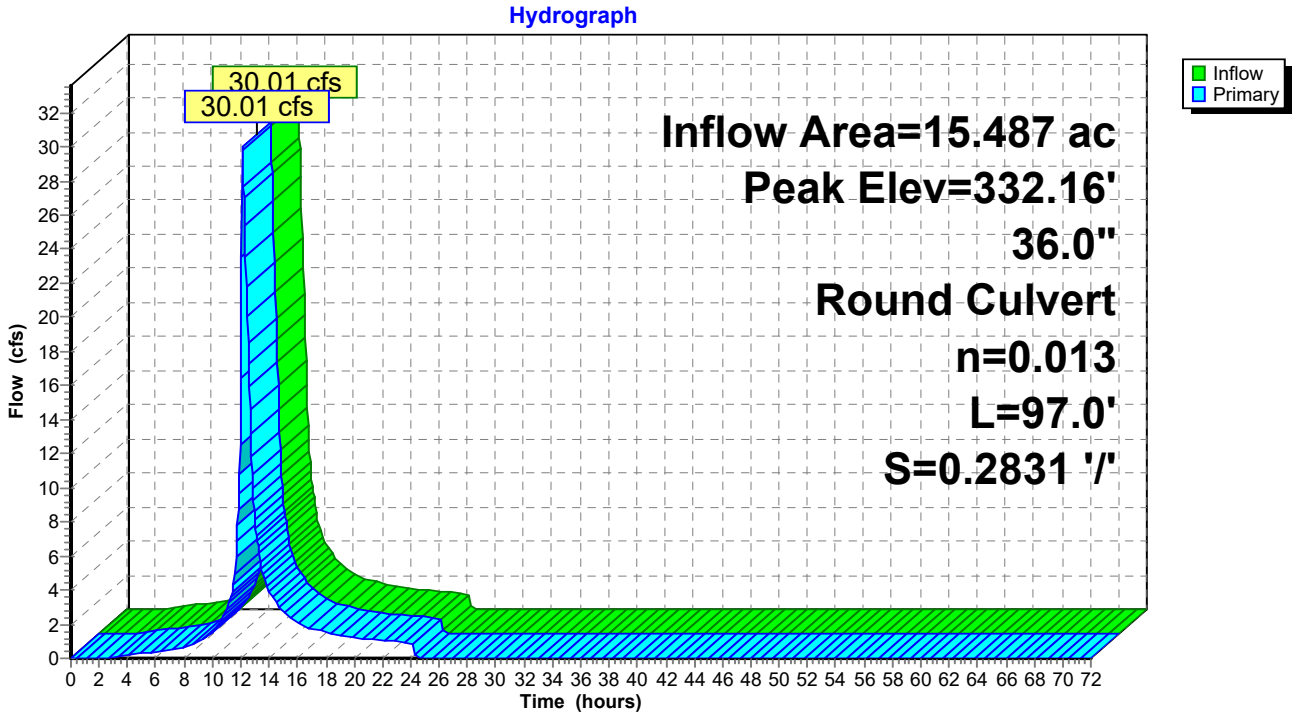
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.16' @ 12.13 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

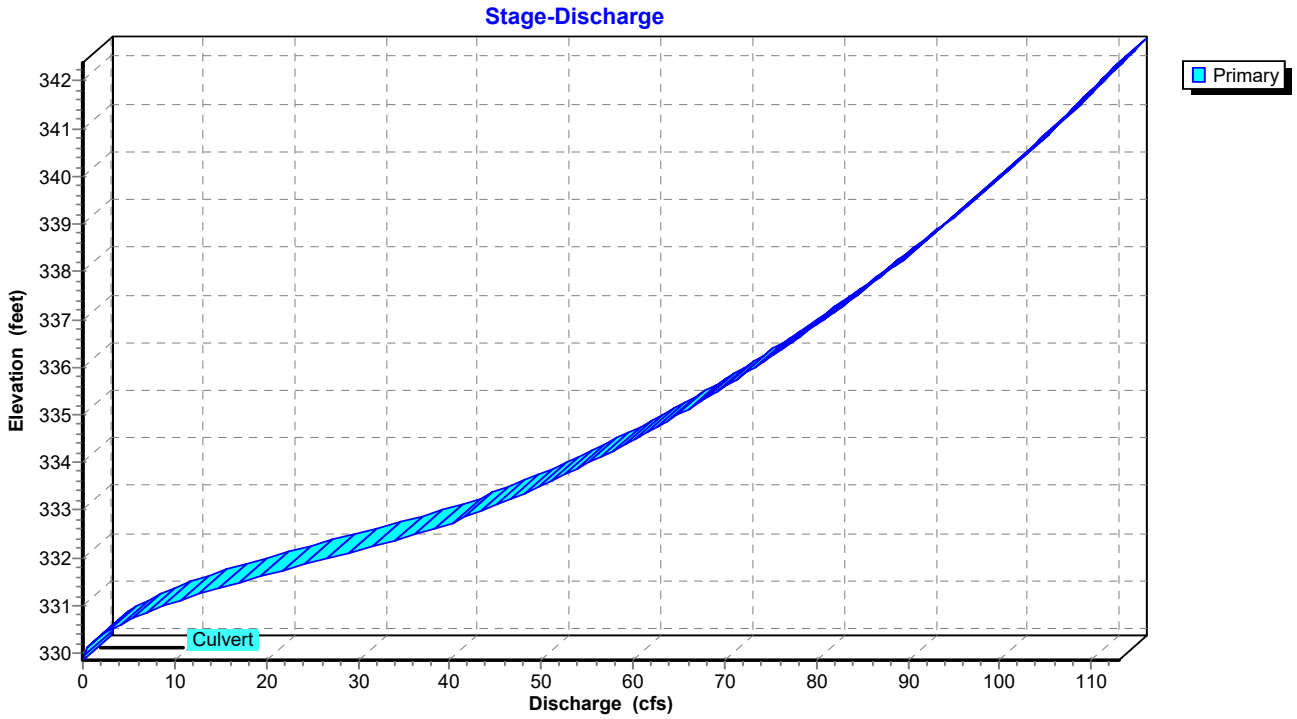
Primary OutFlow Max=29.72 cfs @ 12.13 hrs HW=332.14' TW=300.86' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 29.72 cfs @ 5.15 fps)



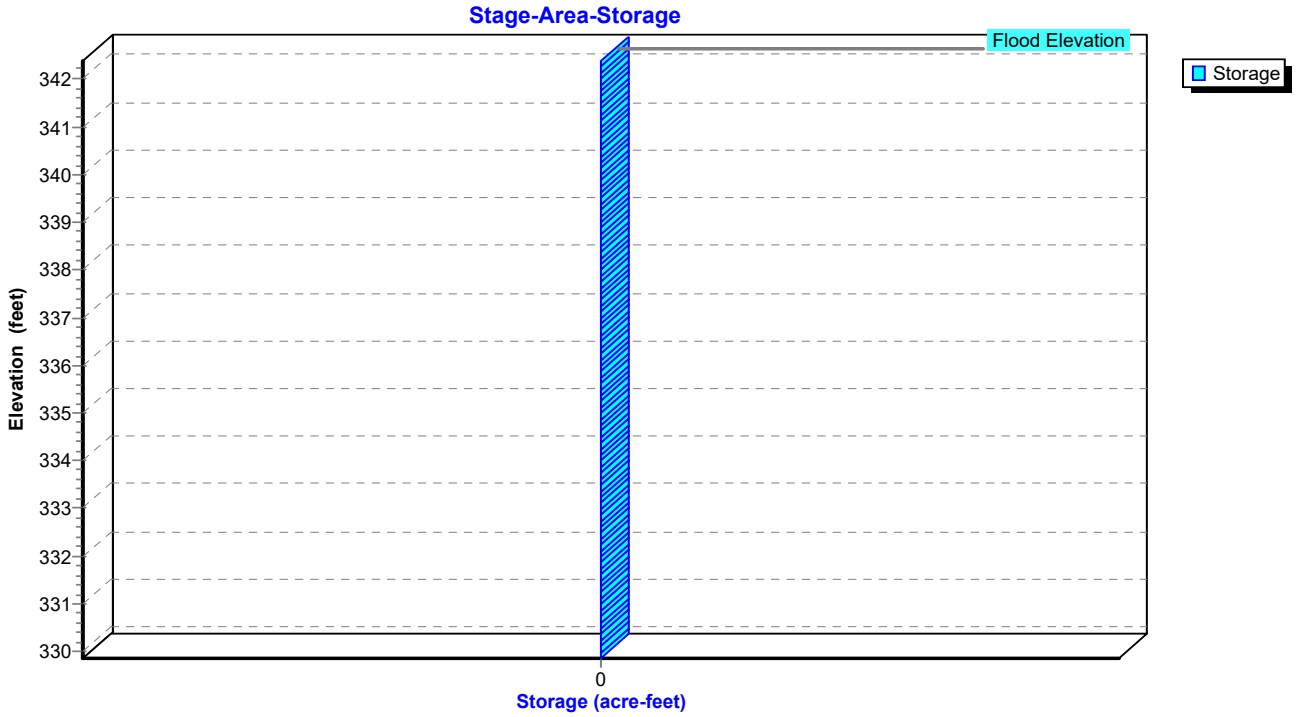
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.86	0.00
2.00	0.00	329.86	0.00
3.00	0.08	329.96	0.08
4.00	0.19	330.02	0.19
5.00	0.29	330.05	0.29
6.00	0.39	330.09	0.39
7.00	0.51	330.12	0.51
8.00	0.68	330.16	0.68
9.00	0.99	330.22	0.99
10.00	1.57	330.32	1.57
11.00	2.90	330.49	2.90
12.00	**16.46**	**331.46**	**16.46**
13.00	**8.10**	**330.94**	**8.10**
14.00	3.96	330.60	3.96
15.00	2.74	330.47	2.74
16.00	2.06	330.39	2.06
17.00	1.73	330.34	1.73
18.00	1.52	330.31	1.52
19.00	1.36	330.29	1.36
20.00	1.24	330.27	1.24
21.00	1.14	330.25	1.14
22.00	1.06	330.23	1.06
23.00	0.99	330.22	0.99
24.00	0.93	330.21	0.93
25.00	0.00	329.86	0.00
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

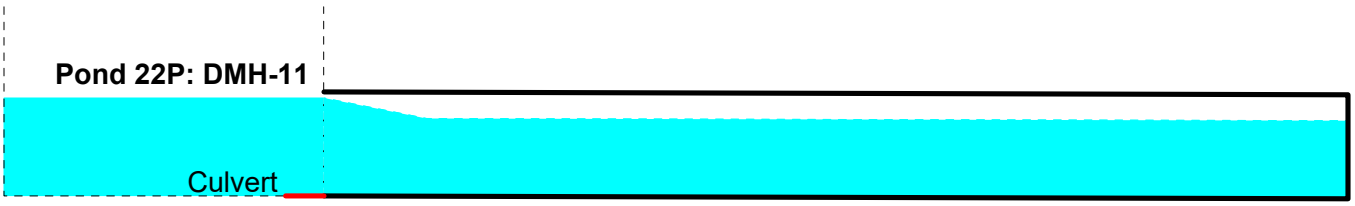
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Outflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.0 min
Primary = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

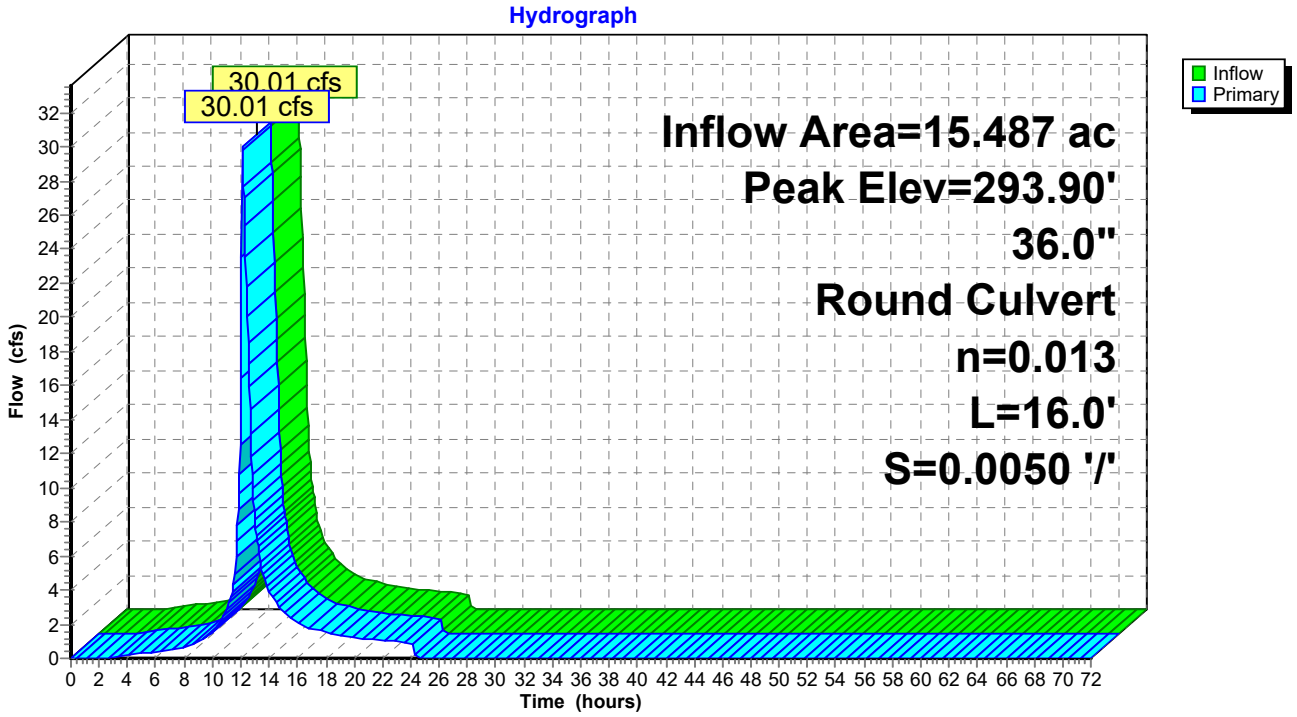
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 293.90' @ 12.13 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

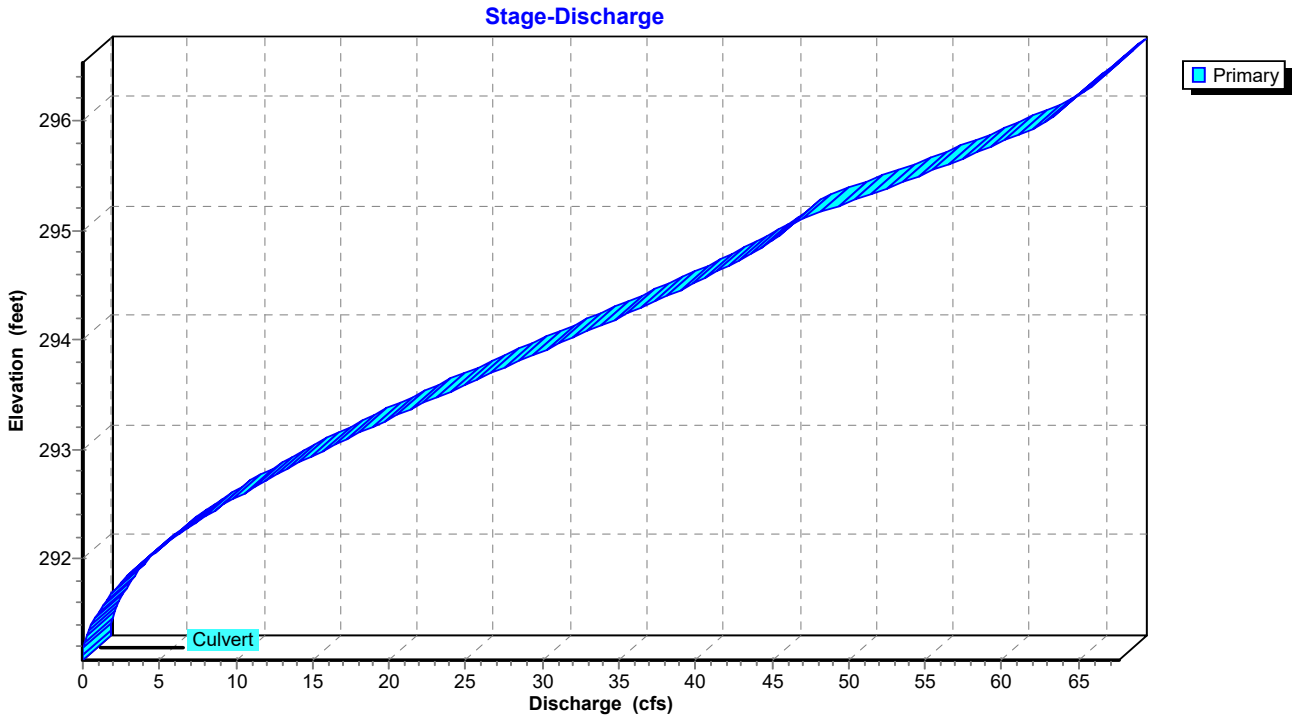
Primary OutFlow Max=29.72 cfs @ 12.13 hrs HW=293.88' TW=289.20' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 29.72 cfs @ 5.62 fps)



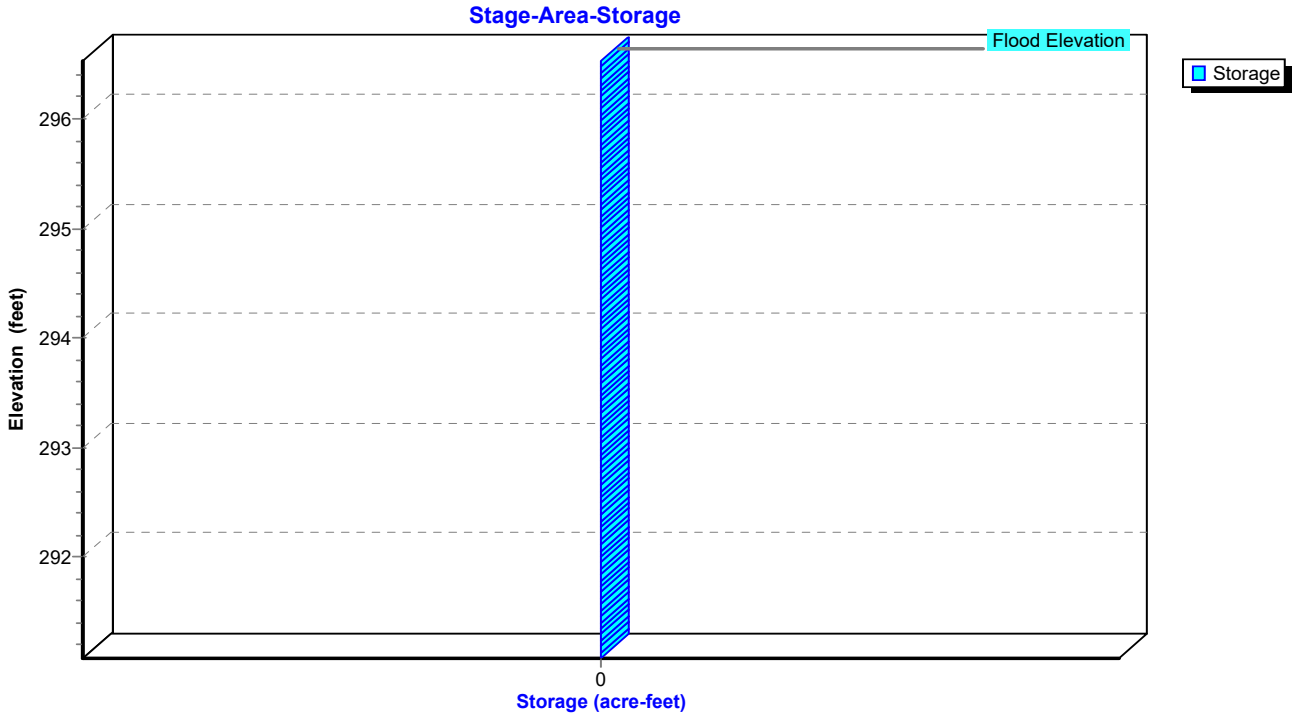
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.08	0.00
2.00	0.00	291.08	0.00
3.00	0.08	291.21	0.08
4.00	0.19	291.27	0.19
5.00	0.29	291.31	0.29
6.00	0.39	291.35	0.39
7.00	0.51	291.39	0.51
8.00	0.68	291.44	0.68
9.00	0.99	291.52	0.99
10.00	1.57	291.63	1.57
11.00	2.90	291.84	2.90
12.00	**16.46**	**293.04**	**16.46**
13.00	**8.10**	**292.40**	**8.10**
14.00	3.96	291.98	3.96
15.00	2.74	291.82	2.74
16.00	2.06	291.72	2.06
17.00	1.73	291.66	1.73
18.00	1.52	291.62	1.52
19.00	1.36	291.59	1.36
20.00	1.24	291.57	1.24
21.00	1.14	291.55	1.14
22.00	1.06	291.53	1.06
23.00	0.99	291.51	0.99
24.00	0.93	291.50	0.93
25.00	0.00	291.08	0.00
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

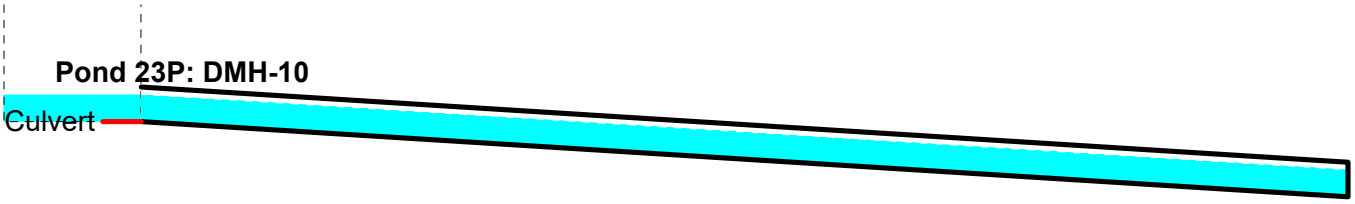
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 3.34" for 10-yr event
Inflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Outflow = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.0 min
Primary = 30.01 cfs @ 12.13 hrs, Volume= 4.314 af
Routed to Pond 22P : DMH-11

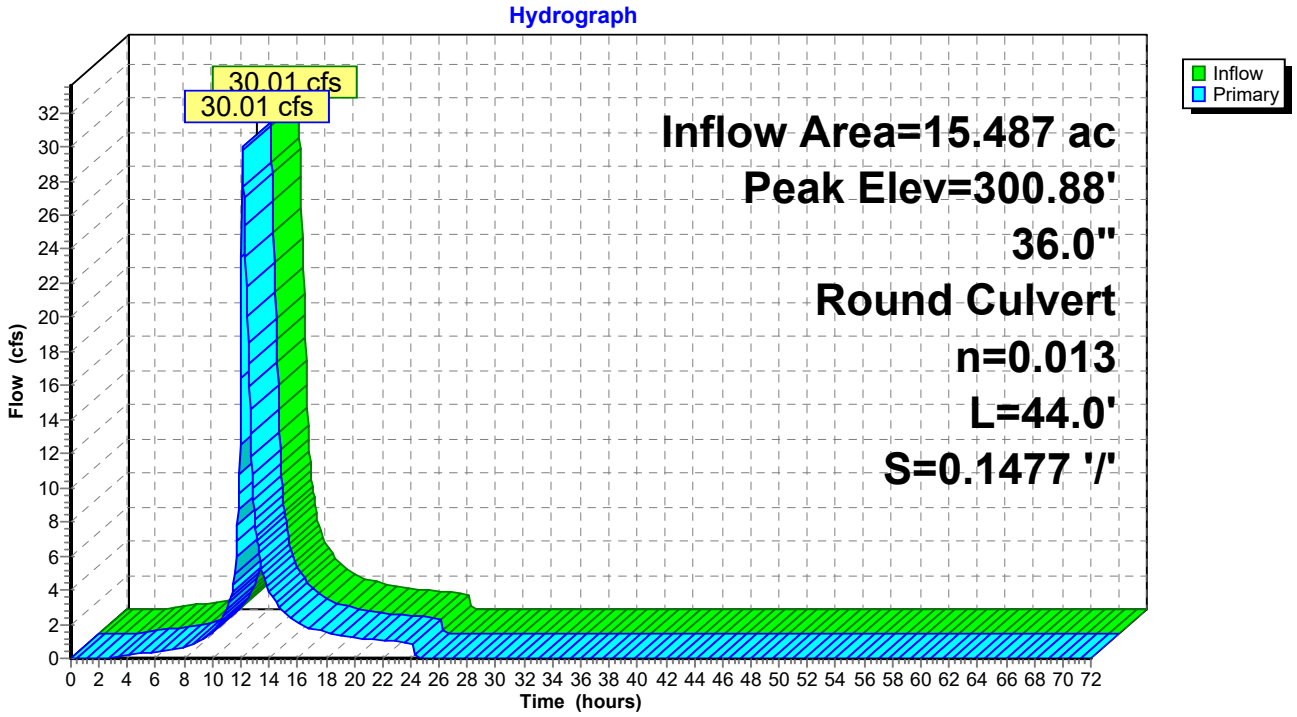
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 300.88' @ 12.13 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

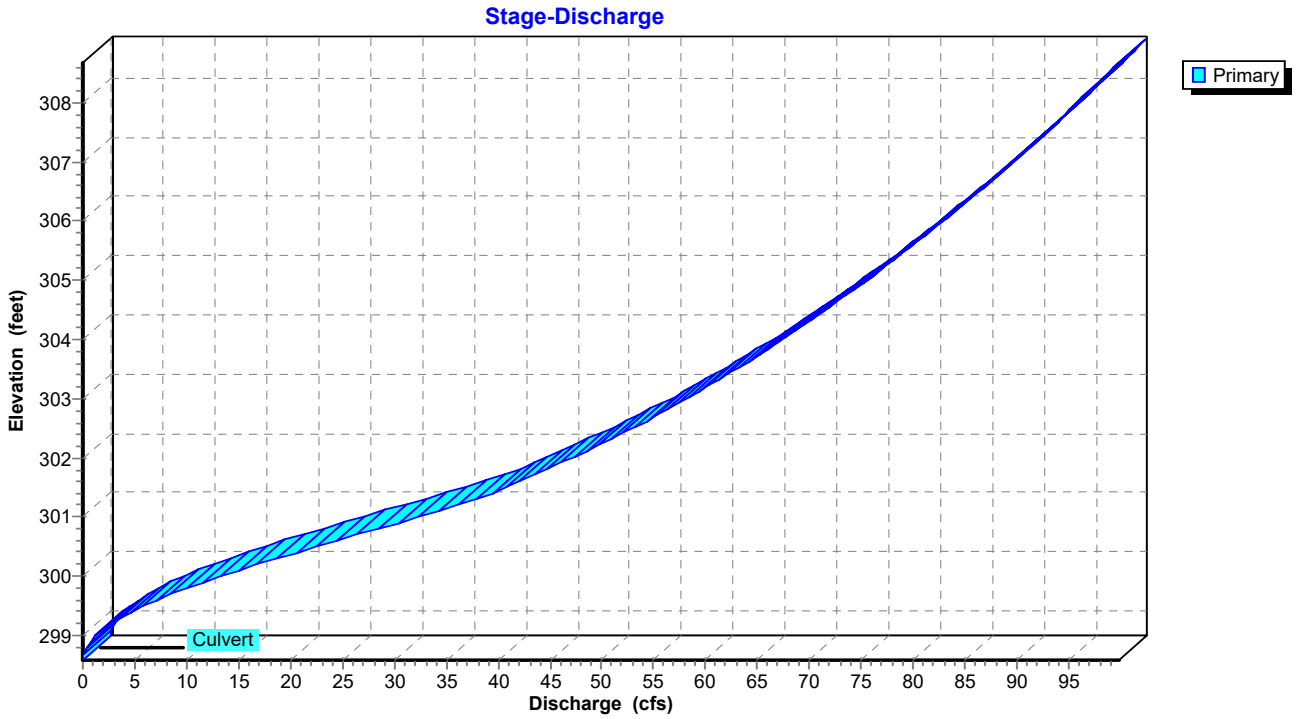
Primary OutFlow Max=29.72 cfs @ 12.13 hrs HW=300.86' TW=293.88' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 29.72 cfs @ 5.15 fps)



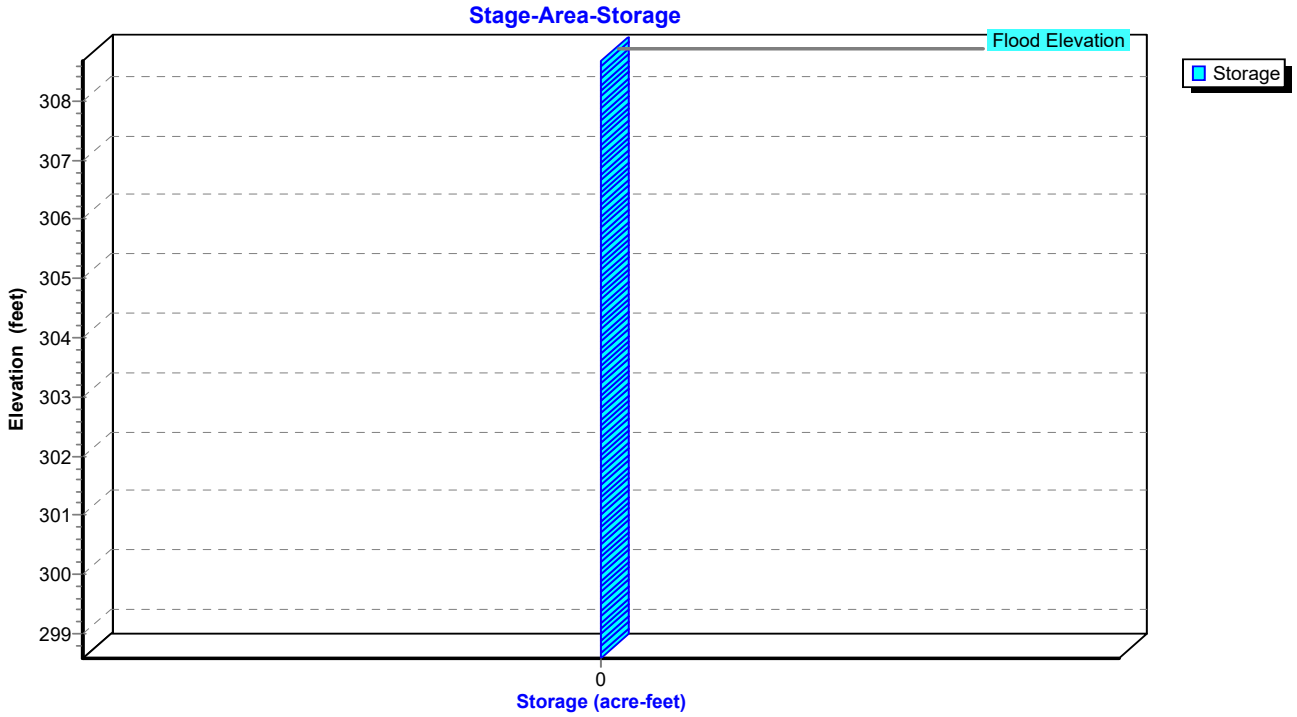
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00
1.00	0.00	298.58	0.00
2.00	0.00	298.58	0.00
3.00	0.08	298.68	0.08
4.00	0.19	298.74	0.19
5.00	0.29	298.77	0.29
6.00	0.39	298.81	0.39
7.00	0.51	298.84	0.51
8.00	0.68	298.88	0.68
9.00	0.99	298.94	0.99
10.00	1.57	299.04	1.57
11.00	2.90	299.21	2.90
12.00	**16.46**	**300.18**	**16.46**
13.00	**8.10**	**299.66**	**8.10**
14.00	3.96	299.32	3.96
15.00	2.74	299.19	2.74
16.00	2.06	299.11	2.06
17.00	1.73	299.06	1.73
18.00	1.52	299.03	1.52
19.00	1.36	299.01	1.36
20.00	1.24	298.99	1.24
21.00	1.14	298.97	1.14
22.00	1.06	298.95	1.06
23.00	0.99	298.94	0.99
24.00	0.93	298.93	0.93
25.00	0.00	298.58	0.00
26.00	0.00	298.58	0.00
27.00	0.00	298.58	0.00
28.00	0.00	298.58	0.00
29.00	0.00	298.58	0.00
30.00	0.00	298.58	0.00
31.00	0.00	298.58	0.00
32.00	0.00	298.58	0.00
33.00	0.00	298.58	0.00
34.00	0.00	298.58	0.00
35.00	0.00	298.58	0.00
36.00	0.00	298.58	0.00
37.00	0.00	298.58	0.00
38.00	0.00	298.58	0.00
39.00	0.00	298.58	0.00
40.00	0.00	298.58	0.00
41.00	0.00	298.58	0.00
42.00	0.00	298.58	0.00
43.00	0.00	298.58	0.00
44.00	0.00	298.58	0.00
45.00	0.00	298.58	0.00
46.00	0.00	298.58	0.00
47.00	0.00	298.58	0.00
48.00	0.00	298.58	0.00
49.00	0.00	298.58	0.00
50.00	0.00	298.58	0.00
51.00	0.00	298.58	0.00
52.00	0.00	298.58	0.00
53.00	0.00	298.58	0.00
54.00	0.00	298.58	0.00
55.00	0.00	298.58	0.00
56.00	0.00	298.58	0.00
57.00	0.00	298.58	0.00
58.00	0.00	298.58	0.00
59.00	0.00	298.58	0.00
60.00	0.00	298.58	0.00
61.00	0.00	298.58	0.00
62.00	0.00	298.58	0.00
63.00	0.00	298.58	0.00
64.00	0.00	298.58	0.00
65.00	0.00	298.58	0.00
66.00	0.00	298.58	0.00
67.00	0.00	298.58	0.00
68.00	0.00	298.58	0.00
69.00	0.00	298.58	0.00
70.00	0.00	298.58	0.00
71.00	0.00	298.58	0.00
72.00	0.00	298.58	0.00

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

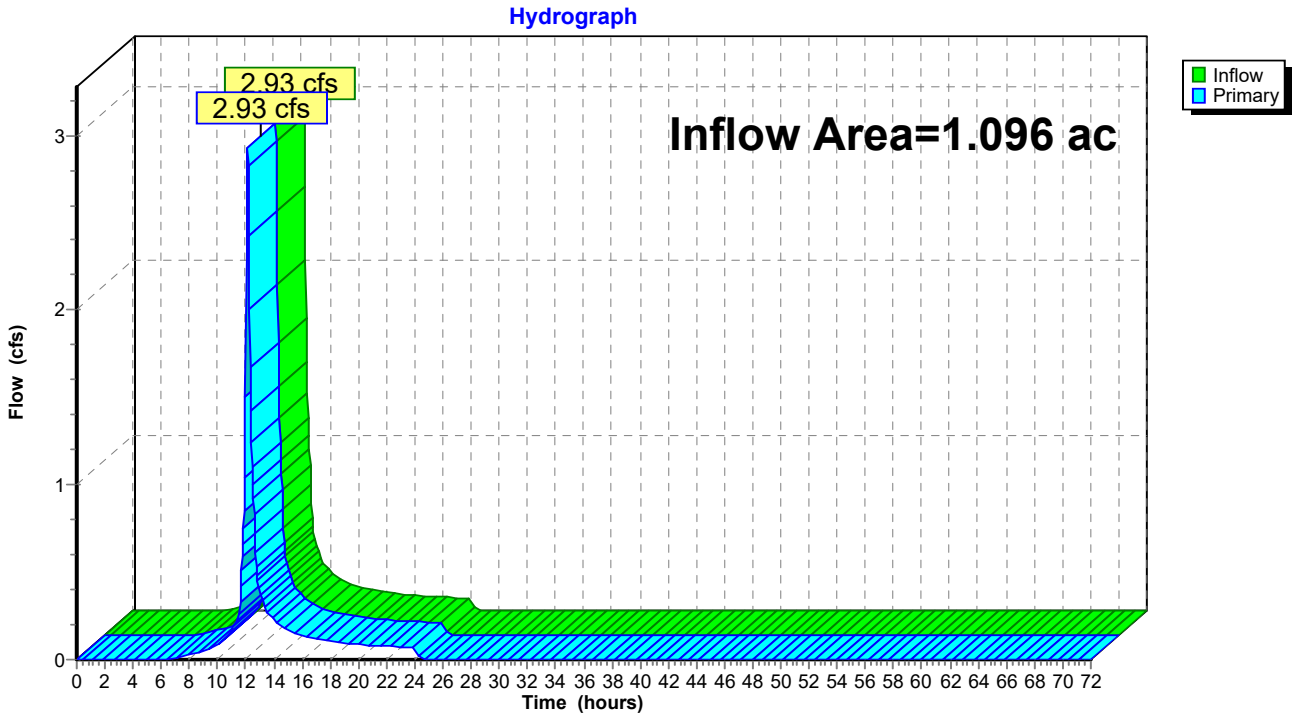
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 3.02" for 10-yr event
Inflow = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af
Primary = 2.93 cfs @ 12.12 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

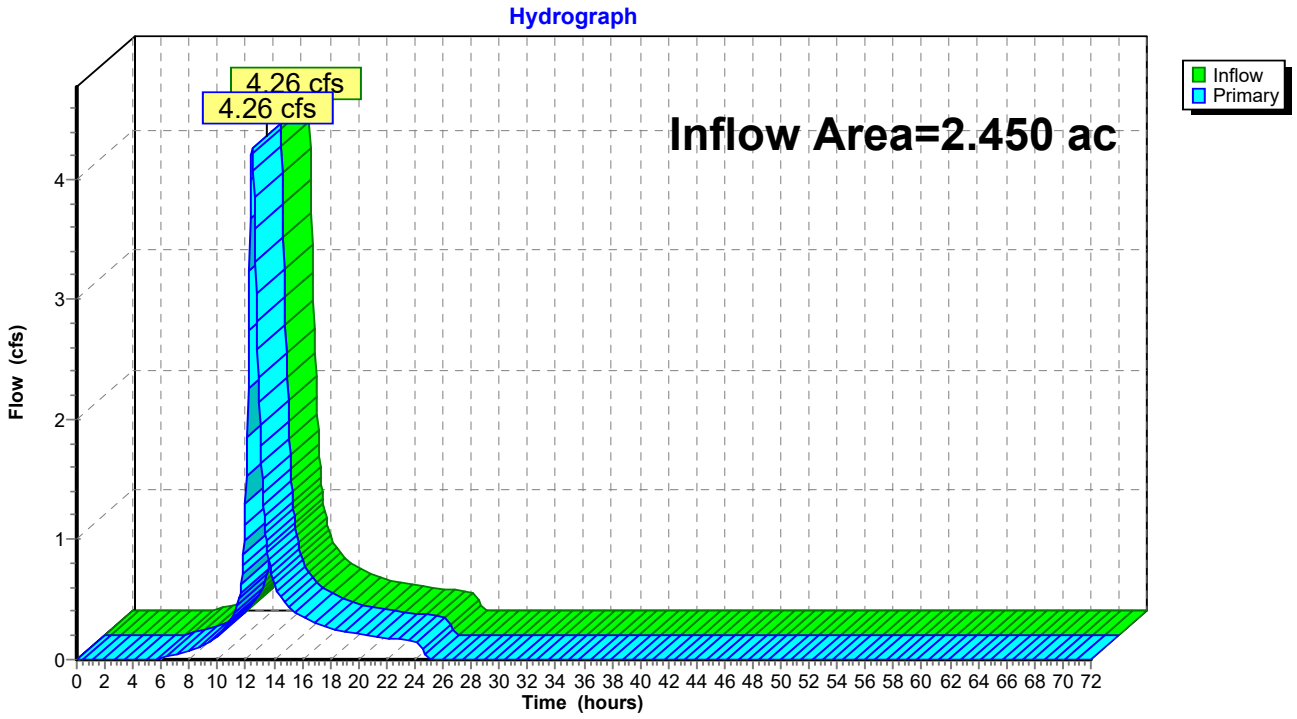
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.01	0.00	0.01
8.00	0.03	0.00	0.03
9.00	0.05	0.00	0.05
10.00	0.09	0.00	0.09
11.00	0.17	0.00	0.17
12.00	**1.51**	0.00	**1.51**
13.00	**0.38**	0.00	**0.38**
14.00	0.23	0.00	0.23
15.00	0.17	0.00	0.17
16.00	0.14	0.00	0.14
17.00	0.12	0.00	0.12
18.00	0.11	0.00	0.11
19.00	0.10	0.00	0.10
20.00	0.09	0.00	0.09
21.00	0.08	0.00	0.08
22.00	0.08	0.00	0.08
23.00	0.07	0.00	0.07
24.00	0.07	0.00	0.07
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 3.30" for 10-yr event
Inflow = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af
Primary = 4.26 cfs @ 12.45 hrs, Volume= 0.674 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

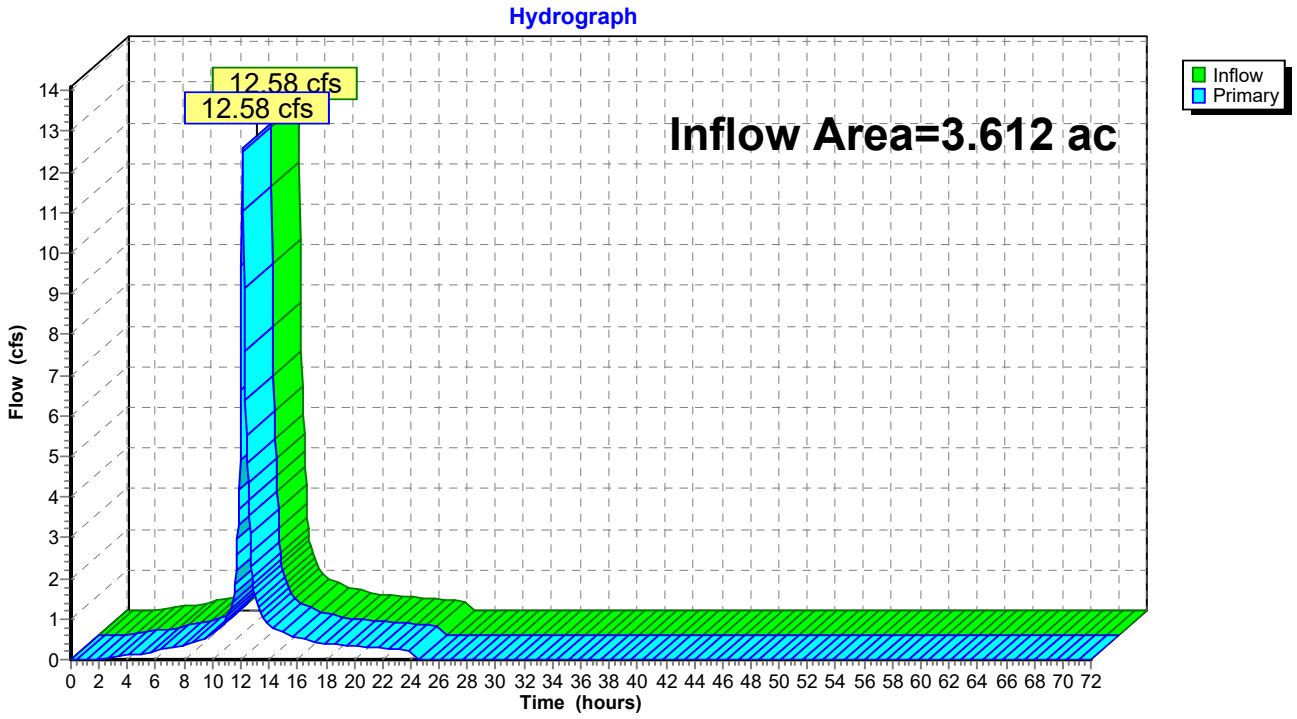
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01
7.00	0.04	0.00	0.04
8.00	0.08	0.00	0.08
9.00	0.13	0.00	0.13
10.00	0.20	0.00	0.20
11.00	0.35	0.00	0.35
12.00	**1.29**	0.00	**1.29**
13.00	**1.96**	0.00	**1.96**
14.00	0.64	0.00	0.64
15.00	0.44	0.00	0.44
16.00	0.35	0.00	0.35
17.00	0.30	0.00	0.30
18.00	0.26	0.00	0.26
19.00	0.23	0.00	0.23
20.00	0.21	0.00	0.21
21.00	0.20	0.00	0.20
22.00	0.18	0.00	0.18
23.00	0.17	0.00	0.17
24.00	0.16	0.00	0.16
25.00	0.01	0.00	0.01
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 4.34" for 10-yr event
Inflow = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af
Primary = 12.58 cfs @ 12.13 hrs, Volume= 1.305 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

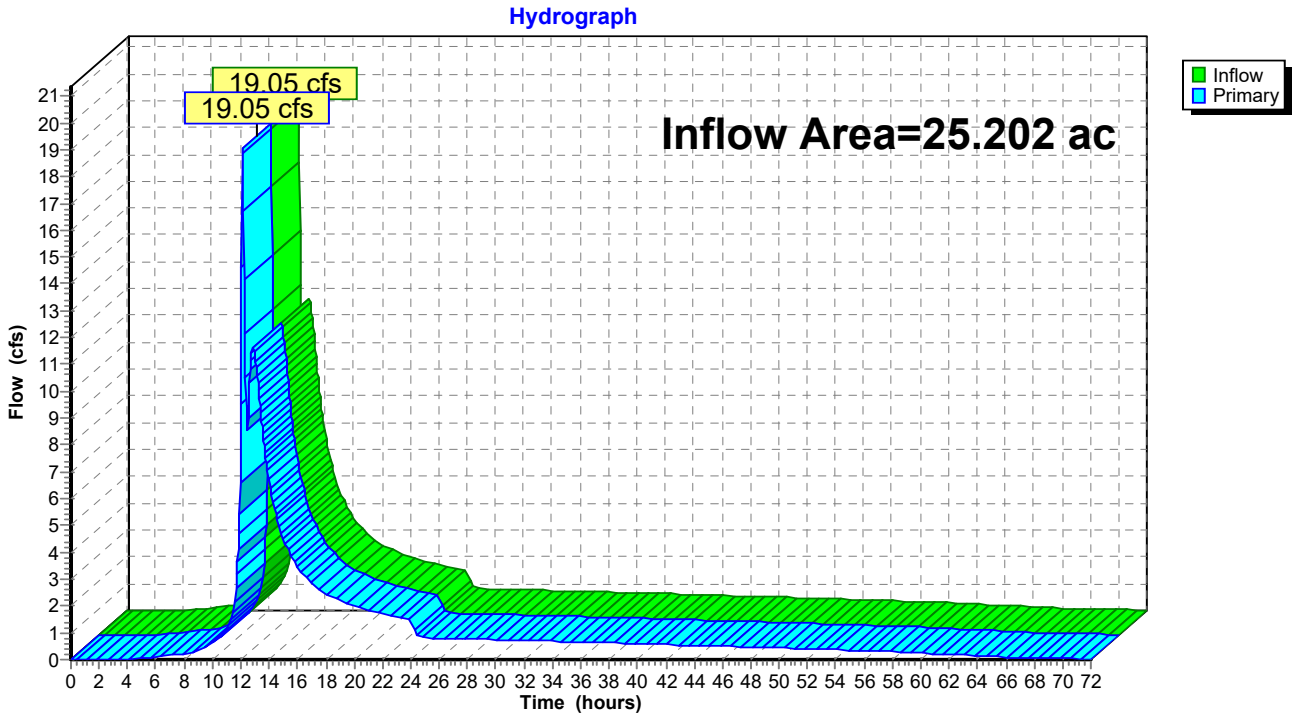
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.05	0.00	0.05
4.00	0.10	0.00	0.10
5.00	0.15	0.00	0.15
6.00	0.21	0.00	0.21
7.00	0.28	0.00	0.28
8.00	0.36	0.00	0.36
9.00	0.47	0.00	0.47
10.00	0.65	0.00	0.65
11.00	1.04	0.00	1.04
12.00	**6.64**	0.00	**6.64**
13.00	**1.54**	0.00	**1.54**
14.00	0.89	0.00	0.89
15.00	0.66	0.00	0.66
16.00	0.54	0.00	0.54
17.00	0.46	0.00	0.46
18.00	0.41	0.00	0.41
19.00	0.37	0.00	0.37
20.00	0.33	0.00	0.33
21.00	0.31	0.00	0.31
22.00	0.29	0.00	0.29
23.00	0.27	0.00	0.27
24.00	0.25	0.00	0.25
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 2.90" for 10-yr event
Inflow = 19.05 cfs @ 12.13 hrs, Volume= 6.090 af
Primary = 19.05 cfs @ 12.13 hrs, Volume= 6.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.01	0.00	0.01
5.00	0.04	0.00	0.04
6.00	0.10	0.00	0.10
7.00	0.17	0.00	0.17
8.00	0.22	0.00	0.22
9.00	0.34	0.00	0.34
10.00	0.61	0.00	0.61
11.00	1.16	0.00	1.16
12.00	**9.50**	0.00	**9.50**
13.00	**11.33**	0.00	**11.33**
14.00	6.61	0.00	6.61
15.00	4.50	0.00	4.50
16.00	3.43	0.00	3.43
17.00	2.84	0.00	2.84
18.00	2.47	0.00	2.47
19.00	2.21	0.00	2.21
20.00	2.01	0.00	2.01
21.00	1.85	0.00	1.85
22.00	1.72	0.00	1.72
23.00	1.61	0.00	1.61
24.00	1.52	0.00	1.52
25.00	0.82	0.00	0.82
26.00	0.80	0.00	0.80
27.00	0.79	0.00	0.79
28.00	0.77	0.00	0.77
29.00	0.76	0.00	0.76
30.00	0.75	0.00	0.75
31.00	0.73	0.00	0.73
32.00	0.72	0.00	0.72
33.00	0.70	0.00	0.70
34.00	0.69	0.00	0.69
35.00	0.67	0.00	0.67
36.00	0.66	0.00	0.66
37.00	0.64	0.00	0.64
38.00	0.63	0.00	0.63
39.00	0.61	0.00	0.61
40.00	0.60	0.00	0.60
41.00	0.58	0.00	0.58
42.00	0.57	0.00	0.57
43.00	0.55	0.00	0.55
44.00	0.53	0.00	0.53
45.00	0.52	0.00	0.52
46.00	0.50	0.00	0.50
47.00	0.49	0.00	0.49
48.00	0.47	0.00	0.47
49.00	0.45	0.00	0.45
50.00	0.43	0.00	0.43
51.00	0.42	0.00	0.42
52.00	0.40	0.00	0.40
53.00	0.38	0.00	0.38
54.00	0.37	0.00	0.37
55.00	0.35	0.00	0.35
56.00	0.33	0.00	0.33
57.00	0.31	0.00	0.31
58.00	0.29	0.00	0.29
59.00	0.27	0.00	0.27
60.00	0.25	0.00	0.25
61.00	0.22	0.00	0.22
62.00	0.20	0.00	0.20
63.00	0.17	0.00	0.17
64.00	0.15	0.00	0.15
65.00	0.12	0.00	0.12
66.00	0.09	0.00	0.09
67.00	0.07	0.00	0.07
68.00	0.06	0.00	0.06
69.00	0.05	0.00	0.05
70.00	0.04	0.00	0.04
71.00	0.03	0.00	0.03
72.00	0.03	0.00	0.03

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=6.84"
Flow Length=253' Tc=12.2 min CN=80 Runoff=5.78 cfs 0.625 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=7.22"
Flow Length=548' Tc=36.4 min CN=83 Runoff=8.31 cfs 1.473 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=8.44"
Flow Length=469' Tc=13.4 min CN=93 Runoff=20.96 cfs 2.542 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=8.44"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=39.78 cfs 4.680 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=6.09"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=30.91 cfs 3.795 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=5.72"
Flow Length=968' Tc=12.4 min CN=71 Runoff=43.12 cfs 4.628 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=8.69"
Flow Length=398' Tc=6.0 min CN=95 Runoff=10.41 cfs 0.987 af

Pond 6P: Infiltrators Peak Elev=349.29' Storage=0.239 af Inflow=10.41 cfs 0.987 af
Discarded=0.07 cfs 0.160 af Primary=3.80 cfs 0.827 af Outflow=3.87 cfs 0.987 af

Pond 9P: Detention Piping - 48" Peak Elev=335.23' Storage=0.538 af Inflow=16.97 cfs 1.358 af
Outflow=10.93 cfs 1.358 af

Pond 18P: Micropool Extended Peak Elev=292.45' Storage=125,758 cf Inflow=56.31 cfs 9.302 af
Primary=29.72 cfs 9.277 af Secondary=0.00 cfs 0.000 af Outflow=29.72 cfs 9.277 af

Pond 19P: DMH-7 Peak Elev=341.97' Inflow=72.39 cfs 9.302 af
Primary=56.31 cfs 7.943 af Secondary=16.97 cfs 1.358 af Outflow=72.39 cfs 9.302 af

Pond 20P: DMH-8 Peak Elev=338.30' Inflow=56.31 cfs 9.302 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=56.31 cfs 9.302 af

Pond 21P: DMH-9 Peak Elev=334.10' Inflow=56.31 cfs 9.302 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=56.31 cfs 9.302 af

Pond 22P: DMH-11 Peak Elev=295.59' Inflow=56.31 cfs 9.302 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=56.31 cfs 9.302 af

Pond 23P: DMH-10 Peak Elev=302.82' Inflow=56.31 cfs 9.302 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=56.31 cfs 9.302 af

Link DP-1: Design Point - 1 Inflow=5.78 cfs 0.625 af
Primary=5.78 cfs 0.625 af

Link DP-2: Design Point - 2 Inflow=8.31 cfs 1.473 af
Primary=8.31 cfs 1.473 af

Link DP-3: Design Point - 3 Inflow=20.96 cfs 2.542 af
Primary=20.96 cfs 2.542 af

Link DP-4: DP-4 Inflow=68.72 cfs 13.905 af
Primary=68.72 cfs 13.905 af

Total Runoff Area = 32.360 ac Runoff Volume = 18.730 af Average Runoff Depth = 6.95"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

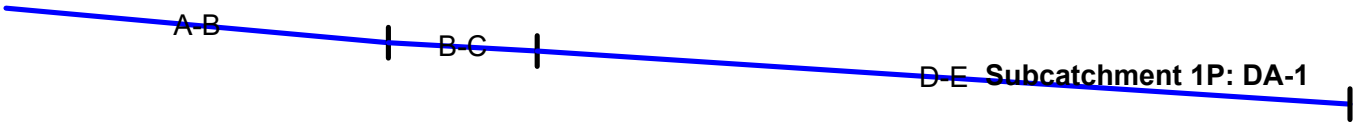
Summary for Subcatchment 1P: DA-1

Runoff = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af, Depth= 6.84"
Routed to Link DP-1 : Design Point - 1

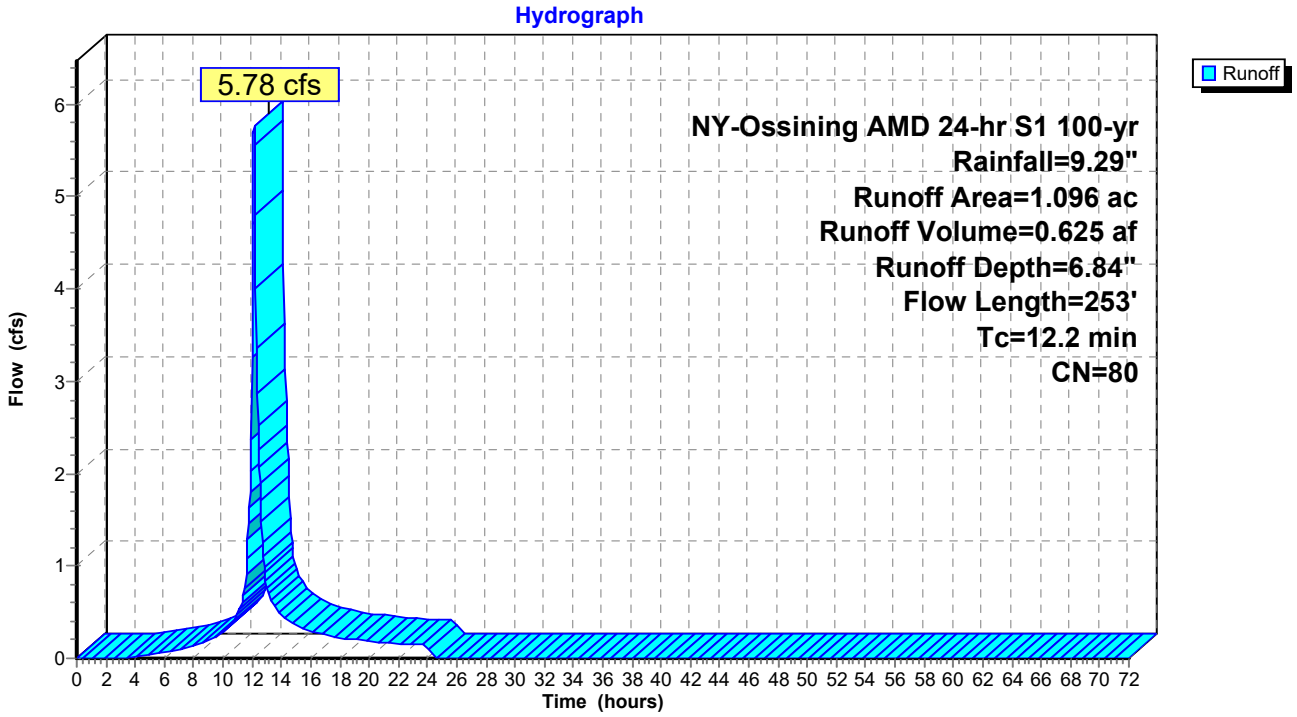
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.01
5.00	0.80	0.03	0.04
6.00	1.00	0.08	0.07
7.00	1.22	0.16	0.10
8.00	1.48	0.28	0.14
9.00	1.78	0.44	0.20
10.00	2.16	0.67	0.28
11.00	2.70	1.03	0.48
12.00	4.96	2.86	**3.26**
13.00	6.61	4.34	**0.78**
14.00	7.14	4.82	0.47
15.00	7.52	5.17	0.36
16.00	7.82	5.45	0.29
17.00	8.07	5.69	0.25
18.00	8.30	5.90	0.22
19.00	8.50	6.09	0.20
20.00	8.68	6.26	0.19
21.00	8.85	6.42	0.17
22.00	9.00	6.57	0.16
23.00	9.15	6.71	0.15
24.00	**9.29**	**6.84**	0.14
25.00	9.29	6.84	0.00
26.00	9.29	6.84	0.00
27.00	9.29	6.84	0.00
28.00	9.29	6.84	0.00
29.00	9.29	6.84	0.00
30.00	9.29	6.84	0.00
31.00	9.29	6.84	0.00
32.00	9.29	6.84	0.00
33.00	9.29	6.84	0.00
34.00	9.29	6.84	0.00
35.00	9.29	6.84	0.00
36.00	9.29	6.84	0.00
37.00	9.29	6.84	0.00
38.00	9.29	6.84	0.00
39.00	9.29	6.84	0.00
40.00	9.29	6.84	0.00
41.00	9.29	6.84	0.00
42.00	9.29	6.84	0.00
43.00	9.29	6.84	0.00
44.00	9.29	6.84	0.00
45.00	9.29	6.84	0.00
46.00	9.29	6.84	0.00
47.00	9.29	6.84	0.00
48.00	9.29	6.84	0.00
49.00	9.29	6.84	0.00
50.00	9.29	6.84	0.00
51.00	9.29	6.84	0.00
52.00	9.29	6.84	0.00
53.00	9.29	6.84	0.00
54.00	9.29	6.84	0.00
55.00	9.29	6.84	0.00
56.00	9.29	6.84	0.00
57.00	9.29	6.84	0.00
58.00	9.29	6.84	0.00
59.00	9.29	6.84	0.00
60.00	9.29	6.84	0.00
61.00	9.29	6.84	0.00
62.00	9.29	6.84	0.00
63.00	9.29	6.84	0.00
64.00	9.29	6.84	0.00
65.00	9.29	6.84	0.00
66.00	9.29	6.84	0.00
67.00	9.29	6.84	0.00
68.00	9.29	6.84	0.00
69.00	9.29	6.84	0.00
70.00	9.29	6.84	0.00
71.00	9.29	6.84	0.00
72.00	9.29	6.84	0.00

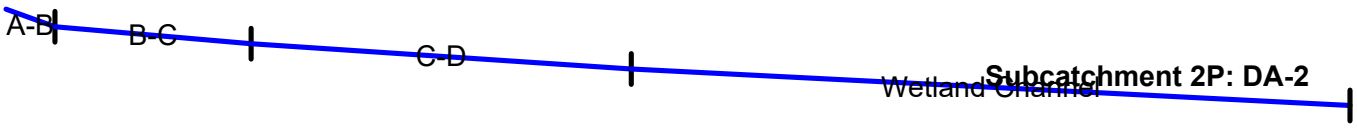
Summary for Subcatchment 2P: DA-2

Runoff = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af, Depth= 7.22"
Routed to Link DP-2 : Design Point - 2

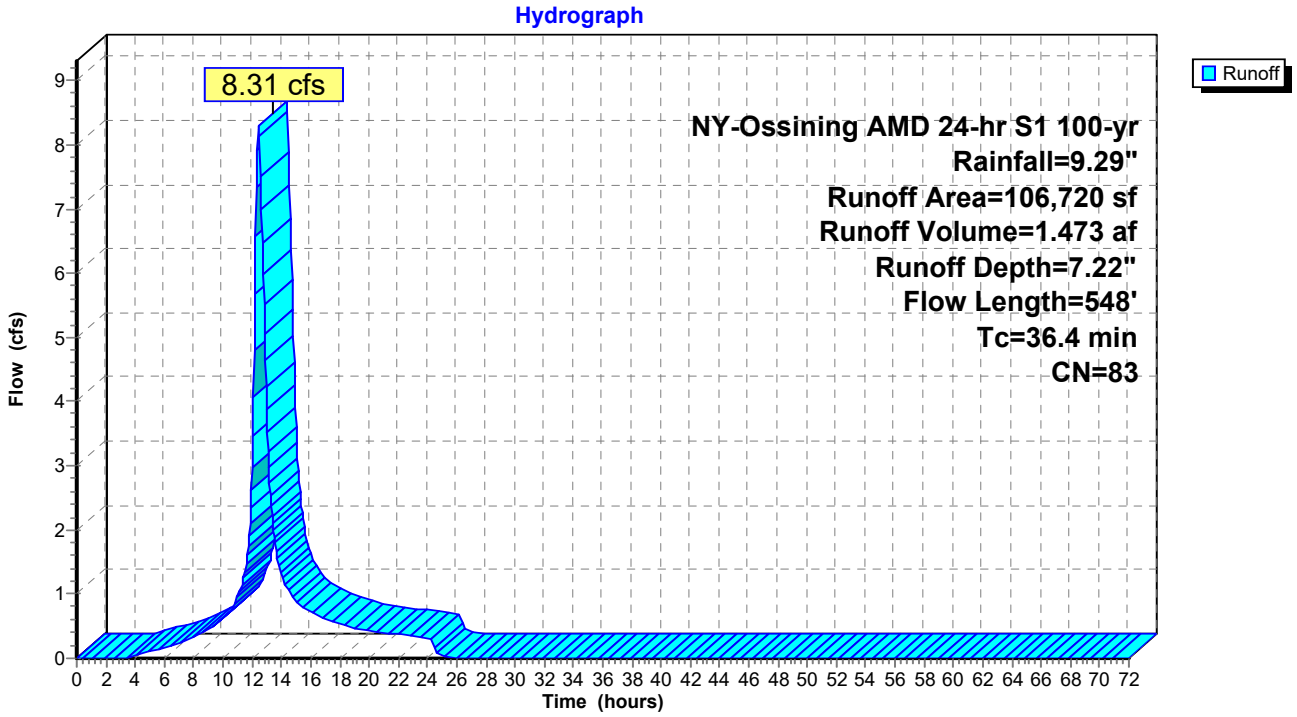
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.02	0.04
5.00	0.80	0.06	0.10
6.00	1.00	0.13	0.17
7.00	1.22	0.23	0.24
8.00	1.48	0.37	0.33
9.00	1.78	0.55	0.45
10.00	2.16	0.81	0.62
11.00	2.70	1.21	0.96
12.00	4.96	3.14	**2.98**
13.00	6.61	4.66	**3.86**
14.00	7.14	5.16	1.29
15.00	7.52	5.52	0.89
16.00	7.82	5.80	0.71
17.00	8.07	6.05	0.61
18.00	8.30	6.26	0.53
19.00	8.50	6.45	0.48
20.00	8.68	6.63	0.44
21.00	8.85	6.79	0.40
22.00	9.00	6.94	0.37
23.00	9.15	7.08	0.35
24.00	**9.29**	**7.22**	0.33
25.00	9.29	7.22	0.02
26.00	9.29	7.22	0.00
27.00	9.29	7.22	0.00
28.00	9.29	7.22	0.00
29.00	9.29	7.22	0.00
30.00	9.29	7.22	0.00
31.00	9.29	7.22	0.00
32.00	9.29	7.22	0.00
33.00	9.29	7.22	0.00
34.00	9.29	7.22	0.00
35.00	9.29	7.22	0.00
36.00	9.29	7.22	0.00
37.00	9.29	7.22	0.00
38.00	9.29	7.22	0.00
39.00	9.29	7.22	0.00
40.00	9.29	7.22	0.00
41.00	9.29	7.22	0.00
42.00	9.29	7.22	0.00
43.00	9.29	7.22	0.00
44.00	9.29	7.22	0.00
45.00	9.29	7.22	0.00
46.00	9.29	7.22	0.00
47.00	9.29	7.22	0.00
48.00	9.29	7.22	0.00
49.00	9.29	7.22	0.00
50.00	9.29	7.22	0.00
51.00	9.29	7.22	0.00
52.00	9.29	7.22	0.00
53.00	9.29	7.22	0.00
54.00	9.29	7.22	0.00
55.00	9.29	7.22	0.00
56.00	9.29	7.22	0.00
57.00	9.29	7.22	0.00
58.00	9.29	7.22	0.00
59.00	9.29	7.22	0.00
60.00	9.29	7.22	0.00
61.00	9.29	7.22	0.00
62.00	9.29	7.22	0.00
63.00	9.29	7.22	0.00
64.00	9.29	7.22	0.00
65.00	9.29	7.22	0.00
66.00	9.29	7.22	0.00
67.00	9.29	7.22	0.00
68.00	9.29	7.22	0.00
69.00	9.29	7.22	0.00
70.00	9.29	7.22	0.00
71.00	9.29	7.22	0.00
72.00	9.29	7.22	0.00

Summary for Subcatchment 3P: DA-3

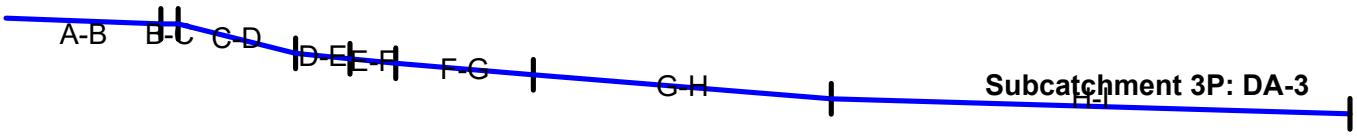
[47] Hint: Peak is 370% of capacity of segment #8

Runoff = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Depth= 8.44"
Routed to Link DP-3 : Design Point - 3

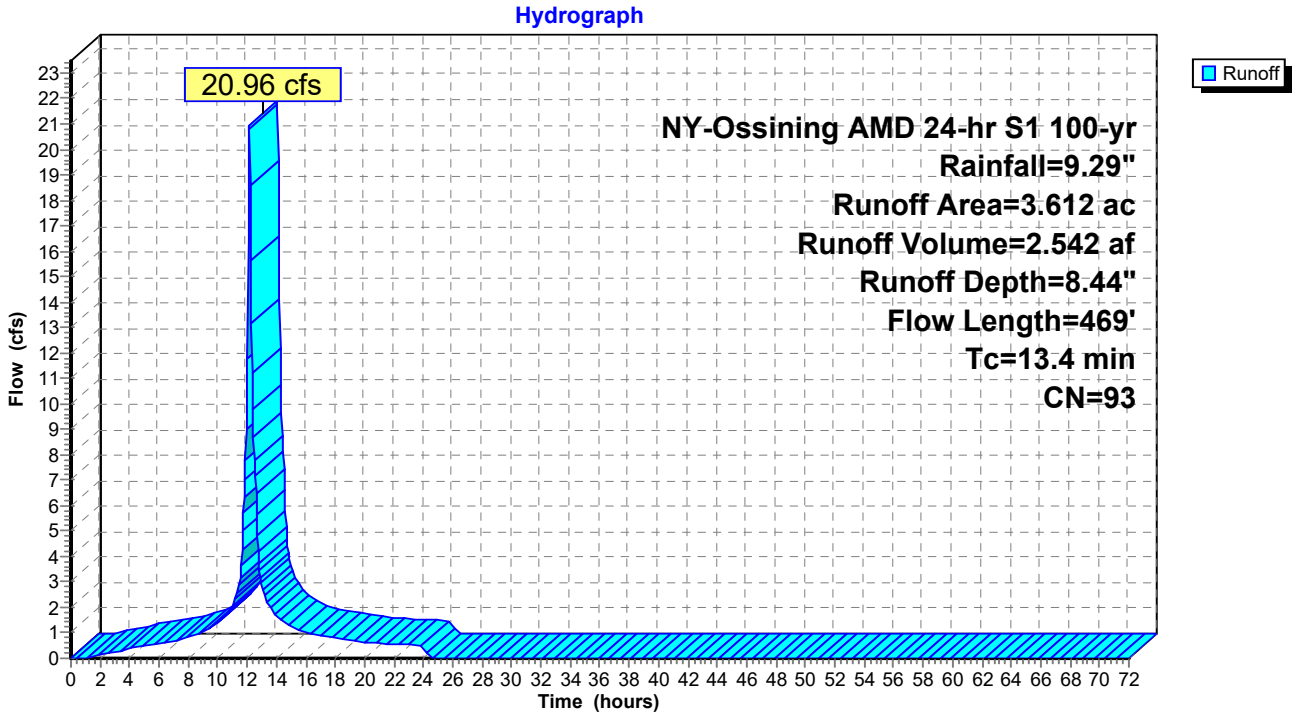
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.02	0.12
3.00	0.44	0.08	0.26
4.00	0.61	0.18	0.37
5.00	0.80	0.30	0.48
6.00	1.00	0.45	0.58
7.00	1.22	0.63	0.70
8.00	1.48	0.85	0.84
9.00	1.78	1.12	1.04
10.00	2.16	1.47	1.38
11.00	2.70	1.97	2.11
12.00	4.96	4.16	**11.76**
13.00	6.61	5.79	**2.86**
14.00	7.14	6.31	1.67
15.00	7.52	6.68	1.25
16.00	7.82	6.98	1.03
17.00	8.07	7.23	0.88
18.00	8.30	7.46	0.78
19.00	8.50	7.66	0.71
20.00	8.68	7.84	0.65
21.00	8.85	8.00	0.60
22.00	9.00	8.16	0.56
23.00	9.15	8.31	0.52
24.00	**9.29**	**8.44**	0.49
25.00	9.29	8.44	0.00
26.00	9.29	8.44	0.00
27.00	9.29	8.44	0.00
28.00	9.29	8.44	0.00
29.00	9.29	8.44	0.00
30.00	9.29	8.44	0.00
31.00	9.29	8.44	0.00
32.00	9.29	8.44	0.00
33.00	9.29	8.44	0.00
34.00	9.29	8.44	0.00
35.00	9.29	8.44	0.00
36.00	9.29	8.44	0.00
37.00	9.29	8.44	0.00
38.00	9.29	8.44	0.00
39.00	9.29	8.44	0.00
40.00	9.29	8.44	0.00
41.00	9.29	8.44	0.00
42.00	9.29	8.44	0.00
43.00	9.29	8.44	0.00
44.00	9.29	8.44	0.00
45.00	9.29	8.44	0.00
46.00	9.29	8.44	0.00
47.00	9.29	8.44	0.00
48.00	9.29	8.44	0.00
49.00	9.29	8.44	0.00
50.00	9.29	8.44	0.00
51.00	9.29	8.44	0.00
52.00	9.29	8.44	0.00
53.00	9.29	8.44	0.00
54.00	9.29	8.44	0.00
55.00	9.29	8.44	0.00
56.00	9.29	8.44	0.00
57.00	9.29	8.44	0.00
58.00	9.29	8.44	0.00
59.00	9.29	8.44	0.00
60.00	9.29	8.44	0.00
61.00	9.29	8.44	0.00
62.00	9.29	8.44	0.00
63.00	9.29	8.44	0.00
64.00	9.29	8.44	0.00
65.00	9.29	8.44	0.00
66.00	9.29	8.44	0.00
67.00	9.29	8.44	0.00
68.00	9.29	8.44	0.00
69.00	9.29	8.44	0.00
70.00	9.29	8.44	0.00
71.00	9.29	8.44	0.00
72.00	9.29	8.44	0.00

Summary for Subcatchment 4AP: DA-4A

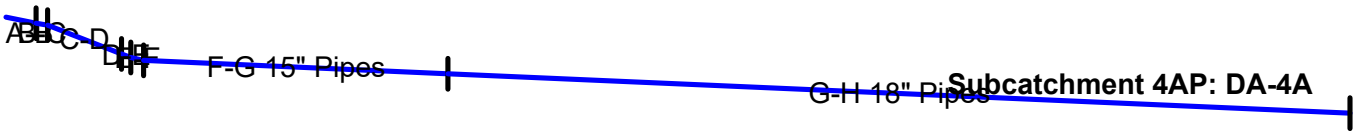
[47] Hint: Peak is 871% of capacity of segment #6
[47] Hint: Peak is 536% of capacity of segment #7

Runoff = 39.78 cfs @ 12.12 hrs, Volume= 4.680 af, Depth= 8.44"
Routed to Pond 19P : DMH-7

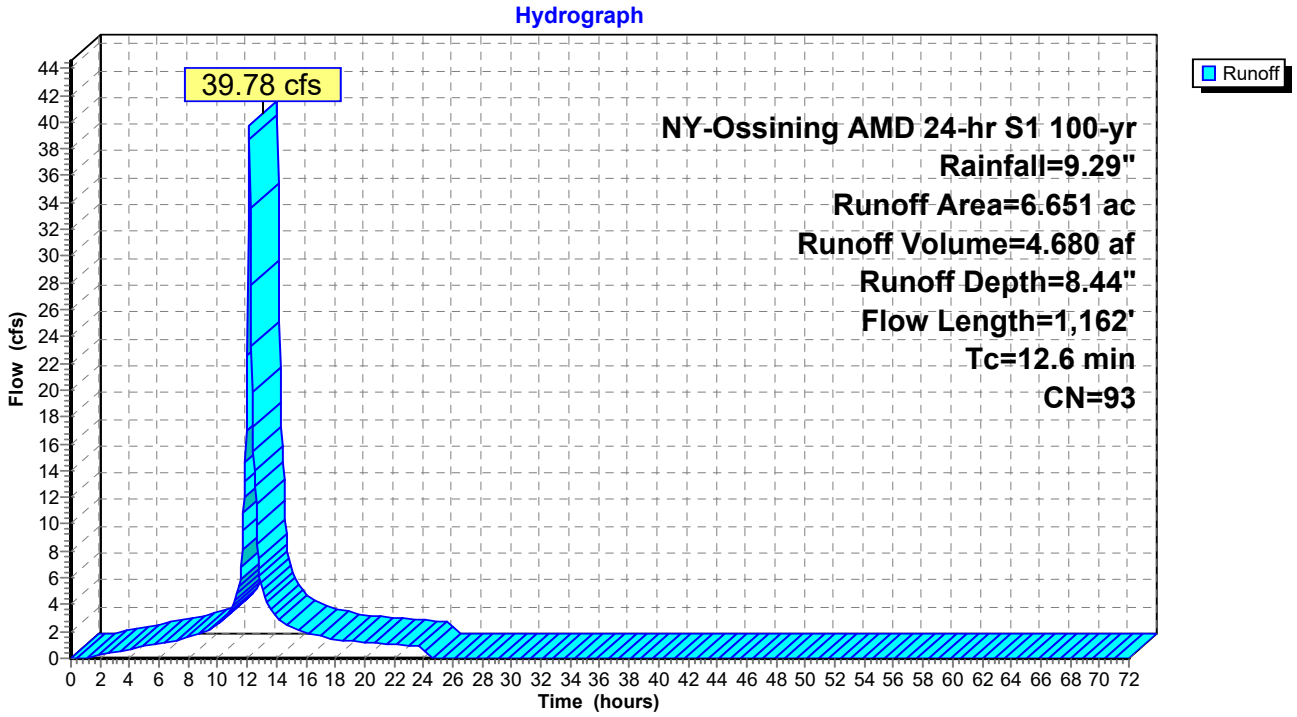
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.02	0.23
3.00	0.44	0.08	0.48
4.00	0.61	0.18	0.69
5.00	0.80	0.30	0.88
6.00	1.00	0.45	1.07
7.00	1.22	0.63	1.29
8.00	1.48	0.85	1.55
9.00	1.78	1.12	1.93
10.00	2.16	1.47	2.54
11.00	2.70	1.97	3.91
12.00	4.96	4.16	**22.63**
13.00	6.61	5.79	**5.18**
14.00	7.14	6.31	3.06
15.00	7.52	6.68	2.30
16.00	7.82	6.98	1.89
17.00	8.07	7.23	1.62
18.00	8.30	7.46	1.44
19.00	8.50	7.66	1.30
20.00	8.68	7.84	1.19
21.00	8.85	8.00	1.10
22.00	9.00	8.16	1.02
23.00	9.15	8.31	0.96
24.00	**9.29**	**8.44**	0.91
25.00	9.29	8.44	0.00
26.00	9.29	8.44	0.00
27.00	9.29	8.44	0.00
28.00	9.29	8.44	0.00
29.00	9.29	8.44	0.00
30.00	9.29	8.44	0.00
31.00	9.29	8.44	0.00
32.00	9.29	8.44	0.00
33.00	9.29	8.44	0.00
34.00	9.29	8.44	0.00
35.00	9.29	8.44	0.00
36.00	9.29	8.44	0.00
37.00	9.29	8.44	0.00
38.00	9.29	8.44	0.00
39.00	9.29	8.44	0.00
40.00	9.29	8.44	0.00
41.00	9.29	8.44	0.00
42.00	9.29	8.44	0.00
43.00	9.29	8.44	0.00
44.00	9.29	8.44	0.00
45.00	9.29	8.44	0.00
46.00	9.29	8.44	0.00
47.00	9.29	8.44	0.00
48.00	9.29	8.44	0.00
49.00	9.29	8.44	0.00
50.00	9.29	8.44	0.00
51.00	9.29	8.44	0.00
52.00	9.29	8.44	0.00
53.00	9.29	8.44	0.00
54.00	9.29	8.44	0.00
55.00	9.29	8.44	0.00
56.00	9.29	8.44	0.00
57.00	9.29	8.44	0.00
58.00	9.29	8.44	0.00
59.00	9.29	8.44	0.00
60.00	9.29	8.44	0.00
61.00	9.29	8.44	0.00
62.00	9.29	8.44	0.00
63.00	9.29	8.44	0.00
64.00	9.29	8.44	0.00
65.00	9.29	8.44	0.00
66.00	9.29	8.44	0.00
67.00	9.29	8.44	0.00
68.00	9.29	8.44	0.00
69.00	9.29	8.44	0.00
70.00	9.29	8.44	0.00
71.00	9.29	8.44	0.00
72.00	9.29	8.44	0.00

Summary for Subcatchment 4BP: DA-4B

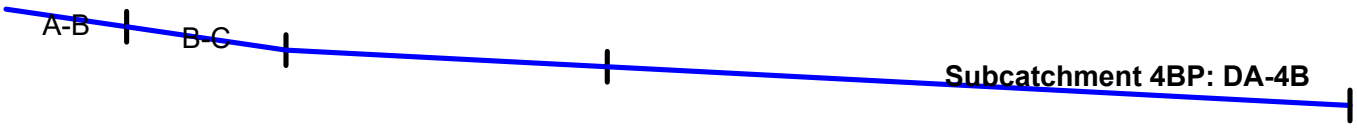
[47] Hint: Peak is 1227% of capacity of segment #3
[47] Hint: Peak is 193% of capacity of segment #4

Runoff = 30.91 cfs @ 12.19 hrs, Volume= 3.795 af, Depth= 6.09"
Routed to Pond 19P : DMH-7

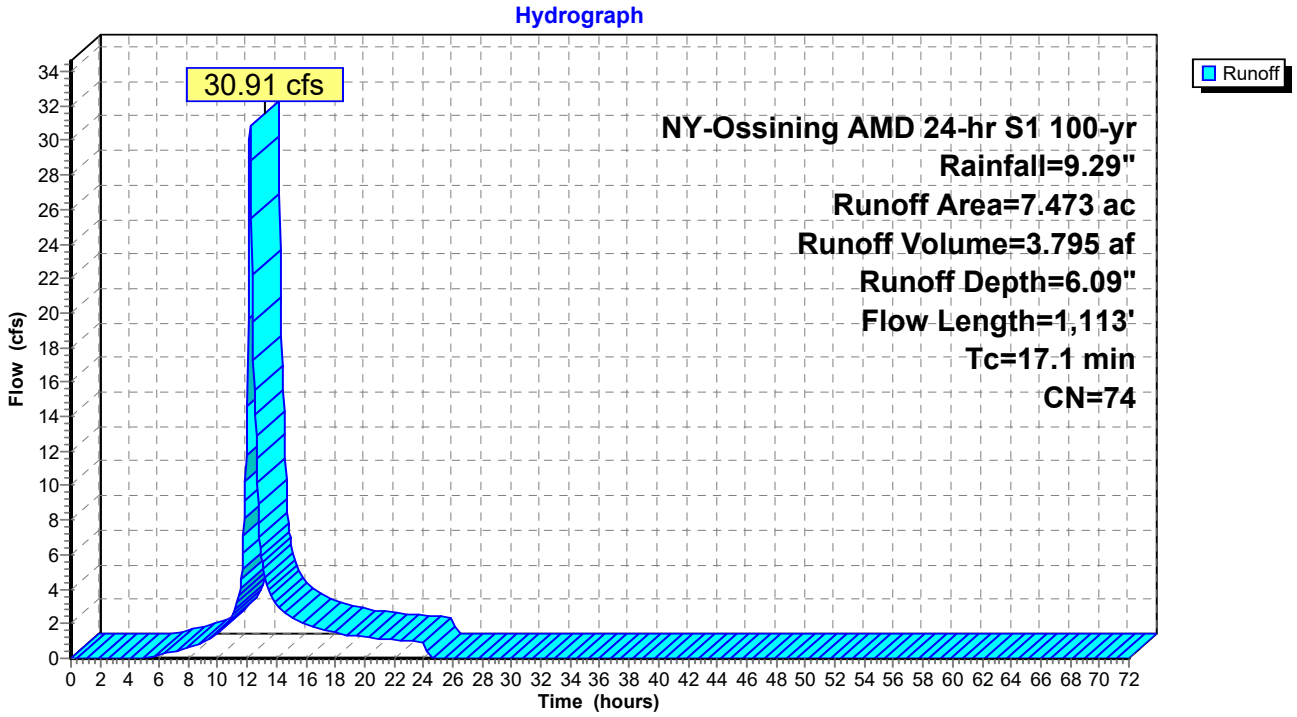
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.00
5.00	0.80	0.00	0.04
6.00	1.00	0.02	0.19
7.00	1.22	0.07	0.38
8.00	1.48	0.14	0.61
9.00	1.78	0.25	0.94
10.00	2.16	0.43	1.46
11.00	2.70	0.73	2.55
12.00	4.96	2.34	**14.57**
13.00	6.61	3.71	**5.56**
14.00	7.14	4.16	3.11
15.00	7.52	4.49	2.34
16.00	7.82	4.76	1.93
17.00	8.07	4.99	1.66
18.00	8.30	5.19	1.47
19.00	8.50	5.37	1.33
20.00	8.68	5.54	1.22
21.00	8.85	5.69	1.13
22.00	9.00	5.83	1.06
23.00	9.15	5.97	1.00
24.00	**9.29**	**6.09**	0.94
25.00	9.29	6.09	0.00
26.00	9.29	6.09	0.00
27.00	9.29	6.09	0.00
28.00	9.29	6.09	0.00
29.00	9.29	6.09	0.00
30.00	9.29	6.09	0.00
31.00	9.29	6.09	0.00
32.00	9.29	6.09	0.00
33.00	9.29	6.09	0.00
34.00	9.29	6.09	0.00
35.00	9.29	6.09	0.00
36.00	9.29	6.09	0.00
37.00	9.29	6.09	0.00
38.00	9.29	6.09	0.00
39.00	9.29	6.09	0.00
40.00	9.29	6.09	0.00
41.00	9.29	6.09	0.00
42.00	9.29	6.09	0.00
43.00	9.29	6.09	0.00
44.00	9.29	6.09	0.00
45.00	9.29	6.09	0.00
46.00	9.29	6.09	0.00
47.00	9.29	6.09	0.00
48.00	9.29	6.09	0.00
49.00	9.29	6.09	0.00
50.00	9.29	6.09	0.00
51.00	9.29	6.09	0.00
52.00	9.29	6.09	0.00
53.00	9.29	6.09	0.00
54.00	9.29	6.09	0.00
55.00	9.29	6.09	0.00
56.00	9.29	6.09	0.00
57.00	9.29	6.09	0.00
58.00	9.29	6.09	0.00
59.00	9.29	6.09	0.00
60.00	9.29	6.09	0.00
61.00	9.29	6.09	0.00
62.00	9.29	6.09	0.00
63.00	9.29	6.09	0.00
64.00	9.29	6.09	0.00
65.00	9.29	6.09	0.00
66.00	9.29	6.09	0.00
67.00	9.29	6.09	0.00
68.00	9.29	6.09	0.00
69.00	9.29	6.09	0.00
70.00	9.29	6.09	0.00
71.00	9.29	6.09	0.00
72.00	9.29	6.09	0.00

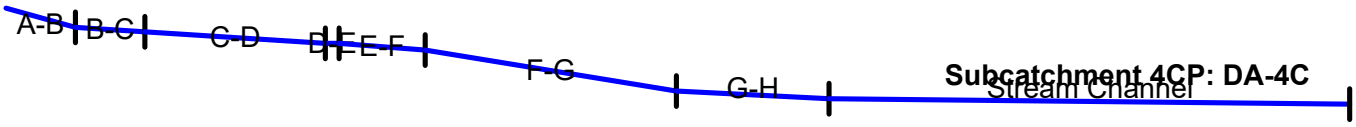
Summary for Subcatchment 4CP: DA-4C

Runoff = 43.12 cfs @ 12.12 hrs, Volume= 4.628 af, Depth= 5.72"
Routed to Link DP-4 : DP-4

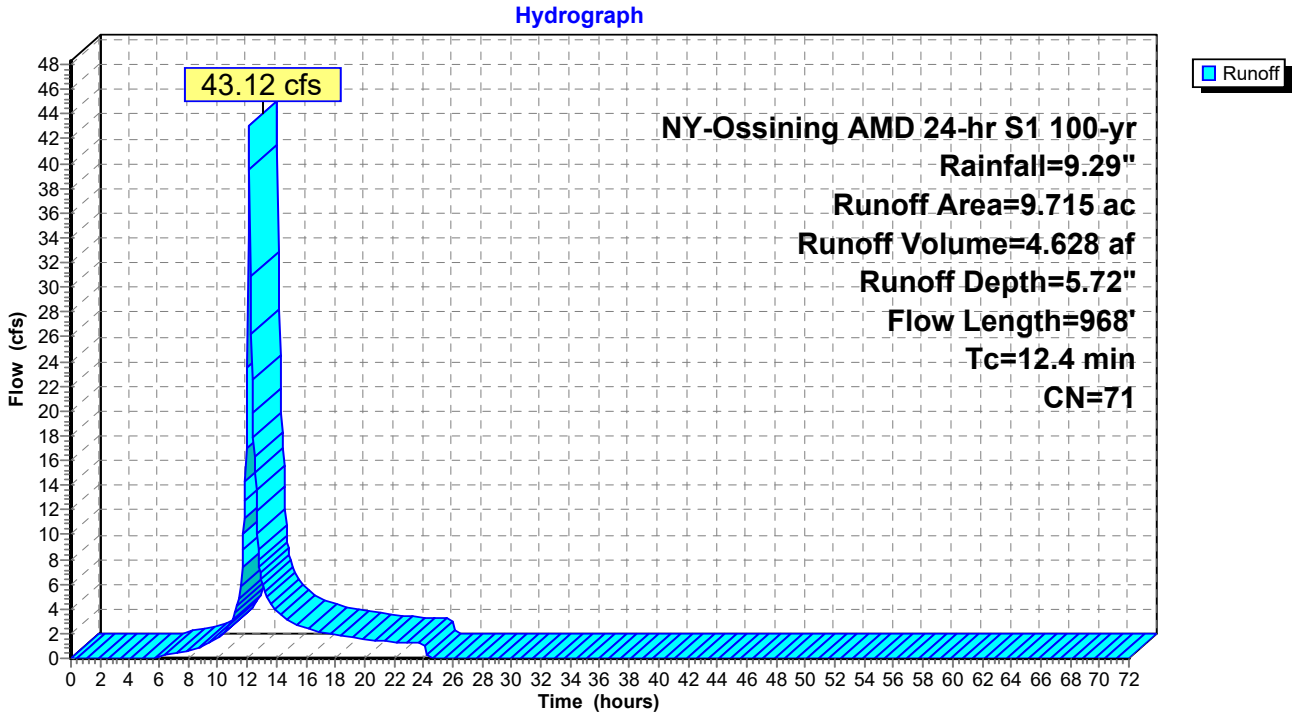
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.00
2.00	0.29	0.00	0.00
3.00	0.44	0.00	0.00
4.00	0.61	0.00	0.00
5.00	0.80	0.00	0.00
6.00	1.00	0.01	0.13
7.00	1.22	0.04	0.36
8.00	1.48	0.09	0.64
9.00	1.78	0.19	1.04
10.00	2.16	0.33	1.68
11.00	2.70	0.60	3.10
12.00	4.96	2.09	**23.50**
13.00	6.61	3.40	**6.29**
14.00	7.14	3.84	3.80
15.00	7.52	4.16	2.89
16.00	7.82	4.42	2.40
17.00	8.07	4.64	2.08
18.00	8.30	4.84	1.85
19.00	8.50	5.01	1.68
20.00	8.68	5.17	1.54
21.00	8.85	5.32	1.43
22.00	9.00	5.46	1.34
23.00	9.15	5.59	1.26
24.00	**9.29**	**5.72**	1.19
25.00	9.29	5.72	0.00
26.00	9.29	5.72	0.00
27.00	9.29	5.72	0.00
28.00	9.29	5.72	0.00
29.00	9.29	5.72	0.00
30.00	9.29	5.72	0.00
31.00	9.29	5.72	0.00
32.00	9.29	5.72	0.00
33.00	9.29	5.72	0.00
34.00	9.29	5.72	0.00
35.00	9.29	5.72	0.00
36.00	9.29	5.72	0.00
37.00	9.29	5.72	0.00
38.00	9.29	5.72	0.00
39.00	9.29	5.72	0.00
40.00	9.29	5.72	0.00
41.00	9.29	5.72	0.00
42.00	9.29	5.72	0.00
43.00	9.29	5.72	0.00
44.00	9.29	5.72	0.00
45.00	9.29	5.72	0.00
46.00	9.29	5.72	0.00
47.00	9.29	5.72	0.00
48.00	9.29	5.72	0.00
49.00	9.29	5.72	0.00
50.00	9.29	5.72	0.00
51.00	9.29	5.72	0.00
52.00	9.29	5.72	0.00
53.00	9.29	5.72	0.00
54.00	9.29	5.72	0.00
55.00	9.29	5.72	0.00
56.00	9.29	5.72	0.00
57.00	9.29	5.72	0.00
58.00	9.29	5.72	0.00
59.00	9.29	5.72	0.00
60.00	9.29	5.72	0.00
61.00	9.29	5.72	0.00
62.00	9.29	5.72	0.00
63.00	9.29	5.72	0.00
64.00	9.29	5.72	0.00
65.00	9.29	5.72	0.00
66.00	9.29	5.72	0.00
67.00	9.29	5.72	0.00
68.00	9.29	5.72	0.00
69.00	9.29	5.72	0.00
70.00	9.29	5.72	0.00
71.00	9.29	5.72	0.00
72.00	9.29	5.72	0.00

Summary for Subcatchment 4DP: DA-4D

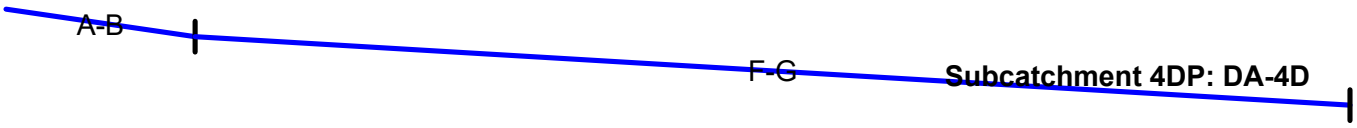
[47] Hint: Peak is 161% of capacity of segment #2

Runoff = 10.41 cfs @ 12.04 hrs, Volume= 0.987 af, Depth= 8.69"
Routed to Pond 6P : Infiltrators

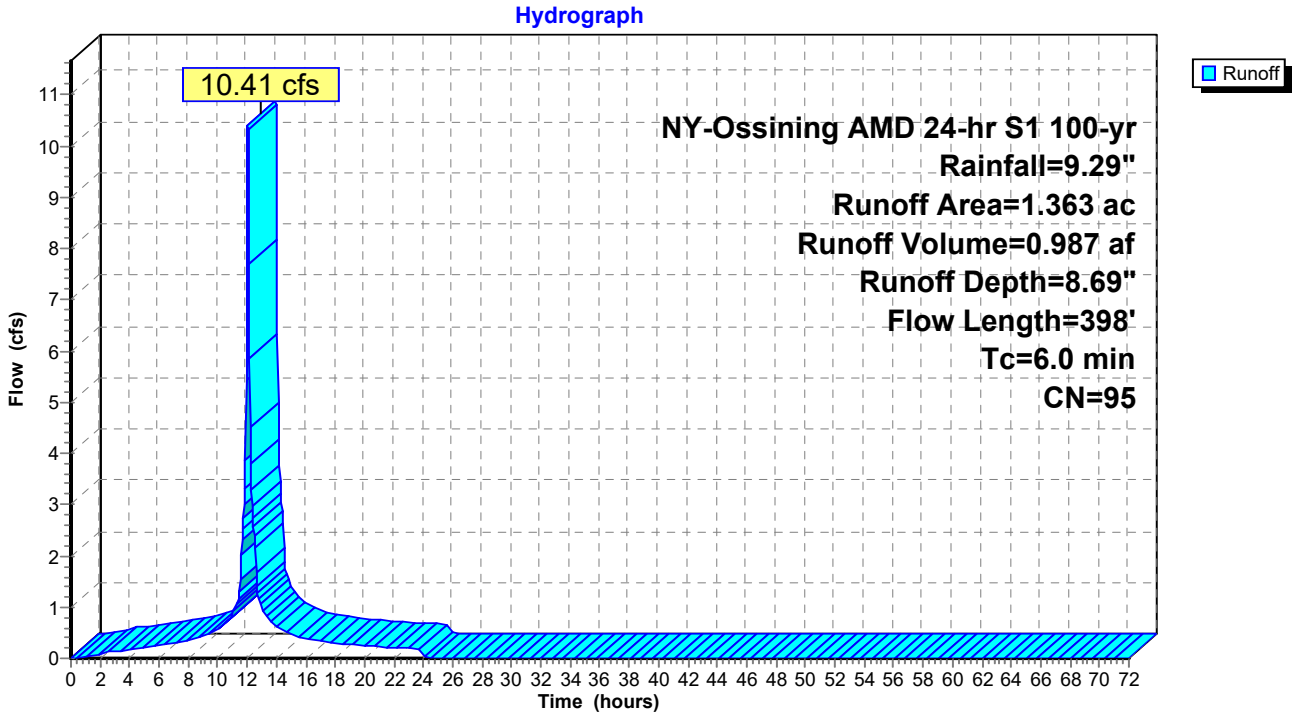
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 100-yr Rainfall=9.29"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.14	0.00	0.01
2.00	0.29	0.05	0.09
3.00	0.44	0.13	0.14
4.00	0.61	0.25	0.18
5.00	0.80	0.39	0.21
6.00	1.00	0.56	0.25
7.00	1.22	0.76	0.29
8.00	1.48	0.99	0.35
9.00	1.78	1.28	0.42
10.00	2.16	1.64	0.56
11.00	2.70	2.16	0.87
12.00	4.96	4.38	**9.27**
13.00	6.61	6.02	**0.97**
14.00	7.14	6.55	0.61
15.00	7.52	6.92	0.46
16.00	7.82	7.22	0.38
17.00	8.07	7.47	0.33
18.00	8.30	7.70	0.29
19.00	8.50	7.90	0.26
20.00	8.68	8.08	0.24
21.00	8.85	8.25	0.22
22.00	9.00	8.40	0.21
23.00	9.15	8.55	0.20
24.00	**9.29**	**8.69**	0.19
25.00	9.29	8.69	0.00
26.00	9.29	8.69	0.00
27.00	9.29	8.69	0.00
28.00	9.29	8.69	0.00
29.00	9.29	8.69	0.00
30.00	9.29	8.69	0.00
31.00	9.29	8.69	0.00
32.00	9.29	8.69	0.00
33.00	9.29	8.69	0.00
34.00	9.29	8.69	0.00
35.00	9.29	8.69	0.00
36.00	9.29	8.69	0.00
37.00	9.29	8.69	0.00
38.00	9.29	8.69	0.00
39.00	9.29	8.69	0.00
40.00	9.29	8.69	0.00
41.00	9.29	8.69	0.00
42.00	9.29	8.69	0.00
43.00	9.29	8.69	0.00
44.00	9.29	8.69	0.00
45.00	9.29	8.69	0.00
46.00	9.29	8.69	0.00
47.00	9.29	8.69	0.00
48.00	9.29	8.69	0.00
49.00	9.29	8.69	0.00
50.00	9.29	8.69	0.00
51.00	9.29	8.69	0.00
52.00	9.29	8.69	0.00
53.00	9.29	8.69	0.00
54.00	9.29	8.69	0.00
55.00	9.29	8.69	0.00
56.00	9.29	8.69	0.00
57.00	9.29	8.69	0.00
58.00	9.29	8.69	0.00
59.00	9.29	8.69	0.00
60.00	9.29	8.69	0.00
61.00	9.29	8.69	0.00
62.00	9.29	8.69	0.00
63.00	9.29	8.69	0.00
64.00	9.29	8.69	0.00
65.00	9.29	8.69	0.00
66.00	9.29	8.69	0.00
67.00	9.29	8.69	0.00
68.00	9.29	8.69	0.00
69.00	9.29	8.69	0.00
70.00	9.29	8.69	0.00
71.00	9.29	8.69	0.00
72.00	9.29	8.69	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 8.69" for 100-yr event
Inflow = 10.41 cfs @ 12.04 hrs, Volume= 0.987 af
Outflow = 3.87 cfs @ 12.25 hrs, Volume= 0.987 af, Atten= 63%, Lag= 12.6 min
Discarded = 0.07 cfs @ 2.70 hrs, Volume= 0.160 af
Primary = 3.80 cfs @ 12.25 hrs, Volume= 0.827 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 349.29' @ 12.25 hrs Surf.Area= 0.132 ac Storage= 0.239 af

Plug-Flow detention time= 80.7 min calculated for 0.986 af (100% of inflow)
Center-of-Mass det. time= 80.9 min (837.6 - 756.7)

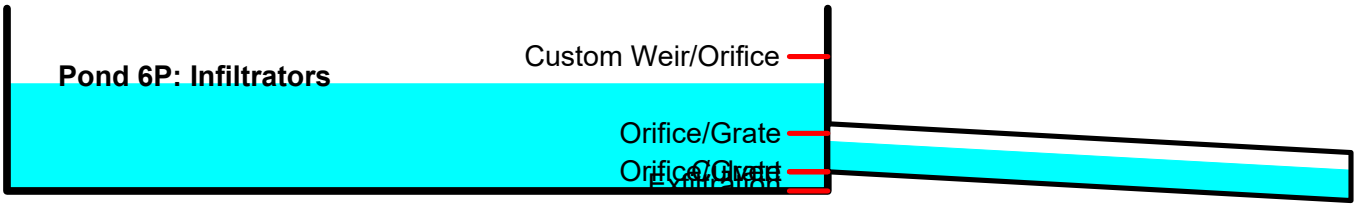
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 2.70 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=3.80 cfs @ 12.25 hrs HW=349.29' TW=340.62' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.80 cfs of 6.02 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.35 cfs @ 6.88 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.45 cfs @ 4.90 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

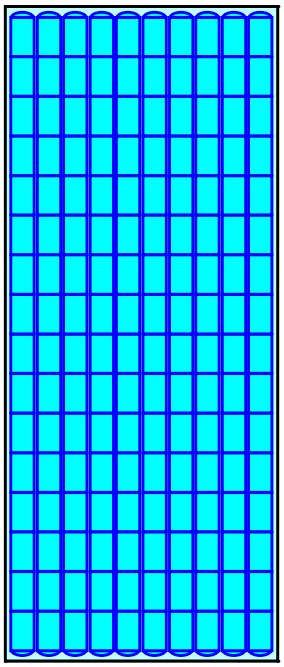
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

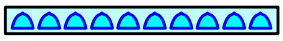
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

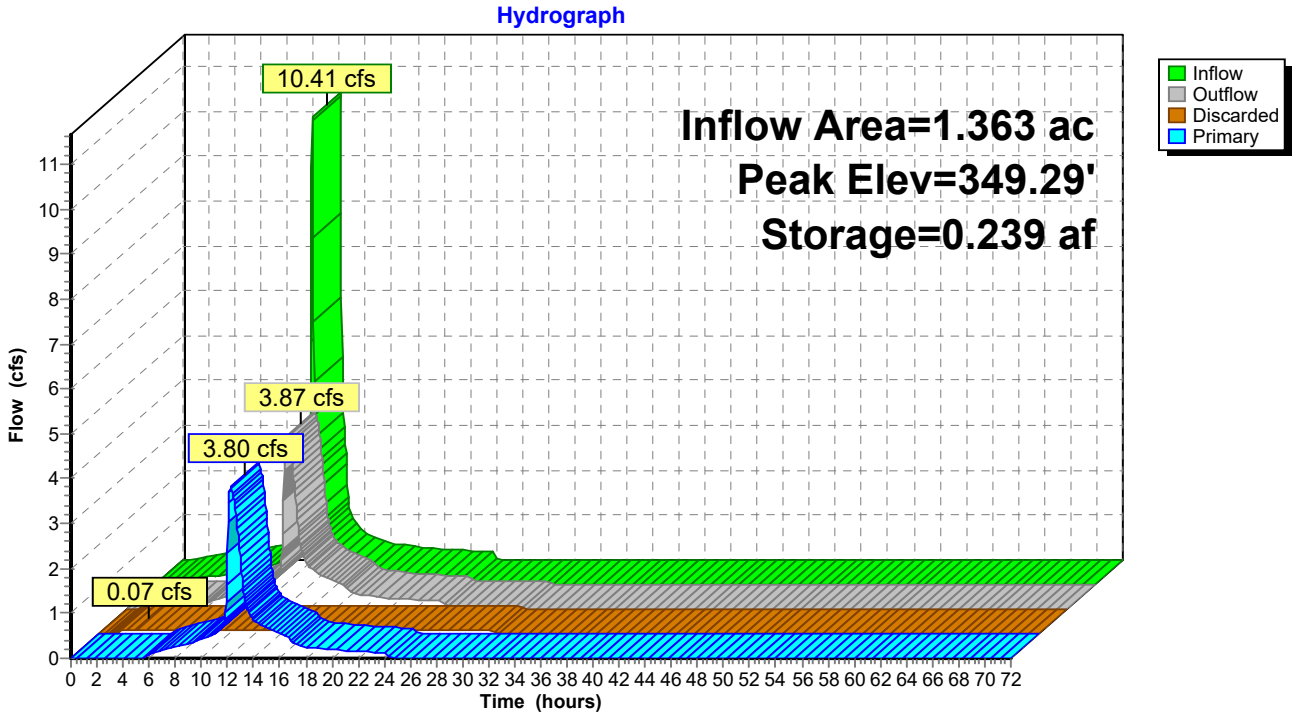
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08

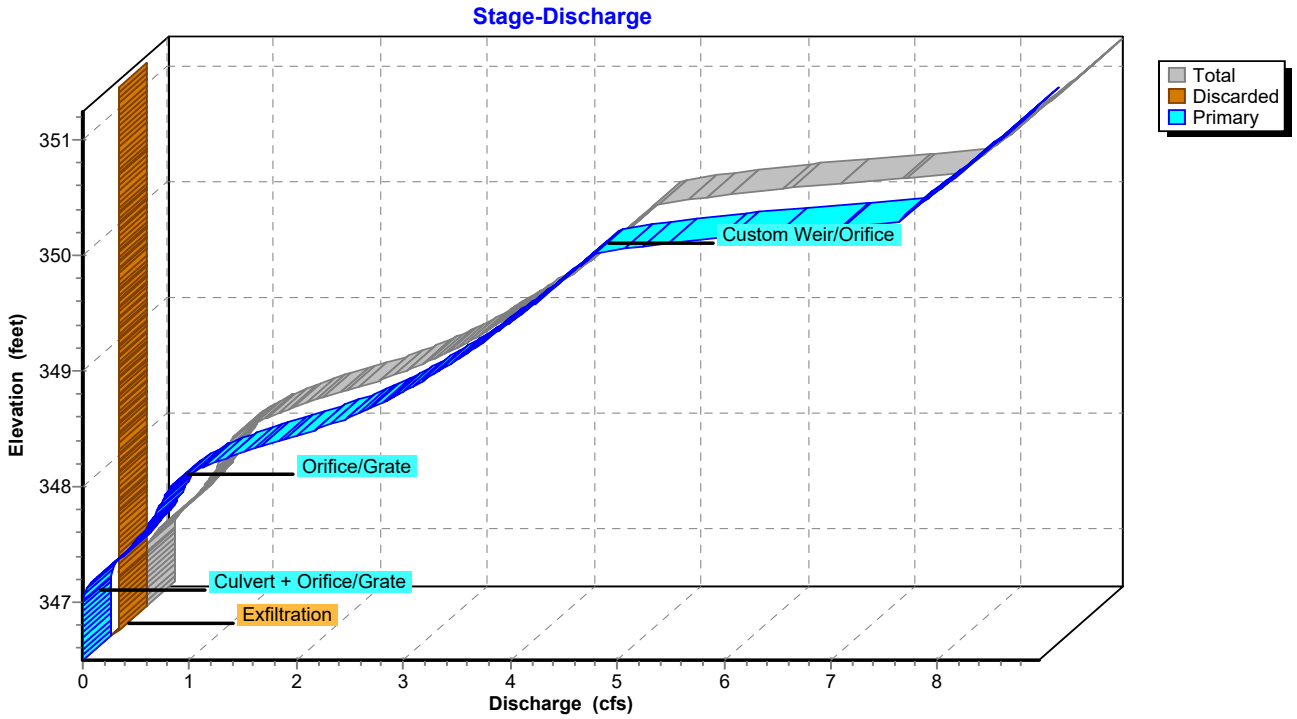




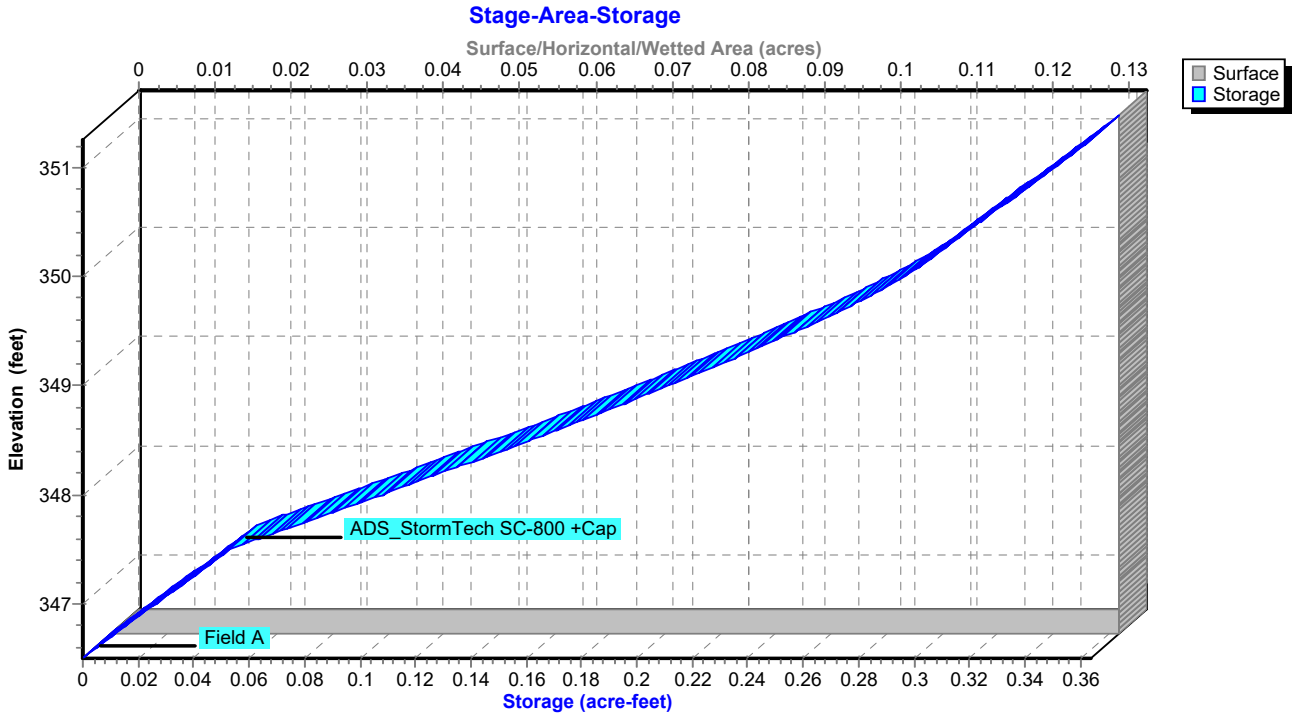
Pond 6P: Infiltrators



Pond 6P: Infiltrators



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.11	0.002	346.53	0.07	**0.07**	0.00
5.00	0.21	0.022	346.92	0.07	**0.07**	0.00
7.50	0.32	0.042	347.29	0.28	0.07	0.22
10.00	**0.56**	**0.050**	**347.45**	**0.49**	0.07	**0.42**
12.50	**2.39**	**0.222**	**349.11**	**3.58**	0.07	**3.51**
15.00	0.46	0.086	347.80	0.77	0.07	0.70
17.50	0.31	0.045	347.35	0.36	0.07	0.29
20.00	0.24	0.041	347.27	0.25	0.07	0.19
22.50	0.20	0.039	347.23	0.21	0.07	0.14
25.00	0.00	0.029	347.05	0.07	0.07	0.01
27.50	0.00	0.015	346.79	0.07	0.07	0.00
30.00	0.00	0.002	346.53	0.07	0.07	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

Inflow = 16.97 cfs @ 12.19 hrs, Volume= 1.358 af
Outflow = 10.93 cfs @ 12.79 hrs, Volume= 1.358 af, Atten= 36%, Lag= 35.9 min
Primary = 10.93 cfs @ 12.79 hrs, Volume= 1.358 af
Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 335.23' @ 12.48 hrs Surf.Area= 0.347 ac Storage= 0.538 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.1 min (795.6 - 767.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.35 cfs @ 12.79 hrs HW=334.69' TW=332.91' (Dynamic Tailwater)
↑**1=Culvert** (Controls 11.35 cfs)
↑**2=Orifice/Grate** (Orifice Controls 11.35 cfs @ 6.42 fps)

Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

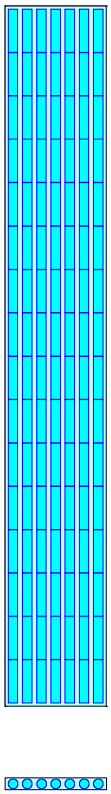
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

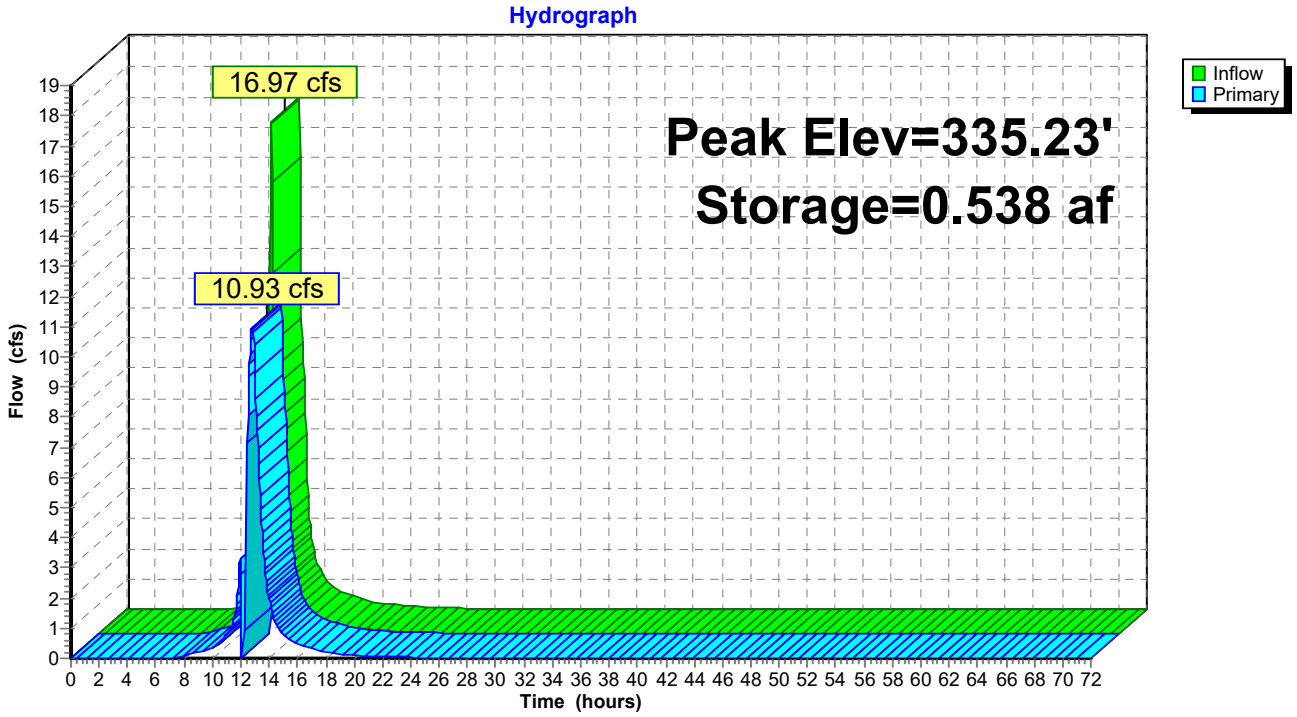
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

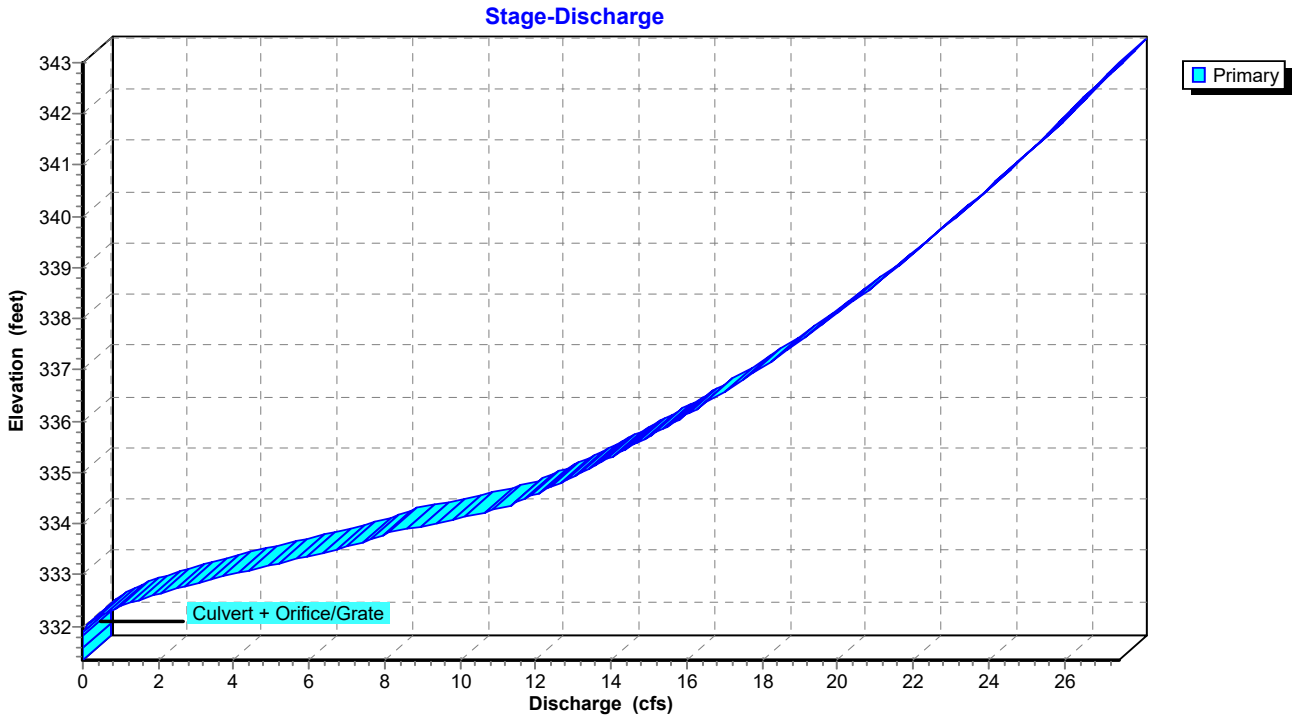
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



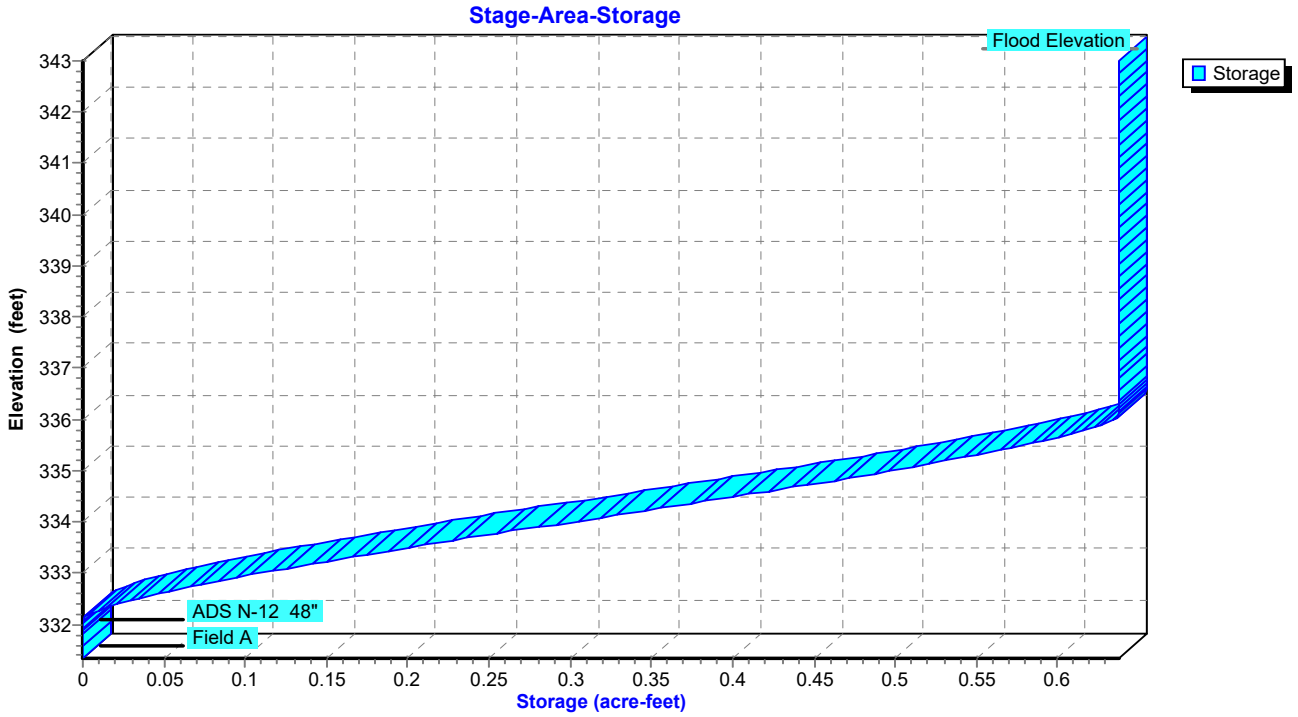
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.84	0.00
7.50	0.05	0.000	331.95	0.05
10.00	**0.44**	0.002	332.16	0.37
12.50	**7.66**	**0.538**	**335.23**	**8.06**
15.00	0.64	0.015	332.33	**0.82**
17.50	0.23	0.000	332.11	0.26
20.00	0.11	0.000	332.01	0.11
22.50	0.05	0.000	331.96	0.05
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Outflow = 29.72 cfs @ 12.63 hrs, Volume= 9.277 af, Atten= 47%, Lag= 29.7 min
Primary = 29.72 cfs @ 12.63 hrs, Volume= 9.277 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 292.45' @ 12.63 hrs Surf.Area= 54,602 sf Storage= 125,758 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 381.1 min calculated for 9.270 af (100% of inflow)
Center-of-Mass det. time= 381.0 min (1,189.0 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

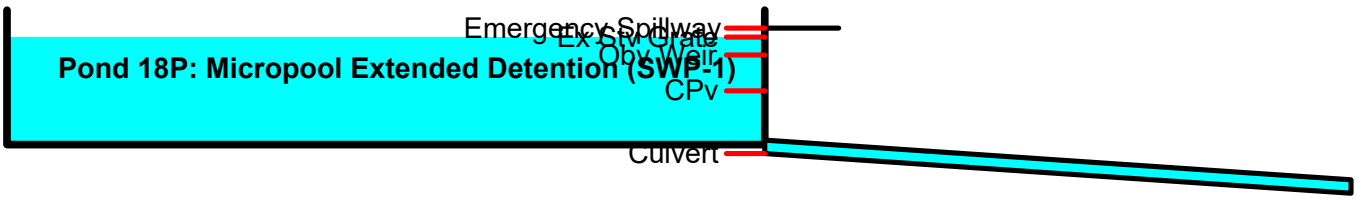
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

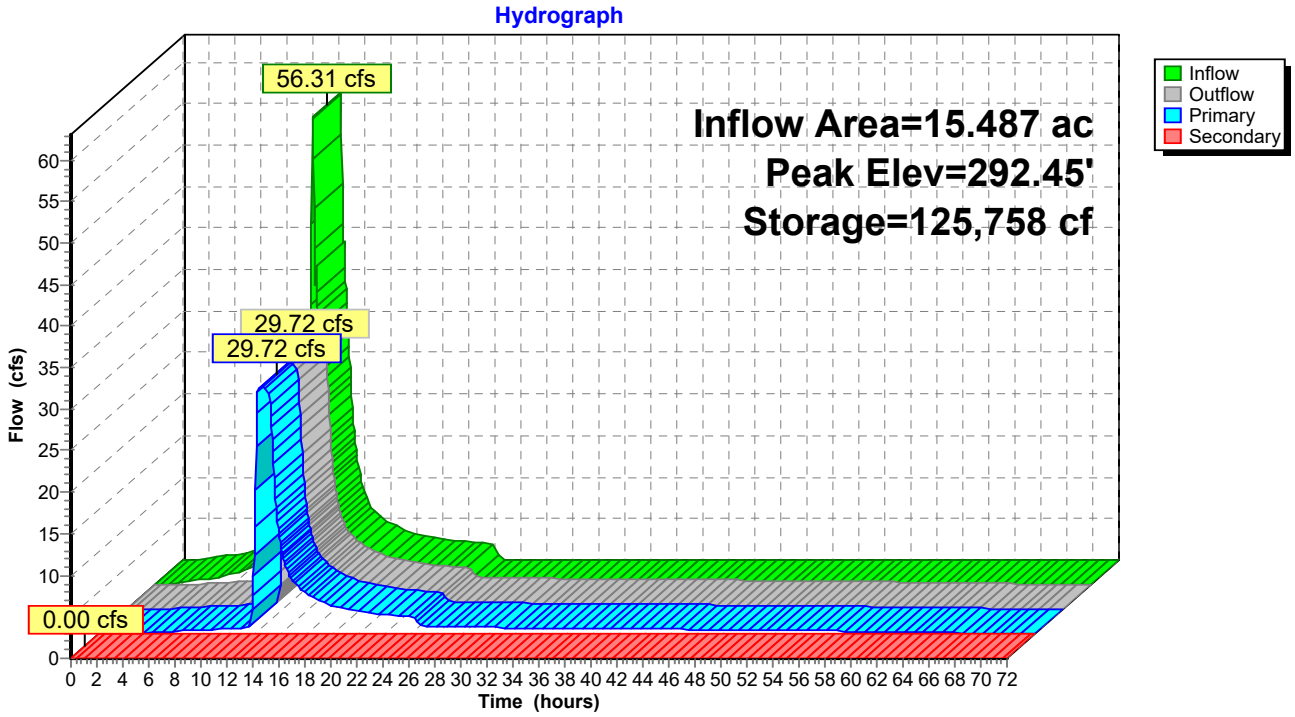
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=29.72 cfs @ 12.63 hrs HW=292.45' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 29.72 cfs @ 16.82 fps)
  ├─**2=CPv** (Passes < 1.01 cfs potential flow)
  ├─**3=Obv Weir** (Passes < 34.58 cfs potential flow)
  └─**4=Ex Stv Grate** (Controls 0.00 cfs)

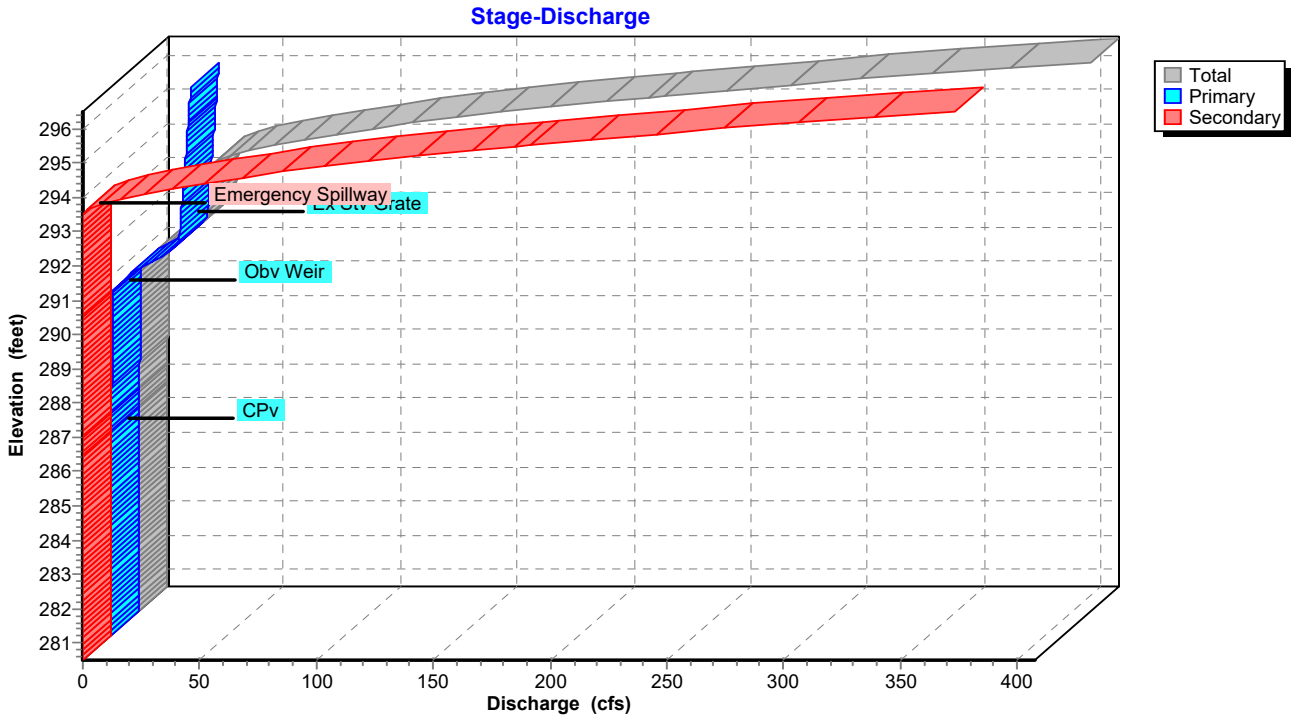
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



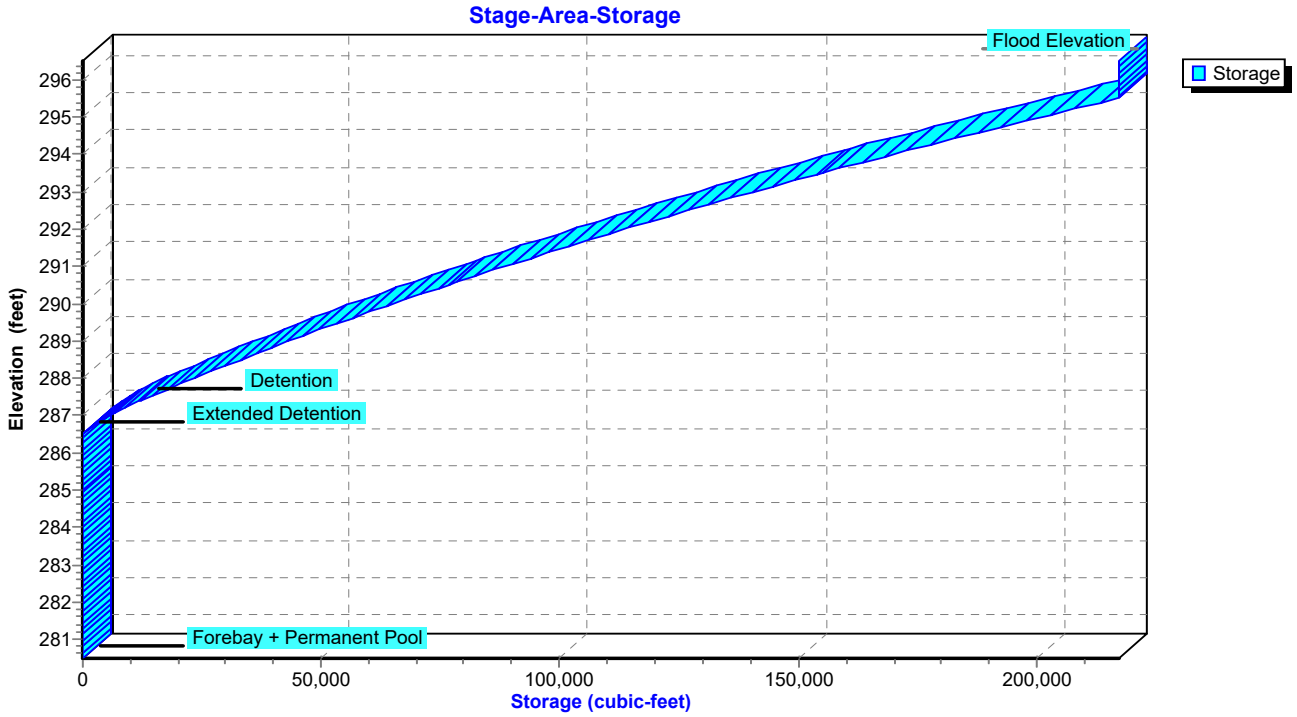
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.37	847	286.59	0.02	0.02	0.00
5.00	0.91	5,413	286.98	0.24	0.24	0.00
7.50	2.12	15,776	287.60	0.41	0.41	0.00
10.00	**4.35**	38,708	288.78	0.61	0.61	0.00
12.50	**33.44**	**124,704**	**292.41**	**29.67**	**29.67**	0.00
15.00	5.52	**86,803**	**290.93**	**6.25**	**6.25**	0.00
17.50	3.40	83,171	290.78	3.66	3.66	0.00
20.00	2.60	81,608	290.71	2.72	2.72	0.00
22.50	2.16	80,725	290.67	2.24	2.24	0.00
25.00	0.01	76,917	290.51	0.85	0.85	0.00
27.50	0.00	69,654	290.20	0.79	0.79	0.00
30.00	0.00	62,702	289.89	0.75	0.75	0.00
32.50	0.00	56,070	289.59	0.72	0.72	0.00
35.00	0.00	49,764	289.30	0.68	0.68	0.00
37.50	0.00	43,793	289.02	0.64	0.64	0.00
40.00	0.00	38,163	288.75	0.61	0.61	0.00
42.50	0.00	32,883	288.49	0.57	0.57	0.00
45.00	0.00	27,959	288.24	0.53	0.53	0.00
47.50	0.00	23,399	288.01	0.49	0.49	0.00
50.00	0.00	19,210	287.79	0.44	0.44	0.00
52.50	0.00	15,399	287.58	0.40	0.40	0.00
55.00	0.00	11,973	287.40	0.36	0.36	0.00
57.50	0.00	8,944	287.22	0.31	0.31	0.00
60.00	0.00	6,361	287.05	0.26	0.26	0.00
62.50	0.00	4,284	286.89	0.20	0.20	0.00
65.00	0.00	2,774	286.77	0.13	0.13	0.00
67.50	0.00	1,870	286.69	0.07	0.07	0.00
70.00	0.00	1,357	286.64	0.04	0.04	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

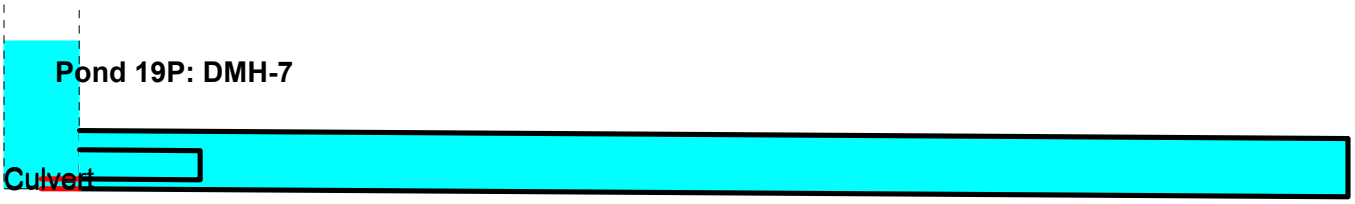
Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 72.39 cfs @ 12.15 hrs, Volume= 9.302 af
Outflow = 72.39 cfs @ 12.15 hrs, Volume= 9.302 af, Atten= 0%, Lag= 0.0 min
Primary = 56.31 cfs @ 12.14 hrs, Volume= 7.943 af
Routed to Pond 20P : DMH-8
Secondary = 16.97 cfs @ 12.19 hrs, Volume= 1.358 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 341.97' @ 12.19 hrs
Flood Elev= 343.83'

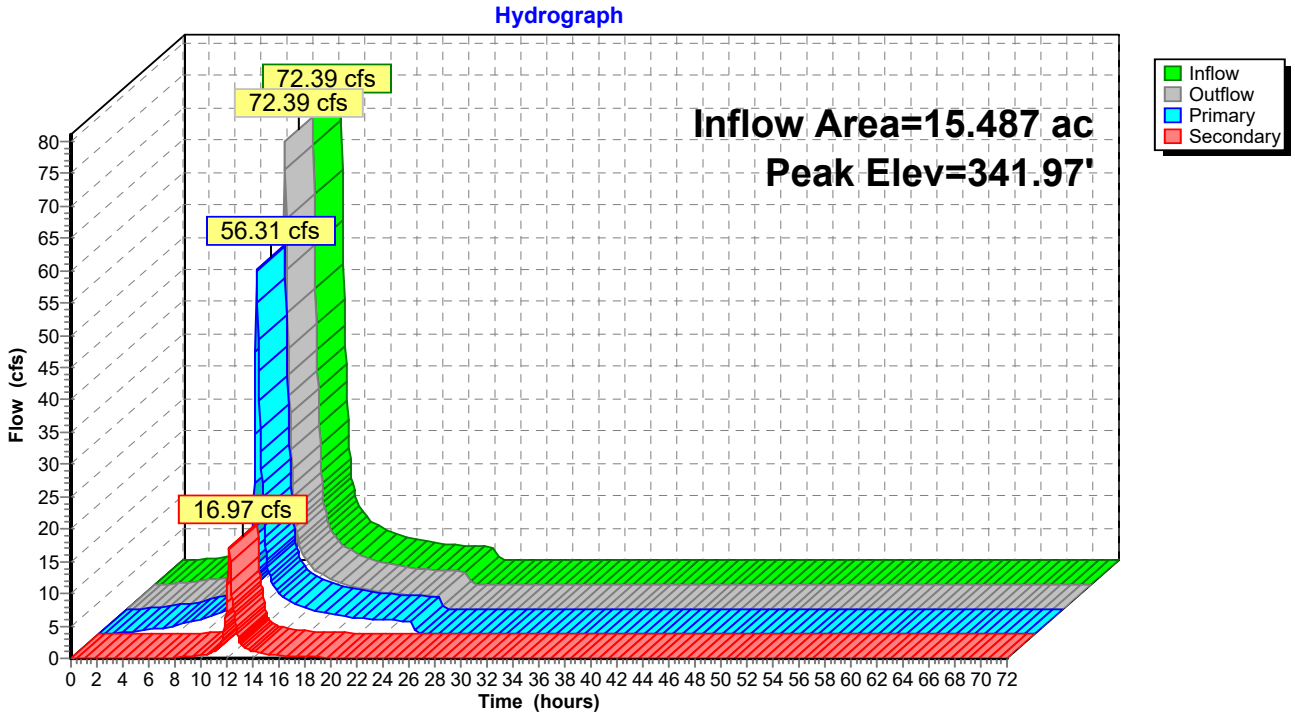
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=47.31 cfs @ 12.14 hrs HW=341.10' TW=338.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 47.31 cfs @ 6.69 fps)

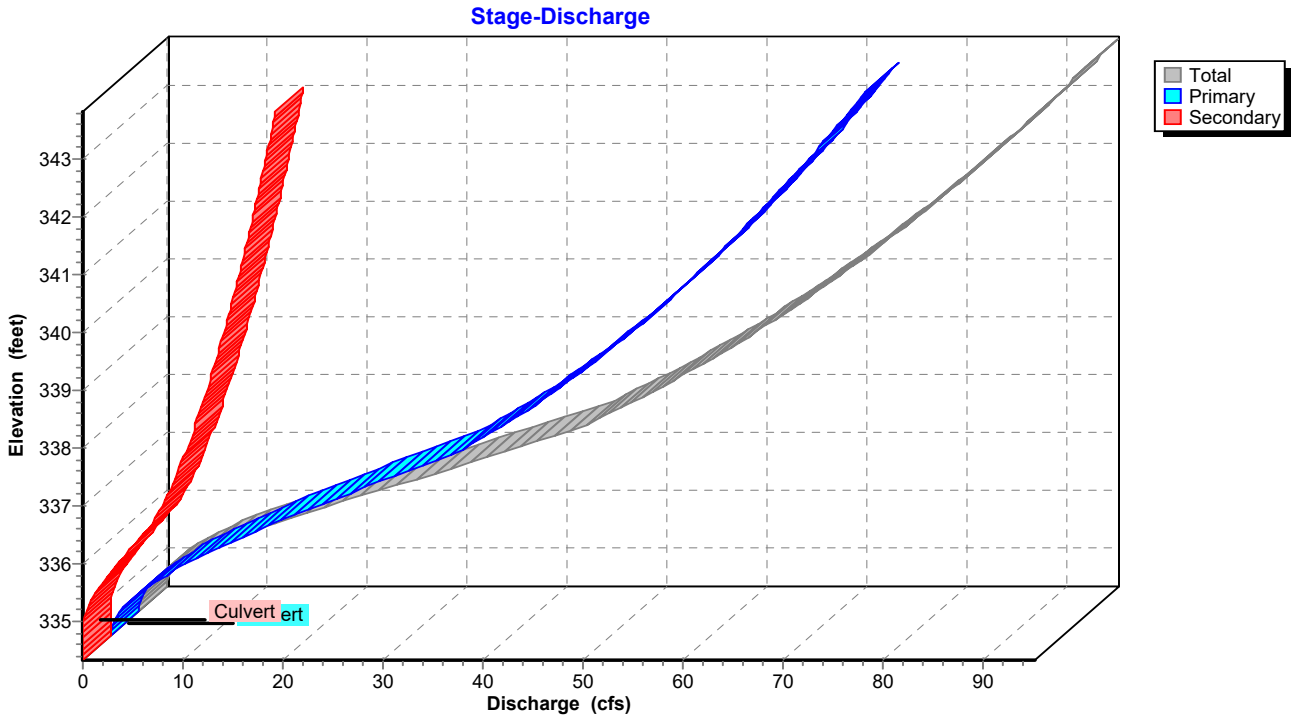
Secondary OutFlow Max=16.74 cfs @ 12.19 hrs HW=341.80' TW=334.11' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 16.74 cfs @ 9.47 fps)



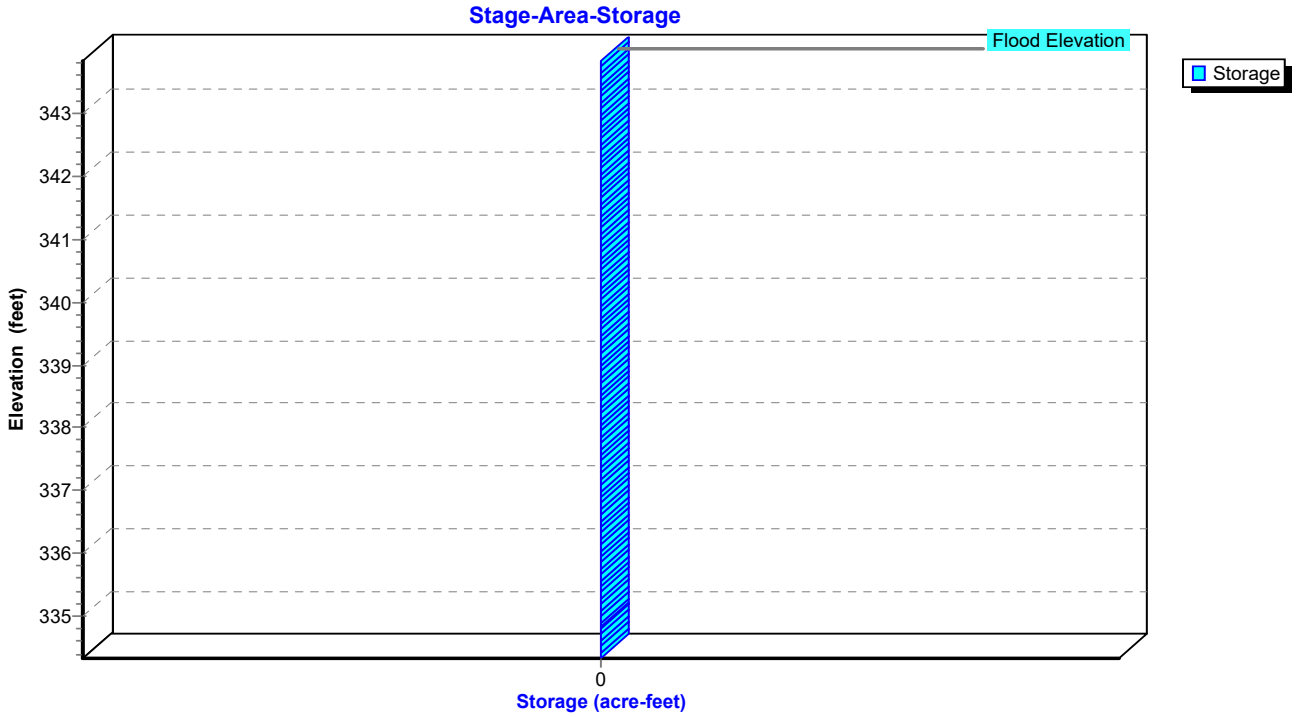
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.37	334.60	0.37	0.37	0.00
5.00	0.91	334.74	0.91	0.91	0.00
7.50	2.12	334.96	2.12	2.07	0.05
10.00	**4.42**	**335.21**	**4.42**	**3.98**	**0.44**
12.50	**33.03**	**336.90**	**33.03**	**25.38**	**7.66**
15.00	5.34	335.29	5.34	4.70	0.64
17.50	3.38	335.11	3.38	3.14	0.23
20.00	2.60	335.02	2.60	2.49	0.11
22.50	2.16	334.96	2.16	2.11	0.05
25.00	0.01	334.38	0.01	0.01	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.44	0.05	0.05	0.00
334.54	0.22	0.22	0.00
334.64	0.50	0.50	0.00
334.74	0.89	0.89	0.00
334.84	1.38	1.38	0.00
334.94	2.00	1.97	0.03
335.04	2.77	2.64	0.13
335.14	3.68	3.39	0.29
335.24	4.72	4.22	0.50
335.34	5.88	5.12	0.76
335.44	7.15	6.09	1.07
335.54	8.53	7.12	1.41
335.64	10.00	8.21	1.80
335.74	11.57	9.35	2.22
335.84	13.21	10.54	2.67
335.94	14.93	11.79	3.14
336.04	16.72	13.08	3.64
336.14	18.55	14.41	4.15
336.24	20.44	15.77	4.66
336.34	22.35	17.17	5.18
336.44	24.29	18.60	5.69
336.54	26.23	20.06	6.17
336.64	28.16	21.53	6.63
336.74	30.05	23.02	7.02
336.84	31.81	24.53	7.28
336.94	33.84	26.04	7.80
337.04	35.64	27.55	8.09
337.14	37.42	29.06	8.36
337.24	39.18	30.55	8.63
337.34	40.92	32.03	8.89
337.44	42.62	33.49	9.14
337.54	44.29	34.91	9.38
337.64	45.67	36.05	9.62
337.74	46.89	37.04	9.85
337.84	48.08	38.00	10.08
337.94	49.24	38.94	10.30
338.04	50.37	39.85	10.51
338.14	51.48	40.75	10.73
338.24	52.56	41.63	10.94
338.34	53.62	42.48	11.14
338.44	54.67	43.33	11.34
338.54	55.69	44.15	11.54
338.64	56.69	44.96	11.73
338.74	57.68	45.76	11.92
338.84	58.65	46.54	12.11
338.94	59.60	47.31	12.29
339.04	60.54	48.07	12.48
339.14	61.47	48.81	12.66
339.24	62.38	49.55	12.83
339.34	63.28	50.27	13.01
339.44	64.16	50.98	13.18
339.54	65.04	51.69	13.35
339.64	65.90	52.38	13.52
339.74	66.75	53.06	13.68
339.84	67.59	53.74	13.85
339.94	68.42	54.41	14.01
340.04	69.24	55.07	14.17
340.14	70.05	55.72	14.33
340.24	70.85	56.36	14.49
340.34	71.64	57.00	14.64
340.44	72.42	57.63	14.79
340.54	73.20	58.25	14.95
340.64	73.96	58.87	15.10
340.74	74.72	59.48	15.24
340.84	75.47	60.08	15.39
340.94	76.22	60.68	15.54
341.04	76.95	61.27	15.68
341.14	77.68	61.86	15.83
341.24	78.41	62.44	15.97
341.34	79.12	63.02	16.11
341.44	79.83	63.59	16.25
341.54	80.54	64.15	16.39
341.64	81.23	64.71	16.52
341.74	81.93	65.27	16.66
341.84	82.61	65.82	16.79
341.94	83.29	66.36	16.93
342.04	83.97	66.91	17.06
342.14	84.63	67.44	17.19
342.24	85.30	67.98	17.32
342.34	85.96	68.50	17.45
342.44	86.61	69.03	17.58
342.54	87.26	69.55	17.71
342.64	87.90	70.07	17.84
342.74	88.54	70.58	17.96
342.84	89.18	71.09	18.09
342.94	89.81	71.60	18.21
343.04	90.43	72.10	18.34
343.14	91.06	72.60	18.46
343.24	91.67	73.09	18.58
343.34	92.29	73.59	18.70
343.44	92.90	74.07	18.82
343.54	93.50	74.56	18.94
343.64	94.10	75.04	19.06
343.74	**94.70**	**75.52**	**19.18**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000
334.44	0.000	339.64	0.000
334.54	0.000	339.74	0.000
334.64	0.000	339.84	0.000
334.74	0.000	339.94	0.000
334.84	0.000	340.04	0.000
334.94	0.000	340.14	0.000
335.04	0.000	340.24	0.000
335.14	0.000	340.34	0.000
335.24	0.000	340.44	0.000
335.34	0.000	340.54	0.000
335.44	0.000	340.64	0.000
335.54	0.000	340.74	0.000
335.64	0.000	340.84	0.000
335.74	0.000	340.94	0.000
335.84	0.000	341.04	0.000
335.94	0.000	341.14	0.000
336.04	0.000	341.24	0.000
336.14	0.000	341.34	0.000
336.24	0.000	341.44	0.000
336.34	0.000	341.54	0.000
336.44	0.000	341.64	0.000
336.54	0.000	341.74	0.000
336.64	0.000	341.84	0.000
336.74	0.000	341.94	0.000
336.84	0.000	342.04	0.000
336.94	0.000	342.14	0.000
337.04	0.000	342.24	0.000
337.14	0.000	342.34	0.000
337.24	0.000	342.44	0.000
337.34	0.000	342.54	0.000
337.44	0.000	342.64	0.000
337.54	0.000	342.74	0.000
337.64	0.000	342.84	0.000
337.74	0.000	342.94	0.000
337.84	0.000	343.04	0.000
337.94	0.000	343.14	0.000
338.04	0.000	343.24	0.000
338.14	0.000	343.34	0.000
338.24	0.000	343.44	0.000
338.34	0.000	343.54	0.000
338.44	0.000	343.64	0.000
338.54	0.000	343.74	0.000
338.64	0.000		
338.74	0.000		
338.84	0.000		
338.94	0.000		
339.04	0.000		
339.14	0.000		
339.24	0.000		
339.34	0.000		
339.44	0.000		

Summary for Pond 20P: DMH-8

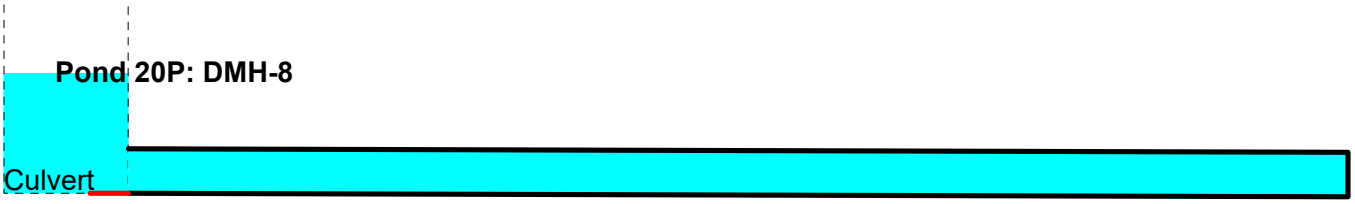
[80] Warning: Exceeded Pond 9P by 4.42' @ 12.15 hrs (17.89 cfs 0.354 af)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Outflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af, Atten= 0%, Lag= 0.0 min
Primary = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Routed to Pond 21P : DMH-9

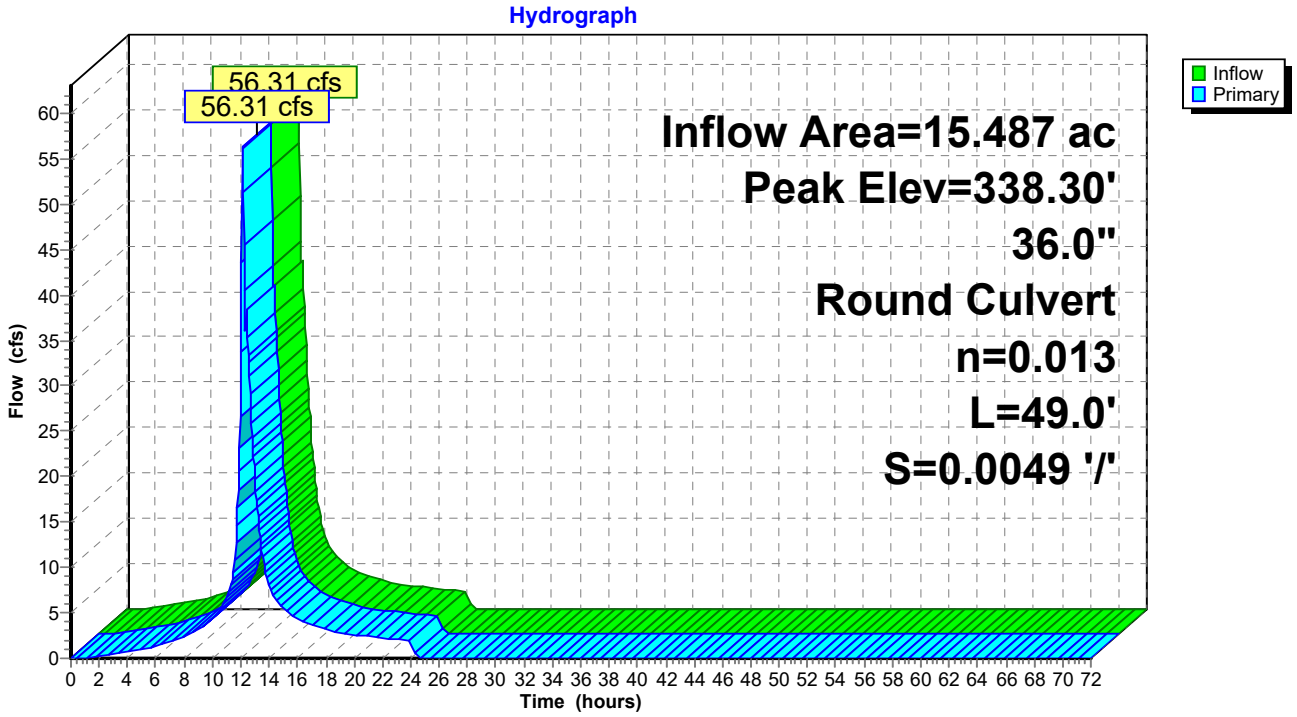
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 338.30' @ 12.16 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

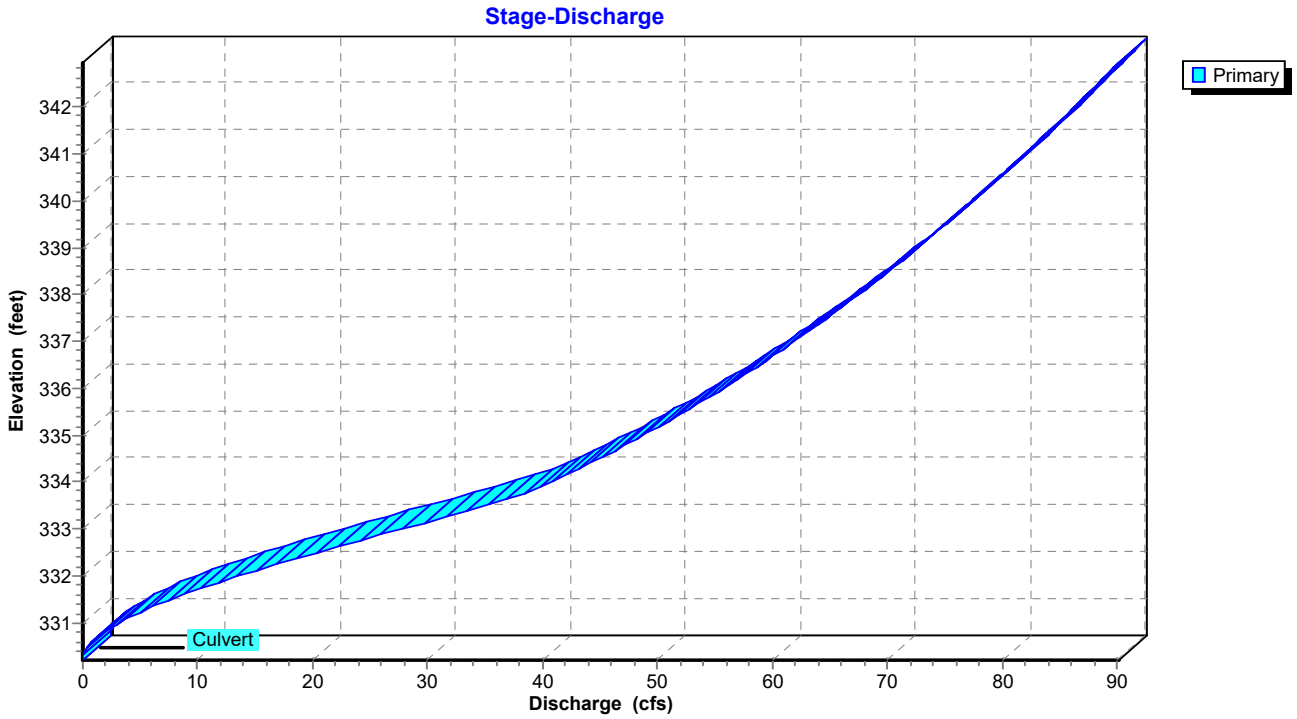
Primary OutFlow Max=53.46 cfs @ 12.14 hrs HW=338.00' TW=334.04' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 53.46 cfs @ 7.56 fps)



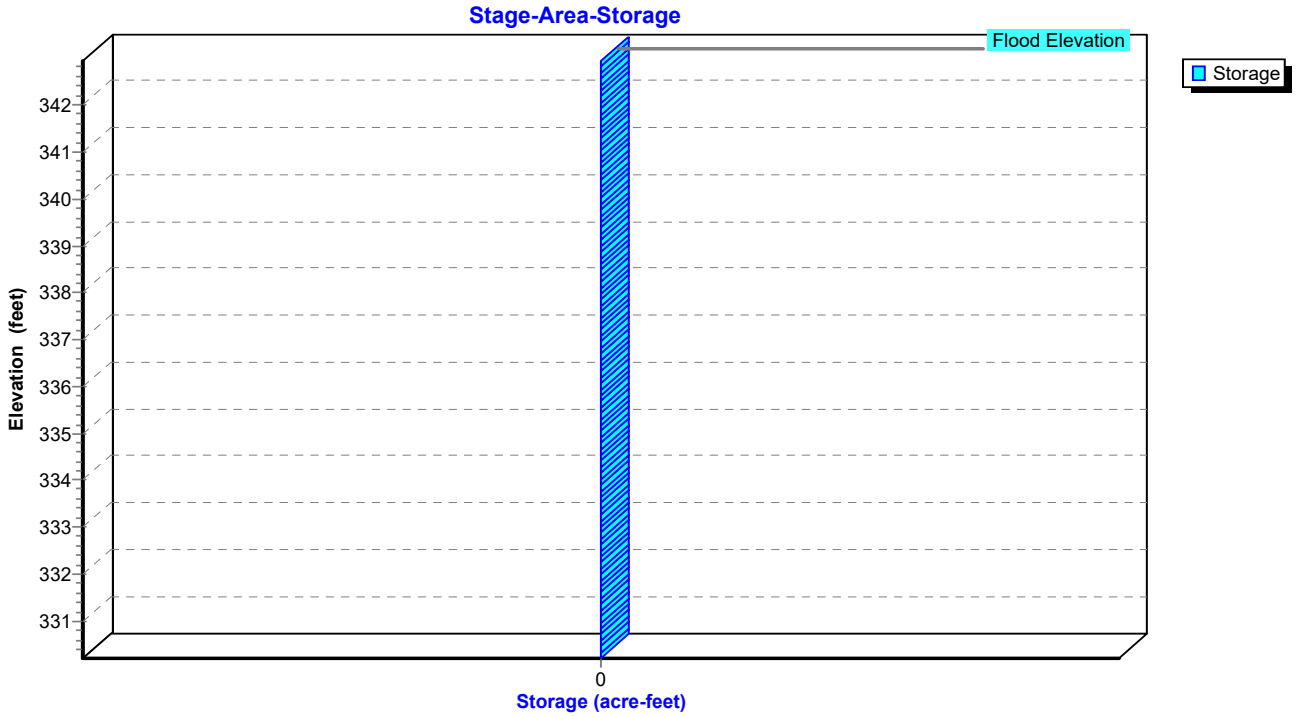
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.20	0.00
2.00	0.23	330.41	0.23
3.00	0.48	330.50	0.48
4.00	0.69	330.56	0.69
5.00	0.91	330.62	0.91
6.00	1.33	330.70	1.33
7.00	1.85	330.80	1.85
8.00	2.42	330.89	2.42
9.00	3.18	331.00	3.18
10.00	4.35	331.15	4.35
11.00	6.75	331.41	6.75
12.00	**33.69**	**333.56**	**33.69**
13.00	**19.75**	**332.51**	**19.75**
14.00	7.94	331.52	7.94
15.00	5.52	331.28	5.52
16.00	4.44	331.16	4.44
17.00	3.69	331.07	3.69
18.00	3.17	331.00	3.17
19.00	2.84	330.95	2.84
20.00	2.60	330.92	2.60
21.00	2.40	330.89	2.40
22.00	2.23	330.86	2.23
23.00	2.09	330.84	2.09
24.00	1.98	330.82	1.98
25.00	0.01	330.24	0.01
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

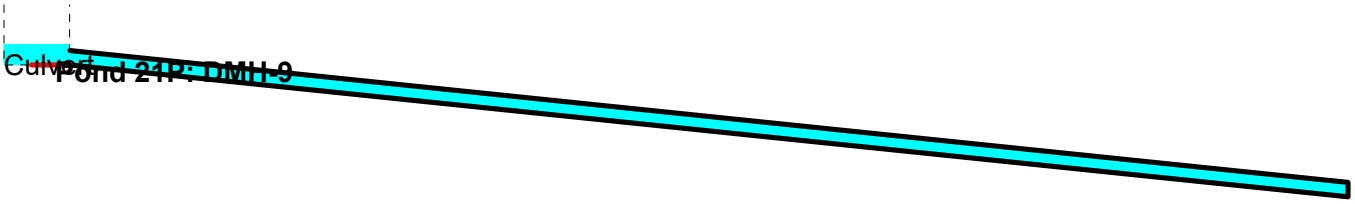
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Outflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af, Atten= 0%, Lag= 0.0 min
Primary = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Routed to Pond 23P : DMH-10

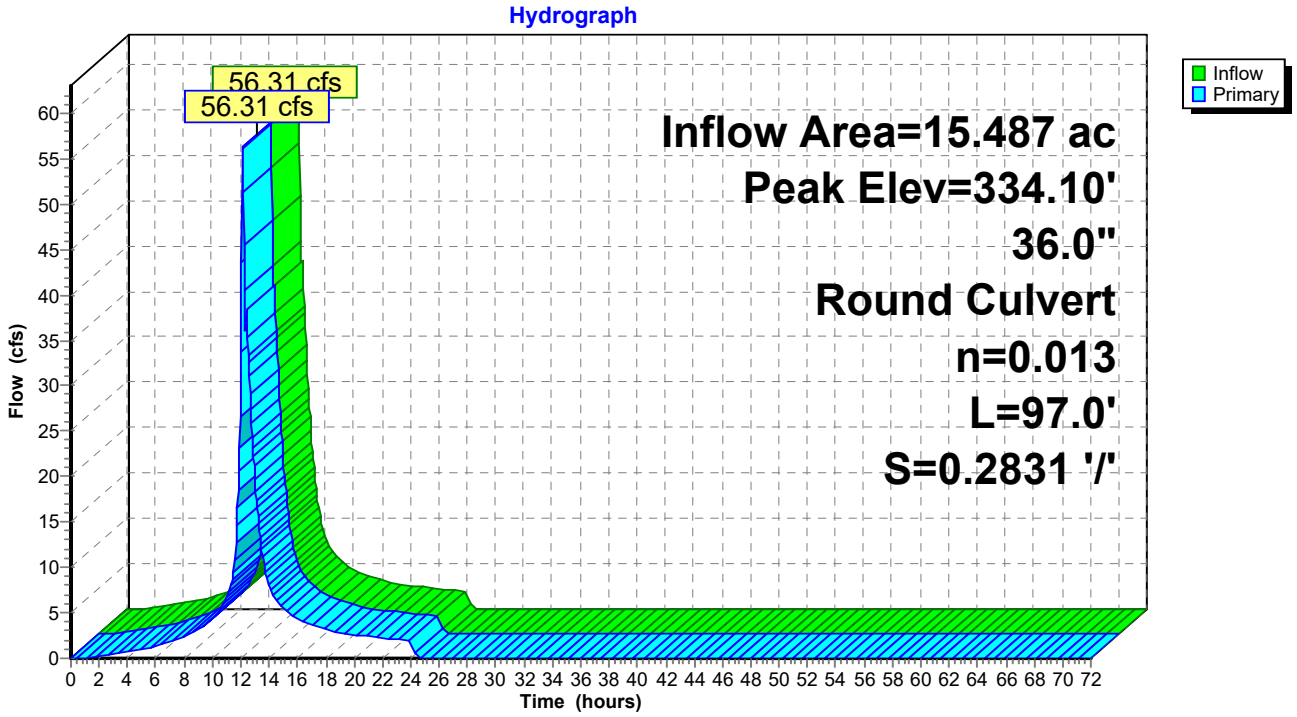
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 334.10' @ 12.14 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

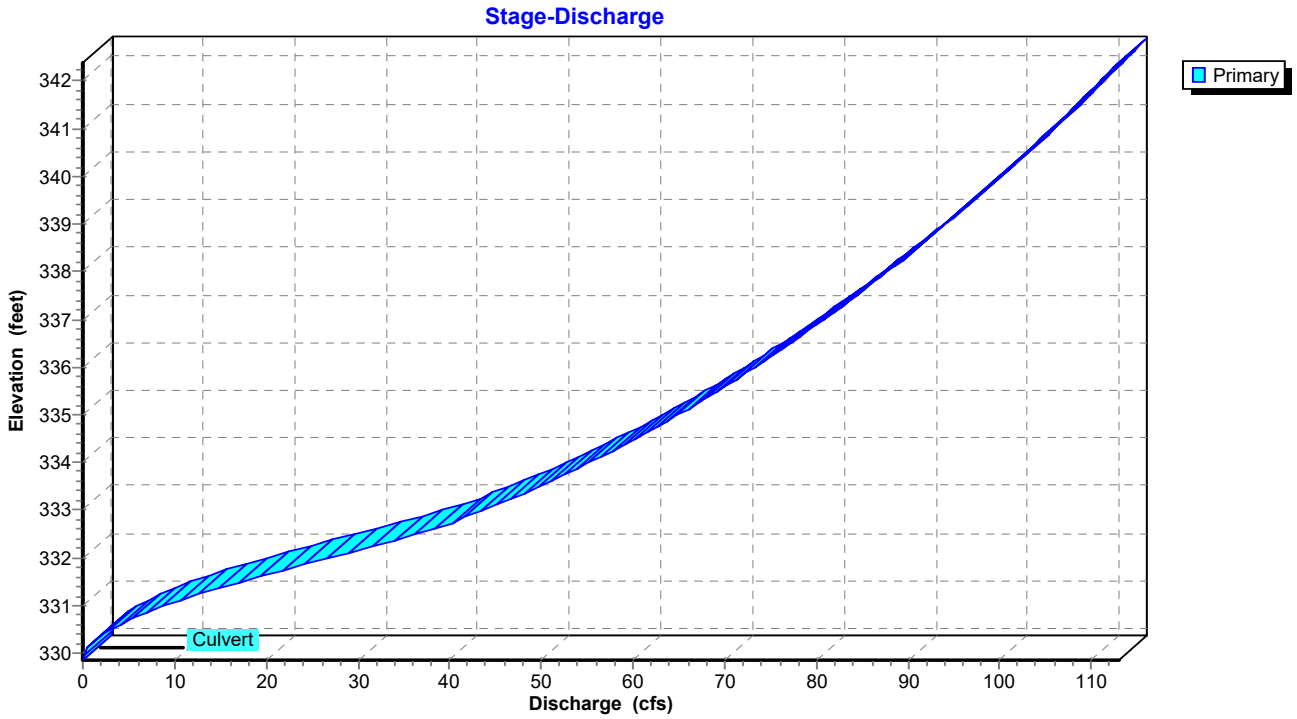
Primary OutFlow Max=55.72 cfs @ 12.14 hrs HW=334.04' TW=302.76' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 55.72 cfs @ 7.88 fps)



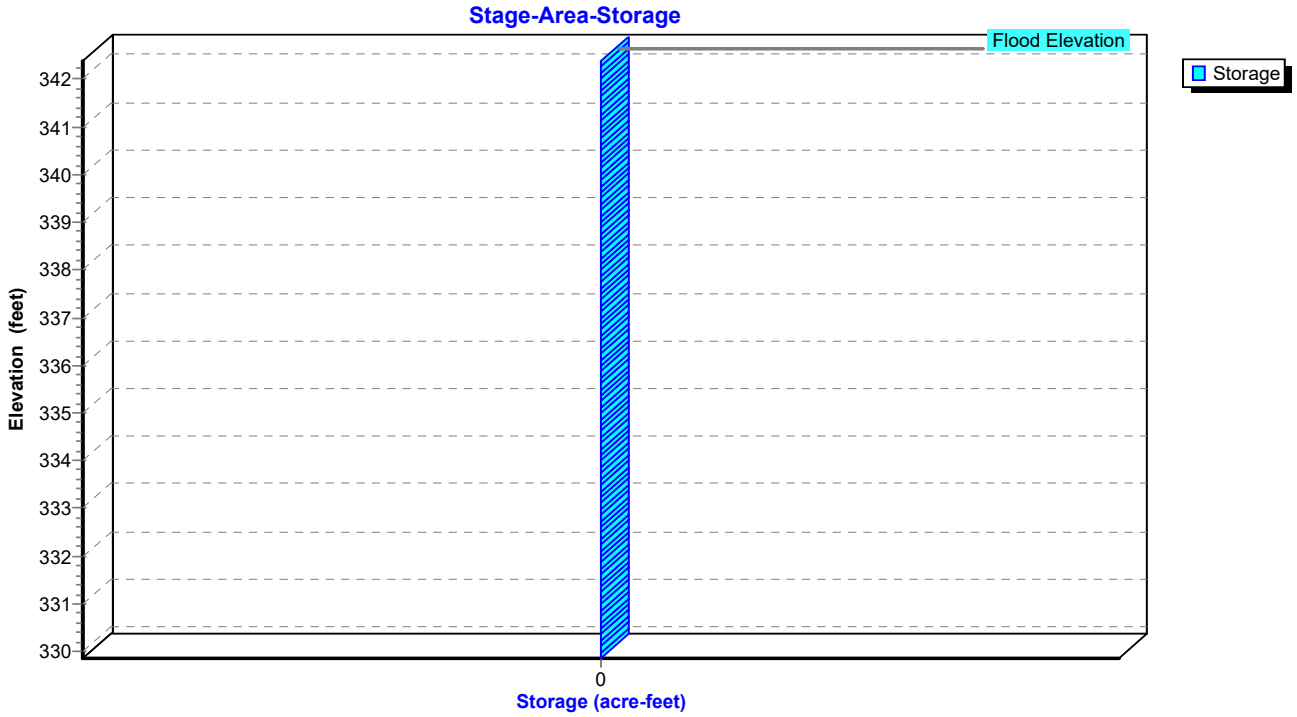
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.86	0.00
2.00	0.23	330.03	0.23
3.00	0.48	330.11	0.48
4.00	0.69	330.16	0.69
5.00	0.91	330.21	0.91
6.00	1.33	330.28	1.33
7.00	1.85	330.36	1.85
8.00	2.42	330.43	2.42
9.00	3.18	330.52	3.18
10.00	4.35	330.64	4.35
11.00	6.75	330.84	6.75
12.00	**33.69**	**332.35**	**33.69**
13.00	**19.75**	**331.63**	**19.75**
14.00	7.94	330.93	7.94
15.00	5.52	330.74	5.52
16.00	4.44	330.64	4.44
17.00	3.69	330.57	3.69
18.00	3.17	330.52	3.17
19.00	2.84	330.48	2.84
20.00	2.60	330.45	2.60
21.00	2.40	330.43	2.40
22.00	2.23	330.41	2.23
23.00	2.09	330.39	2.09
24.00	1.98	330.38	1.98
25.00	0.01	329.89	0.01
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

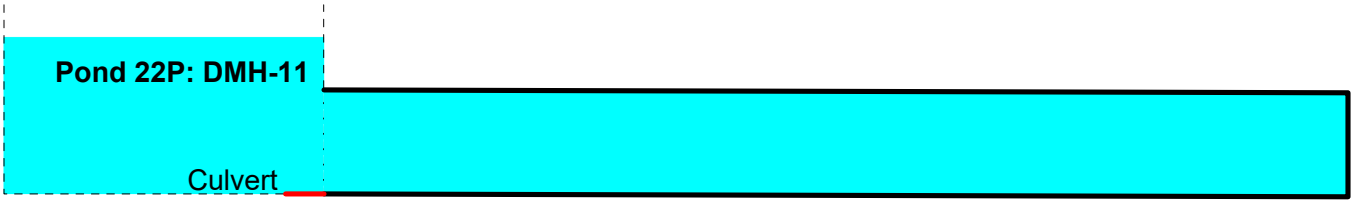
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Outflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af, Atten= 0%, Lag= 0.0 min
Primary = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

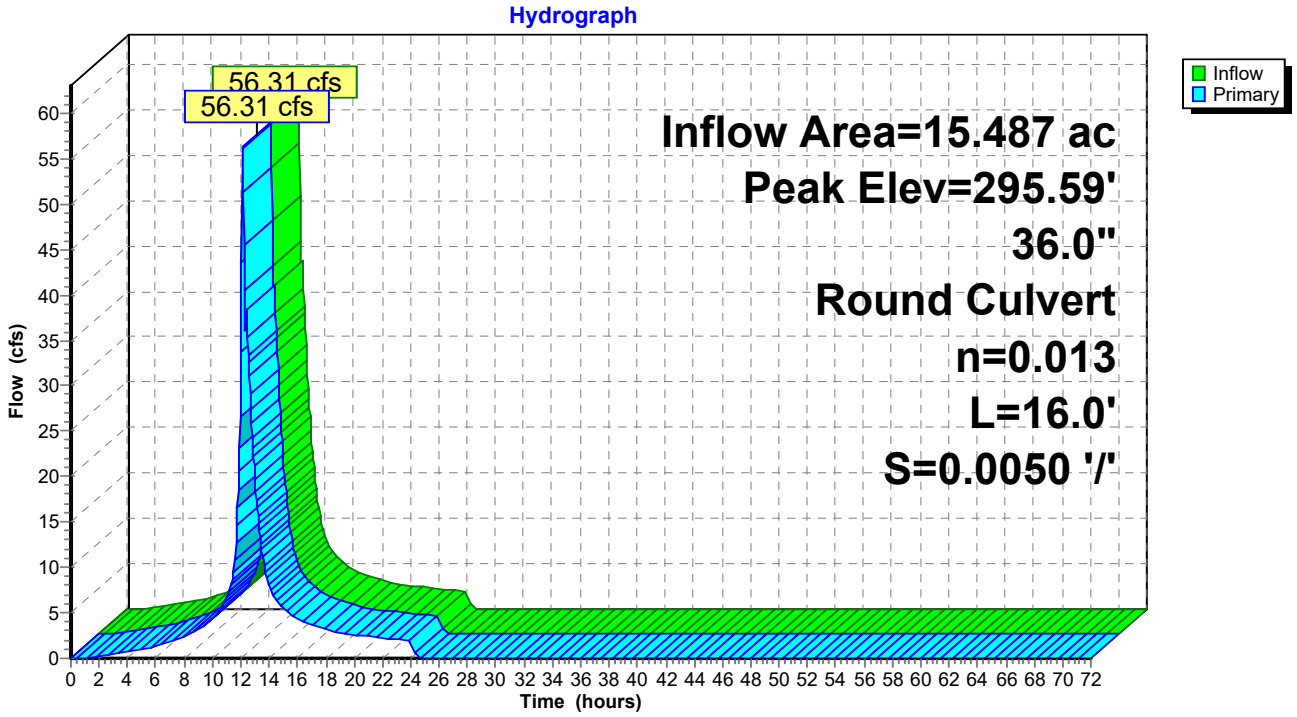
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 295.59' @ 12.14 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

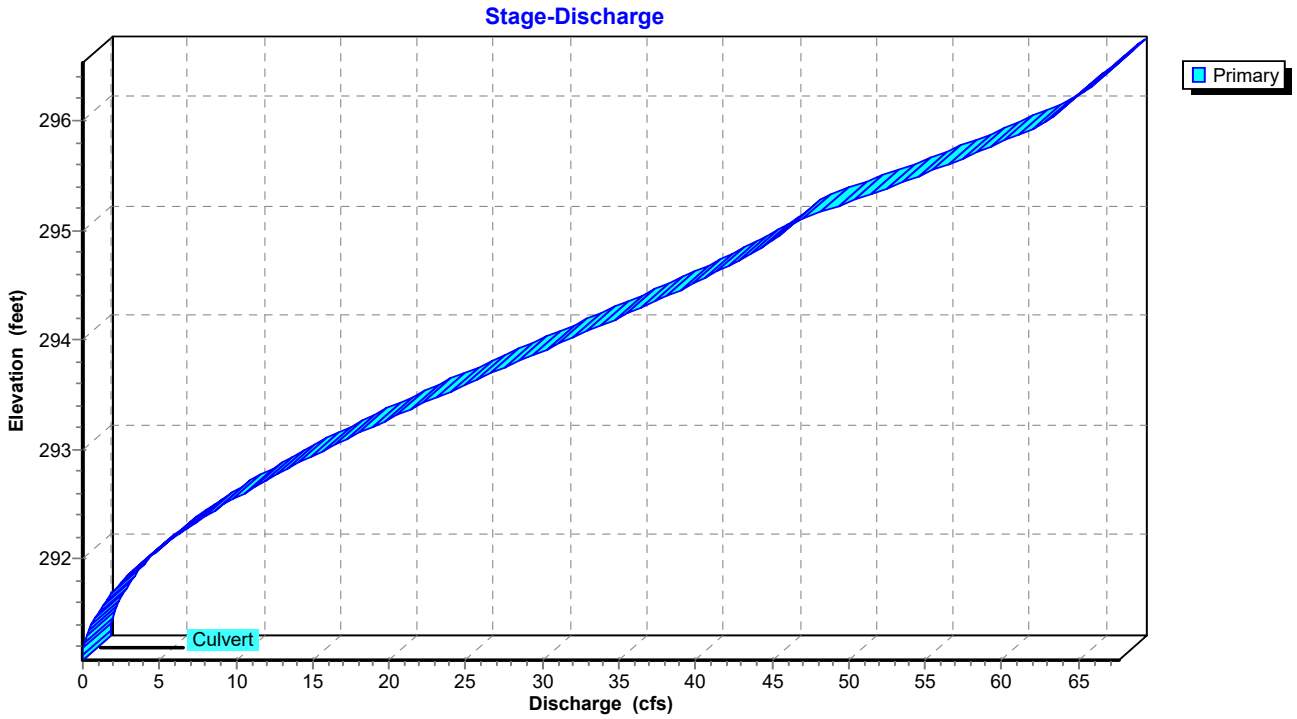
Primary OutFlow Max=55.72 cfs @ 12.14 hrs HW=295.56' TW=291.77' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 55.72 cfs @ 7.88 fps)



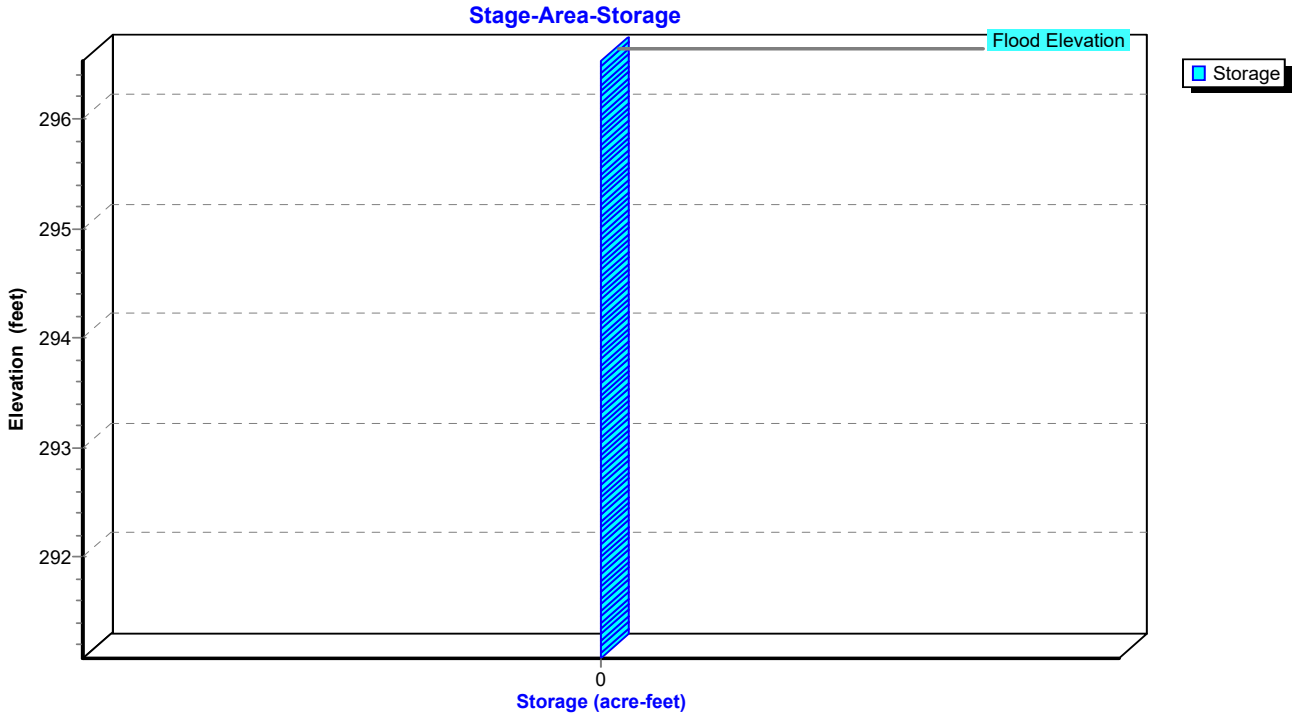
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.08	0.00
2.00	0.23	291.29	0.23
3.00	0.48	291.38	0.48
4.00	0.69	291.44	0.69
5.00	0.91	291.50	0.91
6.00	1.33	291.59	1.33
7.00	1.85	291.68	1.85
8.00	2.42	291.77	2.42
9.00	3.18	291.88	3.18
10.00	4.35	292.03	4.35
11.00	6.75	292.28	6.75
12.00	**33.69**	**294.12**	**33.69**
13.00	**19.75**	**293.26**	**19.75**
14.00	7.94	292.39	7.94
15.00	5.52	292.15	5.52
16.00	4.44	292.04	4.44
17.00	3.69	291.95	3.69
18.00	3.17	291.88	3.17
19.00	2.84	291.83	2.84
20.00	2.60	291.80	2.60
21.00	2.40	291.77	2.40
22.00	2.23	291.74	2.23
23.00	2.09	291.72	2.09
24.00	1.98	291.70	1.98
25.00	0.01	291.12	0.01
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

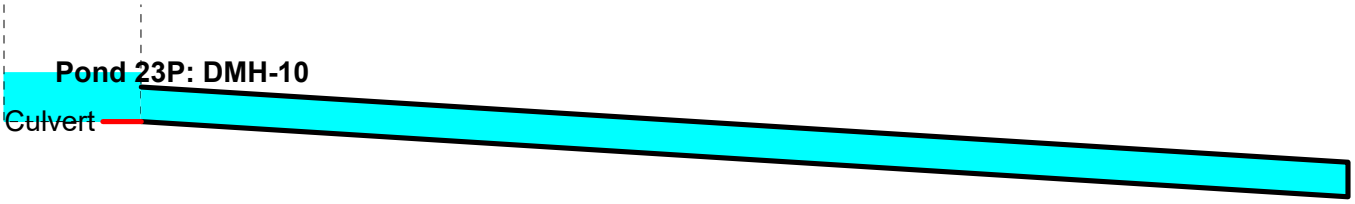
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Outflow = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af, Atten= 0%, Lag= 0.0 min
Primary = 56.31 cfs @ 12.14 hrs, Volume= 9.302 af
Routed to Pond 22P : DMH-11

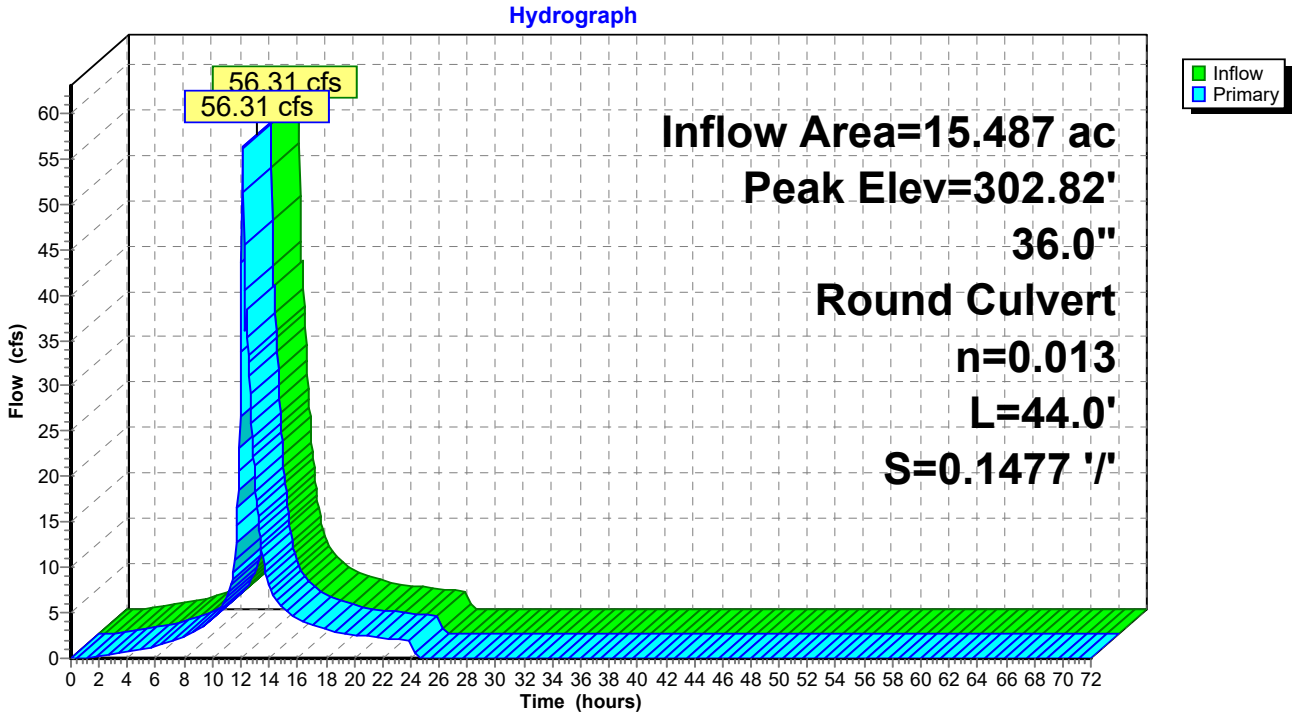
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 302.82' @ 12.14 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

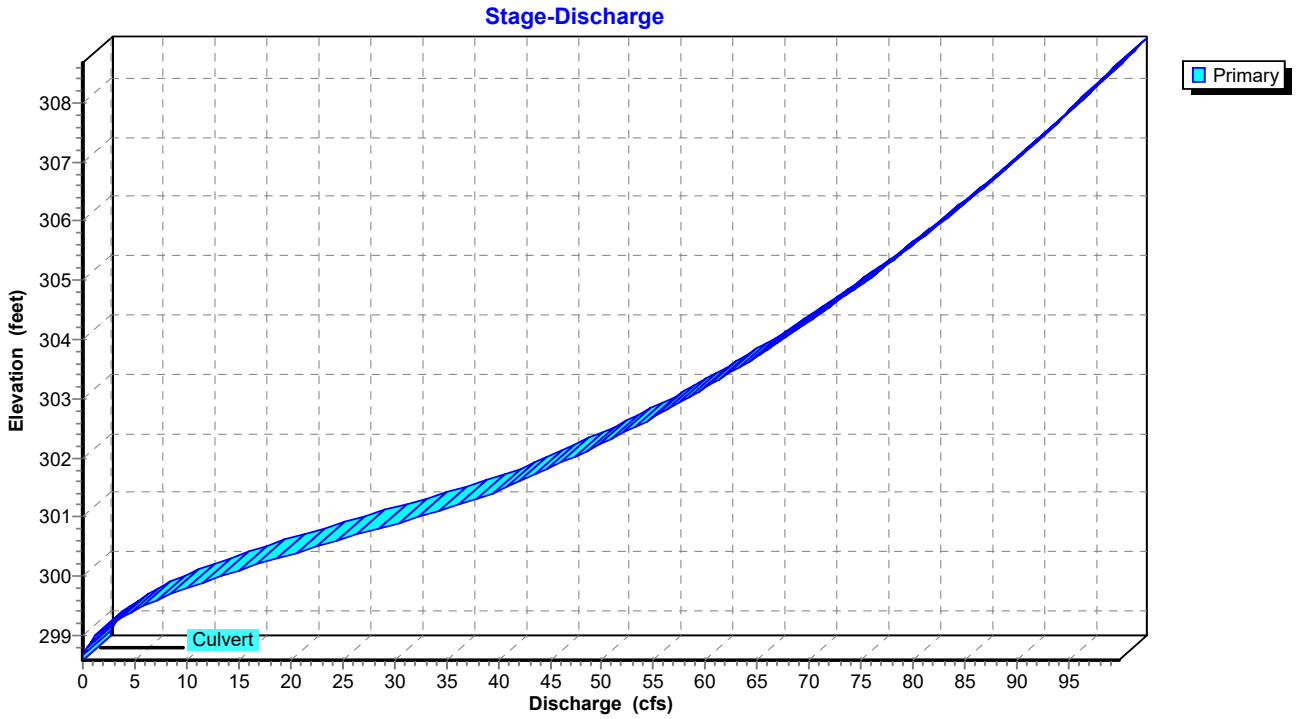
Primary OutFlow Max=55.72 cfs @ 12.14 hrs HW=302.76' TW=295.56' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 55.72 cfs @ 7.88 fps)



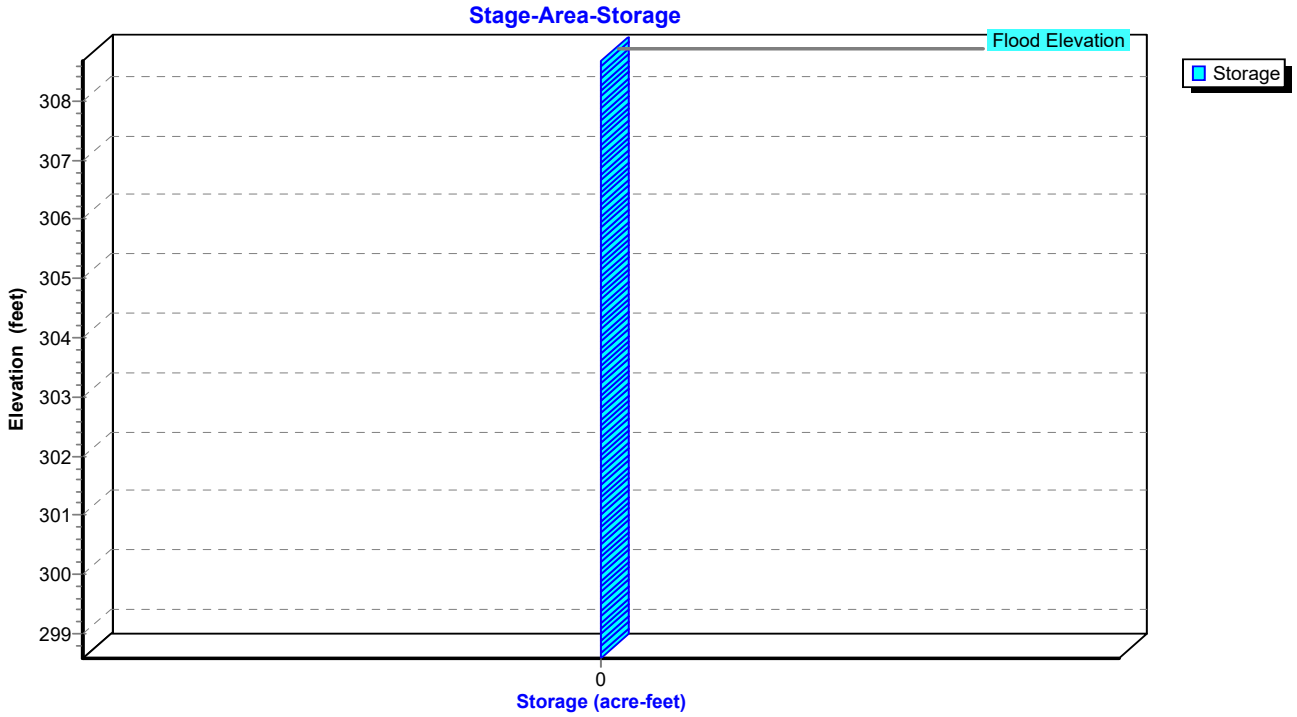
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00
1.00	0.00	298.58	0.00
2.00	0.23	298.75	0.23
3.00	0.48	298.83	0.48
4.00	0.69	298.88	0.69
5.00	0.91	298.93	0.91
6.00	1.33	299.00	1.33
7.00	1.85	299.08	1.85
8.00	2.42	299.15	2.42
9.00	3.18	299.24	3.18
10.00	4.35	299.36	4.35
11.00	6.75	299.56	6.75
12.00	**33.69**	**301.07**	**33.69**
13.00	**19.75**	**300.35**	**19.75**
14.00	7.94	299.65	7.94
15.00	5.52	299.46	5.52
16.00	4.44	299.36	4.44
17.00	3.69	299.29	3.69
18.00	3.17	299.24	3.17
19.00	2.84	299.20	2.84
20.00	2.60	299.17	2.60
21.00	2.40	299.15	2.40
22.00	2.23	299.13	2.23
23.00	2.09	299.11	2.09
24.00	1.98	299.10	1.98
25.00	0.01	298.61	0.01
26.00	0.00	298.58	0.00
27.00	0.00	298.58	0.00
28.00	0.00	298.58	0.00
29.00	0.00	298.58	0.00
30.00	0.00	298.58	0.00
31.00	0.00	298.58	0.00
32.00	0.00	298.58	0.00
33.00	0.00	298.58	0.00
34.00	0.00	298.58	0.00
35.00	0.00	298.58	0.00
36.00	0.00	298.58	0.00
37.00	0.00	298.58	0.00
38.00	0.00	298.58	0.00
39.00	0.00	298.58	0.00
40.00	0.00	298.58	0.00
41.00	0.00	298.58	0.00
42.00	0.00	298.58	0.00
43.00	0.00	298.58	0.00
44.00	0.00	298.58	0.00
45.00	0.00	298.58	0.00
46.00	0.00	298.58	0.00
47.00	0.00	298.58	0.00
48.00	0.00	298.58	0.00
49.00	0.00	298.58	0.00
50.00	0.00	298.58	0.00
51.00	0.00	298.58	0.00
52.00	0.00	298.58	0.00
53.00	0.00	298.58	0.00
54.00	0.00	298.58	0.00
55.00	0.00	298.58	0.00
56.00	0.00	298.58	0.00
57.00	0.00	298.58	0.00
58.00	0.00	298.58	0.00
59.00	0.00	298.58	0.00
60.00	0.00	298.58	0.00
61.00	0.00	298.58	0.00
62.00	0.00	298.58	0.00
63.00	0.00	298.58	0.00
64.00	0.00	298.58	0.00
65.00	0.00	298.58	0.00
66.00	0.00	298.58	0.00
67.00	0.00	298.58	0.00
68.00	0.00	298.58	0.00
69.00	0.00	298.58	0.00
70.00	0.00	298.58	0.00
71.00	0.00	298.58	0.00
72.00	0.00	298.58	0.00

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

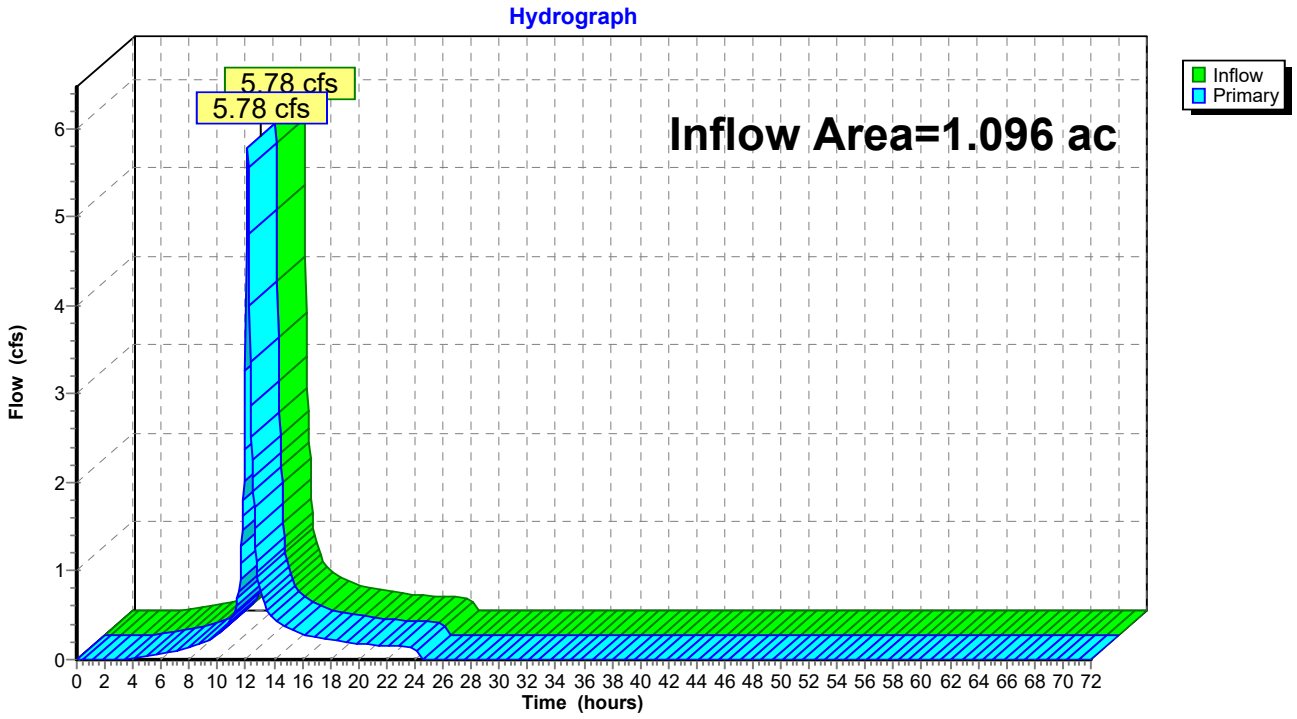
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 6.84" for 100-yr event
Inflow = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af
Primary = 5.78 cfs @ 12.12 hrs, Volume= 0.625 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

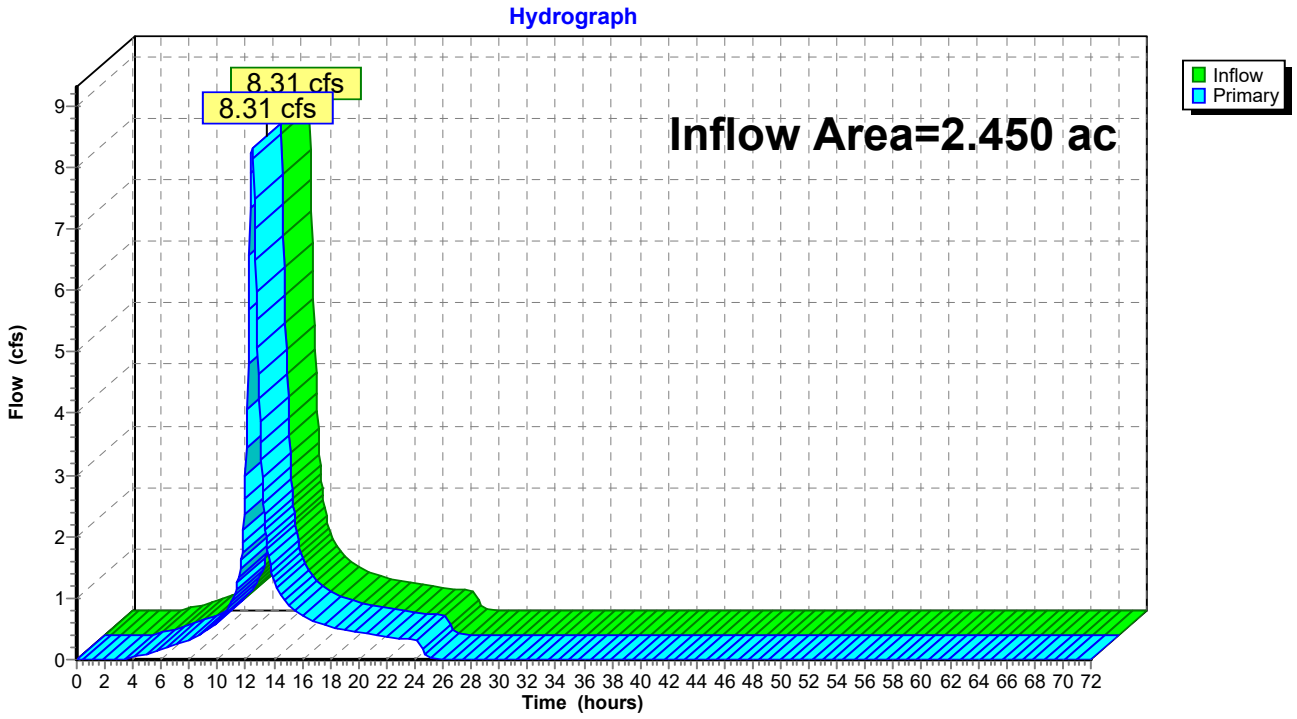
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.01	0.00	0.01
5.00	0.04	0.00	0.04
6.00	0.07	0.00	0.07
7.00	0.10	0.00	0.10
8.00	0.14	0.00	0.14
9.00	0.20	0.00	0.20
10.00	0.28	0.00	0.28
11.00	0.48	0.00	0.48
12.00	**3.26**	0.00	**3.26**
13.00	**0.78**	0.00	**0.78**
14.00	0.47	0.00	0.47
15.00	0.36	0.00	0.36
16.00	0.29	0.00	0.29
17.00	0.25	0.00	0.25
18.00	0.22	0.00	0.22
19.00	0.20	0.00	0.20
20.00	0.19	0.00	0.19
21.00	0.17	0.00	0.17
22.00	0.16	0.00	0.16
23.00	0.15	0.00	0.15
24.00	0.14	0.00	0.14
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 7.22" for 100-yr event
Inflow = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af
Primary = 8.31 cfs @ 12.45 hrs, Volume= 1.473 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

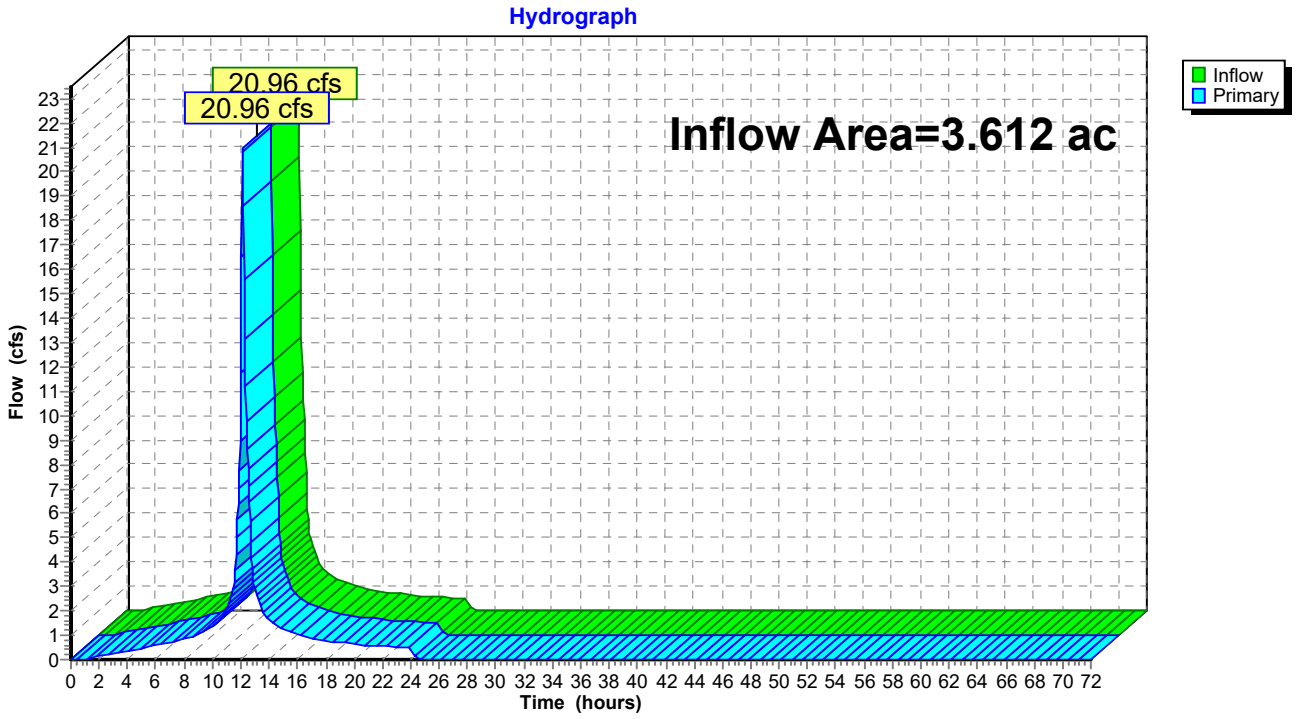
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.04	0.00	0.04
5.00	0.10	0.00	0.10
6.00	0.17	0.00	0.17
7.00	0.24	0.00	0.24
8.00	0.33	0.00	0.33
9.00	0.45	0.00	0.45
10.00	0.62	0.00	0.62
11.00	0.96	0.00	0.96
12.00	**2.98**	0.00	**2.98**
13.00	**3.86**	0.00	**3.86**
14.00	1.29	0.00	1.29
15.00	0.89	0.00	0.89
16.00	0.71	0.00	0.71
17.00	0.61	0.00	0.61
18.00	0.53	0.00	0.53
19.00	0.48	0.00	0.48
20.00	0.44	0.00	0.44
21.00	0.40	0.00	0.40
22.00	0.37	0.00	0.37
23.00	0.35	0.00	0.35
24.00	0.33	0.00	0.33
25.00	0.02	0.00	0.02
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 8.44" for 100-yr event
Inflow = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af
Primary = 20.96 cfs @ 12.13 hrs, Volume= 2.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

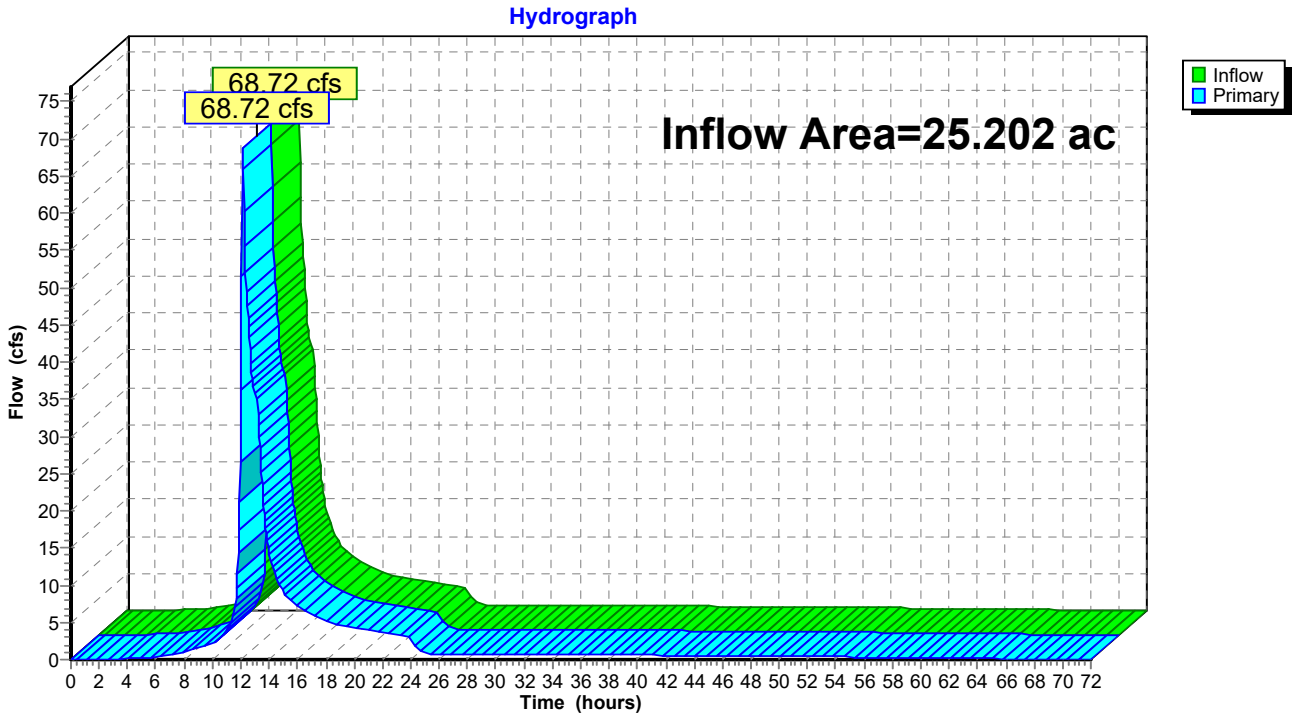
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.12	0.00	0.12
3.00	0.26	0.00	0.26
4.00	0.37	0.00	0.37
5.00	0.48	0.00	0.48
6.00	0.58	0.00	0.58
7.00	0.70	0.00	0.70
8.00	0.84	0.00	0.84
9.00	1.04	0.00	1.04
10.00	1.38	0.00	1.38
11.00	2.11	0.00	2.11
12.00	**11.76**	0.00	**11.76**
13.00	**2.86**	0.00	**2.86**
14.00	1.67	0.00	1.67
15.00	1.25	0.00	1.25
16.00	1.03	0.00	1.03
17.00	0.88	0.00	0.88
18.00	0.78	0.00	0.78
19.00	0.71	0.00	0.71
20.00	0.65	0.00	0.65
21.00	0.60	0.00	0.60
22.00	0.56	0.00	0.56
23.00	0.52	0.00	0.52
24.00	0.49	0.00	0.49
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 6.62" for 100-yr event
Inflow = 68.72 cfs @ 12.15 hrs, Volume= 13.905 af
Primary = 68.72 cfs @ 12.15 hrs, Volume= 13.905 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.05	0.00	0.05
4.00	0.16	0.00	0.16
5.00	0.24	0.00	0.24
6.00	0.44	0.00	0.44
7.00	0.73	0.00	0.73
8.00	1.08	0.00	1.08
9.00	1.56	0.00	1.56
10.00	2.29	0.00	2.29
11.00	3.82	0.00	3.82
12.00	**36.27**	0.00	**36.27**
13.00	**35.69**	0.00	**35.69**
14.00	14.35	0.00	14.35
15.00	9.15	0.00	9.15
16.00	7.23	0.00	7.23
17.00	6.08	0.00	6.08
18.00	5.23	0.00	5.23
19.00	4.67	0.00	4.67
20.00	4.26	0.00	4.26
21.00	3.93	0.00	3.93
22.00	3.66	0.00	3.66
23.00	3.43	0.00	3.43
24.00	3.23	0.00	3.23
25.00	0.85	0.00	0.85
26.00	0.81	0.00	0.81
27.00	0.80	0.00	0.80
28.00	0.78	0.00	0.78
29.00	0.77	0.00	0.77
30.00	0.75	0.00	0.75
31.00	0.74	0.00	0.74
32.00	0.73	0.00	0.73
33.00	0.71	0.00	0.71
34.00	0.70	0.00	0.70
35.00	0.68	0.00	0.68
36.00	0.67	0.00	0.67
37.00	0.65	0.00	0.65
38.00	0.64	0.00	0.64
39.00	0.62	0.00	0.62
40.00	0.61	0.00	0.61
41.00	0.59	0.00	0.59
42.00	0.57	0.00	0.57
43.00	0.56	0.00	0.56
44.00	0.54	0.00	0.54
45.00	0.53	0.00	0.53
46.00	0.51	0.00	0.51
47.00	0.49	0.00	0.49
48.00	0.48	0.00	0.48
49.00	0.46	0.00	0.46
50.00	0.44	0.00	0.44
51.00	0.43	0.00	0.43
52.00	0.41	0.00	0.41
53.00	0.39	0.00	0.39
54.00	0.38	0.00	0.38
55.00	0.36	0.00	0.36
56.00	0.34	0.00	0.34
57.00	0.32	0.00	0.32
58.00	0.30	0.00	0.30
59.00	0.28	0.00	0.28
60.00	0.26	0.00	0.26
61.00	0.24	0.00	0.24
62.00	0.21	0.00	0.21
63.00	0.19	0.00	0.19
64.00	0.16	0.00	0.16
65.00	0.13	0.00	0.13
66.00	0.11	0.00	0.11
67.00	0.08	0.00	0.08
68.00	0.07	0.00	0.07
69.00	0.05	0.00	0.05
70.00	0.04	0.00	0.04
71.00	0.04	0.00	0.04
72.00	0.03	0.00	0.03

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=8.61"
Flow Length=253' Tc=12.2 min CN=80 Runoff=6.94 cfs 0.786 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=9.00"
Flow Length=548' Tc=36.4 min CN=83 Runoff=9.99 cfs 1.838 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=10.28"
Flow Length=469' Tc=13.4 min CN=93 Runoff=24.40 cfs 3.093 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=10.28"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=46.28 cfs 5.695 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=7.80"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=38.04 cfs 4.857 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=7.39"
Flow Length=968' Tc=12.4 min CN=71 Runoff=53.59 cfs 5.981 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=10.52"
Flow Length=398' Tc=6.0 min CN=95 Runoff=12.03 cfs 1.195 af

Pond 6P: Infiltrators Peak Elev=349.73' Storage=0.277 af Inflow=12.03 cfs 1.195 af
Discarded=0.07 cfs 0.162 af Primary=4.41 cfs 1.033 af Outflow=4.48 cfs 1.195 af

Pond 9P: Detention Piping - 48" Peak Elev=340.38' Storage=0.638 af Inflow=21.63 cfs 1.760 af
Outflow=15.80 cfs 1.760 af

Pond 18P: Micropool Extended Peak Elev=293.32' Storage=150,087 cf Inflow=65.70 cfs 11.585 af
Primary=30.76 cfs 11.559 af Secondary=0.00 cfs 0.000 af Outflow=30.76 cfs 11.559 af

Pond 19P: DMH-7 Peak Elev=345.95' Inflow=86.34 cfs 11.585 af
Primary=65.70 cfs 9.825 af Secondary=21.63 cfs 1.760 af Outflow=86.34 cfs 11.585 af

Pond 20P: DMH-8 Peak Elev=340.86' Inflow=65.70 cfs 11.585 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=65.70 cfs 11.585 af

Pond 21P: DMH-9 Peak Elev=335.08' Inflow=65.70 cfs 11.585 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=65.70 cfs 11.585 af

Pond 22P: DMH-11 Peak Elev=296.29' Inflow=65.70 cfs 11.585 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=65.70 cfs 11.585 af

Pond 23P: DMH-10 Peak Elev=303.80' Inflow=65.70 cfs 11.585 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=65.70 cfs 11.585 af

Link DP-1: Design Point - 1 Inflow=6.94 cfs 0.786 af
Primary=6.94 cfs 0.786 af

Link DP-2: Design Point - 2 Inflow=9.99 cfs 1.838 af
Primary=9.99 cfs 1.838 af

Link DP-3: Design Point - 3 Inflow=24.40 cfs 3.093 af
Primary=24.40 cfs 3.093 af

Link DP-4: DP-4 Inflow=82.34 cfs 17.540 af
Primary=82.34 cfs 17.540 af

Total Runoff Area = 32.360 ac Runoff Volume = 23.444 af Average Runoff Depth = 8.69"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

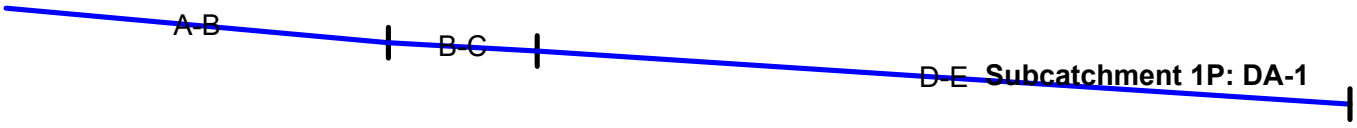
Summary for Subcatchment 1P: DA-1

Runoff = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af, Depth= 8.61"
Routed to Link DP-1 : Design Point - 1

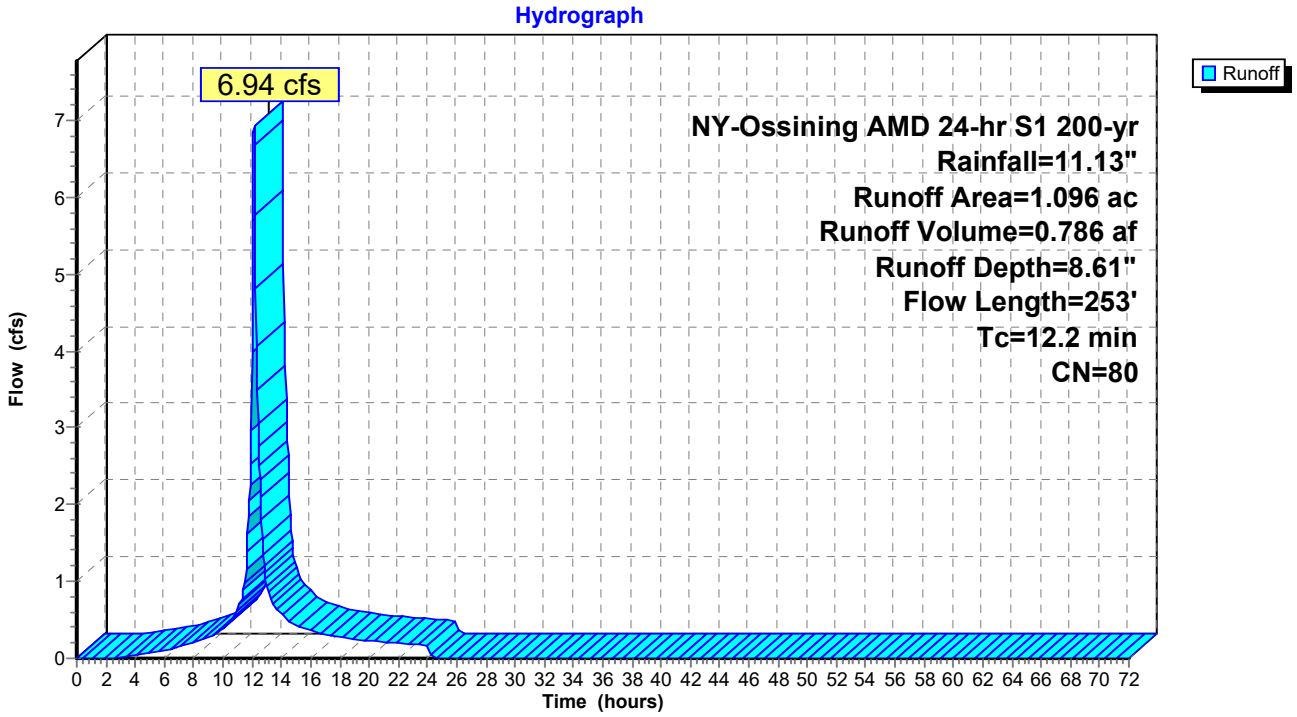
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.02	0.03
5.00	0.97	0.07	0.07
6.00	1.22	0.16	0.11
7.00	1.49	0.28	0.15
8.00	1.80	0.45	0.20
9.00	2.17	0.67	0.27
10.00	2.63	0.98	0.38
11.00	3.28	1.46	0.63
12.00	5.93	3.72	**3.99**
13.00	7.88	5.52	**0.96**
14.00	8.52	6.11	0.58
15.00	8.97	6.54	0.44
16.00	9.34	6.89	0.36
17.00	9.65	7.18	0.31
18.00	9.92	7.44	0.28
19.00	10.16	7.68	0.25
20.00	10.38	7.89	0.23
21.00	10.59	8.09	0.21
22.00	10.78	8.27	0.20
23.00	10.96	8.44	0.19
24.00	**11.13**	**8.61**	0.18
25.00	11.13	8.61	0.00
26.00	11.13	8.61	0.00
27.00	11.13	8.61	0.00
28.00	11.13	8.61	0.00
29.00	11.13	8.61	0.00
30.00	11.13	8.61	0.00
31.00	11.13	8.61	0.00
32.00	11.13	8.61	0.00
33.00	11.13	8.61	0.00
34.00	11.13	8.61	0.00
35.00	11.13	8.61	0.00
36.00	11.13	8.61	0.00
37.00	11.13	8.61	0.00
38.00	11.13	8.61	0.00
39.00	11.13	8.61	0.00
40.00	11.13	8.61	0.00
41.00	11.13	8.61	0.00
42.00	11.13	8.61	0.00
43.00	11.13	8.61	0.00
44.00	11.13	8.61	0.00
45.00	11.13	8.61	0.00
46.00	11.13	8.61	0.00
47.00	11.13	8.61	0.00
48.00	11.13	8.61	0.00
49.00	11.13	8.61	0.00
50.00	11.13	8.61	0.00
51.00	11.13	8.61	0.00
52.00	11.13	8.61	0.00
53.00	11.13	8.61	0.00
54.00	11.13	8.61	0.00
55.00	11.13	8.61	0.00
56.00	11.13	8.61	0.00
57.00	11.13	8.61	0.00
58.00	11.13	8.61	0.00
59.00	11.13	8.61	0.00
60.00	11.13	8.61	0.00
61.00	11.13	8.61	0.00
62.00	11.13	8.61	0.00
63.00	11.13	8.61	0.00
64.00	11.13	8.61	0.00
65.00	11.13	8.61	0.00
66.00	11.13	8.61	0.00
67.00	11.13	8.61	0.00
68.00	11.13	8.61	0.00
69.00	11.13	8.61	0.00
70.00	11.13	8.61	0.00
71.00	11.13	8.61	0.00
72.00	11.13	8.61	0.00

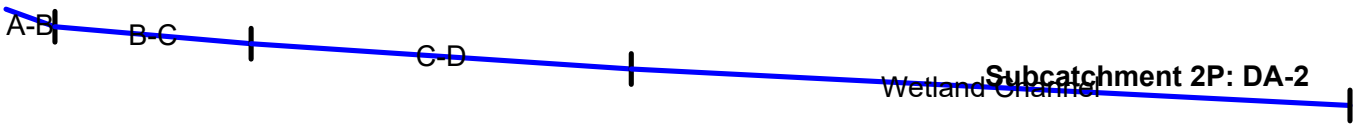
Summary for Subcatchment 2P: DA-2

Runoff = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af, Depth= 9.00"
Routed to Link DP-2 : Design Point - 2

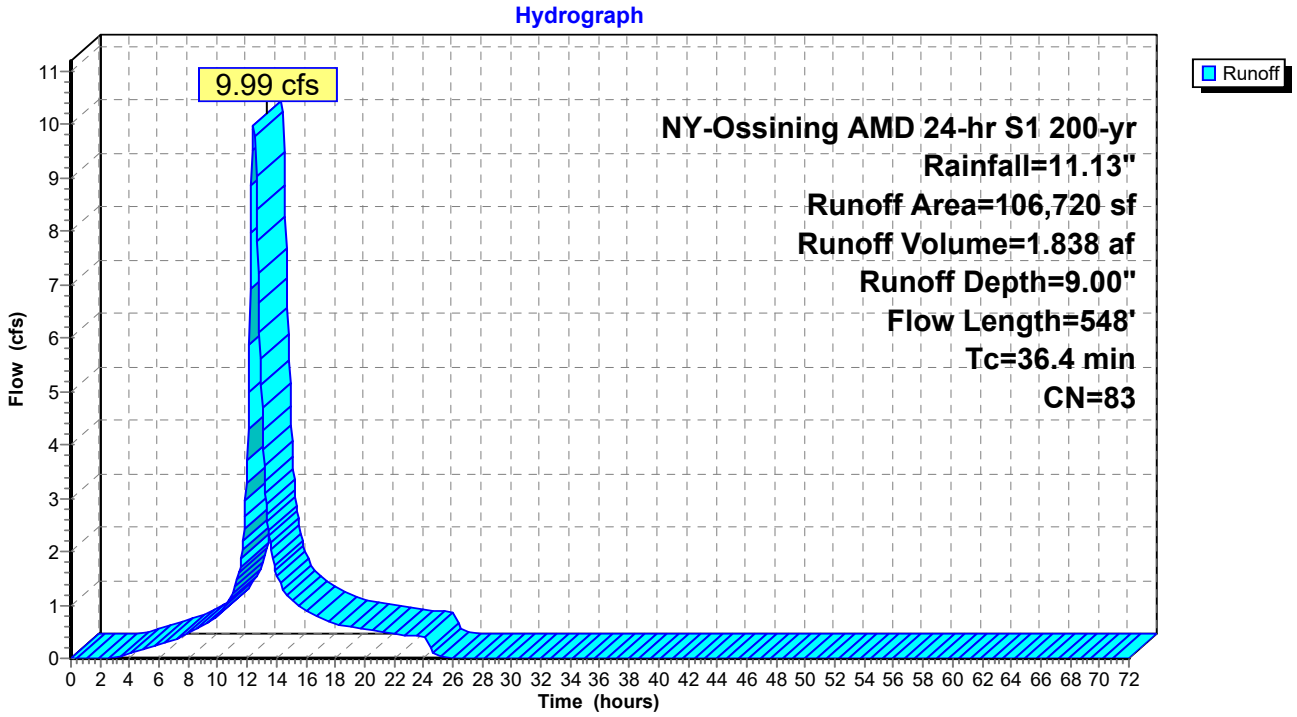
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.01	0.02
4.00	0.75	0.05	0.09
5.00	0.97	0.12	0.18
6.00	1.22	0.23	0.26
7.00	1.49	0.37	0.35
8.00	1.80	0.56	0.46
9.00	2.17	0.81	0.61
10.00	2.63	1.15	0.82
11.00	3.28	1.67	1.24
12.00	5.93	4.02	**3.72**
13.00	7.88	5.87	**4.68**
14.00	8.52	6.47	1.57
15.00	8.97	6.91	1.09
16.00	9.34	7.26	0.88
17.00	9.65	7.56	0.75
18.00	9.92	7.82	0.66
19.00	10.16	8.06	0.59
20.00	10.38	8.28	0.54
21.00	10.59	8.48	0.50
22.00	10.78	8.66	0.46
23.00	10.96	8.84	0.43
24.00	**11.13**	**9.00**	0.41
25.00	11.13	9.00	0.03
26.00	11.13	9.00	0.00
27.00	11.13	9.00	0.00
28.00	11.13	9.00	0.00
29.00	11.13	9.00	0.00
30.00	11.13	9.00	0.00
31.00	11.13	9.00	0.00
32.00	11.13	9.00	0.00
33.00	11.13	9.00	0.00
34.00	11.13	9.00	0.00
35.00	11.13	9.00	0.00
36.00	11.13	9.00	0.00
37.00	11.13	9.00	0.00
38.00	11.13	9.00	0.00
39.00	11.13	9.00	0.00
40.00	11.13	9.00	0.00
41.00	11.13	9.00	0.00
42.00	11.13	9.00	0.00
43.00	11.13	9.00	0.00
44.00	11.13	9.00	0.00
45.00	11.13	9.00	0.00
46.00	11.13	9.00	0.00
47.00	11.13	9.00	0.00
48.00	11.13	9.00	0.00
49.00	11.13	9.00	0.00
50.00	11.13	9.00	0.00
51.00	11.13	9.00	0.00
52.00	11.13	9.00	0.00
53.00	11.13	9.00	0.00
54.00	11.13	9.00	0.00
55.00	11.13	9.00	0.00
56.00	11.13	9.00	0.00
57.00	11.13	9.00	0.00
58.00	11.13	9.00	0.00
59.00	11.13	9.00	0.00
60.00	11.13	9.00	0.00
61.00	11.13	9.00	0.00
62.00	11.13	9.00	0.00
63.00	11.13	9.00	0.00
64.00	11.13	9.00	0.00
65.00	11.13	9.00	0.00
66.00	11.13	9.00	0.00
67.00	11.13	9.00	0.00
68.00	11.13	9.00	0.00
69.00	11.13	9.00	0.00
70.00	11.13	9.00	0.00
71.00	11.13	9.00	0.00
72.00	11.13	9.00	0.00

Summary for Subcatchment 3P: DA-3

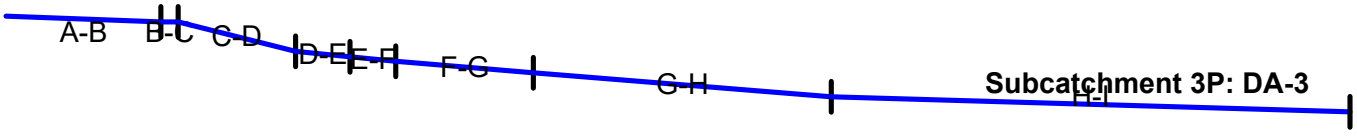
[47] Hint: Peak is 430% of capacity of segment #8

Runoff = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Depth=10.28"
Routed to Link DP-3 : Design Point - 3

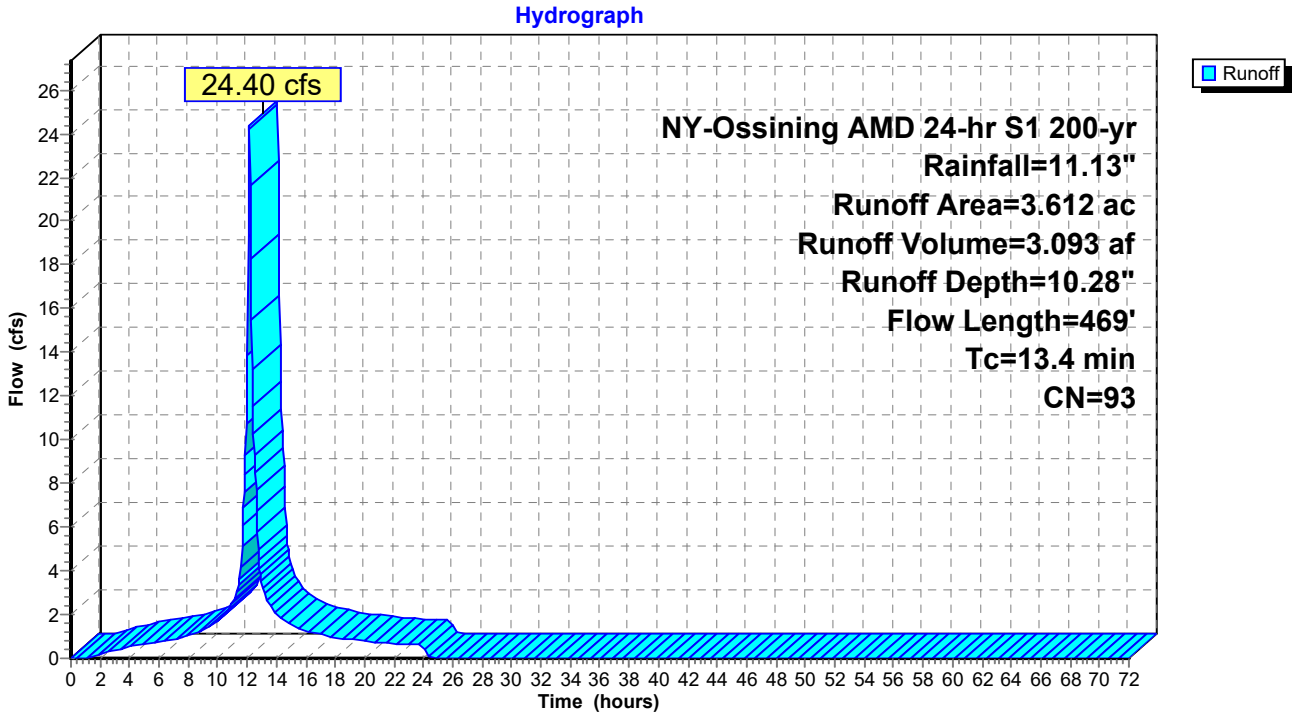
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.04	0.21
3.00	0.54	0.13	0.38
4.00	0.75	0.26	0.51
5.00	0.97	0.43	0.63
6.00	1.22	0.62	0.75
7.00	1.49	0.86	0.89
8.00	1.80	1.13	1.06
9.00	2.17	1.47	1.30
10.00	2.63	1.90	1.70
11.00	3.28	2.52	2.57
12.00	5.93	5.11	**13.89**
13.00	7.88	7.05	**3.44**
14.00	8.52	7.68	2.02
15.00	8.97	8.13	1.52
16.00	9.34	8.49	1.25
17.00	9.65	8.80	1.07
18.00	9.92	9.07	0.95
19.00	10.16	9.31	0.86
20.00	10.38	9.53	0.79
21.00	10.59	9.74	0.73
22.00	10.78	9.93	0.68
23.00	10.96	10.11	0.64
24.00	**11.13**	**10.28**	0.60
25.00	11.13	10.28	0.00
26.00	11.13	10.28	0.00
27.00	11.13	10.28	0.00
28.00	11.13	10.28	0.00
29.00	11.13	10.28	0.00
30.00	11.13	10.28	0.00
31.00	11.13	10.28	0.00
32.00	11.13	10.28	0.00
33.00	11.13	10.28	0.00
34.00	11.13	10.28	0.00
35.00	11.13	10.28	0.00
36.00	11.13	10.28	0.00
37.00	11.13	10.28	0.00
38.00	11.13	10.28	0.00
39.00	11.13	10.28	0.00
40.00	11.13	10.28	0.00
41.00	11.13	10.28	0.00
42.00	11.13	10.28	0.00
43.00	11.13	10.28	0.00
44.00	11.13	10.28	0.00
45.00	11.13	10.28	0.00
46.00	11.13	10.28	0.00
47.00	11.13	10.28	0.00
48.00	11.13	10.28	0.00
49.00	11.13	10.28	0.00
50.00	11.13	10.28	0.00
51.00	11.13	10.28	0.00
52.00	11.13	10.28	0.00
53.00	11.13	10.28	0.00
54.00	11.13	10.28	0.00
55.00	11.13	10.28	0.00
56.00	11.13	10.28	0.00
57.00	11.13	10.28	0.00
58.00	11.13	10.28	0.00
59.00	11.13	10.28	0.00
60.00	11.13	10.28	0.00
61.00	11.13	10.28	0.00
62.00	11.13	10.28	0.00
63.00	11.13	10.28	0.00
64.00	11.13	10.28	0.00
65.00	11.13	10.28	0.00
66.00	11.13	10.28	0.00
67.00	11.13	10.28	0.00
68.00	11.13	10.28	0.00
69.00	11.13	10.28	0.00
70.00	11.13	10.28	0.00
71.00	11.13	10.28	0.00
72.00	11.13	10.28	0.00

Summary for Subcatchment 4AP: DA-4A

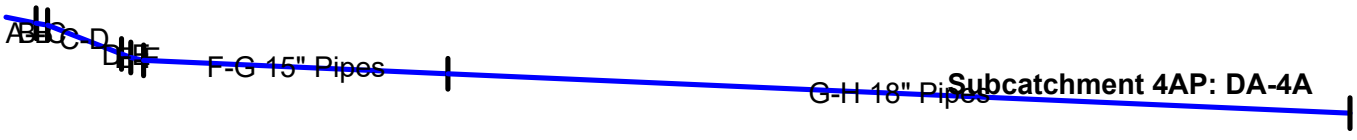
[47] Hint: Peak is 1013% of capacity of segment #6
[47] Hint: Peak is 623% of capacity of segment #7

Runoff = 46.28 cfs @ 12.12 hrs, Volume= 5.695 af, Depth=10.28"
Routed to Pond 19P : DMH-7

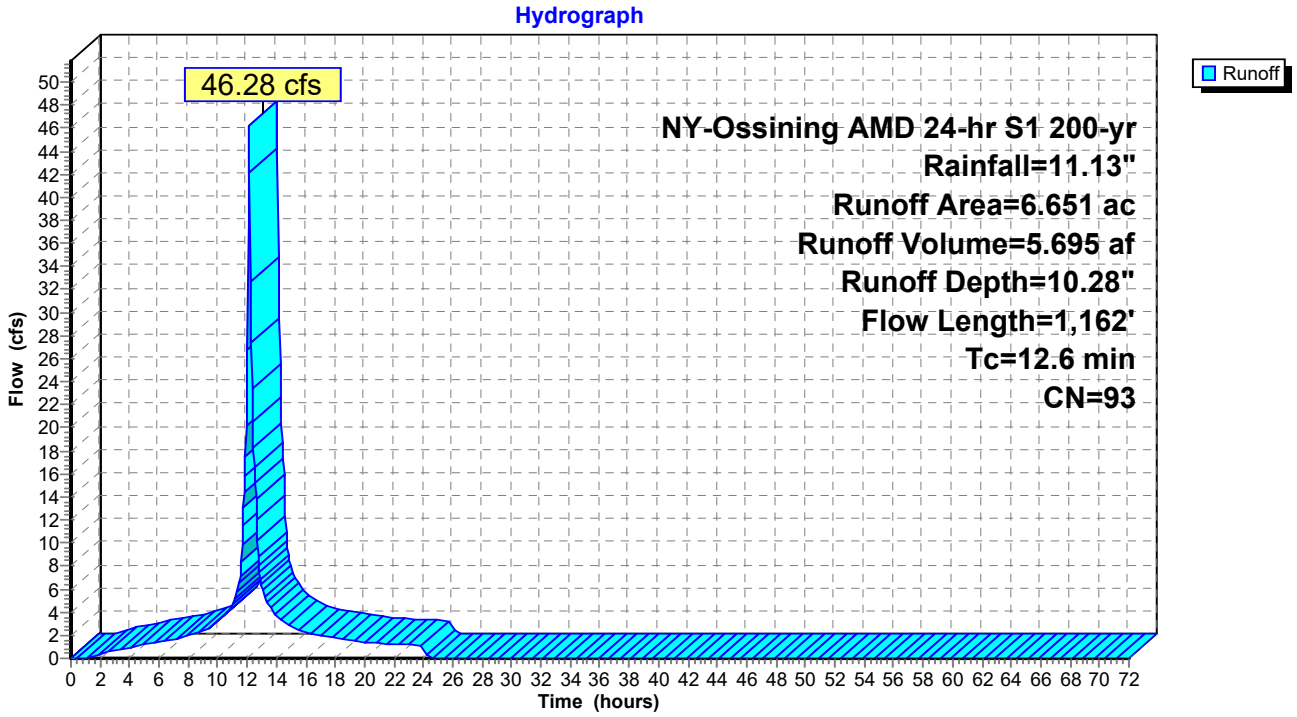
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.04	0.40
3.00	0.54	0.13	0.70
4.00	0.75	0.26	0.95
5.00	0.97	0.43	1.17
6.00	1.22	0.62	1.39
7.00	1.49	0.86	1.64
8.00	1.80	1.13	1.96
9.00	2.17	1.47	2.40
10.00	2.63	1.90	3.14
11.00	3.28	2.52	4.77
12.00	5.93	5.11	**26.70**
13.00	7.88	7.05	**6.24**
14.00	8.52	7.68	3.69
15.00	8.97	8.13	2.79
16.00	9.34	8.49	2.29
17.00	9.65	8.80	1.98
18.00	9.92	9.07	1.75
19.00	10.16	9.31	1.58
20.00	10.38	9.53	1.45
21.00	10.59	9.74	1.34
22.00	10.78	9.93	1.25
23.00	10.96	10.11	1.18
24.00	**11.13**	**10.28**	1.11
25.00	11.13	10.28	0.00
26.00	11.13	10.28	0.00
27.00	11.13	10.28	0.00
28.00	11.13	10.28	0.00
29.00	11.13	10.28	0.00
30.00	11.13	10.28	0.00
31.00	11.13	10.28	0.00
32.00	11.13	10.28	0.00
33.00	11.13	10.28	0.00
34.00	11.13	10.28	0.00
35.00	11.13	10.28	0.00
36.00	11.13	10.28	0.00
37.00	11.13	10.28	0.00
38.00	11.13	10.28	0.00
39.00	11.13	10.28	0.00
40.00	11.13	10.28	0.00
41.00	11.13	10.28	0.00
42.00	11.13	10.28	0.00
43.00	11.13	10.28	0.00
44.00	11.13	10.28	0.00
45.00	11.13	10.28	0.00
46.00	11.13	10.28	0.00
47.00	11.13	10.28	0.00
48.00	11.13	10.28	0.00
49.00	11.13	10.28	0.00
50.00	11.13	10.28	0.00
51.00	11.13	10.28	0.00
52.00	11.13	10.28	0.00
53.00	11.13	10.28	0.00
54.00	11.13	10.28	0.00
55.00	11.13	10.28	0.00
56.00	11.13	10.28	0.00
57.00	11.13	10.28	0.00
58.00	11.13	10.28	0.00
59.00	11.13	10.28	0.00
60.00	11.13	10.28	0.00
61.00	11.13	10.28	0.00
62.00	11.13	10.28	0.00
63.00	11.13	10.28	0.00
64.00	11.13	10.28	0.00
65.00	11.13	10.28	0.00
66.00	11.13	10.28	0.00
67.00	11.13	10.28	0.00
68.00	11.13	10.28	0.00
69.00	11.13	10.28	0.00
70.00	11.13	10.28	0.00
71.00	11.13	10.28	0.00
72.00	11.13	10.28	0.00

Summary for Subcatchment 4BP: DA-4B

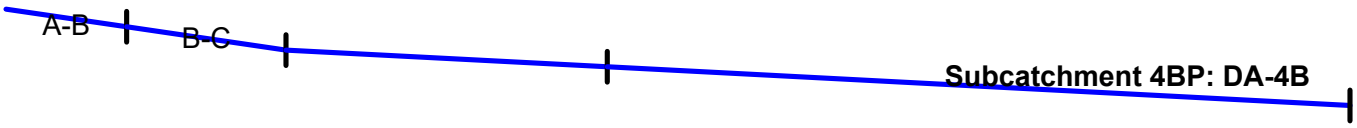
[47] Hint: Peak is 1510% of capacity of segment #3
[47] Hint: Peak is 238% of capacity of segment #4

Runoff = 38.04 cfs @ 12.19 hrs, Volume= 4.857 af, Depth= 7.80"
Routed to Pond 19P : DMH-7

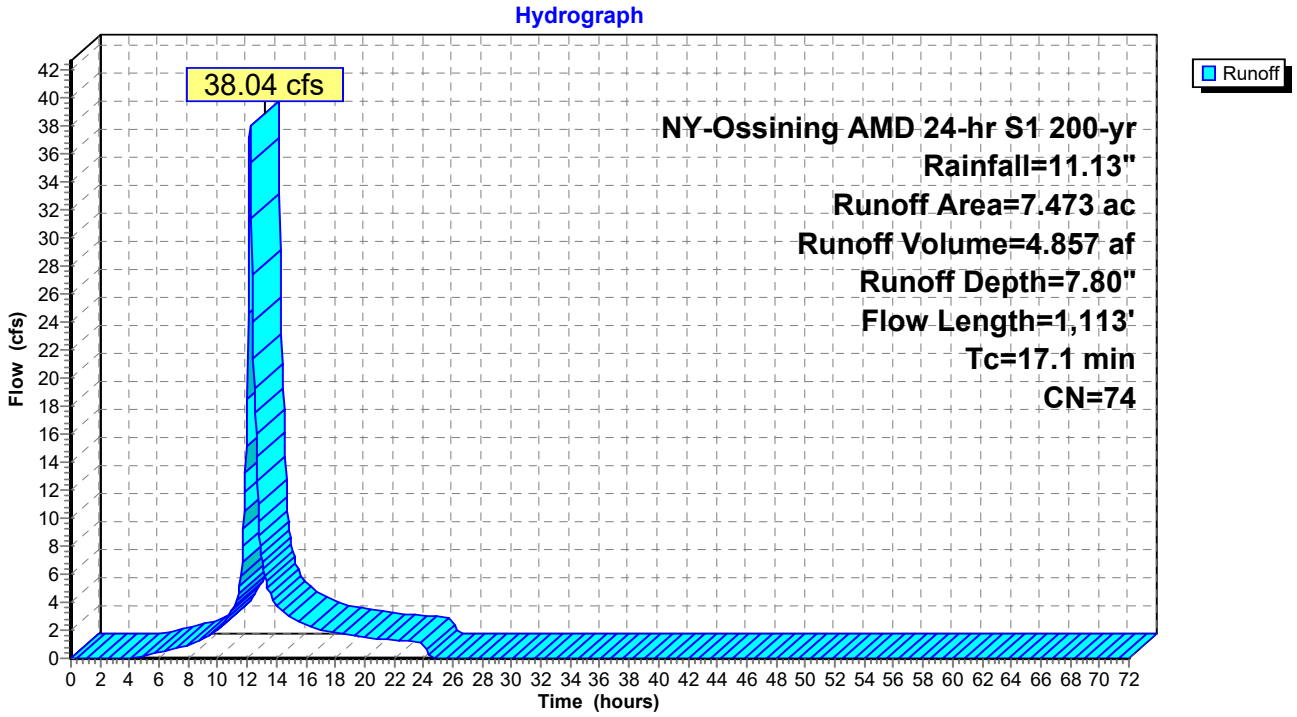
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.00	0.00
5.00	0.97	0.02	0.19
6.00	1.22	0.07	0.40
7.00	1.49	0.14	0.65
8.00	1.80	0.26	0.97
9.00	2.17	0.43	1.39
10.00	2.63	0.68	2.06
11.00	3.28	1.09	3.48
12.00	5.93	3.12	**18.53**
13.00	7.88	4.82	**6.91**
14.00	8.52	5.39	3.87
15.00	8.97	5.80	2.91
16.00	9.34	6.14	2.40
17.00	9.65	6.42	2.07
18.00	9.92	6.67	1.84
19.00	10.16	6.90	1.66
20.00	10.38	7.10	1.53
21.00	10.59	7.30	1.41
22.00	10.78	7.47	1.32
23.00	10.96	7.64	1.24
24.00	**11.13**	**7.80**	1.18
25.00	11.13	7.80	0.00
26.00	11.13	7.80	0.00
27.00	11.13	7.80	0.00
28.00	11.13	7.80	0.00
29.00	11.13	7.80	0.00
30.00	11.13	7.80	0.00
31.00	11.13	7.80	0.00
32.00	11.13	7.80	0.00
33.00	11.13	7.80	0.00
34.00	11.13	7.80	0.00
35.00	11.13	7.80	0.00
36.00	11.13	7.80	0.00
37.00	11.13	7.80	0.00
38.00	11.13	7.80	0.00
39.00	11.13	7.80	0.00
40.00	11.13	7.80	0.00
41.00	11.13	7.80	0.00
42.00	11.13	7.80	0.00
43.00	11.13	7.80	0.00
44.00	11.13	7.80	0.00
45.00	11.13	7.80	0.00
46.00	11.13	7.80	0.00
47.00	11.13	7.80	0.00
48.00	11.13	7.80	0.00
49.00	11.13	7.80	0.00
50.00	11.13	7.80	0.00
51.00	11.13	7.80	0.00
52.00	11.13	7.80	0.00
53.00	11.13	7.80	0.00
54.00	11.13	7.80	0.00
55.00	11.13	7.80	0.00
56.00	11.13	7.80	0.00
57.00	11.13	7.80	0.00
58.00	11.13	7.80	0.00
59.00	11.13	7.80	0.00
60.00	11.13	7.80	0.00
61.00	11.13	7.80	0.00
62.00	11.13	7.80	0.00
63.00	11.13	7.80	0.00
64.00	11.13	7.80	0.00
65.00	11.13	7.80	0.00
66.00	11.13	7.80	0.00
67.00	11.13	7.80	0.00
68.00	11.13	7.80	0.00
69.00	11.13	7.80	0.00
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71.00	11.13	7.80	0.00
72.00	11.13	7.80	0.00

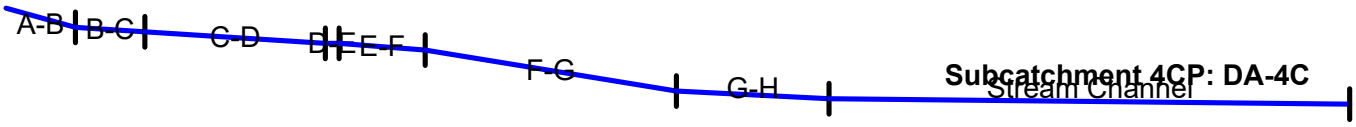
Summary for Subcatchment 4CP: DA-4C

Runoff = 53.59 cfs @ 12.12 hrs, Volume= 5.981 af, Depth= 7.39"
Routed to Link DP-4 : DP-4

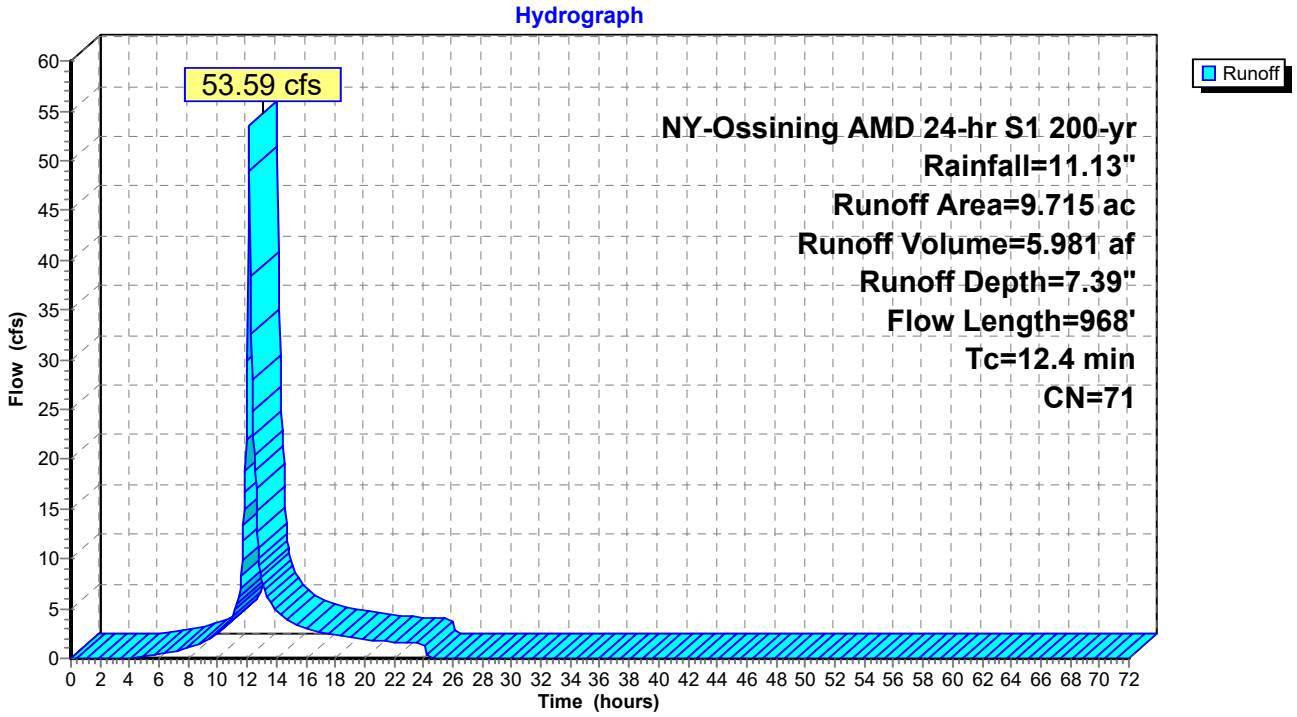
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.00	0.00
2.00	0.35	0.00	0.00
3.00	0.54	0.00	0.00
4.00	0.75	0.00	0.00
5.00	0.97	0.01	0.12
6.00	1.22	0.04	0.38
7.00	1.49	0.10	0.68
8.00	1.80	0.19	1.07
9.00	2.17	0.34	1.60
10.00	2.63	0.56	2.46
11.00	3.28	0.93	4.31
12.00	5.93	2.84	**29.98**
13.00	7.88	4.48	**7.89**
14.00	8.52	5.03	4.76
15.00	8.97	5.43	3.63
16.00	9.34	5.76	3.01
17.00	9.65	6.04	2.61
18.00	9.92	6.28	2.32
19.00	10.16	6.50	2.10
20.00	10.38	6.71	1.93
21.00	10.59	6.89	1.79
22.00	10.78	7.07	1.68
23.00	10.96	7.23	1.58
24.00	**11.13**	**7.39**	1.50
25.00	11.13	7.39	0.00
26.00	11.13	7.39	0.00
27.00	11.13	7.39	0.00
28.00	11.13	7.39	0.00
29.00	11.13	7.39	0.00
30.00	11.13	7.39	0.00
31.00	11.13	7.39	0.00
32.00	11.13	7.39	0.00
33.00	11.13	7.39	0.00
34.00	11.13	7.39	0.00
35.00	11.13	7.39	0.00
36.00	11.13	7.39	0.00
37.00	11.13	7.39	0.00
38.00	11.13	7.39	0.00
39.00	11.13	7.39	0.00
40.00	11.13	7.39	0.00
41.00	11.13	7.39	0.00
42.00	11.13	7.39	0.00
43.00	11.13	7.39	0.00
44.00	11.13	7.39	0.00
45.00	11.13	7.39	0.00
46.00	11.13	7.39	0.00
47.00	11.13	7.39	0.00
48.00	11.13	7.39	0.00
49.00	11.13	7.39	0.00
50.00	11.13	7.39	0.00
51.00	11.13	7.39	0.00
52.00	11.13	7.39	0.00
53.00	11.13	7.39	0.00
54.00	11.13	7.39	0.00
55.00	11.13	7.39	0.00
56.00	11.13	7.39	0.00
57.00	11.13	7.39	0.00
58.00	11.13	7.39	0.00
59.00	11.13	7.39	0.00
60.00	11.13	7.39	0.00
61.00	11.13	7.39	0.00
62.00	11.13	7.39	0.00
63.00	11.13	7.39	0.00
64.00	11.13	7.39	0.00
65.00	11.13	7.39	0.00
66.00	11.13	7.39	0.00
67.00	11.13	7.39	0.00
68.00	11.13	7.39	0.00
69.00	11.13	7.39	0.00
70.00	11.13	7.39	0.00
71.00	11.13	7.39	0.00
72.00	11.13	7.39	0.00

Summary for Subcatchment 4DP: DA-4D

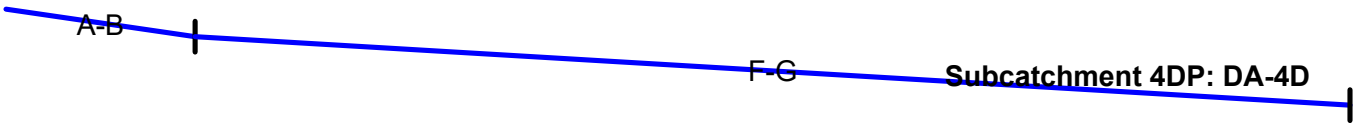
[47] Hint: Peak is 186% of capacity of segment #2

Runoff = 12.03 cfs @ 12.04 hrs, Volume= 1.195 af, Depth=10.52"
Routed to Pond 6P : Infiltrators

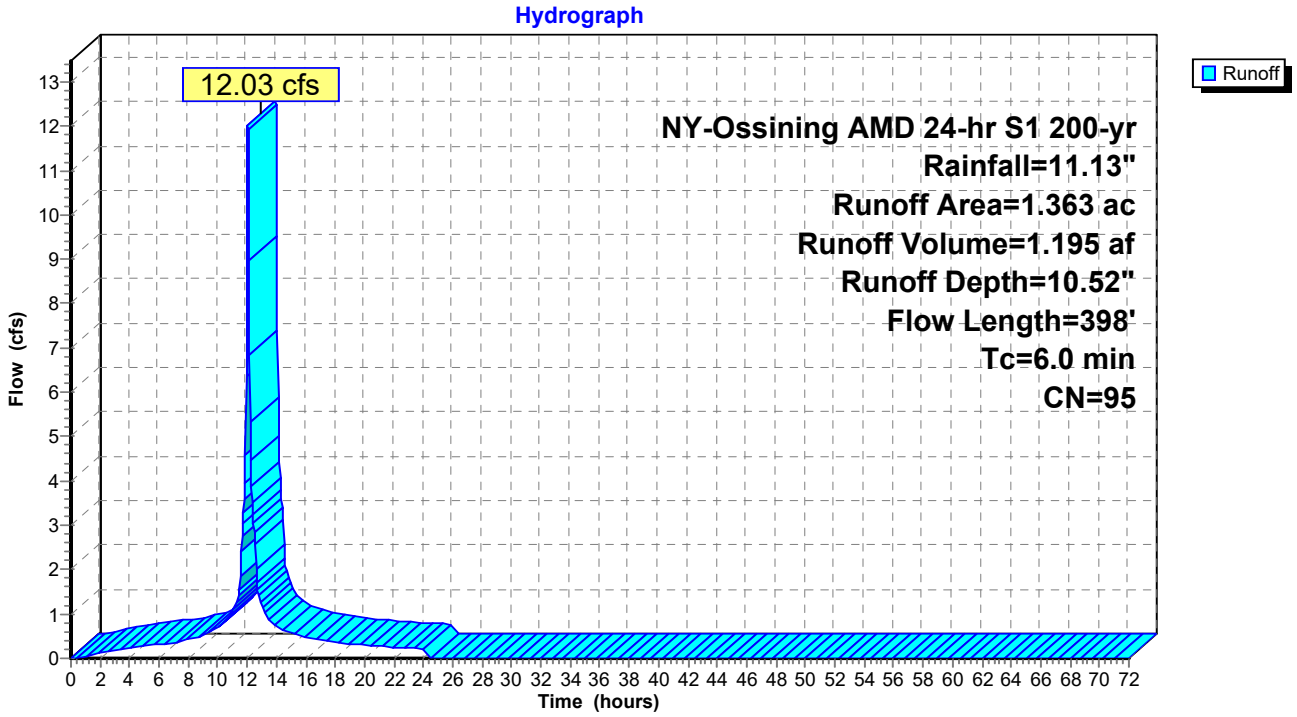
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 200-yr Rainfall=11.13"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.17	0.01	0.04
2.00	0.35	0.08	0.13
3.00	0.54	0.20	0.19
4.00	0.75	0.35	0.23
5.00	0.97	0.54	0.27
6.00	1.22	0.75	0.31
7.00	1.49	1.00	0.36
8.00	1.80	1.30	0.43
9.00	2.17	1.65	0.52
10.00	2.63	2.09	0.68
11.00	3.28	2.72	1.06
12.00	5.93	5.34	**10.73**
13.00	7.88	7.29	**1.17**
14.00	8.52	7.92	0.73
15.00	8.97	8.37	0.56
16.00	9.34	8.73	0.46
17.00	9.65	9.04	0.40
18.00	9.92	9.31	0.36
19.00	10.16	9.56	0.32
20.00	10.38	9.78	0.29
21.00	10.59	9.98	0.27
22.00	10.78	10.17	0.26
23.00	10.96	10.35	0.24
24.00	**11.13**	**10.52**	0.23
25.00	11.13	10.52	0.00
26.00	11.13	10.52	0.00
27.00	11.13	10.52	0.00
28.00	11.13	10.52	0.00
29.00	11.13	10.52	0.00
30.00	11.13	10.52	0.00
31.00	11.13	10.52	0.00
32.00	11.13	10.52	0.00
33.00	11.13	10.52	0.00
34.00	11.13	10.52	0.00
35.00	11.13	10.52	0.00
36.00	11.13	10.52	0.00
37.00	11.13	10.52	0.00
38.00	11.13	10.52	0.00
39.00	11.13	10.52	0.00
40.00	11.13	10.52	0.00
41.00	11.13	10.52	0.00
42.00	11.13	10.52	0.00
43.00	11.13	10.52	0.00
44.00	11.13	10.52	0.00
45.00	11.13	10.52	0.00
46.00	11.13	10.52	0.00
47.00	11.13	10.52	0.00
48.00	11.13	10.52	0.00
49.00	11.13	10.52	0.00
50.00	11.13	10.52	0.00
51.00	11.13	10.52	0.00
52.00	11.13	10.52	0.00
53.00	11.13	10.52	0.00
54.00	11.13	10.52	0.00
55.00	11.13	10.52	0.00
56.00	11.13	10.52	0.00
57.00	11.13	10.52	0.00
58.00	11.13	10.52	0.00
59.00	11.13	10.52	0.00
60.00	11.13	10.52	0.00
61.00	11.13	10.52	0.00
62.00	11.13	10.52	0.00
63.00	11.13	10.52	0.00
64.00	11.13	10.52	0.00
65.00	11.13	10.52	0.00
66.00	11.13	10.52	0.00
67.00	11.13	10.52	0.00
68.00	11.13	10.52	0.00
69.00	11.13	10.52	0.00
70.00	11.13	10.52	0.00
71.00	11.13	10.52	0.00
72.00	11.13	10.52	0.00

Summary for Pond 6P: Infiltrators

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 10.52" for 200-yr event
Inflow = 12.03 cfs @ 12.04 hrs, Volume= 1.195 af
Outflow = 4.48 cfs @ 12.25 hrs, Volume= 1.195 af, Atten= 63%, Lag= 12.9 min
Discarded = 0.07 cfs @ 2.10 hrs, Volume= 0.162 af
Primary = 4.41 cfs @ 12.25 hrs, Volume= 1.033 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 349.73' @ 12.25 hrs Surf.Area= 0.132 ac Storage= 0.277 af

Plug-Flow detention time= 75.7 min calculated for 1.194 af (100% of inflow)
Center-of-Mass det. time= 75.9 min (828.7 - 752.7)

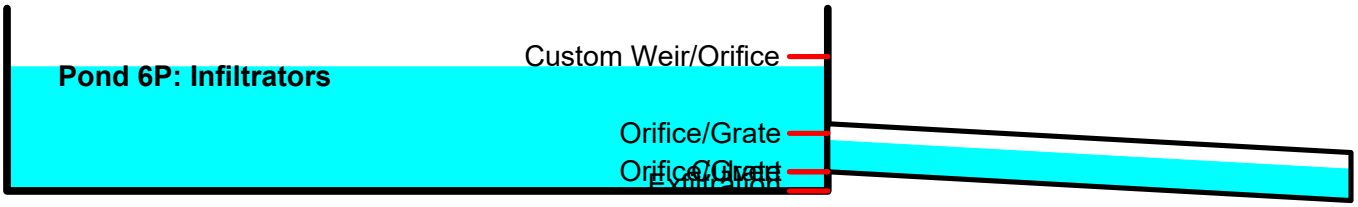
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 2.10 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=4.41 cfs @ 12.25 hrs HW=349.73' TW=343.69' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.41 cfs of 6.77 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.49 cfs @ 7.58 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.92 cfs @ 5.85 fps)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

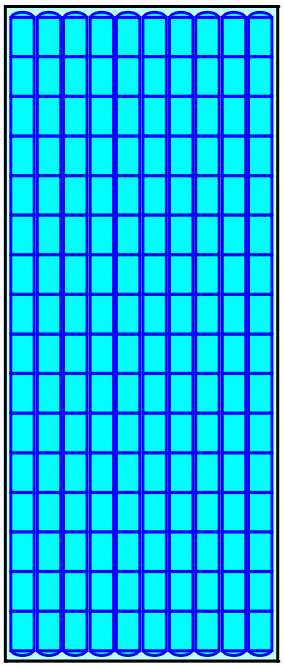
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

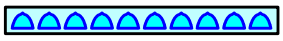
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

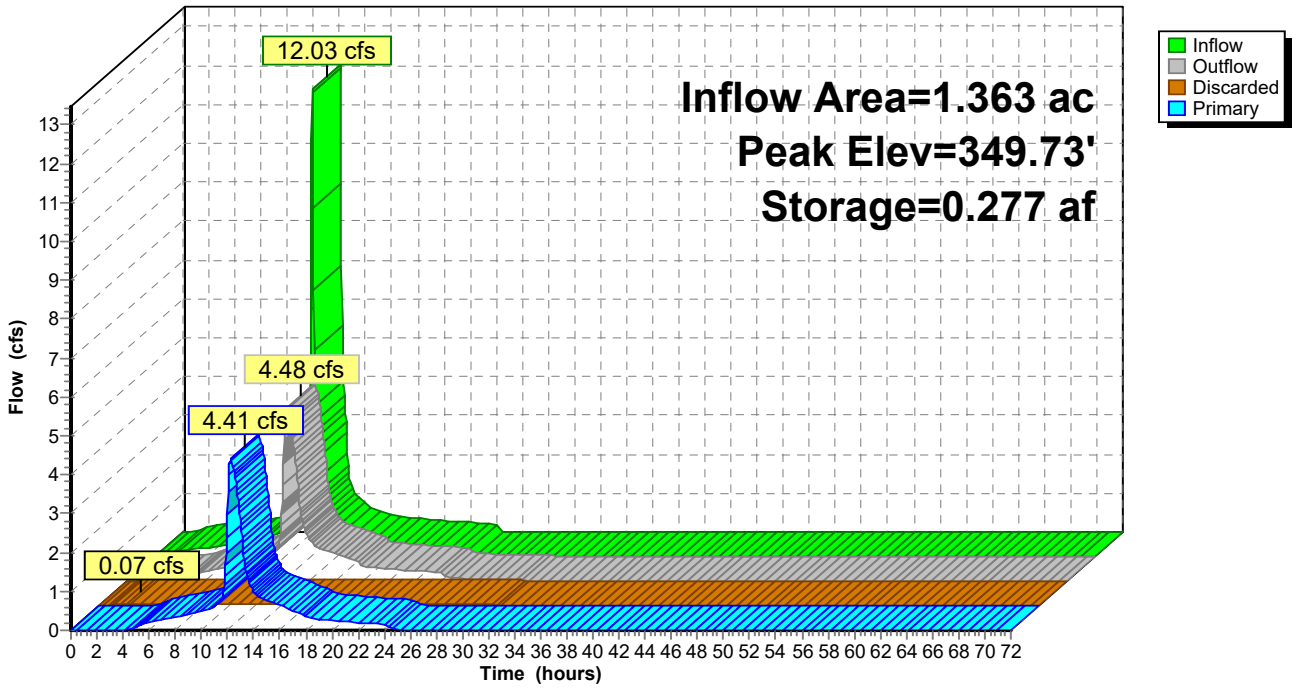
160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08





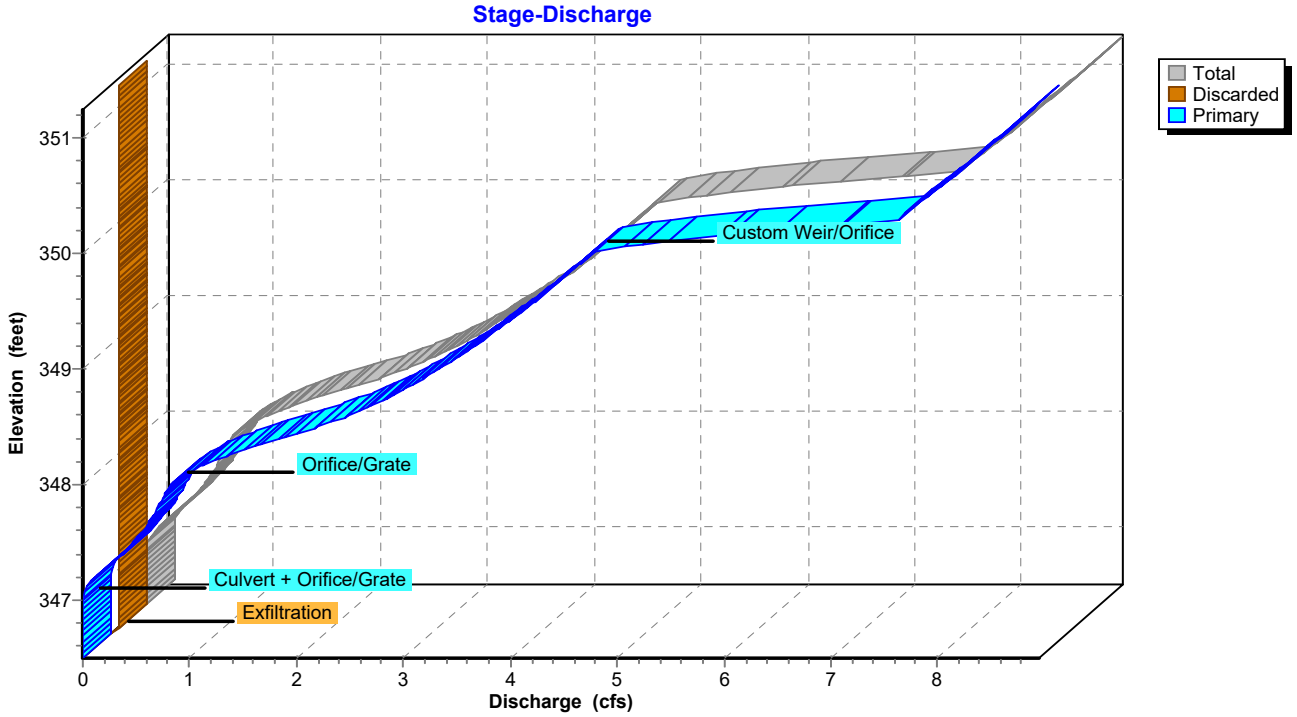
Pond 6P: Infiltrators

Hydrograph

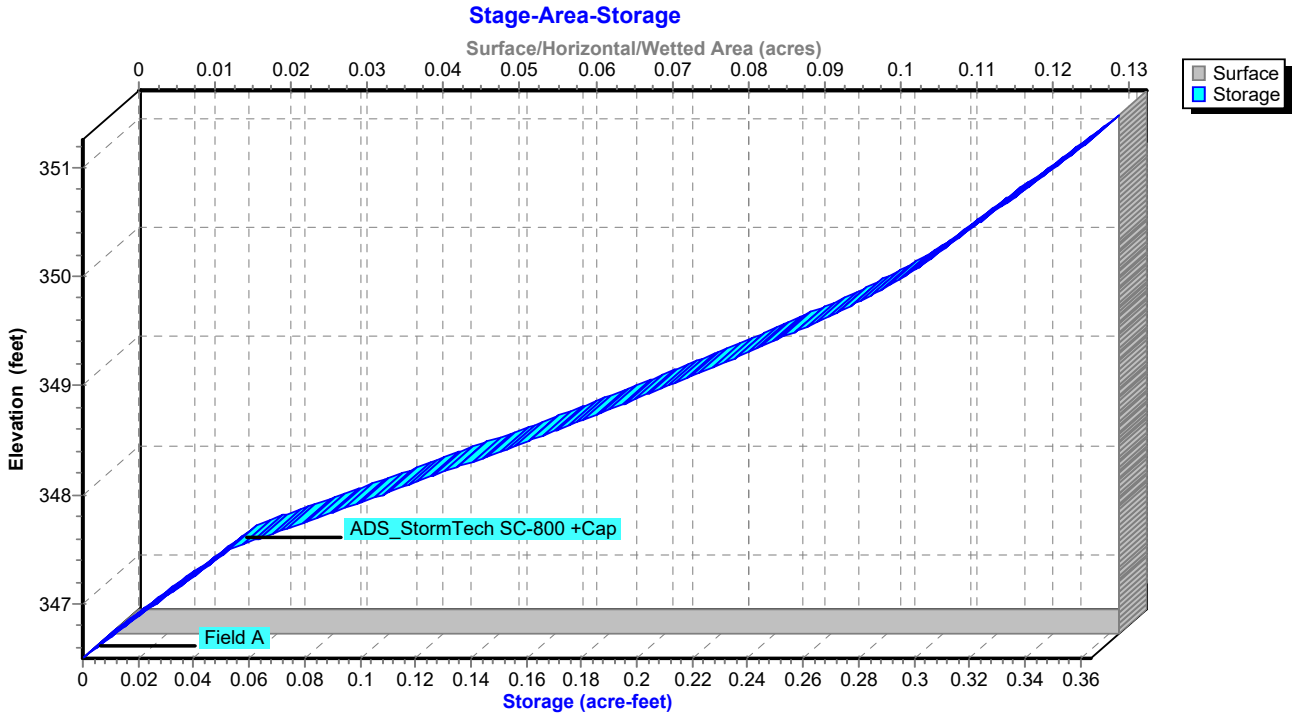


Pond 6P: Infiltrators

Stage-Discharge



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	**0.00**	0.00
2.50	0.16	0.005	346.60	0.07	**0.07**	0.00
5.00	0.27	0.035	347.17	0.15	0.07	0.08
7.50	0.39	0.045	347.35	0.37	0.07	0.30
10.00	**0.68**	**0.056**	**347.52**	**0.56**	0.07	**0.49**
12.50	**2.85**	**0.258**	**349.51**	**4.18**	0.07	**4.12**
15.00	0.56	0.098	347.90	0.83	0.07	0.76
17.50	0.38	0.052	347.47	0.52	0.07	0.45
20.00	0.29	0.043	347.31	0.31	0.07	0.24
22.50	0.25	0.041	347.27	0.26	0.07	0.19
25.00	0.00	0.030	347.06	0.08	0.07	0.01
27.50	0.00	0.016	346.80	0.07	0.07	0.00
30.00	0.00	0.002	346.54	0.07	0.07	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

[93] Warning: Storage range exceeded by 3.54'
[80] Warning: Exceeded Pond 19P by 0.96' @ 12.35 hrs (6.58 cfs 0.027 af)

Inflow	=	21.63 cfs @ 12.18 hrs,	Volume=	1.760 af
Outflow	=	15.80 cfs @ 12.35 hrs,	Volume=	1.760 af, Atten= 27%, Lag= 10.0 min
Primary	=	15.80 cfs @ 12.35 hrs,	Volume=	1.760 af

Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 340.38' @ 12.36 hrs Surf.Area= 0.347 ac Storage= 0.638 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 29.8 min (803.9 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=12.92 cfs @ 12.35 hrs HW=340.24' TW=337.93' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 12.92 cfs)
↑—**2=Orifice/Grate** (Orifice Controls 12.92 cfs @ 7.31 fps)



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

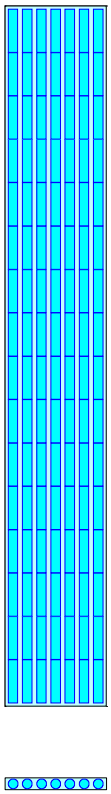
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

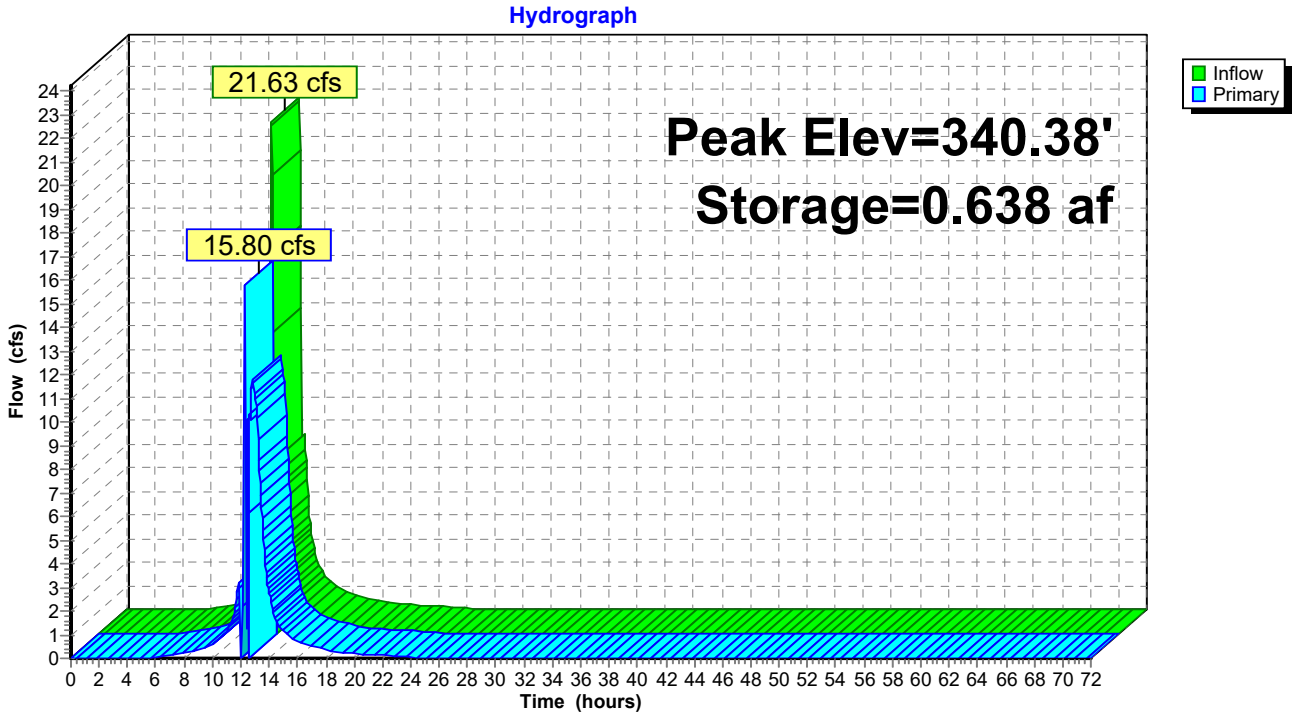
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

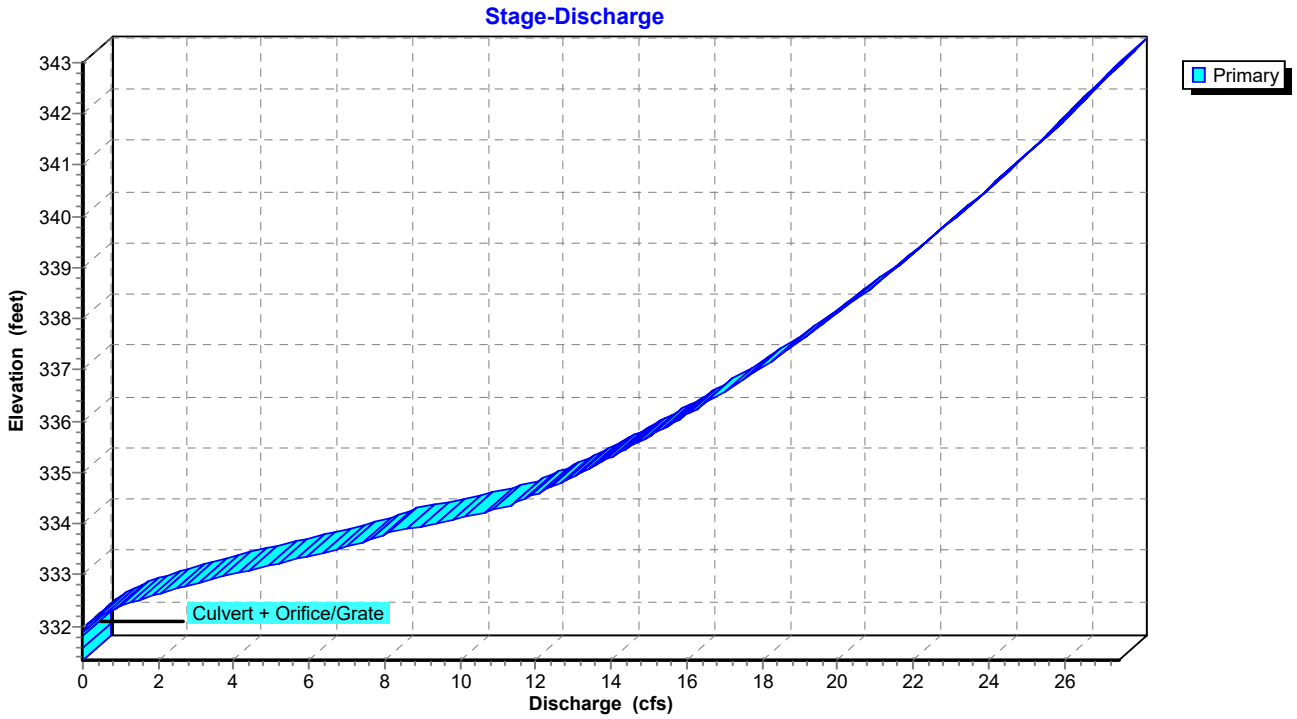
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



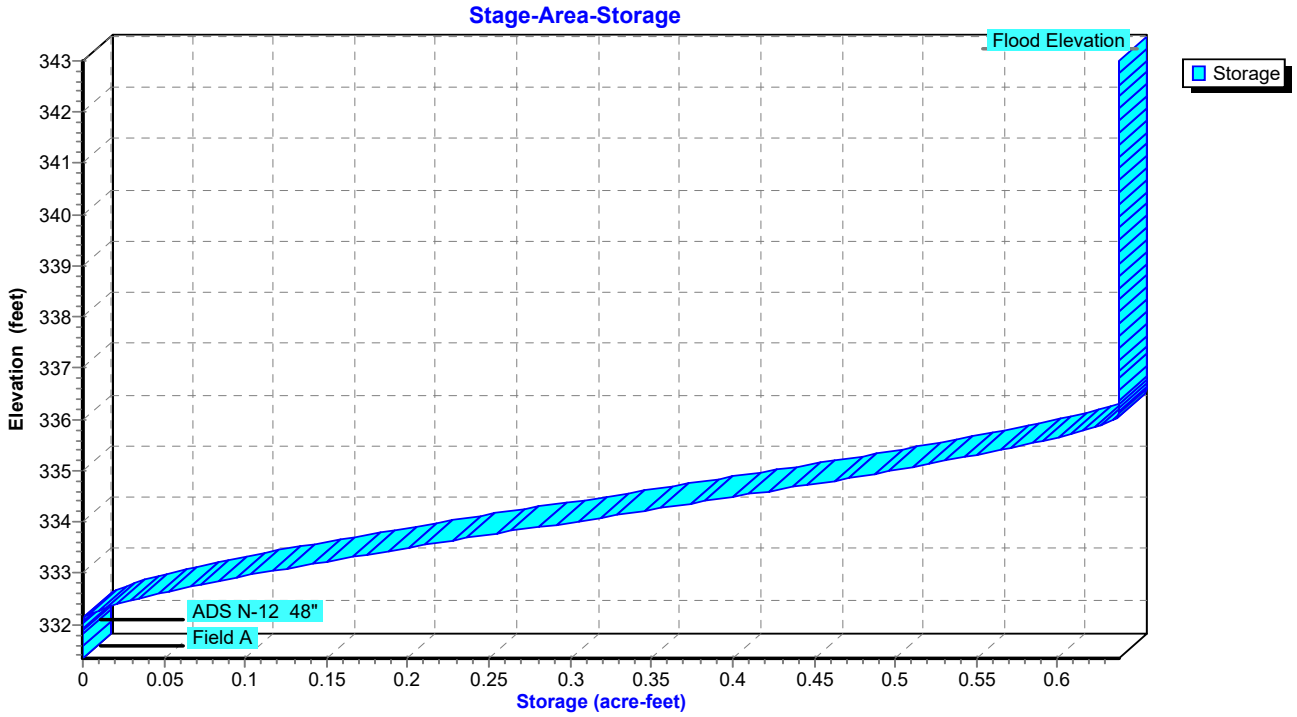
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.85	0.00
7.50	0.15	0.000	332.05	0.15
10.00	**0.72**	**0.008**	**332.26**	**0.60**
12.50	**0.00**	**0.631**	**335.95**	**0.00**
15.00	0.90	0.025	332.43	1.14
17.50	0.40	0.004	332.20	0.45
20.00	0.20	0.000	332.08	0.21
22.50	0.12	0.000	332.02	0.12
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Outflow = 30.76 cfs @ 12.71 hrs, Volume= 11.559 af, Atten= 53%, Lag= 34.6 min
Primary = 30.76 cfs @ 12.71 hrs, Volume= 11.559 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 293.32' @ 12.71 hrs Surf.Area= 56,279 sf Storage= 150,087 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 323.0 min calculated for 11.551 af (100% of inflow)
Center-of-Mass det. time= 323.3 min (1,126.0 - 802.7)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

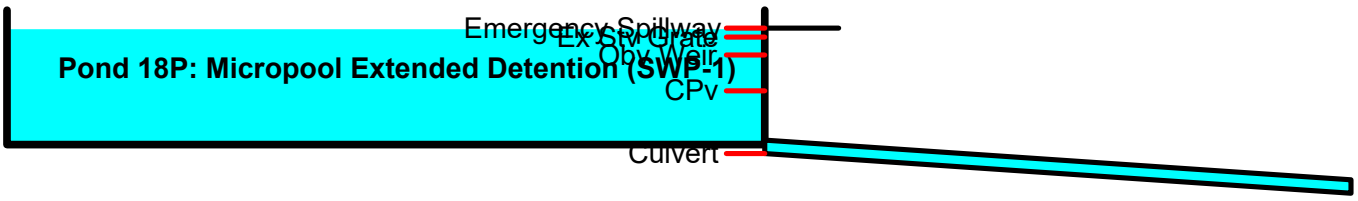
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

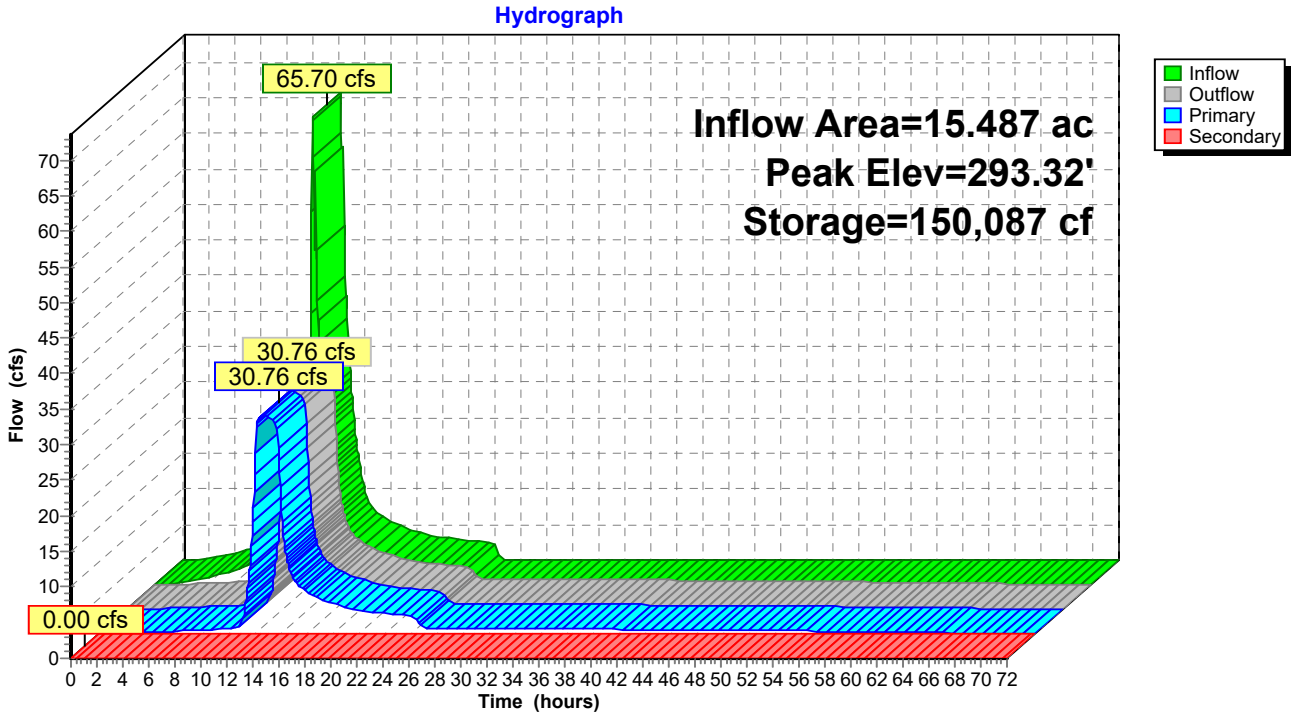
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=30.76 cfs @ 12.71 hrs HW=293.32' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 30.76 cfs @ 17.41 fps)
  ├─**2=CPv** (Passes < 1.08 cfs potential flow)
  ├─**3=Obv Weir** (Passes < 43.93 cfs potential flow)
  └─**4=Ex Stv Grate** (Passes < 31.52 cfs potential flow)

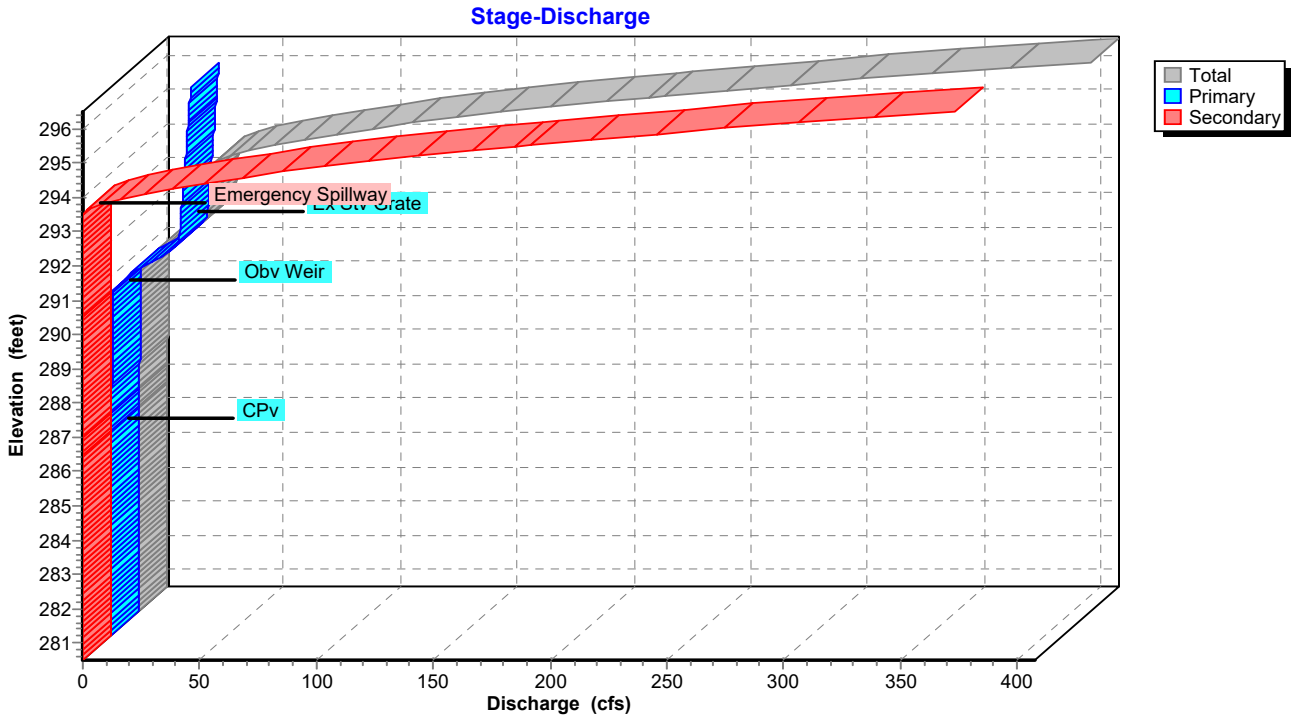
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



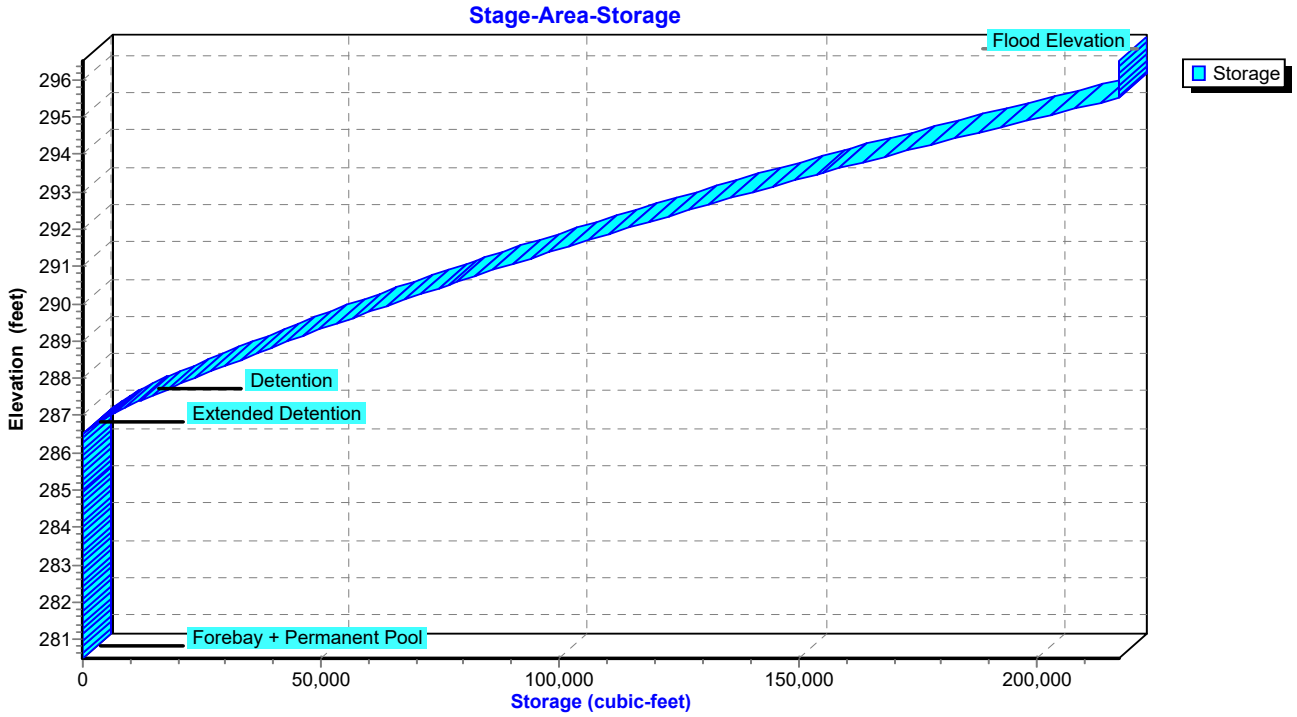
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.56	1,511	286.65	0.05	0.05	0.00
5.00	1.43	8,131	287.17	0.30	0.30	0.00
7.50	2.89	23,882	288.03	0.49	0.49	0.00
10.00	**5.57**	54,577	289.53	0.71	0.71	0.00
12.50	**39.96**	**146,644**	**293.20**	**30.62**	**30.62**	0.00
15.00	6.71	**88,589**	**291.00**	**7.71**	**7.71**	0.00
17.50	4.30	84,527	290.83	4.56	4.56	0.00
20.00	3.22	82,690	290.76	3.35	3.35	0.00
22.50	2.68	81,706	290.72	2.77	2.77	0.00
25.00	0.01	77,303	290.53	0.92	0.92	0.00
27.50	0.00	70,002	290.22	0.79	0.79	0.00
30.00	0.00	63,035	289.91	0.76	0.76	0.00
32.50	0.00	56,387	289.61	0.72	0.72	0.00
35.00	0.00	50,065	289.32	0.68	0.68	0.00
37.50	0.00	44,077	289.03	0.65	0.65	0.00
40.00	0.00	38,431	288.76	0.61	0.61	0.00
42.50	0.00	33,133	288.50	0.57	0.57	0.00
45.00	0.00	28,191	288.25	0.53	0.53	0.00
47.50	0.00	23,614	288.02	0.49	0.49	0.00
50.00	0.00	19,406	287.80	0.45	0.45	0.00
52.50	0.00	15,577	287.59	0.40	0.40	0.00
55.00	0.00	12,131	287.41	0.36	0.36	0.00
57.50	0.00	9,082	287.23	0.32	0.32	0.00
60.00	0.00	6,476	287.06	0.26	0.26	0.00
62.50	0.00	4,373	286.90	0.20	0.20	0.00
65.00	0.00	2,834	286.77	0.14	0.14	0.00
67.50	0.00	1,903	286.69	0.08	0.08	0.00
70.00	0.00	1,376	286.64	0.04	0.04	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

[58] Hint: Peaked 2.12' above defined flood level

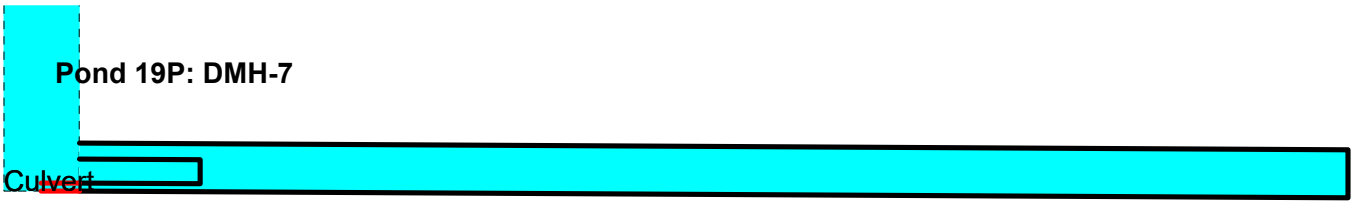
Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 86.34 cfs @ 12.15 hrs, Volume= 11.585 af
Outflow = 86.34 cfs @ 12.15 hrs, Volume= 11.585 af, Atten= 0%, Lag= 0.0 min
Primary = 65.70 cfs @ 12.13 hrs, Volume= 9.825 af
Routed to Pond 20P : DMH-8
Secondary = 21.63 cfs @ 12.18 hrs, Volume= 1.760 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 345.95' @ 12.18 hrs
Flood Elev= 343.83'

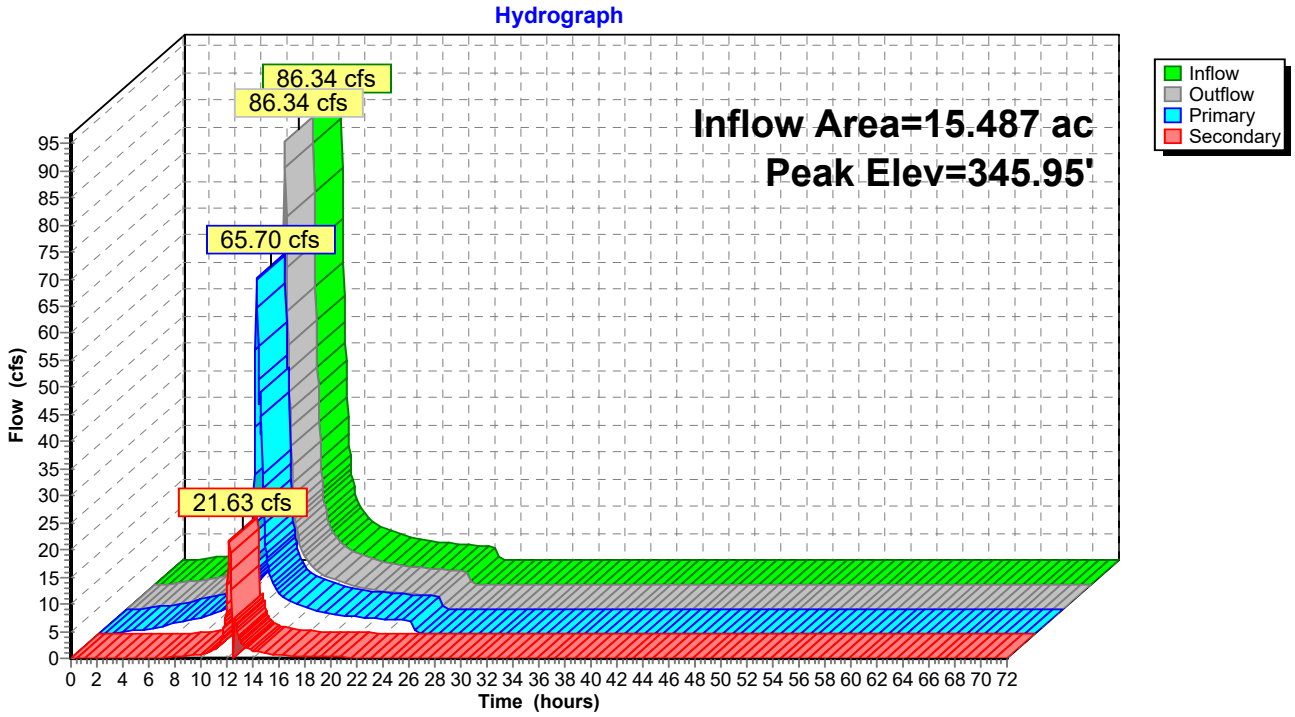
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=52.98 cfs @ 12.13 hrs HW=344.26' TW=340.37' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 52.98 cfs @ 7.50 fps)

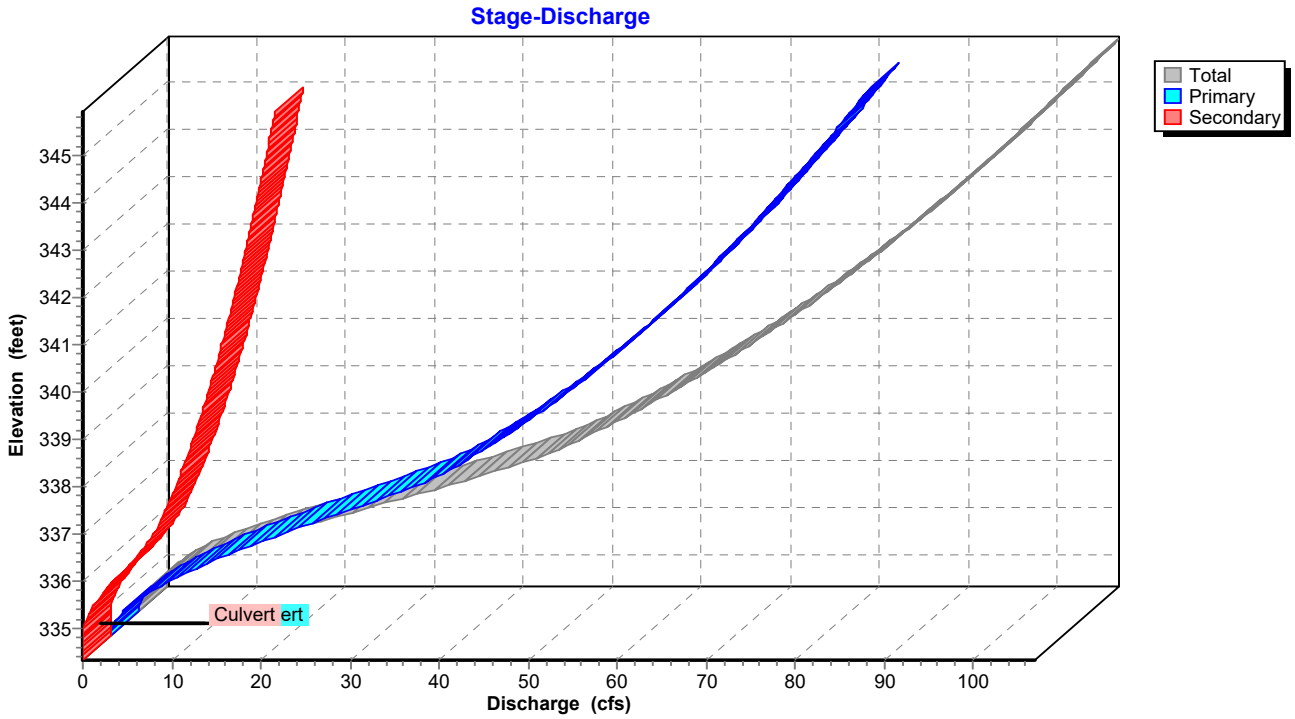
Secondary OutFlow Max=21.35 cfs @ 12.18 hrs HW=345.69' TW=334.62' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 21.35 cfs @ 12.08 fps)



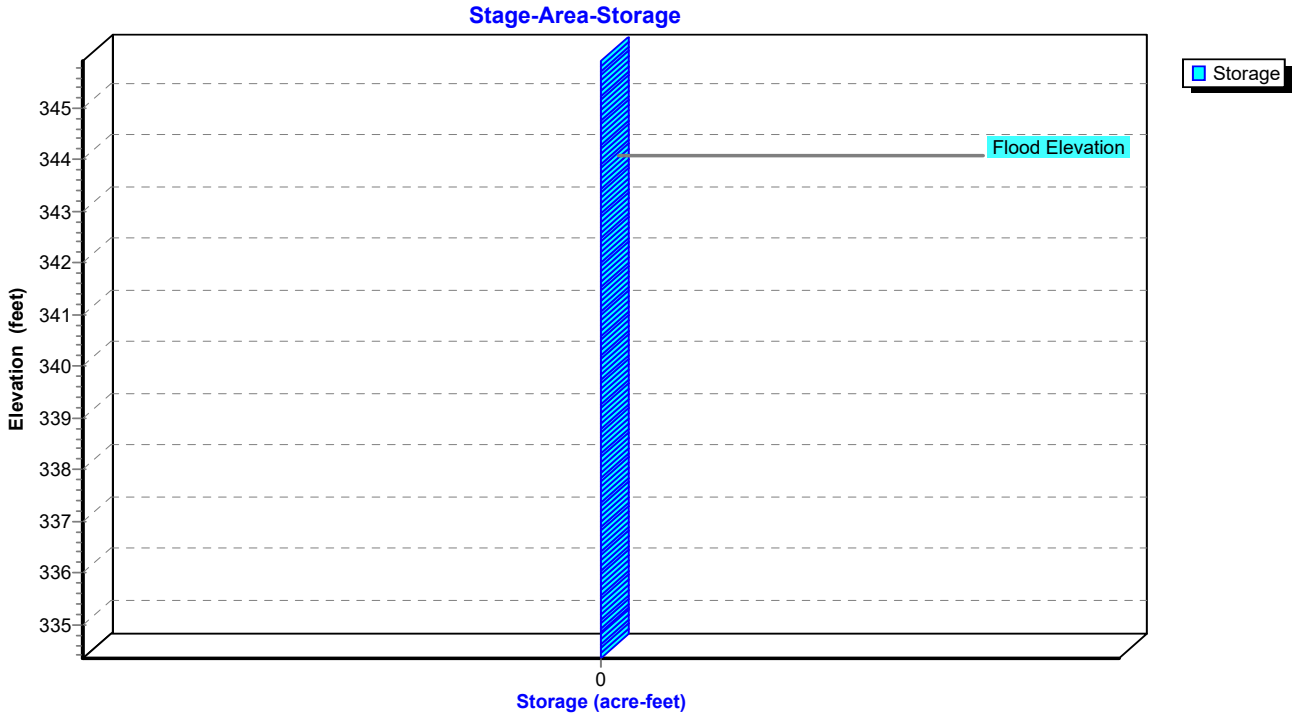
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.56	334.66	0.56	0.56	0.00
5.00	1.43	334.85	1.43	1.43	0.00
7.50	2.89	335.05	2.89	2.74	0.15
10.00	**5.70**	**335.32**	**5.70**	**4.98**	**0.72**
12.50	**39.96**	**338.42**	**39.96**	**39.96**	**0.00**
15.00	6.47	335.39	6.47	5.57	0.90
17.50	4.25	335.20	4.25	3.85	0.40
20.00	3.22	335.09	3.22	3.01	0.20
22.50	2.68	335.03	2.68	2.56	0.12
25.00	0.01	334.39	0.01	0.01	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.54	0.22	0.22	0.00
334.74	0.89	0.89	0.00
334.94	2.00	1.97	0.03
335.14	3.68	3.39	0.29
335.34	5.88	5.12	0.76
335.54	8.53	7.12	1.41
335.74	11.57	9.35	2.22
335.94	14.93	11.79	3.14
336.14	18.55	14.41	4.15
336.34	22.35	17.17	5.18
336.54	26.23	20.06	6.17
336.74	30.05	23.02	7.02
336.94	33.84	26.04	7.80
337.14	37.42	29.06	8.36
337.34	40.92	32.03	8.89
337.54	44.29	34.91	9.38
337.74	46.89	37.04	9.85
337.94	49.24	38.94	10.30
338.14	51.48	40.75	10.73
338.34	53.62	42.48	11.14
338.54	55.69	44.15	11.54
338.74	57.68	45.76	11.92
338.94	59.60	47.31	12.29
339.14	61.47	48.81	12.66
339.34	63.28	50.27	13.01
339.54	65.04	51.69	13.35
339.74	66.75	53.06	13.68
339.94	68.42	54.41	14.01
340.14	70.05	55.72	14.33
340.34	71.64	57.00	14.64
340.54	73.20	58.25	14.95
340.74	74.72	59.48	15.24
340.94	76.22	60.68	15.54
341.14	77.68	61.86	15.83
341.34	79.12	63.02	16.11
341.54	80.54	64.15	16.39
341.74	81.93	65.27	16.66
341.94	83.29	66.36	16.93
342.14	84.63	67.44	17.19
342.34	85.96	68.50	17.45
342.54	87.26	69.55	17.71
342.74	88.54	70.58	17.96
342.94	89.81	71.60	18.21
343.14	91.06	72.60	18.46
343.34	92.29	73.59	18.70
343.54	93.50	74.56	18.94
343.74	94.70	75.52	19.18
343.94	95.88	76.47	19.41
344.14	97.05	77.41	19.64
344.34	98.21	78.34	19.87
344.54	99.35	79.25	20.10
344.74	100.48	80.16	20.32
344.94	101.60	81.06	20.54
345.14	102.70	81.94	20.76
345.34	103.79	82.82	20.98
345.54	104.87	83.69	21.19
345.74	**105.94**	**84.54**	**21.40**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000	344.74	0.000
334.44	0.000	339.64	0.000	344.84	0.000
334.54	0.000	339.74	0.000	344.94	0.000
334.64	0.000	339.84	0.000	345.04	0.000
334.74	0.000	339.94	0.000	345.14	0.000
334.84	0.000	340.04	0.000	345.24	0.000
334.94	0.000	340.14	0.000	345.34	0.000
335.04	0.000	340.24	0.000	345.44	0.000
335.14	0.000	340.34	0.000	345.54	0.000
335.24	0.000	340.44	0.000	345.64	0.000
335.34	0.000	340.54	0.000	345.74	0.000
335.44	0.000	340.64	0.000	345.84	0.000
335.54	0.000	340.74	0.000		
335.64	0.000	340.84	0.000		
335.74	0.000	340.94	0.000		
335.84	0.000	341.04	0.000		
335.94	0.000	341.14	0.000		
336.04	0.000	341.24	0.000		
336.14	0.000	341.34	0.000		
336.24	0.000	341.44	0.000		
336.34	0.000	341.54	0.000		
336.44	0.000	341.64	0.000		
336.54	0.000	341.74	0.000		
336.64	0.000	341.84	0.000		
336.74	0.000	341.94	0.000		
336.84	0.000	342.04	0.000		
336.94	0.000	342.14	0.000		
337.04	0.000	342.24	0.000		
337.14	0.000	342.34	0.000		
337.24	0.000	342.44	0.000		
337.34	0.000	342.54	0.000		
337.44	0.000	342.64	0.000		
337.54	0.000	342.74	0.000		
337.64	0.000	342.84	0.000		
337.74	0.000	342.94	0.000		
337.84	0.000	343.04	0.000		
337.94	0.000	343.14	0.000		
338.04	0.000	343.24	0.000		
338.14	0.000	343.34	0.000		
338.24	0.000	343.44	0.000		
338.34	0.000	343.54	0.000		
338.44	0.000	343.64	0.000		
338.54	0.000	343.74	0.000		
338.64	0.000	343.84	0.000		
338.74	0.000	343.94	0.000		
338.84	0.000	344.04	0.000		
338.94	0.000	344.14	0.000		
339.04	0.000	344.24	0.000		
339.14	0.000	344.34	0.000		
339.24	0.000	344.44	0.000		
339.34	0.000	344.54	0.000		
339.44	0.000	344.64	0.000		

Summary for Pond 20P: DMH-8

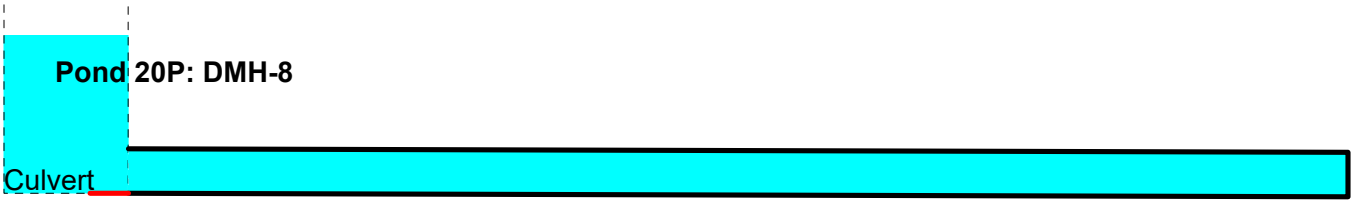
[80] Warning: Exceeded Pond 9P by 6.53' @ 12.15 hrs (21.75 cfs 0.469 af)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Outflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af, Atten= 0%, Lag= 0.0 min
Primary = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Routed to Pond 21P : DMH-9

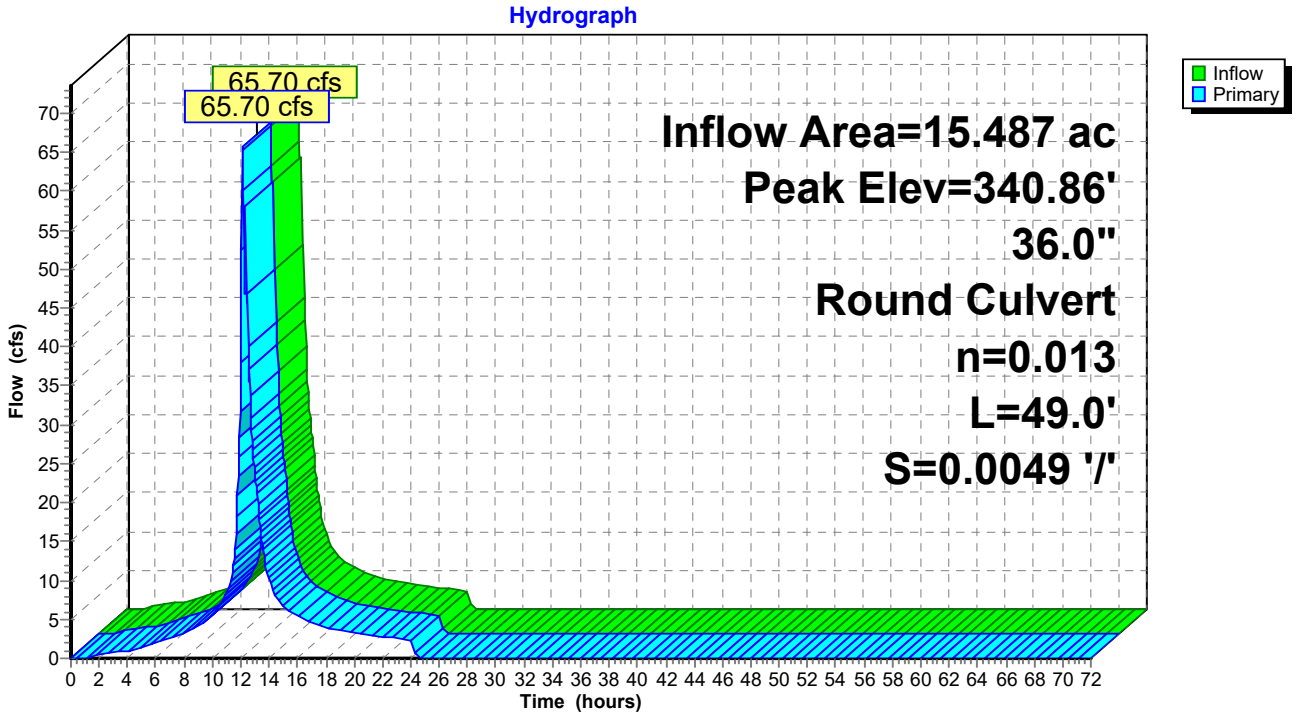
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 340.86' @ 12.16 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

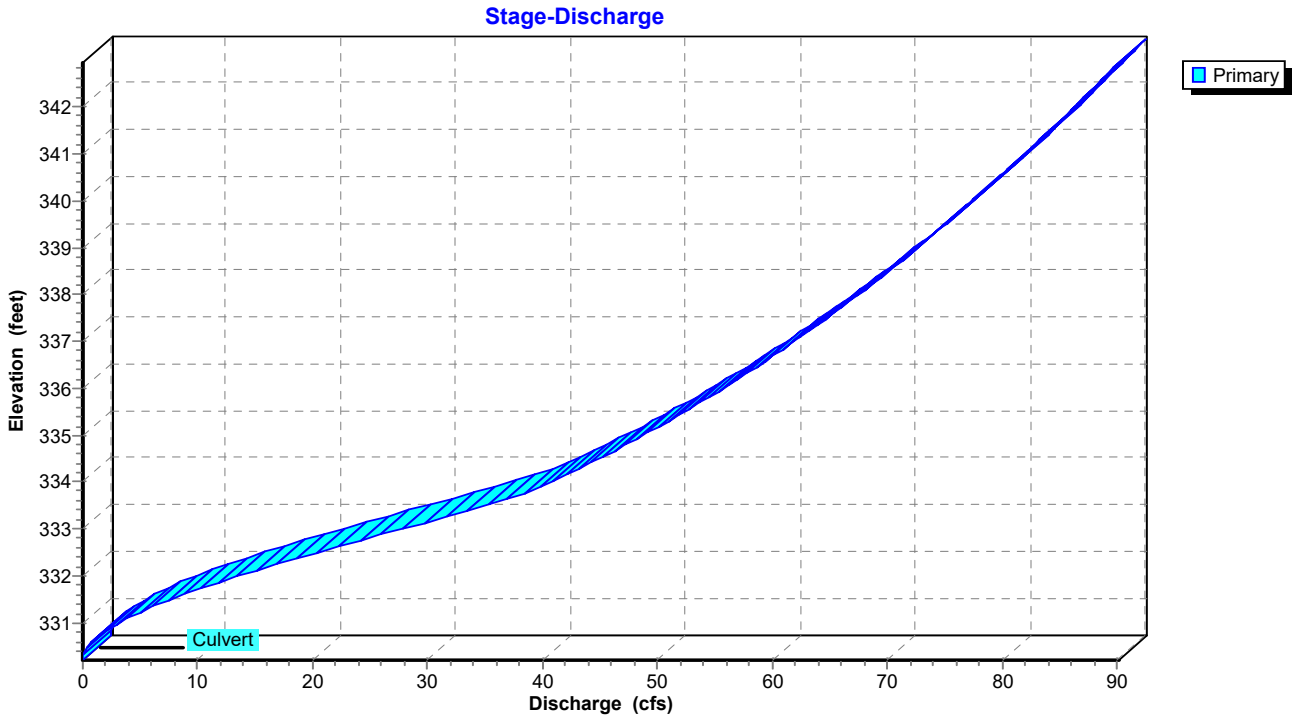
Primary OutFlow Max=62.23 cfs @ 12.13 hrs HW=340.37' TW=335.01' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 62.23 cfs @ 8.80 fps)



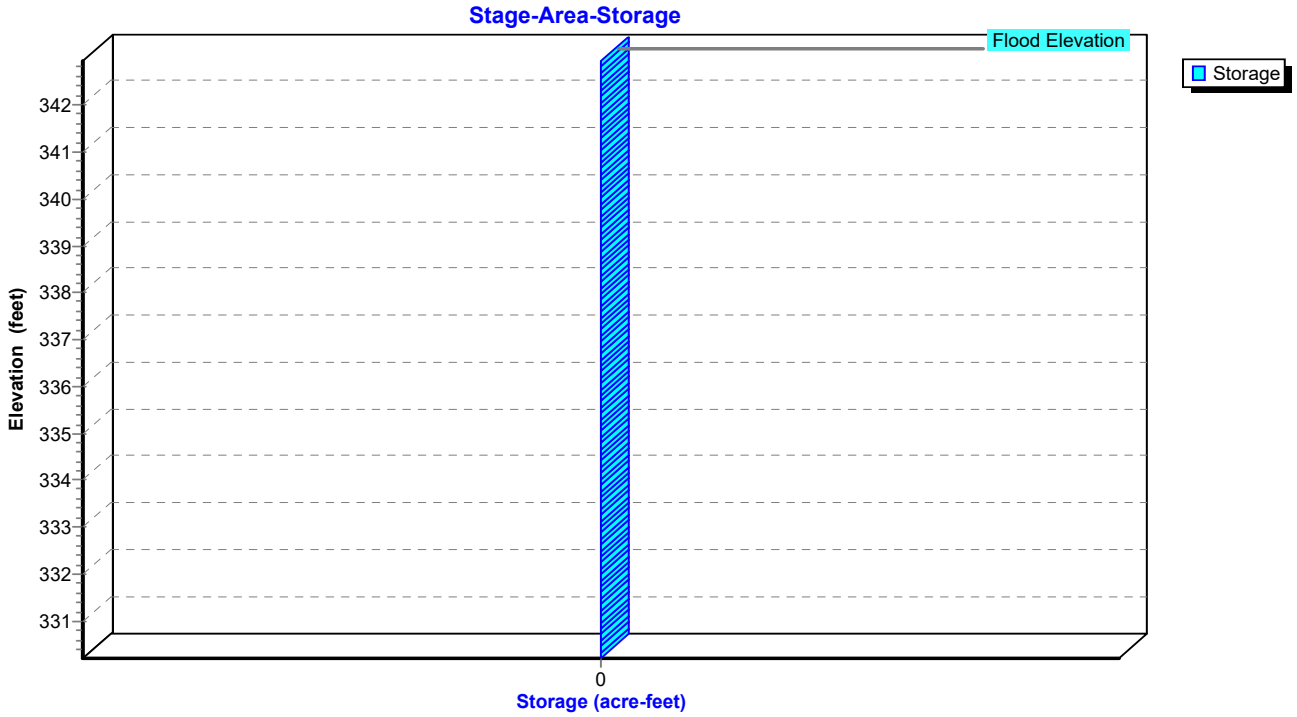
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.22	0.00
2.00	0.40	330.47	0.40
3.00	0.70	330.56	0.70
4.00	0.95	330.62	0.95
5.00	1.43	330.72	1.43
6.00	2.00	330.82	2.00
7.00	2.57	330.91	2.57
8.00	3.25	331.01	3.25
9.00	4.16	331.13	4.16
10.00	5.57	331.29	5.57
11.00	8.53	331.58	8.53
12.00	**38.09**	**334.26**	**38.09**
13.00	**23.66**	**332.80**	**23.66**
14.00	9.88	331.70	9.88
15.00	6.71	331.40	6.71
16.00	5.43	331.27	5.43
17.00	4.62	331.18	4.62
18.00	3.98	331.10	3.98
19.00	3.53	331.05	3.53
20.00	3.22	331.01	3.22
21.00	2.97	330.97	2.97
22.00	2.77	330.94	2.77
23.00	2.60	330.92	2.60
24.00	2.45	330.90	2.45
25.00	0.01	330.25	0.01
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

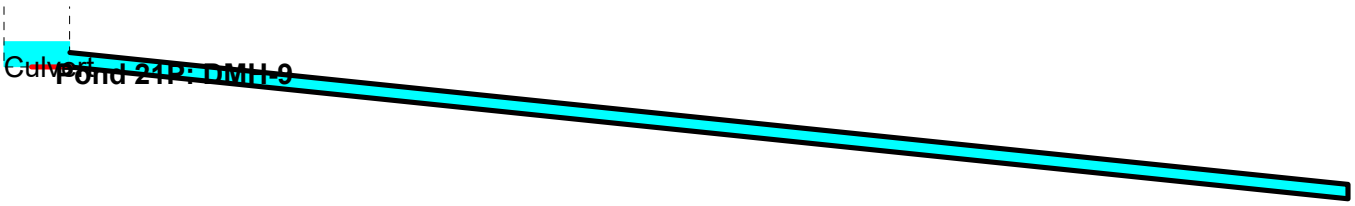
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Outflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af, Atten= 0%, Lag= 0.0 min
Primary = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Routed to Pond 23P : DMH-10

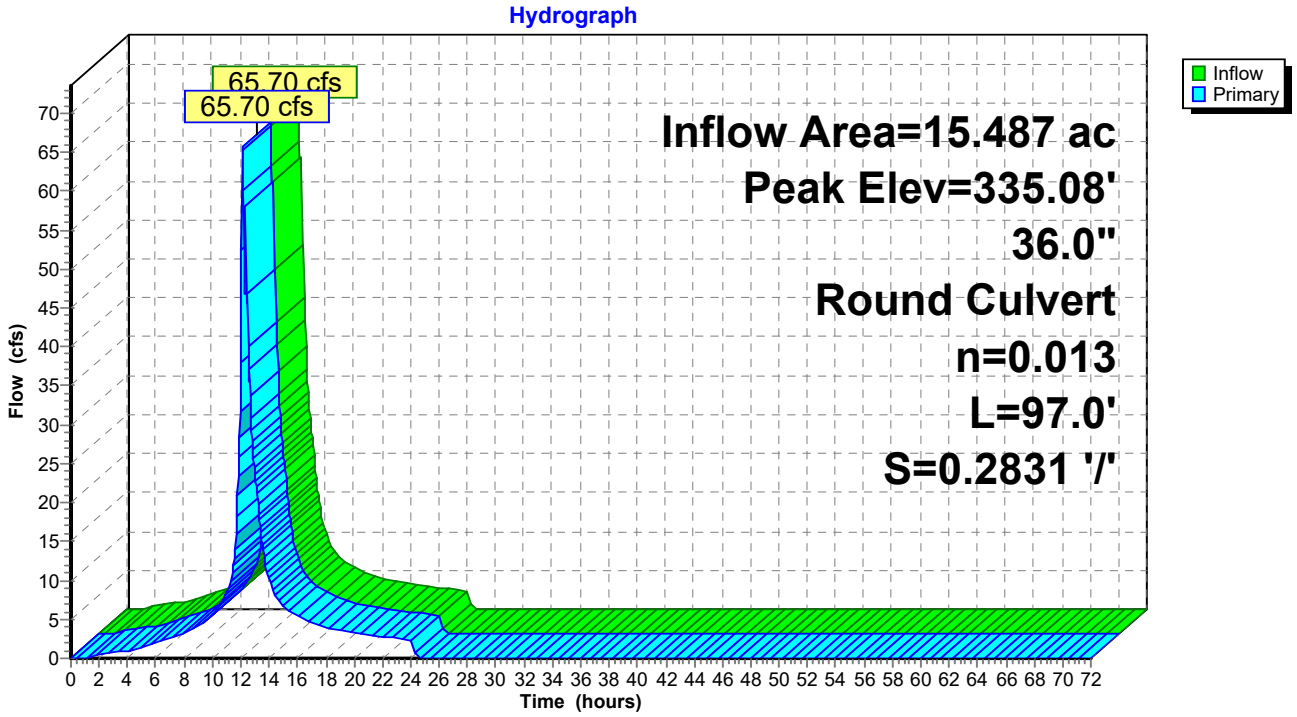
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 335.08' @ 12.13 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

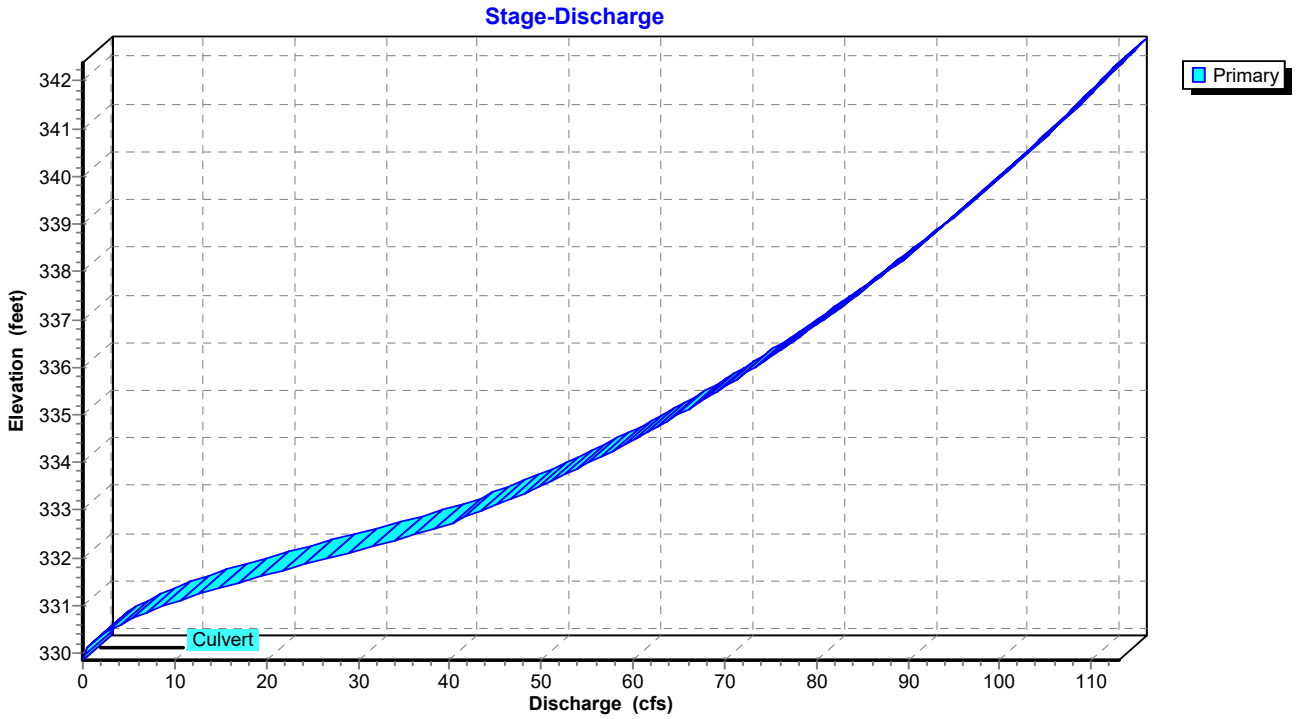
Primary OutFlow Max=64.99 cfs @ 12.13 hrs HW=335.01' TW=303.73' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 64.99 cfs @ 9.19 fps)



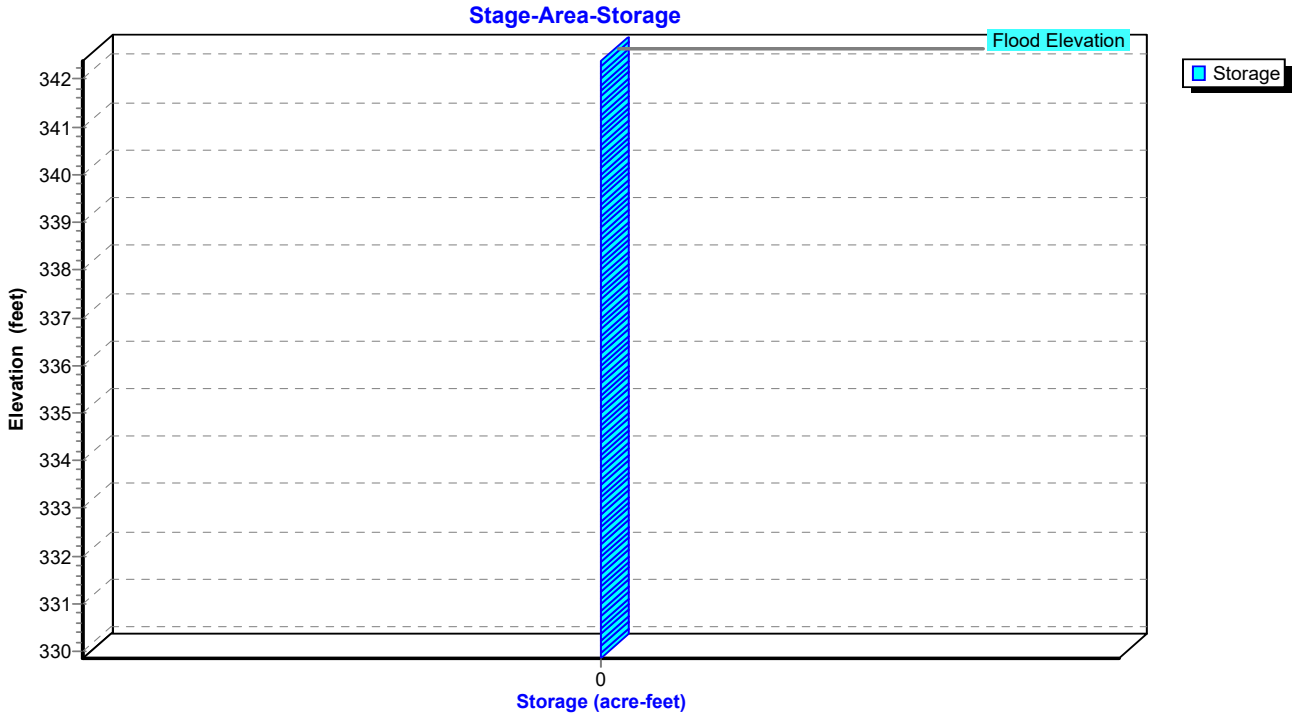
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.88	0.00
2.00	0.40	330.09	0.40
3.00	0.70	330.16	0.70
4.00	0.95	330.21	0.95
5.00	1.43	330.30	1.43
6.00	2.00	330.38	2.00
7.00	2.57	330.45	2.57
8.00	3.25	330.53	3.25
9.00	4.16	330.62	4.16
10.00	5.57	330.74	5.57
11.00	8.53	330.97	8.53
12.00	**38.09**	**332.60**	**38.09**
13.00	**23.66**	**331.84**	**23.66**
14.00	9.88	331.06	9.88
15.00	6.71	330.84	6.71
16.00	5.43	330.73	5.43
17.00	4.62	330.66	4.62
18.00	3.98	330.60	3.98
19.00	3.53	330.56	3.53
20.00	3.22	330.52	3.22
21.00	2.97	330.50	2.97
22.00	2.77	330.47	2.77
23.00	2.60	330.45	2.60
24.00	2.45	330.44	2.45
25.00	0.01	329.90	0.01
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

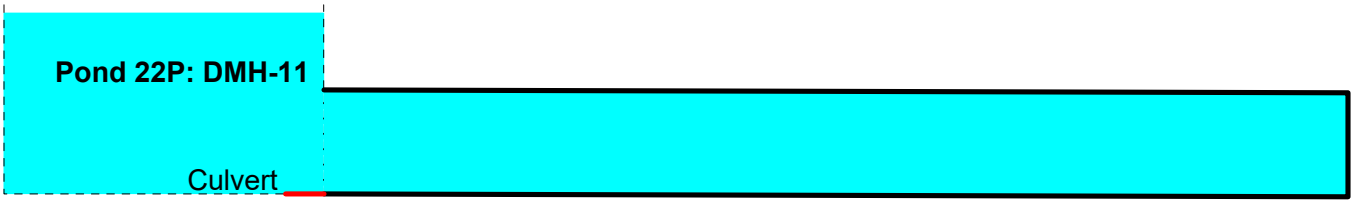
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Outflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af, Atten= 0%, Lag= 0.0 min
Primary = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

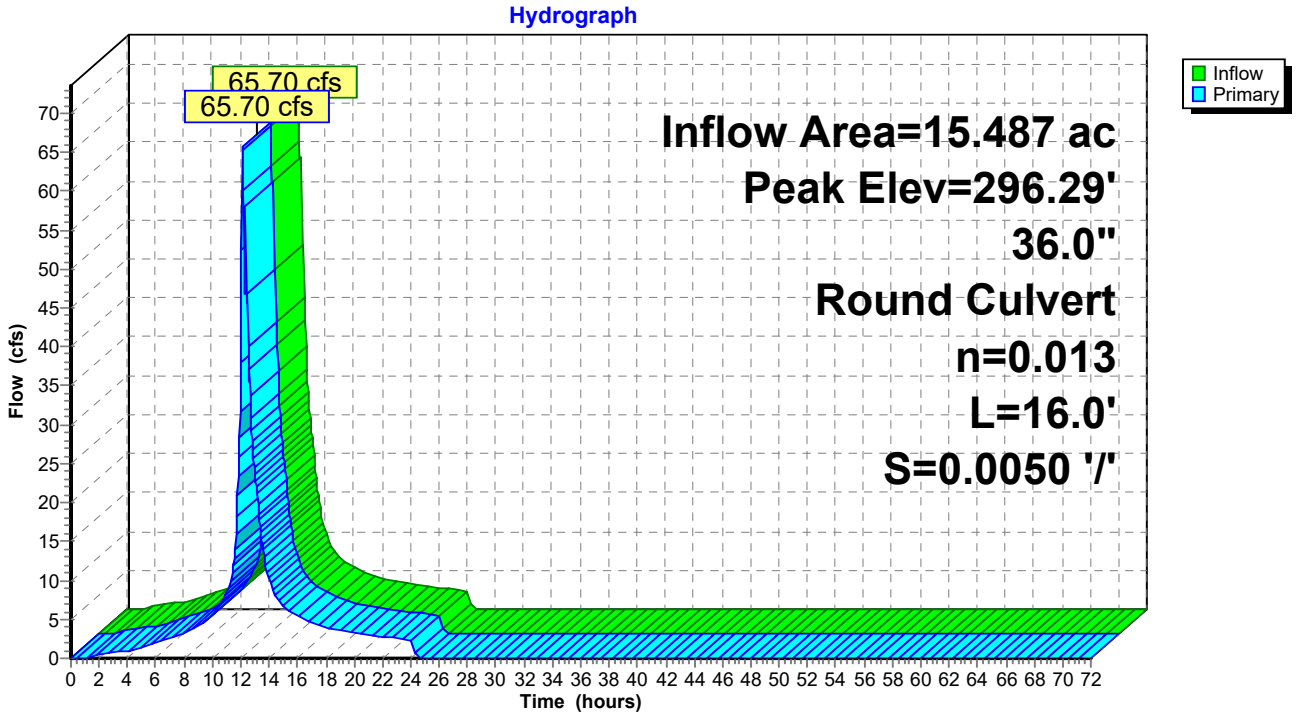
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 296.29' @ 12.13 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

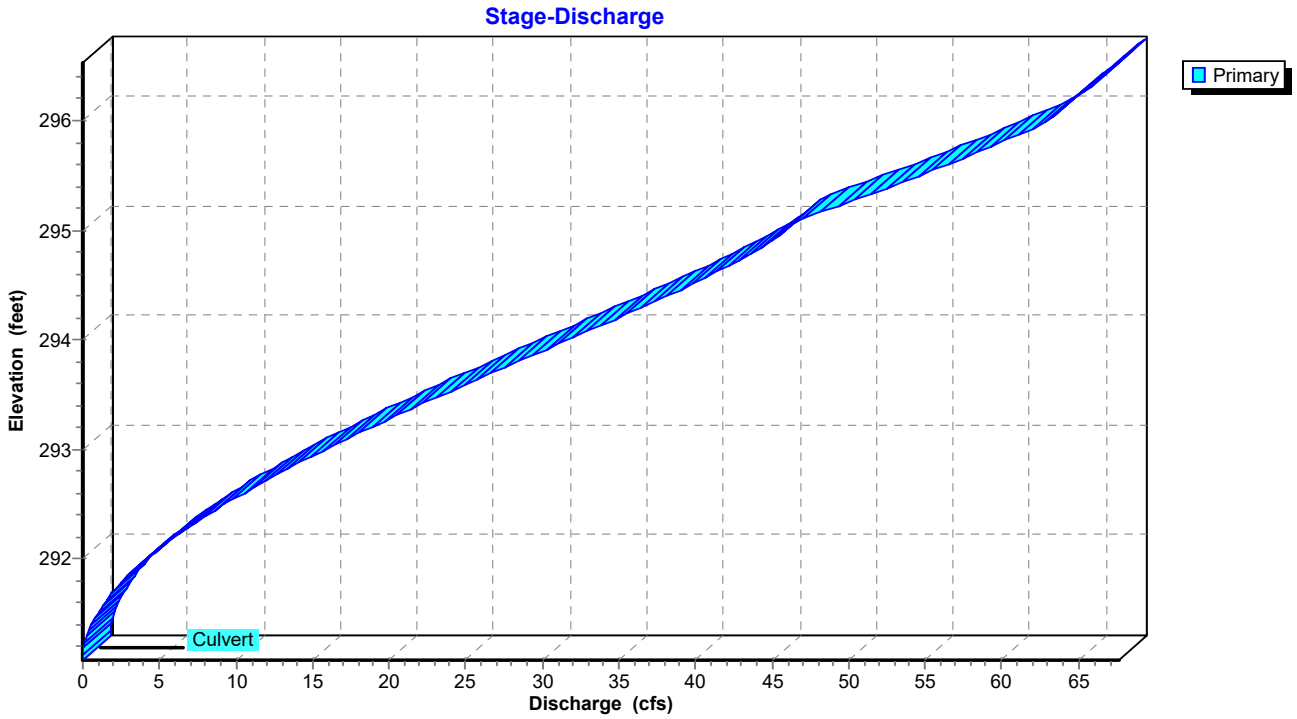
Primary OutFlow Max=64.99 cfs @ 12.13 hrs HW=296.23' TW=292.12' (Dynamic Tailwater)
1=Culvert (Inlet Controls 64.99 cfs @ 9.19 fps)



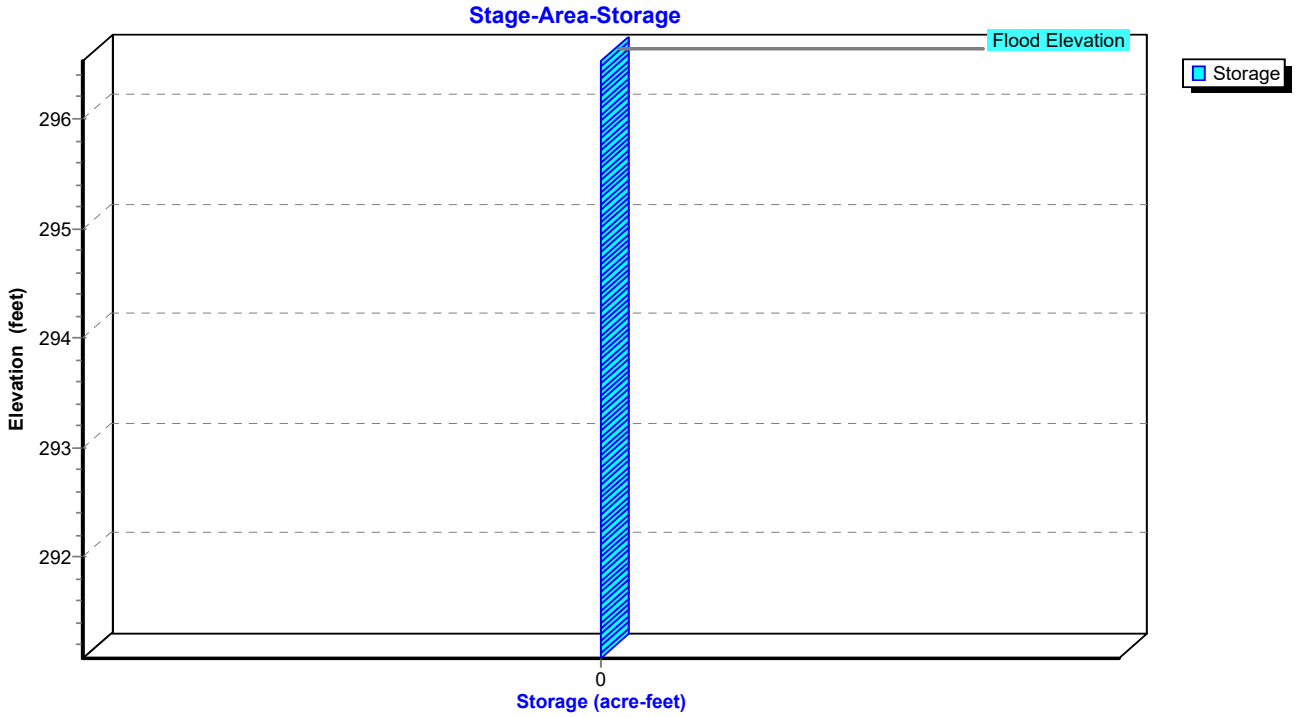
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.10	0.00
2.00	0.40	291.35	0.40
3.00	0.70	291.45	0.70
4.00	0.95	291.51	0.95
5.00	1.43	291.61	1.43
6.00	2.00	291.71	2.00
7.00	2.57	291.79	2.57
8.00	3.25	291.89	3.25
9.00	4.16	292.00	4.16
10.00	5.57	292.16	5.57
11.00	8.53	292.44	8.53
12.00	**38.09**	**294.40**	**38.09**
13.00	**23.66**	**293.76**	**23.66**
14.00	9.88	292.55	9.88
15.00	6.71	292.27	6.71
16.00	5.43	292.14	5.43
17.00	4.62	292.06	4.62
18.00	3.98	291.98	3.98
19.00	3.53	291.93	3.53
20.00	3.22	291.89	3.22
21.00	2.97	291.85	2.97
22.00	2.77	291.82	2.77
23.00	2.60	291.80	2.60
24.00	2.45	291.78	2.45
25.00	0.01	291.13	0.01
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

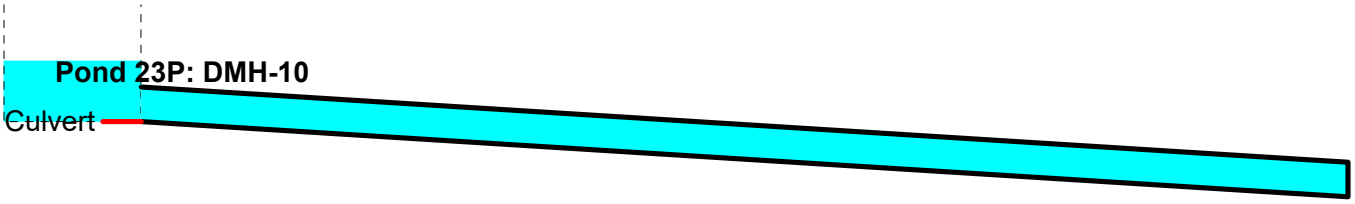
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 8.98" for 200-yr event
Inflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Outflow = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af, Atten= 0%, Lag= 0.0 min
Primary = 65.70 cfs @ 12.13 hrs, Volume= 11.585 af
Routed to Pond 22P : DMH-11

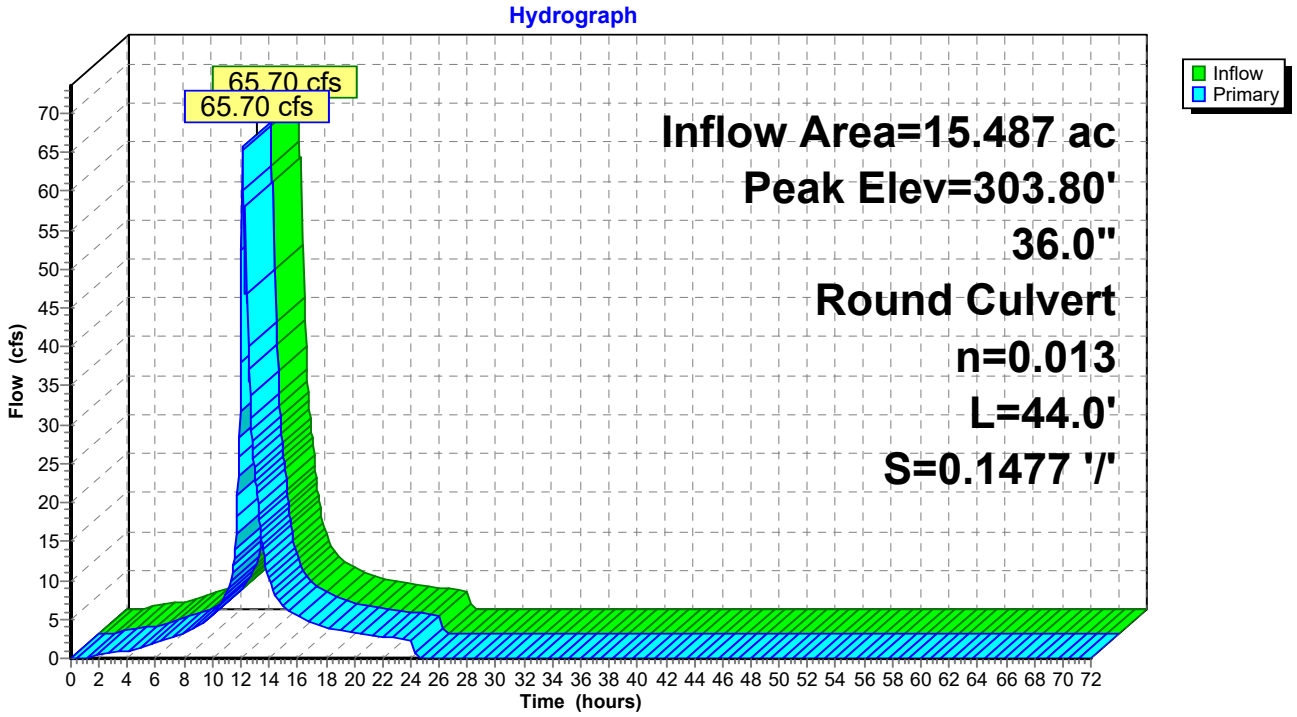
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 303.80' @ 12.13 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

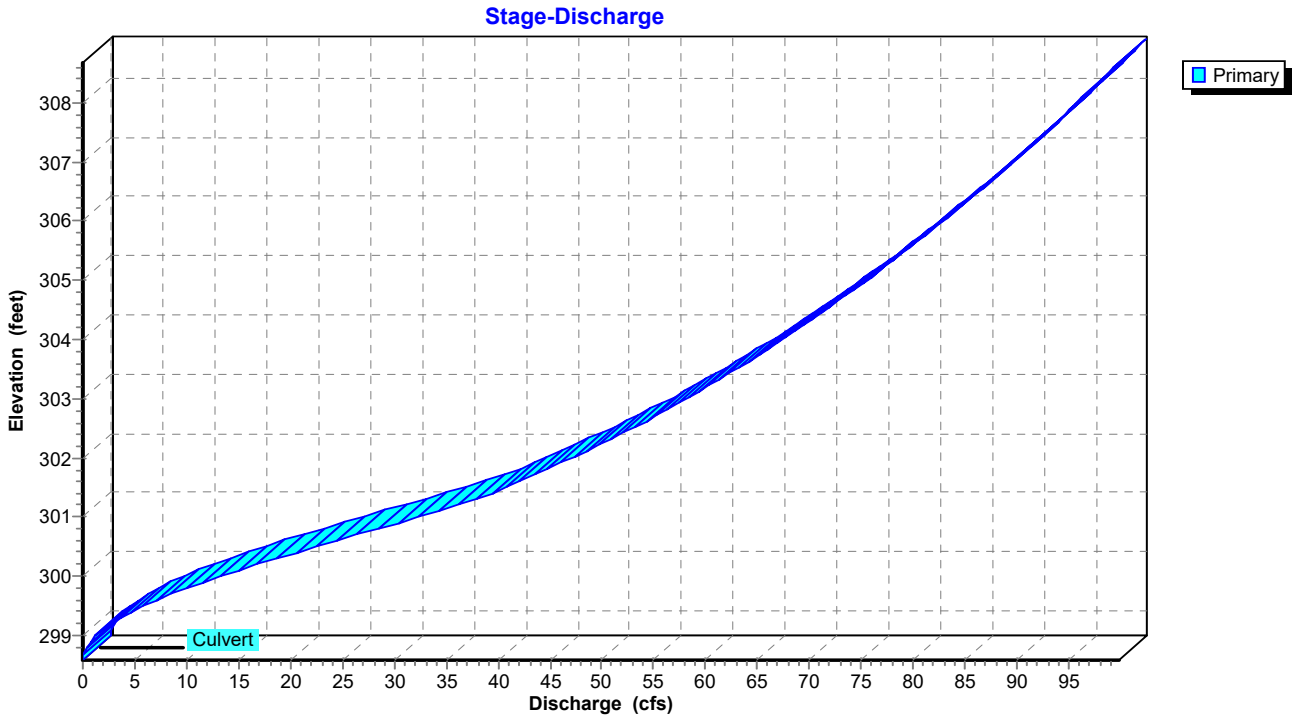
Primary OutFlow Max=64.99 cfs @ 12.13 hrs HW=303.73' TW=296.23' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 64.99 cfs @ 9.19 fps)



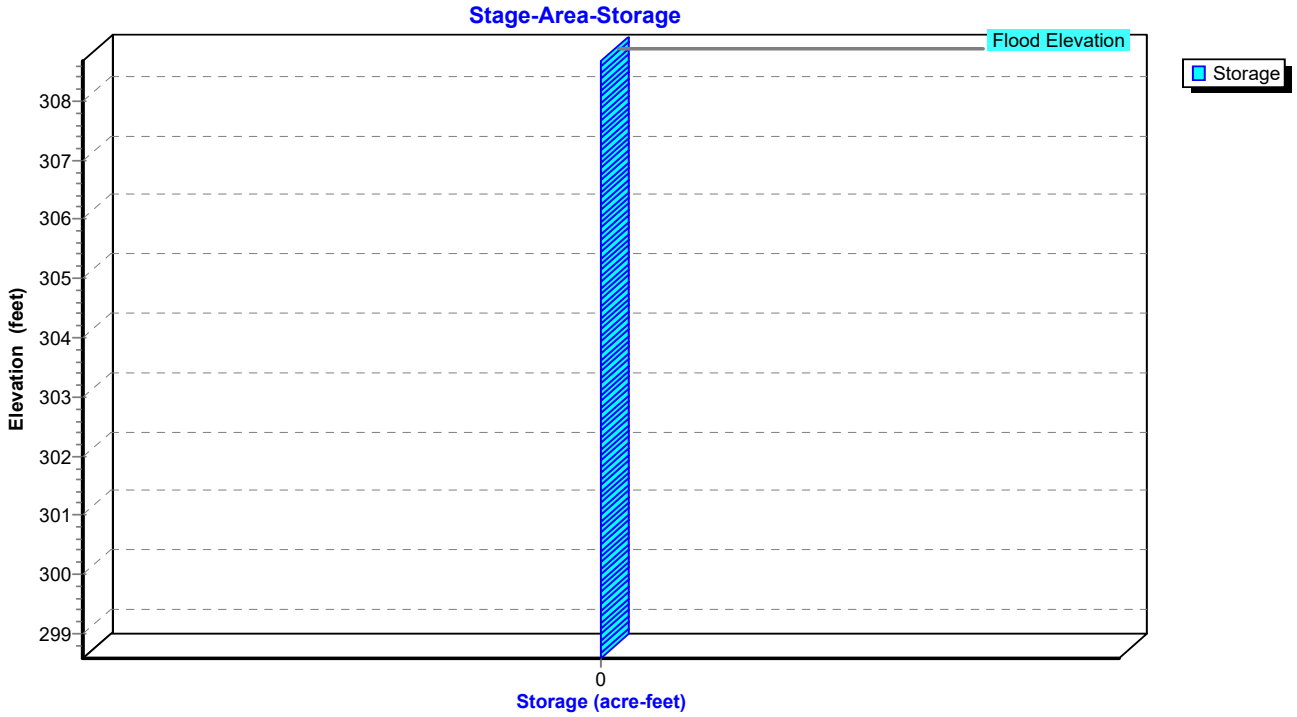
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00
1.00	0.00	298.60	0.00
2.00	0.40	298.81	0.40
3.00	0.70	298.88	0.70
4.00	0.95	298.93	0.95
5.00	1.43	299.02	1.43
6.00	2.00	299.10	2.00
7.00	2.57	299.17	2.57
8.00	3.25	299.25	3.25
9.00	4.16	299.34	4.16
10.00	5.57	299.46	5.57
11.00	8.53	299.69	8.53
12.00	**38.09**	**301.32**	**38.09**
13.00	**23.66**	**300.56**	**23.66**
14.00	9.88	299.78	9.88
15.00	6.71	299.56	6.71
16.00	5.43	299.45	5.43
17.00	4.62	299.38	4.62
18.00	3.98	299.32	3.98
19.00	3.53	299.28	3.53
20.00	3.22	299.24	3.22
21.00	2.97	299.22	2.97
22.00	2.77	299.19	2.77
23.00	2.60	299.17	2.60
24.00	2.45	299.16	2.45
25.00	0.01	298.62	0.01
26.00	0.00	298.58	0.00
27.00	0.00	298.58	0.00
28.00	0.00	298.58	0.00
29.00	0.00	298.58	0.00
30.00	0.00	298.58	0.00
31.00	0.00	298.58	0.00
32.00	0.00	298.58	0.00
33.00	0.00	298.58	0.00
34.00	0.00	298.58	0.00
35.00	0.00	298.58	0.00
36.00	0.00	298.58	0.00
37.00	0.00	298.58	0.00
38.00	0.00	298.58	0.00
39.00	0.00	298.58	0.00
40.00	0.00	298.58	0.00
41.00	0.00	298.58	0.00
42.00	0.00	298.58	0.00
43.00	0.00	298.58	0.00
44.00	0.00	298.58	0.00
45.00	0.00	298.58	0.00
46.00	0.00	298.58	0.00
47.00	0.00	298.58	0.00
48.00	0.00	298.58	0.00
49.00	0.00	298.58	0.00
50.00	0.00	298.58	0.00
51.00	0.00	298.58	0.00
52.00	0.00	298.58	0.00
53.00	0.00	298.58	0.00
54.00	0.00	298.58	0.00
55.00	0.00	298.58	0.00
56.00	0.00	298.58	0.00
57.00	0.00	298.58	0.00
58.00	0.00	298.58	0.00
59.00	0.00	298.58	0.00
60.00	0.00	298.58	0.00
61.00	0.00	298.58	0.00
62.00	0.00	298.58	0.00
63.00	0.00	298.58	0.00
64.00	0.00	298.58	0.00
65.00	0.00	298.58	0.00
66.00	0.00	298.58	0.00
67.00	0.00	298.58	0.00
68.00	0.00	298.58	0.00
69.00	0.00	298.58	0.00
70.00	0.00	298.58	0.00
71.00	0.00	298.58	0.00
72.00	0.00	298.58	0.00

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

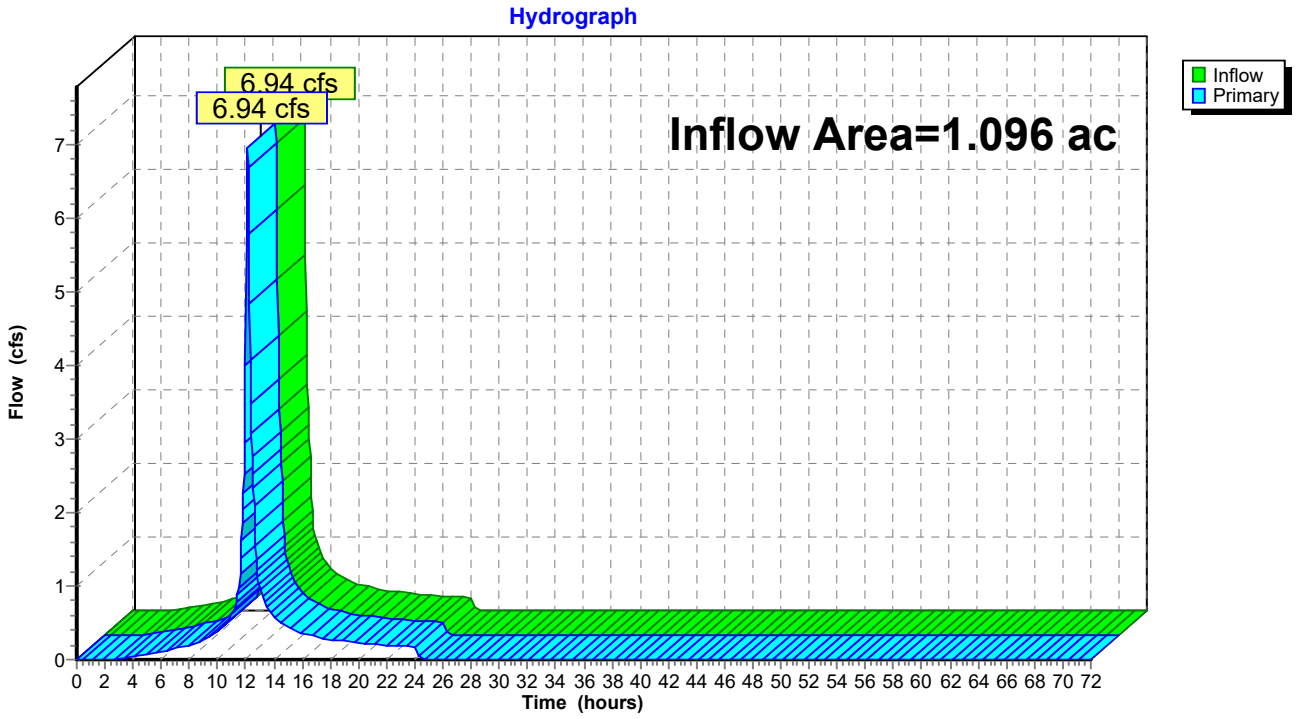
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 8.61" for 200-yr event
Inflow = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af
Primary = 6.94 cfs @ 12.12 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

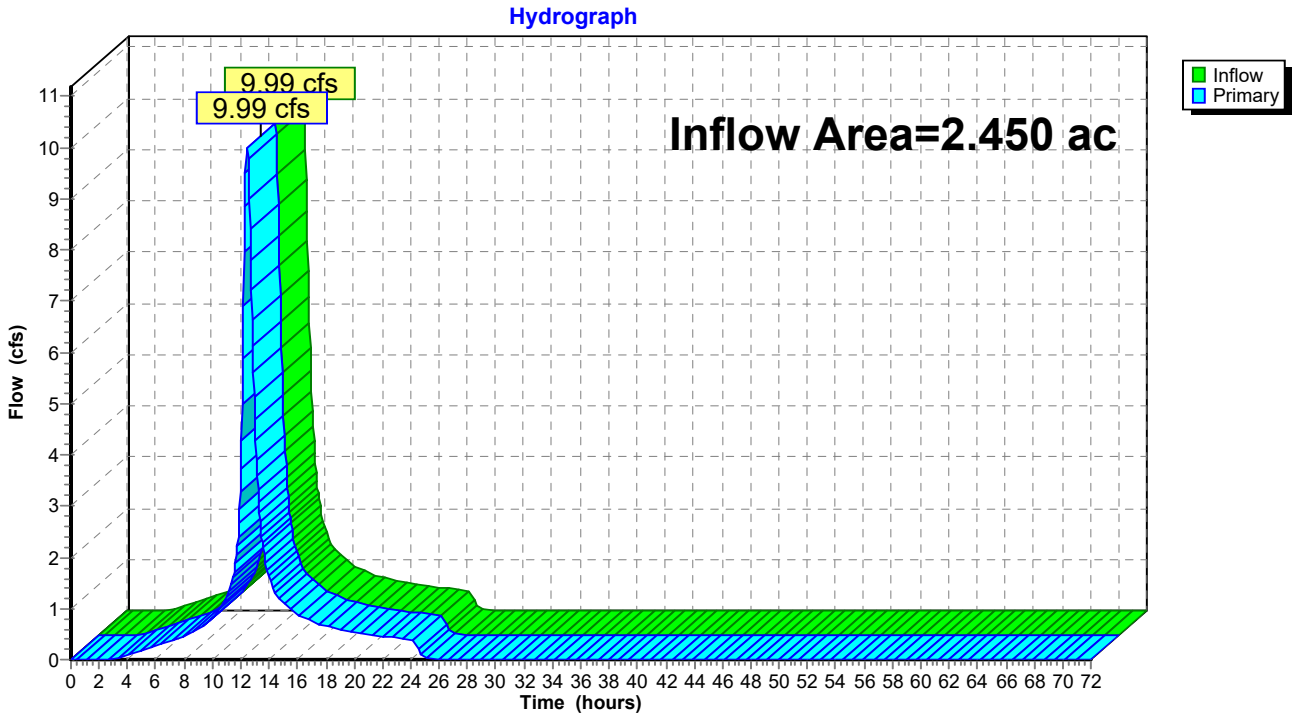
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.03	0.00	0.03
5.00	0.07	0.00	0.07
6.00	0.11	0.00	0.11
7.00	0.15	0.00	0.15
8.00	0.20	0.00	0.20
9.00	0.27	0.00	0.27
10.00	0.38	0.00	0.38
11.00	0.63	0.00	0.63
12.00	**3.99**	0.00	**3.99**
13.00	**0.96**	0.00	**0.96**
14.00	0.58	0.00	0.58
15.00	0.44	0.00	0.44
16.00	0.36	0.00	0.36
17.00	0.31	0.00	0.31
18.00	0.28	0.00	0.28
19.00	0.25	0.00	0.25
20.00	0.23	0.00	0.23
21.00	0.21	0.00	0.21
22.00	0.20	0.00	0.20
23.00	0.19	0.00	0.19
24.00	0.18	0.00	0.18
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 9.00" for 200-yr event
Inflow = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af
Primary = 9.99 cfs @ 12.44 hrs, Volume= 1.838 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

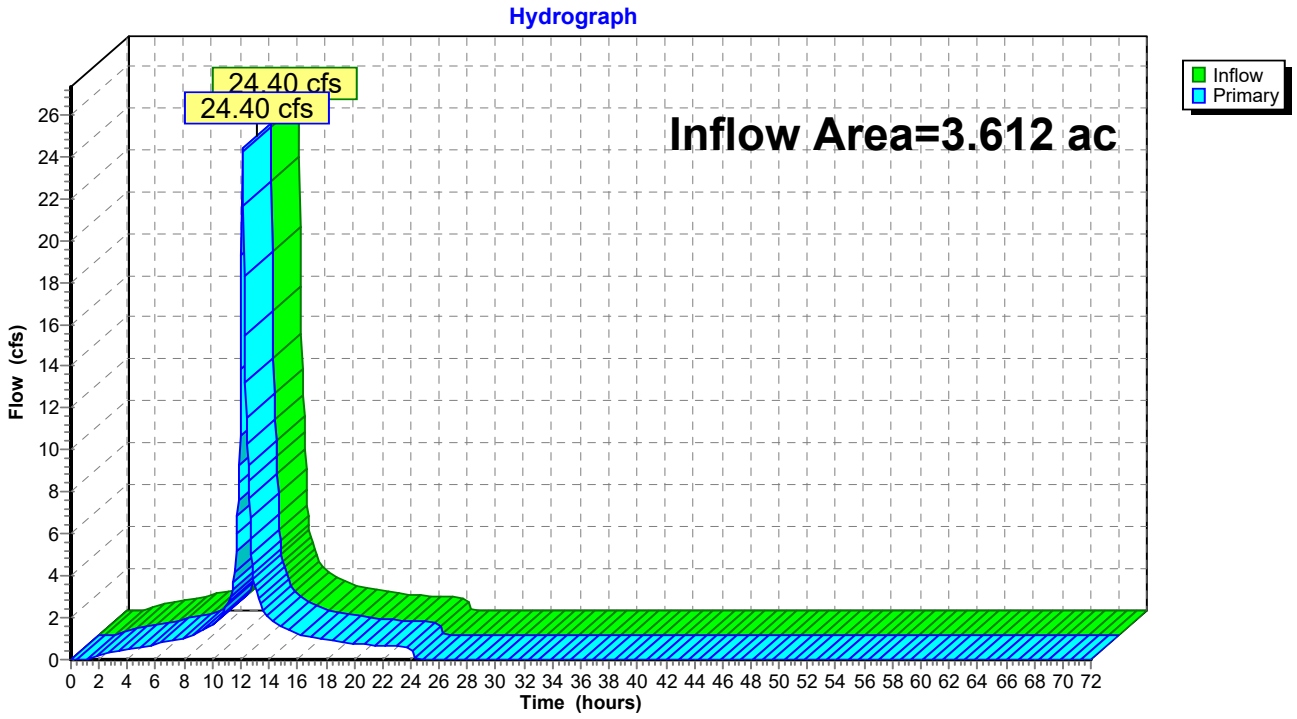
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.02	0.00	0.02
4.00	0.09	0.00	0.09
5.00	0.18	0.00	0.18
6.00	0.26	0.00	0.26
7.00	0.35	0.00	0.35
8.00	0.46	0.00	0.46
9.00	0.61	0.00	0.61
10.00	0.82	0.00	0.82
11.00	1.24	0.00	1.24
12.00	**3.72**	0.00	**3.72**
13.00	**4.68**	0.00	**4.68**
14.00	1.57	0.00	1.57
15.00	1.09	0.00	1.09
16.00	0.88	0.00	0.88
17.00	0.75	0.00	0.75
18.00	0.66	0.00	0.66
19.00	0.59	0.00	0.59
20.00	0.54	0.00	0.54
21.00	0.50	0.00	0.50
22.00	0.46	0.00	0.46
23.00	0.43	0.00	0.43
24.00	0.41	0.00	0.41
25.00	0.03	0.00	0.03
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 10.28" for 200-yr event
Inflow = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af
Primary = 24.40 cfs @ 12.13 hrs, Volume= 3.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

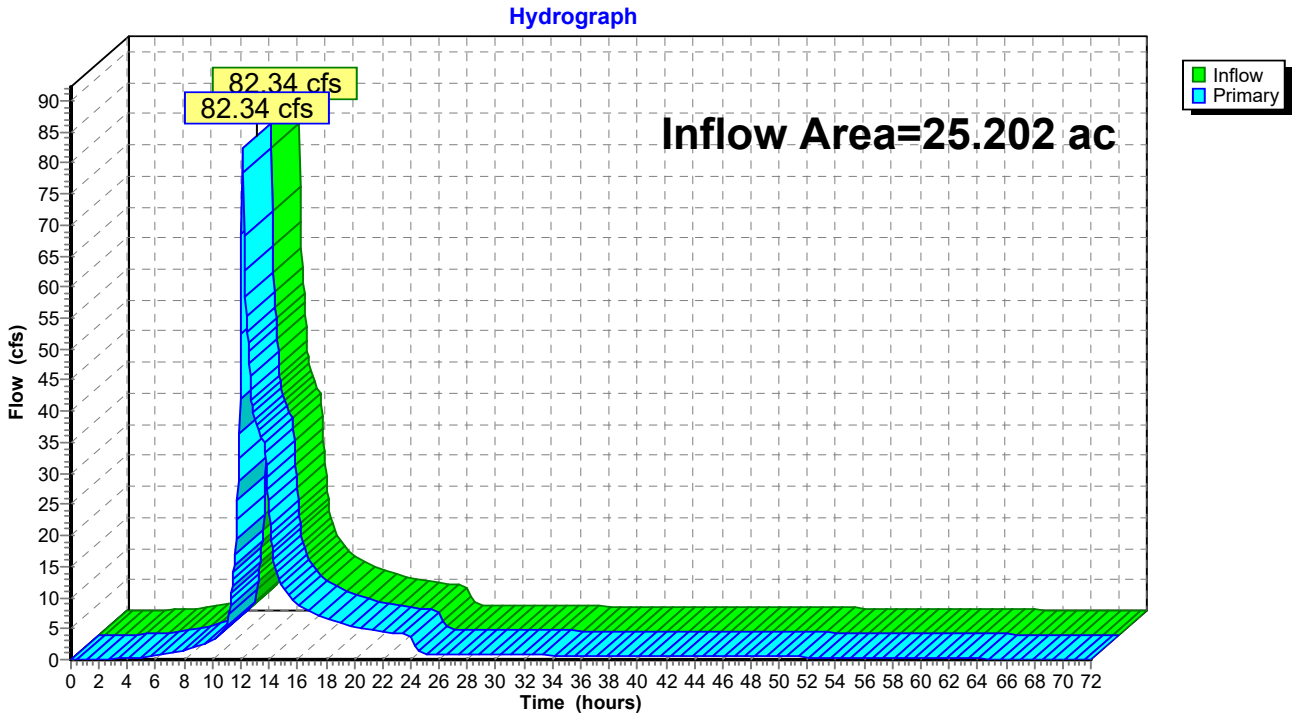
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.21	0.00	0.21
3.00	0.38	0.00	0.38
4.00	0.51	0.00	0.51
5.00	0.63	0.00	0.63
6.00	0.75	0.00	0.75
7.00	0.89	0.00	0.89
8.00	1.06	0.00	1.06
9.00	1.30	0.00	1.30
10.00	1.70	0.00	1.70
11.00	2.57	0.00	2.57
12.00	**13.89**	0.00	**13.89**
13.00	**3.44**	0.00	**3.44**
14.00	2.02	0.00	2.02
15.00	1.52	0.00	1.52
16.00	1.25	0.00	1.25
17.00	1.07	0.00	1.07
18.00	0.95	0.00	0.95
19.00	0.86	0.00	0.86
20.00	0.79	0.00	0.79
21.00	0.73	0.00	0.73
22.00	0.68	0.00	0.68
23.00	0.64	0.00	0.64
24.00	0.60	0.00	0.60
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 8.35" for 200-yr event
Inflow = 82.34 cfs @ 12.13 hrs, Volume= 17.540 af
Primary = 82.34 cfs @ 12.13 hrs, Volume= 17.540 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.01	0.00	0.01
3.00	0.12	0.00	0.12
4.00	0.22	0.00	0.22
5.00	0.41	0.00	0.41
6.00	0.75	0.00	0.75
7.00	1.13	0.00	1.13
8.00	1.60	0.00	1.60
9.00	2.22	0.00	2.22
10.00	3.17	0.00	3.17
11.00	5.14	0.00	5.14
12.00	**52.34**	0.00	**52.34**
13.00	**38.48**	0.00	**38.48**
14.00	23.55	0.00	23.55
15.00	11.34	0.00	11.34
16.00	8.88	0.00	8.88
17.00	7.53	0.00	7.53
18.00	6.56	0.00	6.56
19.00	5.82	0.00	5.82
20.00	5.29	0.00	5.29
21.00	4.88	0.00	4.88
22.00	4.55	0.00	4.55
23.00	4.26	0.00	4.26
24.00	4.02	0.00	4.02
25.00	0.92	0.00	0.92
26.00	0.81	0.00	0.81
27.00	0.80	0.00	0.80
28.00	0.78	0.00	0.78
29.00	0.77	0.00	0.77
30.00	0.76	0.00	0.76
31.00	0.74	0.00	0.74
32.00	0.73	0.00	0.73
33.00	0.71	0.00	0.71
34.00	0.70	0.00	0.70
35.00	0.68	0.00	0.68
36.00	0.67	0.00	0.67
37.00	0.65	0.00	0.65
38.00	0.64	0.00	0.64
39.00	0.62	0.00	0.62
40.00	0.61	0.00	0.61
41.00	0.59	0.00	0.59
42.00	0.58	0.00	0.58
43.00	0.56	0.00	0.56
44.00	0.55	0.00	0.55
45.00	0.53	0.00	0.53
46.00	0.51	0.00	0.51
47.00	0.50	0.00	0.50
48.00	0.48	0.00	0.48
49.00	0.46	0.00	0.46
50.00	0.45	0.00	0.45
51.00	0.43	0.00	0.43
52.00	0.41	0.00	0.41
53.00	0.40	0.00	0.40
54.00	0.38	0.00	0.38
55.00	0.36	0.00	0.36
56.00	0.34	0.00	0.34
57.00	0.32	0.00	0.32
58.00	0.31	0.00	0.31
59.00	0.28	0.00	0.28
60.00	0.26	0.00	0.26
61.00	0.24	0.00	0.24
62.00	0.22	0.00	0.22
63.00	0.19	0.00	0.19
64.00	0.17	0.00	0.17
65.00	0.14	0.00	0.14
66.00	0.11	0.00	0.11
67.00	0.09	0.00	0.09
68.00	0.07	0.00	0.07
69.00	0.05	0.00	0.05
70.00	0.04	0.00	0.04
71.00	0.04	0.00	0.04
72.00	0.03	0.00	0.03

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1P: DA-1 Runoff Area=1.096 ac 0.00% Impervious Runoff Depth=0.15"
Flow Length=253' Tc=12.2 min CN=80 Runoff=0.08 cfs 0.014 af

Subcatchment2P: DA-2 Runoff Area=106,720 sf 0.00% Impervious Runoff Depth=0.22"
Flow Length=548' Tc=36.4 min CN=83 Runoff=0.23 cfs 0.044 af

Subcatchment3P: DA-3 Runoff Area=3.612 ac 68.49% Impervious Runoff Depth=0.60"
Flow Length=469' Tc=13.4 min CN=93 Runoff=2.08 cfs 0.181 af

Subcatchment4AP: DA-4A Runoff Area=6.651 ac 77.58% Impervious Runoff Depth=0.60"
Flow Length=1,162' Tc=12.6 min CN=93 Runoff=3.93 cfs 0.334 af

Subcatchment4BP: DA-4B Runoff Area=7.473 ac 1.69% Impervious Runoff Depth=0.06"
Flow Length=1,113' Tc=17.1 min CN=74 Runoff=0.08 cfs 0.037 af

Subcatchment4CP: DA-4C Runoff Area=9.715 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=968' Tc=12.4 min CN=71 Runoff=0.03 cfs 0.025 af

Subcatchment4DP: DA-4D Runoff Area=1.363 ac 82.91% Impervious Runoff Depth=0.73"
Flow Length=398' Tc=6.0 min CN=95 Runoff=1.31 cfs 0.083 af

Pond 6P: Infiltrators Peak Elev=347.11' Storage=0.032 af Inflow=1.31 cfs 0.083 af
Discarded=0.07 cfs 0.078 af Primary=0.04 cfs 0.005 af Outflow=0.10 cfs 0.083 af

Pond 9P: Detention Piping - 48" Peak Elev=332.12' Storage=0.000 af Inflow=0.34 cfs 0.005 af
Outflow=0.28 cfs 0.005 af

Pond 18P: Micropool Extended Detention Peak Elev=287.17' Storage=8,097 cf Inflow=3.87 cfs 0.376 af
Primary=0.30 cfs 0.371 af Secondary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.371 af

Pond 19P: DMH-7 Peak Elev=335.17' Inflow=3.93 cfs 0.376 af
Primary=3.60 cfs 0.371 af Secondary=0.34 cfs 0.005 af Outflow=3.93 cfs 0.376 af

Pond 20P: DMH-8 Peak Elev=331.09' Inflow=3.87 cfs 0.376 af
36.0" Round Culvert n=0.013 L=49.0' S=0.0049 '/' Outflow=3.87 cfs 0.376 af

Pond 21P: DMH-9 Peak Elev=330.59' Inflow=3.87 cfs 0.376 af
36.0" Round Culvert n=0.013 L=97.0' S=0.2831 '/' Outflow=3.87 cfs 0.376 af

Pond 22P: DMH-11 Peak Elev=291.97' Inflow=3.87 cfs 0.376 af
36.0" Round Culvert n=0.013 L=16.0' S=0.0050 '/' Outflow=3.87 cfs 0.376 af

Pond 23P: DMH-10 Peak Elev=299.31' Inflow=3.87 cfs 0.376 af
36.0" Round Culvert n=0.013 L=44.0' S=0.1477 '/' Outflow=3.87 cfs 0.376 af

Link DP-1: Design Point - 1 Inflow=0.08 cfs 0.014 af
Primary=0.08 cfs 0.014 af

Link DP-2: Design Point - 2 Inflow=0.23 cfs 0.044 af
Primary=0.23 cfs 0.044 af

Link DP-3: Design Point - 3 Inflow=2.08 cfs 0.181 af
Primary=2.08 cfs 0.181 af

Link DP-4: DP-4 Inflow=0.33 cfs 0.397 af
Primary=0.33 cfs 0.397 af

Total Runoff Area = 32.360 ac Runoff Volume = 0.718 af Average Runoff Depth = 0.27"
72.53% Pervious = 23.470 ac 27.47% Impervious = 8.890 ac

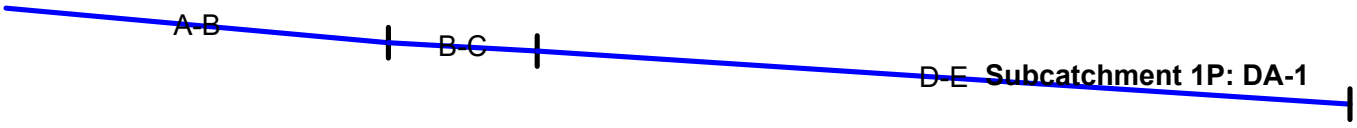
Summary for Subcatchment 1P: DA-1

Runoff = 0.08 cfs @ 12.20 hrs, Volume= 0.014 af, Depth= 0.15"
Routed to Link DP-1 : Design Point - 1

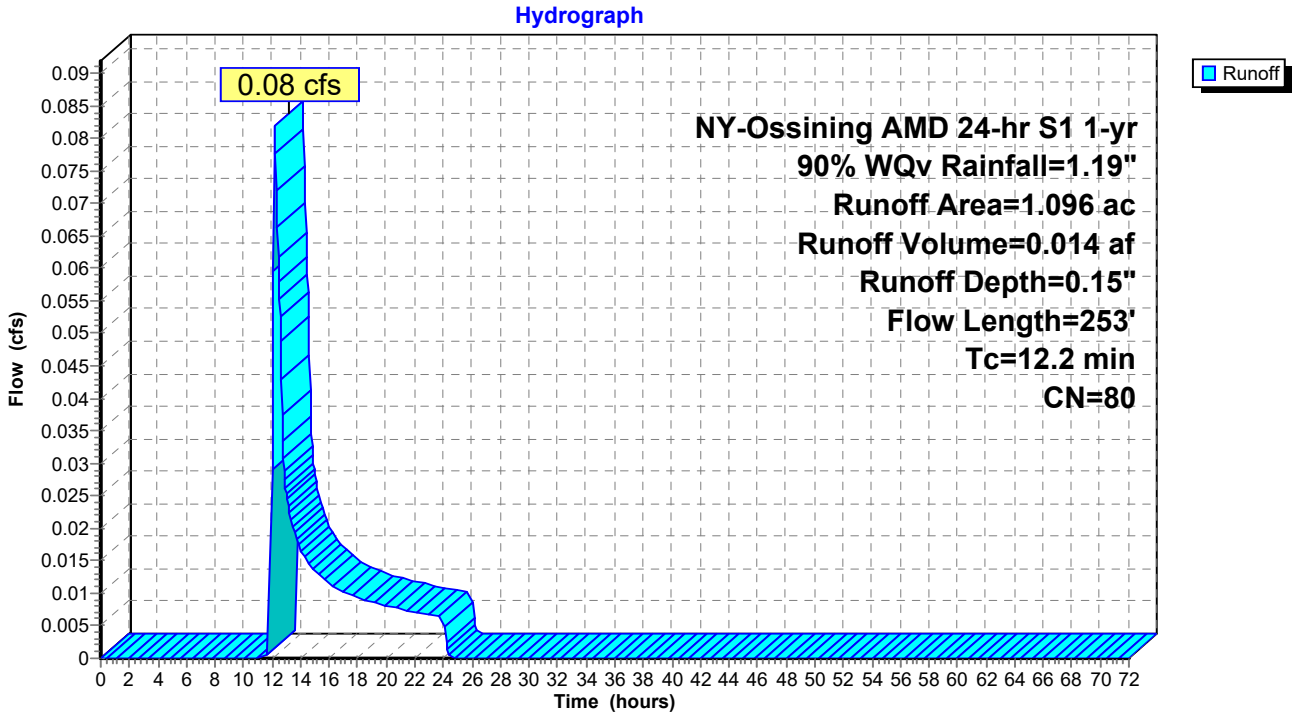
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
0.755	79	Woods, Fair, HSG D
0.341	82	Woods/grass comb., Fair, HSG D
1.096	80	Weighted Average
1.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	72	0.0700	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
5.5	28	0.0429	0.08		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.41"
2.3	153	0.0503	1.12		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
12.2	253	Total			



Subcatchment 1P: DA-1



Hydrograph for Subcatchment 1P: DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.00
9.00	0.21	0.00	0.00
10.00	0.25	0.00	0.00
11.00	0.32	0.00	0.00
12.00	0.65	0.01	**0.01**
13.00	0.87	0.05	**0.03**
14.00	0.94	0.07	0.02
15.00	0.98	0.08	0.01
16.00	1.02	0.09	0.01
17.00	1.05	0.10	0.01
18.00	1.08	0.11	0.01
19.00	1.10	0.12	0.01
20.00	1.12	0.12	0.01
21.00	1.14	0.13	0.01
22.00	1.16	0.14	0.01
23.00	1.17	0.14	0.01
24.00	**1.19**	**0.15**	0.01
25.00	1.19	0.15	0.00
26.00	1.19	0.15	0.00
27.00	1.19	0.15	0.00
28.00	1.19	0.15	0.00
29.00	1.19	0.15	0.00
30.00	1.19	0.15	0.00
31.00	1.19	0.15	0.00
32.00	1.19	0.15	0.00
33.00	1.19	0.15	0.00
34.00	1.19	0.15	0.00
35.00	1.19	0.15	0.00
36.00	1.19	0.15	0.00
37.00	1.19	0.15	0.00
38.00	1.19	0.15	0.00
39.00	1.19	0.15	0.00
40.00	1.19	0.15	0.00
41.00	1.19	0.15	0.00
42.00	1.19	0.15	0.00
43.00	1.19	0.15	0.00
44.00	1.19	0.15	0.00
45.00	1.19	0.15	0.00
46.00	1.19	0.15	0.00
47.00	1.19	0.15	0.00
48.00	1.19	0.15	0.00
49.00	1.19	0.15	0.00
50.00	1.19	0.15	0.00
51.00	1.19	0.15	0.00
52.00	1.19	0.15	0.00
53.00	1.19	0.15	0.00
54.00	1.19	0.15	0.00
55.00	1.19	0.15	0.00
56.00	1.19	0.15	0.00
57.00	1.19	0.15	0.00
58.00	1.19	0.15	0.00
59.00	1.19	0.15	0.00
60.00	1.19	0.15	0.00
61.00	1.19	0.15	0.00
62.00	1.19	0.15	0.00
63.00	1.19	0.15	0.00
64.00	1.19	0.15	0.00
65.00	1.19	0.15	0.00
66.00	1.19	0.15	0.00
67.00	1.19	0.15	0.00
68.00	1.19	0.15	0.00
69.00	1.19	0.15	0.00
70.00	1.19	0.15	0.00
71.00	1.19	0.15	0.00
72.00	1.19	0.15	0.00

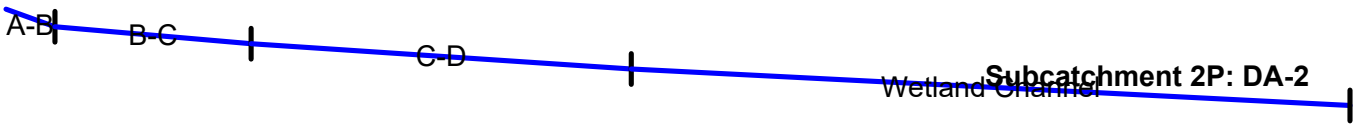
Summary for Subcatchment 2P: DA-2

Runoff = 0.23 cfs @ 12.56 hrs, Volume= 0.044 af, Depth= 0.22"
Routed to Link DP-2 : Design Point - 2

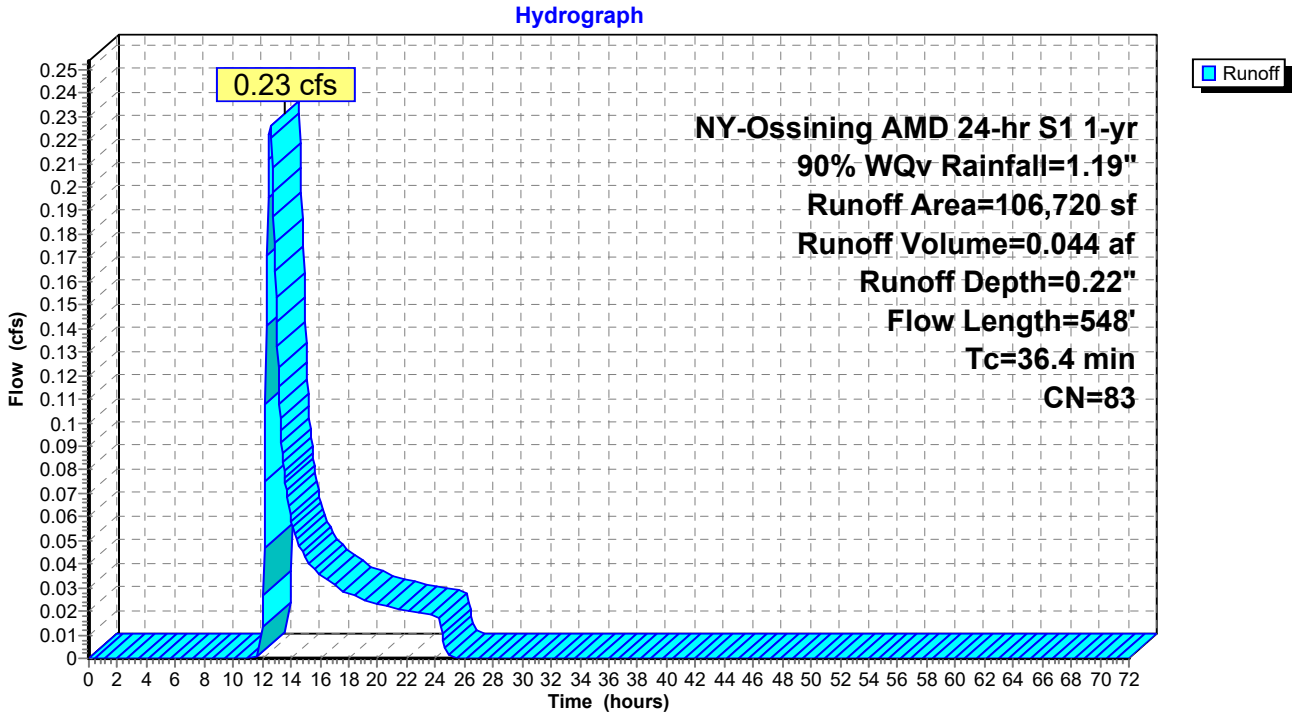
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (sf)	CN	Description
90,920	83	Woods, Poor, HSG D
15,800	80	Pasture/grassland/range, Good, HSG D
106,720	83	Weighted Average
106,720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	20	0.1021	0.24		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
27.9	80	0.0246	0.05		**Sheet Flow, B-C** Woods: Dense underbrush n= 0.800 P2= 3.41"
3.7	155	0.0191	0.69		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
3.4	293	0.0145	1.44	22.56	**Channel Flow, Wetland Channel** Area= 15.7 sf Perim= 30.5' r= 0.51' n= 0.080 Earth, long dense weeds
36.4	548	Total			



Subcatchment 2P: DA-2



Hydrograph for Subcatchment 2P: DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.00
9.00	0.21	0.00	0.00
10.00	0.25	0.00	0.00
11.00	0.32	0.00	0.00
12.00	0.65	0.03	**0.01**
13.00	0.87	0.09	**0.14**
14.00	0.94	0.11	0.06
15.00	0.98	0.13	0.04
16.00	1.02	0.14	0.04
17.00	1.05	0.15	0.03
18.00	1.08	0.16	0.03
19.00	1.10	0.17	0.03
20.00	1.12	0.18	0.02
21.00	1.14	0.19	0.02
22.00	1.16	0.20	0.02
23.00	1.17	0.21	0.02
24.00	**1.19**	**0.22**	0.02
25.00	1.19	0.22	0.00
26.00	1.19	0.22	0.00
27.00	1.19	0.22	0.00
28.00	1.19	0.22	0.00
29.00	1.19	0.22	0.00
30.00	1.19	0.22	0.00
31.00	1.19	0.22	0.00
32.00	1.19	0.22	0.00
33.00	1.19	0.22	0.00
34.00	1.19	0.22	0.00
35.00	1.19	0.22	0.00
36.00	1.19	0.22	0.00
37.00	1.19	0.22	0.00
38.00	1.19	0.22	0.00
39.00	1.19	0.22	0.00
40.00	1.19	0.22	0.00
41.00	1.19	0.22	0.00
42.00	1.19	0.22	0.00
43.00	1.19	0.22	0.00
44.00	1.19	0.22	0.00
45.00	1.19	0.22	0.00
46.00	1.19	0.22	0.00
47.00	1.19	0.22	0.00
48.00	1.19	0.22	0.00
49.00	1.19	0.22	0.00
50.00	1.19	0.22	0.00
51.00	1.19	0.22	0.00
52.00	1.19	0.22	0.00
53.00	1.19	0.22	0.00
54.00	1.19	0.22	0.00
55.00	1.19	0.22	0.00
56.00	1.19	0.22	0.00
57.00	1.19	0.22	0.00
58.00	1.19	0.22	0.00
59.00	1.19	0.22	0.00
60.00	1.19	0.22	0.00
61.00	1.19	0.22	0.00
62.00	1.19	0.22	0.00
63.00	1.19	0.22	0.00
64.00	1.19	0.22	0.00
65.00	1.19	0.22	0.00
66.00	1.19	0.22	0.00
67.00	1.19	0.22	0.00
68.00	1.19	0.22	0.00
69.00	1.19	0.22	0.00
70.00	1.19	0.22	0.00
71.00	1.19	0.22	0.00
72.00	1.19	0.22	0.00

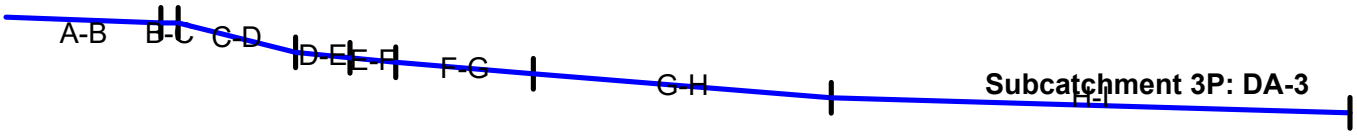
Summary for Subcatchment 3P: DA-3

Runoff = 2.08 cfs @ 12.14 hrs, Volume= 0.181 af, Depth= 0.60"
Routed to Link DP-3 : Design Point - 3

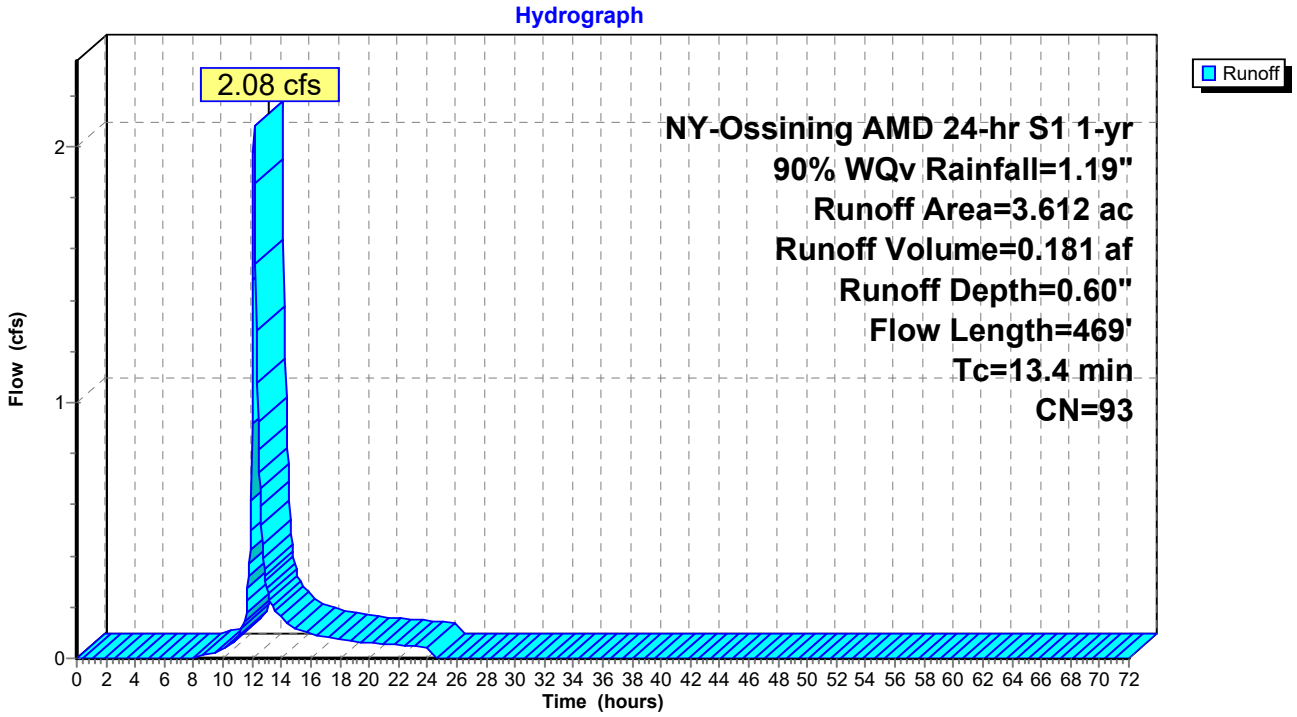
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
0.523	83	Woods, Poor, HSG D
0.255	98	Roofs, HSG D
2.118	98	Paved roads w/curbs & sewers, HSG D
0.615	79	Pasture/grassland/range, Poor, HSG B
0.071	98	Unconnected pavement, HSG B
0.030	98	Paved parking, HSG B
3.612	93	Weighted Average
1.138		31.51% Pervious Area
2.474		68.49% Impervious Area
0.071		2.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	54	0.0097	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.3	6	0.0017	0.30		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
2.9	41	0.0671	0.24		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.3	19	0.0261	1.13		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	16	0.0265	3.30		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
0.8	48	0.0226	1.05		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.6	104	0.0216	2.98		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.7	181	0.0077	4.62	5.67	**Pipe Channel, H-I** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
13.4	469	Total			



Subcatchment 3P: DA-3



Hydrograph for Subcatchment 3P: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.00
9.00	0.21	0.00	0.02
10.00	0.25	0.01	0.04
11.00	0.32	0.03	0.09
12.00	0.65	0.20	**0.92**
13.00	0.87	0.36	**0.27**
14.00	0.94	0.40	0.16
15.00	0.98	0.44	0.12
16.00	1.02	0.47	0.10
17.00	1.05	0.49	0.08
18.00	1.08	0.51	0.07
19.00	1.10	0.53	0.07
20.00	1.12	0.55	0.06
21.00	1.14	0.56	0.06
22.00	1.16	0.58	0.05
23.00	1.17	0.59	0.05
24.00	**1.19**	**0.60**	0.05
25.00	1.19	0.60	0.00
26.00	1.19	0.60	0.00
27.00	1.19	0.60	0.00
28.00	1.19	0.60	0.00
29.00	1.19	0.60	0.00
30.00	1.19	0.60	0.00
31.00	1.19	0.60	0.00
32.00	1.19	0.60	0.00
33.00	1.19	0.60	0.00
34.00	1.19	0.60	0.00
35.00	1.19	0.60	0.00
36.00	1.19	0.60	0.00
37.00	1.19	0.60	0.00
38.00	1.19	0.60	0.00
39.00	1.19	0.60	0.00
40.00	1.19	0.60	0.00
41.00	1.19	0.60	0.00
42.00	1.19	0.60	0.00
43.00	1.19	0.60	0.00
44.00	1.19	0.60	0.00
45.00	1.19	0.60	0.00
46.00	1.19	0.60	0.00
47.00	1.19	0.60	0.00
48.00	1.19	0.60	0.00
49.00	1.19	0.60	0.00
50.00	1.19	0.60	0.00
51.00	1.19	0.60	0.00
52.00	1.19	0.60	0.00
53.00	1.19	0.60	0.00
54.00	1.19	0.60	0.00
55.00	1.19	0.60	0.00
56.00	1.19	0.60	0.00
57.00	1.19	0.60	0.00
58.00	1.19	0.60	0.00
59.00	1.19	0.60	0.00
60.00	1.19	0.60	0.00
61.00	1.19	0.60	0.00
62.00	1.19	0.60	0.00
63.00	1.19	0.60	0.00
64.00	1.19	0.60	0.00
65.00	1.19	0.60	0.00
66.00	1.19	0.60	0.00
67.00	1.19	0.60	0.00
68.00	1.19	0.60	0.00
69.00	1.19	0.60	0.00
70.00	1.19	0.60	0.00
71.00	1.19	0.60	0.00
72.00	1.19	0.60	0.00

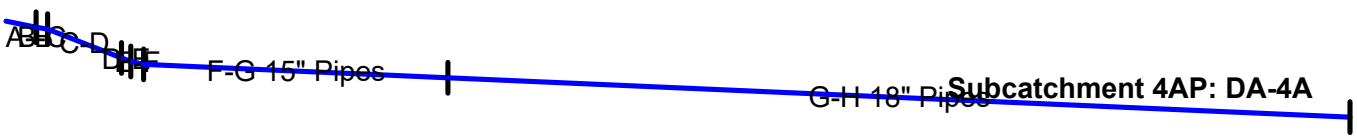
Summary for Subcatchment 4AP: DA-4A

Runoff = 3.93 cfs @ 12.13 hrs, Volume= 0.334 af, Depth= 0.60"
Routed to Pond 19P : DMH-7

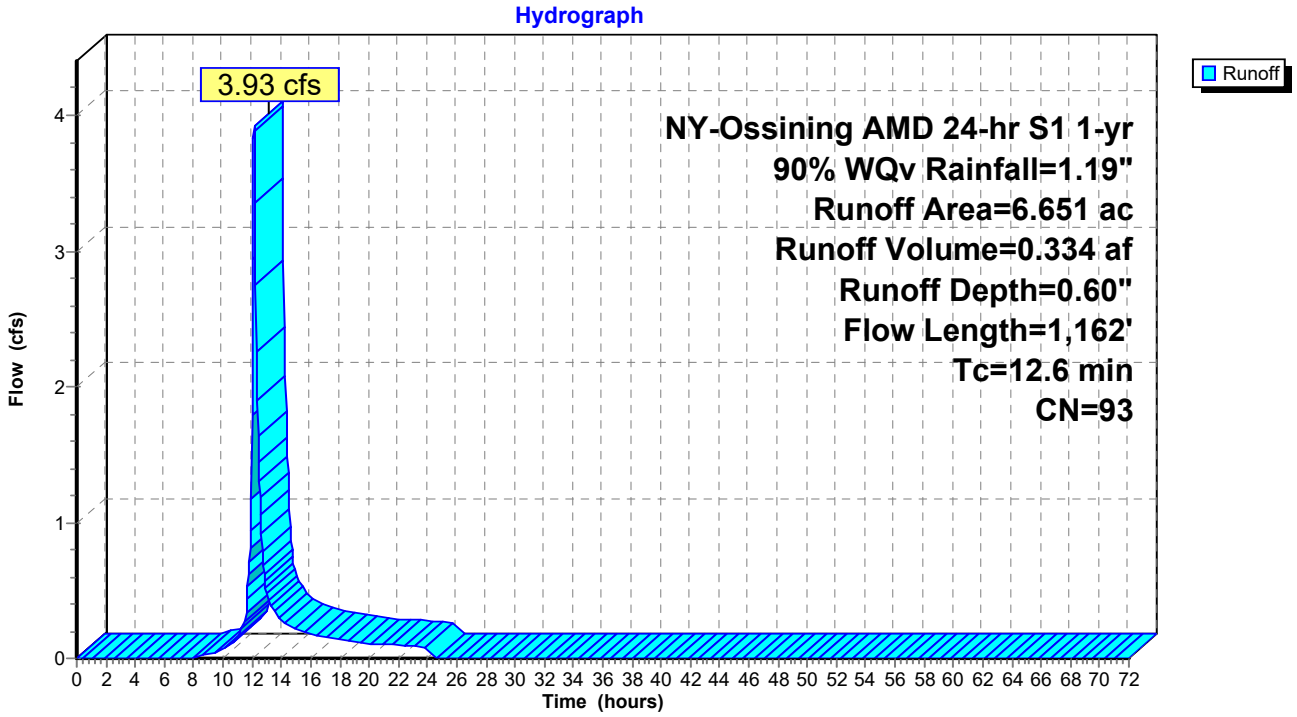
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
0.741	98	Unconnected pavement, HSG D
1.491	74	>75% Grass cover, Good, HSG C
1.683	98	Roofs, HSG C
2.736	98	Unconnected pavement, HSG C
6.651	93	Weighted Average
1.491		22.42% Pervious Area
5.160		77.58% Impervious Area
3.477		67.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	26	0.0230	0.14		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
0.2	10	0.0200	0.90		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.41"
4.8	64	0.0448	0.22		**Sheet Flow, C-D** Grass: Short n= 0.150 P2= 3.41"
0.1	8	0.0444	1.47		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0245	3.18		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.2	263	0.0050	3.72	4.57	**Pipe Channel, F-G 15" Pipes** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
3.1	780	0.0050	4.20	7.43	**Pipe Channel, G-H 18" Pipes** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
12.6	1,162	Total			



Subcatchment 4AP: DA-4A



Hydrograph for Subcatchment 4AP: DA-4A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.01
9.00	0.21	0.00	0.03
10.00	0.25	0.01	0.07
11.00	0.32	0.03	0.16
12.00	0.65	0.20	**1.80**
13.00	0.87	0.36	**0.48**
14.00	0.94	0.40	0.29
15.00	0.98	0.44	0.21
16.00	1.02	0.47	0.18
17.00	1.05	0.49	0.15
18.00	1.08	0.51	0.13
19.00	1.10	0.53	0.12
20.00	1.12	0.55	0.11
21.00	1.14	0.56	0.10
22.00	1.16	0.58	0.10
23.00	1.17	0.59	0.09
24.00	**1.19**	**0.60**	0.08
25.00	1.19	0.60	0.00
26.00	1.19	0.60	0.00
27.00	1.19	0.60	0.00
28.00	1.19	0.60	0.00
29.00	1.19	0.60	0.00
30.00	1.19	0.60	0.00
31.00	1.19	0.60	0.00
32.00	1.19	0.60	0.00
33.00	1.19	0.60	0.00
34.00	1.19	0.60	0.00
35.00	1.19	0.60	0.00
36.00	1.19	0.60	0.00
37.00	1.19	0.60	0.00
38.00	1.19	0.60	0.00
39.00	1.19	0.60	0.00
40.00	1.19	0.60	0.00
41.00	1.19	0.60	0.00
42.00	1.19	0.60	0.00
43.00	1.19	0.60	0.00
44.00	1.19	0.60	0.00
45.00	1.19	0.60	0.00
46.00	1.19	0.60	0.00
47.00	1.19	0.60	0.00
48.00	1.19	0.60	0.00
49.00	1.19	0.60	0.00
50.00	1.19	0.60	0.00
51.00	1.19	0.60	0.00
52.00	1.19	0.60	0.00
53.00	1.19	0.60	0.00
54.00	1.19	0.60	0.00
55.00	1.19	0.60	0.00
56.00	1.19	0.60	0.00
57.00	1.19	0.60	0.00
58.00	1.19	0.60	0.00
59.00	1.19	0.60	0.00
60.00	1.19	0.60	0.00
61.00	1.19	0.60	0.00
62.00	1.19	0.60	0.00
63.00	1.19	0.60	0.00
64.00	1.19	0.60	0.00
65.00	1.19	0.60	0.00
66.00	1.19	0.60	0.00
67.00	1.19	0.60	0.00
68.00	1.19	0.60	0.00
69.00	1.19	0.60	0.00
70.00	1.19	0.60	0.00
71.00	1.19	0.60	0.00
72.00	1.19	0.60	0.00

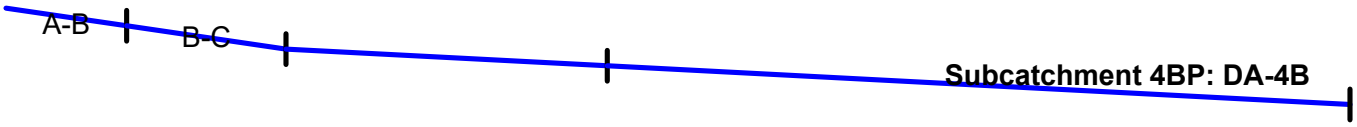
Summary for Subcatchment 4BP: DA-4B

Runoff = 0.08 cfs @ 12.65 hrs, Volume= 0.037 af, Depth= 0.06"
Routed to Pond 19P : DMH-7

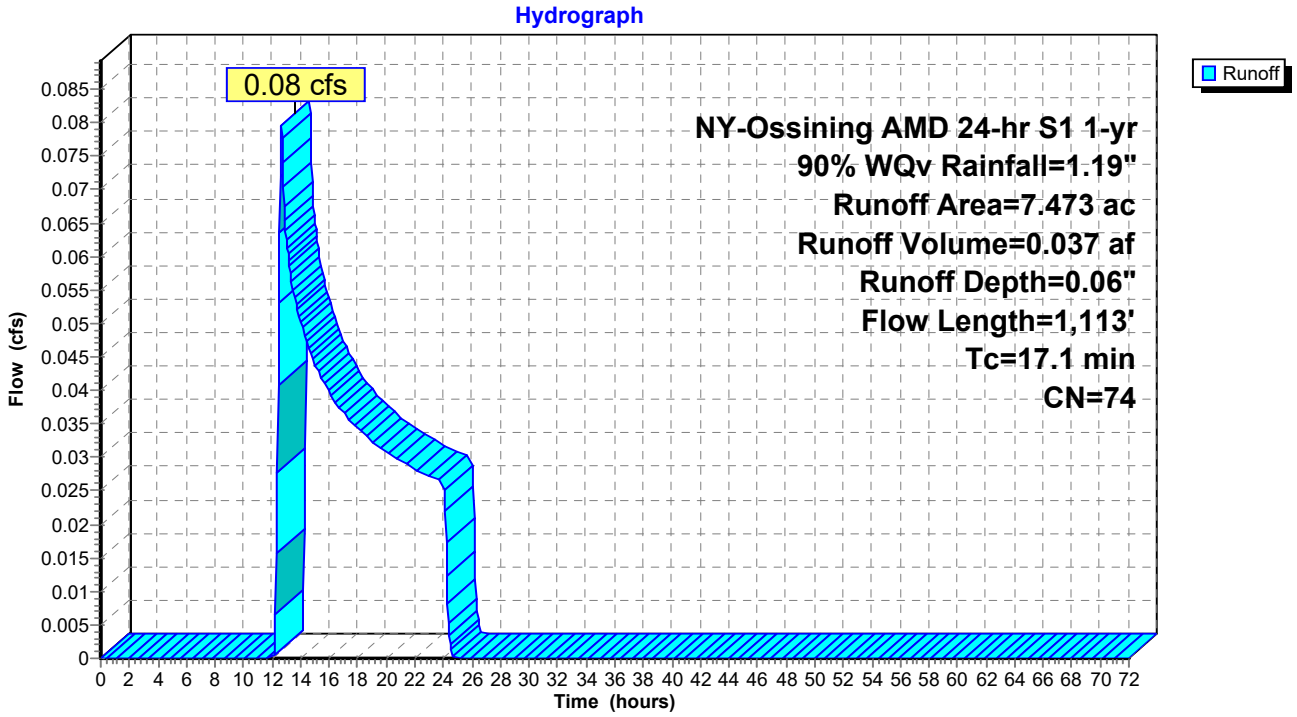
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
6.735	74	>75% Grass cover, Good, HSG C
0.612	71	Meadow, non-grazed, HSG C
0.126	98	Unconnected pavement, HSG C
7.473	74	Weighted Average
7.347		98.31% Pervious Area
0.126		1.69% Impervious Area
0.126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.0139	0.15		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.41"
2.7	132	0.0140	0.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.4	266	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
2.0	615	0.0050	5.09	16.00	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Corrugated PE, smooth interior
17.1	1,113	Total			



Subcatchment 4BP: DA-4B



Hydrograph for Subcatchment 4BP: DA-4B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.00
9.00	0.21	0.00	0.00
10.00	0.25	0.00	0.00
11.00	0.32	0.00	0.00
12.00	0.65	0.00	**0.00**
13.00	0.87	0.01	**0.06**
14.00	0.94	0.01	0.05
15.00	0.98	0.02	0.04
16.00	1.02	0.03	0.04
17.00	1.05	0.03	0.04
18.00	1.08	0.04	0.03
19.00	1.10	0.04	0.03
20.00	1.12	0.04	0.03
21.00	1.14	0.05	0.03
22.00	1.16	0.05	0.03
23.00	1.17	0.06	0.03
24.00	**1.19**	**0.06**	0.03
25.00	1.19	0.06	0.00
26.00	1.19	0.06	0.00
27.00	1.19	0.06	0.00
28.00	1.19	0.06	0.00
29.00	1.19	0.06	0.00
30.00	1.19	0.06	0.00
31.00	1.19	0.06	0.00
32.00	1.19	0.06	0.00
33.00	1.19	0.06	0.00
34.00	1.19	0.06	0.00
35.00	1.19	0.06	0.00
36.00	1.19	0.06	0.00
37.00	1.19	0.06	0.00
38.00	1.19	0.06	0.00
39.00	1.19	0.06	0.00
40.00	1.19	0.06	0.00
41.00	1.19	0.06	0.00
42.00	1.19	0.06	0.00
43.00	1.19	0.06	0.00
44.00	1.19	0.06	0.00
45.00	1.19	0.06	0.00
46.00	1.19	0.06	0.00
47.00	1.19	0.06	0.00
48.00	1.19	0.06	0.00
49.00	1.19	0.06	0.00
50.00	1.19	0.06	0.00
51.00	1.19	0.06	0.00
52.00	1.19	0.06	0.00
53.00	1.19	0.06	0.00
54.00	1.19	0.06	0.00
55.00	1.19	0.06	0.00
56.00	1.19	0.06	0.00
57.00	1.19	0.06	0.00
58.00	1.19	0.06	0.00
59.00	1.19	0.06	0.00
60.00	1.19	0.06	0.00
61.00	1.19	0.06	0.00
62.00	1.19	0.06	0.00
63.00	1.19	0.06	0.00
64.00	1.19	0.06	0.00
65.00	1.19	0.06	0.00
66.00	1.19	0.06	0.00
67.00	1.19	0.06	0.00
68.00	1.19	0.06	0.00
69.00	1.19	0.06	0.00
70.00	1.19	0.06	0.00
71.00	1.19	0.06	0.00
72.00	1.19	0.06	0.00

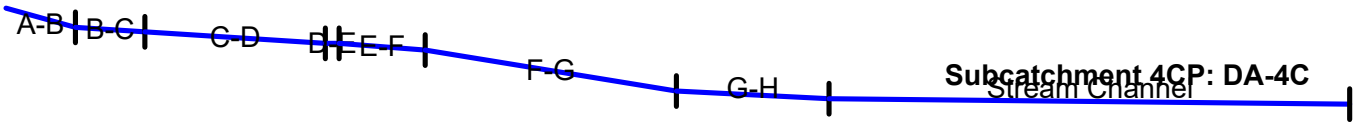
Summary for Subcatchment 4CP: DA-4C

Runoff = 0.03 cfs @ 15.00 hrs, Volume= 0.025 af, Depth= 0.03"
Routed to Link DP-4 : DP-4

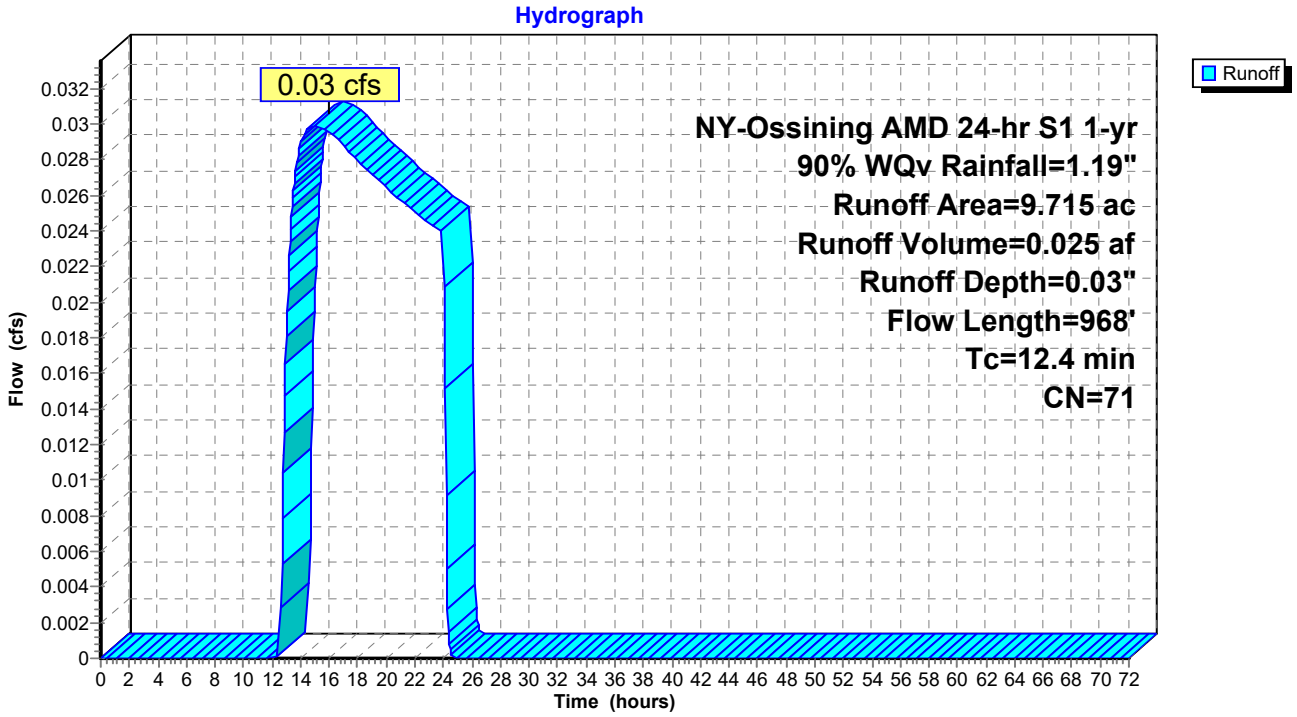
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
0.147	96	Gravel surface, HSG B
0.634	83	Woods, Poor, HSG D
0.561	77	Woods, Poor, HSG C
4.583	66	Woods, Poor, HSG B
3.790	74	>75% Grass cover, Good, HSG C
9.715	71	Weighted Average
9.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.5000	0.38		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.41"
2.7	50	0.1194	0.31		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.41"
1.3	130	0.1134	1.68		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.8	10	0.0001	0.20		**Shallow Concentrated Flow, D-E** Paved Kv= 20.3 fps
0.6	62	0.1393	1.87		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
1.1	181	0.2920	2.70		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
1.2	110	0.0895	1.50		**Shallow Concentrated Flow, G-H** Woodland Kv= 5.0 fps
2.5	375	0.0187	2.54	144.79	**Channel Flow, Stream Channel** Area= 57.0 sf Perim= 57.0' r= 1.00' n= 0.080 Earth, long dense weeds
12.4	968	Total			



Subcatchment 4CP: DA-4C



Hydrograph for Subcatchment 4CP: DA-4C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.00	0.00
9.00	0.21	0.00	0.00
10.00	0.25	0.00	0.00
11.00	0.32	0.00	0.00
12.00	0.65	0.00	0.00
13.00	0.87	0.00	0.02
14.00	0.94	0.00	0.03
15.00	0.98	0.01	**0.03**
16.00	1.02	0.01	0.03
17.00	1.05	0.01	0.03
18.00	1.08	0.02	0.03
19.00	1.10	0.02	0.03
20.00	1.12	0.02	0.03
21.00	1.14	0.02	0.03
22.00	1.16	0.03	0.03
23.00	1.17	0.03	0.02
24.00	**1.19**	**0.03**	0.02
25.00	1.19	0.03	0.00
26.00	1.19	0.03	0.00
27.00	1.19	0.03	0.00
28.00	1.19	0.03	0.00
29.00	1.19	0.03	0.00
30.00	1.19	0.03	0.00
31.00	1.19	0.03	0.00
32.00	1.19	0.03	0.00
33.00	1.19	0.03	0.00
34.00	1.19	0.03	0.00
35.00	1.19	0.03	0.00
36.00	1.19	0.03	0.00
37.00	1.19	0.03	0.00
38.00	1.19	0.03	0.00
39.00	1.19	0.03	0.00
40.00	1.19	0.03	0.00
41.00	1.19	0.03	0.00
42.00	1.19	0.03	0.00
43.00	1.19	0.03	0.00
44.00	1.19	0.03	0.00
45.00	1.19	0.03	0.00
46.00	1.19	0.03	0.00
47.00	1.19	0.03	0.00
48.00	1.19	0.03	0.00
49.00	1.19	0.03	0.00
50.00	1.19	0.03	0.00
51.00	1.19	0.03	0.00
52.00	1.19	0.03	0.00
53.00	1.19	0.03	0.00
54.00	1.19	0.03	0.00
55.00	1.19	0.03	0.00
56.00	1.19	0.03	0.00
57.00	1.19	0.03	0.00
58.00	1.19	0.03	0.00
59.00	1.19	0.03	0.00
60.00	1.19	0.03	0.00
61.00	1.19	0.03	0.00
62.00	1.19	0.03	0.00
63.00	1.19	0.03	0.00
64.00	1.19	0.03	0.00
65.00	1.19	0.03	0.00
66.00	1.19	0.03	0.00
67.00	1.19	0.03	0.00
68.00	1.19	0.03	0.00
69.00	1.19	0.03	0.00
70.00	1.19	0.03	0.00
71.00	1.19	0.03	0.00
72.00	1.19	0.03	0.00

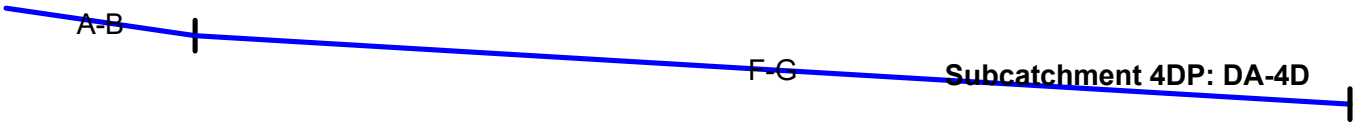
Summary for Subcatchment 4DP: DA-4D

Runoff = 1.31 cfs @ 12.04 hrs, Volume= 0.083 af, Depth= 0.73"
Routed to Pond 6P : Infiltrators

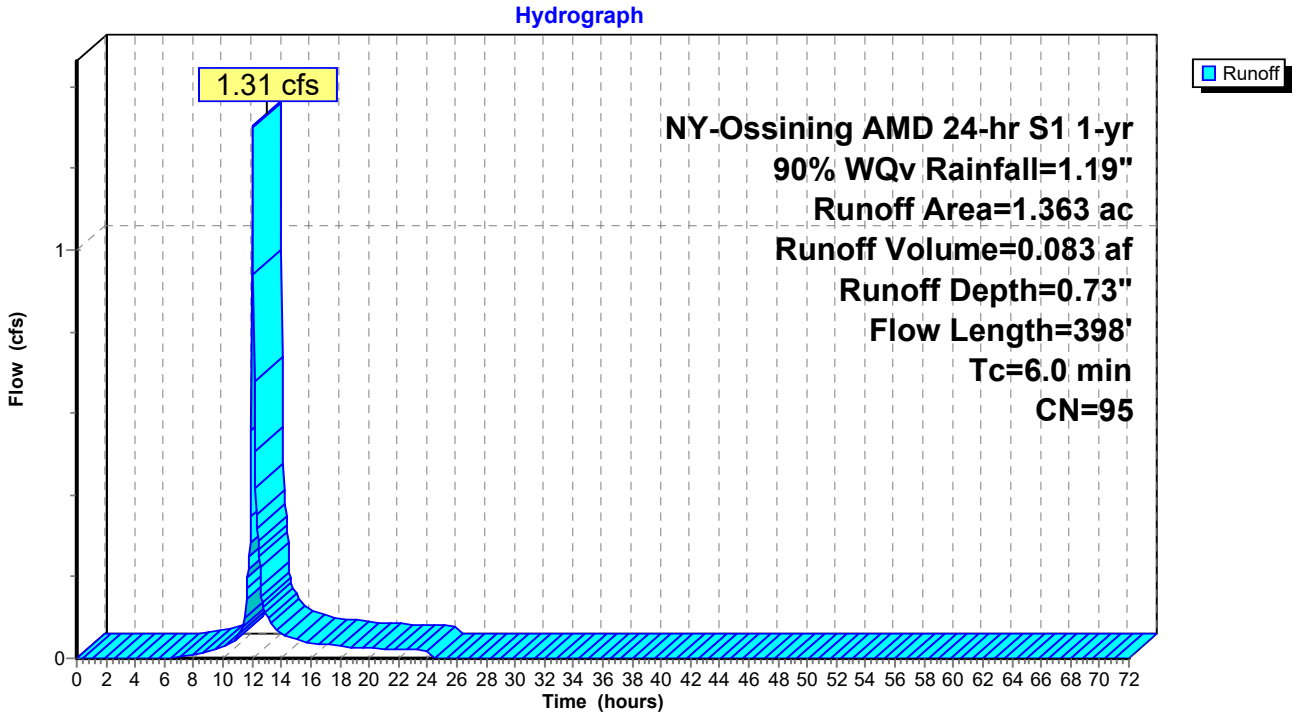
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
NY-Ossining AMD 24-hr S1 1-yr 90% WQv Rainfall=1.19"

Area (ac)	CN	Description
0.479	98	Paved parking, HSG D
0.651	98	Paved parking, HSG D
0.233	80	>75% Grass cover, Good, HSG D
1.363	95	Weighted Average
0.233		17.09% Pervious Area
1.130		82.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	56	0.0244	1.37		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.41"
1.1	342	0.0100	5.26	6.46	**Pipe Channel, F-G** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.8	398	Total, Increased to minimum Tc = 6.0 min			



Subcatchment 4DP: DA-4D



Hydrograph for Subcatchment 4DP: DA-4D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.09	0.00	0.00
6.00	0.11	0.00	0.00
7.00	0.14	0.00	0.00
8.00	0.17	0.01	0.01
9.00	0.21	0.02	0.02
10.00	0.25	0.03	0.03
11.00	0.32	0.06	0.05
12.00	0.65	0.28	**1.11**
13.00	0.87	0.46	**0.10**
14.00	0.94	0.51	0.06
15.00	0.98	0.55	0.05
16.00	1.02	0.58	0.04
17.00	1.05	0.61	0.03
18.00	1.08	0.63	0.03
19.00	1.10	0.65	0.03
20.00	1.12	0.67	0.02
21.00	1.14	0.69	0.02
22.00	1.16	0.70	0.02
23.00	1.17	0.72	0.02
24.00	**1.19**	**0.73**	0.02
25.00	1.19	0.73	0.00
26.00	1.19	0.73	0.00
27.00	1.19	0.73	0.00
28.00	1.19	0.73	0.00
29.00	1.19	0.73	0.00
30.00	1.19	0.73	0.00
31.00	1.19	0.73	0.00
32.00	1.19	0.73	0.00
33.00	1.19	0.73	0.00
34.00	1.19	0.73	0.00
35.00	1.19	0.73	0.00
36.00	1.19	0.73	0.00
37.00	1.19	0.73	0.00
38.00	1.19	0.73	0.00
39.00	1.19	0.73	0.00
40.00	1.19	0.73	0.00
41.00	1.19	0.73	0.00
42.00	1.19	0.73	0.00
43.00	1.19	0.73	0.00
44.00	1.19	0.73	0.00
45.00	1.19	0.73	0.00
46.00	1.19	0.73	0.00
47.00	1.19	0.73	0.00
48.00	1.19	0.73	0.00
49.00	1.19	0.73	0.00
50.00	1.19	0.73	0.00
51.00	1.19	0.73	0.00
52.00	1.19	0.73	0.00
53.00	1.19	0.73	0.00
54.00	1.19	0.73	0.00
55.00	1.19	0.73	0.00
56.00	1.19	0.73	0.00
57.00	1.19	0.73	0.00
58.00	1.19	0.73	0.00
59.00	1.19	0.73	0.00
60.00	1.19	0.73	0.00
61.00	1.19	0.73	0.00
62.00	1.19	0.73	0.00
63.00	1.19	0.73	0.00
64.00	1.19	0.73	0.00
65.00	1.19	0.73	0.00
66.00	1.19	0.73	0.00
67.00	1.19	0.73	0.00
68.00	1.19	0.73	0.00
69.00	1.19	0.73	0.00
70.00	1.19	0.73	0.00
71.00	1.19	0.73	0.00
72.00	1.19	0.73	0.00

Summary for Pond 6P: Infiltrators

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 1.363 ac, 82.91% Impervious, Inflow Depth = 0.73" for 90% WQv event
Inflow = 1.31 cfs @ 12.04 hrs, Volume= 0.083 af
Outflow = 0.10 cfs @ 13.00 hrs, Volume= 0.083 af, Atten= 92%, Lag= 57.6 min
Discarded = 0.07 cfs @ 11.80 hrs, Volume= 0.078 af
Primary = 0.04 cfs @ 13.00 hrs, Volume= 0.005 af
Routed to Pond 19P : DMH-7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 347.11' @ 13.00 hrs Surf.Area= 0.132 ac Storage= 0.032 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 167.9 min (997.9 - 830.0)

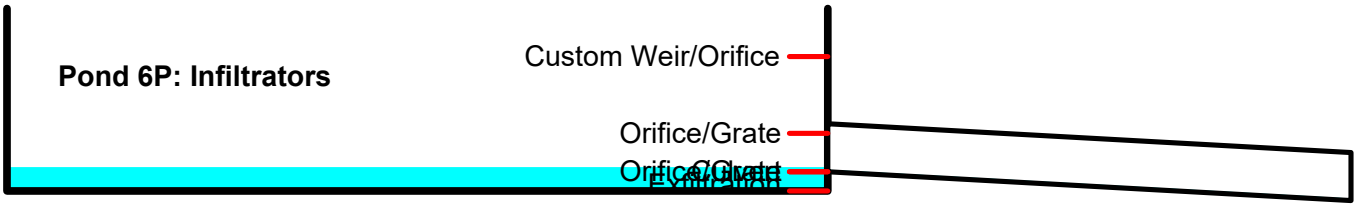
Volume	Invert	Avail.Storage	Storage Description
#1A	346.50'	0.176 af	**49.00'W x 117.63'L x 4.75'H Field A** 0.629 af Overall - 0.187 af Embedded = 0.441 af x 40.0% Voids
#2A	347.50'	0.187 af	**ADS_StormTech SC-800 +Cap** x 160 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 160 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		0.364 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	347.00'	**15.0" Round Culvert** L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.00' / 346.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	346.50'	**0.500 in/hr Exfiltration over Surface area**
#3	Device 1	347.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	348.00'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	350.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 5.00 5.00

Discarded OutFlow Max=0.07 cfs @ 11.80 hrs HW=346.55' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.04 cfs @ 13.00 hrs HW=347.11' TW=334.66' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.04 cfs of 0.05 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.13 fps)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Custom Weir/Orifice** (Controls 0.00 cfs)


Pond 6P: Infiltrators
Custom Weir/Orifice
Orifice/Grate
Orifice/Grate

Pond 6P: Infiltrators - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

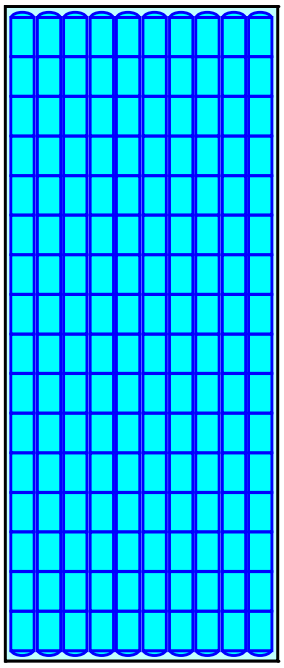
16 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 115.63' Row Length +12.0" End Stone x 2 = 117.63' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

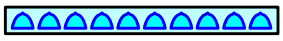
160 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 8,163.2 cf Chamber Storage

27,379.2 cf Field - 8,163.2 cf Chambers = 19,216.0 cf Stone x 40.0% Voids = 7,686.4 cf Stone Storage

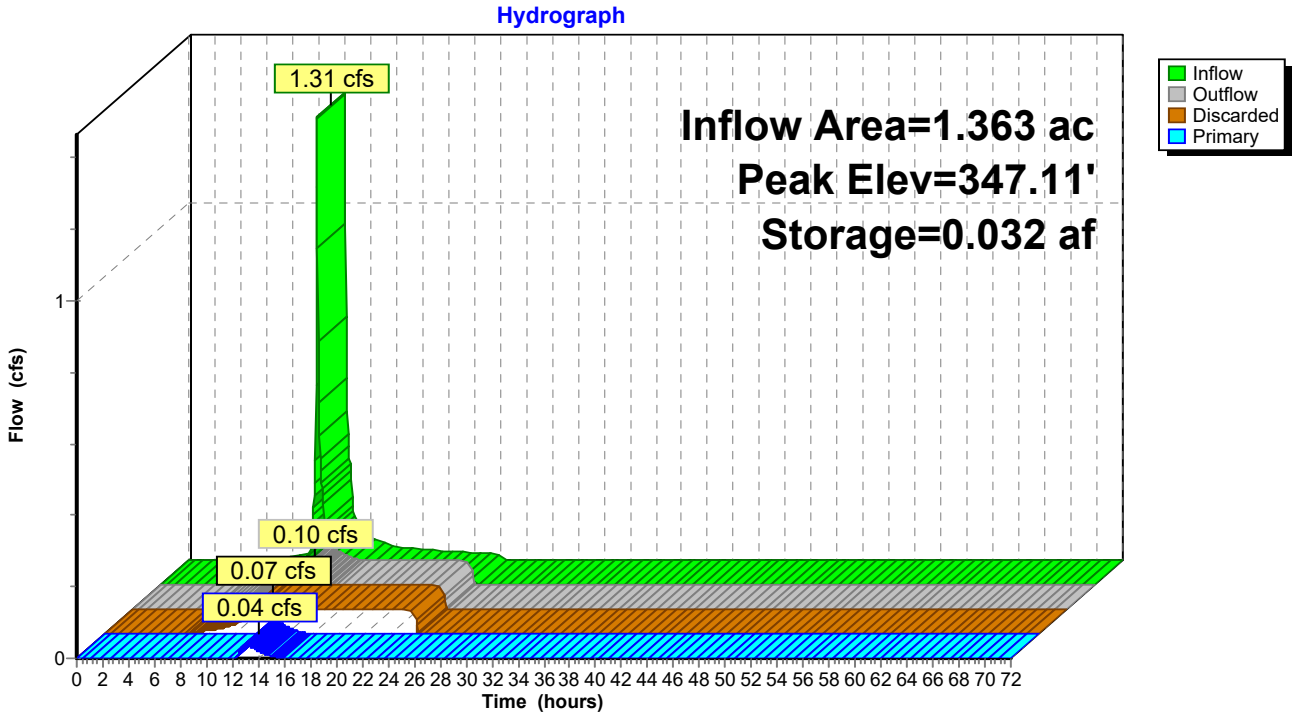
Chamber Storage + Stone Storage = 15,849.6 cf = 0.364 af
Overall Storage Efficiency = 57.9%
Overall System Size = 117.63' x 49.00' x 4.75'

160 Chambers @ $ 750.00 /ea = $ 120,000.00
1,014.0 cy Field Excavation @ $ 30.00 /cy = $ 30,421.29
711.7 cy Stone @ $ 85.00 /cy = $ 60,494.80
Total Cost = $ 210,916.08

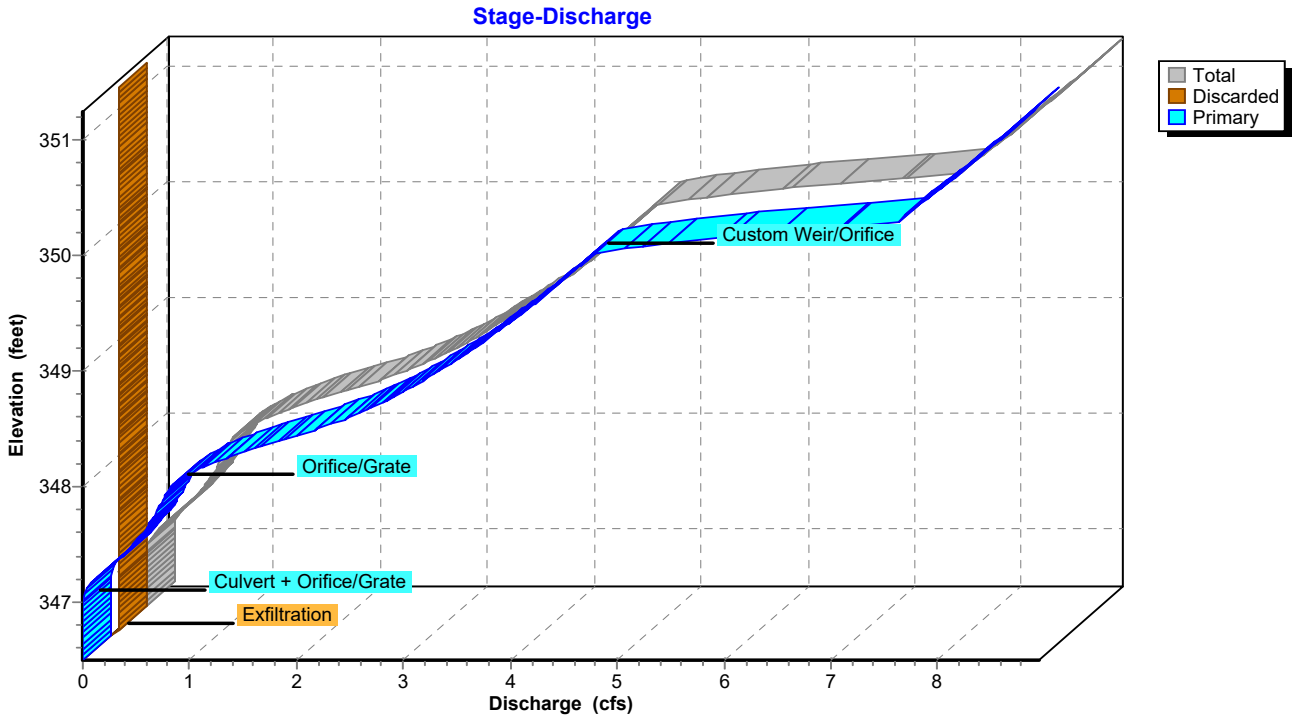




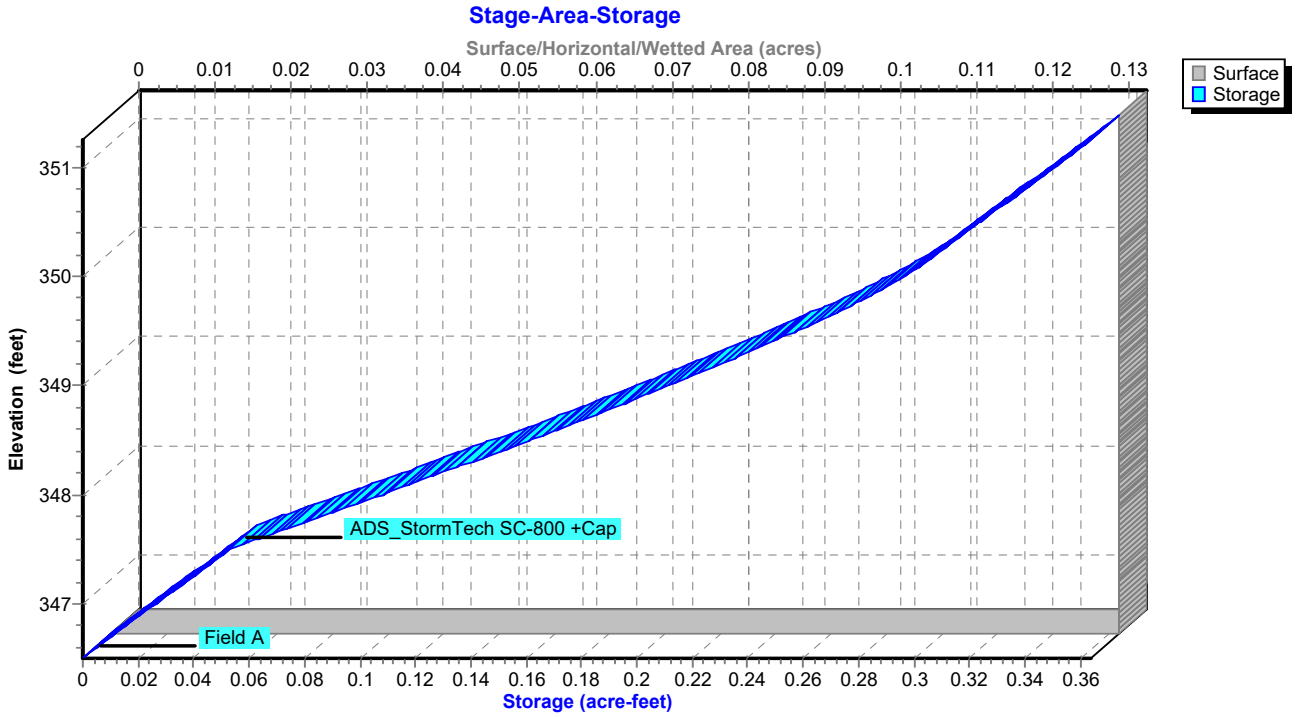
Pond 6P: Infiltrators



Pond 6P: Infiltrators



Pond 6P: Infiltrators



Hydrograph for Pond 6P: Infiltrators

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	346.50	0.00	0.00	0.00
2.50	0.00	0.000	346.50	0.00	0.00	0.00
5.00	0.00	0.000	346.50	0.00	0.00	0.00
7.50	0.01	0.000	346.50	0.01	0.01	0.00
10.00	**0.03**	0.000	346.50	0.03	**0.03**	0.00
12.50	**0.25**	**0.030**	**347.07**	**0.08**	**0.07**	**0.02**
15.00	0.05	**0.029**	**347.04**	**0.07**	0.07	**0.01**
17.50	0.03	0.023	346.93	0.07	0.07	0.00
20.00	0.02	0.015	346.78	0.07	0.07	0.00
22.50	0.02	0.005	346.60	0.07	0.07	0.00
25.00	0.00	0.000	346.50	0.00	0.00	0.00
27.50	0.00	0.000	346.50	0.00	0.00	0.00
30.00	0.00	0.000	346.50	0.00	0.00	0.00
32.50	0.00	0.000	346.50	0.00	0.00	0.00
35.00	0.00	0.000	346.50	0.00	0.00	0.00
37.50	0.00	0.000	346.50	0.00	0.00	0.00
40.00	0.00	0.000	346.50	0.00	0.00	0.00
42.50	0.00	0.000	346.50	0.00	0.00	0.00
45.00	0.00	0.000	346.50	0.00	0.00	0.00
47.50	0.00	0.000	346.50	0.00	0.00	0.00
50.00	0.00	0.000	346.50	0.00	0.00	0.00
52.50	0.00	0.000	346.50	0.00	0.00	0.00
55.00	0.00	0.000	346.50	0.00	0.00	0.00
57.50	0.00	0.000	346.50	0.00	0.00	0.00
60.00	0.00	0.000	346.50	0.00	0.00	0.00
62.50	0.00	0.000	346.50	0.00	0.00	0.00
65.00	0.00	0.000	346.50	0.00	0.00	0.00
67.50	0.00	0.000	346.50	0.00	0.00	0.00
70.00	0.00	0.000	346.50	0.00	0.00	0.00

Stage-Discharge for Pond 6P: Infiltrators

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
346.50	0.00	**0.00**	0.00
346.55	0.07	**0.07**	0.00
346.60	0.07	0.07	0.00
346.65	0.07	0.07	0.00
346.70	0.07	0.07	0.00
346.75	0.07	0.07	0.00
346.80	0.07	0.07	0.00
346.85	0.07	0.07	0.00
346.90	0.07	0.07	0.00
346.95	0.07	0.07	0.00
347.00	0.07	0.07	0.00
347.05	0.07	0.07	0.01
347.10	0.10	0.07	0.03
347.15	0.13	0.07	0.07
347.20	0.18	0.07	0.11
347.25	0.23	0.07	0.17
347.30	0.30	0.07	0.23
347.35	0.36	0.07	0.30
347.40	0.43	0.07	0.36
347.45	0.49	0.07	0.43
347.50	0.54	0.07	0.47
347.55	0.58	0.07	0.52
347.60	0.63	0.07	0.56
347.65	0.66	0.07	0.60
347.70	0.70	0.07	0.63
347.75	0.74	0.07	0.67
347.80	0.77	0.07	0.70
347.85	0.80	0.07	0.73
347.90	0.83	0.07	0.76
347.95	0.86	0.07	0.79
348.00	0.89	0.07	0.82
348.05	0.95	0.07	0.88
348.10	1.04	0.07	0.97
348.15	1.15	0.07	1.08
348.20	1.28	0.07	1.21
348.25	1.41	0.07	1.35
348.30	1.56	0.07	1.50
348.35	1.72	0.07	1.66
348.40	1.89	0.07	1.83
348.45	2.07	0.07	2.00
348.50	2.26	0.07	2.19
348.55	2.42	0.07	2.35
348.60	2.56	0.07	2.49
348.65	2.68	0.07	2.61
348.70	2.80	0.07	2.73
348.75	2.91	0.07	2.84
348.80	3.01	0.07	2.95
348.85	3.11	0.07	3.05
348.90	3.21	0.07	3.14
348.95	3.30	0.07	3.24
349.00	3.39	0.07	3.33
349.05	3.48	0.07	3.41
349.10	3.56	0.07	3.50
349.15	3.65	0.07	3.58
349.20	3.73	0.07	3.66
349.25	3.80	0.07	3.74
349.30	3.88	0.07	3.81
349.35	3.96	0.07	3.89
349.40	4.03	0.07	3.96
349.45	4.10	0.07	4.03
349.50	4.17	0.07	4.11
349.55	4.24	0.07	4.17
349.60	4.31	0.07	4.24
349.65	4.38	0.07	4.31
349.70	4.44	0.07	4.38
349.75	4.51	0.07	4.44
349.80	4.57	0.07	4.50
349.85	4.63	0.07	4.57
349.90	4.70	0.07	4.63
349.95	4.76	0.07	4.69
350.00	4.82	0.07	4.75
350.05	5.06	0.07	4.99
350.10	5.45	0.07	5.39
350.15	5.94	0.07	5.88
350.20	6.51	0.07	6.45
350.25	7.15	0.07	7.09
350.30	7.70	0.07	7.63
350.35	7.77	0.07	7.70
350.40	7.84	0.07	7.77
350.45	7.91	0.07	7.84
350.50	7.98	0.07	7.91
350.55	8.04	0.07	7.98
350.60	8.11	0.07	8.05
350.65	8.18	0.07	8.11
350.70	8.25	0.07	8.18
350.75	8.31	0.07	8.25
350.80	8.38	0.07	8.31
350.85	8.44	0.07	8.38
350.90	8.51	0.07	8.44
350.95	8.57	0.07	8.51
351.00	8.64	0.07	8.57
351.05	8.70	0.07	8.63
351.10	8.76	0.07	8.70
351.15	8.83	0.07	8.76
351.20	8.89	0.07	8.82
351.25	**8.95**	0.07	**8.88**

Stage-Area-Storage for Pond 6P: Infiltrators

Elevation (feet)	Surface (acres)	Storage (acre-feet)
346.50	**0.132**	0.000
346.55	0.132	0.003
346.60	0.132	0.005
346.65	0.132	0.008
346.70	0.132	0.011
346.75	0.132	0.013
346.80	0.132	0.016
346.85	0.132	0.019
346.90	0.132	0.021
346.95	0.132	0.024
347.00	0.132	0.026
347.05	0.132	0.029
347.10	0.132	0.032
347.15	0.132	0.034
347.20	0.132	0.037
347.25	0.132	0.040
347.30	0.132	0.042
347.35	0.132	0.045
347.40	0.132	0.048
347.45	0.132	0.050
347.50	0.132	0.053
347.55	0.132	0.059
347.60	0.132	0.064
347.65	0.132	0.070
347.70	0.132	0.075
347.75	0.132	0.081
347.80	0.132	0.086
347.85	0.132	0.092
347.90	0.132	0.097
347.95	0.132	0.103
348.00	0.132	0.108
348.05	0.132	0.114
348.10	0.132	0.119
348.15	0.132	0.125
348.20	0.132	0.130
348.25	0.132	0.135
348.30	0.132	0.141
348.35	0.132	0.146
348.40	0.132	0.151
348.45	0.132	0.156
348.50	0.132	0.162
348.55	0.132	0.167
348.60	0.132	0.172
348.65	0.132	0.177
348.70	0.132	0.182
348.75	0.132	0.187
348.80	0.132	0.192
348.85	0.132	0.197
348.90	0.132	0.202
348.95	0.132	0.207
349.00	0.132	0.212
349.05	0.132	0.217
349.10	0.132	0.221
349.15	0.132	0.226
349.20	0.132	0.231
349.25	0.132	0.235
349.30	0.132	0.240
349.35	0.132	0.245
349.40	0.132	0.249
349.45	0.132	0.253
349.50	0.132	0.258
349.55	0.132	0.262
349.60	0.132	0.266
349.65	0.132	0.270
349.70	0.132	0.275
349.75	0.132	0.278
349.80	0.132	0.282
349.85	0.132	0.286
349.90	0.132	0.290
349.95	0.132	0.293
350.00	0.132	0.296
350.05	0.132	0.300
350.10	0.132	0.303
350.15	0.132	0.305
350.20	0.132	0.308
350.25	0.132	0.311
350.30	0.132	0.314
350.35	0.132	0.316
350.40	0.132	0.319
350.45	0.132	0.322
350.50	0.132	0.324
350.55	0.132	0.327
350.60	0.132	0.329
350.65	0.132	0.332
350.70	0.132	0.335
350.75	0.132	0.337
350.80	0.132	0.340
350.85	0.132	0.343
350.90	0.132	0.345
350.95	0.132	0.348
351.00	0.132	0.351
351.05	0.132	0.353
351.10	0.132	0.356
351.15	0.132	0.359
351.20	0.132	0.361
351.25	0.132	**0.364**

Summary for Pond 9P: Detention Piping - 48"

Inflow = 0.34 cfs @ 12.13 hrs, Volume= 0.005 af
Outflow = 0.28 cfs @ 12.17 hrs, Volume= 0.005 af, Atten= 16%, Lag= 2.6 min
Primary = 0.28 cfs @ 12.17 hrs, Volume= 0.005 af
Routed to Pond 20P : DMH-8

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 332.12' @ 12.17 hrs Surf.Area= 0.347 ac Storage= 0.000 af
Flood Elev= 343.00' Surf.Area= 0.347 ac Storage= 0.638 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.7 min (730.1 - 729.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	331.34'	0.000 af	**46.75'W x 323.00'L x 5.50'H Field A** 1.907 af Overall - 0.764 af Embedded = 1.143 af x 0.0% Voids
#2A	331.84'	0.638 af	**ADS N-12 48"** x 112 Inside #1 Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf 112 Chambers in 7 Rows
		0.638 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	331.84'	**18.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 331.84' / 331.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	331.84'	**18.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 12.17 hrs HW=332.12' TW=331.06' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.28 cfs @ 1.85 fps)
└─**2=Orifice/Grate** (Passes 0.28 cfs of 0.42 cfs potential flow)

Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48" - Chamber Wizard Field A

Chamber Model = ADS N-12 48" (ADS N-12® Pipe)
Inside= 47.7"W x 47.7"H => 12.40 sf x 20.00'L = 248.0 cf
Outside= 54.0"W x 54.0"H => 14.85 sf x 20.00'L = 297.0 cf

54.0" Wide + 24.5" Spacing = 78.5" C-C Row Spacing

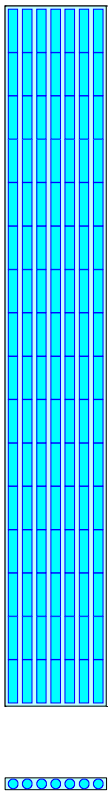
16 Chambers/Row x 20.00' Long = 320.00' Row Length +18.0" End Stone x 2 = 323.00' Base Length
7 Rows x 54.0" Wide + 24.5" Spacing x 6 + 18.0" Side Stone x 2 = 46.75' Base Width
6.0" Stone Base + 54.0" Chamber Height + 6.0" Stone Cover = 5.50' Field Height

112 Chambers x 248.0 cf = 27,776.0 cf Chamber Storage
112 Chambers x 297.0 cf = 33,261.7 cf Displacement

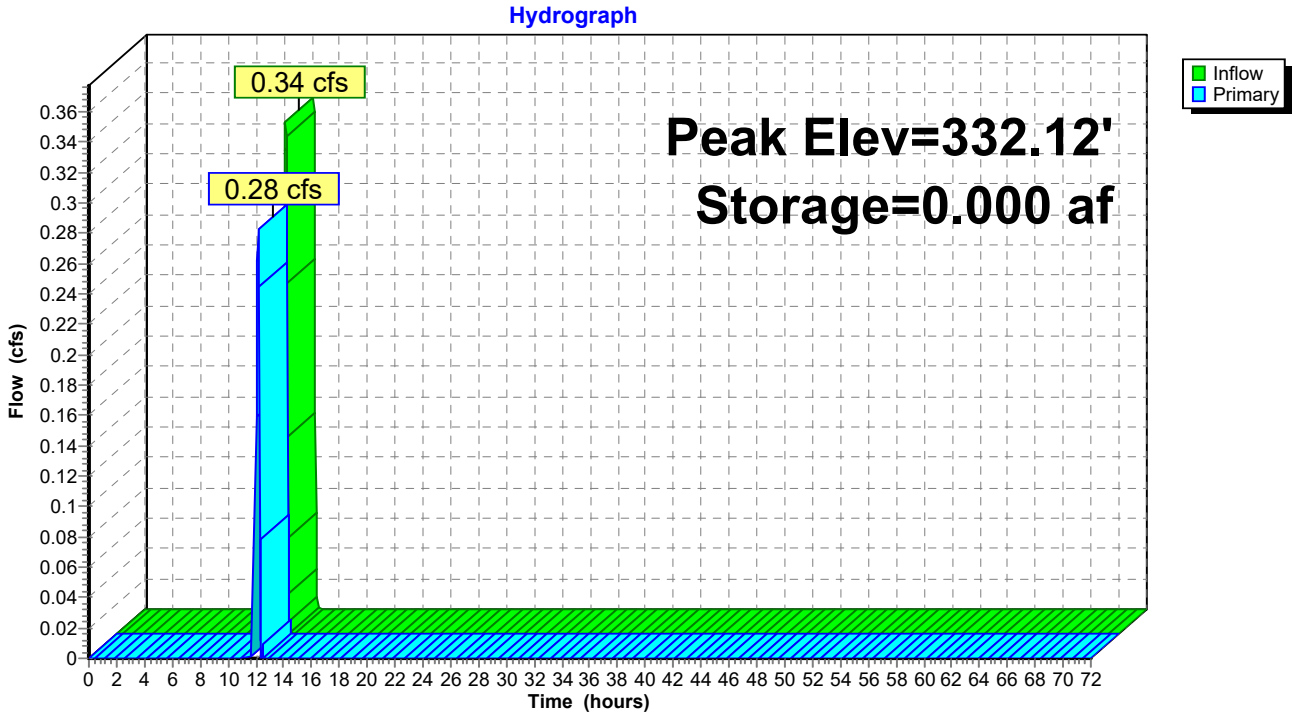
83,054.1 cf Field - 33,261.7 cf Chambers = 49,792.4 cf Stone x 0.0% Voids = 0.0 cf Stone Storage

Chamber Storage = 27,776.0 cf = 0.638 af
Overall Storage Efficiency = 33.4%
Overall System Size = 323.00' x 46.75' x 5.50'

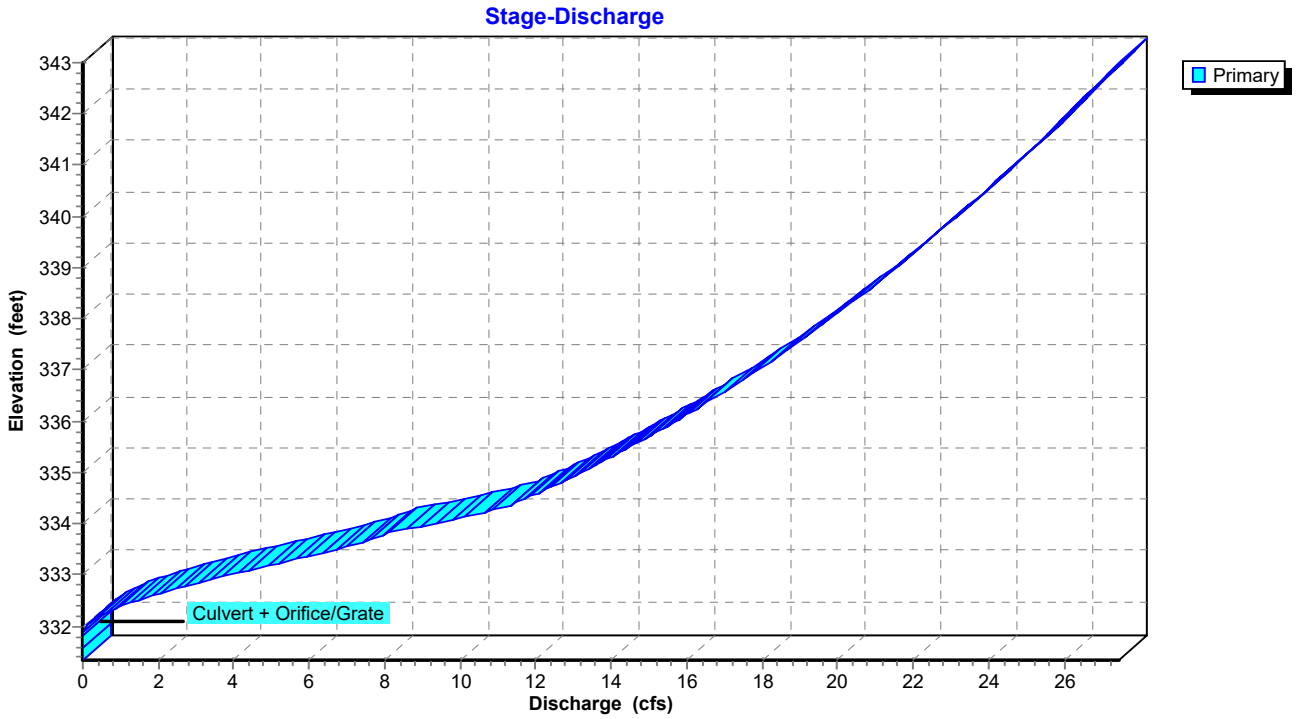
112 Chambers @ $ 250.00 /ea = $ 28,000.00
3,076.1 cy Field Excavation @ $ 30.00 /cy = $ 92,282.37
1,844.2 cy Stone @ $ 85.00 /cy = $ 156,754.00
Total Cost = $ 277,036.37



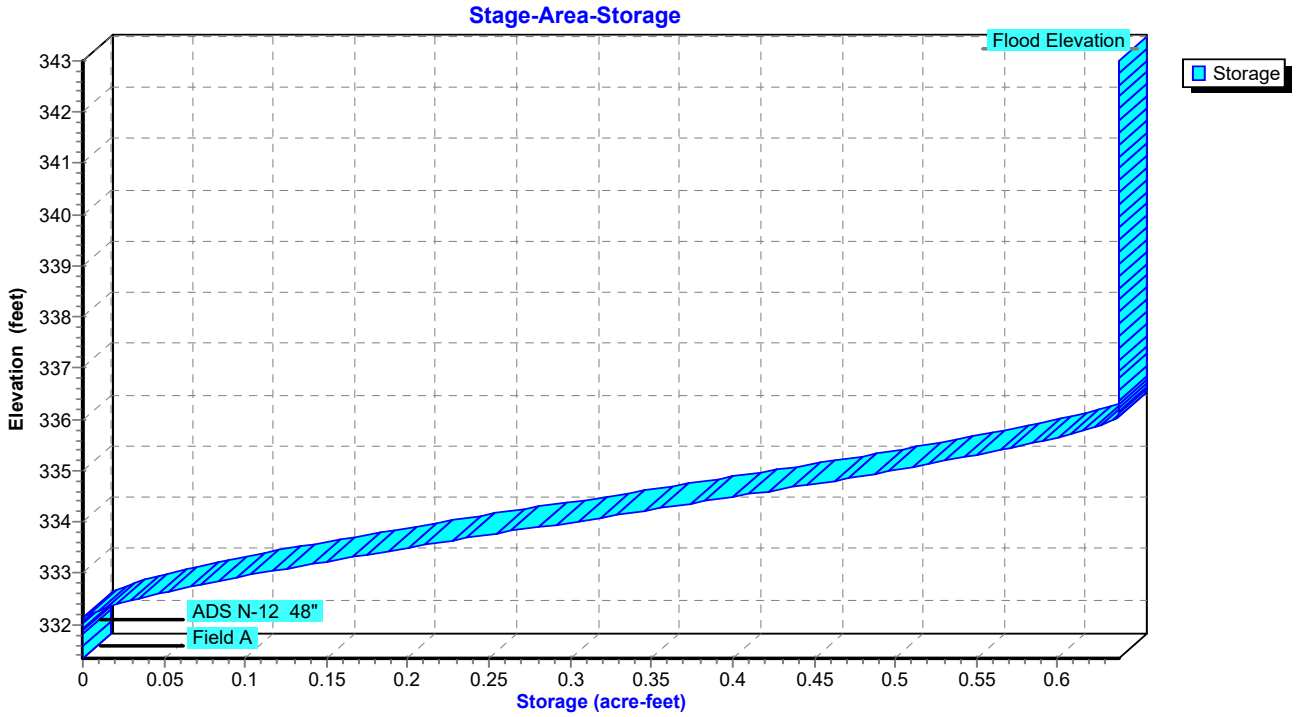
Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Pond 9P: Detention Piping - 48"



Hydrograph for Pond 9P: Detention Piping - 48"

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	331.34	0.00
2.50	0.00	0.000	331.84	0.00
5.00	0.00	0.000	331.84	0.00
7.50	0.00	0.000	331.84	0.00
10.00	**0.00**	**0.000**	**331.84**	**0.00**
12.50	**0.00**	**0.000**	**331.34**	**0.00**
15.00	0.00	0.000	331.84	0.00
17.50	0.00	0.000	331.84	0.00
20.00	0.00	0.000	331.84	0.00
22.50	0.00	0.000	331.84	0.00
25.00	0.00	0.000	331.84	0.00
27.50	0.00	0.000	331.84	0.00
30.00	0.00	0.000	331.84	0.00
32.50	0.00	0.000	331.84	0.00
35.00	0.00	0.000	331.84	0.00
37.50	0.00	0.000	331.84	0.00
40.00	0.00	0.000	331.84	0.00
42.50	0.00	0.000	331.84	0.00
45.00	0.00	0.000	331.84	0.00
47.50	0.00	0.000	331.84	0.00
50.00	0.00	0.000	331.84	0.00
52.50	0.00	0.000	331.84	0.00
55.00	0.00	0.000	331.84	0.00
57.50	0.00	0.000	331.84	0.00
60.00	0.00	0.000	331.84	0.00
62.50	0.00	0.000	331.84	0.00
65.00	0.00	0.000	331.84	0.00
67.50	0.00	0.000	331.84	0.00
70.00	0.00	0.000	331.84	0.00

Stage-Discharge for Pond 9P: Detention Piping - 48"

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
331.34	0.00	336.54	16.91	341.74	25.74
331.44	0.00	336.64	17.12	341.84	25.88
331.54	0.00	336.74	17.33	341.94	26.02
331.64	0.00	336.84	17.54	342.04	26.16
331.74	0.00	336.94	17.75	342.14	26.29
331.84	0.00	337.04	17.95	342.24	26.43
331.94	0.04	337.14	18.15	342.34	26.57
332.04	0.14	337.24	18.35	342.44	26.70
332.14	0.32	337.34	18.54	342.54	26.84
332.24	0.55	337.44	18.74	342.64	26.97
332.34	0.84	337.54	18.93	342.74	27.11
332.44	1.18	337.64	19.12	342.84	27.24
332.54	1.57	337.74	19.31	342.94	**27.37**
332.64	2.00	337.84	19.50		
332.74	2.47	337.94	19.68		
332.84	2.98	338.04	19.86		
332.94	3.51	338.14	20.05		
333.04	4.06	338.24	20.23		
333.14	4.63	338.34	20.40		
333.24	5.21	338.44	20.58		
333.34	5.79	338.54	20.76		
333.44	6.35	338.64	20.93		
333.54	6.90	338.74	21.10		
333.64	7.40	338.84	21.27		
333.74	7.84	338.94	21.44		
333.84	8.12	339.04	21.61		
333.94	8.84	339.14	21.78		
334.04	9.51	339.24	21.94		
334.14	10.13	339.34	22.11		
334.24	10.72	339.44	22.27		
334.34	11.26	339.54	22.43		
334.44	11.57	339.64	22.59		
334.54	11.88	339.74	22.75		
334.64	12.18	339.84	22.91		
334.74	12.48	339.94	23.07		
334.84	12.76	340.04	23.22		
334.94	13.04	340.14	23.38		
335.04	13.32	340.24	23.53		
335.14	13.59	340.34	23.69		
335.24	13.85	340.44	23.84		
335.34	14.11	340.54	23.99		
335.44	14.36	340.64	24.14		
335.54	14.61	340.74	24.29		
335.64	14.86	340.84	24.44		
335.74	15.10	340.94	24.59		
335.84	15.34	341.04	24.73		
335.94	15.57	341.14	24.88		
336.04	15.80	341.24	25.03		
336.14	16.03	341.34	25.17		
336.24	16.26	341.44	25.31		
336.34	16.48	341.54	25.46		
336.44	16.70	341.64	25.60		

Stage-Area-Storage for Pond 9P: Detention Piping - 48"

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
331.34	0.000	336.54	0.638	341.74	0.638
331.44	0.000	336.64	0.638	341.84	0.638
331.54	0.000	336.74	0.638	341.94	0.638
331.64	0.000	336.84	0.638	342.04	0.638
331.74	0.000	336.94	0.638	342.14	0.638
331.84	0.000	337.04	0.638	342.24	0.638
331.94	0.000	337.14	0.638	342.34	0.638
332.04	0.000	337.24	0.638	342.44	0.638
332.14	0.001	337.34	0.638	342.54	0.638
332.24	0.007	337.44	0.638	342.64	0.638
332.34	0.015	337.54	0.638	342.74	0.638
332.44	0.026	337.64	0.638	342.84	0.638
332.54	0.038	337.74	0.638	342.94	0.638
332.64	0.051	337.84	0.638		
332.74	0.066	337.94	0.638		
332.84	0.081	338.04	0.638		
332.94	0.098	338.14	0.638		
333.04	0.115	338.24	0.638		
333.14	0.132	338.34	0.638		
333.24	0.151	338.44	0.638		
333.34	0.169	338.54	0.638		
333.44	0.188	338.64	0.638		
333.54	0.208	338.74	0.638		
333.64	0.228	338.84	0.638		
333.74	0.248	338.94	0.638		
333.84	0.268	339.04	0.638		
333.94	0.288	339.14	0.638		
334.04	0.309	339.24	0.638		
334.14	0.329	339.34	0.638		
334.24	0.349	339.44	0.638		
334.34	0.370	339.54	0.638		
334.44	0.390	339.64	0.638		
334.54	0.410	339.74	0.638		
334.64	0.430	339.84	0.638		
334.74	0.449	339.94	0.638		
334.84	0.468	340.04	0.638		
334.94	0.487	340.14	0.638		
335.04	0.505	340.24	0.638		
335.14	0.523	340.34	0.638		
335.24	0.540	340.44	0.638		
335.34	0.556	340.54	0.638		
335.44	0.572	340.64	0.638		
335.54	0.586	340.74	0.638		
335.64	0.600	340.84	0.638		
335.74	0.612	340.94	0.638		
335.84	0.622	341.04	0.638		
335.94	0.631	341.14	0.638		
336.04	**0.637**	341.24	0.638		
336.14	**0.638**	341.34	0.638		
336.24	0.638	341.44	0.638		
336.34	0.638	341.54	0.638		
336.44	0.638	341.64	0.638		

Summary for Pond 18P: Micropool Extended Detention (SWP-1)

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 0.30 cfs @ 14.56 hrs, Volume= 0.371 af, Atten= 92%, Lag= 145.6 min
Primary = 0.30 cfs @ 14.56 hrs, Volume= 0.371 af
Routed to Link DP-4 : DP-4
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-4 : DP-4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 287.17' @ 14.56 hrs Surf.Area= 24,728 sf Storage= 8,097 cf
Flood Elev= 296.50' Surf.Area= 60,676 sf Storage= 217,293 cf

Plug-Flow detention time= 415.0 min calculated for 0.371 af (99% of inflow)
Center-of-Mass det. time= 409.4 min (1,282.3 - 872.9)

Volume	Invert	Avail.Storage	Storage Description
#1	280.50'	0 cf	**Forebay (Irregular)** Listed below (Recalc) 4,297 cf Overall x 0.0% Voids
#2	280.50'	0 cf	**Permanent Pool (Irregular)** Listed below (Recalc) 22,487 cf Overall x 0.0% Voids
#3	286.50'	12,022 cf	**Extended Detention (Irregular)** Listed below (Recalc)
#4	287.40'	205,271 cf	**Detention (Irregular)** Listed below (Recalc)
		217,293 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	76	34.3	0	0	76
286.50	1,712	147.4	4,297	4,297	1,800

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
280.50	1,625	178.6	0	0	1,625
285.00	4,608	263.5	13,454	13,454	4,773
286.50	7,557	326.3	9,033	22,487	7,754

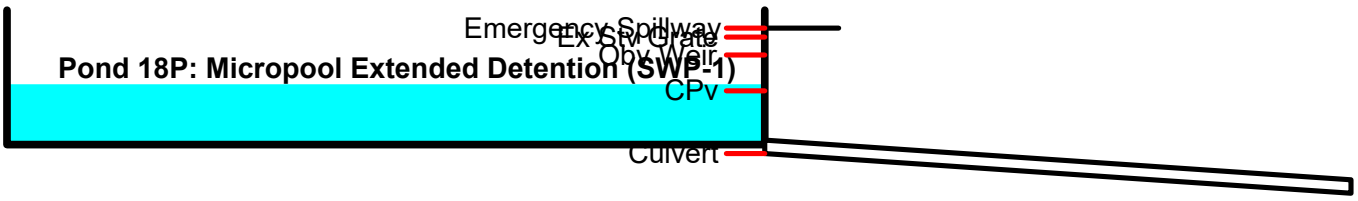
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
286.50	9,269	473.7	0	0	9,269
287.00	13,554	494.0	5,672	5,672	10,851
287.40	18,317	531.6	6,350	12,022	13,926

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.40	18,317	531.6	0	0	18,317
295.50	33,090	684.3	205,271	205,271	33,891

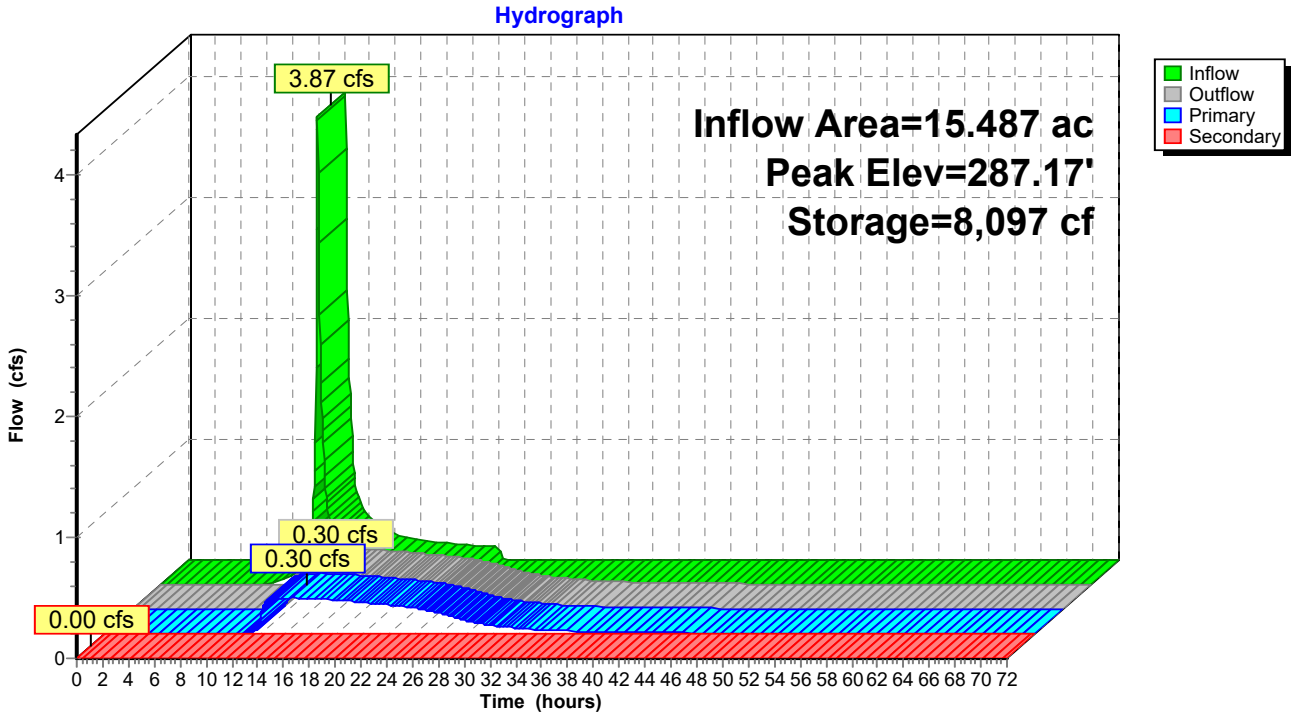
Device	Routing	Invert	Outlet Devices
#1	Primary	279.50'	**18.0" Round Culvert** L= 79.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 279.50' / 275.06' S= 0.0559 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	286.50'	**4.0" Vert. CPv** C= 0.600 Limited to weir flow at low heads
#3	Device 1	290.50'	**24.0" W x 12.0" H Vert. Obv Weir X 3.00** C= 0.600 Limited to weir flow at low heads
#4	Device 1	292.50'	**4.0" x 2.0" Horiz. Ex Stv Grate X 10.00 columns** X 13 rows C= 0.600 in 48.0" x 48.0" Grate (45% open area) Limited to weir flow at low heads
#5	Secondary	293.50'	**20.0' long + 3.0 '/' SideZ x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 14.56 hrs HW=287.17' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.30 cfs of 22.38 cfs potential flow)
  ├─**2=CPv** (Orifice Controls 0.30 cfs @ 3.41 fps)
  ├─**3=Obv Weir** (Controls 0.00 cfs)
  └─**4=Ex Stv Grate** (Controls 0.00 cfs)

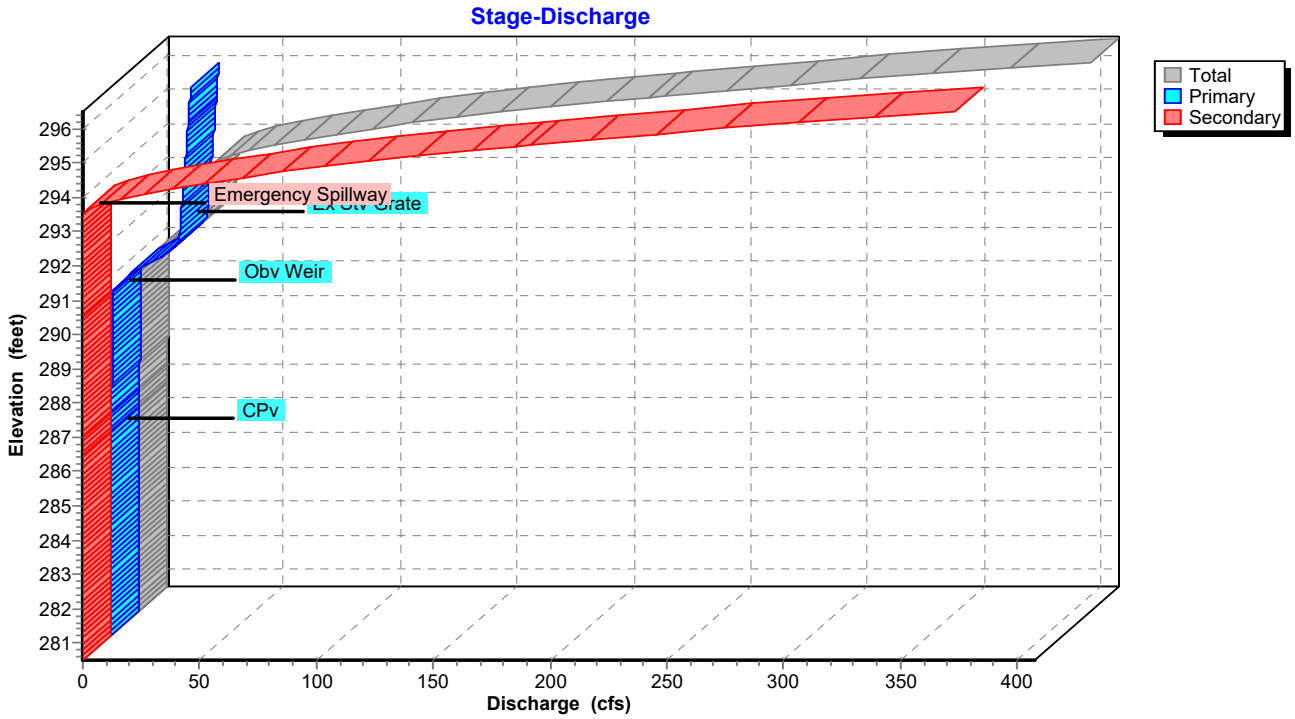
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=280.50' TW=0.00' (Dynamic Tailwater)
└─**5=Emergency Spillway** (Controls 0.00 cfs)



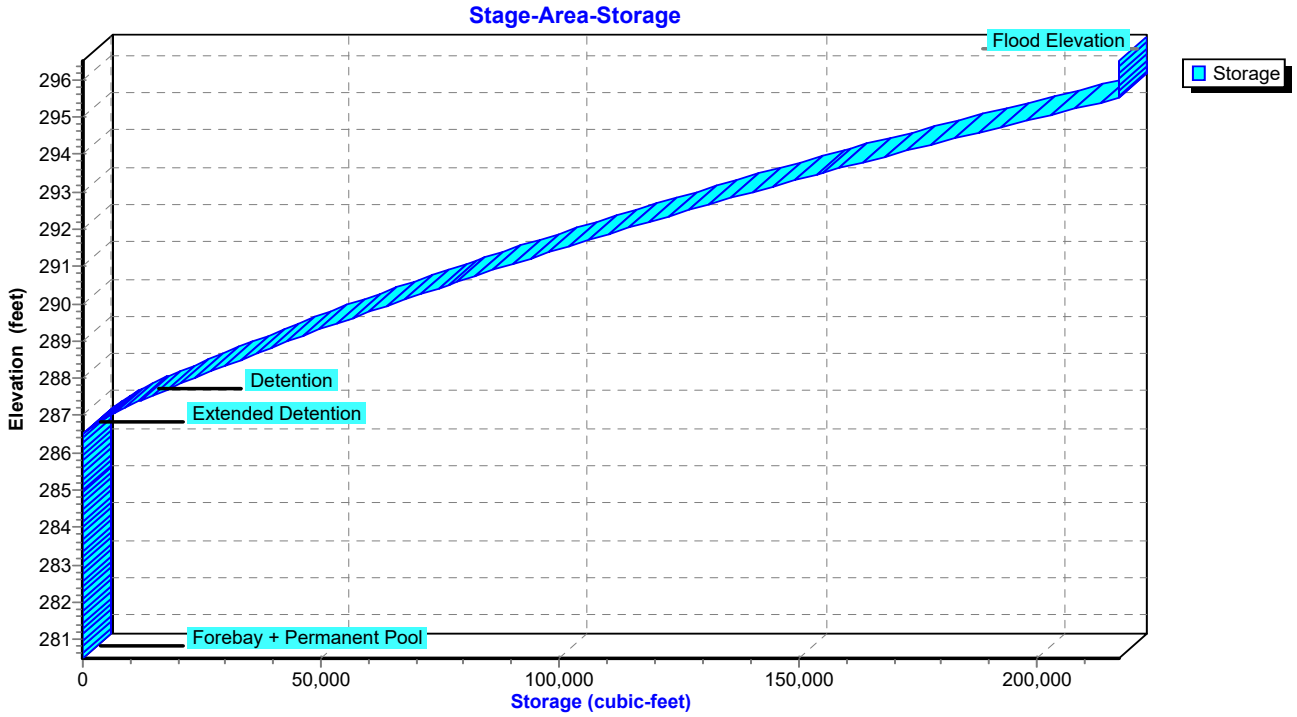
Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Pond 18P: Micropool Extended Detention (SWP-1)



Hydrograph for Pond 18P: Micropool Extended Detention (SWP-1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	280.50	0.00	0.00	**0.00**
2.50	0.00	0	286.50	0.00	0.00	0.00
5.00	0.00	0	286.50	0.00	0.00	0.00
7.50	0.00	0	286.50	0.00	0.00	0.00
10.00	**0.07**	239	286.53	0.00	0.00	0.00
12.50	**1.38**	**6,398**	**287.05**	**0.26**	**0.26**	0.00
15.00	0.26	**8,069**	**287.17**	**0.30**	**0.30**	0.00
17.50	0.18	7,361	287.12	0.28	0.28	0.00
20.00	0.14	6,337	287.05	0.26	0.26	0.00
22.50	0.12	5,294	286.97	0.23	0.23	0.00
25.00	0.00	4,060	286.88	0.19	0.19	0.00
27.50	0.00	2,628	286.76	0.12	0.12	0.00
30.00	0.00	1,788	286.68	0.07	0.07	0.00
32.50	0.00	1,309	286.63	0.04	0.04	0.00
35.00	0.00	1,016	286.60	0.03	0.03	0.00
37.50	0.00	823	286.59	0.02	0.02	0.00
40.00	0.00	688	286.57	0.01	0.01	0.00
42.50	0.00	589	286.56	0.01	0.01	0.00
45.00	0.00	514	286.55	0.01	0.01	0.00
47.50	0.00	456	286.55	0.01	0.01	0.00
50.00	0.00	408	286.54	0.00	0.00	0.00
52.50	0.00	370	286.54	0.00	0.00	0.00
55.00	0.00	338	286.54	0.00	0.00	0.00
57.50	0.00	311	286.53	0.00	0.00	0.00
60.00	0.00	287	286.53	0.00	0.00	0.00
62.50	0.00	267	286.53	0.00	0.00	0.00
65.00	0.00	250	286.53	0.00	0.00	0.00
67.50	0.00	235	286.53	0.00	0.00	0.00
70.00	0.00	221	286.52	0.00	0.00	0.00

Stage-Discharge for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
280.50	0.00	0.00	0.00
280.70	0.00	0.00	0.00
280.90	0.00	0.00	0.00
281.10	0.00	0.00	0.00
281.30	0.00	0.00	0.00
281.50	0.00	0.00	0.00
281.70	0.00	0.00	0.00
281.90	0.00	0.00	0.00
282.10	0.00	0.00	0.00
282.30	0.00	0.00	0.00
282.50	0.00	0.00	0.00
282.70	0.00	0.00	0.00
282.90	0.00	0.00	0.00
283.10	0.00	0.00	0.00
283.30	0.00	0.00	0.00
283.50	0.00	0.00	0.00
283.70	0.00	0.00	0.00
283.90	0.00	0.00	0.00
284.10	0.00	0.00	0.00
284.30	0.00	0.00	0.00
284.50	0.00	0.00	0.00
284.70	0.00	0.00	0.00
284.90	0.00	0.00	0.00
285.10	0.00	0.00	0.00
285.30	0.00	0.00	0.00
285.50	0.00	0.00	0.00
285.70	0.00	0.00	0.00
285.90	0.00	0.00	0.00
286.10	0.00	0.00	0.00
286.30	0.00	0.00	0.00
286.50	0.00	0.00	0.00
286.70	0.08	0.08	0.00
286.90	0.20	0.20	0.00
287.10	0.28	0.28	0.00
287.30	0.33	0.33	0.00
287.50	0.38	0.38	0.00
287.70	0.43	0.43	0.00
287.90	0.47	0.47	0.00
288.10	0.50	0.50	0.00
288.30	0.54	0.54	0.00
288.50	0.57	0.57	0.00
288.70	0.60	0.60	0.00
288.90	0.63	0.63	0.00
289.10	0.66	0.66	0.00
289.30	0.68	0.68	0.00
289.50	0.71	0.71	0.00
289.70	0.73	0.73	0.00
289.90	0.76	0.76	0.00
290.10	0.78	0.78	0.00
290.30	0.80	0.80	0.00
290.50	0.82	0.82	0.00
290.70	2.57	2.57	0.00
290.90	5.74	5.74	0.00
291.10	9.84	9.84	0.00
291.30	14.69	14.69	0.00
291.50	20.18	20.18	0.00
291.70	24.54	24.54	0.00
291.90	27.99	27.99	0.00
292.10	29.29	29.29	0.00
292.30	29.54	29.54	0.00
292.50	29.78	29.78	0.00
292.70	30.02	30.02	0.00
292.90	30.26	30.26	0.00
293.10	30.50	30.50	0.00
293.30	30.74	30.74	0.00
293.50	30.97	30.97	0.00
293.70	35.77	31.21	4.56
293.90	45.01	31.44	13.57
294.10	58.57	31.67	26.90
294.30	74.09	31.89	42.19
294.50	92.15	32.12	60.03
294.70	113.25	32.34	80.91
294.90	135.89	32.57	103.32
295.10	160.17	32.79	127.38
295.30	188.06	33.01	155.05
295.50	218.41	33.23	185.18
295.70	251.22	33.44	217.78
295.90	286.51	33.66	252.85
296.10	324.30	33.88	290.42
296.30	364.59	34.09	330.50
296.50	**407.43**	**34.30**	**373.13**

Stage-Area-Storage for Pond 18P: Micropool Extended Detention (SWP-1)

Elevation (feet)	Storage (cubic-feet)
280.50	0
280.70	0
280.90	0
281.10	0
281.30	0
281.50	0
281.70	0
281.90	0
282.10	0
282.30	0
282.50	0
282.70	0
282.90	0
283.10	0
283.30	0
283.50	0
283.70	0
283.90	0
284.10	0
284.30	0
284.50	0
284.70	0
284.90	0
285.10	0
285.30	0
285.50	0
285.70	0
285.90	0
286.10	0
286.30	0
286.50	0
286.70	2,013
286.90	4,363
287.10	7,083
287.30	10,254
287.50	13,862
287.70	17,588
287.90	21,377
288.10	25,229
288.30	29,146
288.50	33,127
288.70	37,173
288.90	41,286
289.10	45,464
289.30	49,709
289.50	54,021
289.70	58,401
289.90	62,850
290.10	67,367
290.30	71,954
290.50	76,610
290.70	81,337
290.90	86,135
291.10	91,005
291.30	95,946
291.50	100,960
291.70	106,048
291.90	111,208
292.10	116,443
292.30	121,753
292.50	127,138
292.70	132,598
292.90	138,135
293.10	143,749
293.30	149,439
293.50	155,208
293.70	161,055
293.90	166,981
294.10	172,987
294.30	179,072
294.50	185,238
294.70	191,485
294.90	197,813
295.10	204,224
295.30	210,717
295.50	**217,293**
295.70	217,293
295.90	217,293
296.10	217,293
296.30	217,293
296.50	217,293

Summary for Pond 19P: DMH-7

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.93 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 3.93 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min
Primary = 3.60 cfs @ 12.13 hrs, Volume= 0.371 af
Routed to Pond 20P : DMH-8
Secondary = 0.34 cfs @ 12.13 hrs, Volume= 0.005 af
Routed to Pond 9P : Detention Piping - 48"

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 335.17' @ 12.13 hrs
Flood Elev= 343.83'

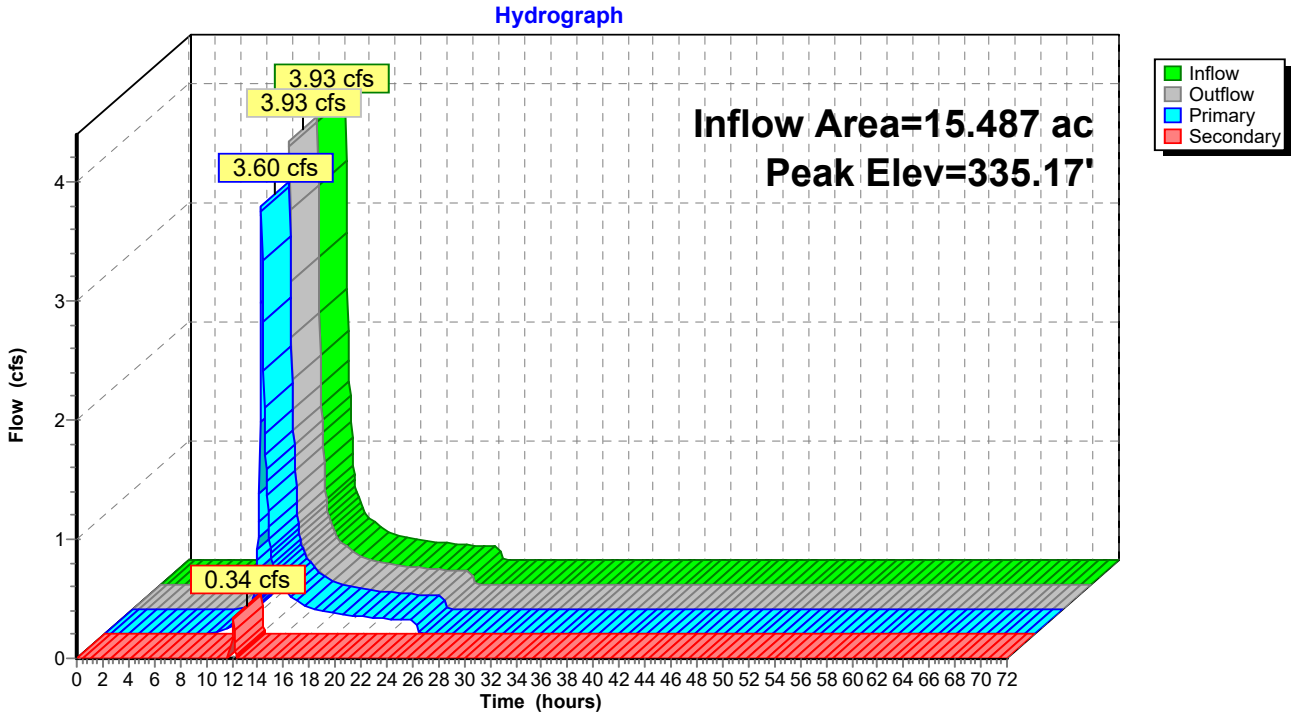
Device	Routing	Invert	Outlet Devices
#1	Primary	334.34'	**36.0" Round Culvert** L= 84.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.34' / 333.92' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	334.84'	**18.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 334.84' / 334.80' S= 0.0050 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 1.77 sf

Primary OutFlow Max=3.54 cfs @ 12.13 hrs HW=335.16' TW=331.08' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.54 cfs @ 3.41 fps)

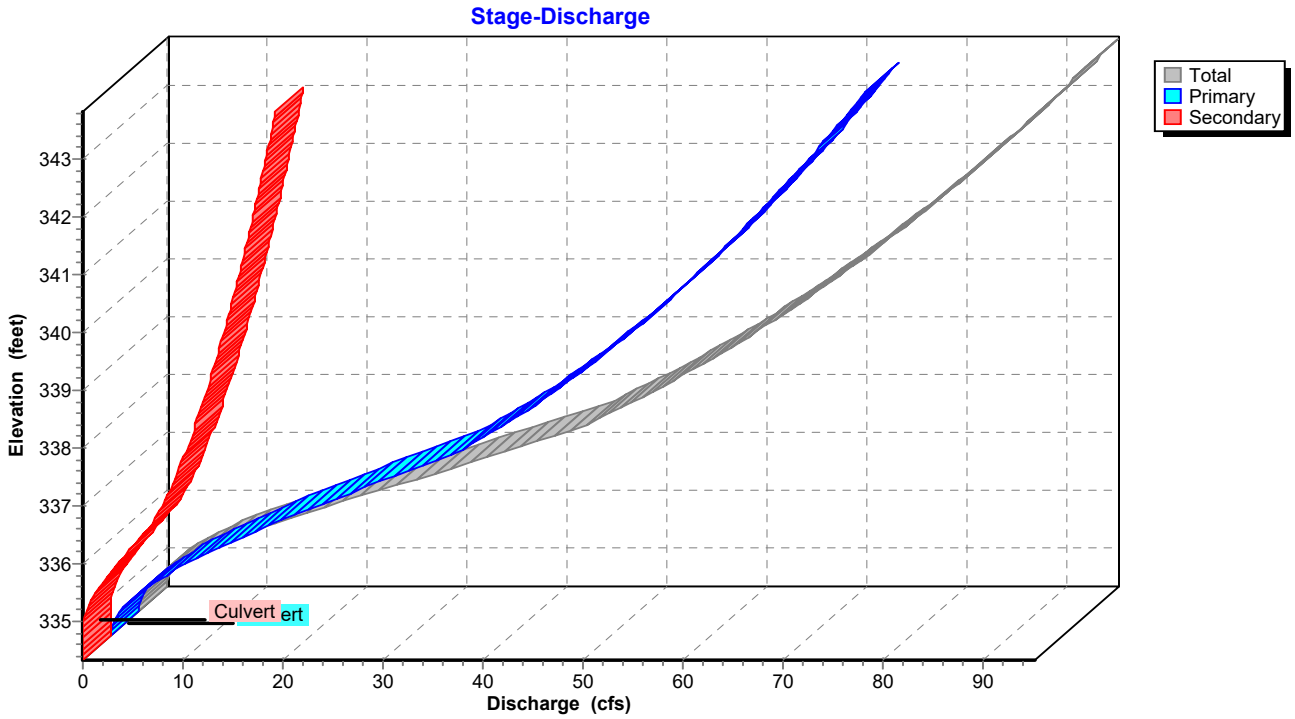
Secondary OutFlow Max=0.32 cfs @ 12.13 hrs HW=335.16' TW=332.12' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 0.32 cfs @ 1.79 fps)



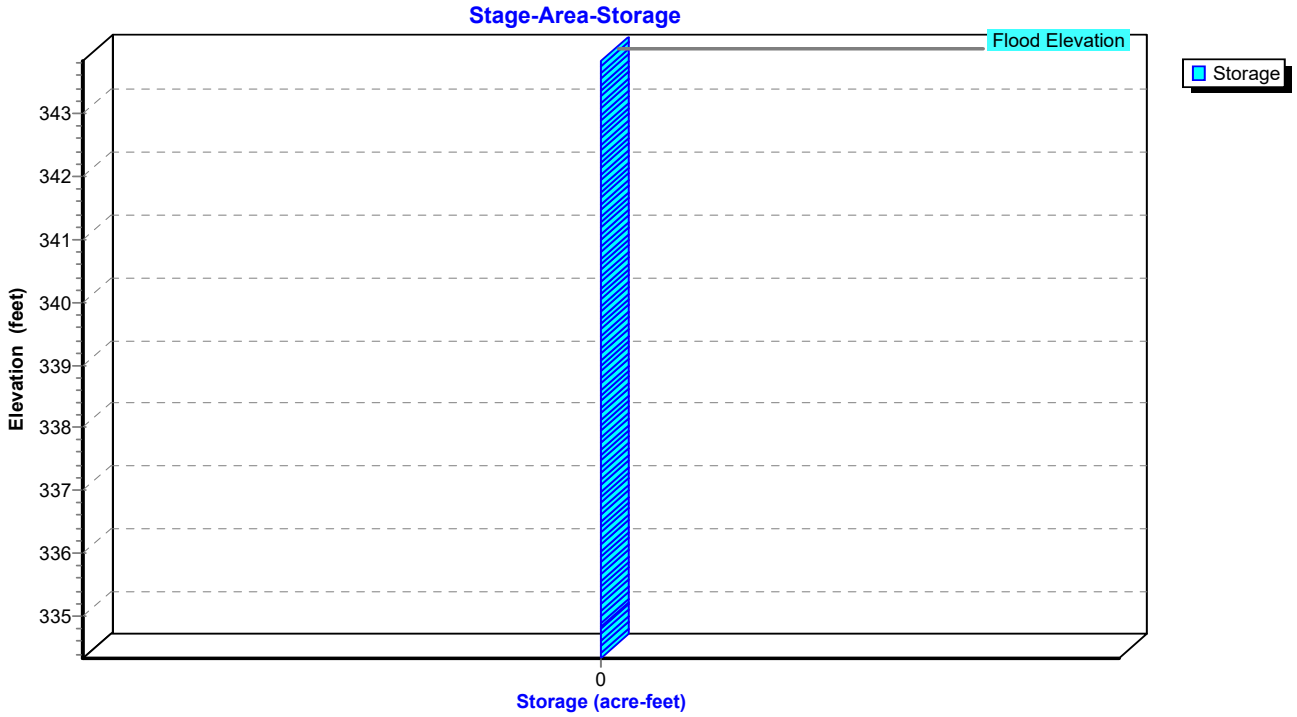
Pond 19P: DMH-7



Pond 19P: DMH-7



Pond 19P: DMH-7



Hydrograph for Pond 19P: DMH-7

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	334.34	0.00	0.00	0.00
2.50	0.00	334.34	0.00	0.00	0.00
5.00	0.00	334.34	0.00	0.00	0.00
7.50	0.00	334.35	0.00	0.00	0.00
10.00	**0.07**	**334.46**	**0.07**	**0.07**	**0.00**
12.50	**1.38**	**334.84**	**1.38**	**1.38**	**0.00**
15.00	0.26	334.56	0.26	0.26	0.00
17.50	0.18	334.52	0.18	0.18	0.00
20.00	0.14	334.50	0.14	0.14	0.00
22.50	0.12	334.49	0.12	0.12	0.00
25.00	0.00	334.34	0.00	0.00	0.00
27.50	0.00	334.34	0.00	0.00	0.00
30.00	0.00	334.34	0.00	0.00	0.00
32.50	0.00	334.34	0.00	0.00	0.00
35.00	0.00	334.34	0.00	0.00	0.00
37.50	0.00	334.34	0.00	0.00	0.00
40.00	0.00	334.34	0.00	0.00	0.00
42.50	0.00	334.34	0.00	0.00	0.00
45.00	0.00	334.34	0.00	0.00	0.00
47.50	0.00	334.34	0.00	0.00	0.00
50.00	0.00	334.34	0.00	0.00	0.00
52.50	0.00	334.34	0.00	0.00	0.00
55.00	0.00	334.34	0.00	0.00	0.00
57.50	0.00	334.34	0.00	0.00	0.00
60.00	0.00	334.34	0.00	0.00	0.00
62.50	0.00	334.34	0.00	0.00	0.00
65.00	0.00	334.34	0.00	0.00	0.00
67.50	0.00	334.34	0.00	0.00	0.00
70.00	0.00	334.34	0.00	0.00	0.00

Stage-Discharge for Pond 19P: DMH-7

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
334.34	0.00	0.00	0.00
334.44	0.05	0.05	0.00
334.54	0.22	0.22	0.00
334.64	0.50	0.50	0.00
334.74	0.89	0.89	0.00
334.84	1.38	1.38	0.00
334.94	2.00	1.97	0.03
335.04	2.77	2.64	0.13
335.14	3.68	3.39	0.29
335.24	4.72	4.22	0.50
335.34	5.88	5.12	0.76
335.44	7.15	6.09	1.07
335.54	8.53	7.12	1.41
335.64	10.00	8.21	1.80
335.74	11.57	9.35	2.22
335.84	13.21	10.54	2.67
335.94	14.93	11.79	3.14
336.04	16.72	13.08	3.64
336.14	18.55	14.41	4.15
336.24	20.44	15.77	4.66
336.34	22.35	17.17	5.18
336.44	24.29	18.60	5.69
336.54	26.23	20.06	6.17
336.64	28.16	21.53	6.63
336.74	30.05	23.02	7.02
336.84	31.81	24.53	7.28
336.94	33.84	26.04	7.80
337.04	35.64	27.55	8.09
337.14	37.42	29.06	8.36
337.24	39.18	30.55	8.63
337.34	40.92	32.03	8.89
337.44	42.62	33.49	9.14
337.54	44.29	34.91	9.38
337.64	45.67	36.05	9.62
337.74	46.89	37.04	9.85
337.84	48.08	38.00	10.08
337.94	49.24	38.94	10.30
338.04	50.37	39.85	10.51
338.14	51.48	40.75	10.73
338.24	52.56	41.63	10.94
338.34	53.62	42.48	11.14
338.44	54.67	43.33	11.34
338.54	55.69	44.15	11.54
338.64	56.69	44.96	11.73
338.74	57.68	45.76	11.92
338.84	58.65	46.54	12.11
338.94	59.60	47.31	12.29
339.04	60.54	48.07	12.48
339.14	61.47	48.81	12.66
339.24	62.38	49.55	12.83
339.34	63.28	50.27	13.01
339.44	64.16	50.98	13.18
339.54	65.04	51.69	13.35
339.64	65.90	52.38	13.52
339.74	66.75	53.06	13.68
339.84	67.59	53.74	13.85
339.94	68.42	54.41	14.01
340.04	69.24	55.07	14.17
340.14	70.05	55.72	14.33
340.24	70.85	56.36	14.49
340.34	71.64	57.00	14.64
340.44	72.42	57.63	14.79
340.54	73.20	58.25	14.95
340.64	73.96	58.87	15.10
340.74	74.72	59.48	15.24
340.84	75.47	60.08	15.39
340.94	76.22	60.68	15.54
341.04	76.95	61.27	15.68
341.14	77.68	61.86	15.83
341.24	78.41	62.44	15.97
341.34	79.12	63.02	16.11
341.44	79.83	63.59	16.25
341.54	80.54	64.15	16.39
341.64	81.23	64.71	16.52
341.74	81.93	65.27	16.66
341.84	82.61	65.82	16.79
341.94	83.29	66.36	16.93
342.04	83.97	66.91	17.06
342.14	84.63	67.44	17.19
342.24	85.30	67.98	17.32
342.34	85.96	68.50	17.45
342.44	86.61	69.03	17.58
342.54	87.26	69.55	17.71
342.64	87.90	70.07	17.84
342.74	88.54	70.58	17.96
342.84	89.18	71.09	18.09
342.94	89.81	71.60	18.21
343.04	90.43	72.10	18.34
343.14	91.06	72.60	18.46
343.24	91.67	73.09	18.58
343.34	92.29	73.59	18.70
343.44	92.90	74.07	18.82
343.54	93.50	74.56	18.94
343.64	94.10	75.04	19.06
343.74	**94.70**	**75.52**	**19.18**

Stage-Area-Storage for Pond 19P: DMH-7

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
334.34	**0.000**	339.54	0.000
334.44	0.000	339.64	0.000
334.54	0.000	339.74	0.000
334.64	0.000	339.84	0.000
334.74	0.000	339.94	0.000
334.84	0.000	340.04	0.000
334.94	0.000	340.14	0.000
335.04	0.000	340.24	0.000
335.14	0.000	340.34	0.000
335.24	0.000	340.44	0.000
335.34	0.000	340.54	0.000
335.44	0.000	340.64	0.000
335.54	0.000	340.74	0.000
335.64	0.000	340.84	0.000
335.74	0.000	340.94	0.000
335.84	0.000	341.04	0.000
335.94	0.000	341.14	0.000
336.04	0.000	341.24	0.000
336.14	0.000	341.34	0.000
336.24	0.000	341.44	0.000
336.34	0.000	341.54	0.000
336.44	0.000	341.64	0.000
336.54	0.000	341.74	0.000
336.64	0.000	341.84	0.000
336.74	0.000	341.94	0.000
336.84	0.000	342.04	0.000
336.94	0.000	342.14	0.000
337.04	0.000	342.24	0.000
337.14	0.000	342.34	0.000
337.24	0.000	342.44	0.000
337.34	0.000	342.54	0.000
337.44	0.000	342.64	0.000
337.54	0.000	342.74	0.000
337.64	0.000	342.84	0.000
337.74	0.000	342.94	0.000
337.84	0.000	343.04	0.000
337.94	0.000	343.14	0.000
338.04	0.000	343.24	0.000
338.14	0.000	343.34	0.000
338.24	0.000	343.44	0.000
338.34	0.000	343.54	0.000
338.44	0.000	343.64	0.000
338.54	0.000	343.74	0.000
338.64	0.000		
338.74	0.000		
338.84	0.000		
338.94	0.000		
339.04	0.000		
339.14	0.000		
339.24	0.000		
339.34	0.000		
339.44	0.000		

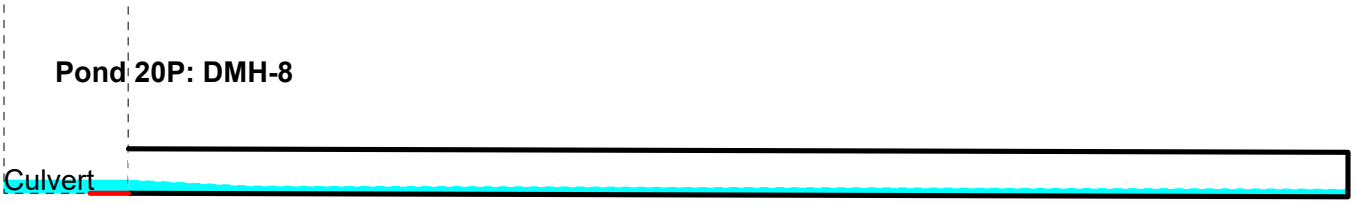
Summary for Pond 20P: DMH-8

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min
Primary = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Routed to Pond 21P : DMH-9

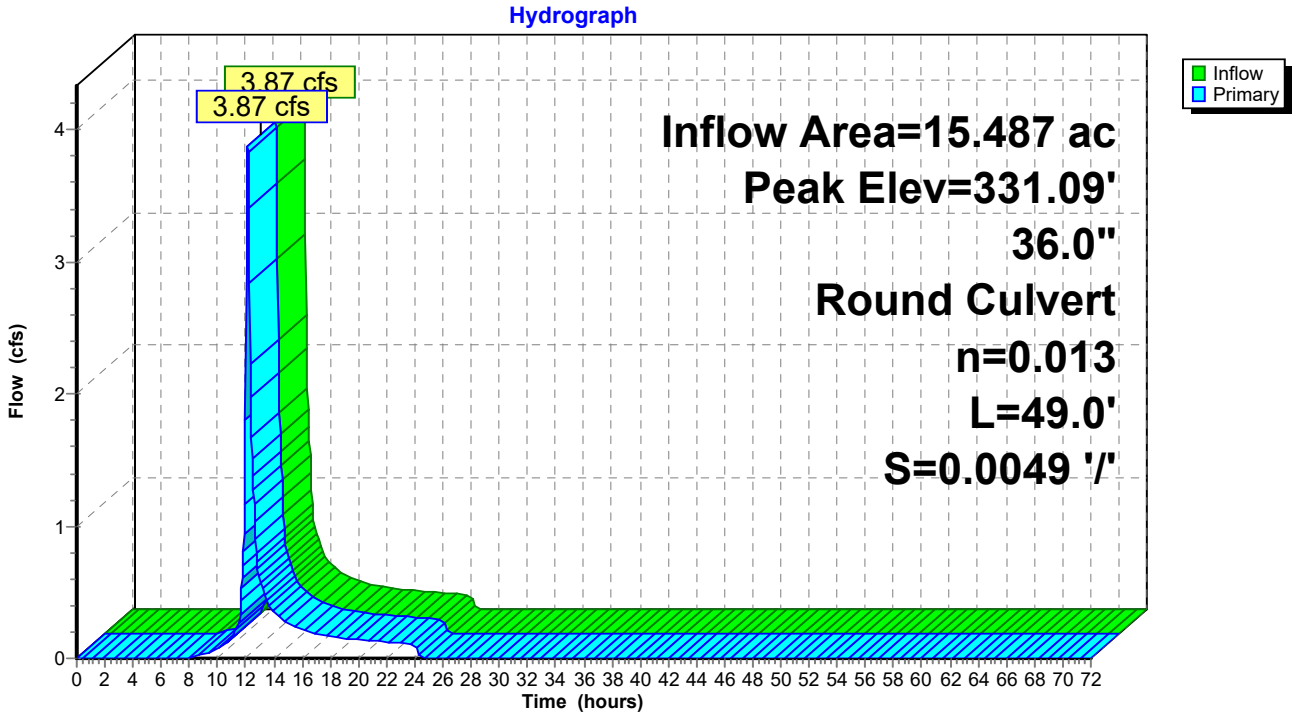
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 331.09' @ 12.13 hrs
Flood Elev= 342.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	330.20'	**36.0" Round Culvert** L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 330.20' / 329.96' S= 0.0049 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

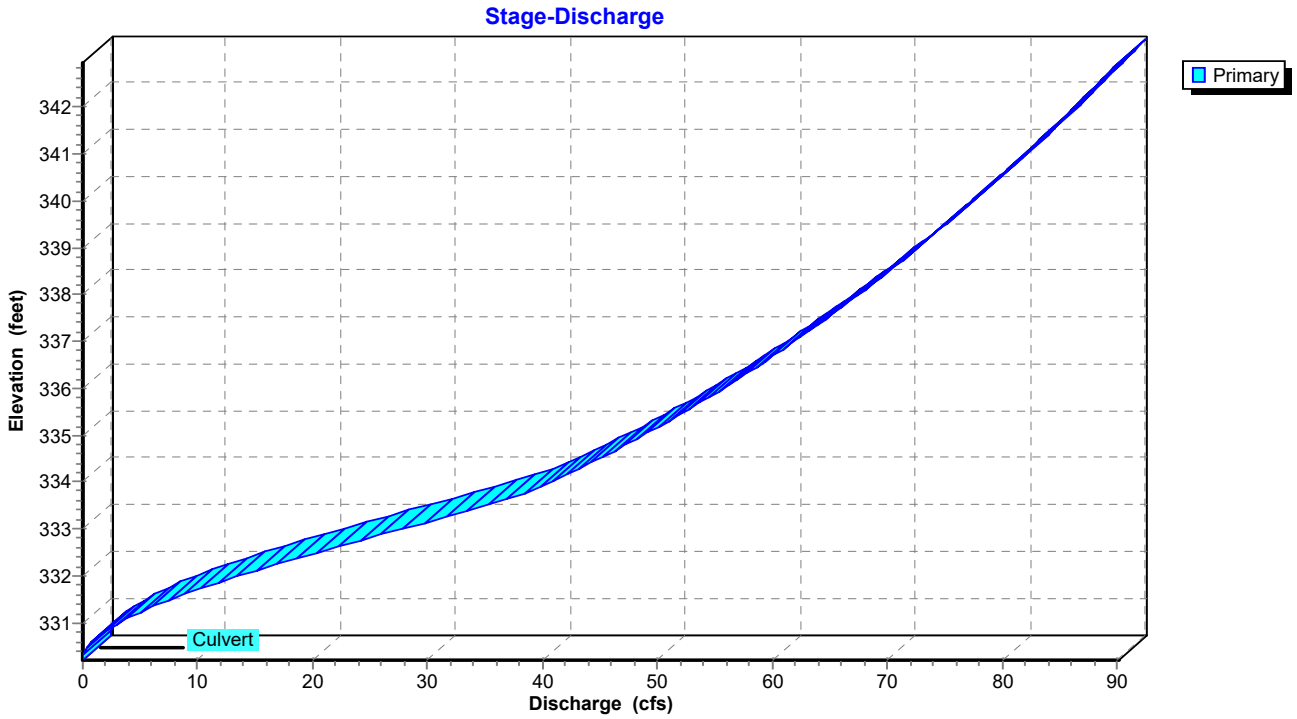
Primary OutFlow Max=3.81 cfs @ 12.13 hrs HW=331.08' TW=330.58' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.81 cfs @ 3.29 fps)



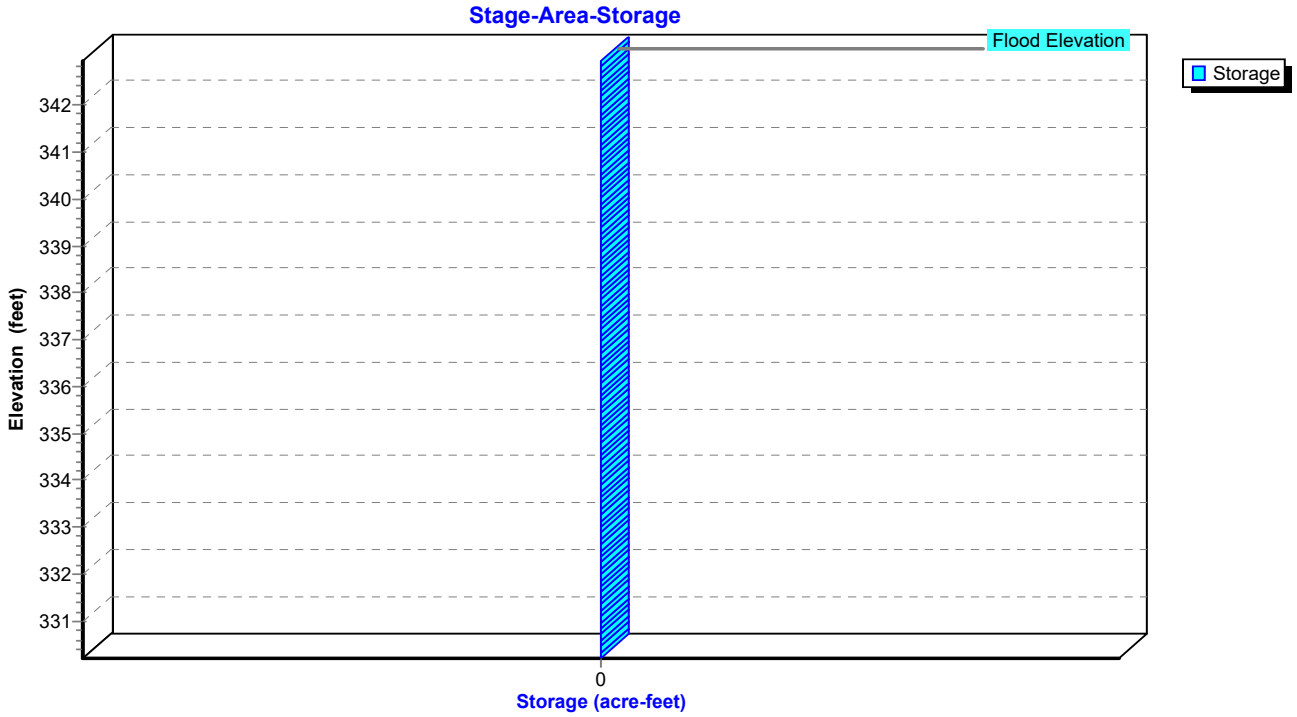
Pond 20P: DMH-8



Pond 20P: DMH-8



Pond 20P: DMH-8



Hydrograph for Pond 20P: DMH-8

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	330.20	0.00
1.00	0.00	330.20	0.00
2.00	0.00	330.20	0.00
3.00	0.00	330.20	0.00
4.00	0.00	330.20	0.00
5.00	0.00	330.20	0.00
6.00	0.00	330.20	0.00
7.00	0.00	330.20	0.00
8.00	0.01	330.24	0.01
9.00	0.03	330.28	0.03
10.00	0.07	330.32	0.07
11.00	0.16	330.37	0.16
12.00	**1.80**	**330.79**	**1.80**
13.00	**0.58**	**330.53**	**0.58**
14.00	0.36	330.46	0.36
15.00	0.26	330.42	0.26
16.00	0.22	330.40	0.22
17.00	0.19	330.39	0.19
18.00	0.17	330.38	0.17
19.00	0.15	330.37	0.15
20.00	0.14	330.36	0.14
21.00	0.13	330.36	0.13
22.00	0.12	330.35	0.12
23.00	0.12	330.35	0.12
24.00	0.11	330.35	0.11
25.00	0.00	330.20	0.00
26.00	0.00	330.20	0.00
27.00	0.00	330.20	0.00
28.00	0.00	330.20	0.00
29.00	0.00	330.20	0.00
30.00	0.00	330.20	0.00
31.00	0.00	330.20	0.00
32.00	0.00	330.20	0.00
33.00	0.00	330.20	0.00
34.00	0.00	330.20	0.00
35.00	0.00	330.20	0.00
36.00	0.00	330.20	0.00
37.00	0.00	330.20	0.00
38.00	0.00	330.20	0.00
39.00	0.00	330.20	0.00
40.00	0.00	330.20	0.00
41.00	0.00	330.20	0.00
42.00	0.00	330.20	0.00
43.00	0.00	330.20	0.00
44.00	0.00	330.20	0.00
45.00	0.00	330.20	0.00
46.00	0.00	330.20	0.00
47.00	0.00	330.20	0.00
48.00	0.00	330.20	0.00
49.00	0.00	330.20	0.00
50.00	0.00	330.20	0.00
51.00	0.00	330.20	0.00
52.00	0.00	330.20	0.00
53.00	0.00	330.20	0.00
54.00	0.00	330.20	0.00
55.00	0.00	330.20	0.00
56.00	0.00	330.20	0.00
57.00	0.00	330.20	0.00
58.00	0.00	330.20	0.00
59.00	0.00	330.20	0.00
60.00	0.00	330.20	0.00
61.00	0.00	330.20	0.00
62.00	0.00	330.20	0.00
63.00	0.00	330.20	0.00
64.00	0.00	330.20	0.00
65.00	0.00	330.20	0.00
66.00	0.00	330.20	0.00
67.00	0.00	330.20	0.00
68.00	0.00	330.20	0.00
69.00	0.00	330.20	0.00
70.00	0.00	330.20	0.00
71.00	0.00	330.20	0.00
72.00	0.00	330.20	0.00

Stage-Discharge for Pond 20P: DMH-8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
330.20	0.00	335.40	51.69	340.60	80.16
330.30	0.05	335.50	52.38	340.70	80.61
330.40	0.21	335.60	53.06	340.80	81.06
330.50	0.48	335.70	53.74	340.90	81.50
330.60	0.85	335.80	54.41	341.00	81.94
330.70	1.31	335.90	55.07	341.10	82.38
330.80	1.85	336.00	55.72	341.20	82.82
330.90	2.48	336.10	56.36	341.30	83.25
331.00	3.18	336.20	57.00	341.40	83.69
331.10	3.95	336.30	57.63	341.50	84.12
331.20	4.79	336.40	58.25	341.60	84.54
331.30	5.70	336.50	58.87	341.70	84.97
331.40	6.66	336.60	59.48	341.80	85.39
331.50	7.69	336.70	60.08	341.90	85.82
331.60	8.77	336.80	60.68	342.00	86.23
331.70	9.91	336.90	61.27	342.10	86.65
331.80	11.09	337.00	61.86	342.20	87.07
331.90	12.32	337.10	62.44	342.30	87.48
332.00	13.59	337.20	63.02	342.40	87.89
332.10	14.90	337.30	63.59	342.50	88.30
332.20	16.25	337.40	64.15	342.60	88.71
332.30	17.62	337.50	64.71	342.70	89.12
332.40	19.03	337.60	65.27	342.80	89.52
332.50	20.46	337.70	65.82	342.90	**89.92**
332.60	21.91	337.80	66.36		
332.70	23.38	337.90	66.91		
332.80	24.86	338.00	67.44		
332.90	26.34	338.10	67.98		
333.00	27.83	338.20	68.50		
333.10	29.31	338.30	69.03		
333.20	30.78	338.40	69.55		
333.30	32.23	338.50	70.07		
333.40	33.65	338.60	70.58		
333.50	35.04	338.70	71.09		
333.60	36.38	338.80	71.60		
333.70	37.66	338.90	72.10		
333.80	38.87	339.00	72.60		
333.90	39.85	339.10	73.09		
334.00	40.75	339.20	73.59		
334.10	41.63	339.30	74.07		
334.20	42.06	339.40	74.56		
334.30	43.33	339.50	75.04		
334.40	44.15	339.60	75.52		
334.50	44.96	339.70	76.00		
334.60	45.76	339.80	76.47		
334.70	46.54	339.90	76.94		
334.80	47.31	340.00	77.41		
334.90	48.07	340.10	77.88		
335.00	48.81	340.20	78.34		
335.10	49.55	340.30	78.80		
335.20	50.27	340.40	79.25		
335.30	50.98	340.50	79.71		

Stage-Area-Storage for Pond 20P: DMH-8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
330.20	**0.000**	335.40	0.000	340.60	0.000
330.30	0.000	335.50	0.000	340.70	0.000
330.40	0.000	335.60	0.000	340.80	0.000
330.50	0.000	335.70	0.000	340.90	0.000
330.60	0.000	335.80	0.000	341.00	0.000
330.70	0.000	335.90	0.000	341.10	0.000
330.80	0.000	336.00	0.000	341.20	0.000
330.90	0.000	336.10	0.000	341.30	0.000
331.00	0.000	336.20	0.000	341.40	0.000
331.10	0.000	336.30	0.000	341.50	0.000
331.20	0.000	336.40	0.000	341.60	0.000
331.30	0.000	336.50	0.000	341.70	0.000
331.40	0.000	336.60	0.000	341.80	0.000
331.50	0.000	336.70	0.000	341.90	0.000
331.60	0.000	336.80	0.000	342.00	0.000
331.70	0.000	336.90	0.000	342.10	0.000
331.80	0.000	337.00	0.000	342.20	0.000
331.90	0.000	337.10	0.000	342.30	0.000
332.00	0.000	337.20	0.000	342.40	0.000
332.10	0.000	337.30	0.000	342.50	0.000
332.20	0.000	337.40	0.000	342.60	0.000
332.30	0.000	337.50	0.000	342.70	0.000
332.40	0.000	337.60	0.000	342.80	0.000
332.50	0.000	337.70	0.000	342.90	0.000
332.60	0.000	337.80	0.000		
332.70	0.000	337.90	0.000		
332.80	0.000	338.00	0.000		
332.90	0.000	338.10	0.000		
333.00	0.000	338.20	0.000		
333.10	0.000	338.30	0.000		
333.20	0.000	338.40	0.000		
333.30	0.000	338.50	0.000		
333.40	0.000	338.60	0.000		
333.50	0.000	338.70	0.000		
333.60	0.000	338.80	0.000		
333.70	0.000	338.90	0.000		
333.80	0.000	339.00	0.000		
333.90	0.000	339.10	0.000		
334.00	0.000	339.20	0.000		
334.10	0.000	339.30	0.000		
334.20	0.000	339.40	0.000		
334.30	0.000	339.50	0.000		
334.40	0.000	339.60	0.000		
334.50	0.000	339.70	0.000		
334.60	0.000	339.80	0.000		
334.70	0.000	339.90	0.000		
334.80	0.000	340.00	0.000		
334.90	0.000	340.10	0.000		
335.00	0.000	340.20	0.000		
335.10	0.000	340.30	0.000		
335.20	0.000	340.40	0.000		
335.30	0.000	340.50	0.000		

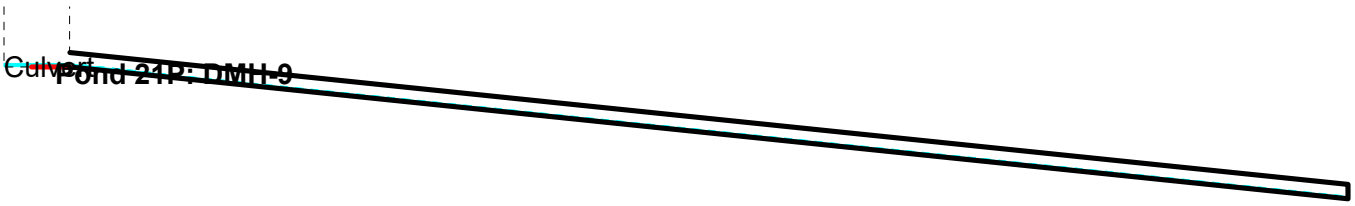
Summary for Pond 21P: DMH-9

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min
Primary = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Routed to Pond 23P : DMH-10

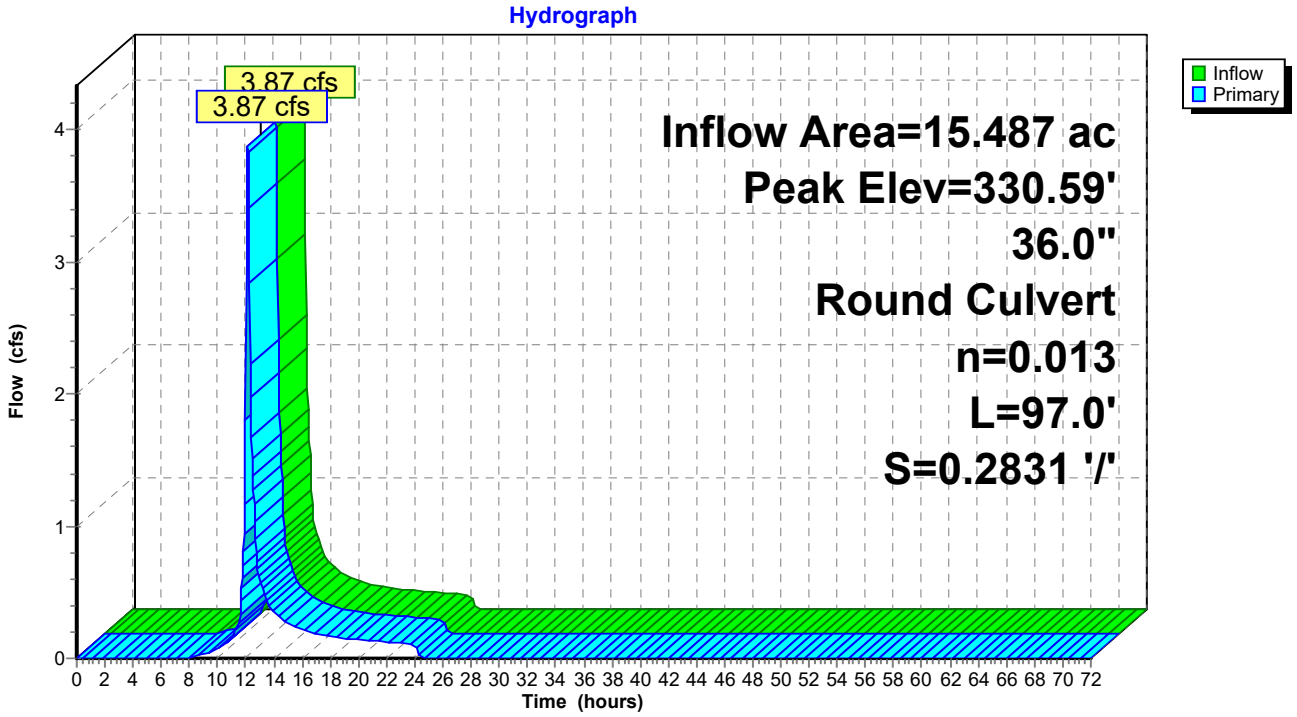
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 330.59' @ 12.13 hrs
Flood Elev= 342.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	329.86'	**36.0" Round Culvert** L= 97.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 329.86' / 302.40' S= 0.2831 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 7.07 sf

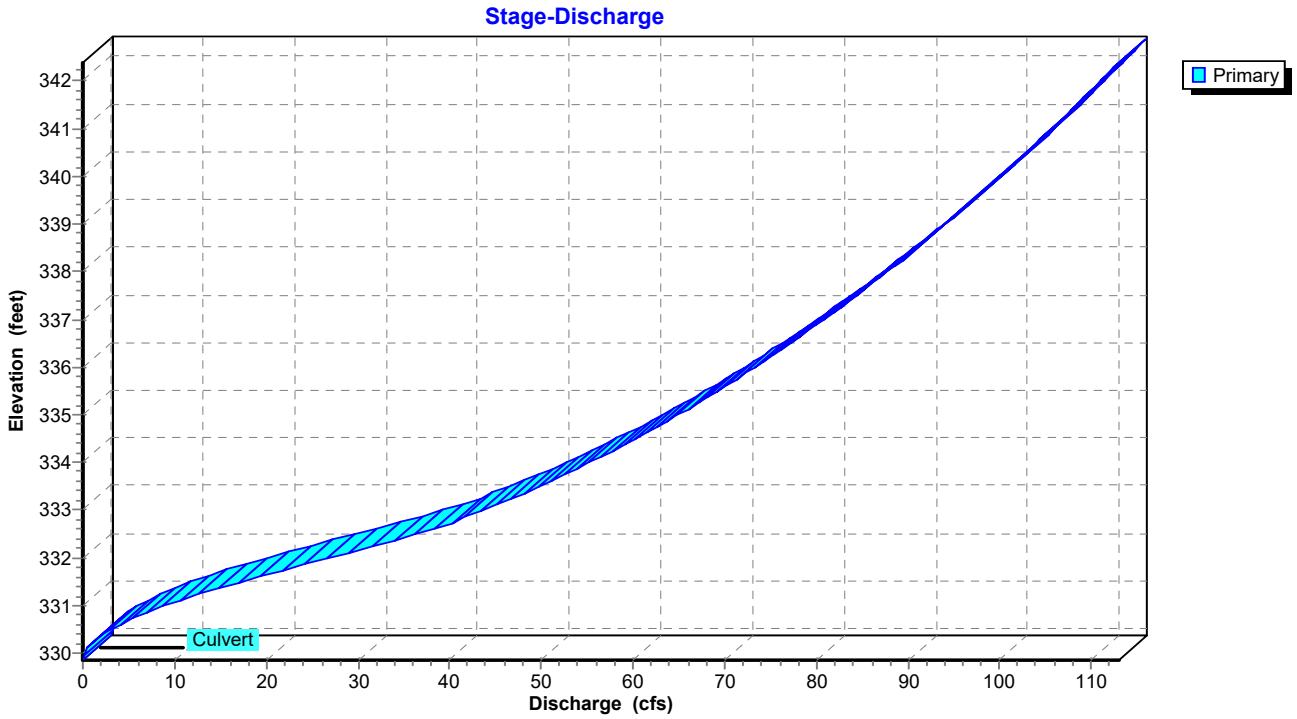
Primary OutFlow Max=3.81 cfs @ 12.13 hrs HW=330.58' TW=299.30' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.81 cfs @ 2.90 fps)



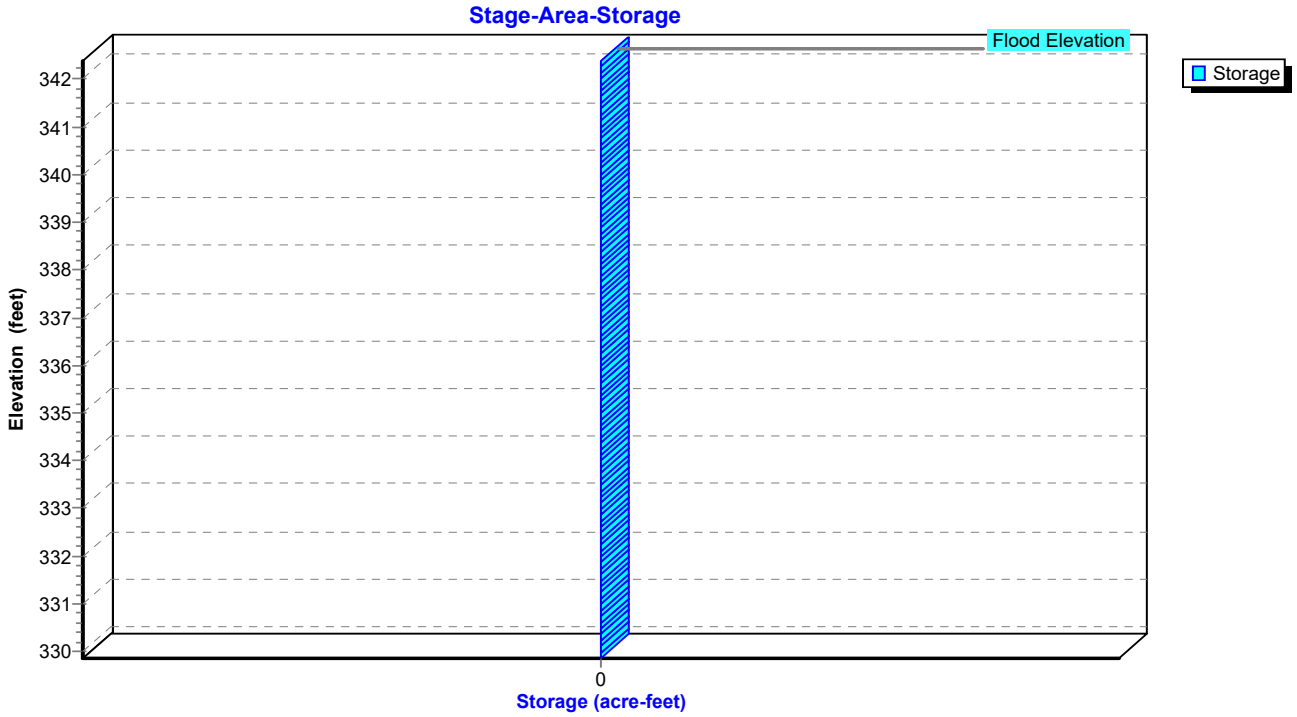
Pond 21P: DMH-9



Pond 21P: DMH-9



Pond 21P: DMH-9



Hydrograph for Pond 21P: DMH-9

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	329.86	0.00
1.00	0.00	329.86	0.00
2.00	0.00	329.86	0.00
3.00	0.00	329.86	0.00
4.00	0.00	329.86	0.00
5.00	0.00	329.86	0.00
6.00	0.00	329.86	0.00
7.00	0.00	329.86	0.00
8.00	0.01	329.89	0.01
9.00	0.03	329.92	0.03
10.00	0.07	329.95	0.07
11.00	0.16	330.00	0.16
12.00	**1.80**	**330.35**	**1.80**
13.00	**0.58**	**330.14**	**0.58**
14.00	0.36	330.08	0.36
15.00	0.26	330.05	0.26
16.00	0.22	330.03	0.22
17.00	0.19	330.02	0.19
18.00	0.17	330.01	0.17
19.00	0.15	330.00	0.15
20.00	0.14	330.00	0.14
21.00	0.13	329.99	0.13
22.00	0.12	329.99	0.12
23.00	0.12	329.98	0.12
24.00	0.11	329.98	0.11
25.00	0.00	329.86	0.00
26.00	0.00	329.86	0.00
27.00	0.00	329.86	0.00
28.00	0.00	329.86	0.00
29.00	0.00	329.86	0.00
30.00	0.00	329.86	0.00
31.00	0.00	329.86	0.00
32.00	0.00	329.86	0.00
33.00	0.00	329.86	0.00
34.00	0.00	329.86	0.00
35.00	0.00	329.86	0.00
36.00	0.00	329.86	0.00
37.00	0.00	329.86	0.00
38.00	0.00	329.86	0.00
39.00	0.00	329.86	0.00
40.00	0.00	329.86	0.00
41.00	0.00	329.86	0.00
42.00	0.00	329.86	0.00
43.00	0.00	329.86	0.00
44.00	0.00	329.86	0.00
45.00	0.00	329.86	0.00
46.00	0.00	329.86	0.00
47.00	0.00	329.86	0.00
48.00	0.00	329.86	0.00
49.00	0.00	329.86	0.00
50.00	0.00	329.86	0.00
51.00	0.00	329.86	0.00
52.00	0.00	329.86	0.00
53.00	0.00	329.86	0.00
54.00	0.00	329.86	0.00
55.00	0.00	329.86	0.00
56.00	0.00	329.86	0.00
57.00	0.00	329.86	0.00
58.00	0.00	329.86	0.00
59.00	0.00	329.86	0.00
60.00	0.00	329.86	0.00
61.00	0.00	329.86	0.00
62.00	0.00	329.86	0.00
63.00	0.00	329.86	0.00
64.00	0.00	329.86	0.00
65.00	0.00	329.86	0.00
66.00	0.00	329.86	0.00
67.00	0.00	329.86	0.00
68.00	0.00	329.86	0.00
69.00	0.00	329.86	0.00
70.00	0.00	329.86	0.00
71.00	0.00	329.86	0.00
72.00	0.00	329.86	0.00

Stage-Discharge for Pond 21P: DMH-9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
329.86	0.00	335.06	65.47	340.26	101.54
329.96	0.08	335.16	66.35	340.36	102.11
330.06	0.31	335.26	67.21	340.46	102.67
330.16	0.69	335.36	68.07	340.56	103.23
330.26	1.21	335.46	68.92	340.66	103.79
330.36	1.86	335.56	69.75	340.76	104.35
330.46	2.65	335.66	70.58	340.86	104.90
330.56	3.57	335.76	71.39	340.96	105.45
330.66	4.61	335.86	72.20	341.06	106.00
330.76	5.76	335.96	73.00	341.16	106.55
330.86	7.02	336.06	73.79	341.26	107.09
330.96	8.39	336.16	74.57	341.36	107.63
331.06	9.85	336.26	75.34	341.46	108.17
331.16	11.40	336.36	76.10	341.56	108.70
331.26	13.03	336.46	76.86	341.66	109.23
331.36	14.74	336.56	77.61	341.76	109.76
331.46	16.51	336.66	78.35	341.86	110.29
331.56	18.34	336.76	79.09	341.96	110.81
331.66	20.23	336.86	79.82	342.06	111.33
331.76	22.15	336.96	80.54	342.16	111.85
331.86	24.10	337.06	81.26	342.26	112.37
331.96	26.08	337.16	81.97	342.36	**112.88**
332.06	28.05	337.26	82.67		
332.16	30.03	337.36	83.37		
332.26	31.98	337.46	84.06		
332.36	33.88	337.56	84.75		
332.46	35.73	337.66	85.43		
332.56	37.49	337.76	86.10		
332.66	39.12	337.86	86.77		
332.76	40.56	337.96	87.44		
332.86	41.68	338.06	88.10		
332.96	43.05	338.16	88.75		
333.06	44.38	338.26	89.40		
333.16	45.66	338.36	90.05		
333.26	46.91	338.46	90.69		
333.36	48.13	338.56	91.33		
333.46	49.32	338.66	91.96		
333.56	50.48	338.76	92.59		
333.66	51.62	338.86	93.21		
333.76	52.73	338.96	93.83		
333.86	53.81	339.06	94.44		
333.96	54.88	339.16	95.05		
334.06	55.93	339.26	95.66		
334.16	56.95	339.36	96.27		
334.26	57.96	339.46	96.87		
334.36	58.95	339.56	97.46		
334.46	59.92	339.66	98.05		
334.56	60.88	339.76	98.64		
334.66	61.83	339.86	99.23		
334.76	62.76	339.96	99.81		
334.86	63.67	340.06	100.39		
334.96	64.58	340.16	100.96		

Stage-Area-Storage for Pond 21P: DMH-9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
329.86	**0.000**	335.06	0.000	340.26	0.000
329.96	0.000	335.16	0.000	340.36	0.000
330.06	0.000	335.26	0.000	340.46	0.000
330.16	0.000	335.36	0.000	340.56	0.000
330.26	0.000	335.46	0.000	340.66	0.000
330.36	0.000	335.56	0.000	340.76	0.000
330.46	0.000	335.66	0.000	340.86	0.000
330.56	0.000	335.76	0.000	340.96	0.000
330.66	0.000	335.86	0.000	341.06	0.000
330.76	0.000	335.96	0.000	341.16	0.000
330.86	0.000	336.06	0.000	341.26	0.000
330.96	0.000	336.16	0.000	341.36	0.000
331.06	0.000	336.26	0.000	341.46	0.000
331.16	0.000	336.36	0.000	341.56	0.000
331.26	0.000	336.46	0.000	341.66	0.000
331.36	0.000	336.56	0.000	341.76	0.000
331.46	0.000	336.66	0.000	341.86	0.000
331.56	0.000	336.76	0.000	341.96	0.000
331.66	0.000	336.86	0.000	342.06	0.000
331.76	0.000	336.96	0.000	342.16	0.000
331.86	0.000	337.06	0.000	342.26	0.000
331.96	0.000	337.16	0.000	342.36	0.000
332.06	0.000	337.26	0.000		
332.16	0.000	337.36	0.000		
332.26	0.000	337.46	0.000		
332.36	0.000	337.56	0.000		
332.46	0.000	337.66	0.000		
332.56	0.000	337.76	0.000		
332.66	0.000	337.86	0.000		
332.76	0.000	337.96	0.000		
332.86	0.000	338.06	0.000		
332.96	0.000	338.16	0.000		
333.06	0.000	338.26	0.000		
333.16	0.000	338.36	0.000		
333.26	0.000	338.46	0.000		
333.36	0.000	338.56	0.000		
333.46	0.000	338.66	0.000		
333.56	0.000	338.76	0.000		
333.66	0.000	338.86	0.000		
333.76	0.000	338.96	0.000		
333.86	0.000	339.06	0.000		
333.96	0.000	339.16	0.000		
334.06	0.000	339.26	0.000		
334.16	0.000	339.36	0.000		
334.26	0.000	339.46	0.000		
334.36	0.000	339.56	0.000		
334.46	0.000	339.66	0.000		
334.56	0.000	339.76	0.000		
334.66	0.000	339.86	0.000		
334.76	0.000	339.96	0.000		
334.86	0.000	340.06	0.000		
334.96	0.000	340.16	0.000		

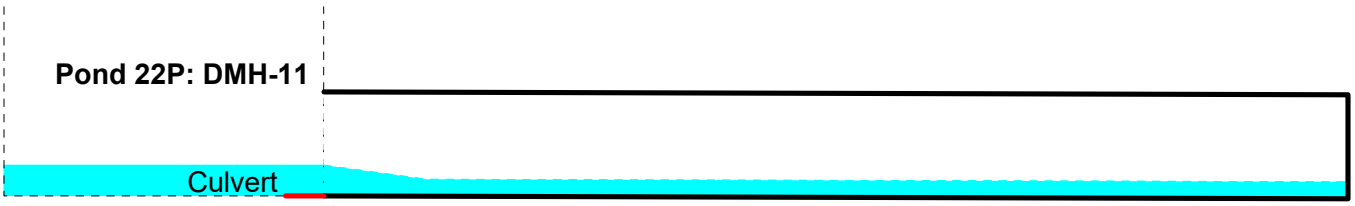
Summary for Pond 22P: DMH-11

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min
Primary = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Routed to Pond 18P : Micropool Extended Detention (SWP-1)

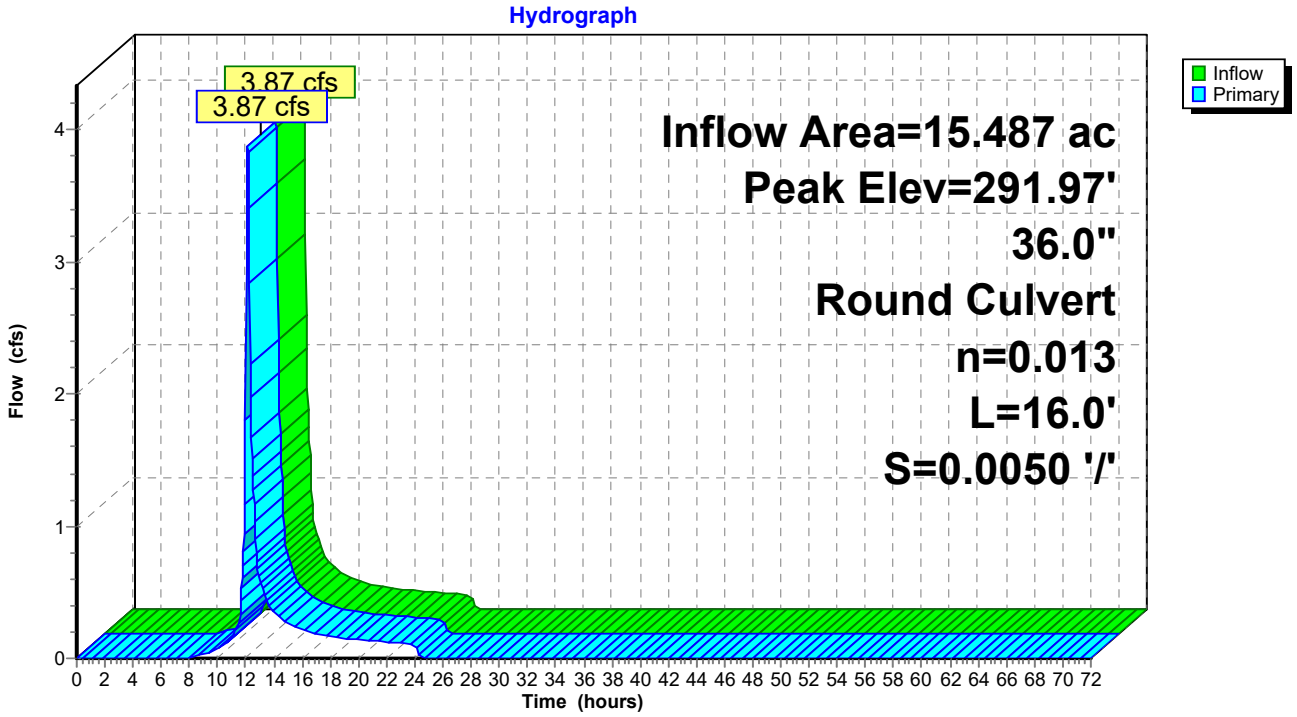
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 291.97' @ 12.13 hrs
Flood Elev= 296.53'

Device	Routing	Invert	Outlet Devices
#1	Primary	291.08'	**36.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 291.08' / 291.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

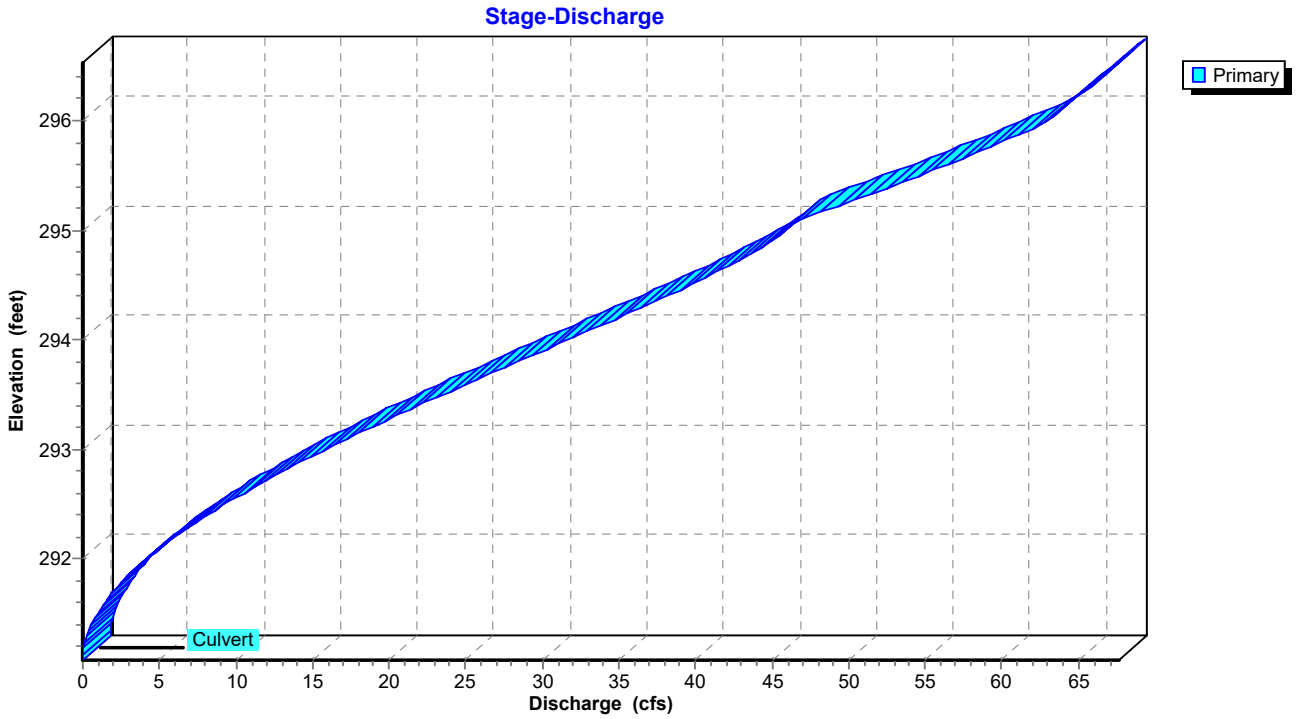
Primary OutFlow Max=3.81 cfs @ 12.13 hrs HW=291.96' TW=286.83' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.81 cfs @ 3.30 fps)



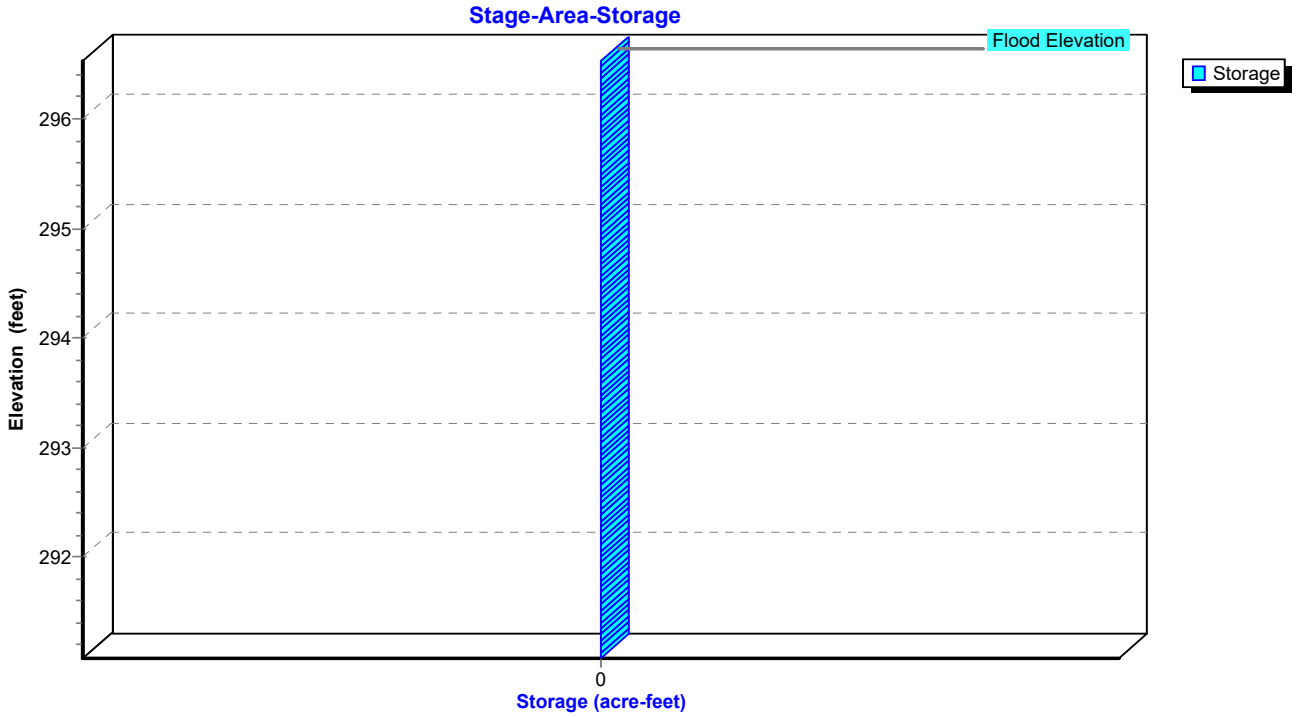
Pond 22P: DMH-11



Pond 22P: DMH-11



Pond 22P: DMH-11



Hydrograph for Pond 22P: DMH-11

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	291.08	0.00
1.00	0.00	291.08	0.00
2.00	0.00	291.08	0.00
3.00	0.00	291.08	0.00
4.00	0.00	291.08	0.00
5.00	0.00	291.08	0.00
6.00	0.00	291.08	0.00
7.00	0.00	291.08	0.00
8.00	0.01	291.12	0.01
9.00	0.03	291.16	0.03
10.00	0.07	291.20	0.07
11.00	0.16	291.25	0.16
12.00	**1.80**	**291.67**	**1.80**
13.00	**0.58**	**291.41**	**0.58**
14.00	0.36	291.34	0.36
15.00	0.26	291.30	0.26
16.00	0.22	291.28	0.22
17.00	0.19	291.27	0.19
18.00	0.17	291.26	0.17
19.00	0.15	291.25	0.15
20.00	0.14	291.24	0.14
21.00	0.13	291.24	0.13
22.00	0.12	291.23	0.12
23.00	0.12	291.23	0.12
24.00	0.11	291.23	0.11
25.00	0.00	291.08	0.00
26.00	0.00	291.08	0.00
27.00	0.00	291.08	0.00
28.00	0.00	291.08	0.00
29.00	0.00	291.08	0.00
30.00	0.00	291.08	0.00
31.00	0.00	291.08	0.00
32.00	0.00	291.08	0.00
33.00	0.00	291.08	0.00
34.00	0.00	291.08	0.00
35.00	0.00	291.08	0.00
36.00	0.00	291.08	0.00
37.00	0.00	291.08	0.00
38.00	0.00	291.08	0.00
39.00	0.00	291.08	0.00
40.00	0.00	291.08	0.00
41.00	0.00	291.08	0.00
42.00	0.00	291.08	0.00
43.00	0.00	291.08	0.00
44.00	0.00	291.08	0.00
45.00	0.00	291.08	0.00
46.00	0.00	291.08	0.00
47.00	0.00	291.08	0.00
48.00	0.00	291.08	0.00
49.00	0.00	291.08	0.00
50.00	0.00	291.08	0.00
51.00	0.00	291.08	0.00
52.00	0.00	291.08	0.00
53.00	0.00	291.08	0.00
54.00	0.00	291.08	0.00
55.00	0.00	291.08	0.00
56.00	0.00	291.08	0.00
57.00	0.00	291.08	0.00
58.00	0.00	291.08	0.00
59.00	0.00	291.08	0.00
60.00	0.00	291.08	0.00
61.00	0.00	291.08	0.00
62.00	0.00	291.08	0.00
63.00	0.00	291.08	0.00
64.00	0.00	291.08	0.00
65.00	0.00	291.08	0.00
66.00	0.00	291.08	0.00
67.00	0.00	291.08	0.00
68.00	0.00	291.08	0.00
69.00	0.00	291.08	0.00
70.00	0.00	291.08	0.00
71.00	0.00	291.08	0.00
72.00	0.00	291.08	0.00

Stage-Discharge for Pond 22P: DMH-11

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
291.08	0.00	293.68	26.40	296.28	65.47
291.13	0.01	293.73	27.21	296.33	65.91
291.18	0.05	293.78	28.04	296.38	66.35
291.23	0.12	293.83	28.86	296.43	66.78
291.28	0.21	293.88	29.68	296.48	67.21
291.33	0.33	293.93	30.50	296.53	**67.64**
291.38	0.48	293.98	31.33		
291.43	0.65	294.03	32.15		
291.48	0.84	294.08	32.97		
291.53	1.06	294.13	33.78		
291.58	1.30	294.18	34.59		
291.63	1.56	294.23	35.40		
291.68	1.84	294.28	36.20		
291.73	2.14	294.33	36.99		
291.78	2.47	294.38	37.77		
291.83	2.81	294.43	38.54		
291.88	3.18	294.48	39.30		
291.93	3.56	294.53	40.05		
291.98	3.97	294.58	40.78		
292.03	4.39	294.63	41.50		
292.08	4.83	294.68	42.19		
292.13	5.29	294.73	42.86		
292.18	5.77	294.78	43.51		
292.23	6.27	294.83	44.12		
292.28	6.78	294.88	44.71		
292.33	7.31	294.93	45.24		
292.38	7.86	294.98	45.73		
292.43	8.42	295.03	46.14		
292.48	9.00	295.08	46.37		
292.53	9.59	295.13	47.43		
292.58	10.20	295.18	48.47		
292.63	10.82	295.23	49.49		
292.68	11.45	295.28	50.48		
292.73	12.10	295.33	51.46		
292.78	12.77	295.38	52.42		
292.83	13.44	295.43	53.36		
292.88	14.13	295.48	54.28		
292.93	14.83	295.53	55.19		
292.98	15.54	295.58	56.09		
293.03	16.26	295.63	56.97		
293.08	16.99	295.68	57.83		
293.13	17.73	295.73	58.69		
293.18	18.48	295.78	59.53		
293.23	19.24	295.83	60.36		
293.28	20.01	295.88	61.18		
293.33	20.79	295.93	61.99		
293.38	21.57	295.98	62.76		
293.43	22.36	296.03	63.22		
293.48	23.16	296.08	63.67		
293.53	23.96	296.13	64.13		
293.58	24.77	296.18	64.58		
293.63	25.58	296.23	65.02		

Stage-Area-Storage for Pond 22P: DMH-11

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
291.08	**0.000**	293.68	0.000	296.28	0.000
291.13	0.000	293.73	0.000	296.33	0.000
291.18	0.000	293.78	0.000	296.38	0.000
291.23	0.000	293.83	0.000	296.43	0.000
291.28	0.000	293.88	0.000	296.48	0.000
291.33	0.000	293.93	0.000	296.53	0.000
291.38	0.000	293.98	0.000		
291.43	0.000	294.03	0.000		
291.48	0.000	294.08	0.000		
291.53	0.000	294.13	0.000		
291.58	0.000	294.18	0.000		
291.63	0.000	294.23	0.000		
291.68	0.000	294.28	0.000		
291.73	0.000	294.33	0.000		
291.78	0.000	294.38	0.000		
291.83	0.000	294.43	0.000		
291.88	0.000	294.48	0.000		
291.93	0.000	294.53	0.000		
291.98	0.000	294.58	0.000		
292.03	0.000	294.63	0.000		
292.08	0.000	294.68	0.000		
292.13	0.000	294.73	0.000		
292.18	0.000	294.78	0.000		
292.23	0.000	294.83	0.000		
292.28	0.000	294.88	0.000		
292.33	0.000	294.93	0.000		
292.38	0.000	294.98	0.000		
292.43	0.000	295.03	0.000		
292.48	0.000	295.08	0.000		
292.53	0.000	295.13	0.000		
292.58	0.000	295.18	0.000		
292.63	0.000	295.23	0.000		
292.68	0.000	295.28	0.000		
292.73	0.000	295.33	0.000		
292.78	0.000	295.38	0.000		
292.83	0.000	295.43	0.000		
292.88	0.000	295.48	0.000		
292.93	0.000	295.53	0.000		
292.98	0.000	295.58	0.000		
293.03	0.000	295.63	0.000		
293.08	0.000	295.68	0.000		
293.13	0.000	295.73	0.000		
293.18	0.000	295.78	0.000		
293.23	0.000	295.83	0.000		
293.28	0.000	295.88	0.000		
293.33	0.000	295.93	0.000		
293.38	0.000	295.98	0.000		
293.43	0.000	296.03	0.000		
293.48	0.000	296.08	0.000		
293.53	0.000	296.13	0.000		
293.58	0.000	296.18	0.000		
293.63	0.000	296.23	0.000		

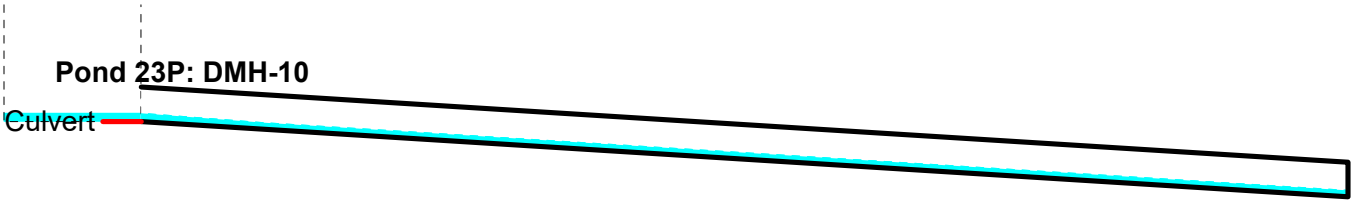
Summary for Pond 23P: DMH-10

Inflow Area = 15.487 ac, 41.43% Impervious, Inflow Depth = 0.29" for 90% WQv event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Outflow = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min
Primary = 3.87 cfs @ 12.13 hrs, Volume= 0.376 af
Routed to Pond 22P : DMH-11

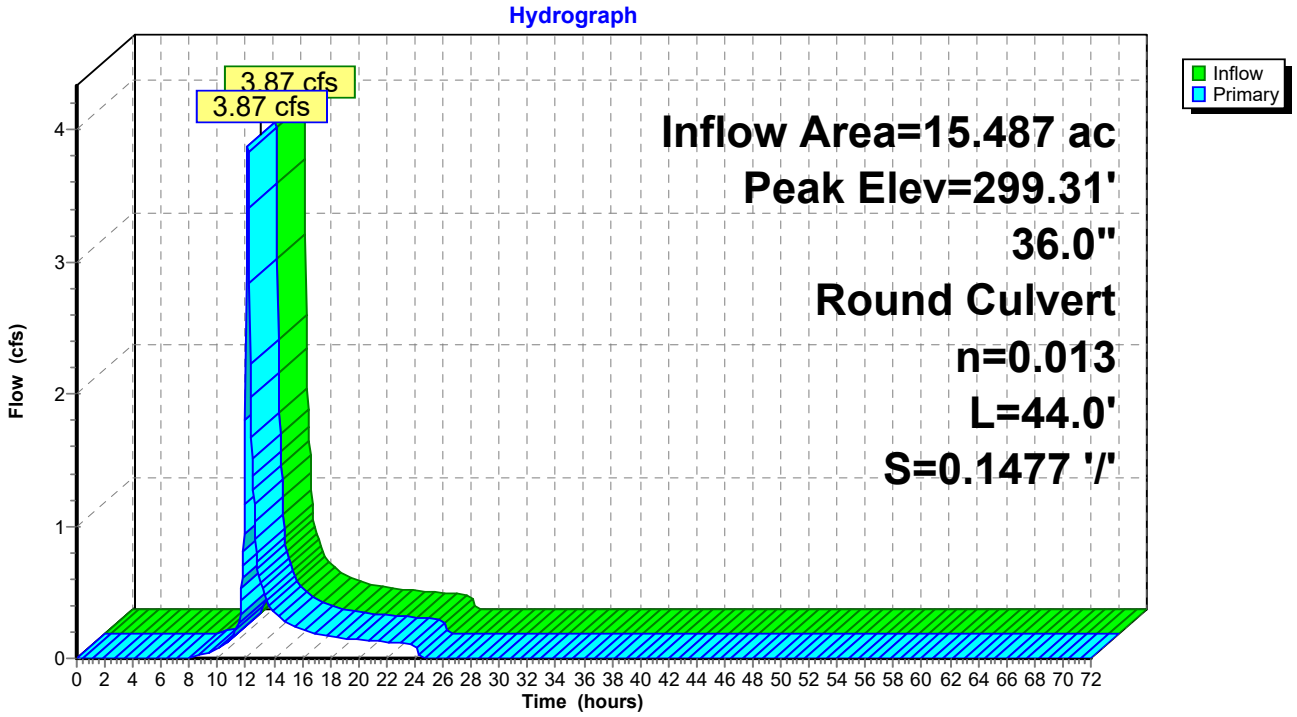
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 299.31' @ 12.13 hrs
Flood Elev= 308.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.58'	**36.0" Round Culvert** L= 44.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 298.58' / 292.08' S= 0.1477 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

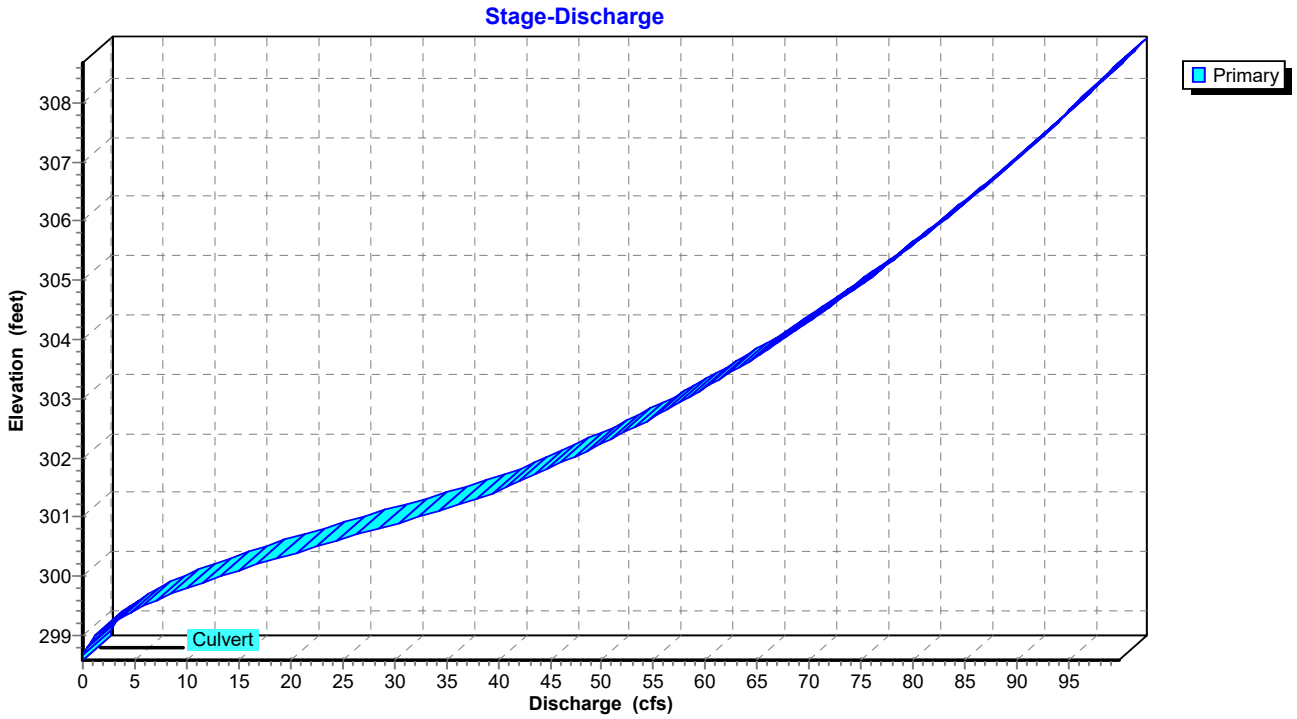
Primary OutFlow Max=3.81 cfs @ 12.13 hrs HW=299.30' TW=291.96' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.81 cfs @ 2.90 fps)



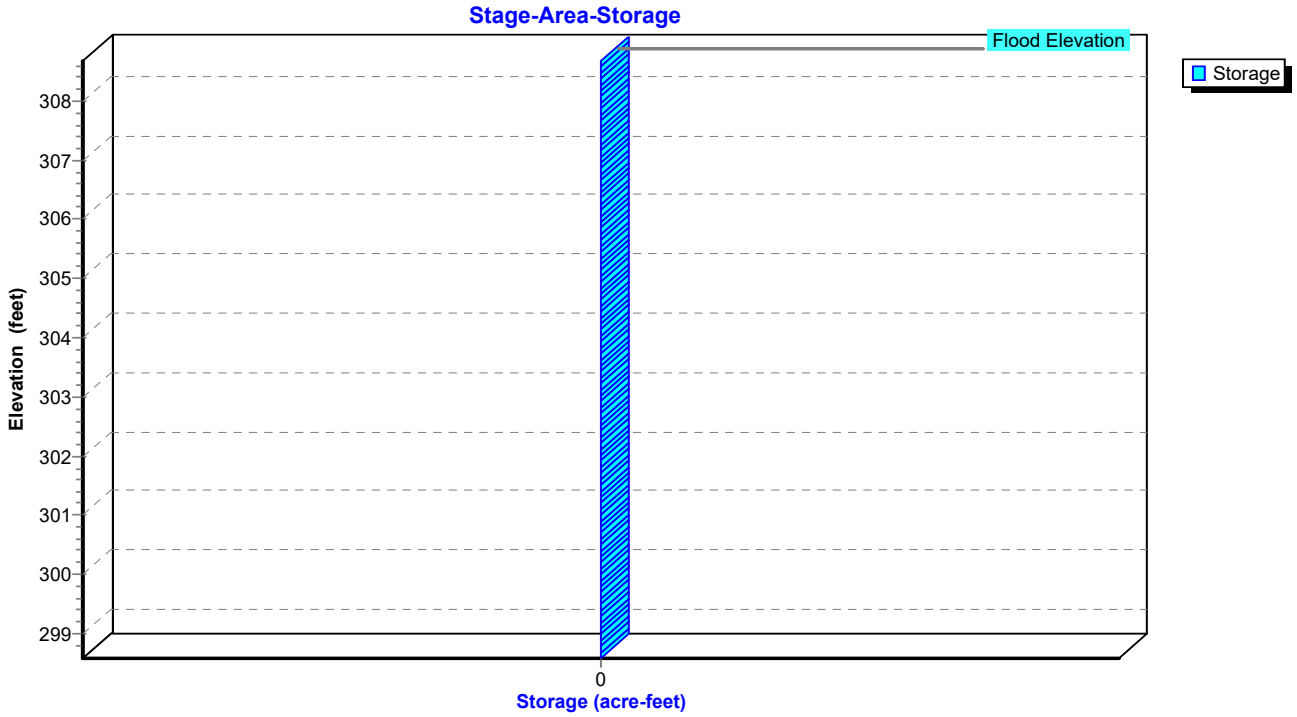
Pond 23P: DMH-10



Pond 23P: DMH-10



Pond 23P: DMH-10



Hydrograph for Pond 23P: DMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	298.58	0.00
1.00	0.00	298.58	0.00
2.00	0.00	298.58	0.00
3.00	0.00	298.58	0.00
4.00	0.00	298.58	0.00
5.00	0.00	298.58	0.00
6.00	0.00	298.58	0.00
7.00	0.00	298.58	0.00
8.00	0.01	298.61	0.01
9.00	0.03	298.64	0.03
10.00	0.07	298.67	0.07
11.00	0.16	298.72	0.16
12.00	**1.80**	**299.07**	**1.80**
13.00	**0.58**	**298.86**	**0.58**
14.00	0.36	298.80	0.36
15.00	0.26	298.77	0.26
16.00	0.22	298.75	0.22
17.00	0.19	298.74	0.19
18.00	0.17	298.73	0.17
19.00	0.15	298.72	0.15
20.00	0.14	298.72	0.14
21.00	0.13	298.71	0.13
22.00	0.12	298.71	0.12
23.00	0.12	298.70	0.12
24.00	0.11	298.70	0.11
25.00	0.00	298.58	0.00
26.00	0.00	298.58	0.00
27.00	0.00	298.58	0.00
28.00	0.00	298.58	0.00
29.00	0.00	298.58	0.00
30.00	0.00	298.58	0.00
31.00	0.00	298.58	0.00
32.00	0.00	298.58	0.00
33.00	0.00	298.58	0.00
34.00	0.00	298.58	0.00
35.00	0.00	298.58	0.00
36.00	0.00	298.58	0.00
37.00	0.00	298.58	0.00
38.00	0.00	298.58	0.00
39.00	0.00	298.58	0.00
40.00	0.00	298.58	0.00
41.00	0.00	298.58	0.00
42.00	0.00	298.58	0.00
43.00	0.00	298.58	0.00
44.00	0.00	298.58	0.00
45.00	0.00	298.58	0.00
46.00	0.00	298.58	0.00
47.00	0.00	298.58	0.00
48.00	0.00	298.58	0.00
49.00	0.00	298.58	0.00
50.00	0.00	298.58	0.00
51.00	0.00	298.58	0.00
52.00	0.00	298.58	0.00
53.00	0.00	298.58	0.00
54.00	0.00	298.58	0.00
55.00	0.00	298.58	0.00
56.00	0.00	298.58	0.00
57.00	0.00	298.58	0.00
58.00	0.00	298.58	0.00
59.00	0.00	298.58	0.00
60.00	0.00	298.58	0.00
61.00	0.00	298.58	0.00
62.00	0.00	298.58	0.00
63.00	0.00	298.58	0.00
64.00	0.00	298.58	0.00
65.00	0.00	298.58	0.00
66.00	0.00	298.58	0.00
67.00	0.00	298.58	0.00
68.00	0.00	298.58	0.00
69.00	0.00	298.58	0.00
70.00	0.00	298.58	0.00
71.00	0.00	298.58	0.00
72.00	0.00	298.58	0.00

Stage-Discharge for Pond 23P: DMH-10

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
298.58	0.00	301.18	35.73	303.78	65.47	306.38	85.43
298.63	0.02	301.23	36.62	303.83	65.91	306.43	85.77
298.68	0.08	301.28	37.49	303.88	66.35	306.48	86.10
298.73	0.17	301.33	38.32	303.93	66.78	306.53	86.44
298.78	0.31	301.38	39.12	303.98	67.21	306.58	86.77
298.83	0.48	301.43	39.87	304.03	67.64	306.63	87.11
298.88	0.69	301.48	40.56	304.08	68.07	306.68	87.44
298.93	0.93	301.53	41.19	304.13	68.49	306.73	87.77
298.98	1.21	301.58	41.68	304.18	68.92	306.78	88.10
299.03	1.52	301.63	42.37	304.23	69.33	306.83	88.43
299.08	1.86	301.68	43.05	304.28	69.75	306.88	88.75
299.13	2.24	301.73	43.72	304.33	70.17	306.93	89.08
299.18	2.65	301.78	44.38	304.38	70.58	306.98	89.40
299.23	3.10	301.83	45.02	304.43	70.99	307.03	89.73
299.28	3.57	301.88	45.66	304.48	71.39	307.08	90.05
299.33	4.07	301.93	46.29	304.53	71.80	307.13	90.37
299.38	4.61	301.98	46.91	304.58	72.20	307.18	90.69
299.43	5.17	302.03	47.53	304.63	72.60	307.23	91.01
299.48	5.76	302.08	48.13	304.68	73.00	307.28	91.33
299.53	6.38	302.13	48.73	304.73	73.39	307.33	91.64
299.58	7.02	302.18	49.32	304.78	73.79	307.38	91.96
299.63	7.69	302.23	49.91	304.83	74.18	307.43	92.27
299.68	8.39	302.28	50.48	304.88	74.57	307.48	92.59
299.73	9.11	302.33	51.05	304.93	74.95	307.53	92.90
299.78	9.85	302.38	51.62	304.98	75.34	307.58	93.21
299.83	10.61	302.43	52.17	305.03	75.72	307.63	93.52
299.88	11.40	302.48	52.73	305.08	76.10	307.68	93.83
299.93	12.20	302.53	53.27	305.13	76.48	307.73	94.14
299.98	13.03	302.58	53.81	305.18	76.86	307.78	94.44
300.03	13.88	302.63	54.35	305.23	77.24	307.83	94.75
300.08	14.74	302.68	54.88	305.28	77.61	307.88	95.05
300.13	15.62	302.73	55.41	305.33	77.98	307.93	95.36
300.18	16.51	302.78	55.93	305.38	78.35	307.98	95.66
300.23	17.42	302.83	56.44	305.43	78.72	308.03	95.96
300.28	18.34	302.88	56.95	305.48	79.09	308.08	96.27
300.33	19.28	302.93	57.46	305.53	79.46	308.13	96.57
300.38	20.23	302.98	57.96	305.58	79.82	308.18	96.87
300.43	21.18	303.03	58.46	305.63	80.18	308.23	97.16
300.48	22.15	303.08	58.95	305.68	80.54	308.28	97.46
300.53	23.12	303.13	59.44	305.73	80.90	308.33	97.76
300.58	24.10	303.18	59.92	305.78	81.26	308.38	98.05
300.63	25.09	303.23	60.41	305.83	81.61	308.43	98.35
300.68	26.08	303.28	60.88	305.88	81.97	308.48	98.64
300.73	27.07	303.33	61.36	305.93	82.32	308.53	98.94
300.78	28.05	303.38	61.83	305.98	82.67	308.58	99.23
300.83	29.04	303.43	62.29	306.03	83.02	308.63	99.52
300.88	30.03	303.48	62.76	306.08	83.37	308.68	**99.81**
300.93	31.00	303.53	63.22	306.13	83.72		
300.98	31.98	303.58	63.67	306.18	84.06		
301.03	32.94	303.63	64.13	306.23	84.40		
301.08	33.88	303.68	64.58	306.28	84.75		
301.13	34.82	303.73	65.02	306.33	85.09		

Stage-Area-Storage for Pond 23P: DMH-10

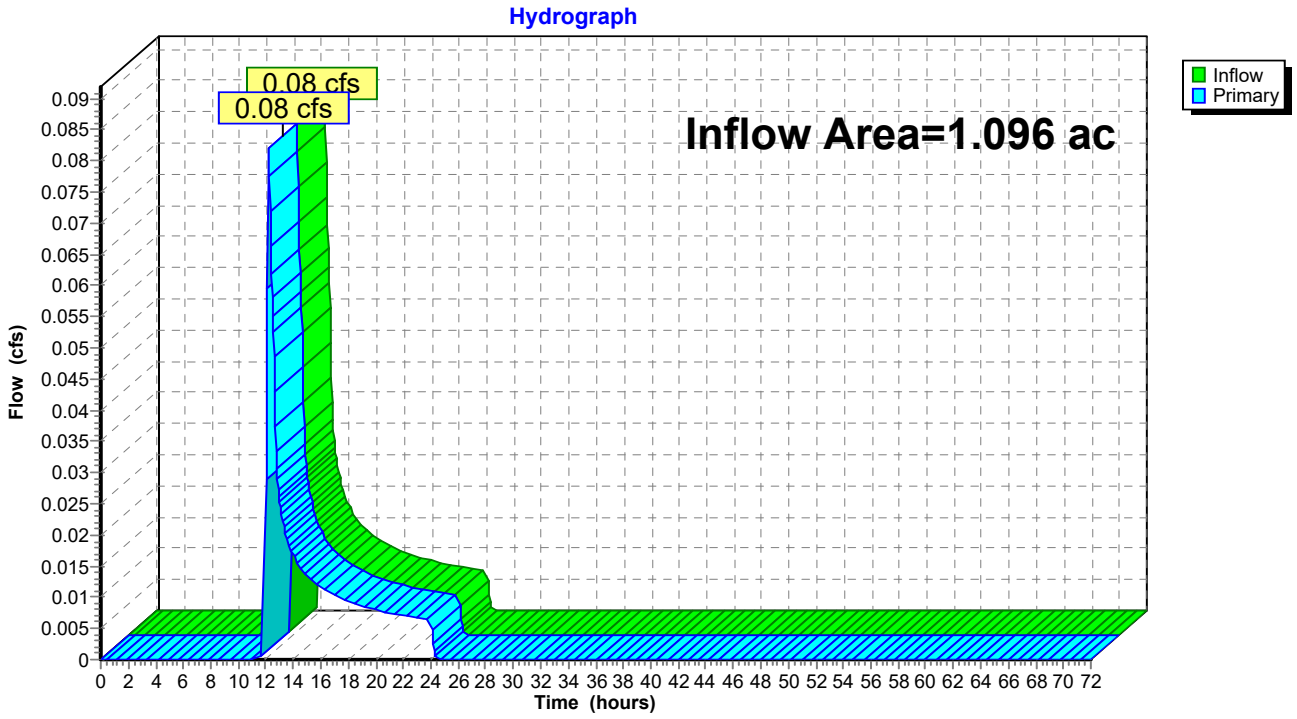
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
298.58	**0.000**	303.78	0.000
298.68	0.000	303.88	0.000
298.78	0.000	303.98	0.000
298.88	0.000	304.08	0.000
298.98	0.000	304.18	0.000
299.08	0.000	304.28	0.000
299.18	0.000	304.38	0.000
299.28	0.000	304.48	0.000
299.38	0.000	304.58	0.000
299.48	0.000	304.68	0.000
299.58	0.000	304.78	0.000
299.68	0.000	304.88	0.000
299.78	0.000	304.98	0.000
299.88	0.000	305.08	0.000
299.98	0.000	305.18	0.000
300.08	0.000	305.28	0.000
300.18	0.000	305.38	0.000
300.28	0.000	305.48	0.000
300.38	0.000	305.58	0.000
300.48	0.000	305.68	0.000
300.58	0.000	305.78	0.000
300.68	0.000	305.88	0.000
300.78	0.000	305.98	0.000
300.88	0.000	306.08	0.000
300.98	0.000	306.18	0.000
301.08	0.000	306.28	0.000
301.18	0.000	306.38	0.000
301.28	0.000	306.48	0.000
301.38	0.000	306.58	0.000
301.48	0.000	306.68	0.000
301.58	0.000	306.78	0.000
301.68	0.000	306.88	0.000
301.78	0.000	306.98	0.000
301.88	0.000	307.08	0.000
301.98	0.000	307.18	0.000
302.08	0.000	307.28	0.000
302.18	0.000	307.38	0.000
302.28	0.000	307.48	0.000
302.38	0.000	307.58	0.000
302.48	0.000	307.68	0.000
302.58	0.000	307.78	0.000
302.68	0.000	307.88	0.000
302.78	0.000	307.98	0.000
302.88	0.000	308.08	0.000
302.98	0.000	308.18	0.000
303.08	0.000	308.28	0.000
303.18	0.000	308.38	0.000
303.28	0.000	308.48	0.000
303.38	0.000	308.58	0.000
303.48	0.000	308.68	0.000
303.58	0.000		
303.68	0.000		

Summary for Link DP-1: Design Point - 1

Inflow Area = 1.096 ac, 0.00% Impervious, Inflow Depth = 0.15" for 90% WQv event
Inflow = 0.08 cfs @ 12.20 hrs, Volume= 0.014 af
Primary = 0.08 cfs @ 12.20 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: Design Point - 1



Hydrograph for Link DP-1: Design Point - 1

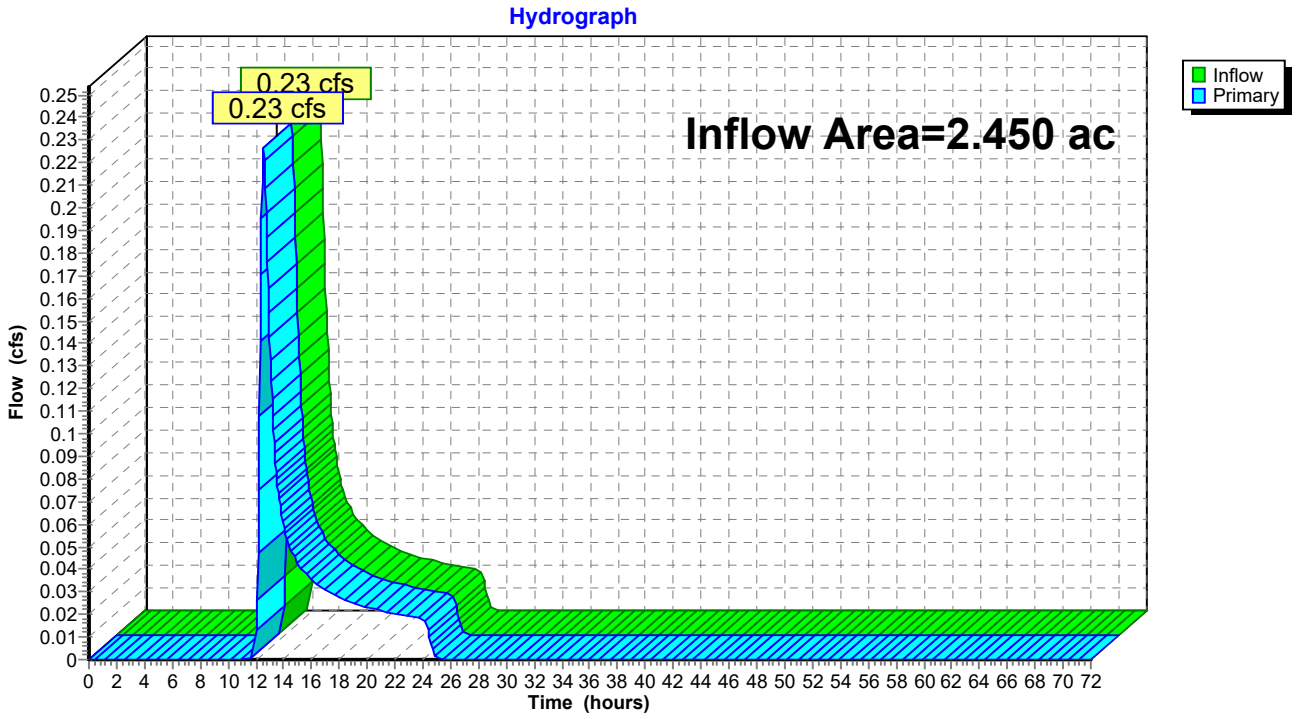
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00
12.00	**0.01**	0.00	**0.01**
13.00	**0.03**	0.00	**0.03**
14.00	0.02	0.00	0.02
15.00	0.01	0.00	0.01
16.00	0.01	0.00	0.01
17.00	0.01	0.00	0.01
18.00	0.01	0.00	0.01
19.00	0.01	0.00	0.01
20.00	0.01	0.00	0.01
21.00	0.01	0.00	0.01
22.00	0.01	0.00	0.01
23.00	0.01	0.00	0.01
24.00	0.01	0.00	0.01
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-2: Design Point - 2

Inflow Area = 2.450 ac, 0.00% Impervious, Inflow Depth = 0.22" for 90% WQv event
Inflow = 0.23 cfs @ 12.56 hrs, Volume= 0.044 af
Primary = 0.23 cfs @ 12.56 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: Design Point - 2



Hydrograph for Link DP-2: Design Point - 2

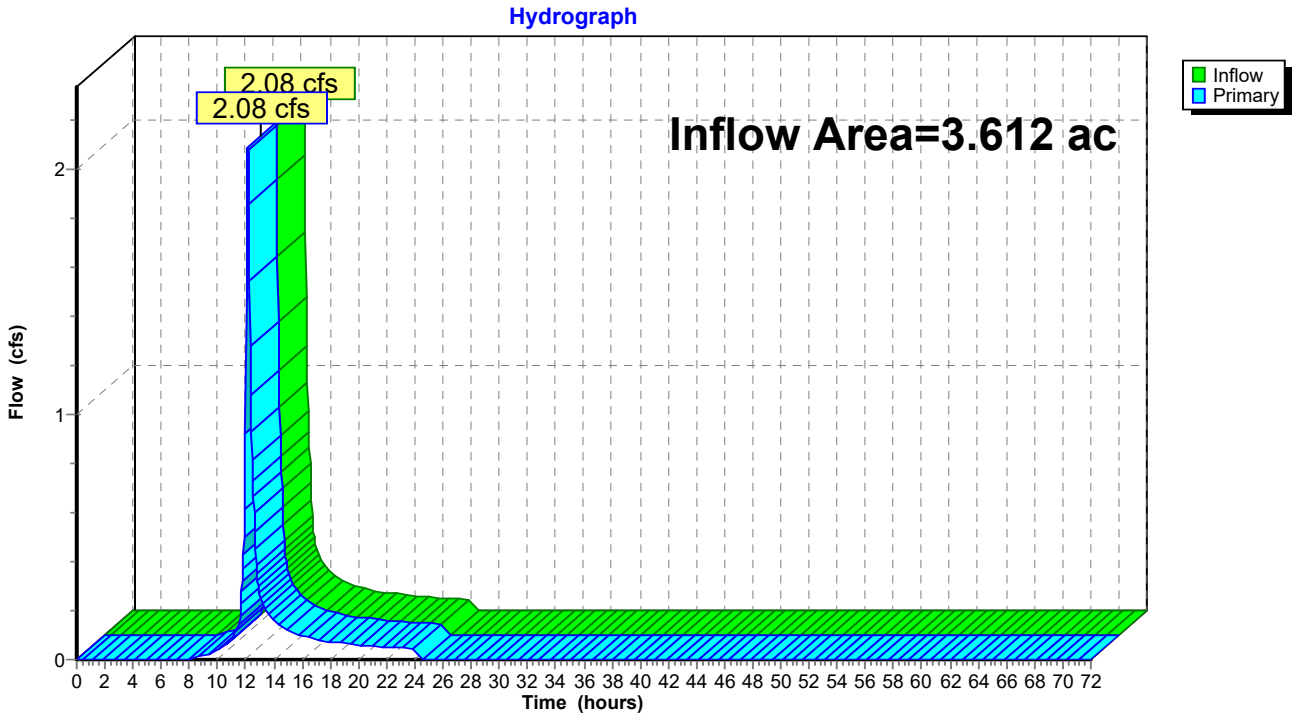
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	52.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
12.00	**0.01**	0.00	**0.01**	64.00	0.00	0.00	0.00
13.00	**0.14**	0.00	**0.14**	65.00	0.00	0.00	0.00
14.00	0.06	0.00	0.06	66.00	0.00	0.00	0.00
15.00	0.04	0.00	0.04	67.00	0.00	0.00	0.00
16.00	0.04	0.00	0.04	68.00	0.00	0.00	0.00
17.00	0.03	0.00	0.03	69.00	0.00	0.00	0.00
18.00	0.03	0.00	0.03	70.00	0.00	0.00	0.00
19.00	0.03	0.00	0.03	71.00	0.00	0.00	0.00
20.00	0.02	0.00	0.02	72.00	0.00	0.00	0.00
21.00	0.02	0.00	0.02				
22.00	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				

Summary for Link DP-3: Design Point - 3

Inflow Area = 3.612 ac, 68.49% Impervious, Inflow Depth = 0.60" for 90% WQv event
Inflow = 2.08 cfs @ 12.14 hrs, Volume= 0.181 af
Primary = 2.08 cfs @ 12.14 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: Design Point - 3



Hydrograph for Link DP-3: Design Point - 3

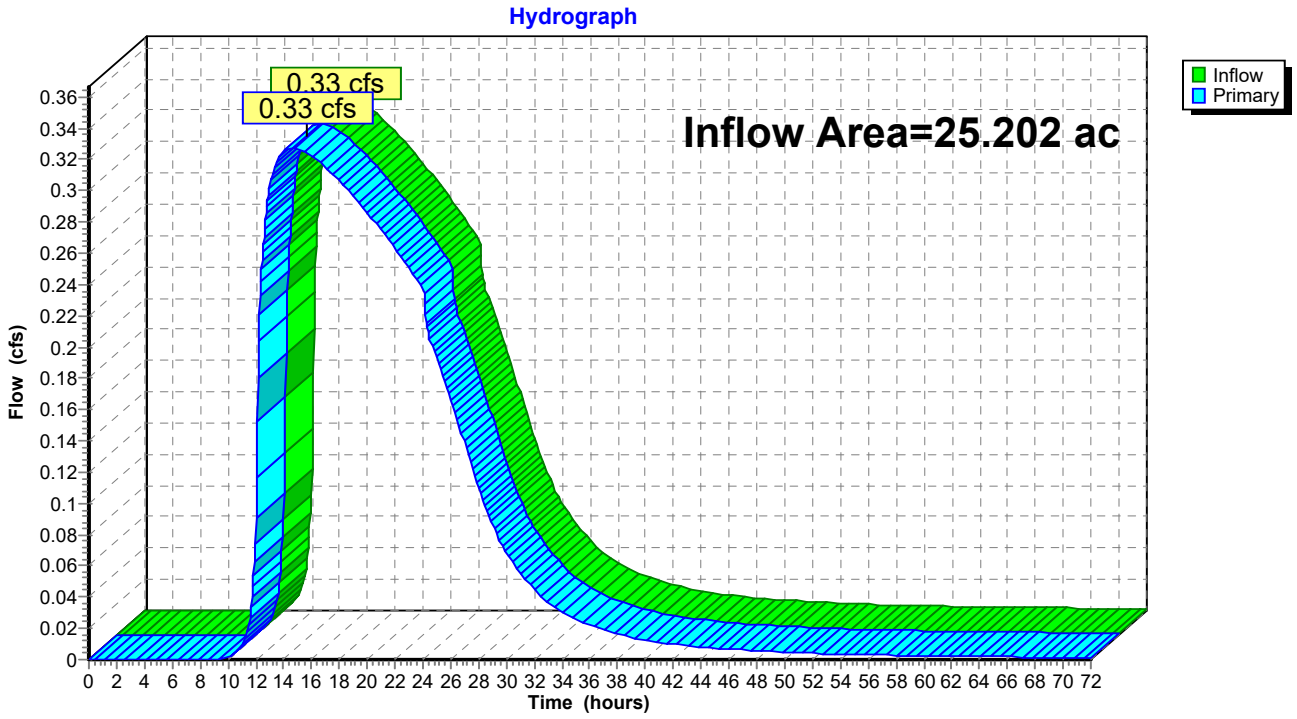
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.02	0.00	0.02
10.00	0.04	0.00	0.04
11.00	0.09	0.00	0.09
12.00	**0.92**	0.00	**0.92**
13.00	**0.27**	0.00	**0.27**
14.00	0.16	0.00	0.16
15.00	0.12	0.00	0.12
16.00	0.10	0.00	0.10
17.00	0.08	0.00	0.08
18.00	0.07	0.00	0.07
19.00	0.07	0.00	0.07
20.00	0.06	0.00	0.06
21.00	0.06	0.00	0.06
22.00	0.05	0.00	0.05
23.00	0.05	0.00	0.05
24.00	0.05	0.00	0.05
25.00	0.00	0.00	0.00
26.00	0.00	0.00	0.00
27.00	0.00	0.00	0.00
28.00	0.00	0.00	0.00
29.00	0.00	0.00	0.00
30.00	0.00	0.00	0.00
31.00	0.00	0.00	0.00
32.00	0.00	0.00	0.00
33.00	0.00	0.00	0.00
34.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00
36.00	0.00	0.00	0.00
37.00	0.00	0.00	0.00
38.00	0.00	0.00	0.00
39.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00
41.00	0.00	0.00	0.00
42.00	0.00	0.00	0.00
43.00	0.00	0.00	0.00
44.00	0.00	0.00	0.00
45.00	0.00	0.00	0.00
46.00	0.00	0.00	0.00
47.00	0.00	0.00	0.00
48.00	0.00	0.00	0.00
49.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

Summary for Link DP-4: DP-4

Inflow Area = 25.202 ac, 25.46% Impervious, Inflow Depth > 0.19" for 90% WQv event
Inflow = 0.33 cfs @ 14.65 hrs, Volume= 0.397 af
Primary = 0.33 cfs @ 14.65 hrs, Volume= 0.397 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: DP-4



Hydrograph for Link DP-4: DP-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
1.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00
11.00	0.01	0.00	0.01
12.00	0.09	0.00	0.09
13.00	0.30	0.00	0.30
14.00	**0.33**	0.00	**0.33**
15.00	**0.33**	0.00	**0.33**
16.00	0.32	0.00	0.32
17.00	0.32	0.00	0.32
18.00	0.31	0.00	0.31
19.00	0.30	0.00	0.30
20.00	0.29	0.00	0.29
21.00	0.27	0.00	0.27
22.00	0.26	0.00	0.26
23.00	0.25	0.00	0.25
24.00	0.24	0.00	0.24
25.00	0.19	0.00	0.19
26.00	0.17	0.00	0.17
27.00	0.14	0.00	0.14
28.00	0.11	0.00	0.11
29.00	0.09	0.00	0.09
30.00	0.07	0.00	0.07
31.00	0.06	0.00	0.06
32.00	0.04	0.00	0.04
33.00	0.04	0.00	0.04
34.00	0.03	0.00	0.03
35.00	0.03	0.00	0.03
36.00	0.02	0.00	0.02
37.00	0.02	0.00	0.02
38.00	0.02	0.00	0.02
39.00	0.01	0.00	0.01
40.00	0.01	0.00	0.01
41.00	0.01	0.00	0.01
42.00	0.01	0.00	0.01
43.00	0.01	0.00	0.01
44.00	0.01	0.00	0.01
45.00	0.01	0.00	0.01
46.00	0.01	0.00	0.01
47.00	0.01	0.00	0.01
48.00	0.01	0.00	0.01
49.00	0.01	0.00	0.01
50.00	0.00	0.00	0.00
51.00	0.00	0.00	0.00
52.00	0.00	0.00	0.00
53.00	0.00	0.00	0.00
54.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00
56.00	0.00	0.00	0.00
57.00	0.00	0.00	0.00
58.00	0.00	0.00	0.00
59.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00
61.00	0.00	0.00	0.00
62.00	0.00	0.00	0.00
63.00	0.00	0.00	0.00
64.00	0.00	0.00	0.00
65.00	0.00	0.00	0.00
66.00	0.00	0.00	0.00
67.00	0.00	0.00	0.00
68.00	0.00	0.00	0.00
69.00	0.00	0.00	0.00
70.00	0.00	0.00	0.00
71.00	0.00	0.00	0.00
72.00	0.00	0.00	0.00

APPENDIX E

WATER QUALITY VOLUME CALCULATIONS, RUNOFF REDUCTION VOLUME CALCULATIONS & CHANNEL PROTECTION CALCULATIONS

(Revised to Only Include Phase 2 Information)

NOI QUESTIONS

#	eNOI Question 49	Reported Value	
		cf	af
49	Total Water Quality Volume (WQv) Required	39111	0.898
49	Total RRV Provided	9140	0.210
49	Is RRv Provided ≥WQv Required?	No	
49	Minimum RRv	7797	0.179
49	Is RRv Provided ≥ Minimum RRv Required?	Yes	
49	Total WQv Treated	35392	0.812
49	Sum of Volume Reduced & Treated	44532	1.022
49	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Step 1 - Site Planning

	Practice	Description	Applicable	Project Specific Evaluation
Preservation of Natural Features and Conservation Design	**Preservation of Undisturbed Areas**	Delineate and protect undisturbed forests, native vegetated areas, riparian corridors, water bodies, wetlands, and natural terrain.	Yes	The project does propose permanent conservation of this area at this time. Owner will be putting existing undevelopable land into a conservation easement.
	Preservation of Buffers	Delineate and protect naturally vegetated buffers along perennial streams, rivers, shorelines, and wetlands.	No	
	Reduction of Clearing and Grading	Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	Yes	Clearing and grading will be limited to the area of disturbance and will be minimized to the greatest extent practical. The limits of all proposed clearing will be demarcated in the field with orange construction fencing, prior to construction, to prevent unnecessary removal of trees.
	Locating Development in Less Sensitive Areas	Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	No	
	Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	No	
	Soil Restoration	Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.	Yes	All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual.
	Roadway Reduction	Minimize roadway widths and lengths, below local requirements, to reduce site impervious area	No	

Step 1 - Site Planning

Reduction of Impervious Cover	**Sidewalk Reduction**	Minimize sidewalk lengths and widths, below local requirements, to reduce site impervious area	No	
	Driveway Reduction	Minimize driveway lengths and widths, below local requirements, to reduce site impervious area	No	
	Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	Yes	No cul-de-sacs are proposed as part of this project.
	Building Footprint Reduction	Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	No	
	Parking Reduction	Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, reducing stall dimensions below local requirements, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	No	

Step 2 - Calculate Water Quality Volume

Is this project subject to Section 4.3 of the NYS Design Manual for Enhanced Phosphorus Removal?	No
What is the nature of this construction project?	Redevelopment with increase in impervious area

Design Point:	DP-4		
P=	1.50	inches	*Enter 90% Rainfall Event as P*

Calculate Required WQv

Drainage Area Number	Contributing Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (cf)	SMP Description
1	4.13		0	0.05		Conservation of Natural Areas
2	1.00	0.83	83	0.80	4,340	Filtration Bioretention
3	19.55	5.78	30	0.32	33,647	Micropool Extended Detention Pond
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total	24.68	6.61	27	0.29	**39111**	**Required WQv**

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

Practice		Description	Applicable	Project Specific Evaluation
RR Techniques	**Conservation of Natural Areas (RR-1)**	Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas by permanently conserving these areas on a site. Undisturbed natural areas include: forest retention areas; reforestation areas; stream and river corridors; shorelines; wetlands, vernal pools, and associated vegetated buffers; and undisturbed open space.	Yes	Existing lands unable to developed in the future are to remain wild and protect the natural landscape that remains on property. Existing Federal Wetlands exist on property and are to be protected as part of the project.
	Sheet Flow to Riparian Buffer/Filter Strip (RR-2)	Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from some areas of a development project.	No	Sheet flow to riparian buffers or grass filter strips is not proposed at this time. The project proposes treatment by RR techniques, Standard SMPs with RRv capacity, or Standard SMPs without RRv capacity.
	Tree Planting/Tree Pit/Tree Trench (RR-3)	Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, conservation areas and erosion and sediment control.	No	
	Disconnection of Rooftop Runoff (RR-4)	Direct runoff from rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates.	No	
	Vegetated Swale (RR-5)	The natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration.	No	
	Rain Garden (RR-6)	Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression.	No	

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

RR Techniques	**Stormwater Planter (RR-7)**	Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality.	No	
	Rainwater Harvesting System (RR-8)	Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities.	No	
	Porous Pavement (RR-9)	Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils.	No	
	Green Roof (RR-10)	Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system.	No	
	Stream Daylighting (RR-11)	Stream Daylight previously-culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads.	No	
	Infiltration Trench (I-1)	An infiltration practice that stores the water quality volume in the void spaces of a gravel trench before it is infiltrated into the ground.	No	
	Infiltration Basin (I-2)	An infiltration practice that stores the water quality volume in a shallow depression, before it is infiltrated it into the ground.	No	
	Dry Well (I-3)	An infiltration practice similar in design to the infiltration trench, and best suited for treatment of rooftop runoff.	No	

Step 3 - Evaluation of RR Techniques and Standard SMPs with RRv Capacity

Standard SMPs with RRv Capacity	**Underground Infiltration System (I-4)**	An infiltration practice below grade that stores the water quality volume in pre-manufactured pipes, vaults or other modular structures, before it is infiltrated into the ground.	No	Site Soils are not appropriate for underground infiltration for RRv or WQv treatment.
	Infiltration Bioretention (F-4)	A shallow depression that treats stormwater as it flows through a soil matrix, before it is infiltrated into the ground.	No	
	Filtration Bioretention (F-5)	A shallow depression that treats stormwater as it flows through a soil matrix and is returned to the storm drain system.	Yes	Fitration Bioretention is treating the runoff from the bus loop and the area around the front of the new building.
	Bioslope (F-6)	Permeable engineered soil media that is installed along embankments or other slopes, designed to capture and treat stormwater runoff from adjacent paved areas.	No	
	Dry Swale (O-1)	An open drainage channel or depression explicitly designed to detain and promote the filtration of stormwater runoff into the soil media.	No	

Steps 3 and 5 - Apply RR Techniques and Standard SMPs

Runoff Reduction Volume and Treated Volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**(cf)**	**(cf)**
RR Techniques	Conservation of Natural Areas	RR-1	4.13		6,545	
	Sheet Flow to Riparian Buffer/Filter Strip	RR-2	0.00	0.00	0	
	Tree Planting/Tree Pit/Tree Trench	RR-3	0.00	0.00	0	
	Disconnection of Rooftop Runoff	RR-4		0.00	0	
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rainwater Harvesting Systems	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Extensive & Intensive)	RR-10	0.00	0.00	0	
	Stream Daylighting	RR-11				
Standard SMPs w/ RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4	0.00	0.00	0	0
	Infiltration Bioretention	F-4	0.00	0.00	0	0
	Filtration Bioretention	F-5	1.00	0.83	2,595	1,745
	Bioslope	F-6	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention	P-1	19.55	5.78		33,647
	Wet Pond	P-2	0.00	0.00		0
	Wet Extended Detention	P-3	0.00	0.00		0
	Multiple Pond System	P-4	0.00	0.00		0
	Shallow Wetland	W-1	0.00	0.00		0
	Extended Detention Shallow Wetland	W-2	0.00	0.00		0
	Pond/Wetland System	W-3	0.00	0.00		0
	Pocket Wetland	W-4	0.00	0.00		0
	Gravel Wetland	W-5	0.00	0.00		0
	Surface Sand Filter	F-1	0.00	0.00		0
	Underground Sand Filter	F-2	0.00	0.00		0
	Perimeter Sand Filter	F-3	0.00	0.00		0
	Wet Swale	O-2	0.00	0.00		0
Alt. SMPs	Flow Based Alternative Practice	-	0.00	0.00		0
	Volume Based Alternative Practice	-				
	Totals by RR Technique	→	4.13	0.00	6,545	
	Totals by Standard SMP w/RRV	→	1.00	0.83	2,595	1,745
	Totals by Standard SMP	→	19.55	5.78		33,647
	Totals by Alternative SMP	→	0.00	0.00		0
	Totals (RR Techniques + all SMPs)	→	24.68	6.61	9,140	35,392

Step 4 - Calcuate Minimum RRv Required

Enter the Soils Data for the entire site		
Hydrologic Soil Group	Acres	S
A		55%
B	2.00	40%
C	3.00	30%
D	20.00	20%
Total Area	25	

Calculate the Minimum RRv		
S =	**0.23**	
Impervious =	6.61	*acres*
Precipitation	1.50	*inches*
Rv	0.95	
Minimum RRv	**0.179**	***af***
	7797	cf

Conservation of Natural Areas (RR-1)

Design Point:	**DP-4**	**Drainage Area Number**	1

Design Criteria		
Does the conservation area proposed have a minimum contiguous area of 10,000	Yes	
Is the conservation area permanently protected through establishment of a legal conservation easement?	Yes	
Does the conservation area receive runoff from existing or new impervious areas?	No	
Is Sheet Flow to Riparian Buffer or another area based practice already being used for this area?	No	

Sizing Criteria

	Contributing Area (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)
Required WQv	24.68	6.61	27	0.29	39,111	1.50
Subtract Area Conserved	4.13					
Area Reduction WQv	20.55	6.61		0.29	32,566	1.50

Area Reduction Adjustments

RRv Provided	**6,545**	**cf**

Conservation of Natural Areas (RR-1)

Total Area	4.13	acres
Total RRv Provided	6,545	cf

Stormwater Ponds

Design Point:	DP-4

Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)	**Description**
3	19.55	5.78	30	0.32	33,647	1.50	Micropool Extended Detention Pond

Select pond type	Micropool Extended Detention

Design Criteria					
Is the pond located within jurisdictional waters?	No				
Enter the natural slope of the pond area (%)	15				
Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D).	0				
Has an impermeable liner been provided?	Yes				
Is the pond located within a sole source aquifer?	No				
Is the pond located within a designated hotspot?	No				
Enter depth to seasonal high water table (ft)	2				
Enter depth to sound bedrock (ft)	5				
List any drainage areas treated by other practices that will be directed to this practice.	7			Additional Areas	0
Is the contributing area less than the minimum contributing area?	No				
Will the pond discharge to trout waters?	No				
Has a controlled outlet been provided?	Yes				
Has an emergency spillway been provided?	Yes				
Has pretreatment been provided per Section 6.1.3?	Yes				
Enter freeboard depth (ft)	1				
Enter side slopes above permanent pool (X:1)	4				
Enter aquatic bench slope (%)	10				
Enter aquatic bench slope to pond floor (X:1)	3				
Enter min. aquatic bench width provided (ft)	15				
Enter aquatic bench average width provided (ft)	15				
Enter aquatic bench depth (inches)	18				
Enter maintenance access slope (%)	15				
Enter maintenance access width (ft)	12				
Enter permanent pool depth (ft)	4				
Minimum permanent pool depth per Water Balance Calculation (ft)	4.00				

Sizing Criteria			
	Value	Units	Notes
Required Water Quality Volume	33647	cf	
Pretreatment WQv Provided	3365	cf	
Permanent Pool WQv Provided	13459	cf	
Extended Detention WQv Provided	20188	cf	

Determine the Water Quality Volume Treated		
Water Quality Volume Treated	**33,647**	**cf**

Stormwater Ponds

Design Point:	DP-4

Stormwater Ponds

Micropool Extended Detention

Total Area	19.55	acres
	19.55	acres
		acres
		acres
		acres
		acres
Total Impervious	5.78	acres
	5.78	acres
		acres
		acres
		acres
		acres
Total WQv Provided	33,647	cf
	33647	cf
		cf
		cf
		cf
		cf

Wet Pond

Total Area	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total Impervious	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total WQv Provided	0	cf
	0	cf
	0	cf
	0	cf
	0	cf
	0	cf

Wet Extended Detention

Total Area	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total Impervious	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total WQv Provided	0	cf
	0	cf
	0	cf
	0	cf
	0	cf
	0	cf

Multiple Pond System

Total Area	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total Impervious	0.00	acres
	0	acres
	0	acres
	0	acres
	0	acres
	0	acres
Total WQv Provided	0	cf
	0	cf
	0	cf
	0	cf
	0	cf
	0	cf

Stormwater Ponds

Filtration Bioretention (F-5)

Design Point:	DP-4

Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)	**Description**
2	1.00	0.83	83	0.80	4,340	1.50	Filtration Bioretention

Design Criteria		
Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D)	0.05	Underdrains required
Is the contributing area to the practice a stormwater hotspot?	No	
Is the practice the first in series for treatment of a Level 1 (Infiltration Restricted) hotspot?	No	
Is contributing area greater than max. contributing area?	No	
Enter depth to seasonal high water table (ft)	5	
Enter depth to bedrock (ft)	10	
Is pretreatment provided, in conformance with Section 6.4.3.1?	Yes	
Enter average height of ponding (ft)	0.5	
Enter depth of surface layer (inches)	3	
Enter depth of filter media (ft)	2.5	
Enter depth of drainage layer (inches)	10	
Enter slope of maintenance access (%)	5	
Enter width of maintenance access (ft)	24	

Sizing Criteria				
		Value	Units	Notes
Permeability Flow Rate	k	1	ft/day	
Filter Time	tf	2	days	
Required Filter Area	Af	1808	sf	
Enter Provided Filter Area	Af	2703	sf	
Recalculated Water Quality Volume (based on provided filter area)	WQv calc	6487.2	cf	

Calculate Runoff Reduction			
RRv Provided	**2,595**	***cf***	
WQv Treated	1745	cf	This is the portion of the WQv that is not reduced in the practice.

Filtration Bioretention (F-5)

Total Area	1.00	acres
Total Impervious	0.83	acres
Total RRv Provided	2,595	cf
Total WQv Provided	1,745	cf

Project:	**R24.16941.00**
Project Name:	**OUFSD New 7&8 Building**
Location:	**Town of Ossining**
County:	**Westchester**
State:	**NY**
Date:	**4/20/2026** **Revised:**

Water Quality Calculations

$$WQ_V = \frac{P * Rv * A}{12}$$

Where:
WQ_v = Water Quality
P = 90% Rainfall Event Number (see Figure 4.1)
I = Impervious Cover (Percent)
Rv = 0.05 + 0.009 (I)
A = site area in acres

Note: This is only area contributing to WQv to be treated in the pond.

Site Area (acres)	Prop. Impervious Area (acres)	Total Impervious (acres)	I (%)	Rv	P	WQ_v (acre-feet)	WQ_v (ft^3)
19.55	**5.78**	**5.78**	30	0.32	**1.5**	0.772	33647

Project:	**R24.16941.00**
Project Name:	**OUFSD New 7&8 Building**
Location:	**Town of Ossining**
County:	**Westchester**
State:	**NY**
Date:	**4/20/2026 Revised:**

Stormwater Pond Sizing

SWP-1:

Water Quality Volume, WQv, to be Treated (acre-ft) =	0.772
Water Quality Volume, WQv, to be Treated, (ft^3) =	33647.4

Type of Pond to be Used:

MICROPOOL EXTENDED DETENTION POND (P-1)

Pre-Treatment Volume: Size of Forebay

Volume Required by Forebay (acre-ft) =	0.077
Volume Required by Forebay (ft^3) =	3364.7

$$SizeofForebay = 10\% * WQ_v$$

Permanent Pool Volume:

Percent of WQ_v to be contained by Permanent Pool = **(see Table 6.1 in the NYS Stormwater Design Manual)**		**68%**
Permanent Pool Volume (acre-ft) =	0.525	
Permanent Pool Volume (ft^3) =	22880.2	

$$PermanentPoolVolume = \%ofWQ_vTreated * WQ_v$$

Extended Detention Volume:

Percent of WQ_v to be contained by Extended Detention = **(see Table 6.1 in the NYS Stormwater Design Manual)**		**31%**
Extended Detention Volume (acre-ft) =	0.239	
Extended Detention Volume (ft^3) =	10430.7	

$$ExtendedDetentionVolume = \%ofWQ_vTreated * WQ_v$$

Set Forebay W_{sel} (ft) =	**286.50**	Provided		Required	* all values of provided must be greater than
Volume of Forebay at W_{sel} (acre-ft) =		**0.155**	**> or =**	0.077	or equal to the required, or additional measures
Volume of Permanent Pool at W_{sel} (ft^3) =		**6767.0**	**> or =**	3364.7	are required

Set Permanent Pool W_{sel} (ft) =	**286.50**	Provided		Required	* all values of provided must be greater than
Cum. Volume at Permanent Pool W_{sel} (acre-ft) =	**0.421**	**> or =**		0.603	or equal to the required, or additional measures
Cum. Volume at Permanent Pool W_{sel} (ft^3) =	**18337.0**	**> or =**		22880.2	are required

Set Extended Detention W_{sel} (ft) =	**287.50**	Provided		Required	* all values of provided must be greater than
Cum. Volume at Ext. Detention W_{sel} (acre-ft) =	**0.855**	**> or =**		0.842	or equal to the required, or additional measures
Cum. Volume at Ext. Detention W_{sel} (ft^3) =	**37243.0**	**> or =**		33310.9	are required

**Refer to HydroCAD output for weir & orifice sizing*

Orifice Sizing:

$$AverageEDReleaseRate = \frac{EDvolume * 43560}{24 * 3600}$$

WQv - ED Orifice to release =	0.239	acre-ft over 24 hours
Average ED release rate (ft^3/s) =	0.121	
Invert of WQv - ED Orifice set W_{sel} of (ft) =		**286.50**
Average Head (ft) =		0.5

$$AverageHead = \frac{ExtendedDetentionW_{sel} - InvertofWQ_vED_{orifice}}{2}$$

Cross-Sectional Area of Orifice, A (ft^2) =	0.035
Diameter of Orifice, D (ft) =	0.213
Diameter of Orifice, D (inches) =	0.426

Rounded Diameter of Orifice, D (inches) =	1.0

* Use a 4" Diameter Orifice with a Gate Valve to achieve equivalent diameters for orifices less than 4" in diameter use the same methodology for odd sized orifices.

$$A = \frac{Q}{C * (2gh)^{0.5}}$$

Where:
A = Cross-Sectional Area, ft^2
Q = Average ED release rate, ft^3/s
C = Discharge Coefficient, 0.6
G = Gravitational Acceleration, 32.174 ft/s^2
H = Average Head, ft

$$D = \sqrt{\frac{4 * A}{\pi}}$$

Where:
D = Diameter of Orifice, ft
A = Cross-Sectional Area, ft^2

Project:	**R24.16941.00**
Project Name:	**OUFSD New 7&8 Building**
Location:	**Town of Ossining**
County:	**Westchester**
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Date:	**4/20/2026** **Revised:**

Channel Protection Storage Volume

DA-4

S = 1000/CN

Ia=0.2 x S

$V_s/V_r = 0.682-1.43(q_0/q_1)+1.64(q_0/q_1)^2-0.804(q_0/q_1)^3$

$V_s= (V_s/V_r)(Q_d)(A)/12$

$P_{1\text{-}yr}$ (in) =	2.78			**Site Area (acres) =**	**19.55**					
CN	**Ia**	**$Ia/P_{1\text{-}yr}$**	**T_c (hrs)**	**q_u (csm/in) ,(Exhibit 4-III TR-55 Manual)**	**T (hrs)**	**q_o/q_i (from figure 8.5)**	**V_S/V_R (Appendix B)**	**Qd (in)**	**$V_s = Cp_v$ (acre-feet)**	**V_s (ft^3)**
84	**0.381**	**0.138**	0.293	475	24	0.041	**0.628**	1.34	**1.3710**	**59719.73**

Average Release Rate

DA-4

The above acre volume is to be released over a 24 hour period (12 hours if released to a trout stream).

$$Average\,\mathrm{Re}\,leaseRate = \frac{(V_s * 43560\,ft^2/ac)}{(24hrs * 3600\,\mathrm{sec}/hr)}$$

Average Release Rate (cfs) =	**0.691**

Project:	**R24.16941.00**
Project Name:	**OUFSD New 7&8 Building**
Location:	**Town of Ossining**
County:	**Westchester**
State:	**NY**
Date:	**4/20/2026** **Revised:**

Overbank Flood Protection Volume, (Qp_{10})

Design Point 4:

Q = Post Development Runoff Volume

		Site Area (acres) =	25.2				
q_{i10} (cfs), (post-developed)	q_{o10} (cfs), (pre developed)	$(q_{o10})/(q_{i10})$	CN, (post development)	Vs/Vr, (see figure 8.6)	Q	Vs (acre-feet)	Vs (ft^3)
56.62	29.36	0.519	77.32	0.270	5.241	1.417	61721.738

Project:	**R24.16941.00**		
Project Name:	**OUFSD New 7&8 Building**		
Location:	**Town of Ossining**		
County:	**Westchester**		
State:	**NY**		
Date:	**4/20/2026**	**Revised:**	**June 2025**

Extreme Flood Protection Volume, (Q_f)

Design Point 4:

Q = post-development total storm runoff volume (acre-feet)

		Site Area (acres) =	**25.2**				
q_{i100} (cfs), (post-developed)	**q_{o100} (cfs), (pre developed)**	**$(q_{o100})/(q_{i100})$**	**CN, (post development)**	**Vs/Vr, (see figure 8.6)**	**Q (acre-feet)**	**Vs (acre-feet)**	**Vs (ft^3)**
114.75	**64.64**	**0.563**	**77**	**0.254**	**12.216**	**3.105**	**135242.78**

APPENDIX F

SOIL REPORT & GEOTECHNICAL REPORTS

(Updated with Additional Geotechnical Information)

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
ChE—Charlton loam, 25 to 35 percent slopes														
Charlton	80	B	0-8	Loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 5	65-95-95	50-92-92	30-75-80	20-55-65	15-20-25	NP-3 -5
			8-24	Sandy loam, gravelly fine sandy loam, gravelly loam	ML, SM	A-2, A-4	0- 0- 0	0- 2- 15	65-92-95	50-85-92	30-50-80	20-30-65	15-20-25	NP-2 -3
			24-60	Gravelly sandy loam, gravelly fine sandy loam, loam, sandy loam	GM, SM	A-2, A-4	0- 0- 0	0- 2- 15	50-92-95	35-85-92	15-50-80	10-30-55	—	NP

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
CrC—Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky														
Charlton, very stony	50	B	0-2	Slightly decomposed plant material, highly decomposed plant material, moderately decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			2-4	Fine sandy loam, loam, sandy loam, gravelly loam, gravelly sandy loam	GC-GM, SC-SM, GM, SM	A-1-a, A-1-b, A-2-4, A-4, A-5	0- 0- 9	0- 0- 18	48-100-100	31-84-84	24-72-77	13-41-46	0-45 -80	NP-4 -8
			4-27	Gravelly fine sandy loam, loam, sandy loam, fine sandy loam, gravelly loam, very gravelly sandy loam, gravelly sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, OL, SC, SM	A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7-5	0- 0- 6	0- 3- 13	59-87-100	46-79-91	37-68-88	22-41-57	0-22 -41	NP-6 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
			27-65	Gravelly fine sandy loam, loam, sandy loam, very gravelly sandy loam, fine sandy loam, gravelly loam, gravelly sandy loam	GC-GM, SC-SM, GC, GM, SC, SM	A-1-b, A-2-4, A-4	0- 0- 6	0- 7- 25	49-76-100	36-68-92	30-60-82	16-35-47	0-22 -24	NP-6 -6
Chatfield, very stony	30	B	0-1	Moderately decomposed plant material, slightly decomposed plant material, highly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			1-2	Cobbly fine sandy loam, cobbly loam, gravelly fine sandy loam, gravelly loam, gravelly sandy loam, very gravelly loam, very gravelly sandy loam, loam, silt loam, stony fine sandy loam, stony loam, very fine sandy loam, highly organic fine sandy loam, fine sandy loam	GC-GM, GP-GC, GP-GM, SC-SM, SP-SC, SP-SM, SW-SC, SW-SM, GW-GM, GW-GC, GM, SM	A-1-a, A-1-b, A-2-4, A-2-5, A-4, A-5	0- 0- 7	0- 0- 29	56-95-95	27-88-88	21-75-80	11-43-48	0-42 -80	NP-4 -8
			2-30	Very fine sandy loam, stony loam, stony fine sandy loam, silt loam, loam, gravelly sandy loam, gravelly loam, gravelly fine sandy loam, fine sandy loam, cobbly loam, cobbly fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7-5	0- 0- 7	0- 8- 29	70-82-94	40-74-92	32-63-89	18-38-57	0-22 -41	NP-6 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
CsD—Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky														
Chatfield, very stony	45	B	0-1	Slightly decomposed plant material, moderately decomposed plant material, highly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			1-2	Highly organic fine sandy loam, stony fine sandy loam, stony loam, very gravelly loam, cobbly fine sandy loam, gravelly loam, cobbly loam, gravelly sandy loam, gravelly fine sandy loam, silt loam, very fine sandy loam, loam, very gravelly sandy loam, fine sandy loam	GC-GM, GP-GC, GP-GM, SC-SM, SP-SC, SP-SM, SW-SC, SW-SM, GW-GM, GW-GC, GM, SM	A-1-a, A-1-b, A-2-4, A-2-5, A-4, A-5	0- 0- 7	0- 0- 29	56-95-95	27-88-88	21-75-80	11-43-48	0-42 -80	NP-4 -8

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
			2-30	Fine sandy loam, loam, very fine sandy loam, silt loam, gravelly fine sandy loam, gravelly sandy loam, cobbly loam, gravelly loam, cobbly fine sandy loam, stony loam, stony fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7-5	0- 0- 7	0- 8- 29	70-82-94	40-74-92	32-63-89	18-38-57	0-22 -41	NP-6 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
			30-40	Bedrock	—	—	—	—	—	—	—	—	—	—
Charlton, very stony	35	B	0-2	Slightly decomposed plant material, highly decomposed plant material, moderately decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			2-4	Sandy loam, fine sandy loam, gravelly sandy loam, loam, gravelly loam	GC-GM, SC-SM, GM, SM	A-1-a, A-1-b, A-2-4, A-4, A-5	0- 0- 9	0- 0- 18	48-100-100	31-84-84	24-72-77	13-41-46	0-45 -80	NP-4 -8
			4-27	Very gravelly sandy loam, gravelly fine sandy loam, sandy loam, gravelly sandy loam, loam, gravelly loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, OL, SC, SM	A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7-5	0- 0- 6	0- 3- 13	59-87-100	46-79-91	37-68-88	22-41-57	0-22 -41	NP-6 -11
			27-65	Gravelly loam, loam, fine sandy loam, sandy loam, gravelly fine sandy loam, gravelly sandy loam, very gravelly sandy loam	GC-GM, SC-SM, GC, GM, SC, SM	A-1-b, A-2-4, A-4	0- 0- 6	0- 7- 25	49-76-100	36-68-92	30-60-82	16-35-47	0-22 -24	NP-6 -6

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	**Pct. of map unit**	**Hydrologic group**	**Depth**	**USDA texture**	**Classification**		**Pct Fragments**		**Percentage passing sieve number—**				**Liquid limit**	**Plasticity index**
					Unified	**AASHTO**	**>10 inches**	**3-10 inches**	**4**	**10**	**40**	**200**		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
Ff—Fluvaquents-Udifluvents complex, frequently flooded														
Fluvaquents	50	A/D	0-5	Gravelly silt loam	CL, GM, ML, SC, SM	A-1, A-2, A-4	0- 0- 0	0- 5- 10	60-80-100	55-78-100	30-65-100	10-50-90	15-20-25	NP-8-15
			5-70	Silty clay loam, very gravelly silt loam, gravelly sand	SC-SM, CL, GC, GM, ML	A-1, A-2, A-4, A-6	0- 0- 0	0- 8- 15	35-68-100	30-65-100	15-58-100	5-48- 90	15-23-30	NP-10-20
Udifluvents	35	A	0-4	Gravelly silt loam	CL, GM, ML, SC, SM	A-1, A-2, A-4	0- 0- 0	0- 5- 10	60-70-80	55-65-75	30-53-75	10-38-65	15-20-25	NP-10-20
			4-70	Very gravelly sand, very gravelly loam, silty clay loam	CL, GC, GM, ML	A-1, A-2, A-4, A-6	0- 0- 0	0- 8- 15	35-68-100	30-65-100	15-58-100	5-48- 90	15-23-30	NP-10-20

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
LcB—Leicester loam, 3 to 8 percent slopes, stony														
Leicester, somewhat poorly drained	50	A/D	0-8	Loam	GM, ML, SM	A-2, A-4	0- 0- 0	0- 0- 7	85-95-95	80-92-92	55-80-85	30-60-70	15-20 -25	NP-3 -5
			8-26	Sandy loam, loam, gravelly fine sandy loam	GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 15	65-95-95	50-92-92	30-60-80	15-30-65	15-20 -25	NP
			26-60	Sandy loam, very gravelly sandy loam, gravelly fine sandy loam	GM, SM	A-1, A-2, A-4	0- 0- 0	0- 2- 15	60-90-92	35-85-85	20-50-65	15-30-45	—	NP
Leicester, poorly drained	35	A/D	0-8	Loam	GM, ML, SM	A-2, A-4	0- 0- 0	0- 0- 7	85-95-95	80-92-92	55-80-85	30-60-70	15-20 -25	NP-3 -5
			8-26	Sandy loam, loam, gravelly fine sandy loam	GM, ML, SM	A-1, A-2, A-4	0- 0- 0	0- 0- 15	65-95-95	50-92-92	30-60-80	15-30-65	15-20 -25	NP
			26-60	Sandy loam, very gravelly sandy loam, gravelly fine sandy loam	GM, SM	A-1, A-2, A-4	0- 0- 0	0- 2- 15	60-90-92	35-85-85	20-50-65	15-30-45	—	NP

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
PnC—Paxton fine sandy loam, 8 to 15 percent slopes														
Paxton	85	C	0-8	Gravelly sandy loam, fine sandy loam, loam, gravelly fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, OH, OL, SC, SM	A-1-b, A-2-4, A-2-5, A-4, A-5	0- 0- 21	0- 0- 21	49-90-90	47-90-90	36-76-86	19-44-56	0-30 -60	NP-5 -10
			8-15	Loam, gravelly sandy loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 7	0- 0- 14	52-91-91	50-91-91	38-76-87	20-44-57	0-21 -32	NP-3 -11
			15-26	Loam, gravelly sandy loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 13	56-85-92	55-85-92	41-71-88	22-41-57	0-19 -29	NP-3 -11
			26-65	Gravelly sandy loam, loam, gravelly coarse sandy loam, gravelly fine sandy loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 12	61-70-94	59-69-93	45-58-90	24-34-58	0-18 -28	NP-3 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
PnD—Paxton fine sandy loam, 15 to 25 percent slopes														
Paxton	85	C	0-8	Loam, gravelly fine sandy loam, gravelly sandy loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, OH, OL, SC, SM	A-1-b, A-2-4, A-2-5, A-4, A-5	0- 0- 21	0- 0- 21	49-90-90	47-90-90	36-76-86	19-44-56	0-30 -60	NP-5 -10
			8-15	Fine sandy loam, loam, gravelly sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 7	0- 0- 14	52-91-91	50-91-91	38-76-87	20-44-57	0-21 -32	NP-3 -11
			15-26	Fine sandy loam, gravelly sandy loam, loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 13	56-85-92	55-85-92	41-71-88	22-41-57	0-19 -29	NP-3 -11
			26-65	Gravelly sandy loam, gravelly fine sandy loam, loam, fine sandy loam, gravelly coarse sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 12	61-70-94	59-69-93	45-58-90	24-34-58	0-18 -28	NP-3 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
RdB—Ridgebury complex, 3 to 8 percent slopes														
Ridgebury, loam	50	D	0-1	Highly decomposed plant material, moderately decomposed plant material, slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			1-6	Sandy loam, mucky fine sandy loam, stony loam, gravelly loam, loam, fine sandy loam, gravelly fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, MH, ML, OH, OL, SC, SM	A-2-4, A-2-5, A-4, A-5	0- 0- 42	0-11- 16	52-88-88	50-87-88	40-79-85	26-54-60	0-44 -60	NP-7 -10
			6-10	Gravelly fine sandy loam, fine sandy loam, gravelly loam, very fine sandy loam, gravelly sandy loam, stony fine sandy loam, sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-1-b, A-2-4, A-2-6, A-4, A-6	0- 0- 7	0- 0- 7	60-76-91	58-75-91	45-63-86	24-36-53	0-20 -36	NP-6 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
			10-19	Sandy loam, gravelly sandy loam, fine sandy loam, stony fine sandy loam, gravelly loam, very fine sandy loam, gravelly fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 6	64-79-93	62-78-92	48-66-87	26-38-54	0-19 -30	NP-7 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
			19-66	Coarse sandy loam, gravelly sandy loam, very fine sandy loam, gravelly fine sandy loam, gravelly loam, sandy loam, stony fine sandy loam, fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 6	67-75-93	65-74-93	52-67-90	34-46-64	0-22 -28	NP-9 -11
Ridgebury, somewhat poorly drained	35	D	0-1	Highly decomposed plant material, moderately decomposed plant material, slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	—	—	—	—	—	—
			1-7	Gravelly fine sandy loam, fine sandy loam, loam, gravelly loam, stony loam, mucky fine sandy loam, sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, MH, ML, OH, OL, SC, SM	A-2-4, A-2-5, A-4, A-5	0- 0- 42	0- 0- 16	52-88-88	50-88-88	40-79-85	26-55-60	0-44 -60	NP-7 -10
			7-13	Gravelly fine sandy loam, fine sandy loam, gravelly loam, very fine sandy loam, gravelly sandy loam, stony fine sandy loam, sandy loam, loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 7	0- 0- 7	60-88-91	58-88-91	46-79-88	30-54-62	0-24 -36	NP-7 -11
			13-21	Gravelly fine sandy loam, very fine sandy loam, gravelly loam, stony fine sandy loam, fine sandy loam, gravelly sandy loam, sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 6	64-85-93	62-85-92	48-71-87	26-41-54	0-19 -30	NP-7 -11

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
Sh—Sun loam														
Sun	85	C/D	0-9	Loam	CL-ML, SC-SM, ML, SM	A-2, A-4	0- 0- 0	0- 0- 5	85-95-100	80-92-100	45-80-95	25-60-85	10-13-15	NP-3 -5
			9-27	Gravelly fine sandy loam, gravelly sandy loam, silt loam, loam	SC-SM, GM, ML, SM	A-2, A-4	0- 0- 0	0- 2- 5	65-92-99	50-85-99	30-70-95	15-55-80	10-13-15	NP-3 -5
			27-60	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam	GC-GM, SC-SM, GM, SM	A-1, A-2, A-4	0- 0- 0	0- 3- 5	50-80-85	35-70-70	15-50-65	10-30-50	10-13-15	NP-3 -5
Ub—Udorthents, smoothed														
Udorthents, smoothed	80	B	0-4	Gravelly loam	CL, ML, SC, SM	A-2, A-4, A-6	0- 0- 0	0- 3- 5	80-90-100	75-88-100	55-78-100	30-63-95	15-30-45	NP-8-15
			4-70	Very gravelly sandy loam, channery loam, silty clay loam, very gravelly loam	CL, GM, ML, SC	A-1, A-2, A-4, A-6	0- 0- 0	0- 5- 10	35-68-100	30-65-100	20-60-100	10-53-95	15-30-45	NP-8-15

Engineering Properties–Westchester County, New York														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
WdB—Woodbridge loam, 3 to 8 percent slopes														
Woodbridge, loam	85	C/D	0-6	Sandy loam, gravelly fine sandy loam, fine sandy loam, loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, OH, OL, SC, SM	A-2-4, A-2-5, A-4, A-5	0- 0- 3	0- 0- 3	69-81-100	67-81-100	54-73-98	34-49-68	0-33 -60	NP-6 -10
			6-18	Sandy loam, gravelly fine sandy loam, loam, fine sandy loam, gravelly loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 5	0- 0- 14	54-77-100	52-76-100	42-69-98	26-46-68	0-23 -34	NP-7 -11
			18-29	Fine sandy loam, gravelly loam, sandy loam, gravelly fine sandy loam, loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 5	0- 0- 14	54-77-100	52-76-100	42-69-98	26-46-68	0-22 -30	NP-8 -11
			29-65	Fine sandy loam, sandy loam, loam, gravelly loam, gravelly fine sandy loam	CL-ML, GC-GM, SC-SM, CL, GC, GM, ML, SC, SM	A-2-4, A-2-6, A-4, A-6	0- 0- 6	0- 0- 12	60-75-100	58-74-100	47-67-98	29-45-68	0-21 -27	NP-9 -11

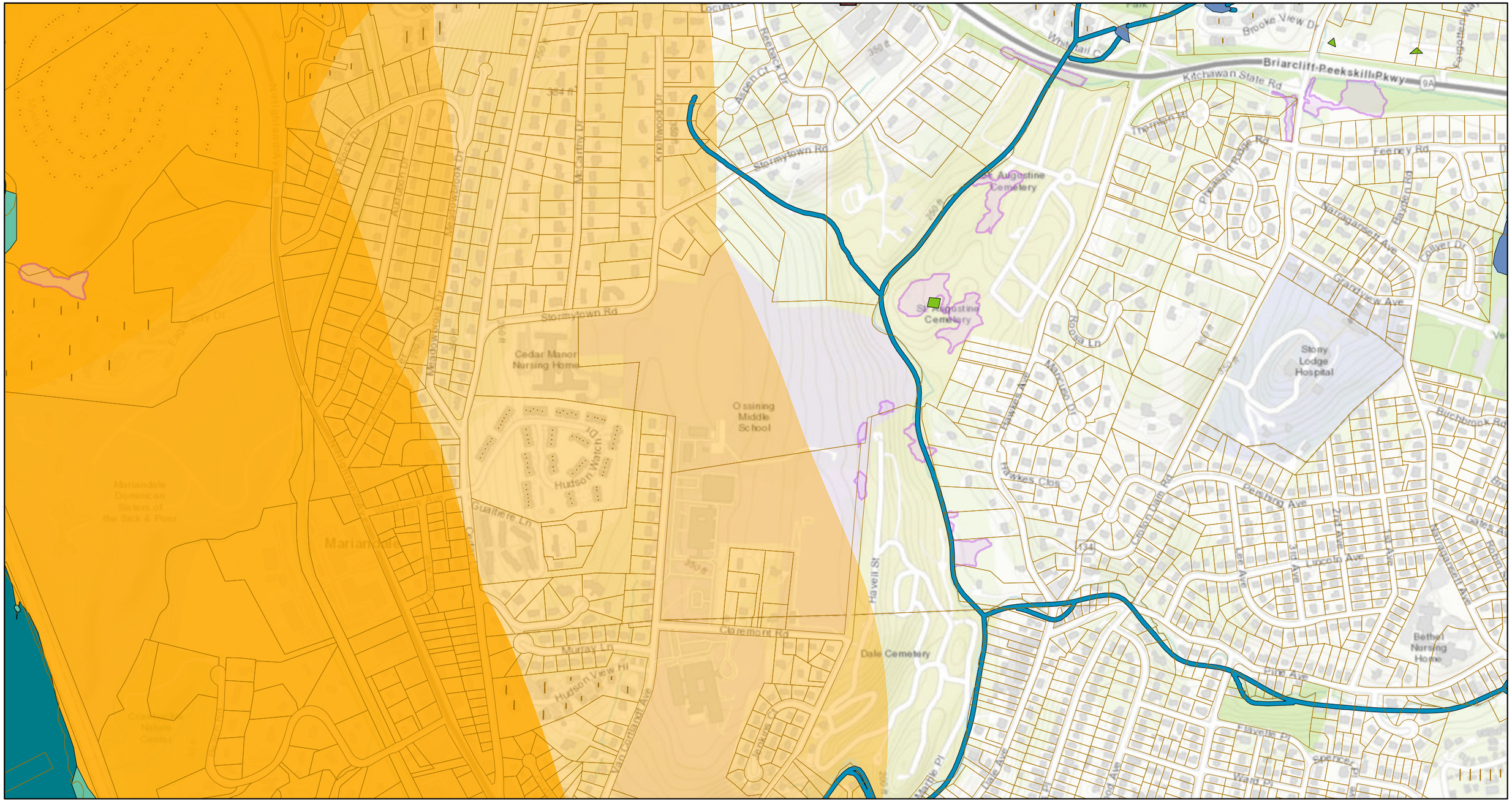
Data Source Information

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 20, Aug 26, 2024

APPENDIX G

SEQR & SHPO DOCUMENTATION

Ossining Union Free School District


Stormytown Rd
Cedar Manor Nursing Home
Ossining Middle School
Hudson Watch Dr
Guiltiere Ln
Mariandale Dominican Sisters of the Sick & Poor
Crawbuckie Nature Center
Murray Ln
Hudson View Hl
Van Cortlandt Ave
Claremont Rd
Dale Cemetery
Havell St
Maple Pl
Pine Ave
Havell Pl
Ward Pl
Spencer Pl
St Augustine Cemetery
Augustine Cemetery
Kitchawan State Rd
Briarcliff-Peekskill Pkwy
9A
Brooke View Dr
Thomas Ln
Feeney Rd
Pleasantville Rd
Gainsborough Ave
Gainsborough Rd
Gainsborough Ave
Gainsborough Rd
Oliver Dr
Gainsborough Ave
Stony Lodge Hospital
Rogers Ln
Hawkes Clos
Lincoln Ave
Lincoln Ave
Lincoln Ave

BOARD OF EDUCATION
OSSINING UNION FREE SCHOOL DISTRICT
Ossining, New York

Regular Meeting
Anne M. Dorner Middle School – Cafeteria **June 12, 2024**
100 Van Cortlandt Avenue **7:30 P.M.**
Ossining, NY 10562

MINUTES

Present: Ms. Katherin Crossling, Ms. Christine Mangiamele, Vice President, Ms. Melissa Banta, Mr. Roger Battacharia, Ms. Annie Gomez, Mr. Robert Melstein, Mr. Frank Schnecker

Others Present: Ms. Mary Fox-Alter, Interim Superintendent of Schools, Ms. Kimberly Mauricio, Assistant Superintendent for Student Services, Dr. Donald Marra, Assistant Superintendent for Human Resources, Ms. Maria Angélica Meyer, Assistant Superintendent for Curriculum and Instruction, Ms. Jessica Turner, Executive Director for Instructional Support, Ms. Alita Zuber, Assistant Superintendent for Business

1. Call to Order - Board President

1.1 Call to Order

President of the Board, Katherin Crossling, called the Regular meeting of June 12, 2024, to order at 7:34 p.m.

1.2 Pledge of Allegiance

Board Trustee Frank Schnecker led all those present in the pledge of allegiance.

2. Work Session

2.1 Special Recognition: Tenure Recipients

The following individuals received tenure and were acknowledged and recognized by the administrators named below:

Tenure Recipient	Administrator
• Christopher DeMattia	Maria Angélica Meyer
• Kimberly Mauricio	Mary Fox-Alter
• Jessica Turner	Mary Fox-Alter
• Holly Freehill	Kimberly Mauricio
• Krystle Roth	Kimberly Mauricio
• Alexis Nichols	Nicole Nover
• Jaden de Guzman	Kate Mathews
• William Garone	Maria Angélica Meyer
• Lillian Savastano	Maria Angélica Meyer
• Kenny Taveras	Maria Angélica Meyer
• James Langelotti	Nicole Nover

Board Trustees congratulated the newly tenured staff members and wished them well.

Board Trustee Mr. Roger Battacharia arrived at 7:41 p.m.

Board President Katherin Crossling requested a motion to move up resolutions 7.1 and 7.2 for Board action.

Roger Battacharia moved and Christine Mangiemele seconded the motion to move up resolutions 7.1 and 7.2 for Board action.

7.1 Resolution Regarding Administrative Staff Tenure Appointment(s)

I move that upon recommendation of the Superintendent of Schools the Board of Education grant tenure to the Administrative Staff member(s) so noted.

Last Name	First Name	Building	Tenure Area	Date of Prob. Appointment	Tenure Date
DeMattia	Christopher	Central Office	Director of Science, Technology, Engineering & Math	7/2/2024	7/2/2024
Mauricio	Kimberly	Central Office	Assistant Superintendent of Student Services	7/1/2021	7/1/2024
Turner	Jessica	Central Office	Executive Director of Student Services	7/30/2021	7/30/2024

7.2 Resolution Regarding Professional Staff Tenure Appointment(s)

I move that upon recommendation of the Superintendent of Schools the Board of Education grant tenure to the Professional Staff member(s) so noted.

Last Name	First Name	Building	Tenure Area	Date of Prob. Appointment	Tenure Date
Freehill	Holly	Brookside School	Special Education	8/28/2019	8/28/2024
Roth	Krystle	Anne M. Dorner Middle School	Deaf/ Hearing Impaired Teacher	8/31/2021	8/31/2024
Nicholas	Alexis	Ossining High School	Foreign Language	9/1/2020	9/1/2024
de Guzman	Jaden	Claremont	Music	9/1/2020	9/1/2024
Garone	William	Ossining High School	Social Studies	9/1/2020	9/1/2024
Savastano	Lillian	Ossining High School	Math	9/1/2020	9/1/2024
Taveras	Kenny	Ossining High School	Guidance Counselor	9/1/2020	9/1/2024
Langelotti	James	Anne M. Dorner Middle School	Elementary	9/1/2020	9/1/2024

Motion carried: 6-0

At 8:16 p.m., Board President Katherin Crossling paused the meeting for a photo opportunity for the tenure recipients and their families.

At 8:22 p.m., the Board meeting resumed.

2.2 Superintendent's Update

Ms. Mary Fox-Alter, Interim Superintendent of Schools, shared the following:

- OHS Engineering Club is collecting Legos for students in Guatemala. Drop off is at the Ossining Public Library.
- Park School students took part in a story walk. Thank you to Ossining MATTERS for supporting this project.
- The Brookside School Song Share took place.
- Peekskill Superintendent and administrators visited our OHS Media Studio to tour our space and learn more about our media programs.

- Excellent Jazz benefit concert held on Monday to raise funds for our OHS Marching Band as they prepare to perform at Pearl Harbor Day in Hawaii.
- Thank you to our AMD student leaders that took part in our incoming 6th grade orientation.
- Park School held field day.
- AMD held their Senior Awards night.
- OHS held their Cultural Arts Awards night.
- AMD 8th grade dance was a great success.
- OHS Prom is tonight at Villa Berone.

2.3 Equity: Ossining Matters Update

Ms. Gina Marie Balog-Sartario, Chairperson and Ms. Rebecca Raymond, Grants Chair, provided an overview of their various fund-raising activities and community events and encouraged anyone who wanted to participate and volunteer their time at Ossining Matters is welcome!

The following grants were awarded to the Ossining School District:

1. Printmaking for Community Outreach
Applicant: Elizabeth Boushell
School: OHS
Amount Requested/Proposed Funding: $2,739/**$409**
Use: Linocut Press

2. Fabric Choice
Applicant: Adria Ingegneri
School: OHS
Amount Requested/Proposed Funding: $500/**$500**
Use: Fabric

3. Author Study with Kwame Alexander
Applicant: Sudha Narsipur
School: OHS (and AMD)
Amount Requested/Proposed Funding: $600/**$600**
Use: 2 Author Talks

4. Science Department Seismograph
Applicant: Rich Sicignano
School: OHS
Amount Requested/FC Award: $658/**$658**
Use: Seismograph

5. Brookside School Inclusive Sensory Table
Applicant: Liza Boland
School: Brookside
Amount Requested/Proposed Funding: $1,000/**$1,000**
Use: Materials to refill a sensory table they already have

6. Hudson River Sloop Clearwater Sailing Classroom
Applicant: Emily Nastasi
School: OHS
Amount Requested/Proposed Funding: $1095/**$1095**
Use: Hudson River Sloop Clearwater Class Instruction

7. Science Models for Energy
Applicant: Aaron Mace
School: Claremont
Amount Requested/Proposed Funding: $1,320/**$1,320**
Use: 20 Newton's Cradles and 20 Stirling Engines

8. Story Walkway

Applicant: Greta Ringel
School: Park
Amount Requested/Proposed Funding: $3,121.35/**$1,561**
Use: planning time for teachers, storybooks, art materials, and graphic designer

9. Business Club

Applicant: Mariana Pavic
School: AMD
Amount Requested/Proposed Funding: $5,000/**$2,500**
Use: materials to create things to sell for fundraisers, Pizza, DECA blazers, DECA chords, an etiquette class

10. Cameras for Film students

Applicant: Ron Whitehead
School: OHS
Amount Requested/Proposed Funding: $4, 870.37/**$4,870.37**
Use: 6 Canon EOS Rebel DSLR cameras

Board President Katherin Crossling thanked Ms. Balog-Sartario and Ms. Raymond for their update and expressed the Board's appreciation of all that they do on behalf of our students and staff, and for their very many years of support and for their valuable partnership with the district to help programs become a reality.

At 8:33 p.m. Board President Katherin Crossling called for a pause of the meeting for a photo opportunity with Ms. Balog-Sartario and Ms. Raymond.

At 8:36 p.m. the Board meeting resumed.

Board President Katherin Crossling requested a motion to move up resolution 4.2 for Board action.

Frank Schnecker moved and Christine Mangiamele seconded the motion to move up resolution 4.2.

4.2 Resolution Regarding the Hilda Bonavist Distinguished Service Award

I move that the Board of Education congratulate Ms. Lisa Wheeler on receiving the Hilda Bonavist Distinguished Service Award and thank her for her years of dedicated service.

Motion carried: 6-0

Assistant Superintendent for Human Resources, Dr. Donald Marra, took a few minutes to recognize Ms. Lisa Wheeler, recipient of the Hilda Bonavist Distinguished Service Award. Ms. Wheeler was unable to attend tonight's meeting.

Dr. Marra provided a brief overview of the Award and congratulated Ms. Wheeler on this special recognition and thanked her for over 30 years of service to the district.

2.4 Facilities Update

Interim Superintendent Mary Fox-Alter provided an overview of the proposed capital improvement plan. In 2020, the district began creating a "Facilities Framework", taking into account instructional needs, space limitations, and looked at maximizing NYS building aid and capital reserves to minimize the local impact to taxpayers. Discussions took place about the major and significant space constraints within the buildings, dire

shortage of support spaces (i.e., related spaces, school counseling), and compromised and substandard common spaces.

The proposed capital improvement plan is "Focused and Future Ready". It takes into account the many varied space challenges experienced in the classrooms, hallways, stairwells, landing areas, stages, outdated and undersized cafeterias (impacts lunch periods and recess), as well as safety concerns and the anxiety and stress levels that impact students and staff on a daily basis.

The plan is a transformative plan to renovate and expand school facilities to meet the 21st century needs of our students and staff; to build and improve district facilities to support the growth and success of everyone within our educational community.

The initial plan was presented in the spring of 2023-24 and has since been refined. The plan has been *restructured at the request of the Board of Education so that the tax impact is zero while maintaining program needs front and center.*

During the 2023-24 school year, various engagement opportunities took place – information and updates were provided and dialogue took place:

- Board of Education meetings and updates
- Website
- District facilities committee meetings – 7 meetings held this year
- School-based faculty meetings and evening events
- Saturday Explore & Learn events
- PTA meetings
- Community survey (sent out in the fall)
- Feedback from staff at AMD and OHS
- Traffic Study
- Capital projects and the 2024-25 budget process

Tonight's work session will focus on facilities, including a capital improvement plan review. Important Board decisions will be made tonight, such as a Lead Agency declaration, including consideration of an alternative/contingent option for the bond referendum tentatively scheduled for September 24, 2024.

Mr. Christopher Colby, architect at CPL, provided an overview of the proposed plans for Ossining High School, church renovation and STEAM addition, new building for 7th and 8th grade on the AMD property, plans for the overall AMD campus, and Claremont School.

Mr. Paul Tozzi of Arris Contracting provided an overview of the proposed financial information for the bond project (cost per project – OHS additions and renovations, 7th and 8th grade new construction, and Claremont School additions and renovations).

Ms. Alita McCoy Zuber, Assistant Superintendent for Business, provided an overview of the budget appropriations projects at Park School, Brookside School, access drive to Stormytown Road, air conditioning at AMD, and district-wide energy performance contract. If the Board approves proposition #1, it is a flexible plan.

The district's fiscal advisors provided financial information for the proposed $210M Bond Project from 2023-24 through 2055-56.

An alternate plan known as proposed proposition #2 (contingent) would result in a slight tax increase of 0.38% and includes athletic improvements for the 7th and 8th grade new construction in the form of fields, in the amount of an additional $7,964,897M.

At the conclusion of the presentations, Board discussion took place. Board Trustees asked questions and made comments. Board President Katherin Crossling asked each Board Trustee for their thoughts on the two proposals. The Board was unanimous in it's decision to go with the first proposition of $210M with 0% tax increase.

Ms. Crossling thanked the presenters and members of the facilities committee.

3. Audience Recognition - Agenda Items Only

There were no attendees in person or attending virtually who wished to be recognized.

4. Consent Agenda: Business of the Board

Roger Battacharia moved and Annie Gomez seconded the motion to move resolution 4.1.

4.1 Resolution Regarding Intention to Serve as SEQRA Lead Agency - Bond for Capital Work at Claremont Elementary School, Anne M. Dorner Middle School, and Ossining High School Campus

WHEREAS, the Board of Education of the Ossining Union Free School District (the "BOE") is considering a proposed 2024 Bond for capital work to be undertaken at the Claremont Elementary School, Anne M. Dorner Middle School, and the Ossining High School Campus for the purpose of addressing space, programming, recreational and parking needs, as well routine renovations (the "Project"); and

WHEREAS, the Project includes the following work at the Claremont Elementary School, as described more fully in the associated Full Environmental Assessment Form ("FEAF"): (1) two-story, 12,600 square foot classroom addition over an existing asphalt area, (2) addition for elevator, and (3) various interior renovations and reconfigurations; and

WHEREAS, the Project includes the following work at the Anne M. Dorner Middle School, as described more fully in the associated FEAF: (1) 66,000 square foot (footprint), three-story new building with related site improvements, (2) stormwater facilities, (3) 125-space parking lot, (4) two-story, 12,600 square foot addition to the existing building, and (5) various interior renovations and rehabilitation; and

WHEREAS, the Project includes the following work at the Ossining High School Campus, including the recently acquired parcels at 1 Emwilton Place and 3 Emwilton Place, as described more fully in the associated FEAF: (1) 19,600 gross square foot, two-story locker room overbuild, (2) 8,200 square foot, one-story overbuild, (3) various interior renovations and reconfigurations, and (4) demolition of the former rectory building and construction of a 18,500 square foot, three-story addition; and

WHEREAS, through the assistance of CPL Architecture, Engineering and Planning, the BOE has reviewed the completed Full Environmental Assessment Forms, Part 1 and supplemental information for the Project; and

WHEREAS, while separate EAFs have been prepared for work proposed to be funded at each of the three school campuses, review of the Project will include a cumulative look at the totality of the improvements proposed to be funded by the Bond; and

WHEREAS, the BOE wishes to notify potentially involved agencies and known interested parties of its intent to act as lead agency under the State Environmental Quality Review Act ("SEQRA") for the Project.

NOW, THEREFORE, BE IT RESOLVED, that the BOE classifies the Project as a Type I Action, as defined by the SEQRA regulations; and

BE IT FURTHER RESOLVED, that the BOE declares its intent to become Lead Agency for the Project for SEQRA purposes; and

BE IT FURTHER RESOLVED, that the BOE hereby directs CPL Architecture, Engineering and Planning to circulate a notice of the BOE's intention to serve as SEQRA Lead Agency for the Project, together with Part 1 of

the EAF to involved agencies and to circulate a notice to interested agencies of the BOE's intention to serve as SEQRA Lead Agency for the Project; and

BE IT FURTHER RESOLVED, that the BOE shall become the SEQRA Lead Agency for the Project if no objection to such Lead Agency status is received from any other involved agency within thirty (30) days of circulation of the aforementioned notice of intention.

4.3 Resolution to Appoint a Consultant for the 2024-2025 School Year

RESOLVED, that the Board of Education hereby authorizes the Superintendent of Schools to engage the services of the following consultant for the 2024-25 school year at fees not to exceed the amount noted below.

Name of Consultant	Brief Description of Expertise	Descriptive Need for Consultant	Fees Not to Exceed (note if grant funded)
Center for Curriculum Renewal LLC Judy Carr, Director/Consultant	Consultant who collaborates strategy identification, gap analysis and develops next steps for improving in areas related to instructional support as we deepen our implementation so that all students benefit, and performance improves.	Four (4) days consultant to work with Executive Director on: ● The Dynamics of the Change Process ● Systems Development for Instructional Excellence ● Models for Instructional Support/MTSS ● Approaches to Program Review	$8,000

4.4 Resolution to Affirm the Results of the Annual District Budget Vote and Board of Education Elections Held on May 21, 2024

RESOLVED that the Board of Education of the Ossining Union Free School District does hereby affirm the results of the Annual Budget Vote and Board of Education Elections, including the Ossining Public Library Budget Vote and Board of Trustees Election, held on May 21, 2024.

Propositions on the Ballot:

		YES	NO
Proposition 1	School Budget	980	314
Proposition 2	Library Budget	1,026	268
Proposition 3	Authorize Expenditure from the "Facilities Improvement Program 2017" Capital Reserve Fund	1,049	243

Board of Education Trustees:

Katherin Crossling	925
Roger Battacharia	884

Ossining Public Library Trustee:

Alice Joselow	924

4.5 Resolution to Approve the Minutes of the Regular Meeting of April 23, 2024

RESOLVED that the Board of Education approve the minutes of the Regular Meeting of April 23, 2024.

4.6 Resolution to Approve the Minutes of the Special Meeting of May 1, 2024

RESOLVED that the Board of Education approve the minutes of the Special Meeting of May 1, 2024.

4.7 Resolution to Approve the Minutes of the Special Meeting/Statutory Budget Hearing of May 7, 2024

RESOLVED that the Board of Education approve the minutes of the Special Meeting/Statutory Budget Hearing of May 7, 2024.

4.8 Resolution to Approve the Minutes of the Special Meeting of May 14, 2024

RESOLVED that the Board of Education approve the minutes of the Special Meeting of May 14, 2024.

4.9 Resolution to Approve the Minutes of the Special District Meeting Held on May 21, 2024

I move that the Board of Education approve the minutes of the Special District Meeting held on May 21, 2024.

4.10 Resolution to Approve the Minutes of the Regular Meeting of May 29, 2024

RESOLVED that the Board of Education approve the minutes of the Regular Meeting of May 29, 2024.

Motion carried: 7-0

5. Consent Agenda: Curriculum and Instruction

Annie Gomez moved and Christine Mangiamele seconded the motion to move resolution 5.1.

5.1 Motion to Accept Recommended Placements of Special Education Students

I move that the Board of Education accept the recommended classifications, placements and related services recommended in the IEP for students as recommended by the Committee on Special Education and Sub-Committees on Special Education in meetings held on May 22, 28, 29, 30, 31 and direct the administration to arrange for the appropriate placement as set forth.

Motion carried: 7-0

6. Consent Agenda: Business Office Matters

Robert Melstein moved and Christine Mangiamele seconded the motion to move resolutions 6.1 through 6.6. Resolution 6.7 is for information only and no action is required.

6.1 Resolution Regarding Acceptance of Funds - AP Examinations

RESOLVED: That upon recommendation of the Superintendent of Schools, the Ossining Board of Education hereby accepts $32,122.87 and increases the 2023-2024 General Fund by that amount. The offsetting revenue shall be A 2770.000 Misc. Revenue; and

BE IT FURTHER RESOLVED: That the total amount of $32,122.87 is appropriated in the following budget code:

Budget Code	Amount	Description
2060-401-00-0000	$32,122.87	Other Expenses

6.2 Resolution Regarding Award of Bid 2024-2025 Elevator Maintenance and Service

RESOLVED: That the Board of Education hereby awards the bid of the 2023-2024 Elevator Maintenance and service agreement to Taconic Elevator Co. as recommended by the Director of School Facilities, Operations and Maintenance.

Annual Agreement	$14,640.00
Labor:	$175.00/hr
Material Markup	25%

6.3 Resolution Regarding Acceptance of Donation of 3D Printing Equipment from the Robotics Company - OHS Engineering Club

RESOLVED: That upon recommendation by the Superintendent of Schools, the Board of Education accepts the generous donation of 3D printing equipment as donated by the Robotics Company for the OHS Engineering Club.

6.4 Resolution Regarding Renewal of Food Management Service Contract for 2024-2025

RESOLVED: That the Board of Education authorizes and directs the President to enter into a one-year renewal of the Food Management Services contract with Whitsons School Nutrition Corp. for the 2024 - 2025 school year. The contract was originally entered into on May 23, 2023.

6.5 Resolution Regarding Acceptance of Funds - Refund of Field Trip Transportation Costs

RESOLVED: That upon recommendation by the Superintendent of Schools, the Board of Education accepts a refund of funds in the amount of $401 and increases the 2023-2024 general fund in that amount. The offsetting expenditure code 522.00

BE IT FURTHER RESOLVED: That the total amount of $401 be appropriated to the following code:

Budget Code	Amount	Description
A5541-401-00-000	$401	Trans. Other Expenses

6.6 Resolution Regarding Interfund Transfers

RESOLVED: that the Board of Education authorizes the Superintendent of Schools to execute interfund transfers as specified below.

Fund	Code	Description	Amount		Fund	Code	Description	Amount
A	2110-490-00-0000	Spec Svcs	6,500		A	2331-151-11-0000	OHS Hourly	6,500
A	1620-420-00-0000	B&G Fuel	26,000		A	1620-439-00-0000	Operation of Plant	26,000
A	1620-426-00-0000	B&G Rentals	8,000		A	1620-439-00-0000	Operation of Plant	8,000
A	1620-550-00-0000	B&G Mat Goods	6,530		A	1620-439-00-0000	Operation of Plant	6,530

Motion carried: 7-0

6.7 Claims Audited and Paid - For Information Only

The following funds have been duly audited and paid and are presented for Board of Education members' information. No action is requested.

1. General Fund - Fund A
2. School Lunch - Fund C
3. Special Aid Fund - Fund F
4. Capital Fund – Fund H
5. Trust Expendable - TE

7. Consent Agenda: Personnel Matters

Christine Mangimele moved, and Roger Battacharia seconded the motion to move resolutions 7.3 through 7.16. Resolutions 7.17 and 7.18 is for information only and no action is required.

7.3 Resolution Regarding Rescinding Support Staff Appointment(s)

I move upon recommendation of the Superintendent of Schools the Board of Education rescind the appointments of the person(s) so noted.

Ms. Elys Samojedny for the Extended School Year Special Education Planning and the Extended School Year Special Education Program.

7.4 Resolution Regarding Professional Staff Resignation(s)

I move that upon recommendation of the Superintendent of Schools the Board of Education accept the Professional Staff resignation(s) so noted.

Last Name	First Name	Building	Category or Tenure Area	Current Hire Date	Eff. Date of Resign./Term.	Current Appt. Status	Reason
VanHerwynen	Jessica	Ossining High School	Music	8/30/2022	8/27/2024	Probationary	Resignation
Gorman	Kristen	Ossining High School	Special Education	8/30/2021	8/27/2024	Tenured	Resignation
Mejia	Ester	Park School	Elementary	8/30/2022	6/30/2024	Probationary	Resignation
Heron	Michael	Ossining High School	Special Education	8/31/2021	6/30/2024	Probationary	Resignation

7.5 Resolution Regarding Civil Service Staff Resignation(s)

I move upon recommendation of the Superintendent of Schools the Board of Education accept the Civil Service Staff resignation(s) so noted.

Last Name	First Name	Building	Category or Tenure Area	Current Hire Date	Eff. Date of Resign./Term.	Current Appt. Status	Reason
Allan	Haynes	Maintenance & Storage	Custodial Worker	10/27/2015	7/3/2024	Permanent	Resignation

7.6 Resolution Regarding Support Staff Resignation(s)

I move upon recommendation of the Superintendent of Schools the Board of Education accept the Support Staff resignation(s) so noted.

Last Name	First Name	Building	Category or Tenure Area	Current Hire Date	Eff. Date of Resign./Term.	Current Appt. Status	Reason
Allan	Haynes	Maintenance & Storage	Custodial Worker	10/27/2015	7/3/2024	Permanent	Resignation
Carlucci	Jennifer	Brookside School	Teaching Assistant	10/16/2023	6/30/2024	Annual	Resignation

7.7 Resolution Regarding Professional Staff Appointment(s)

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Professional Staff appointment(s) so noted.

* This individual must receive three (3) annual APPR composite ratings of Effective or Highly Effective, in at least (3) of the preceding (4) years and cannot have an APPR composite score of Ineffective in the last year of his or her probationary appointment to be granted or considered for tenure.

^ This individual may be eligible for a reduced probationary period of three (3) years based upon his/her prior tenure or substitute service credit. However, appointment to the reduced period will not occur until after the individual has received, and submitted to the district, a composite APPR rating for his/her final year of service in the prior tenure area/district/or as a substitute, as applicable.

Last Name	First Name	Title or Tenure Area	Certif. Status	Degree Status	Step	Salary	Appt. Type	% Time	Effect. Date	Expire Date	Building	Fund Source
* Hurd	Rachel	Speech Therapist	Speech	MA	2	$74,864.00	Probationary	100%	8/28/2024	8/27/2027	Claremont School	A
* Heron	Michael	Social Studies	Social Studies	MA	4	$81,146.00	Probationary	100% (Revised)	8/28/2024	8/30/2025	Ossining High School	A
*^ Gaetano	Jessie	Special Education	Students with Disabilities	MA	9	$89,295.00	Probationary	100%	8/28/2024	8/27/2028	Roosevelt School	A
*^ Colantuono	Rachel	Special Education	Students with Disabilities	MA	12	$96,301.00	Probationary	100%	8/28/2024	8/27/2028	Brookside School	A
*^ Carlucci	Jennifer	Special Education	Students with Disabilities	MA	11	$93,906.00	Probationary	100%	8/28/2024	8/27/2028	Claremont School	A
Lamar	Angelica	Regular Substitute	Speech	MA	1	$73,002.00	Annual	100%	8/28/2024	6/30/2025	Anne M. Dorner Middle School	A
Cerqueira	Cindy	Regular Substitute	Childhood Education	MA	2	$74,864.00	Annual	100%	8/28/2024	6/30/2025	Claremont School	A
Quiroga	Harry	AMD Graduation Photographer	Art	n/a	n/a	$700.00	Annual	100%	6/22/2024	6/28/2024	Anne M. Dorner Middle School	A
Morales	April	Mental Health Intern	School Psychologist	n/a	n/a	$1,000.00	Annual	100%	1/2/2024	5/31/2024	Ossining High School	Grant
Achon-Cabrera	Alexa	Mental Health Intern	School Psychologist	n/a	n/a	$1,000.00	Annual	100%	1/2/2024	5/31/2024	Roosevelt School	Grant
Tornambe	Giovanni	Athletic Coordinator	Physical Education	n/a	n/a	$6,877.00	Annual	100%	8/28/2024	6/30/2025	Ossining High School	A

Damiano	Amy	Social media & Website Facilitator	Elementary	n/a	n/a	$300.00	Annual	100%	7/1/2024	6/30/2025	Ossining Staff Develop Center	Grant
Bacon	Allison	Digital Archive Facilitator	English	n/a	n/a	$500.00	Annual	100%	7/1/2024	6/30/2025	Ossining Staff Develop Center	Grant
Bacon	Allison	Best Practices Book Study Facilitator	English	n/a	n/a	$700.00	Annual	100%	7/1/2024	6/30/2025	Ossining Staff Develop Center	Grant
Bravo	Olga	Registration Facilitator	Elementary	n/a	n/a	$1,500.00	Annual	100%	7/1/2024	6/30/2025	Ossining Staff Develop Center	Grant
Hillman	Mary Catherine	Teacher Center Director	Elementary	n/a	n/a	$15,750.00	Annual	100%	7/1/2024	6/30/2025	Ossining Staff Develop Center	Grant
Maida	Caley	Extra Period	Math	n/a	n/a	$6,211.21	Annual	100%	3/28/2024	6/30/2024 (Revised)	Ossining High School	A
Morana	Jessica	Extra Period	Math	n/a	n/a	$5,367.09	Annual	100%	3/28/2024	6/30/2024 (Revised)	Ossining High School	A
Barajas	Zaira	Extra Period	Social Studies	n/a	n/a	$4,813.45	Annual	100%	3/4/2024	5/31/2024	Ossining High School	A
del Solar	Dulcinea	Extra Period	ENL	n/a	n/a	$5,296.72	Annual	100%	3/4/2024	5/31/2024	Ossining High School	A
Gannon	Daniel	Extra Period	Social Studies	n/a	n/a	$5,621.52	Annual	100%	3/4/2024	5/31/2024	Ossining High School	A
Faugno	Maria	Extra Period	ENL	n/a	n/a	$5,062.02	Annual	100%	3/4/2024	5/31/2024	Ossining High School	A
Baker	Katherine	Extra Period	ENL	n/a	n/a	$5,621.52	Annual	100%	3/4/2024	5/31/2024	Ossining High School	A
Rosenthal	Jennifer	Extra Period	Special Education	n/a	n/a	$ 3,319.63	Annual	100%	5/3/2024	6/7/2024 (Revised)	Ossining High School	A
Frljuckic	Lutvija	Extra Period	Social Studies	n/a	n/a	$ 3,491.06	Annual	100%	5/3/2024	6/7/2024 (Revised)	Ossining High School	A
Gebler	Christopher	Extra Period	Special Education	n/a	n/a	$2,738.81	Annual	100%	5/3/2024	6/7/2024 (Revised)	Ossining High School	A
Prince	Brian	Extra Period	Special Education	n/a	n/a	$2,868.41	Annual	100%	5/3/2024	6/7/2024 (Revised)	Ossining High School	A
Aguilar	Mirna	Extra Period	Social Studies	n/a	n/a	$3,860.97	Annual	100%	5/3/2024	6/7/2024 (Revised)	Ossining High School	A
Fernandez-Maher	Arelis	Extra Period	Elementary	n/a	n/a	$3,231.88	Annual	100%	5/7/20204 (Revised)	6/30/2024	Anne M. Dorner Middle School	A
Wager	Catherine	Extra Period	Science	n/a	n/a	$27,548.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Apicella	Nicholas	Extra Period	Math	n/a	n/a	$17,955.00 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Albrecht	Douglas	Extra Period	Science	n/a	n/a	$27,548.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Gomez	Omayra	Extra Period	Math	n/a	n/a	$27,548.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A

Bedoya	Juan	Extra Period	Math	n/a	n/a	$22,522.40 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Kemencei	Margaret	Extra Period	Special Education	n/a	n/a	$27,548.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Rodriguez	Sonia	Extra Period	Special Education	n/a	n/a	$27,548.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Davide	Francesca	Extra Period	Math	n/a	n/a	$22,522.40 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A
Diaz	Jerrelyn	Extra Period	Special Education	n/a	n/a	$18,505.80 (Revised)	Annual	100%	9/5/2023	6/30/2024	Ossining High School	A

7.8 Resolution Regarding Bus Attendant Appointments

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Bus Attendants appointments so noted.

Position	Building	Effective Date	End Date	First Name	Last Name	Hourly Rate
Bus Attendant	Central Office	8/26/2024	6/30/2025	Emilia	Diaz	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Amparo	Augilera	$16.87
Bus Attendant	Central Office	7/1/2024	6/30/2025	Zoila	Aroca	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Ligia	Avila Fajardo	$15.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Gabriela	Bolivar	$16.87
Bus Attendant	Central Office	7/1/2024	6/30/2025	Sophia	Bonitto	$17.91
Bus Attendant	Central Office	7/1/2024	6/30/2025	Cora	Brodie	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Maria	Cabrera Yunga	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Mayra	Chuchuca Farfan	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Eliza	Cooper	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Pedro	Duenas Toledo	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Nadia	Espejo Valencia	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Nilsa	Espinoza	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Leopoldo	Fernandez	$15.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Rosa	Gallego	$18.35
Bus Attendant	Central Office	7/1/2024	6/30/2025	Lucy	Gomez	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Nancy	Gonzalez	$17.40
Bus Attendant	Central Office	7/1/2024	6/30/2025	Yudelka	Gonzalez	$17.40
Bus Attendant	Central Office	7/1/2024	6/30/2025	Luz	Guartazaca Sumba	$15.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Alicia	Herrera	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	D'Yanira	Hicks	$15.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Bernice	Hunter-Lemon	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Raul	Jara-Aguilar	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Toni	Knapp	$18.35
Bus Attendant	Central Office	7/1/2024	6/30/2025	Fanny	Loja Duque	$15.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Maria	Maita Lojano	$17.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Maria	Matailo Yari	$15.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Shirley	McFadden	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Shyann	Murray	$16.87
Bus Attendant	Central Office	7/1/2024	6/30/2025	Angelica	Nieves Seminario	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Argelia	Ovalle	$16.87
Bus Attendant	Central Office	7/1/2024	6/30/2025	Martha	Pagan	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Katerine	Palacios	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Jessica	Panza Quito	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Olga	Patino-Sanmartin	$16.87

Bus Attendant	Central Office	7/1/2024	6/30/2025	Pascuala	Pena	$17.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Gloria	Perez Paredes	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Raphael	Pinto Gutierrez	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Veronica	Ramos	$17.91
Bus Attendant	Central Office	7/1/2024	6/30/2025	Elizabeth	Reyes Angeles	$15.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Evelyn	Rodriguez	$17.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Augusta	Sanmartin	$17.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Adrianna	Serrano	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Claudia	Sirano Cordova	$15.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Rafaela	Soto-Abad	$16.37
Bus Attendant	Central Office	7/1/2024	6/30/2025	Gloria	Suarez Ortiz	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Rafael	Tapia	$16.00
Bus Attendant	Central Office	7/1/2024	6/30/2025	Juliann	Thomas	$16.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Shanell	Thomas	$16.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Theresa	Thomas	$15.38
Bus Attendant	Central Office	7/1/2024	6/30/2025	Maria	Tirado	$16.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Nancy	Villa	$16.87
Bus Attendant	Central Office	7/1/2024	6/30/2025	Yajaira	Villa	$18.31
Bus Attendant	Central Office	7/1/2024	6/30/2025	Rosmery	Yaulimango Cuyubamba	$16.50
Bus Attendant	Central Office	7/1/2024	6/30/2025	Ninfa	Zhinin	$17.50

7.9 Resolution Regarding Professional Staff Appointment(s) – Before/After School Programs

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Professional Staff appointment(s) so noted.

Last Name	First Name	Cert. Status	Appt. Type	Program	Building	Step	Hourly Rate	% Time	Source	Effective Date	Expire Date
Lebenberg	Michelle	Speech	Annual	Extended School Year ESY Planning	Roosevelt	5	$71.37	Max 18 hours	Grant	4/15/2024	6/30/2024
Samojedny	Elyse	Special Education	Annual	Extended School Year ESY Planning	Roosevelt	1	$50.27	Max 18 hours	Grant	4/15/2024	6/30/2024
Gaetano	Jessie	Special Education	Annual	Extended School Year ESY Planning	Roosevelt	1	$50.27	Max 18 hours	Grant	4/15/2024	6/30/2024
Hamill	Neil	Literacy	Annual	Extended School Year ESY Planning	Roosevelt	5	$71.37	Max 18 hours	Grant	4/15/2024	6/30/2024
Aguilar	Mirna	Social Studies	Annual	ENL Regents Prep	Ossining High School	5	$71.37	5 hours	Grant	6/13/2024	6/30/2024
Wager	Catharine	Science	Annual	ENL Regents Prep	Ossining High School	5	$71.37	5 hours	Grant	6/13/2024	6/30/2024
Barajas	Zaira	Social Studies	Annual	ENL Regents Prep	Ossining High School	2	$57.63	5 hours	Grant	6/13/2024	6/30/2024
Shin	Sohee	Special Education	Annual	ENL Regents Prep	Ossining High School	1	$50.27	5 hours	Grant	6/13/2024	6/30/2024
Wexler	Lauren	Math	Annual	ENL Regents Prep	Ossining High School	2	$57.63	5 hours	Grant	6/13/2024	6/30/2024
Abbate	Giovanna	Reading	Annual	ENL Regents Prep	Ossining High School	3	$61.57	5 hours	Grant	6/13/2024	6/30/2024
Nicholas	Alexis	American Sign Language	Annual	ASL Seal of Biliteracy Prep Sessions	Ossining High School	3	$61.57	20 hours	A	3/1/2024	5/30/2024

7.10 Resolution Regarding Support Staff Appointment(s) – Before/After School Programs

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Support Staff appointment(s) for the persons so noted.

Last Name	First Name	Cert. Status	Appt. Type	Program	Building	Step	Hourly Rate	% Time	Source	Effective Date	Expire Date
Ramos	Elizabeth	Level 1	Annual	Extended School Year Planning (ESY)	Roosevelt	2	$21.26	1 hour	Grant	5/13/2024	6/28/2024
Ligeiro	Jessica	Level 1	Annual	Extended School Year Planning (ESY)	Roosevelt	1	$20.61	1 hour	Grant	5/13/2024	6/28/2024
DeBenedictis	Gina	Level 1	Annual	Extended School Year Planning (ESY)	Roosevelt	2	$21.26	1 hour	Grant	5/13/2024	6/28/2024
Gonder	Kayla	Childhood Education	Annual	Extended School Year Planning (ESY)	Roosevelt	1	$20.61	1 hour	Grant	5/13/2024	6/28/2024
Viera	Julia	n/a	Annual	Extended School Year Planning (ESY)	Roosevelt	1	$16.22	1 hour	Grant	5/13/2024	6/28/2024
Carone	Nicholas	Level 1	Annual	Extended School Year Planning (ESY)	Roosevelt	2	$21.26	1 hour	Grant	5/13/2024	6/28/2024
Espinoza	Nilsa	n/a	Annual	Extended School Year Planning (ESY)	Roosevelt	1	$16.22	1 hour	Grant	5/13/2024	6/28/2024
Savinon, Jr.	Javier	Level 1	Annual	Extended School Year Planning (ESY)	Roosevelt	1	$20.61	1 hour	Grant	5/13/2024	6/28/2024
Hirschhorn	Samantha	Childhood Education	Annual	Evening Events	Claremont	2	$19.40	As Needed	A	4/18/2024	6/30/2024
Knowles	Brandon	Level 3	Annual	STAR	Anne M. Dorner Middle School	6	$22.43	As Needed	A	9/5/2023	6/26/2024 (Revised)
Graves, II	Anthony	n/a	Annual	STAR	Anne M. Dorner Middle School	2	$16.89	As Needed	A	9/5/2023	6/26/2024 (Revised)
Allen	Janae	Level 1	Annual	STAR	Anne M. Dorner Middle School	1	$18.70	As Needed	A	9/5/2023	6/26/2024 (Revised)
Jones	Robert	Level 1	Annual	STAR	Anne M. Dorner Middle School	2	$19.40	As Needed	A	9/5/2023	6/26/2024 (Revised)
Cook	Michael	n/a	Annual	STAR	Anne M. Dorner Middle School	6	$22.43	As Needed	A	9/5/2023	6/26/2024 (Revised)
Smith	Susan	Level 3	Annual	STAR	Anne M. Dorner Middle School	6	$22.43	As Needed	A	9/5/2023	6/26/2024 (Revised)
Bastar	Richard	Level 3	Annual	STAR	Anne M. Dorner	6	$22.43	As Needed	A	9/5/2023	6/26/2024 (Revised)

					Middle School						
Paniagua	Dahiana	n/a	Annual	STAR	Anne M. Dorner Middle School	1	$16.22	As Needed	A	9/5/2023	6/26/2024 (Revised)

7.11 Resolution Regarding Professional Staff Appointment(s) – Summer School Programs

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Professional Staff appointment(s) so noted.

Last Name	First Name	Cert. Status	Appt. Type	Program	Building	Step	Hourly Rate	% Time	Source	Effective Date	Expire Date
Lebenberg	Michelle	Speech	Annual	Extended School Year Program (ESY)	Roosevelt	5	$72.80	7 hr/5 times wkly	Grant	7/1/2024	8/31/2024
Samojedny	Elyse	Students with Disabilities	Annual	Extended School Year Program (ESY)	Roosevelt	1	$51.28	7 hr/5 times wkly	Grant	7/1/2024	8/31/2024
Gaetano	Jessie	Students with Disabilities	Annual	Extended School Year Program (ESY)	Roosevelt	1	$51.28	7 hr/5 times wkly	Grant	7/1/2024	8/31/2024
Hamill	Neil	Literacy	Annual	Extended School Year Program (ESY)	Roosevelt	5	$72.80	7 hr/5 times wkly	Grant	7/1/2024	8/31/2024
Postupack	Julianne	Special Education	Annual	Extended School Year Program (ESY)	Roosevelt	1	$51.28	7 hr/5 times wkly	Grant	7/1/2024	8/31/2024
Marques	Tyler	School Social Worker	Annual	Elementary Summer Learning Academy	Park	3	$62.83	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Ciliberti	Verdiana	Elementary	Annual	Elementary Summer Learning Academy	Park	4	$67.82	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Tharas	Briana	Elementary	Annual	Elementary Summer Learning Academy	Park	4	$67.82	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Peralta	Lourdes	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
O'Brien	Nicole	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Petrilli	Kristina	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Velez-DeLeon	Terry	ENL	Annual	Elementary Summer Learning Academy	Park	5	$72.50	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024

Done	Sobeyda	Elementary	Annual	Elementary Summer Learning Academy	Park	4	$67.82	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Cambareri	Michell	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.50	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Garone	Erin	Elementary	Annual	Elementary Summer Learning Academy	Park	2	$58.78	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Irizarry	Melinda	ENL	Annual	Elementary Summer Learning Academy	Park	5	$72.50	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Nardella	Andrea	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Larm	Thomas	Special Education	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Vaccaro	Vanessa	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Orta	Victoria	Special Education	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Newman	Christina	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024
Bueno	Claudia	Elementary	Annual	Elementary Summer Learning Academy	Park	1	$51.28	As Needed	Grant	7/1/2024	7/25/2024
Jimenez	Mabell	School Social Worker	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024
Mahoney	Margaret	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024
Rosas	Christine	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024
Diaz	Madelyne	Special Education	Annual	Elementary Summer Learning Academy	Park	2	$58.78	As Needed	Grant	7/1/2024	7/25/2024
DiRienzo	Drew	Music	Annual	Elementary Summer Learning Academy	Park	1	$51.28	As Needed	Grant	7/1/2024	7/25/2024
Hargrave	Heather	Special Education	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024

Eynon	Margaret	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	As Needed	Grant	7/1/2024	7/25/2024
Perez	Lisbel	Elementary	Annual	Elementary Summer Learning Academy	Park	3	$62.83	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Aguilar	Miriam	ENL	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Acevedo	Ivelisse	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Alejandro	Jovana	Elementary	Annual	Elementary Summer Learning Academy	Park	3	$62.83	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Guzman	Carolina	ENL	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Malone	Suzette	Elementary	Annual	Elementary Summer Learning Academy	Park	5	$72.80	4.5 hr/4 times wkly	Grant	7/1/2024	7/25/2024
Bucci	Julie	Elementary	Annual	Elementary Summer Learning Academy	Park	3	$62.83	As Needed	Grant	7/1/2024	7/25/2024
Alejandro	Jonaly	School Social Worker	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Pimentel	Lesley	Reading	Annual	AMD Summer Program	Anne M. Dorner Middle School	5	$72.80	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Meza	Nancy	Reading	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Franklin	Rebecca	Math	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Elliott	Douglas	English	Annual	AMD Summer Program	Anne M. Dorner Middle School	2	$58.78	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Tenzer	Michael	Math	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Holmes	Katrina	Elementary	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Borrego	Caroline	English	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
McGonigal	Julia	English	Annual	AMD Summer Program	Anne M. Dorner Middle School	5	$72.80	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024

Ehrenreich	Michelle	Music	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Bergmann	Lisa	Elementary	Annual	AMD Summer Program	Anne M. Dorner Middle School	5	$72.80	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
McCabe	Susan	Home Economics	Annual	AMD Summer Program	Anne M. Dorner Middle School	5	$72.80	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Block	Erik	Special Education	Annual	AMD Summer Program	Anne M. Dorner Middle School	4	$67.82	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Nicholas	Alexis	American Sign Language	Annual	AMD Summer Program	Anne M. Dorner Middle School	3	$62.83	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Orme	Stephen	ENL	Annual	AMD Summer Program	Anne M. Dorner Middle School	2	$58.78	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Eguez	Michelle	Elementary	Annual	AMD Summer Program	Anne M. Dorner Middle School	2	$58.78	As Needed	Grant	7/8/2024	7/25/2024
Suero Santana	Leidy	ENL	Annual	AMD Summer Program	Anne M. Dorner Middle School	2	$58.78	As Needed	Grant	7/8/2024	7/25/2024
Savastano	Lillian	Math	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Kenny	Bridget	Science	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Davis	Tara	Special Education	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Rodriguez	Sonia	Special Education	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Aguilar	Mirna	Social Studies	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
O'Grady	Kyle	Social Studies	Annual	Summer Program - Credit Recovery	Ossining High School	2	$58.78	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Burns	Kara	Special Education	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Amato	Deyon	English	Annual	Summer Program - Credit Recovery	Ossining High School	2	$58.78	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Budich	Kristen	Special Education	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Love	Donna	Spanish	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024

Neville	Lauren	Special Education	Annual	Summer Program - Credit Recovery	Ossining High School	2	$58.78	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Mannarino	Katherine	Social Studies	Annual	Summer Program - Credit Recovery	Ossining High School	5	$72.80	As Needed	A	7/15/2024	8/9/2024
Abbate	Giovanna	Reading	Annual	Summer Program - Credit Recovery	Ossining High School	3	$62.83	As Needed	A	7/15/2024	8/9/2024
Turner	Elizabeth	Science	Annual	Summer Program - Credit Recovery	Ossining High School	1	$51.28	As Needed	A	7/15/2024	8/9/2024
Leitner	Ian	Math	Annual	Summer Program - Freshman Academy	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Neville	Lauren	Special Education	Annual	Summer Program - Freshman Academy	Ossining High School	2	$58.78	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Sawyer	Ryan	Social Studies	Annual	Summer Program - Freshman Academy	Ossining High School	1	$51.28	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Michas	Briana	Special Education	Annual	Summer Program - Freshman Academy	Ossining High School	4	$67.82	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Sibiski	Nicole	ENL	Annual	Summer Program - Freshman Academy	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Diamond-Gasmer	Tracy	Speech	Annual	Summer Program - Freshman Academy	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Schindler	Chadwich	Physical Education	Annual	Summer Program - Freshman Academy	Ossining High School	4	$67.82	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Jimenez	Yocasta	School Social Worker	Annual	Summer Program - Freshman Academy	Ossining High School	3	$62.83	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Watson	Shamar	School Social Worker	Annual	Summer Program - Freshman Academy	Ossining High School	2	$58.78	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Battista	Robert	Physical Education	Annual	Summer Program - Freshman Academy	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Blanco Ishoo	Leslie	Spanish	Annual	Summer Program - Freshman Academy	Ossining High School	3	$62.83	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Sawyer	Ryan	Social Studies	Annual	Summer Program - Freshman Academy	Ossining High School	1	$51.28	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Aguilar	Mirna	Social Studies	Annual	Summer Program - Regents Test Prep	Ossining High School	5	$72.80	2 hr/5 times wkly	A	8/12/2024	8/16/2024

Campanelli	Daniela	Special Education	Annual	Summer Program - Regents Test Prep	Ossining High School	5	$72.80	2 hr/5 times wkly	A	8/12/2024	8/16/2024
Diaz	Jerrelyn	Special Education	Annual	Summer Program - Regents Test Prep	Ossining High School	3	$62.83	2 hr/5 times wkly	A	8/12/2024	8/16/2024
Davis	Tara	Special Education	Annual	Summer Program - Regents Test Prep	Ossining High School	5	$72.80	2 hr/5 times wkly	A	8/12/2024	8/16/2024
Guerin	Patricia	Special Education	Annual	Summer Program - Life Skills	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Galindo Delgado	Veronica	School Counselor	Annual	Summer Program	Ossining High School	5	$72.80	3.25 hr/5 times wkly	A	7/15/2024	8/9/2024
Whitehead	Ronald	Art	Annual	Summer Program - Arts Academy	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Schizzano	Sydney	Music	Annual	Summer Program - Arts Academy	Ossining High School	1	$51.28	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Frega	Carmen	Elementary	Annual	Summer Program - Arts Academy	Ossining High School	5	$72.80	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Chuquimarca Perez	Leticia	Elementary	Annual	Summer Program - Arts Academy	Ossining High School	2	$58.78	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
del Solar	Dulcinea	ENL	Annual	Summer Program - Arts Academy	Ossining High School	3	$62.83	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Lin	Yoojin	Art	Annual	Summer Program - Arts Academy	Ossining High School	3	$62.83	3.25 hr/4 times wkly	A	7/15/2024	8/9/2024
Leitner	Ian	Math	Annual	Summer Program - Online Credit Recovery	Ossining High School	5	$72.80	1 hr/4 times wkly	Grant	7/15/2024	8/9/2024
Davis	Tara	Special Education	Annual	Summer Program - Online Credit Recovery	Ossining High School	5	$72.80	1 hr/4 times wkly	A	7/15/2024	8/9/2024
Aguilar	Mirna	Social Studies	Annual	Summer Program - Online Credit Recovery	Ossining High School	5	$72.80	1 hr/4 times wkly	A	7/15/2024	8/9/2024

7.12 Resolution Regarding Civil Service Staff Appointment(s) – Summer School Programs

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Civil Service Staff appointment(s) so noted.

Last Name	First Name	Appt. Type	Program	Building	Hourly Rate	% Time	Source	Effective Date	Expire Date
Timm	Jenna	Annual	Middle School Summer Program	Anne M. Dorner Middle School	$31.22	4 hr/4 time wkly	Grant	7/8/2024	7/25/2024

McMahon-Kane	Ellen	Annual	Summer Learning Academy Program	Claremont School	$50.93	5 hr/4 times wkly	A	7/1/2024	8/20/2024
Grimes	Muriel	Annual	Summer Learning Academy Program	Anne M. Dorner Middle School	$47.36	5 hr/4 times wkly	A	7/1/2024	8/20/2024
Cavajani	Analia	Annual	Summer Learning Academy Program	Ossining High School	$48.57	5 hr/4 times wkly	A	7/1/2024	8/20/2024
Sanson	Katherine	Annual	Summer Learning Academy Program	Where Needed	$42.34	As Needed	A	7/1/2024	8/20/2024
Stanzione	Carol	Annual	Summer Learning Academy Program	Where Needed	$39.00	As Needed	A	7/1/2024	8/20/2024
Ciaffone	Maria	Annual	Summer Learning Academy Program	Where Needed	$43.93	As Needed	A	7/1/2024	8/20/2024
Gavazzi	Ann	Annual	Summer Learning Academy Program	Where Needed	$42.86	As Needed	A	7/1/2024	8/20/2024
Lazin	Gemma	Annual	Summer Learning Academy Program	Where Needed	$44.18	As Needed	A	7/1/2024	8/20/2024
Bay	Susan	Annual	Summer Learning Academy Program	Where Needed	$39.37	As Needed	A	7/1/2024	8/20/2024
Bartel	Lovelyn	Annual	Summer Learning Academy Program	Where Needed	$44.12	As Needed	A	7/1/2024	8/20/2024
Osorio	Leslie	Annual	Summer Learning Academy Program	Where Needed	$33.10	As Needed	A	7/1/2024	8/20/2024
Murray	Tammy	Annual	Summer Learning Academy Program	Where Needed	$44.18	As Needed	A	7/1/2024	8/20/2024
Drysdale	Malaki	Annual	Student Helper	District	$15.00	As Needed	A	7/1/2024	6/30/2025
Moore	Derrian	Annual	Student Helper	District	$15.00	As Needed	A	7/1/2024	6/30/2025
Acevedo	Alexander	Annual	Student Helper	District	$15.00	As Needed	A	7/1/2024	6/30/2025
Butts	Erick	Annual	Student Helper	District	$15.00	As Needed	A	7/1/2024	6/30/2025
Diaz	Ivan	Annual	Student Helper	District	$15.50	As Needed	A	7/1/2024	6/30/2025
Brito	Kylen	Annual	Student Helper	District	$15.25	As Needed	A	7/1/2024	6/30/2025
Zhunio	James	Annual	Student Helper	District	$15.50	As Needed	A	7/1/2024	6/30/2025
Hicks	Natalya	Annual	Student Helper	District	$15.25	As Needed	A	7/1/2024	6/30/2025
Gonzalez	Steven	Annual	Student Helper	District	$15.25	As Needed	A	7/1/2024	6/30/2025
Gallego Poguio	Andres	Annual	Student Helper	District	$15.25	As Needed	A	7/1/2024	6/30/2025

7.13 Resolution Regarding Support Staff Appointment(s) – Summer School Programs

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Support Staff appointment(s) for the persons so noted.

Last Name	First Name	Cert. Status	Appt. Type	Program	Building	Step	Hourly Rate	% Time	Source	Effective Date	Expire Date
Gonder	Kayla	Childhood Educatoin	Annual	Extended School Year ESY Program	Roosevelt	2	$21.58	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Viera	Julia	n/a	Annual	Extended School Year ESY Program	Roosevelt	2	$17.15	5.75 hr/5	Grant	7/1/2024	8/9/2024

								times wkly			
Aguilar	Katherine	n/a	Annual	Extended School Year ESY Program	Roosevelt	1	$16.46	As Needed	Grant	7/1/2024	8/9/2024
DeBenedictis	Gina	Level 1	Annual	Extended School Year ESY Program	Roosevelt	1	$16.46	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Carone	Nicholas	Level 1	Annual	Extended School Year ESY Program	Roosevelt	2	$21.58	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Espinoza	Nilsa	n/a	Annual	Extended School Year ESY Program	Roosevelt	1	$16.46	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Savinon Jr.	Javier	Level 1	Annual	Extended School Year ESY Program	Roosevelt	2	$21.58	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Rotimi	Festus	n/a	Annual	Summer Program	Ossining High School	6	$20.17	6 hrs/5 times wkly	A	7/1/2024	8/27/2024
Harrell	Rhonda	Continuous	Annual	Summer Program - Credit Recovery	Ossining High School	6	$22.77	3.15 hr/5 times wkly	A	7/1/2024	8/27/2024
Clayton	Linda	n/a	Annual	Summer Program	Ossining High School	6	$20.17	3.15 hr/5 times wkly	A	7/1/2024	8/27/2024
Smith	Lavaughan	n/a	Annual	Summer Program - Life Skills	Ossining High School	6	$20.17	3.25 hr/5 times wkly	A	7/1/2024	8/27/2024
Ramos	Elizabeth	Level 1	Annual	Extended School Year ESY Program	Roosevelt	2	$21.58	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Ligeiro	Jessica	Childhood Educatoin	Annual	Extended School Year ESY Program	Roosevelt	1	$20.92	5.75 hr/5 times wkly	Grant	7/1/2024	8/9/2024
Yan	Claudia	Level 3	Annual	Elementary Summer Learning Academy	Park	6	$22.77	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Sanmartin	Olga	n/a	Annual	Elementary Summer Learning Academy	Park	4	$18.60	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
McCauley	Laurie	Level 1	Annual	Elementary Summer Learning Academy	Park	6	$22.77	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Roman	Olivia	Level 1	Annual	Elementary Summer Learning Academy	Park	1	$18.98	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Dunlap	Theresa	Level 1	Annual	Elementary Summer Learning Academy	Park	2	$19.69	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Hamill	Neil	Literacy	Annual	Elementary Summer Learning Academy	Park	6	$22.77	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Bottone	Zamara	Level 1	Annual	Elementary Summer	Park	3	$19.69	As Needed	A	7/1/2024	7/25/2024

				Learning Academy							
Chacho Morocho	Marilyn	n/a	Annual	Elementary Summer Learning Academy	Park	2	$17.15	As Needed	A	7/1/2024	7/25/2024
Sanmartin	Augusta	n/a	Annual	Elementary Summer Learning Academy	Park	3	$17.86	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Aguilera	Amparo	n/a	Annual	Elementary Summer Learning Academy	Park	3	$17.86	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Villa	Nancy	n/a	Annual	Elementary Summer Learning Academy	Park	5	$19.37	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Cano	Irma	Level 3	Annual	Elementary Summer Learning Academy	Park	1	$18.98	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Pinto	Elizabeth	n/a	Annual	Elementary Summer Learning Academy	Park	6	$20.17	5 hr/4 times wkly	A	7/1/2024	7/25/2024
Fede-Kamenos	Maria	Level 3	Annual	Elementary Summer Learning Academy	Park	6	$22.77	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Dulin	Lisa	Level 3	Annual	Elementary Summer Learning Academy	Park	6	$22.77	4.5 hr/4 times wkly	A	7/1/2024	7/25/2024
Monteleone	Alyssa	Level 1	Annual	Middle School Summer Program	Anne M. Dorner Middle School	2	$19.69	4 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Villar Vasquez	Jazleen	n/a	Annual	Middle School Summer Program	Anne M. Dorner Middle School	2	$17.15	5 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Bastar	Richard	Level 3	Annual	Middle School Summer Program	Anne M. Dorner Middle School	6	$22.77	6 hr/4 times wkly	Grant	7/8/2024	7/25/2024
Gallego	Blanca	n/a	Annual	Middle School Summer Program	Anne M. Dorner Middle School	2	$17.15	As Needed	Grant	7/8/2024	7/25/2024
Rodrigues	Amanda	Level 1	Annual	Middle School Summer Program	Anne M. Dorner Middle School	1	$18.98	As Needed	Grant	7/8/2024	7/25/2024
Bonitto	Sophia	n/a	Annual	SFSP Supervisor/ Monitor	District	5	$19.37	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Dimmie	Paulette	n/a	Annual	SFSP Supervisor/ Monitor	District	6	$20.17	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Dommar	Denisse	n/a	Annual	SFSP Supervisor/ Monitor	District	5	$19.37	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Gallego	Blanca	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Gallego	Mirian	n/a	Annual	SFSP Supervisor/ Monitor	District	3	$17.86	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024

Howell	Camille	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Molde	Belma	n/a	Annual	SFSP Supervisor/ Monitor	District	6	$20.17	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Neira	Patricia	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Pagan	Martha	n/a	Annual	SFSP Supervisor/ Monitor	District	3	$17.86	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Palacios	Katerine	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Paniagua	Dahiana	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Simmons	Dale	n/a	Annual	SFSP Supervisor/ Monitor	District	1	$16.46	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Toyos	Juana	n/a	Annual	SFSP Supervisor/ Monitor	District	3	$17.86	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Vallejo-Tapia	Gabriela	n/a	Annual	SFSP Supervisor/ Monitor	District	2	$17.15	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Yaulimango Cuyubamba	Rosmery	n/a	Annual	SFSP Supervisor/ Monitor	District	1	$16.46	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Granados	Adriana	n/a	Annual	SFSP Supervisor/ Monitor	District	1	$16.46	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024
Nahim	Doris	n/a	Annual	SFSP Supervisor/ Monitor	District	3	$17.86	5 hr/2-5 times wkly	C	7/1/2024	8/16/2024

7.14 Resolution Regarding Approval of School Volunteers

I move that the persons listed on the following page be appointed by the Board of Education as school volunteers for the 2023-2024 school year.

Last Name	First Name	Volunteer Title	Start	End	Type
Chillemi	Rachelle	Non-Parent	6/20/2024	6/21/2024	Observe Speech Therapist @ AMD
Tagliavia	Claudia	Non-Parent	7/3/2024	8/27/2024	Student Teacher @ Park
Gomez	Melanie	Non-Parent	7/3/2024	8/27/2024	Student Teacher @ Park
Arevalo Delgado	Denise	Non-Parent	7/3/2024	8/27/2024	Student Teacher @ Park Fridays Only

7.15 Resolution Regarding Support Staff Request for a Leave of Absence

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Support Staff Leave Request for the person(s) so noted.

Last Name	**First Name**	**Building**	**Category or Tenure Area**	**Leave Start**	**Leave End**	**Reason**
Carone	Nicholas	Roosevelt	Teaching Assistant	9/3/2024	12/20/2024	Personal

7.16 Resolution Regarding APPR (Annual Professional Performance Review) Accountability

I move that upon recommendation of the Superintendent of Schools the Board of Education approve the Substitute appointments, for the purpose of APPR accountability, so noted.

Per Diem Sub Name	Building	Teacher Name	Start Date	Per Diem Sub Certification
Petrillo, Ava	Ossining High School	Emily Nastasi	5/13/2024	Social Studies

Motion carried: 7-0

7.17 Resolution Regarding Professional Staff Request(s) for Leave of Absence (For Information Only)

The matter is presented here for Board of Education information and no action is necessary.

Last Name	First Name	Building	Category or Tenure Area	Leave Start	Leave End	Reason
Guardino	Joanna	Anne M. Dorner Middle School	Special Education	5/22/2024	10/17/2024	FMLA
Estrada	Roxana	Ossining High School	Science	5/15/2024	10/16/2024	FMLA
Testa	Elizabeth	Ossining High School	ENL	3/4/2024	5/31/2024	FMLA

7.18 Resolution Regarding Civil Service Staff Request(s) for Leave of Absence (For Information Only)

The matter is presented here for Board of Education information and no action is necessary.

Last Name	First Name	Building	Category or Tenure Area	Leave Start	Leave End	Reason
Hall	Jasmine	Central Office	Purchase Clerk	7/3/2024	9/2/2024	Child Rearing

8. Enrollment Report - For Information Only

The matter is presented here for Board of Education information and no action is necessary.

9. Audience Recognition

There were no attendees in person or attending virtually who wished to be recognized.

10. Board Reports and Dialogue

Board Trustees share the following:

- The Board of Education Summer Retreat is scheduled for all day on Thursday, July 25th at PNW BOCES in Yorktown Heights.
- The Board Governance Committee met and drafted a checklist of ideas to review at the Retreat
- The Board Handbook is almost finalized.
- Board President Katherin Crossling announced that she is interested in the Vice President position on the Board
- Board Vice President Christine Mangiamele announced that she is interested in the President position on the Board
- The Annual Reorganization meeting of the Board is scheduled for Wednesday, July 10th at 7:30 p.m.

- Robert Melstein questioned whether the All-Day Saturday Budget Workshop in March is needed. The Board deferred to Mary Fox-Alter and Alita Zuber for thoughts. The Board will decide depending on budget discussions.
- The next Policy Committee meeting is virtual and is scheduled for June 20th at noon.

11. Executive Session

At 10:59 p.m., Christine Mangiamele moved, and Roger Battacharia seconded the motion to go into Executive Session to discuss the employment history of a particular person or corporation, or matters leading to the appointment, employment, promotion, discipline, suspension, dismissal, or removal of a particular person, collective bargaining agreement and contracts.

Motion carried: 7-0

No formal action was taken.

At 11:19 p.m., Melissa Banta moved, and Roger Battacharia seconded the motion to reconvene the Regular meeting for the purpose of adjournment.

Motion carried: 7-0

12. Adjournment

At 11:20 p.m., Robert Melstein moved, and Christine Mangiamele seconded the motion to adjourn the Regular meeting of June 12, 2024.

Motion carried: 7-0

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Ileana Ortiz
District Clerk

Board of Education Meeting

Our Mission, Vision and Plan

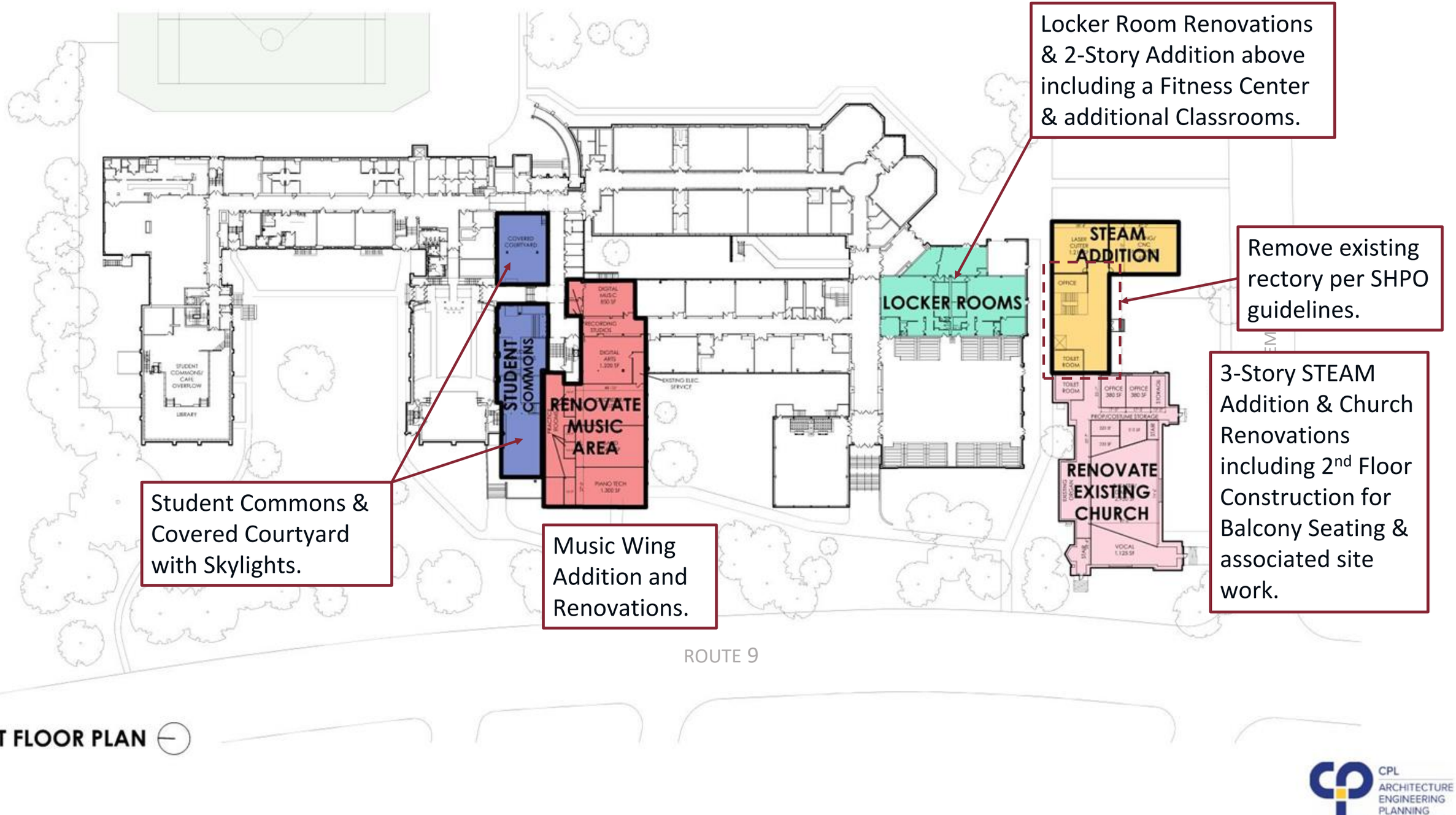
June 12, 2024

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OSSINING UNION FREE SCHOOL DISTRICT

HIGH SCHOOL - PROPOSED PLAN

PRIDE in all that we do

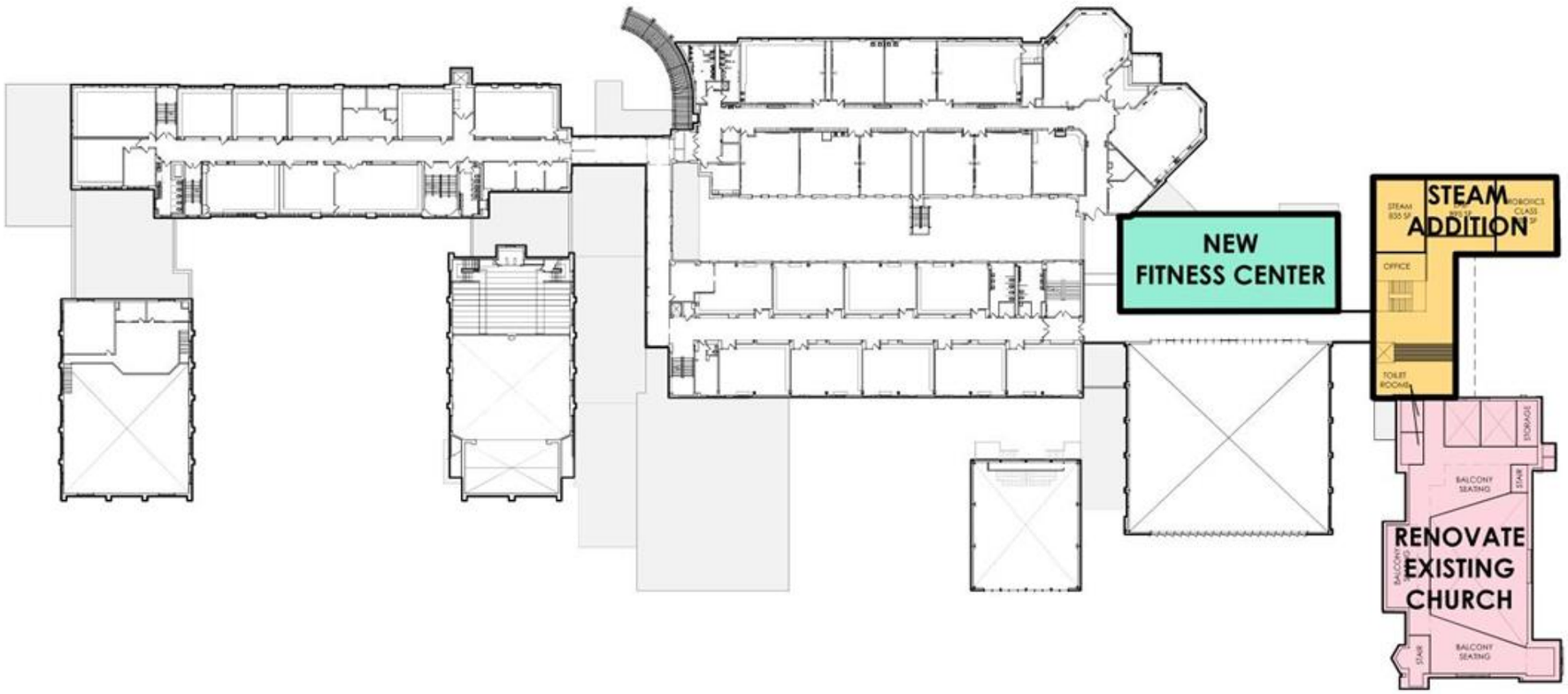


FIRST FLOOR PLAN

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OSSINING UNION FREE SCHOOL DISTRICT

HIGH SCHOOL - PROPOSED PLAN

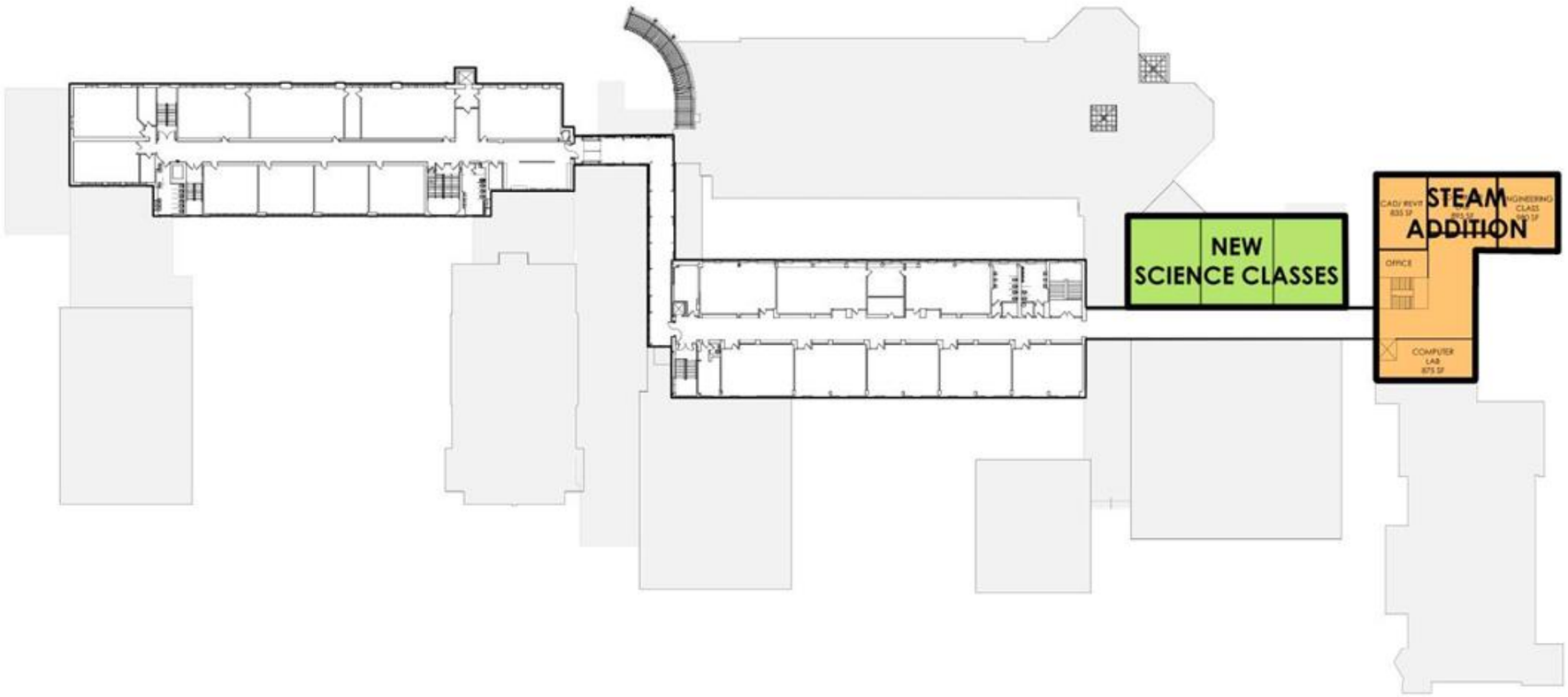


SECOND FLOOR PLAN

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HIGH SCHOOL - PROPOSED PLAN



THIRD FLOOR PLAN

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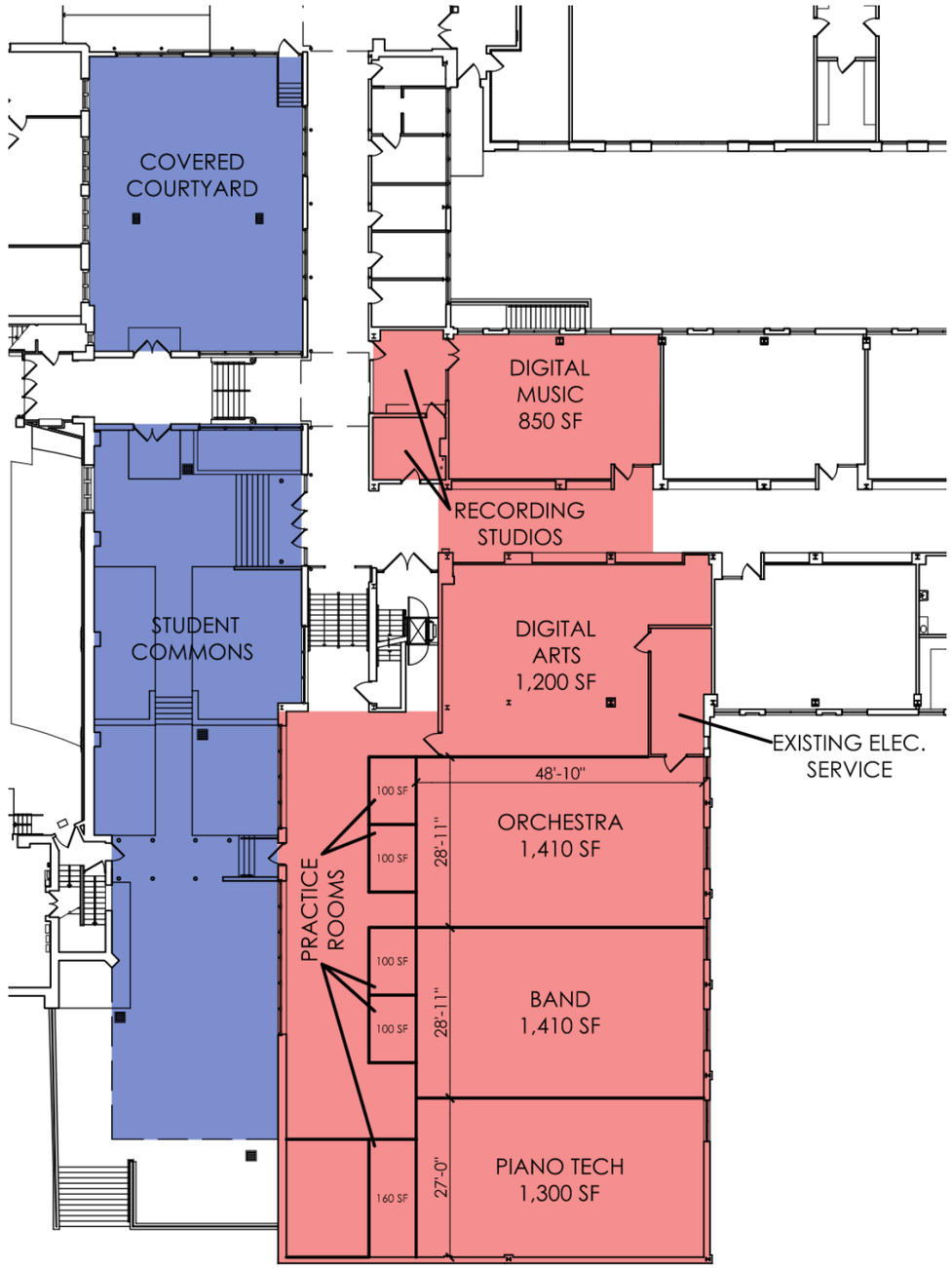
OSSINING UNION FREE SCHOOL DISTRICT

Student Commons & Music Addition

- Additional Lunch Seating for **117** people in Covered Courtyard.

- Additional Lunch Seating for **154** people in Student Commons.

- Additional Lunch Seating for **91** people in Open Air Covered Patio area outside of Student Commons.



1st Floor

OSSINING UNION FREE SCHOOL DISTRICT

Student Commons







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Covered Courtyard

PRIDE in all that we are





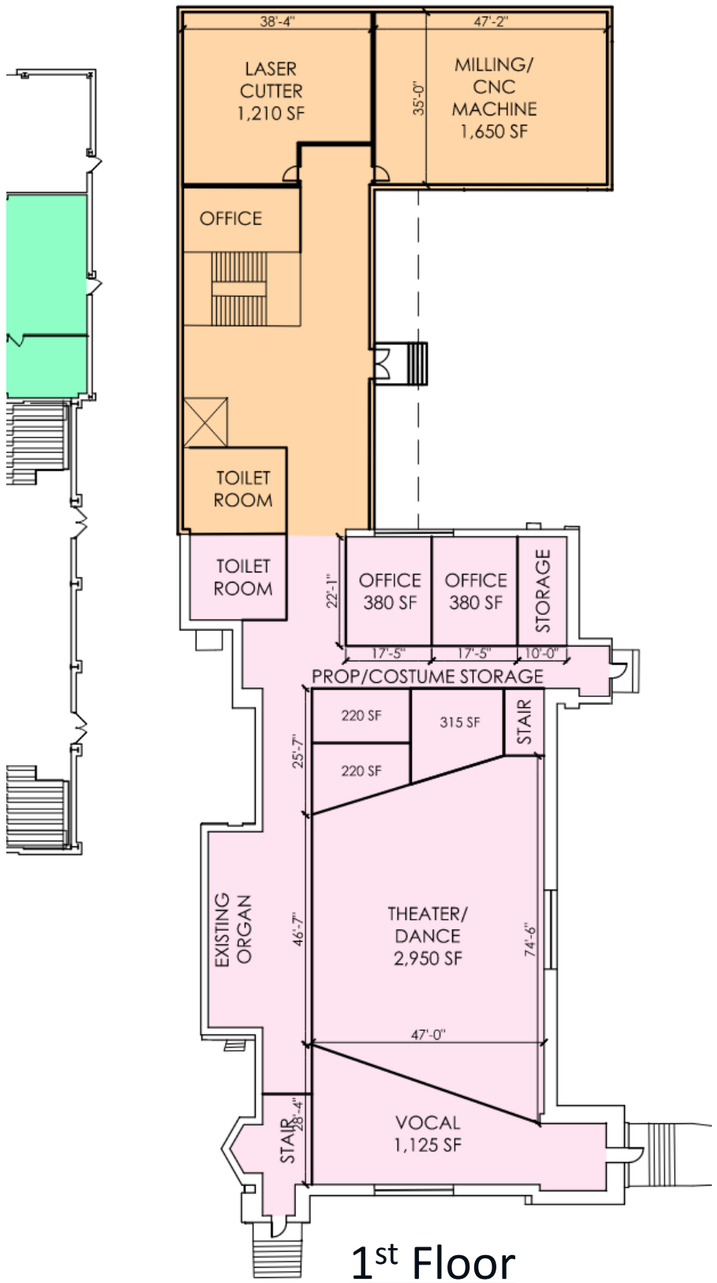


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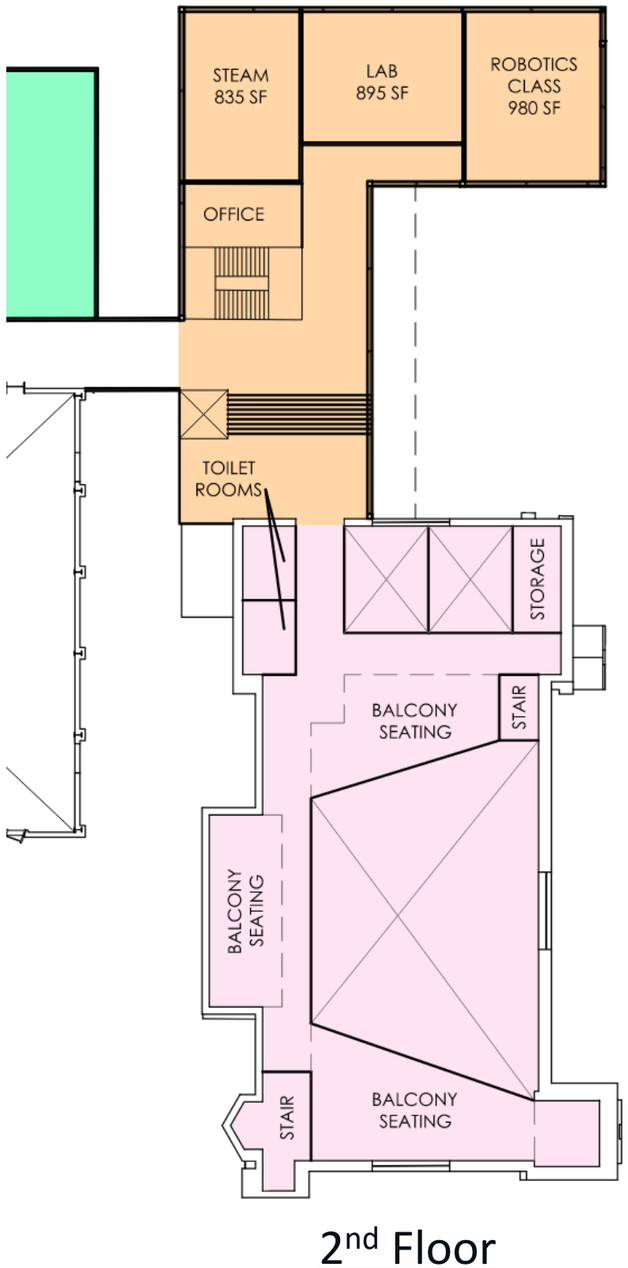
OSSINING UNION FREE SCHOOL DISTRICT

Church Renovation & STEAM Addition

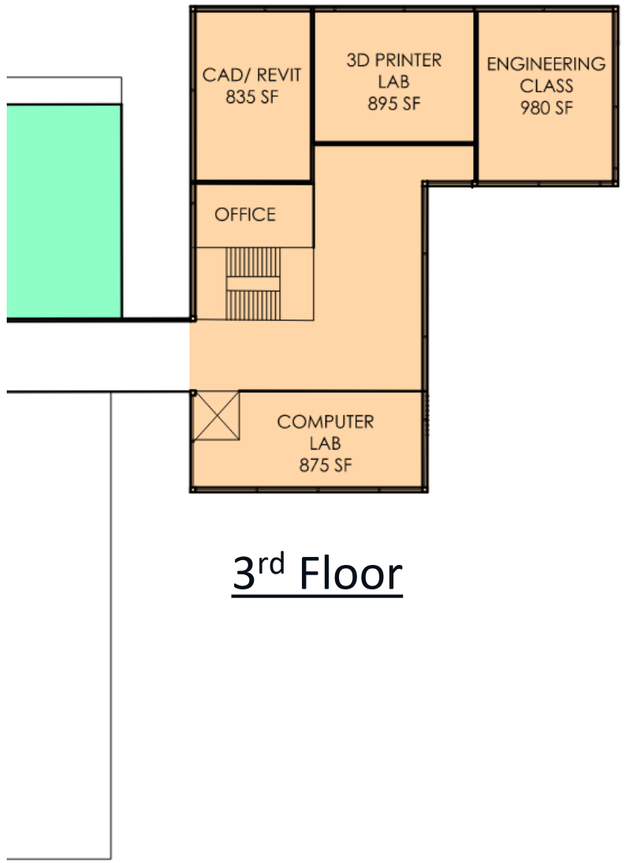
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1st Floor



2nd Floor



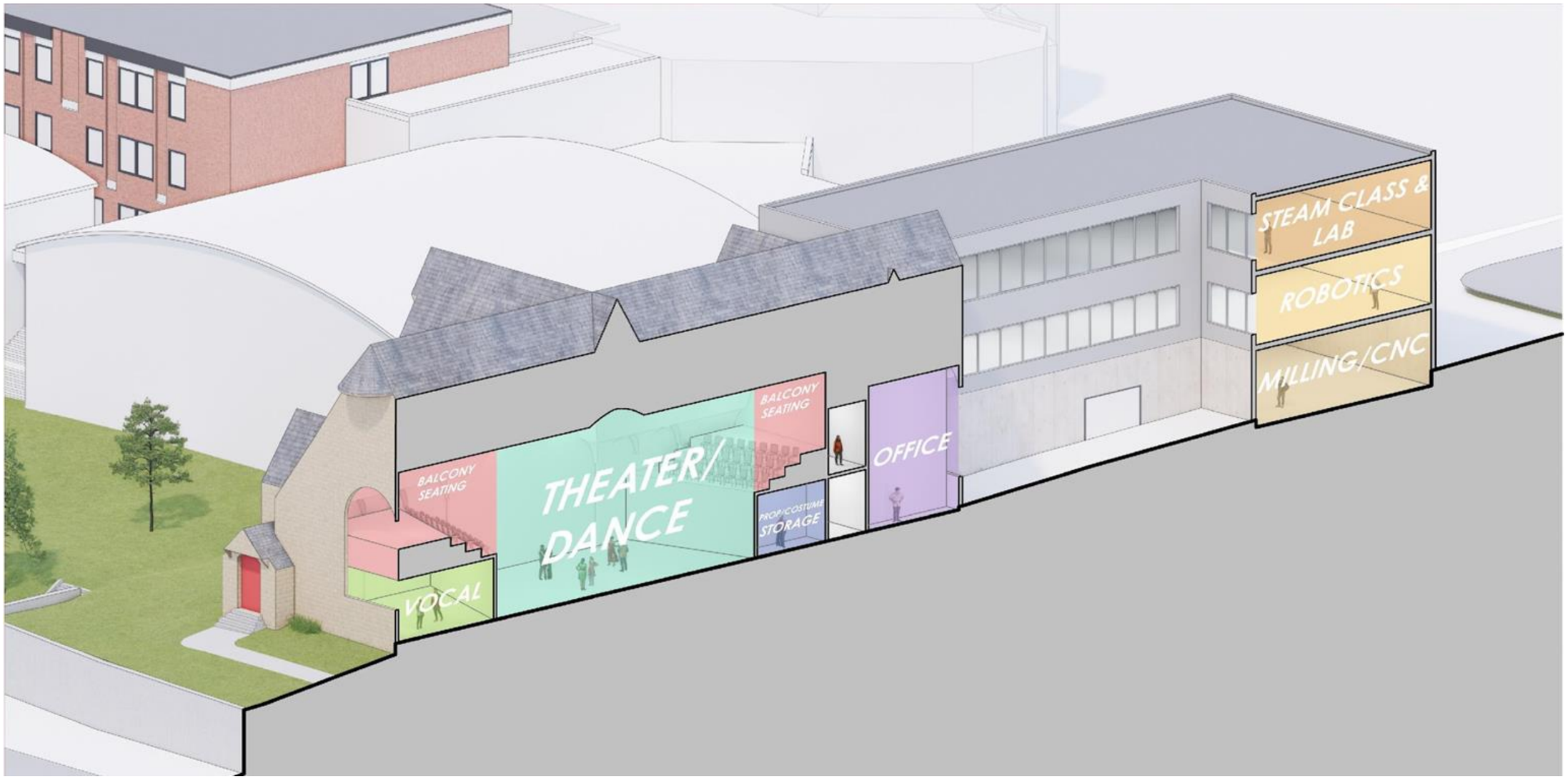
3rd Floor

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Church Renovation & STEAM Addition

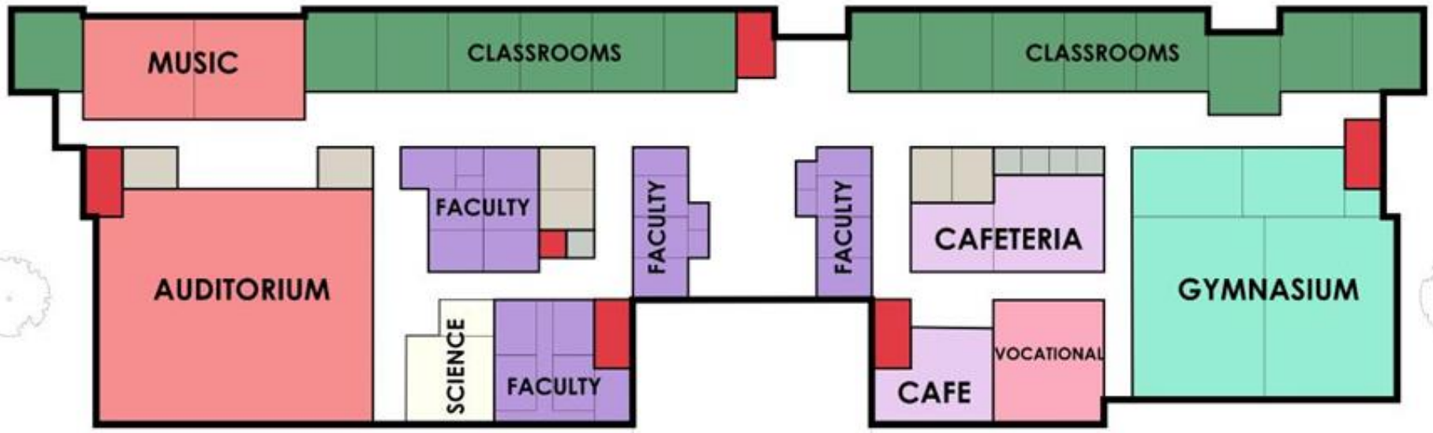
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7TH & 8TH BUILDING - PROPOSED PLAN

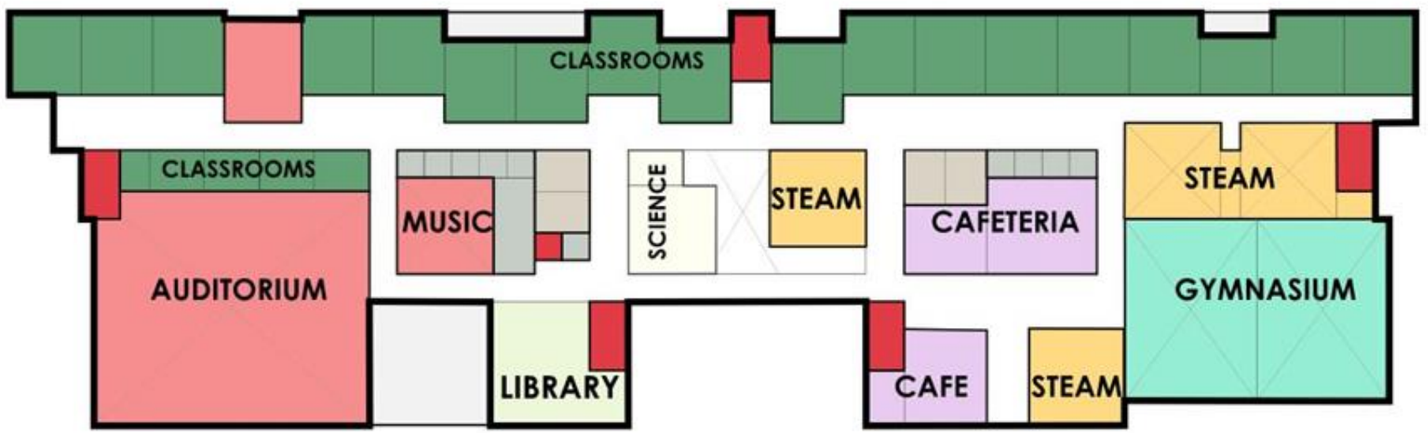


New 3-Story 7/8 Building with Parking areas & associated sitework.

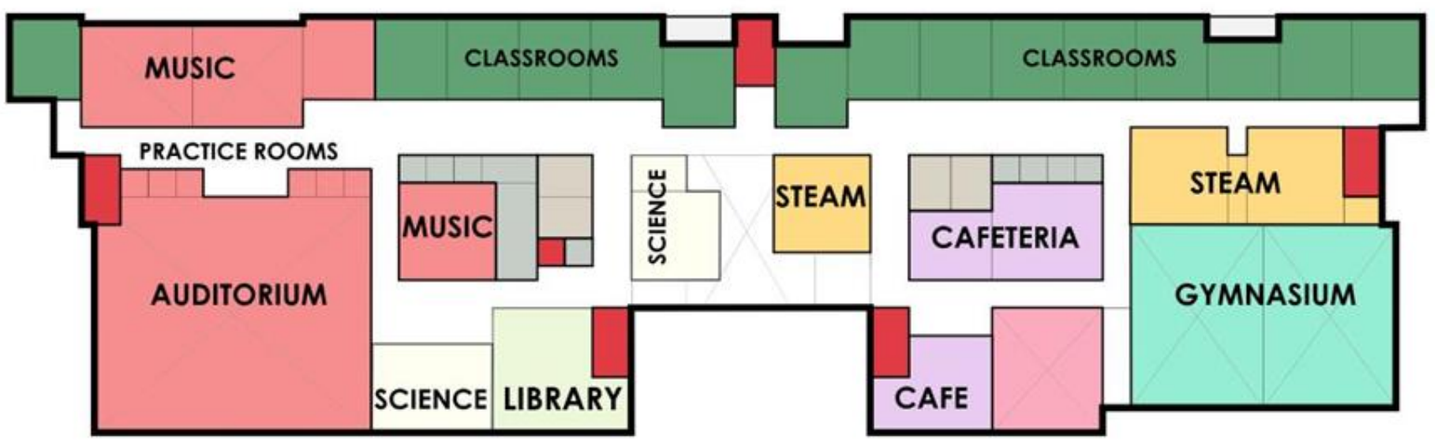
FIRST FLOOR PLAN

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7TH & 8TH BUILDING - PROPOSED PLAN



THIRD FLOOR PLAN



SECOND FLOOR PLAN

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7TH & 8TH BUILDING - RENDERINGS







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AMD Campus – Overall Site Plan

Sitework for additional fields & play areas. See financial information in subsequent slides.

Sitework for New 7/8 Building including parking, lighting, stormwater management, and grass play field (included in **Bond Project**).

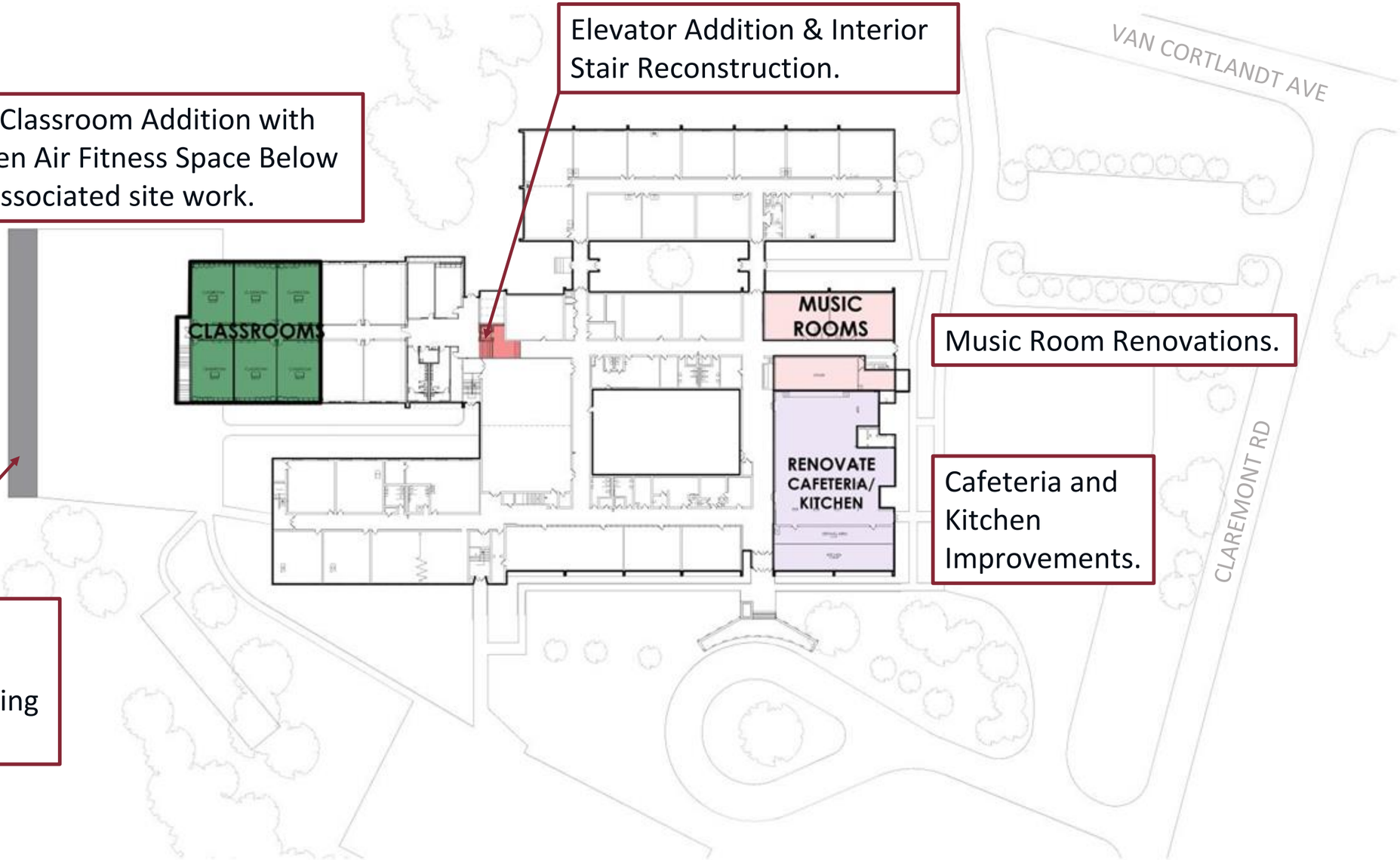
PROPOSED OVERALL CONCEPTUAL SITE PLAN

OSSINING UNION FREE SCHOOL DISTRICT

CLAREMONT - PROPOSED PLAN

Elevator Addition & Interior Stair Reconstruction.

Six Classroom Addition with Open Air Fitness Space Below & associated site work.



Music Room Renovations.

Cafeteria and Kitchen Improvements.

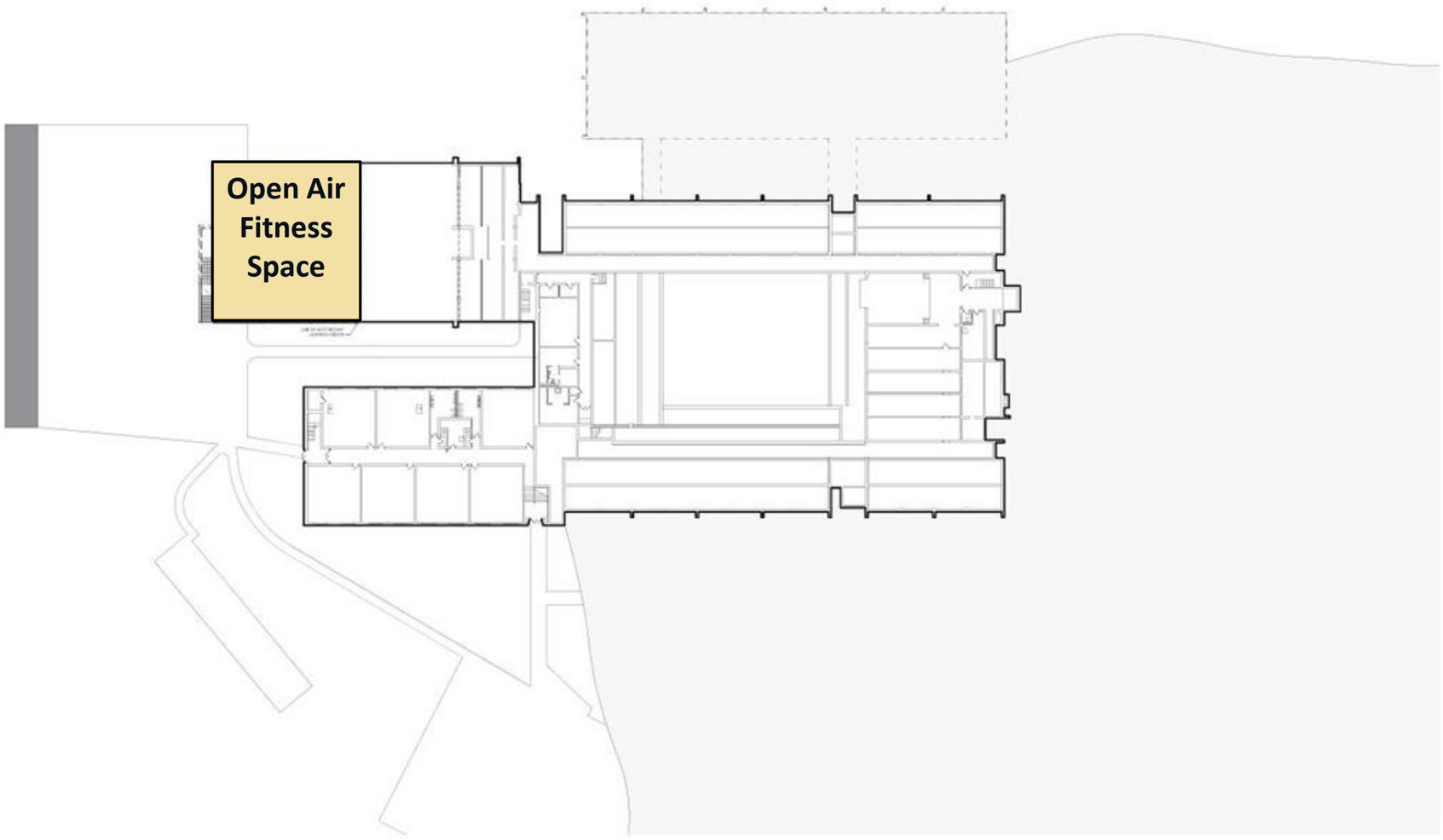
Additional asphalt pavement to accommodate busing logistics.

GROUND FLOOR PLAN

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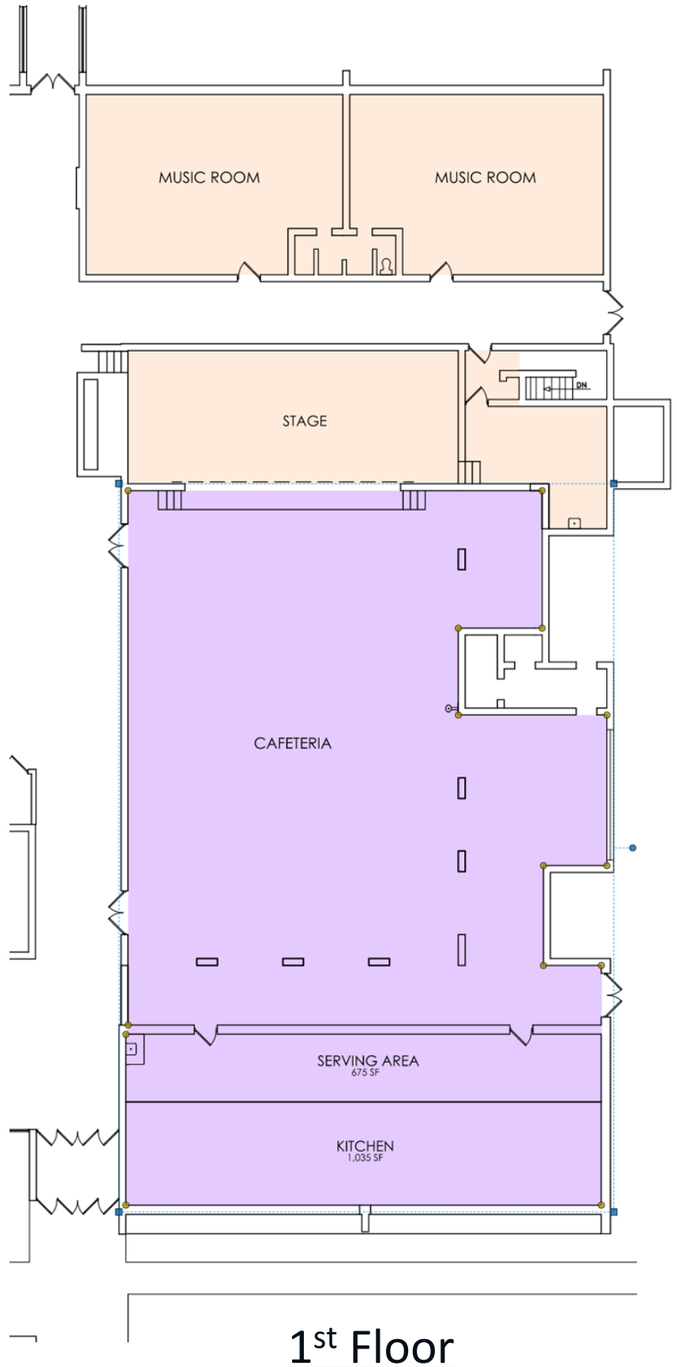
CLAREMONT - PROPOSED PLAN



BASEMENT FLOOR PLAN

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Cafeteria & Music Renovations



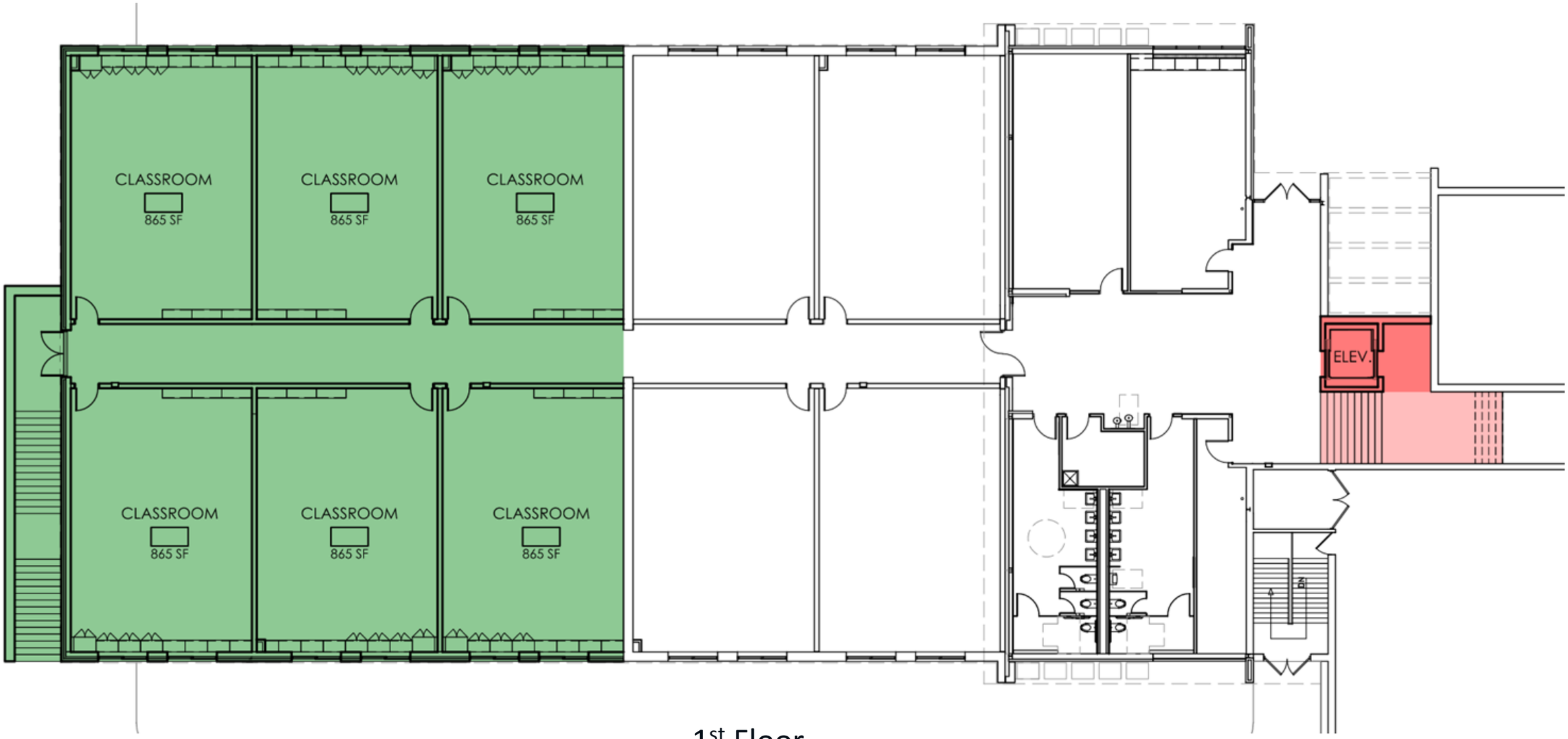
1st Floor

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Classroom Addition

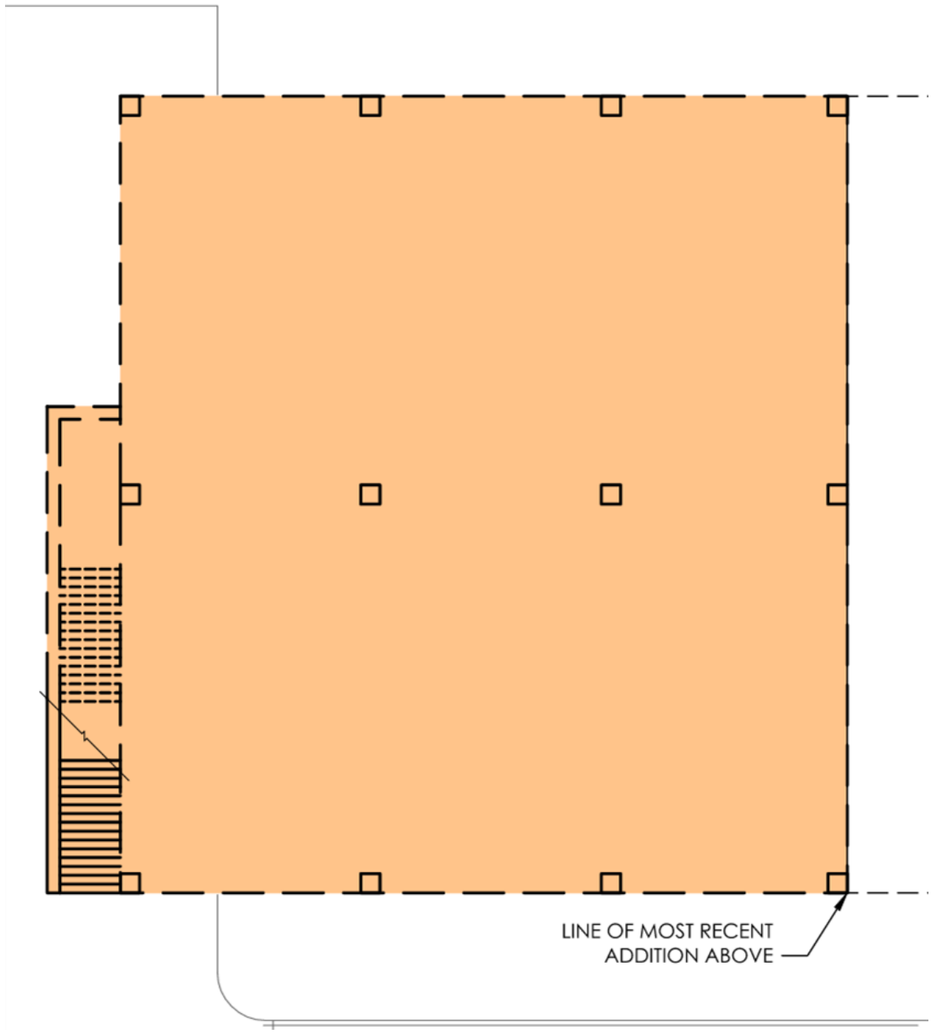
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1st Floor

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Open Air Fitness Area



Basement Floor



OSSINING UNION FREE SCHOOL DISTRICT

Financial Information for Bond Project

Proposition 1	Total Project Costs
	6/6/2024
Ossining High School Additions & Renovations	$67,119,764
7/8 New Construction	$130,899,270
Claremont Elementary School Additions & Renovations	$12,196,737
Total Estimated Bond	**$210,215,771**

- Above estimates include Allowances for Hazmat, Escalation, Contingency, FF&E & Soft Costs.
- FF&E Allowance figured for all Bond Additions & Renovations.
- Air conditioning figured for all new additions and renovations.
- Sprinkler System figured for 7/8 New Building and the Church Building Renovation
- Hazmat Allowance figured for work in existing buildings.

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Budget Appropriation Projects

Budget Appropriation Projects by Year (Approved)	Total Project Costs
	6/7/2024
Park Elementary School Classroom Addition & Cafeteria Expansion (22-23)	$8,500,000
Brookside Elementary School Classroom Addition (23-24)	$11,402,900
Access Drive to Stormytown Road Project (24-25)	$4,631,918
Anne M. Dorner 5/6 Air Conditioning (24-25)	$8,856,748
District Wide Energy Performance Contract (24-25)	$7,177,615

Budget Appropriation Projects by Year (Proposed)	Total Project Costs
	6/7/2024
Brookside Elementary School Cafeteria Renovation & Kitchen Addition (25-26)	$2,712,926
7/8 Building Athletic Improvements (25-26)	$5,387,074
7/8 Building Athletic Improvements (26-27)	$2,577,823

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- Above estimates include Allowances for Hazmat, Escalation, Contingency, FF&E & Soft Costs.
- FF&E Allowance figured for all Bond Additions & Renovations.
- Air conditioning figured for all new additions and renovations.
- Sprinkler System figured for 7/8 New Building and the Church Building Renovation
- Hazmat Allowance figured for work in existing buildings.

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OSSINING UNION FREE SCHOOL DISTRICT

Financial Information for Bond Project

Proposition 1 = $210,215,771

$12,215,819 Capital Reserve, $5,600,000 Budgetary Appropriations in 2026-2027, and $6,900,000 Budgetary Appropriation Per Year Commencing in 2027-2028

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Estimated Project Cost	Use of Capital Reserve	Total Estimated Debt Service	Total Projected Building Aid	Projected Local Share	Budgetary Appropriations	Local Share Less Budgetary Aprop.	% Change in Tax Levy
2024 - 2025	$ 8,839,795	$ 8,839,795	$ -	$ -	$ -	$ -	$ -	$ -
2025 - 2026	11,813,073	3,376,024	-	-	-	-	-	-
2026 - 2027	42,360,804	-	5,937,482	372,228	5,565,254	5,600,000	(34,746)	0.00%
2027 - 2028	86,492,696	-	11,139,446	4,307,681	6,831,765	6,900,000	(68,235)	0.00%
2028 - 2029	42,253,509	-	11,477,629	4,645,278	6,832,351	6,900,000	(67,649)	0.00%
2029 - 2030	13,390,031	-	11,480,687	4,645,278	6,835,409	6,900,000	(64,591)	0.00%
2030 - 2031	5,065,863	-	11,487,888	4,645,278	6,842,611	6,900,000	(57,389)	0.00%
2031 - 2032	-	-	11,483,928	4,645,278	6,838,650	6,900,000	(61,350)	
2032 - 2033	-	-	11,486,140	4,645,278	6,840,862	6,900,000	(59,138)	
2033 - 2034	-	-	11,485,468	4,645,278	6,840,190	6,900,000	(59,810)	
2034 - 2035	-	-	11,486,703	4,645,278	6,841,425	6,900,000	(58,575)	
2035 - 2036	-	-	11,484,430	4,645,278	6,839,152	6,900,000	(60,848)	
2036 - 2037	-	-	11,488,443	4,645,278	6,843,165	6,900,000	(56,835)	
2037 - 2038	-	-	11,488,118	4,645,278	6,842,840	6,900,000	(57,160)	
2038 - 2039	-	-	11,488,248	4,645,278	6,842,970	6,900,000	(57,030)	
2039 - 2040	-	-	11,488,418	4,645,278	6,843,140	6,900,000	(56,860)	
2040 - 2041	-	-	11,488,213	4,645,278	6,842,935	6,900,000	(57,065)	
2041 - 2042	-	-	11,487,218	4,645,278	6,841,940	6,900,000	(58,060)	
2042 - 2043	-	-	11,485,018	4,645,278	6,839,740	6,900,000	(60,260)	
2043 - 2044	-	-	11,486,198	4,645,278	6,840,920	6,900,000	(59,080)	
2044 - 2045	-	-	11,485,135	4,645,278	6,839,857	6,900,000	(60,143)	
2045 - 2046	-	-	11,486,415	4,645,278	6,841,137	6,900,000	(58,863)	
2046 - 2047	-	-	11,114,415	4,273,050	6,841,365	6,900,000	(58,635)	
2047 - 2048	-	-	9,509,075	2,666,809	6,842,266	6,900,000	(57,734)	
2048 - 2049	-	-	9,171,648	2,329,212	6,842,435	6,900,000	(57,565)	
2049 - 2050	-	-	9,171,710	2,329,212	6,842,498	6,900,000	(57,502)	
2050 - 2051	-	-	9,170,360	2,329,212	6,841,148	6,900,000	(58,852)	
2051 - 2052	-	-	9,172,183	2,329,212	6,842,970	6,900,000	(57,030)	
2052 - 2053	-	-	9,171,555	2,329,212	6,842,343	6,900,000	(57,657)	
2053 - 2054	-	-	9,168,063	2,329,212	6,838,850	6,900,000	(61,150)	
2054 - 2055	-	-	9,171,290	2,329,212	6,842,078	6,900,000	(57,922)	
2055 - 2056	-	-	9,170,408	2,329,212	6,841,195	6,900,000	(58,805)	
TOTALS	**$ 210,215,771**	**$ 12,215,819**	**$ 317,811,924**	**$ 113,868,467**	**$ 203,943,457**	**$ 205,700,000**		**0.00%**

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These figures are to be used for estimating only. Fiscal Advisors cannot predict and gives no assurance that the actual aid amounts will be the same as those estimated.

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Funding for Future Maintenance Capital Projects

Capital Projects	2025-26 (Year 1) Source of Funds			2026-27 (Year 2) Source of Funds			2027-28 (Year 3) Source of Funds		
	XFR to Capital	Retired Debt	Reserves	XFR to Capital	Retired Debt	Reserves	XFR to Capital	Retired Debt	Reserves
Brookside Cafeteria Renovation/Kitchen Addition	$ 2,712,926		$ -	$ -	$ -	$ -			$ -
AMD Sitework Earth Ground and Field work	$ 1,278,064			$ -	$ -	$ -			
Maintenance Project Capital Work	$ 2,959,010	$ 1,139,250	$ -	$ 50,000	$ 1,139,250	$ -	$ 50,000	$ -	$ -
Annual ($) Available for Maintenance Capital Work			*$ 4,098,260*			*$ 1,189,250*			*$ 50,000*
Grand Total Available for Maintenance Capital Work									**$ 5,337,510**

Expiring Lease for 400 Executive Boulevard in the amount of approximatel $600K in 2030-31 to offset operating expenses.

Roosevelt Project Scope-TBD

Maintenance Capital Projects from 2019 to 2025 totaled $5,635,874 or $939,312 per year. The above schedule allows for $2,705,191 per year over a three year period. Three times more than in the past 5 years and next year's budget.

Infrastructure Projects by Budget Year

	Roof	Boiler	HVAC / Univents	Field/Track	Electrical Service	Emergency Generator
*PPU**	*25*	*30*	*20*	*15*	*30*	*30*
School						
AMD	2014	2016	2025	2019	2016	2016
Brookside	2018	2016	2024	N/A	Meets Current Capacity	2017
Claremont	2018	2016	2024	N/A	Meets Current Capacity	2014
OHS	2012, 2014, 2016, 2022	2016	2012, 2016, 2024	2014, 2019	2016	2016
Park	2017, 2024	2016	2021, 2024	N/A	2024	2010
Roosevelt	2017	2016	2018	N/A	Meets Current Capacity	2017

	Windows	Bathrooms	Security Entrance	Security Cameras	Building Management System	Fire Alarm System
*PPU**	*30*	*30*	*30*	*10*	*10-15*	*15*
School						
AMD	2016	2016	2016	2015, 2016, 2018	2016, 2024	2016
Brookside	2021	N/A	2021	2015, 2016, 2018	2016, 2024	2025
Claremont	2021	2021	2022	2015, 2016, 2018	2016, 2024	UNK
OHS	2016, 2019	2017	2018	2015, 2016, 2018	2016, 2024	2016
Park	2018, 2024	N/A	2022	2015, 2016, 2018	2016, 2024	2018
Roosevelt	2019	2023	2015	2015, 2016, 2018	2016, 2024	2017

***Period of Probable Usefulness**

To be considered as projects within the next 5 years.

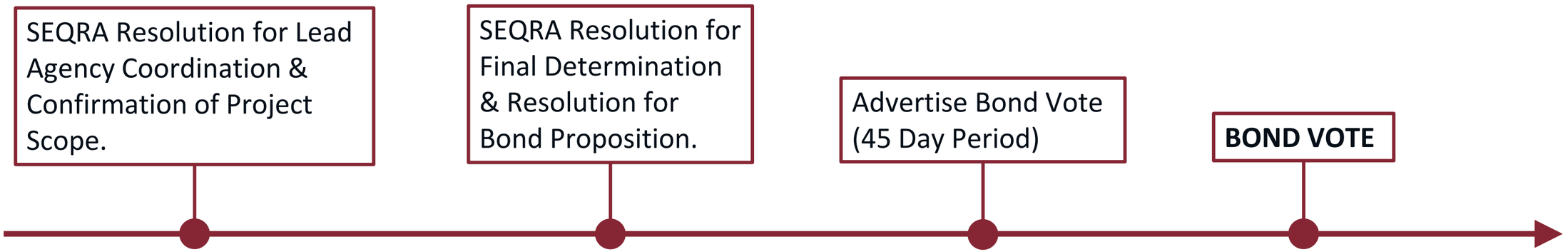
Capital Project Over the Last 10 Years

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Schedule

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NEXT STEPS

Questions/ Feedback

Thank you!

Board of Education Meeting

Our Mission, Vision and Plan

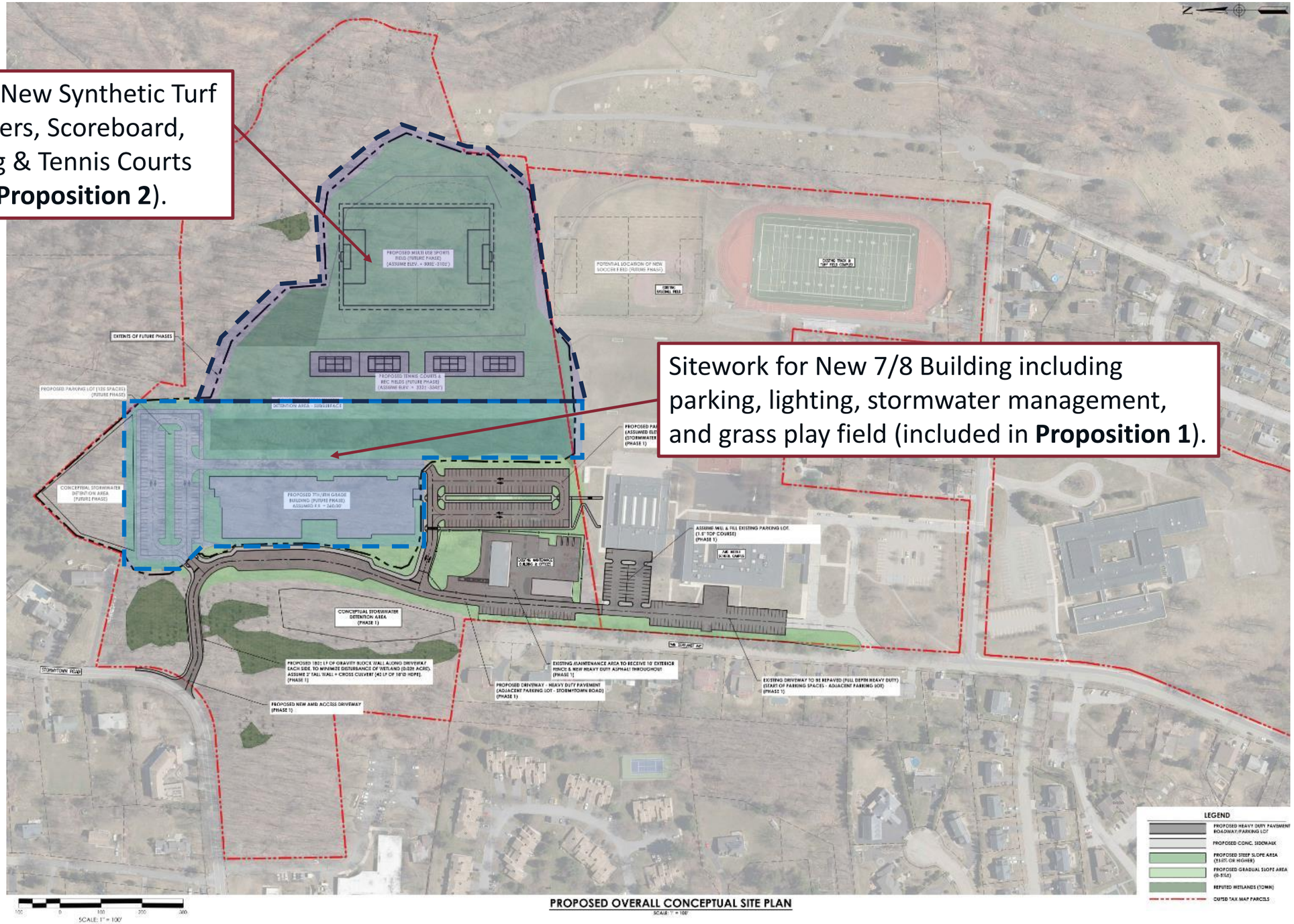
June 12, 2024

OSSINING UNION FREE SCHOOL DISTRICT

AMD Campus – Overall Site Plan

Sitework for New Synthetic Turf Field, Bleachers, Scoreboard, Field Lighting & Tennis Courts (included in **Proposition 2**).

Sitework for New 7/8 Building including parking, lighting, stormwater management, and grass play field (included in **Proposition 1**).



PROPOSED OVERALL CONCEPTUAL SITE PLAN

SCALE: 1" = 100'

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Proposition 2 - 7/8 Building Athletic Improvements	Total Project Costs
	6/6/2024
Sitework Behind New 7/8 Building and New Play Areas (Including Clearing, Earthwork, Storm Drainage, Sidewalks, Synthetic Turf Field, Bleachers, Scoreboard, Field Lighting & Tennis Courts)	+ $7,964,897

- Above estimates include Allowances for Hazmat, Escalation, Contingency, FF&E & Soft Costs.
- FF&E Allowance figured for all Bond Additions & Renovations.
- Air conditioning figured for all new additions and renovations.
- Sprinkler System figured for 7/8 New Building and the Church Building Renovation
- Hazmat Allowance figured for work in existing buildings.

OSSINING UNION FREE SCHOOL DISTRICT

Budget Appropriation Projects

Budget Appropriation Projects by Year (Approved)	Total Project Costs
	6/7/2024
Park Elementary School Classroom Addition & Cafeteria Expansion (22-23)	$8,500,000
Brookside Elementary School Classroom Addition (23-24)	$11,402,900
Access Drive to Stormytown Road Project (24-25)	$4,631,918
Anne M. Dorner 5/6 Air Conditioning (24-25)	$8,856,748
District Wide Energy Performance Contract (24-25)	$7,177,615

Budget Appropriation Projects by Year (Proposed)	Total Project Costs
	6/7/2024
Brookside Elementary School Cafeteria Renovation & Kitchen Addition (25-26)	$2,712,926

- Above estimates include Allowances for Hazmat, Escalation, Contingency, FF&E & Soft Costs.
- FF&E Allowance figured for all Bond Additions & Renovations.
- Air conditioning figured for all new additions and renovations.
- Sprinkler System figured for 7/8 New Building and the Church Building Renovation
- Hazmat Allowance figured for work in existing buildings.

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Financial Information for Bond Project

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Proposition 1 = $210,215,771 + Proposition 2 = $7,964,897

$12,215,819 Capital Reserve, $5,600,000 Budgetary Appropriations in 2026-2027, and $6,900,000 Budgetary Appropriation Per Year Commencing in 2027-2028.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Estimated Project Cost	Use of Capital Reserve	Total Estimated Debt Service	Total Projected Building Aid	Projected Local Share	Budgetary Appropriations	Local Share Less Budgetary Aprop.	% Change in Tax Levy
2024 - 2025	$ 8,839,795	$ 8,839,795	$ -	$ -	$ -	$ -	$ -	$ -
2025 - 2026	11,813,073	3,376,024	-	-	-	-	-	-
2026 - 2027	42,360,804	-	6,057,482	372,228	5,685,254	5,600,000	85,254	0.08%
2027 - 2028	86,492,696	-	11,374,363	4,307,681	7,066,682	6,900,000	166,682	0.08%
2028 - 2029	50,218,406	-	11,792,441	4,645,278	7,147,163	6,900,000	247,163	0.08%
2029 - 2030	13,390,031	-	11,869,875	4,645,278	7,224,597	6,900,000	324,597	0.07%
2030 - 2031	5,065,863	-	11,948,676	4,645,278	7,303,398	6,900,000	403,398	0.07%
2031 - 2032	-	-	11,946,088	4,645,278	7,300,810	6,900,000	400,810	0.00%
2032 - 2033	-	-	11,946,245	4,645,278	7,300,967	6,900,000	400,967	0.00%
2033 - 2034	-	-	11,943,310	4,645,278	7,298,032	6,900,000	398,032	0.00%
2034 - 2035	-	-	11,942,075	4,645,278	7,296,797	6,900,000	396,797	0.00%
2035 - 2036	-	-	11,942,125	4,645,278	7,296,847	6,900,000	396,847	0.00%
2036 - 2037	-	-	11,943,045	4,645,278	7,297,767	6,900,000	397,767	0.00%
2037 - 2038	-	-	11,944,420	4,645,278	7,299,142	6,900,000	399,142	0.00%
2038 - 2039	-	-	11,945,835	4,645,278	7,300,557	6,900,000	400,557	0.00%
2039 - 2040	-	-	11,946,875	4,645,278	7,301,597	6,900,000	401,597	0.00%
2040 - 2041	-	-	11,942,125	4,645,278	7,296,847	6,900,000	396,847	0.00%
2041 - 2042	-	-	11,946,378	4,645,278	7,301,100	6,900,000	401,100	0.00%
2042 - 2043	-	-	11,943,803	4,645,278	7,298,525	6,900,000	398,525	0.00%
2043 - 2044	-	-	11,944,193	4,645,278	7,298,915	6,900,000	398,915	0.00%
2044 - 2045	-	-	11,941,925	4,645,278	7,296,647	6,900,000	396,647	0.00%
2045 - 2046	-	-	11,946,585	4,645,278	7,301,307	6,900,000	401,307	0.00%
2046 - 2047	-	-	11,572,343	4,273,050	7,299,293	6,900,000	399,293	0.00%
2047 - 2048	-	-	9,964,345	2,666,809	7,297,536	6,900,000	397,536	0.00%
2048 - 2049	-	-	9,628,845	2,329,212	7,299,633	6,900,000	399,633	0.00%
2049 - 2050	-	-	9,630,213	2,329,212	7,301,000	6,900,000	401,000	0.00%
2050 - 2051	-	-	9,629,545	2,329,212	7,300,333	6,900,000	400,333	0.00%
2051 - 2052	-	-	9,626,428	2,329,212	7,297,215	6,900,000	397,215	0.00%
2052 - 2053	-	-	9,630,445	2,329,212	7,301,233	6,900,000	401,233	0.00%
2053 - 2054	-	-	9,630,768	2,329,212	7,301,555	6,900,000	401,555	0.00%
2054 - 2055	-	-	9,626,980	2,329,212	7,297,768	6,900,000	397,768	0.00%
2055 - 2056	-	-	9,628,668	2,329,212	7,299,455	6,900,000	399,455	0.00%
TOTALS	**$ 218,180,668**	**$ 12,215,819**	**$ 330,776,439**	**$ 113,868,467**	**$ 216,907,972**	**$ 205,700,000**		**0.38%**

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OSSINING UNION FREE SCHOOL DISTRICT

Funding for Future Maintenance Capital Projects

Capital Projects	2025-26 (Year 1) Source of Funds			2026-27 (Year 2) Source of Funds			2027-28 (Year 3) Source of Funds		
	XFR to Capital	Retired Debt	Reserves	XFR to Capital	Retired Debt	Reserves	XFR to Capital	Retired Debt	Reserves
Brookside Cafeteria Renovation/Kitchen Addition	$ 2,712,926		$ -	$ -	$ -	$ -	$ -	$ -	$ -
AMD Earth Ground and Field work (incl. in Bond)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Maintenance Project Capital Work	$ 4,237,074	$ 1,139,250	$ -	$ 50,000	$ 1,139,250	$ -	$ 50,000	$ -	$ -
Annual ($) Available for Maintenance Capital Work			*$ 5,376,324*			*$ 1,189,250*			*$ 50,000*
Grand Total Available for Maintenance Capital Work									**$ 6,615,574**

Expiring Lease for 400 Executive Boulevard in the amount of approximatel $600K in 2030-31 to offset operating expenses.

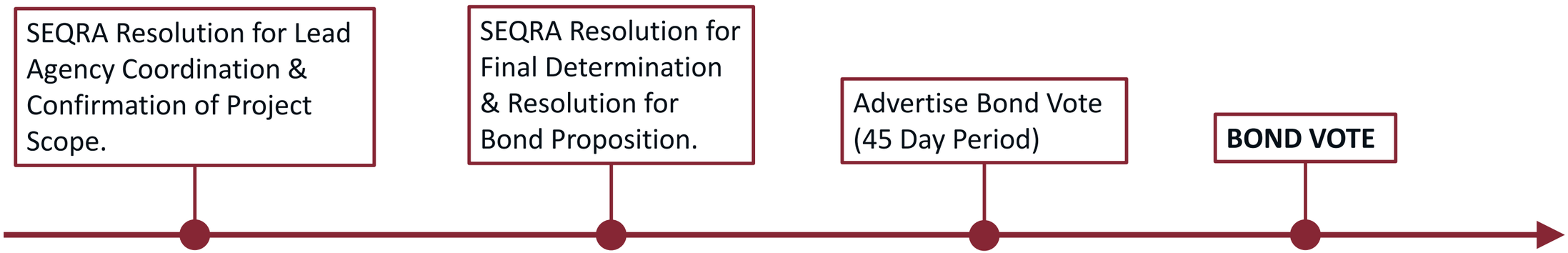
Roosevelt Project Scope-TBD

Maintenance Capital Projects from 2019 to 2025 totaled $5,635,874 or $939,312 per year. The above schedule allows for $2,705,191 per year over a three year period. Three times more than in the past 5 years and next year's budget.

OSSINING UNION FREE SCHOOL DISTRICT

Schedule

PRIDE in all that we are



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NEXT STEPS

Questions/ Feedback

Thank you!

Board of Education Meeting

Focused and Future Ready
Ossining UFSD
Capital Improvement Plan

June 12, 2024

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Focused and Future Ready

Creating a Facilities Framework Started in 2020

What 21st century instructional needs are not being addressed sufficiently?

What compromises are being made that can no longer should be made and are in danger of no longer working?

Are school building limitations driving the instructional program or are student needs?

What is the financial plan to leverage and maximize significant NYS building aid and capital reserves to minimize the local impact to taxpayers?

Focused and Future Ready

Deep Conclusions for Discussion

We have major and significant space constraints.

We have key misalignment between needs and dedicates spaces.

We have a significant, dire shortage of support spaces (related services, school counseling).

We have compromised and substandard common spaces.

Focused and Future Ready

"We need space" - space challenges and space demands permeate the PreK-12 conversations and decisions

- We have compromised spaces
- Cramped classrooms, shared classrooms
- Instructional time and opportunities are lost due to space challenges
- Learning environments in hallways, stairwells, landing areas, stages
- Very dense hallways and stairwells
- Room utilization rates that significantly impeded the ability to schedule program around students needs
- Outdated and dramatically undersized cafeterias and kitchens - impacts lunch and recess
- Space needs generate student safety concerns, anxiety and stress level impacts for students and staff.

OSSINING UNION FREE SCHOOL DISTRICT

Capital Improvement Plan

Focused and Future Ready

A transformative plan to renovate and expand school facilities to meet the 21st century needs of our students and staff.

Plan Vision

To build and improve district facilities to support the growth and success of everyone within our educational community.

Initial Plan presented last spring
23-24 school year - engagement and refinement.

BOE updated charge
Restructure the plan so that the tax impact is zero while keeping the program needs front and center.

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Capital Improvement Plan
Engagement and Communication

Engagement Events and Meetings 23-24 School Year

- BOE Meetings and Updates
- Website section
- District Facilities Committee Meetings - 7 meetings this year
- School based faculty meetings and evening events
- Explore and Learn Events
- PTA
- Community Survey fall
- Feedback from staff - AMD and OHS
- Traffic Study
- Capital Projects and the 24-25 Budget Process

Focused and Future Ready

June 12 BOE Meeting.

- Worksession on Facilities
- Capital Improvement Plan Review - Consultants
- Important BOE Decisions.
- Formal SEQRA Lead Agency Approval
- Date for SEQRA Declaration and BOE Bond Approval - July 24 or 25
- Decision on the AMD outdoor recreation area options. Decision on an alternative/contingent option for the Sept 24 referendum

APPENDIX H

CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOGBOOK

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. Pre-Construction Meeting Documents
   a. Preamble to Site Assessment and Inspections
   b. Pre-Construction Site Assessment Checklist

II. Construction Duration Inspections
   a. Directions
   b. Modification to the SWPPP

I. **PRE-CONSTRUCTION MEETING DOCUMENTS**

Project Name _____

Permit No. _____ **Date of Authorization** _____

Name of Operator _____

Prime Contractor _____

a. **Preamble to Site Assessment and Inspections**

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Inspector (print name)	**Date of Inspection**
Qualified Inspector (print name)	**Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA

[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.

Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.

Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
[ ] [ ] [ ] Sediment basin dewatering pool is dewatering at appropriate rate.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

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STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT

SITE: **PERMIT #** **DATE:**

CPL PROJECT # **WEEKLY/RAINFALL/MISC:**

STABILIZATION CONTROL (See Attached Site Plan/Sketch ☑)

1a. Indicate the location and size of all disturbed site areas and drainage pathways;

1b. Indicate the location and size of areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

1c. Indicate the location and size of areas of the site that have undergone temporary or permanent stabilization;

1.d Indicate the location and size of disturbed site areas that have not undergone active site work during the previous 14-day period;

1.e Indicate the location and size of rill or gully erosion or loss of stabilizing vegetation or seeding/mulching or any erosion near outlet structures.

SEDIMENT AND RUNOFF CONTROL - SUMMARY

2.a Indicate the type, location, degree of sediment accumulation and required maintenance of each sediment and runoff control practice.

2.b Document any excessive deposition of sediment or ponding water along barrier or diversion systems.

2.c Indicate the ability of rock filters around perforated riser pipes to pass water

SWPPP COMPLIANCE - SUMMARY

3a. Indicate any deficiencies that are identified with the implementation of the SWPPP

3b. Indicate any modifications or actions required to implement the SWPPP.

INSPECTOR NAME: _____ **CERTIFIED PROFESSIONAL SIGNATURE:** _____

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

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STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT

4. MAINTAINING WATER QUALITY

Yes	No	N/A	
☐	☐	☐	Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
☐	☐	☐	Is there residue from oil and floating substances, visible oil film, or globules or grease?
☐	☐	☐	All disturbance is within the limits of the approved plans.
☐	☐	☐	Have receiving lake/bay, stream and/or wetland been impacted by silt from the project?

5. HOUSEKEEPING

A. General Site Conditions

Yes	No	N/A	
☐	☐	☐	Is construction site litter and debris appropriately managed?
☐	☐	☐	Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
☐	☐	☐	Is construction impacting the adjacent property?
☐	☐	☐	Is dust adequately controlled?

B. Temporary Stream Crossing

Yes	No	N/A	
☐	☐	☐	Maximum diameter pipes necessary to span creek without dredging are installed.
☐	☐	☐	Installed non-woven geotextile fabric beneath approaches.
☐	☐	☐	Is fill composed of aggregate (no earth or soil)?
☐	☐	☐	Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering watercourse during high flow.

6. RUNOFF CONTROL PRACTICES

A. Excavation Dewatering

Yes	No	N/A	
☐	☐	☐	Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
☐	☐	☐	Clean water from upstream pool is being pumped to the downstream pool.
☐	☐	☐	Sediment laden water from work area is being discharged to a silt-trapping device.
☐	☐	☐	Constructed upstream berm with one-foot minimum freeboard.
☐	☐	☐	**Maintenance required:**

B. Level spreader

Yes	No	N/A	
☐	☐	☐	Installed per plan.
☐	☐	☐	Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
☐	☐	☐	Flow sheets out of level spreader without erosion on downstream edge.
☐	☐	☐	**Maintenance required:**

C. Interceptor Dikes and Swales

Yes	No	N/A	
☐	☐	☐	Installed per plan with minimum side slopes 2H;1V or flatter.
☐	☐	☐	Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
☐	☐	☐	Sediment-laden runoff directed to sediment trapping structure.
☐	☐	☐	**Maintenance required:**

STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT

D. Stone Check Dam

Yes	No	N/A	
☐	☐	☐	Is channel stable? (flow not eroding soil underneath or around the structure).
☐	☐	☐	Check is in good condition (rocks in place and no permanent pools behind the structure).
☐	☐	☐	Has accumulated sediment been removed?
☐	☐	☐	**Maintenance required:**

E. Rock Outlet Protection

Yes	No	N/A	
☐	☐	☐	Installed per plan.
☐	☐	☐	Installed concurrently with pipe installation.
☐	☐	☐	**Maintenance required:**

7. SOIL STABILIZATION

A. Topsoil and Spoil Stockpiles

Yes	No	N/A	
☐	☐	☐	Stockpiles are stabilized with vegetation and/or mulch.
☐	☐	☐	Sediment control is installed at the toe of the slope.
☐	☐	☐	**Maintenance required:**

B. Revegetation

Yes	No	N/A	
☐	☐	☐	Temporary seed and mulch has been applied to idle areas.
☐	☐	☐	4 inches minimum of topsoil has been applied under permanent seedings.
☐	☐	☐	**Maintenance required:**

8. SEDIMENT CONTROL PRACTICES

A. Stabilized Construction Entrance

Yes	No	N/A	
☐	☐	☐	Stone is clean enough to effectively remove mud from vehicles.
☐	☐	☐	Installed per standards and specifications?
☐	☐	☐	Does all traffic use the stabilized entrance to enter and leave the site?
☐	☐	☐	Is adequate drainage provided to prevent ponding at the entrance?
☐	☐	☐	**Maintenance required:**

B. Silt Fence

Yes	No	N/A	
☐	☐	☐	Installed on contour, 10 feet from toe of slope (not across conveyance channels).
☐	☐	☐	Joints constructed by wrapping the two ends together for continuous support.
☐	☐	☐	Fabric buried 6 inches minimum.
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas.
☐	☐	☐	**Maintenance required:**

Sediment accumulation is _____% of design capacity.

C. Temporary Sediment Trap

Yes	No	N/A	
☐	☐	☐	Outlet structure is constructed per the approved plan or drawing.
☐	☐	☐	Geotextile fabric has been placed beneath rock fill.
☐	☐	☐	**Maintenance required:**

Sediment accumulation is_____% of design capacity.

8. SEDIMENT CONTROL PRACTICES - Continued

D. Storm Drain Inlet Protection (Use for stone & block, filter fabric, curb, or excavated practices).

Yes	No	N/A	
☐	☐	☐	Installed concrete blocks lengthwise so open ends face outward, not upward.
☐	☐	☐	Placed wire screen between No. 3 crushed stone and concrete blocks.
☐	☐	☐	Drainage area being 1 acre or less.
☐	☐	☐	Excavated area is 900 cubic feet.
☐	☐	☐	Excavated side slopes should be 2:1.
☐	☐	☐	2" x 4" frame is constructed and structurally sound.
☐	☐	☐	Maximum post spacing is 3 feet.
☐	☐	☐	Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
☐	☐	☐	Posts are stable, fabric is tight and without rips or frayed areas.
☐	☐	☐	**Maintenance required:**

Sediment accumulation is_____% of design capacity.

E. Temporary Sediment Basin

Yes	No	N/A	
☐	☐	☐	Basin and outlet structure constructed per the approved plan.
☐	☐	☐	Basin side slopes are stabilized with seed/mulch.
☐	☐	☐	Drainage structure flushed, and basin surface restored upon removal of sediment basin facility.
☐	☐	☐	**Maintenance required:**

Sediment accumulation is_____% of design capacity.

General Notes/Instructions

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STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:

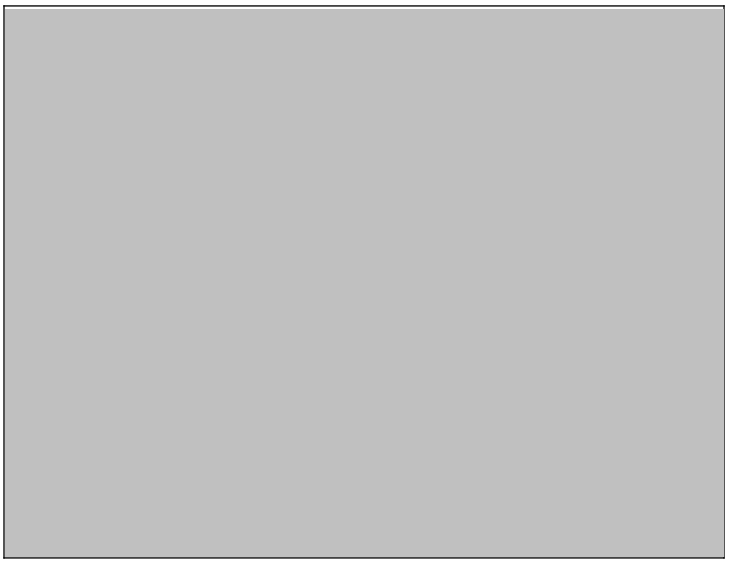


IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:

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STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:

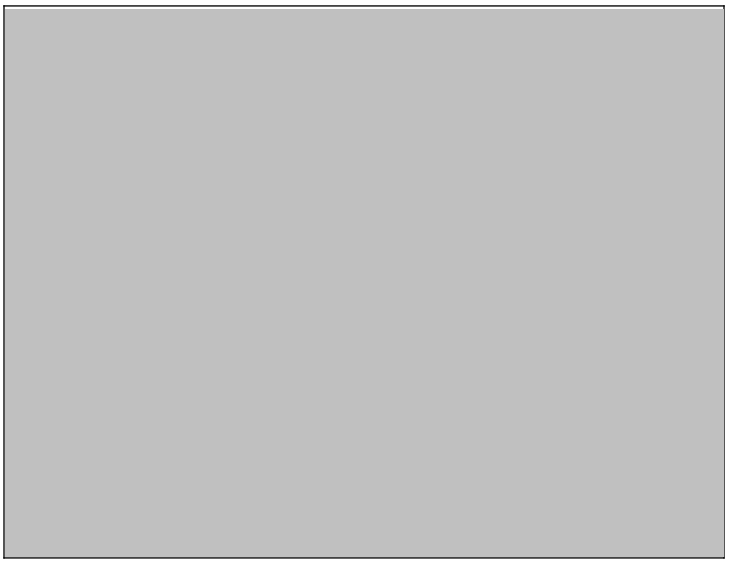


IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:

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26 IBM ROAD
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STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:



IMAGE #

LOCATION:

DESCRIPTION:

ACTION REQUIRED:

STORMWATER MANAGEMENT CONSTRUCTION DURATION INSPECTION REPORT

10. MODIFICATIONS TO THE SWPPP ☐ Yes ☐ No

The Operator shall amend the SWPPP whenever:

1. There is significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to waters of the United States and which has not otherwise been addressed in the SWPPP; or

2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
   c. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason

APPENDIX I

CONTRACTOR & SUBCONTRACTORS CERTIFICATION FORMS AND OTHER RELATED PROJECT FORMS

STORM WATER POLLUTION PREVENTION PLAN
SIGNATORY AUTHORIZATION DESIGNATION

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

"In accordance with the *NYS DEC SPDES General Permit for Storm Water Discharges from Construction Activities, Part VII, Section H (Signatory Requirements),* the Project Manager is hereby duly authorized to sign on my behalf, all reports and certifications that are required under the Permit and as part of this Storm Water Pollution Prevention Plan.

Signed: _____

Printed Name: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Note: Multiple designation forms may be required
(i.e., one from the Operator and one from the Contractor).

STORM WATER POLLUTION PREVENTION PLAN
CONTRACTOR'S CERTIFICATION

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

CONTRACTOR'S CERTIFICATION*:*

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

Name: _____
(Print)

Signature: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Scope of Services: _____

Date: _____

Received by: _____
[Name]

STORM WATER POLLUTION PREVENTION PLAN
SUBCONTRACTOR'S CERTIFICATION

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

SUBCONTRACTOR'S CERTIFICATION:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

Name: _____
(Print)

Signature: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Scope of Services: _____

Date: _____

Received by: _____
[Name]

STORM WATER POLLUTION PREVENTION PLAN

Stabilization Schedule for Major Grading Activities

OSSINING NEW 7/8 BUILDING – 2024 BOND – PHASE 4

			Note: When these activities cease and if activities cease for more than 14 days these columns need to be completed.					
Major Site Construction Activity Areas	**Begin Date**	**Completion Date**	**Temporary Cease Date**	**Resume Date**	**Begin Date for Stabilization Temporary**	**Begin Date for Stabilization Permanent**	**Type of Stabilization (List measures used such as stone, seeding, mulch, landscaping, etc...)**	**Contractor Responsible for Work**
Temp. Gravel Const. Entrance								
Existing Pavements and Structures Removed, Utilities Removed/Relocated								
Mass Grading								
Access Drives Constructed								
Walkways Constructed								
Building Foundation								
Storm Sewers and Utility Installations								
Pervious Areas Stabilized								

STORM WATER POLLUTION PREVENTION PLAN
IMPLEMENTATION SCHEDULE

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

***To be completed prior to initiation of construction by the contractor.**

The Contractor will be responsible for implementing all Erosion and Sediment Control and Storm Water Management control structures. The Contractor may designate these tasks to certain subcontractors as they see fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor.

Construction Activity	*Proposed Initiation Date	*Proposed Completion Date	Actual Initiation Date	Actual Completion Date	Contractor Responsible for Implementation
Preconstruction Meeting					
Temporary Construction Access					
Material laydown/staging area prep					
Install inlet protection					
Install perimeter protection					
Stabilize all areas					
Remove inlet protection					
Clean storm Sewers					
Final inspection					

STORM WATER POLLUTION PREVENTION PLAN
MODIFICATION LOG

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

CHANGES REQUIRED FOR STORM WATER POLLUTION PREVENTION PLAN

The SWPPP must be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has a significant effect on the discharge of pollutants to the Waters of the United States that has not been previously addressed in the SWPPP, if inspections or investigations by site staff, local, state or federal officials determine that discharges are causing water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site, or based on the results of an inspection, or there is a release containing a Hazardous Substance or Oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24 hour period, the SWPPP must be modified to include additional or modified BMPs designed to correct identified problems. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection. Modifications that are the result of inspections shall be initialed within 24 hours and completed within 48 hours. All modifications are to be referenced on both the forms and on a Progress Drawing.

MODIFICATION LOG

MODIFICATION NUMBER*	DATE	BRIEF DESCRIPTION	PROJECT MANAGER REVIEW

***Modification Log Number to correspond with Modification Report Number**

STORM WATER POLLUTION PREVENTION PLAN
MODIFICATION REPORT

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

NUMBER _____ **DATE _____**

TO:
ADDRESS:

TELEPHONE:
FACSIMILE:
SENT VIA: ☐ **Facsimile** ☐ **Courier** ☐ **US Mail**

INSPECTOR: _____ **_____**
(Print Name) **(Inspector Signature)**

QUALIFICATIONS OF INSPECTOR: _____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN:
_____
_____
_____
_____
_____
_____
_____
_____

REASONS FOR CHANGES:
_____
_____
_____
_____
_____
_____
_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:**
_____

Project Manager: **_____**

Other Operator: _____

STORM WATER POLLUTION PREVENTION PLAN

FINAL STABILIZATION CERTIFICATION /NOTICE OF TERMINATION CHECKLIST

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

1. ☐ **All soil disturbing activities are complete and the facility no longer discharges storm water associated with Construction Activities.**

2. ☐ **Temporary Erosion and Sediment Control Measures have been removed or will be removed at the appropriate time.**

3. ☐ **All areas of the Construction Site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 80% or equivalent measures have been employed.**

CONTRACTOR'S CERTIFICATION*:*

"I certify under penalty of law that all storm water discharges associated with Construction Activity from the identified project that are authorized by the NPDES Construction General Permit have been eliminated and that all disturbed areas and soils at the construction site have achieved Final Stabilization and all temporary erosion and sediment control measures have been remove in addition all permanent stormwater structures have been constructed as described in the SWPPP"

Company Name: _____

Name (Print):_____

Signature: _____

Title: _____

Date: _____

Date: _____

Received by: _____
[Name]

STORM WATER POLLUTION PREVENTION PLAN
REPORTABLE QUANTITY RELEASE FORM

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

The discharges of Hazardous Substances or Oil in storm water discharges from construction sites must be prevented or minimized in accordance with the SWPPP. Where a release containing a Hazardous Substance or Oil in an amount equal to or in excess of a reportable quantity established under 40CFR Part 110, 40CFR Part 117 and 40CFR Part 302 occurs, the following steps must be taken:

1. **All measures must be taken to contain and abate the spill and to prevent the discharge of Hazardous Substances or Oil to storm water or off-site.**

2. **Contact the Project Manager or Operator's Engineer immediately upon knowledge of release.**

3. **If a release is equal to or in excess of a reportable quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans must identify measures to prevent the recurrence of such releases and to respond to such releases**

Date of Spill	Material Spilled	Approximate Quantity of Spill (in gallons)	Agency(s) Notified	Date of Notification	SWPPP Revision Date

YEAR 2026

CONSTRUCTION SITE – OSSINING HIGH SCHOOL – 2024 BOND
1 EMWILTON PLACE
OSSINING, NY 10562
STORM WATER POLLUTION PREVENTION PLAN
PROJECT RAINFALL LOG

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Day												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
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21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
PM Initials												

Note: Rainfall amounts are to be based on a 24-hour rainfall event, instead of a cumulative total of rainfall over several days.

STORM WATER POLLUTION PREVENTION PLAN
OPTIONAL PRE-CONSTRUCTION MEETING AGENDA AND ATTENDANCE RECORD

CONSTRUCTION SITE – OSSINING NEW 7/8 MIDDLE SCHOOL – 2024 BOND
300 VAN CORTLANDT AVE.
OSSINING, NY 10562

STORMWATER POLLUTION PREVENTION PLAN DATED OCTOBER 2026

Topic	Discussed	Further action or Information Required (Yes or No)
Overview of SPDES Permit Program		
General Discussion of SWPPP and Records Retention Requirements		
Phasing of Project		
Review of Erosion and Sediment Control Plans (to include all temporary and permanent structural and stabilization measures)		
Locating solid waste containers, portable toilets, concrete washout areas, fueling areas and tank storage area on Progress Drawing		
Posting the Progress Drawing (marked on the Erosion and Sediment Control Plans) at job trailer		
Posting requirements for the Notice of Intent (NOI), Must be posted at Project entrance and inside job trailer wall.		
Allowable non-storm water discharges and handling procedures		
Materials management to include proper material storage, etc.		
Signatory Authorization Delegation		
Contractor's Certification		
Subcontractor's Certification		
Inspection form and required inspection timeframe		
Stabilization schedule		
Implementation schedule		
Modification report and modifying plans		
Final stabilization		
Reportable quantity release procedures		
Rain gage requirement and rainfall logs		
State specific requirements		
Import/Export – Fill and Spoil Materials		
SWPPP accessibility to regulatory officials		
Inspections – assisting and cooperating with regulatory officials – inspection reports and notices of violation (any response must be coordinated through Project Manager)		

Attendance Roster **Date: _____**

Name	Company	Telephone Number	Signature

Attendance Roster (continued)

Name	Company	Telephone Number	Signature

Items which require further action or additional information: _____
_____
_____

Additional items discussed (not addressed above): _____
_____
_____
_____
_____
_____
_____

***This completed form must be included in both the Project Manager's and Construction Site SWPPP Ledger.**

APPENDIX J

Climate Change Considerations

CPL
ARCHITECTURE
ENGINEERING
PLANNING
CPLteam.com

STORM WATER POLLUTION PREVENTION PLAN
CLIMATE CHANGE CONSIDERATIONS

CONSTRUCTION SITE – OSSINING NEW 7/8 BUILDING - OSSINING UNION FREE SCHOOL DISTRICT – '24 BOND – PHASE 4
300 VAN CORTLANDT AVE
OSSINING NY 10562

Physical Risk	Project Site Considerations			
	Overall Site Planning	**Location, Elevation and Sizing of Control Measures and Practices**	**Location, Elevation and Sizing of Conveyance System(s)**	**Location, Elevation and Sizing of Detention System(s)**
Increasing Temperature	Due to site constraints and limited available useful soil, infiltration was not a viable option for stormwater treatment and detention.	SMP(s) have been sized for the 90% storm event. The elevation of ponding controls in the practice is limited by the requirements in the design manual.	Conveyance systems have been sized to safely convey the 10-year & 100-year 24-hour storm event.	System(s) have been designed to keep all runoff on-site with one singular discharge to existing swales to the stream..
Increasing Precipitation	The project proposes runoff reduction techniques to reduce the volume discharging from the project site and promoting groundwater recharge. Detention systems sized to handle the 200 year storm event.	SMP(s) have been sized for the 90% storm event. The elevation of ponding controls in the practice is limited by the requirements in the design manual.	Conveyance systems have been sized to safely convey the 10-year & 100 year 24-hour storm event.	System(s) have been designed to keep all runoff on-site with one singular discharge to existing swales to the stream..
Increasing Precipitation Variability				
Increasing Frequency and Severity of Flooding				
Rising Sea Level	Due to the site location, the property is not expected to be directly impacted by sea levels rising.	Not applicable	Not applicable	Not applicable
Increasing Storm Surge	Due to the site location, the property is not expected to be directly impacted by storm surge.	Due to the site location, the property is not expected to be directly impacted by storm surge.	Due to the site location, the property is not expected to be directly impacted by storm surge.	Due to the site location, the property is not expected to be directly impacted by storm surge.
Shifting Ecology	The plantings selected for the project consider adaptability.	The SMPs selected will utilize hardy species tolerant to both drought and inundation.	The conveyance system proposed does not discharge any runoff off-site. Therefore, this risk is not applicable to the conveyance system.	Detention System has been designed with Local Flora and Fauna in mind. Native wetland plans proposed in pond.

APPENDIX K

PROJECT SPECIFICATIONS (UNDER SEPARATE COVER)

APPENDIX L

CONSTRUCTION PLANS (UNDER SEPARATE COVER)



Georgia | New York | North Carolina | Pennsylvania | South Carolina
800 274 9000 CPLteam.com

SECTION 004000
FORM OF PROPOSAL – SITE CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to SITE CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. SC-00; (General Allowance)
      $ (Insert Amount)
   2. Allowance No. SC-01; (Trench Rock Removal & Replacement)
      $ (Insert Amount)
   3. Allowance No. SC-02; (Unsuitable Soil Removal & Replacement)
      $ (Insert Amount)
   4. Allowance No. SC-03; (Mass Rock Removal & Replacement)
      $ (Insert Amount)

1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)

A. Enter in unit prices from spec section 012200. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)
   1. Unit Price No. SC-01; (Trench Rock Removal & Replacement)
      $ per
   2. Unit Price No. SC-02; (Unsuitable Soil Removal & Replacement)
      $ per
   3. Unit Price No. SC-03; (Mass Rock Removal & Replacement)
      $ per

1.07 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.08 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.09 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.10 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.11 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.

2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
   c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
   d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.12 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.13 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
   3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.14 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.15 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.16 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.17 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.18 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.19 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.20 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.21 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.22 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.23 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vendor Name:
(legal entity) _____
By:
(Signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the Bidder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attached to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004000

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SECTION 004010
FORM OF PROPOSAL – GENERAL CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to GENERAL CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. GC-00; (General Allowance)
      $ (Insert Amount)
   2. Allowance No. GC-01; (Trench Rock Removal & Replacement)
      $ (Insert Amount)
   3. Allowance No. GC-02; (Unsuitable Soil Removal & Replacement)
      $ (Insert Amount)

1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)

A. Enter in unit prices from spec section 012200. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)
   1. Unit Price No. GC-01; (Trench Rock Removal & Replacement)
      $ per
   2. Unit Price No. GC-02; (Unsuitable Soil Removal & Replacement)
      $ per

1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300)

A. Enter a whole dollar amount, even if it is zero ($ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.
   1. Alternate No. GC-1; (Stainless Steel Interior Guardrails & Handrails at Stairs):
      ADD ($)
      DOLLARS
   2. Alternate No. GC-2; (Security Glazing Film):
      ADD ($)
      DOLLARS

1.08 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.09 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.10 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.11 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.12 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
   2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
   3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
   4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
      a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
      b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
      c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
      d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.13 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.14 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
   3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.15 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.16 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.17 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.18 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.19 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.20 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.21 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.22 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.23 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.24 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vendor Name:
(legal entity) _____
By:
(Signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the Bidder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attached to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004010

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SECTION 004020
FORM OF PROPOSAL – MECHANICAL CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to MECHANICAL CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. MC-00; (General Allowance)

$	(Insert Amount)

1.06 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.07 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.08 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.09 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.10 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
   2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
   3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
   4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
      a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
      b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
      c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.11 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.12 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
   3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.13 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.14 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.15 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.16 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.17 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal

not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.18 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.19 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.20 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.21 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vender Name:
(legal entity) _____
By:
(signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the BIdder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attached to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004020

SECTION 004030
FORM OF PROPOSAL – ELECTRICAL CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to ELECTRICAL CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. EC-00; (General Allowance)
      $ (Insert Amount)
   2. Allowance No. EC-01; (Trench Rock Removal & Replacement)
      $ (Insert Amount)
   3. Allowance No. EC-02; (Unsuitable Soil Removal & Replacement)
      $ (Insert Amount)
   4. Allowance No. EC-03; (Mass Rock Removal & Replacement)
      $ (Insert Amount)

1.06 UNIT PRICES (REFERENCE SPECIFICATION SECTION 012200)

A. Enter in unit prices from spec section 012200. (Unit prices are used in anticipation that there will be additional quantities of materials and labor not expressly indicated on the contract documents.)
   1. Unit Price No. EC-1: (Trench Rock Removal & Replacement)
      $ per
   2. Unit Price No. EC-2: (Unsuitable Soil Removal & Replacement)
      $ per
   3. Unit Price No. EC-3: (Mass Rock Removal & Replacement)
      $ per

1.07 ALTERNATES (REFERENCE SPECIFICATION SECTION 012300.)

A. Enter a whole dollar amount, even if it is zero ($ 0), for each Alternate. Circle "ADD" or "DEDUCT" for each Alternate Bid. If neither is circled, "DEDUCT" will be assumed. Do not leave any Alternate amount blank. If any amount is blank, it will be assumed the Bidder will provide that Alternate for no change, neither increase nor decrease, in Contract Price.
   1. Alternate No. EC-1; (Rigging):
      DEDUCT ($)
      DOLLARS
   2. Alternate No. EC-2; (Production Lighting):
      DEDUCT ($)
      DOLLARS
   3. Alternate No. EC-3; (Audio / Visual Systems):
      DEDUCT ($)
      DOLLARS

1.08 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.09 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.10 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.11 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.12 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
   2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
   3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
   4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
      a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
      b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
      c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
      d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.13 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.14 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.15 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.16 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.17 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.18 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.19 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.20 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.21 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.22 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.23 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.24 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vender Name:
(legal entity) _____
By:
(signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the BIdder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attached to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004030

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SECTION 004040
FORM OF PROPOSAL – PLUMBING CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to PLUMBING CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. PC-00; (General Allowance)

$	(Insert Amount)

1.06 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.07 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.08 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.09 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.10 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
   2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
   3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
   4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
      a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
      b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
      c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.11 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.12 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
   3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.13 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.14 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.15 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.16 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.17 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal

not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.18 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.19 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.20 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.21 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)
2.

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vender Name:
(legal entity) _____
By:
(signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the BIdder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attacehd to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004040

SECTION 004050
FORM OF PROPOSAL – FIRE SPRINKLER CONTRACT

PART 1 GENERAL

1.01 SUMMARY

A. Fill in information:

Date:
TO:
OWNER NAME & ADDRESS:
FROM:
BIDDER NAME & ADDRESS

1.02 GENERAL

A. Pursuant to, and in compliance with, the Procurement and Contracting Requirements, Conditions of the Contract, relative thereto and all of the Contract Documents, including any Addenda issued by the Architect and mailed or delivered to the undersigned prior to the opening of Bids, whether received by the undersigned or not,
we,_____

1. having visited the site and being familiar with all conditions and requirements of the Work, hereby propose to furnish all plant, labor, supplies, materials and equipment incidental to FIRE SPRINKLER CONSTRUCTION WORK as required by and in strict accord with the applicable provisions of the Drawings and Specifications entitled New 7th & 8th School Building all to the satisfaction and approval of the Architect and the Owner in accordance with the terms and conditions of the Contract Documents for the following sum:

	DOLLARS
($	)
BASE BID	

1.03 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 45 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid.

1. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.04 TIME OF COMPLETION

A. It is agreed by the undersigned that after receipt of a Notice of Award and a consummation of a Contract Agreement in accord with the terms of the Contract Documents, he or she will start work within 10 consecutive calendar days of the notice to proceed and fully complete the work by as indicated in the Contract Documents.

1.05 ALLOWANCES (REFERENCE SPECIFICATION SECTION 012100)

A. Specified Allowance as indicated in Specification Section 012100. This amount is to be included in the Base Bid above.
   1. Allowance No. FSC-00; (General Allowance)

$	(Insert Amount)

1.06 BID SECURITY

A. Bid Security in the form of a Certified or Cashier's Check or a Bid Bond in the form required by the Contract Documents is attached to and made a part of this Proposal.

1.07 IRAN DIVESTMENT ACT CERTIFICATION

A. Contractor to submit with the bid, Iran Divestment Act Certification which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.08 CERTIFICATION UNDER EXECUTIVE ORDER NO. 16

A. Contractor to submit with the bid, Certification under Executive Order No. 16 which hereto is made a part of this Form of Proposal and is attachd at the end of this Form of Proposal.

1.09 NEW YORK STATE DEPARTMENT OF LABOR CONTRACTOR REGISTRY

A. Pursuant to New York State Department of Labor requirements, Contractor to submit with the bid, a copy of their Contractor Certificate of Registration along with, Labor Law 220-i Certification Form which hereto is made a part of this Form of Proposal and is attached at the end of this Form of Proposal.

1.10 REPRESENTATIONS

A. By submitting this Proposal the Bidder represents and certifies to the Owner and the Architect that
   1. It has examined the Contract Documents, the site of the proposed Work, is familiar with the local conditions at the place where the Work is to be performed and fully comprehends the requirements and intent of the plans and specifications for this Project in accordance with the drawings, specifications and other Contract Documents prepared by CPL the Owners Consultant, for this Project.
   2. It has examined and reviewed, where applicable, all information and data in the Contract Documents related to existing underground facilities at or contiguous to the site. Bidder shall require of the Owner or Architect no further investigations, explorations, tests or reports with respect to such underground facilities in order for the Bidder to perform the Work of the Proposal within the Contract Time and in accordance with the Contract Documents.
   3. It has given notice to the Architect, as required by the Contract Documents of any and all discrepancies it has discovered and accepts the resolution of those discrepancies offered by the Architect.
   4. Pursuant to New York State General Municipal Law section 103-d, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
      a. The prices in this bid have been arrived at independently without collusion, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
      b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not be knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor; and
      c. No attempt has been made or will be made by bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

d. The proposal is based upon the materials, equipment and systems required by the Contract Documents, without exception, unless otherwise set forth in this Proposal in detail.

1.11 CHANGE ORDERS

A. We propose and agree that the above lump sum shall be adjusted for changes in the Contract Work not included in unit prices by addition of the following costs:
   1. Profit and overhead as permitted in the General Conditions.

1.12 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
   2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
   3. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.13 ACCEPTANCE

A. When this Proposal is accepted, the undersigned agrees to enter into a Contract with the Owner as provided in the Form of Agreement.

1.14 AFFIRMS

A. The undersigned affirms and agrees that this Proposal is a firm one which remains in effect and will be irrevocable for a period of forty-five (45) days after opening of Bids.

1.15 TYPE OF BUSINESS

A. The undersigned hereby represents that it is a (select with circle):
   1. Corporation, Partnership, Individual.
   2. If a Corporation, then the undersigned further represents that it is duly qualified as a Corporation under the laws of New York State and it is authorized to do business in this State.

1.16 PLACE OF BUSINESS

A. The following is the name and address of the person to whom all notices required in connection with this Proposal may be telephoned, mailed, or delivered.

Name of Contact Person:	
Name of Business or Firm:	
Address:	
Address:	
Telephone:	Fax
Email Address:	
FEIN: Federal Employer Identification No.:	

1.17 EXECUTION OF CONTRACT

A. When written Notice of Acceptance of the Proposal is mailed or delivered to the undersigned within forty-five (45) days after the opening of Bids, or anytime thereafter should the Proposal

not be withdrawn, the undersigned, within ten (10) days, will execute the Form of Agreement with the Owner.

1.18 ADDENDA

A. Any addenda issued by the Architect and mailed or delivered to the undersigned prior to the Bid opening date shall become part of the Contract Documents. The Bidder shall enter on this list any addenda issued after this Form of Proposal has been received and shall fill in the addenda number and date.

Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	
Addendum #		Dated:	

1.19 ASBESTOS

A. The bidder certifies that no asbestos or asbestos-containing materials will be incorporated into the Work of this Contract.

1.20 AUTHORIZED SIGNATURES FOR PROPOSALS

Individual or Legal Name of Firm or Corporation:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
If Corporation – provide Seal:

1.21 IRAN DIVESTMENT ACT CERTIFICATION

A. By submission of this bid, (DL & AV Equip 1315), or by assuming the responsibility of a Contract awarded hereunder, each bidder and each person signing on behalf of any bidders, certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. That each bidder/contractor/assignee is not on the "Entities Determined To Be Non-Responsive Bidders/Offerers Pursuant to The New York State Iran Divestment Act of 2012" list created pursuant to paragraph (b) subdivision 3 of section 165-a of the New York State Finance Law and posted on the OGS website at http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf and further certifies that it will not utilize on such Contract any subcontractor that is identified on the Prohibited Entities List. Additionally, Bidder/Contractor is advised that should it seek to renew or extend a Contract awarded in response to the solicitation, it must provide the same certification at the time the Contract is renewed or extended. (See Article in the Instructions to Bidders.)
2.

Individual or Legal Name of Firm or Corporation:
Mailing Address:
Signature of Representative of Firm or Corporation:
Printed Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

1.22 SEXUAL HARASSMENT POLICY/TRAINING AFFIRMATION

A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all its employees.

Name of Contractor:	
Name of Business or Firm:	
Address:	
Telephone:	Fax
Email Address:	
Signature and Title of Contractor:	
Date:	

CERTIFICATION UNDER EXECTUIVE ORDER NO. 16

PROHIBITING STATE AGENCIES AND AUTHORITIES FROM CONTRACTING WITH BUSINESSES CONDUCTING BUSINESS IN RUSSIA

Executive order No. 16 provided that"all Affected State Entities are directed to refrain from entering into any new contract or renewing any existing contract with an entity conducting business operations in Russia." The complete text of the Executive Order No. 16 can be found at the following website; https://ogs.ny.gov/EO-16.

The Executive Order remains in effect while sanctions imposed by the federal government are in effect. Accordingly, vendors who may be excluded from ward becasue of current businees operations in Russia are nevertheless encouraged to respond to solicitations to preserve their contracting opportunities in case the sanctions are lifted during a solicitation or even after award in the case of some solicitations.

As defined in Exectuive Order No. 16, an entity conducting business operation in Russia" means an institution or company, wherever located, conducting any cmmerical activity in Russia or transacting business with the Russian Government or with commerical entities headquartered in Russia or with their prinicipal place of business in Russia in the form of contracting, sales, purchasing, investment, or any business partnership.

Is vender an entity conducting business operations in Russia, as defined above? Please answer by circling one of the following numbers:

1.	No, Vender does not conduct business operations in Russia within the meaning of Executive Order No. 16
2.a.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but has taken steps to wind down business operations in Russia or is in the process of winding down business operations in Russia. (Please provide a detailed description of the wind down process and a schedule for completion).
2.b.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16 but only to the extend necessary to provide vital health and safety services within Russia or to comply with federal law, regulations, executive orders, or directives. (Please provide a detailed description of the services being procided or the revelant laws, regulations, etc.).
3.	Yes, Vendor conducts business operations in Russia within the meaning of Executive Order No. 16.

The undersigned certifies under penalties of perjury that they are knowledgeable about the Vendor's business and operations and that the answer provided herein is true to the best of their knowledge and behalf.

Vender Name:
(legal entity) _____
By:
(signature) _____
Name: _____
Title: _____
Date: _____

LABOR LAW 220-I CERTIFICATION FORM

By submission of this bid, the person authorized to sign on behalf of the Bidder hereby certifies, under penalty of perjury, that :

1. The Bidder is registered with the New York State Department of Labor pursuant to Section 220-i of the New York Labor Labor Law, and
2. Each of the subcontractors engaged by the BIdder for this Project will be registered before commencing work.

Bidder further represents that;

1. A copy of the Bidder's Certificate of Registration issued by the Commissioner of the Department of Labor is attacehd to this Bid.
2. All Subcontractors will submit a copy of their Certificate of Registration issued by the Commissioner of the Department of Labor before commencing work.

Project:
Individual or Legal Name of Bidder or Corporation:
Bidder Address:
Signature of Representative of Bidder or Corporation:
Print Name and Title:
Date:
SWORN to before me this date:
Notary Public Signature and Stamp:

END OF SECTION 004050

SECTION 004500
QUALIFICATION STATEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Attached is AIA Document A305-2020, Contractor's Qualification Statement with its associated Exhibits A through E attached.
   1. AIA Document A305-2020 is a standard form of Contractor's Qualification Statement. It is used by an owner preparing to request bids or to award a contract for construction project to verify the background, references, and financial stability of any contractor being considered.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 004500

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AIA® Document A305® – 2020

Contractor's Qualification Statement

THE PARTIES SHOULD EXECUTE A SEPARATE CONFIDENTIALITY AGREEMENT IF THEY INTEND FOR ANY OF THE INFORMATION IN THIS A305-2020 TO BE HELD CONFIDENTIAL.

SUBMITTED BY:
(Organization name and address.)

SUBMITTED TO:
(Organization name and address.)

TYPE OF WORK TYPICALLY PERFORMED
(Indicate the type of work your organization typically performs, such as general contracting, construction manager as constructor services, HVAC contracting, electrical contracting, plumbing contracting, or other.)

THIS CONTRACTOR'S QUALIFICATION STATEMENT INCLUDES THE FOLLOWING:
(Check all that apply.)

[ ] Exhibit A – General Information
[ ] Exhibit B – Financial and Performance Information
[ ] Exhibit C – Project-Specific Information
[ ] Exhibit D – Past Project Experience
[ ] Exhibit E – Past Project Experience (Continued)

CONTRACTOR CERTIFICATION
The undersigned certifies under oath that the information provided in this Contractor's Qualification Statement is true and sufficiently complete so as not to be misleading.

_____ _____
Organization's Authorized Representative Signature **Date**

_____
Printed Name and Title

NOTARY
State of:
County of:
Signed and sworn to before me this day of

_____
Notary Signature

My commission expires:

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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AIA® Document A305® – 2020 Exhibit A

General Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
(In words, indicate day, month and year.)

§ A.1 ORGANIZATION
§ A.1.1 Name and Location
§ A.1.1.1 Identify the full legal name of your organization.

§ A.1.1.2 List all other names under which your organization currently does business and, for each name, identify jurisdictions in which it is registered to do business under that trade name.

§ A.1.1.3 List all prior names under which your organization has operated and, for each name, indicate the date range and jurisdiction in which it was used.

§ A.1.1.4 Identify the address of your organization's principal place of business and list all office locations out of which your organization conducts business. If your organization has multiple offices, you may attach an exhibit or refer to a website.

§ A.1.2 Legal Status
§ A.1.2.1 Identify the legal status under which your organization does business, such as sole proprietorship, partnership, corporation, limited liability corporation, joint venture, or other.

.1 If your organization is a corporation, identify the state in which it is incorporated, the date of incorporation, and its four highest-ranking corporate officers and their titles, as applicable.

.2 If your organization is a partnership, identify its partners and its date of organization.

.3 If your organization is individually owned, identify its owner and date of organization.

ADDITIONS AND DELETIONS:
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.4 If the form of your organization is other than those listed above, describe it and identify its individual leaders:

§ A.1.2.2 Does your organization own, in whole or in part, any other construction-related businesses? If so, identify and describe those businesses and specify percentage of ownership.

§ A.1.3 Other Information

§ A.1.3.1 How many years has your organization been in business?

§ A.1.3.2 How many full-time employees work for your organization?

§ A.1.3.3 List your North American Industry Classification System (NAICS) codes and titles. Specify which is your primary NAICS code.

§ A.1.3.4 Indicate whether your organization is certified as a governmentally recognized special business class, such as a minority business enterprise, woman business enterprise, service disabled veteran owned small business, woman owned small business, small business in a HUBZone, or a small disadvantaged business in the 8(a) Business Development Program. For each, identify the certifying authority and indicate jurisdictions to which such certification applies.

§ A.2 EXPERIENCE

§ A.2.1 Complete Exhibit D to describe up to four projects, either completed or in progress, that are representative of your organization's experience and capabilities.

§ A.2.2 State your organization's total dollar value of work currently under contract.

§ A.2.3 Of the amount stated in Section A.2.2, state the dollar value of work that remains to be completed:

§ A.2.4 State your organization's average annual dollar value of construction work performed during the last five years.

§ A.3 CAPABILITIES

§ A.3.1 List the categories of work that your organization typically self-performs.

§ A.3.2 Identify qualities, accreditations, services, skills, or personnel that you believe differentiate your organization from others.

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§ A.3.3 Does your organization provide design collaboration or pre-construction services? If so, describe those services.

§ A.3.4 Does your organization use building information modeling (BIM)? If so, describe how your organization uses BIM and identify BIM software that your organization regularly uses.

§ A.3.5 Does your organization use a project management information system? If so, identify that system.

§ A.4 REFERENCES

§ A.4.1 Identify three client references:
(Insert name, organization, and contact information)

§ A.4.2 Identify three architect references:
(Insert name, organization, and contact information)

§ A.4.3 Identify one bank reference:
(Insert name, organization, and contact information)

§ A.4.4 Identify three subcontractor or other trade references:
(Insert name, organization, and contact information)

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AIA® Document A305® – 2020 Exhibit B

Financial and Performance Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
(In words, indicate day, month and year.)

ADDITIONS AND DELETIONS:
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§ B.1 FINANCIAL

§ B.1.1 Federal tax identification number:

§ B.1.2 Attach financial statements for the last three years prepared in accordance with Generally Accepted Accounting Principles, including your organization's latest balance sheet and income statement. Also, indicate the name and contact information of the firm that prepared each financial statement.

§ B.1.3 Has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, been the subject of any bankruptcy proceeding within the last ten years?

§ B.1.4 Identify your organization's preferred credit rating agency and identification information.
(Identify rating agency, such as Dun and Bradstreet or Equifax, and insert your organization's identification number or other method of searching your organization's credit rating with such agency.)

§ B.2 DISPUTES AND DISCIPLINARY ACTIONS

§ B.2.1 Are there any pending or outstanding judgments, arbitration proceedings, bond claims, or lawsuits against your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A, Section 1.2, in which the amount in dispute is more than $75,000?
(If the answer is yes, provide an explanation.)

§ B.2.2 In the last five years has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management:
(If the answer to any of the questions below is yes, provide an explanation.)

.1 failed to complete work awarded to it?

.2 been terminated for any reason?

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User Notes: (1802983257)

.3 had any judgments, settlements, or awards pertaining to a construction project in which your organization was responsible for more than $75,000?

.4 filed any lawsuits or requested arbitration regarding a construction project?

.5 not been awarded a contract for which you submitted the lowest bid? If you have answered yes, provide project name, contract description, contact information for project Owner, Architect and/or Construction Manager and reason for not being awarded the contract.

§ B.2.3 In the last five years, has your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management; or any of the individuals listed in Exhibit A Section 1.2:
(If the answer to any of the questions below is yes, provide an explanation.)

.1 been convicted of, or indicted for, a business-related crime?

.2 had any business or professional license subjected to disciplinary action?

.3 been penalized or fined by a state or federal environmental agency?

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AIA® Document A305® – 2020 Exhibit C

Project Specific Information

This Exhibit is part of the Contractor's Qualification Statement, submitted by and dated the day of in the year
(In words, indicate day, month and year.)

PROJECT:
(Name and location or address.)

CONTRACTOR'S PROJECT OFFICE:
(Identify the office out of which the contractor proposes to perform the work for the Project.)

TYPE OF WORK SOUGHT
(Indicate the type of work you are seeking for this Project, such as general contracting, construction manager as constructor, design-build, HVAC subcontracting, electrical subcontracting, plumbing subcontracting, etc.)

CONFLICT OF INTEREST
Describe any conflict of interest your organization, its parent, or a subsidiary, affiliate, or other entity having common ownership or management, or any of the individuals listed in Exhibit A Section 1.2, may have regarding this Project.

§ C.1 PERFORMANCE OF THE WORK

§ C.1.1 When was the Contractor's Project Office established?

§ C.1.2 How many full-time field and office staff are respectively employed at the Contractor's Project Office?

§ C.1.3 List the business license and contractor license or registration numbers for the Contractor's Project Office that pertain to the Project.

§ C.1.4 Identify key personnel from your organization who will be meaningfully involved with work on this Project and indicate (1) their position on the Project team, (2) their office location, (3) their expertise and experience, and (4) projects similar to the Project on which they have worked.

ADDITIONS AND DELETIONS:
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§ C.1.5 Identify portions of work that you intend to self-perform on this Project.

§ C.1.6 To the extent known, list the subcontractors you intend to use for major portions of work on the Project.

§ C.2 EXPERIENCE RELATED TO THE PROJECT

§ C.2.1 Complete Exhibit D to describe up to four projects performed by the Contractor's Project Office, either completed or in progress, that are relevant to this Project, such as projects in a similar geographic area or of similar project type. If you have already completed Exhibit D, but want to provide further examples of projects that are relevant to this Project, you may complete Exhibit E.

§ C.2.2 State the total dollar value of work currently under contract at the Contractor's Project Office:

§ C.2.3 Of the amount stated in Section C.2.2, state the dollar value of work that remains to be completed:

§ C.2.4 State the average annual dollar value of construction work performed by the Contractor's Project Office during the last five years.

§ C.2.5 List the total number of projects the Contractor's Project Office has completed in the last five years and state the dollar value of the largest contract the Contractor's Project Office has completed during that time.

§ C.3 SAFETY PROGRAM AND RECORD

§ C.3.1 Does the Contractor's Project Office have a written safety program?

§ C.3.2 List all safety-related citations and penalties the Contractor's Project Office has received in the last three years.

§ C.3.3 Attach the Contractor's Project Office's OSHA 300a Summary of Work-Related Injuries and Illnesses form for the last three years.

§ C.3.4 Attach a copy of your insurance agent's verification letter for your organization's current workers' compensation experience modification rate and rates for the last three years.

§ C.4 INSURANCE

§ C.4.1 Attach current certificates of insurance for your commercial general liability policy, umbrella insurance policy, and professional liability insurance policy, if any. Identify deductibles or self-insured retentions for your commercial general liability policy.

§ C.4.2 If requested, will your organization be able to provide property insurance for the Project written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis?

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§ C.4.3 Does your commercial general liability policy contain any exclusions or restrictions of coverage that are prohibited in AIA Document A101-2017, Exhibit A, Insurance A.3.2.2.2? If so, identify.

§ C.5 SURETY

§ C.5.1 If requested, will your organization be able to provide a performance and payment bond for this Project?

§ C.5.2 Surety company name:

§ C.5.3 Surety agent name and contact information:

§ C.5.4 Total bonding capacity:

§ C.5.5 Available bonding capacity as of the date of this qualification statement:

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AIA® Document A305® – 2020 Exhibit D

Contractor's Past Project Experience

	1	2	3	4
PROJECT NAME				
PROJECT LOCATION				
PROJECT TYPE				
OWNER				
ARCHITECT				
CONTRACTOR'S PROJECT EXECUTIVE				
KEY PERSONNEL (include titles)				
PROJECT DETAILS	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work
PROJECT DELIVERY METHOD	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:
SUSTAINABILITY CERTIFICATIONS				

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AIA® Document A305® – 2020 Exhibit E

Contractor's Past Project Experience, Continued

	1	2	3	4
PROJECT NAME				
PROJECT LOCATION				
PROJECT TYPE				
OWNER				
ARCHITECT				
CONTRACTOR'S PROJECT EXECUTIVE				
KEY PERSONNEL (include titles)				
PROJECT DETAILS	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work	Contract Amount Completion Date % Self-Performed Work
PROJECT DELIVERY METHOD	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:	☐ Design-bid-build ☐ Design-build ☐ CM constructor ☐ CM advisor ☐ Other:
SUSTAINABILITY CERTIFICATIONS				

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SECTION 004970
HOLD HARMLESS AGREEMENT

A. **This form to be submitted with the Bid.**

Contractor will be required to sign the following "Hold Harmless" Agreement with the Ossining Union Free School District. Compliance with the foregoing requirements for insurance shall not relieve the contractor from liability set forth under the Indemnity Agreement.

The _____
(Name of Company)

hereby agrees to defend, indemnify and save harmless the Ossining Union Free School District from and against any and all liability, loss, damages, claims for bodily injury and/or property damages, cost and expense including counsel fees, to the extent permissible by law, arising out of the services provided for the contractor under the contract including but not limited to the transportation of individuals by the _____
(Name of Company)

its employees, agents, servants, and volunteers.

_____
Date

_____
Contractor/Bidder

_____
Seal - Signature of Authorized Officer
of Corporation, Partnership, etc.

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SECTION 004980
INSURANCE CERTIFICATION FORM

PROJECT NO.: 66-14-01-03-0-028-001

NAME OF PROJECT: OUFSD 24BD_ NEW 7-8 SCHOOL BUILDING

Your insurance representative must complete the form below in order to be considered for the award of this bid or prohect, and it is important that you complete the Bidder's Acknowledgement section of this form. **Please note that this Insurance Certification form must accompany your bid submission in order for your bid to be considered.**

Insurance Representative's Acknowledgement:

We have reviewed the insurance requirements set forth in the Specification and AIA Document A132-2019 Exhibit A, Insurance and Bonds and are capable of providing such insurance to our insured in accordance with such requirements in the event the contract is awarded to our insured and provided our insured pays the appropriate preminum.

Insurance Representative:

_____

Address:

_____

_____

Are you an agent for the companies providing the coverage? Yes_____ No_____

Date: _____

_____

Insurance Repsentative's Signature

Bidder's Acknowledgement:

I acknowledge that I have received the insurance requirements of this bid and have considered the costs, if any, of procuring the required insurance and will be able to supply the insurance required in accordance with the bid, if it is awarded. I understand that this Insurance Certification form must be submitted with my bid and my inability to provide the required insurances may result in the regection of my bid, and the Ossining Union Free School District may award the contract to the next lowest/responsive bidder.

Firm Name: _____

Address: _____

_____

Date: _____

_____

Bidder's Signature

This page intentionally left blank

SECTION 005200
A132 AGREEMENT COVER(CMA)

PART 1 GENERAL

1.01 SUMMARY

A. The following is a “Standard Form of Agreement Between Owner and Contractor – Stipulated Sum, Construction Manager-Adviser Edition,” AIA Document A132 - 2019, is bound with this Section. AIA Document A232 – 2019 is a standard form of agreement between Owner and Contractor for use on projects where the basis of payment is a stipulated sum (fixed price), and where, in addition to the Contractor and the Architect, a Construction Manager assists the Owner in an advisory capacity during design and construction. The document has been prepared for use with A232 – 2019 , General Conditions of the Contract for Construction, Construction Manager-Adviser Edition. This integrated set of documents is for use on projects where the Construction Manager only serves in the capacity of an adviser to the Owner, rather than as constructor.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 005200

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AIA® Document A132® – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

AGREEMENT made as of the day of in the year
(In words, indicate day, month, and year.)

BETWEEN the Owner:
(Name, legal status, address, and other information)

Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

and the Contractor:
(Name, legal status, address, and other information)

for the following Project:
(Name, location, and detailed description)

OUFSD 2024 Bond – New 7-8 Building
300 Van Cortlandt Ave
Ossining, NY 10562

SED No.: 66-14-01-03-0-028-001

CPL Project No.: R24.16941.00

The Construction Manager:
(Name, legal status, address, and other information)

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

The Architect:
(Name, legal status, address, and other information)

CPL Architects, Engineers and Landscape Architect, D.P.C.
d/b/a CPL
26 IBM Road
Poughkeepsie, NY 12601

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[X] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Intentionally Omitted.

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(Table deleted)
(Paragraphs deleted)

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:
(Check one of the following boxes and complete the necessary information.)

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[X] By the following date: See Section 01 11 00

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete
Not Applicable	

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[X] Stipulated Sum, in accordance with Section 4.2 below

[ ] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[ ] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.2.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

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§ 4.2.4 Unit prices, if any:
(Identify the item and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)

See section 8.4 of the AIA Document A232-2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as revised for this Project.

§ 4.6 Other: Not Applicable
(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and Certificates for Payment issued by the Construction Manager and Architect, the Owner shall make progress payments on account of the Contract Sum, to the Contractor, as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 5th day of a month with all required supporting information and documentation required by the Contract Documents, the Owner shall make payment of the amount certified to the Contractor not later than the 7th day of the subsequent month. If an Application for Payment is received by the Construction Manager after the application date fixed above, the Application for Payment will be deemed late. A late Application for Payment will be considered complete on the 5th day of the subsequent month and the Owner shall make payment of the amount certified to the Contractor not later than the 7th day of the following month.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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§ 5.1.4.2 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as revised for this Project, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 Retainage withheld pursuant to Section 5.1.7;

.6 The sum required by law to be held by the Owner for any lien(s) on public improvement filed against the Contract Sum that has not been released or discharged; and

.7 The sum required to be withheld by order of the NYSDOL or its commissioner or designated hearing officers.

(Paragraphs deleted)

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

five percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

Not Applicable

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

Not Applicable

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The amount of this Application for Payment certified for payment shall not exceed the unpaid contract balance less (a) two times the value of any remaining items to be completed or corrected as determined by the Architect in consultation with the Construction Manager; (b) the sum required by law to be held for any lien(s) on

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public improvement filed against the Contract Sum of this Contractor that has not been released or discharged; (c) any sum required to be withheld by order or direction of the NYSDOL or its Commissioner or designated Hearing officer(s); and (d) an amount necessary to satisfy any other claims, liens or judgments against the Contractor or the Contract Sum that have not been suitably released or discharged.
(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

§ 5.2 Final Payment
§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum
§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum less any sum required by law to be withheld due to a lien(s) on public improvement filed with Owner against the Contractor that has not been released or discharged and less any sum required to be withheld by order or direction of the NYSDOL or its Commissioner or designated Hearing officer(s), shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the Contractor has submitted all close-out documents and materials and complied with all close-out requirements; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

§ 5.2.1.2 The Owner's final payment to the Contractor less any sum required by law to be withheld due to a lien(s) on public improvement filed with Owner against the Contractor that has not been released or discharged and less any sum required to be withheld by order or direction of the NYSDOL or its Commissioner or designated Hearing officer(s) shall be made no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment. After final payment, payment of any sums withheld due to a lien against a public improvement filed with the Owner against the Contractor will be made to the Contractor when the lien is discharged or released and payment of any sum withheld by order or direction of NYSDOL shall be paid as ordered or directed by the NYSDOL or its Commissioner or designated Hearing officer(s) or by court order.

(Paragraphs deleted)
§ 5.3 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

two percent (2%) per annum

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 Initial Decision Maker
The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, as revised for this Project, unless the parties appoint by mutual agreement another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:

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(Check the appropriate box.)

[ ] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[X] Litigation in a court of competent jurisdiction in Westchester County, New York.

[ ] Other: *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019, as revised for this Project.

§ 7.1.1.1 If the Contract is terminated in whole or in part for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, as revised for this Project, then the Owner shall pay the Contractor for work executed in compliance with the Contract Documents prior to the date of termination as well as any costs incurred by the Contractor to implement Owner directed work to protect and preserve the Work completed by the Contractor prior to the notice of termination. The Contractor will not be entitled to payment of any other sums. The Contractor will not be entitled to any payment for the terminated portion of the Work and waives and forfeits any claim of damages, overhead and/or loss profits for the terminated portion of the Work.

§ 7.1.2 The Work may be suspended, in whole or in part, by the Owner as provided in Article 14 of AIA Document A232–2019, as revised for this Project.
(Paragraphs deleted)
§ 7.1.3 The Contract may be terminated, in whole or in part, by the Owner for cause in accordance with Article 14 of AIA Document A232-2019, as revised for this Project.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to AIA Document A232-2019, it refers to it, as revised for this Project. Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Jared Mance
Director of School Facilities, Operations & Maintenance
Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

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§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, as revised for this Project, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, as revised for this Project, and elsewhere in the Contract Documents.

§ 8.6 Notice shall be provided as set forth in section 1.6 of AIA Document A232-2019, as revised for this Project.

§ 8.7
(Paragraphs deleted)
Not used.

§ 8.8 Other provisions:

Not Applicable

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, as revised for this Project

.2 AIA Document A132™–2019, Exhibit A, Insurance and Bonds Exhibit, as revised for this Project

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, as revised for this Project

.4 Not used.

.5 Drawings

Number	Title	Date
Project Manual Section 000115	List of Drawings	

.6 Specifications

Section	Title	Date	Pages
Project Manual Section 000110	Table of Contents		

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

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(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work

[ ] AIA Document E235™–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:
(Insert the date of the E235-2019 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

The Contract Documents also include the Advertisement or Invitation to Bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, portions of Addenda relating to bid requirements, and the Contractor's Payment and Performance bonds.

This Agreement is entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

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AIA® Document A132® – 2019 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year
(In words, indicate day, month, and year.)

for the following **PROJECT**:
(Name and location or address)

OUFSD 2024 Bond – New 7-8 Building
300 Van Cortlandt Ave
Ossining, NY 10562

SED No.: 66-14-01-03-0-028-001

CPL Project No,: R24.16941.00

THE OWNER:
(Name, legal status, and address)

Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

THE CONTRACTOR:
(Name, legal status, and address)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A232™–2019, General Conditions of the Contract for Construction. Article 11 of A232™–2019 contains additional insurance provisions

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A232™–2019, General Conditions of the Contract for Construction as revised for this Project.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

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§ A.2.2 Liability Insurance
The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance
§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to false work and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure

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against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4
(Paragraphs deleted)
Intentionally Omitted.

(Paragraphs deleted)
§ A.2.5
(Paragraphs deleted)
Intentionally Omitted.

(Paragraphs deleted)
ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS
§ A.3.1 General
§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. These certificates and the insurance policies required by this Section shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner, Architect and Construction Manager as an additional insured on the Contractor's Commercial General Liability, Auto Liability and excess or umbrella liability policy or policies. The certificate of insurance must describe all services provided by the contractor (e.g., roofing, carpentry or plumbing) that are covered by the liability policies. A fully completed New York Construction Certificate of Liability Insurance Addendum (ACORD 855 2014/15) must be included with the certificates of insurance. For any "Yes" answers on Items G through L on this Addendum, additional details must be provided in writing. Policy exclusions may not be accepted. At the Owner's request, the Contractor shall provide a copy of the declaration page of the liability and umbrella/excess policies with a list of endorsements and forms. If requested, the Contractor will provide a copy of the policy endorsements and forms. There will be no coverage restrictions and/or exclusions involving New York State Labor Law statutes or gravity related injuries. No policies containing escape clauses or exclusions contrary to the Owner's interests will be accepted.

§ A.3.1.1.1 Notice of Cancellation or Expiration of Contractor's Required Insurance Within not less than twenty (20) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor and indemnify the Owner, Architect and Construction Manager for applicable deductibles and self-insured retentions.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner and Construction Manager as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and

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non-contributory to any of the Owner's, Architect's and Construction Manager's general liability, auto liability and umbrella/excess insurance policies and shall apply to both ongoing and completed operations and provide coverage for the Owner, its Board of Education, employees and volunteers, Architect and Construction Manager, including a waiver of subrogation in favor of the Owner, Architect and Construction Manager for all coverages including Workers Compensation. Additional insured status for General Liability coverage shall be provided by standard or other endorsements that extend coverage to the Owner, Architect and Construction Manager for on-going operations (CG 20 38 or equivalent) and products and completed operations (CG 20 37 or equivalent). The decision to accept an endorsement rests solely with the Owner. A completed copy of the endorsements must be attached to the Certificate(s) of Insurance to include General Liability, Auto Liability and Umbrella/Excess coverages. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 38, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, CG 20 32 07 04. All insurance policies provided by the Contractor are required to include Primary and Non-contributory Additional Insured coverage to the Owner, Architect & Construction Manager, except for OCP, Workers Compensation and New York State Disability. All insurance policies provided by the Contractor are required to include a Waiver of Subrogation in favor of the Owner, Architect & Construction Manager, including Workers Compensation and excepting OCP..

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an A.M. Best A- rated or better insurance company or insurance companies licensed and admitted to conduct business in New York State and to issue insurance in New York State. A New York licensed and admitted insurer is required. The specific insurance requirements shall be written for not less than limits of liability specified by the Owner or required by law, whichever coverage is greater. A New York licensed and admitted insurer is required. Contractor acknowledges that failure to obtain the insurance required herein on behalf of the Owner constitutes a material breach of contract and subjects it to liability for damages, indemnification and all other legal remedies available to the Owner. The Contractor is to provide the Owner with a certificate of insurance, evidencing the requirements herein have been met, prior to the commencement of the Contractor's work. The failure of the Owner to object to the contents of the certificate or the absence of same shall not be deemed a waiver of any rights held by the Owner. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.1.2 Subcontractors are subject to the same terms and conditions of insurance as Contractors as stated in this AIA Document A132-2019 Exhibit A and must submit same to the Owner for approval prior to the start of any work.

.1 In the event a Contractor fails to obtain the required certificates of insurance from their Subcontractors and a claim is made or suffered, the Contractor shall indemnify, defend, and hold harmless the Owner, its Board of Education, employees, volunteers, Architect and Construction Manager from any and all claims for which the insurance required of the Subcontractor(s) would have provided coverage. This indemnity obligation is in addition to any other indemnity obligation provided in the Contract.

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than one million dollars ($ 1,000,000.) each occurrence, 2,000,000. ($ two million dollars) general aggregate, and 2,000,000. ($ two million dollars) aggregate for products-completed operations hazard, one million dollars ($ 1,000,000.) personal and advertising injury, one hundred thousand dollars ($ 100,000.) fire damage, ten thousand dollars ($ 10,000.) medical expense, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

.2 personal injury and advertising injury;

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

.4 bodily injury or property damage arising out of completed operations; and

.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

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.6 the general aggregate shall apply on a per-project basis.

Products and completed operations coverage must remain in effect for three years after Project completion and acceptance of the work performed by the Contractor.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.

.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.

.3 Claims for bodily injury other than to employees of the insured.

.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.

.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.

.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.

.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.

.8 Claims related to roofing, if the Work involves roofing.

.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.

.10 Claims related to earth subsidence or movement, where the Work involves such hazards.

.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, hired, borrowed and non-owned vehicles used, by the Contractor, with combined single policy limits of not less than one million dollars ($ 1,000,000.) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.4.1 Umbrella Excess Liability:

$5,000,000 each Occurrence and Aggregate for general construction and no work at elevation (1 story or 10 feet) and contract values less than or equal to $1,000,000.

$10,000,000 each Occurrence and Aggregate for construction contract values greater than $1,000,000.

$10,000,000 each Occurrence and Aggregate for high-risk construction, work at elevation (>1 story or 10 feet).

Umbrella/Excess coverage shall be on a follow-form basis or provide broader coverage over the General Liability and Auto Liability coverages.

§ A.3.2.5 Workers' Compensation and NYS Disability Insurance

Statutory Workers' Compensation (C-105.2 or U-26.3); and NYS Disability Insurance (DB-120.1) for all employees. Proof of coverage must be on the approved specific form, as required by the New York State Workers' Compensation Board. ACORD certificates are not acceptable. A person seeking an exemption must file a CE-200 Form with the state. The form can be completed and submitted directly to the WC Board online.

§ A.3.2.6 Employers' Liability with policy limits not less than ($ 1,000,000) per each accident, and ($ 1,000,000) each employee.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

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§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, see Section A.3.3.2.6.1.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, see Section A.3.3.2.3.

(Paragraphs deleted)

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies licensed and admitted to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[ ] **§ A.3.3.2.1** If there is only one Contractor performing the Work on the Project, property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:
(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

[ ] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than ($) per claim and ($) in the aggregate, for Work within fifty (50) feet of railroad property.

[X] **§ A.3.3.2.3 Asbestos Abatement/Lead Abatement/Pollution Liability Insurance**, if applicable. Such insurance shall include products and completed operations and coverage for the Contractor's operations including, but not limited to, removal, replacement, enclosure, encapsulation and/or disposal of asbestos, or any other hazardous material, along with any related pollution events, including coverage for third-party liability claims for bodily injury, property damage and clean-up costs. If a retroactive date is used, it shall pre-date the inception of the Contract. The limits applicable shall be the greater of the amounts indicated or the amounts carried by the Contractor:
.1 If covered by the Contractor's umbrella/excess liability policy, two million ($2,000,000) each occurrence and two million ($2,000,000) aggregate
.2 If NOT covered by the Contractor's umbrella/excess liability policy, six million ($6,000,000) each occurrence and six million ($6,000,000) aggregate
.3 If the Contractor is using motor vehicles for transporting hazardous materials, the Contractor shall

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maintain pollution liability broadened coverage (ISO Endorsement CA 9948 or CA 01 12), as well as proof of MCS 90. Coverage shall fulfill all requirements of these specifications and shall extend for a period of three (3) years following acceptance by the Owner of the Certificate of Completion.

[ ] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[ ] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[X] **§ A.3.3.2.6 Other Insurance**

§ A.3.3.2.6.1 Testing Company Errors and Omission Insurance, if applicable, for the testing and other professional acts of the Contractor performed under the Contract with the Owner.
With policy limits not less than $1,000,000 per occurrence/$2,000,000 aggregate.

[X] § A.3.3.2.6.2 Cyber Insurance The Contractor must carry coverage applicable to first- and third-party claims, arising from a cyber incident that could impact the Owner's data that the Contractor may have in their possession. Limits shall be the greater of those carried by the Contractor or $250,000 per incident and $250,000 in the aggregate. If coverage is on a claims-made basis, coverage must have a retroactive date no later than the date of agreement with the Owner and provide coverage for two years following the date of Final Completion of the Project. The Cyber policy must be with a NYS licensed carrier.

[X] § A.3.3.2.6.3 Owners Contractors Protective (OCP) Insurance

.1 For projects less than or equal to $1,000,000 and work on 1 story (10 feet) only:
$1,000,000 per occurrence, $2,000,000 aggregate with the Owner as the Named Insured, no Additional Insureds on any OCP Policies.

.2 For projects greater than $1,000,000 or work over 1 story (10 feet):
$2,000,000 per occurrence, $4,000,000 aggregate with the Owner as the Named Insured, no Additional Insureds on any OCP Policies.

.3 The OCP Policy must be with a New York State licensed and admitted carrier.

(Table deleted)

§ A.3.4 Performance Bond and Payment Bond

§ A.3.4.1 The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located. The Contractor shall furnish a Performance Bond and Labor and Material Payment Bond meeting all statutory requirements of the jurisdiction where the Project is located, in form and substance satisfactory to the Owner and, without limitation, complying with the following specific requirements:

.1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment.

.2 Bonds shall be executed by a responsible surety licensed in the jurisdiction where the Project is located, with a Best's rating of no less than A/XII, and shall remain in effect for a period not less than two (2) years following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.

.3 The Performance Bond and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum and shall be adjusted during the Project to reflect increases in the Contract Sum.

.4 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power-of-attorney indicating the monetary limit of such power.

.5 Every Bond provided pursuant to this Subparagraph A3.4.1 must display the Surety's Bond Number and be modified to include the following text or shall incorporate the following text through a Rider attached to each Bond:

(i) The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Any addition, alteration, change, extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived.

(Table deleted)

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(ii) The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner.

(iii) Surety further agrees that in event of any default by the Owner in the performance of the Owner's obligations to the Contractor under the Contract, the Contractor or Surety shall cause written notice of such default (specifying said default in detail) to be given to the Owner, and the Owner shall have fourteen (14) days from receipt of such notice within which to cure such default, or such additional reasonable period of time as may be required if the nature of such default is such that it cannot be cured within fourteen (14) days. Such Notice of Default shall be sent by certified or registered U.S. mail, return receipt requested, first class postage prepaid, to the Owner.

.6 Bonds shall be written on the most recent edition of the AIA Document 312, Payment Bond and Performance Bond.

.7 If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 11.4.1 Contractor shall within ten days thereafter substitute another Bond and surety, both of which must be acceptable to Owner.

.8 Contractor shall deliver Bonds to the Construction Manager or Architect together with executed Construction Contract (A132-2019) and the Bonds shall be dated the same date as Contract or a date later than the date of the Contract.

§ A.3.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

N/A

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SECTION 006000
PROJECT FORMS AND RELATED DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section lists the project forms used for administration of the project as well as documents used for administration and logistics.

1.02 FORMS

A. The following forms are contained within the conditions of the contract section:
   1. FRONT END SUBMISSION LOG
   2. REQUEST FOR INFORMATION (RFI) FORM
   3. SUBCONTRACTOR LIST
   4. ALLOWANCE DISBURSEMENT AUTHORIZTION FORM
   5. SUBSTITUTION REQUEST FORM
   6. SUBMITTAL COVER
   7. INFORMATION BULLETIN
   8. ELECTRONIC DOCUMENT TRANSFER AGREEMENT
   9. AIA FORMS (Forms provided are samples. Original AIA Documents shall be used):
      a. Performance Bond (AIA Document A312-2010).
      b. Payment Bond (AIA Document A312-2010).
      c. Application and Certificate for Payment, Construction Manager as Adviser Edition (AIA G732).
      d. Continuation Sheet (Document G703-1992)
      e. Contractor's Affidavit of Payment of Debts and Claims (AIA Document G706).
      f. Contractor's Affidavit of Release of Liens (AIA Document G706A).
      g. Consent of Surety to Final Payment (AIA Document G707).
      h. Work Changes Proposal Request (AIA Document G709).
      i. Architect's Supplemental Instructions (AIA Document G710).
      j. Change Order, Construction Manager Edition (AIA Document G731-2019)
      k. Construction Change Directive, Construction Manager as Adviser Edition (AIA Document G733-2019)
      l. Certificate of Substantial Completion, Construction Manager as Adviser Edition (AIA Document G734-2019)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROCEDURES

A. **Front End Submission Log**: This document is a checklist of the required submissions. Refer to Bidding Requirements, Section entitled “Instructions to Bidders” and Division 1, Specification Section entitled “SUBMITTAL PROCEDURES” for submission procedures.

B. **Request For Information (RFI) Form:** This form is to be used for information requests. The forms are filled out by any party to the contract and sent to the Architect/Engineer. The Architect/Engineer shall number RFI before processing.

C. **Subcontractor List:** This document is to be used identify subcontractors. The forms are filled out by each Prime Contractor for all proposed subcontractors and sent to the Architect/Engineer in accordance with. Division 1, section entitled “SUBMITTAL PROCEDURES”

D. **Allowance Disbursement Authorization Form:** the Architect/Engineer shall issue this document after all parties have agreed to the conditions of change to be charged to the Allowance Amount in accordance with Division 1, section entitled “ALLOWANCES”, if required.

E. **Substitution Request Form:** This document is to be used for a Contractor to propose substitutions. The forms are filled out by each Prime Contractor and sent to the Architect/Engineer in accordance with. Division 1, section entitled “SUBMITTAL PROCEDURES” and “PRODUCT REQUIREMENTS”.

F. **Submittal Cover:** This document is to be used for submittal submissions. The forms are filled out by each Prime Contractor and sent to the Architect/Engineer in accordance with. Division 1, section entitled “SUBMITTAL PROCEDURES”

G. **Information Bulletin:** The Architect/Engineer shall issue this document for 3 actions.
   1. PROPOSAL REQUEST: A quotations for changes in the Contract Sum and / or proposed modifications to the Contract Documents
   2. SUPPLEMENTAL INSTRUCTIONS: Instructions for changes to the Contract Documents without additional cost or time
   3. CONSTRUCTION CHANGE AUTHORIZATION: A directive to immediately proceed with changes to the work of the contract and to submit final cost for inclusion into a Change Order

H. **Electronic Document Transfer Agreement:** This document is used by a Contractor to request the transfer of electronic files, other than PDF's, for purposes including, but not limited to, creating coordination drawings.

END OF SECTION 006000

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FRONT END SUBMISSION LOG

OUFSD_24BD_NEW 7-8 BUILDING: R24.16941.00

Contractor Name: _____

SUBMISSIONS

Submission	Date Submitted	Date Approved	Remarks
Contract:			
Schedule of Values:			
Bonds:			
Insurance:			
Workers Compensation:			
Automobile Insurance:			
Safety Program:			
Schedule:			
Submittal Schedule:			
Emergency Contact:			
Substitution List:			
Subcontractor List:			
Project Manager:			
Superintendent:			

This log is to be used by the contractor to monitor and complete the required front-end submissions.

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Poughkeepsie, NY 12601
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REQUEST FOR INFORMATION	RFI #:
	Date:

OUFSD_24BD_NEW 7-8 BUILDING: R24.16941.00

Contractor Name: _____

To: _____ Firm: _____

From: _____

WE REQUEST YOUR ATTENTION (OR CONFIRMATION) REGARDING THE FOLLOWING:

Subject: _____

_____

Location: _____

_____

Information is Requested By: _____

MESSAGE: _____

Contractors Name: _____

By: _____ Date: _____

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SUBCONTRACTOR LIST

OUFSD_24BD_NEW 7-8 BUIDLING: R24.16941.00

To: **CPL**
26 IBM Road
Poughkeepsie, NY 12601

From:
(Contractor) _____

_____

Contractors
No.: _____

Contract For: _____

List Subcontractors proposed for use on this Project as required by the Construction Documents. Attach supplemental sheets if necessary.

Section
No.: _____ Section Title: _____
Firm
Name: _____ Contact: _____
Address: _____

Section
No.: _____ Section Title: _____
Firm
Name: _____ Contact: _____
Address: _____

Section
No.: _____ Section Title: _____
Firm
Name: _____ Contact: _____
Address: _____

Section
No.: _____ Section Title: _____
Firm
Name: _____ Contact: _____
Address: _____

Section
No.: Section Title:

☐ Attachment(s)

Signed by: _____ Date: _____

Copies: ☐ **Owner** ☐ **Consultants** ☐ File
☐ ☐ ☐

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ALLOWANCE DISBURSEMENT AUTHORIZATION

Owner	
Architect/Engineer	
Contractor	
Field	
Other	
Other	

OUFSD_24BD_NEW 7-8 BUILDING: R24.16941.00

Allowance Disbursement No. _____ Initiation Date: _____

Contract For: _____

_____

To Contractor: _____

_____

Contract Date: _____

Not valid until signed by Owner, Architect/Engineer, [Construction Manager] and Contractor.

The Original Contract Allowance _____

Net Allowance Disbursements previously authorized _____

Charges to Contract Allowance as a result of this authorization

Current Contract Allowance Balance including this authorization _____

Owner:
Ossining Union Free School District

Architect/Engineer:
CPL

Contractor:
<**Contractor's Name**>

Construction Manager:
Arris Contracting Company, Inc.

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SUBSTITUTION REQUEST FORM

OUFSD_24BD_NEW 7-8 BUILDING R24.16941.00

To:
CPL
26 IBM Road
Poughkeepsie, NY 12601

From:
(Contractor) _____

_____

Re: _____ Substitution Request Number: _____

Contract For: _____

Specification Title: _____ Description: _____

Section Number: _____ Page: _____ Part/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: Address: Phone:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect/Engineer: _____

Contractor: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work:

☐ No

☐ Yes, explain _____

Savings to Owner for accepting substitution: _____ ($ _____)

Proposed substitution changes Contract Time:

☐ Yes; explain ☐ No ☐ Yes [Add] [Deduct] _____ days

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted By: _____

Signed By: _____

Firm: _____

Address _____

_____

_____

Phone: _____

Attachments: _____

_____

_____

REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 013300.

☐ Substitution approved as noted - Make submittals in accordance with Specification Section 013300.

☐ Substitution rejected - Use specified materials.

☐ Substitution Request received too late - Use specified materials.

Signed By: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Architect/Engineer ☐ _____

_____

_____

_____

_____

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SUBMITTAL COVER

(Attach to each submittal)

#
Submittal No. Contractor only

Architect Project Number: R24.16941.00
Contractors Number:
Project Name: OUFSD_24BD_NEW 7-8 BUILDING

Contractor:
Address:
Phone / Fax: ( )

Date returned:

TYPE OF SUBMITTAL
(Check one)

- ☐ Product Data
- ☐ Color Selection
- ☐ O&M Manual
- ☐ Shop Drawings
- ☐ Sample
- ☐ Record Document
- ☐ Other

DATE OF SUBMITTAL:

RESUBMITTED:

NUMBER OF ATTACHED:

SUBSTITUTION
See General Conditions

☐ **YES** ☐ **NO**

PRODUCT IDENTIFICATION

Specification Section No.:
Contract Dwg. No.:
Product Name:
Part/Paragraph:
Detail Reference:
Manufacturer:

CONTRACTOR APPROVAL

Identify that this submittal has been reviewed and approved by the Contractor in accordance with the General Conditions

By: Date:

Deviation from Contract Documents:

Contractor Comments:

FOR USE BY CPL

SHOP DRAWING

- ☐ No Exception Taken
- ☐ Revise & Resubmit
- ☐ Furnish as Corrected
- ☐ Rejected

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe satisfactory manner.

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Date: By:

Architect's Comments:

RECEIVED STAMP

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INFORMATION BULLETIN

PROJECT:	Ossining UFSD 2024 Bond: NEW 7-8 BUILDING	INFORMATION BULLETIN NO.: DATE:	
OWNER:	Ossining Union Free School District	CPL PROJECT NO.:	R24.16941.00
CONTRACTOR:		CONTRACT NO.:	
		CONTRACT DATE:	

DESCRIPTION:

ATTACHMENT(S):

ACTION

☐ 1. *PROPOSAL REQUEST:* Submit an itemized quotation for changes in the Contract Sum and/or time required to implement the above proposed modifications to the Contract Documents. This is not authorization to proceed with the work.

☐ 2. *SUPPLEMENTAL INSTRUCTIONS:* Implement the above instructions without change to the Contract Sum and/or Time. Prior to proceeding, indicate acceptance below and return one copy to the Architect.

☐ 3. *CONSTRUCTION CHANGE AUTHORIZATION:* Proceed with the above described changes to the Contract Documents immediately. Submit final costs and/or change in Contract Time for inclusion in a subsequent Change Order.

Methods: ☐ Lump Sum ☐ Unit Price ☐ Time & Material Not-to-Exceed

Change in Contract Sum of _____

Change in Contract Time of _____ days

ISSUED:	ACCEPTED:	AUTHORIZED:
BY:_____	BY:_____	BY:_____
Architect Date	Owner Date	Contractor Date
Required for Actions 1,2,3	Required for Action 3	Required for Actions 2,3

☐ Owner ☐ Architect ☐ Structural ☐ Civil
☐ Contractor ☐ Field ☐ Mechanical/Electrical ☐ Other (Roofing)

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ELECTRONIC DOCUMENT TRANSFER AGREEMENT

DATE:		**PROJECT #:**	R24.16941.00
PROJECT NAME	Ossining UFSD_24BD_NEW 7-8 BUILDING	**CLIENT / LOCATION**	Ossining Union Free School District
COMPANY REQUESTING AND RECEIVING FILES:		**PERSON REQUESTING:**	
DESCRIPTION OF FILES:		**REASON FOR FILES:**	

1. The requested electronic file(s) (the "Files") remain the property of and are owned by CPL.
2. The Files are not Contract Documents. The use of the Files to alter or revise the scope of work is not permitted.
3. CPL makes no warranties or guarantees that the Files represent or reflect the complete scope of work and/or as-built condition, and CPL assumes no responsibility for data files supplied in electronic format. Such data is provided as a courtesy only.
4. The Company requesting the Files and users of the Files accept full responsibility for verifying the accuracy and completeness of the Files.
5. Files in Revit/Building Information Model format: Unless express written consent of CPL is given through the implementation of a Project Building Information Modeling Protocol Form (AIA® Document G202™ or similar); the information contained within the Files was compiled for the purposes of creating the contract documents and are graphic representations of approximate locations of materials. Therefore, information contained within these files should not be assumed to be accurate and users of the Files accept full responsibility for verifying the accuracy and completeness of the Files with field conditions and the contract documents.
6. Shop drawings shall not be based on reproduction of the contract documents or standard printed data. This includes reproductions of the Files, unless express written consent is given of CPL through the implementation of a Project Building Information Modeling Protocol Form.
7. The Company requesting the Files agrees to defend, indemnify and hold harmless CPL, its officers, employees, consultants, and agents from any claims or damages arising from the use of the Files.
8. In the event that any of the Files contain electronic copies of drawings with permits or professional seals, the Company requesting the Files shall immediately notify CPL and destroy such Files.
9. No use shall be made of the Files for any purpose other than that for which they were originally intended without the express written consent of CPL.
10. No retransmission of the Files in any form to third parties is permitted unless authorized in writing by CPL.
11. The handling fee for the time and effort it will take CPL Lee to deliver the requested Files is $150.00. Under no circumstances shall delivery of the Files be considered a sale by CPL.

Having read and understood the terms set forth in paragraphs 1-11 above, and in consideration of CPL providing electronic files, the undersigned agrees to be bound by these terms.

_____ _____

Signature of Authorized Representative Date

_____

Print Name and Title

The requested electronic files will only be released upon CPL's receipt of a signed Electronic Document Transfer Agreement by a duly authorized representative of the company requesting and receiving the files. CPL reserves the right to deny any request for copies of electronic files.

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Poughkeepsie, NY 12601
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AIA® Document A312® – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

Signature: _____
Name and Title:

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

Sample

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- **.1** have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- **.2** have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

Sample

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§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- **.1** the name of the Claimant;
- **.2** the name of the person for whom the labor was done, or materials or equipment furnished;
- **.3** a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- **.4** a brief description of the labor, materials or equipment furnished;
- **.5** the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- **.6** the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- **.7** the total amount of previous payments received by the Claimant; and
- **.8** the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

Sample

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§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

Sample

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

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AIA® Document A312® – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

Sample

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

Sample

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§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

Sample

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§ 16 Modifications to this bond are as follows:

Sample

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

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AIA® Document G732® – 2019

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:

PROJECT:

APPLICATION NO:

DISTRIBUTION TO:

OWNER ☐
CONSTRUCTION MANAGER ☐
ARCHITECT ☐
CONTRACTOR ☐
FIELD ☐
OTHER ☐

PERIOD TO:

FROM CONTRACTOR:

VIA CONSTRUCTION MANAGER:

CONTRACT DATE:

PROJECT NOS: / /

CONTRACT FOR:

VIA ARCHITECT:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM ..... $

2. NET CHANGES IN THE WORK ..... $

3. CONTRACT SUM TO DATE *(Line 1 ± 2)* ..... $

4. TOTAL COMPLETED AND STORED TO DATE *(Column G on G703)* ..... $

5. RETAINAGE:

a. _____ % of Completed Work
(Column D + E on G703) $

b. _____ % of Stored Material
(Column F on G703) $

Total Retainage *(Lines 5a + 5b, or Total in Column I on G703)* ..... $

6. TOTAL EARNED LESS RETAINAGE ..... $
(Line 4 minus Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT .....
(Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE ..... $

9. BALANCE TO FINISH, INCLUDING RETAINAGE
(Line 3 minus Line 6) $

SUMMARY OF CHANGES IN THE WORK	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month, including Construction Change Directives	$	$
TOTALS	$	$
NET CHANGES IN THE WORK	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My Commission expires: _____

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on evaluations of the Work and the data comprising this application, the Construction Manager and Architect certify to the Owner that to the best of their knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

CONSTRUCTION MANAGER:

By: _____ Date: _____

ARCHITECT: *(NOTE: If multiple contractors are responsible for performating portions of the Project, the Architect's Certification is not required.)*

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

Sample

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AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certificate for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached. Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED *(Not in D or E)*	TOTAL COMPLETED AND STORED TO DATE *(D+E+F)*	% *(G ÷ C)*	BALANCE TO FINISH *(C – G)*	RETAINAGE *(If variable rate)*
			FROM PREVIOUS APPLICATION *(D + E)*	THIS PERIOD					
	GRAND TOTAL								

Sample

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AIA® Document G706® – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

TO OWNER: *(Name and address)*

CONTRACT DATED:

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707™, Consent of Surety to Final Payment, may be used for this purpose.
   Indicate attachment: ☐ Yes ☐ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof
3. Contractor's Affidavit of Release of Liens (AIA Document G706A™)

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

Sample

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AIA® Document G706®A – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

TO OWNER: *(Name and address)*

CONTRACT DATED:

STATE OF:

COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

Sample

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AIA® Document G707™ – 1994

Consent of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

CONTRACT DATED:

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

TO OWNER: *(Name and address)*

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal)

(Printed name and title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

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040511 ACD44

Sample

AIA® Document G709™ – 2018

Proposal Request

PROJECT: *(name and address)*:	**CONTRACT INFORMATION:** Contract For: Date:	Architect's Project number: Proposal Request Number: Proposal Request Date:
OWNER: *(name and address):*	**ARCHITECT:** *(name and address):*	**CONTRACTOR:** *(name and address):*

The Owner requests an itemized proposal for changes to the Contract Sum and Contract Time for proposed modifications to the Contract Documents described herein. The Contractor shall submit this proposal within _____ (___) days or notify the Architect in writing of the anticipated date of submission.

(Insert a detailed description of the proposed modifications to the Contract Documents and, if applicable, attach or reference specific exhibits.)

Sample

THIS IS NOT A CHANGE ORDER, A CONSTRUCTION CHANGE DIRECTIVE, OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.

REQUESTED BY THE ARCHITECT:

_____

PRINTED NAME AND TITLE

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AIA® Document G710™ – 2017

Architect's Supplemental Instructions

PROJECT: *(name and address)*	**CONTRACT INFORMATION:** Contract For: Date:	**ASI INFORMATION:** ASI Number: Date:
OWNER: *(name and address)*	**ARCHITECT:** *(name and address)*	**CONTRACTOR:** *(name and address)*

The Contractor shall carry out the Work in accordance with the following supplemental instructions without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.
(Insert a detailed description of the Architect's supplemental instructions and, if applicable, attach or reference specific exhibits.)

ISSUED BY THE ARCHITECT:

ARCHITECT *(Firm name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE

Sample

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AIA® Document G731™ – 2019

Change Order, Construction Manager as Adviser Edition

PROJECT: *(name and address)*:

CONTRACT INFORMATION:
Contract For:
Date:

CHANGE ORDER INFORMATION:
Change Order Number:
Date:

OWNER: *(name and address):*

ARCHITECT: *(name and address):*

CONSTRUCTION MANAGER: *(name and address):*

CONTRACTOR: *(name and address):*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was	$
Net change by previously authorized Change Orders	$
The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was	$
The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of	$
The new Contract Sum including this Change Order will be	$

The Contract Time will be (increased) (decreased) (unchanged) by ( ) days.
The Contractor's Work shall be substantially complete on

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONSTRUCTION MANAGER, CONTRACTOR, AND OWNER.

ARCHITECT *(Firm name)*	**CONSTRUCTION MANAGER** *(Firm name)*
SIGNATURE	**SIGNATURE**
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**
DATE:	**DATE:**
CONTRACTOR *(Firm name)*	**OWNER** *(Firm name)*
SIGNATURE	**SIGNATURE**
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**
DATE:	**DATE:**

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Sample

AIA® Document G733™ – 2019

Construction Change Directive, Construction Manager as Adviser Edition

PROJECT: *(name and address)*:

CONTRACT INFORMATION:
Contract For:
Date:

CERTIFICATE INFORMATION:
Certificate Number:
Date:

OWNER: *(name and address):*

ARCHITECT: *(name and address):*

CONSTRUCTION MANAGER: *(name and address):*

CONTRACTOR: *(name and address)*

The Contractor is hereby directed to make the following change(s) in this Contract:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits.)

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:

☐ Lump Sum (increase) (decrease) of $

☐ Unit Price of $ per

☐ Cost, as defined below, plus the following fee:
(Insert a definition of, or method for determining, cost)

☐ as follows:

2. The Contract Time is proposed to (be adjusted) (remain unchanged). The proposed adjustment, if any, is (an increase of days) (a decrease of days).

Signature by the Contractor indicates the Contractor's agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this Construction Change Directive.
CONTRACTOR *(Firm name)*
SIGNATURE
PRINTED NAME AND TITLE
DATE:

NOTE: The Owner, Construction Manager, Architect, and Contractor should execute a Change Order to supersede this Construction Change Directive to the extent they agree upon adjustments to the Contract Sum, Contract Time, or Guaranteed Maximum price for the change(s) described herein.

When signed by the Owner, Construction Manager and Architect and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

OWNER *(Firm name)*	**CONSTRUCTION MANAGER** *(Firm name)*	**ARCHITECT** *(Firm name)*
SIGNATURE	**SIGNATURE**	**SIGNATURE**
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**	**PRINTED NAME AND TITLE**
DATE	**DATE**	**DATE**

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AIA® Document G734™ – 2019

Certificate of Substantial Completion, Construction Manager as Adviser Edition

PROJECT: *(name and address)*:	**CONTRACT INFORMATION:** Contract For: Date:	**CERTIFICATE INFORMATION**: Certificate Number: Date:
OWNER: *(name and address):*	**ARCHITECT:** *(name and address):*	**CONSTRUCTION MANAGER:** *(name and address):*

CONTRACTOR(S):
(Enter names and addresses for all Contractors)

The Work identified below has been reviewed and found, to the Construction Manager's and Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work of all of the Contractors, or designated portion thereof, is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project, or portion thereof designated below, is the date established by this Certificate
(Identify the Work of all of the Contractors, or portion thereof, that is substantially complete.)

For all Contractors, the date of Substantial Completion of the Project, or portion thereof, is:
(Insert the date of Substantial Completion for all Contractors of the Work described above.)

CONSTRUCTION MANAGER *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**
ARCHITECT *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**

WARRANTIES
The date of Substantial Completion of the Project, or portion designated above, is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED
A list of items to be completed or corrected by each of the Contractors, including a cost estimate, is attached hereto or transmitted as agreed upon by the parties, and identified as follows:
(Attach a list of items to be completed or corrected by each of the Contractors and provide an identification of each list.)

The failure to include any items on such list does not alter the responsibility of a Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached lists will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. Each Contractor will complete or correct the Work on the appropriate list of items attached hereto within ( ) days from the above date of Substantial Completion.

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Sample

As of the date of Substantial Completion, the Owner shall be responsible for security, maintenance, heat, utilities, damage to the Work, and insurance, except as noted below:
(Identify any responsibilities that are assigned to the Contractors.)

(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**
OWNER *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**

Sample

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SECTION 007200
A232 GENERAL CONDITIONS COVER (CMA)

PART 1 - GENERAL

1.01 SUMMARY

A. The following are the “General Conditions of the Contract for Construction, Construction Manager – Advisor Edition”. AIA Document A232-2019, is bound with this Section. AIA Document A232-2019 sets forth the rights, responsibilities, and relationships of the Owner, Contractor, Architect and Construction Manager.

END OF SECTION 007200

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AIA® Document A232® – 2019

General Conditions of the Contract for Construction, *Construction Manager as Adviser Edition*

for the following PROJECT:
(Name, and location or address)

OUFSD 2024 Bond – New 7-8 Building
300 Van Cortlandt Ave
Ossining, NY 10562

SED No.: 66-14-01-03-0-028-001

CPL Project No,: R24.16941.00

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

THE OWNER:
(Name, legal status, and address)

Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

THE ARCHITECT:
(Name, legal status, and address)

CPL Architects, Engineers and Landscape Architect, D.P.C.
d/b/a CPL
26 IBM Road
Poughkeepsie, NY 12601

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents. The Contract Documents consist of the Agreement between the Owner and Contractor (AIA A132-2019 Standard Form of Agreement as revised for this Project) together with Exhibit A thereto (AIA A132-2019 Exhibit A Insurance and Bonds as revised for this Project) (collectively, hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Instructions to Bidders (AIA A701-2018 as revised for this Project), Supplemental Instructions to Bidders (if any), Addenda issued prior to execution of the Agreement, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, or the Contractor's bid or proposal.

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

§ 1.1.3 The Work. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors (including but not limited to other Prime Contractors), and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager, including but not limited to other Prime Contractors. The term "Contractor" in this Section shall include the Contractor and the Contractor's officers, directors, owners, employees, agents, suppliers, and sub-contractors of any tier.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

§ 1.1.7 The Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.8 The Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

The Specifications may describe (or the Drawings may show) the general placement required of materials or equipment, but the actual required placement may vary depending on the specific material or equipment used by the Contractor or the existing field conditions. The Contractor shall bear all direct and indirect costs associated with such variations.

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Some Specifications may be written in a condensed outline form and omitted words shall be included by interference. If the Specifications identify a task, it shall mean the "Contractor shall furnish, install and complete" the identified task unless otherwise stated.

Reference to standard specifications, manuals or codes shall mean reference to the latest standard specification, manual or code in effect at the time of the execution of the Agreement, unless otherwise stated. When reference is made to a manufacturer, trade association, reference standard or similar source (such as ASTM, ASA, AISC, ACI, etc.) the standards or requirements of such entity shall be incorporated into the Specifications and have the force and effect as though they were set forth expressly. Upon entering into the Agreement, the Contactor acknowledges its familiarity with those references, codes, etc. The date of the referenced standard shall be the latest edition in effect at the time of the execution of the Agreement unless otherwise stated.

§ 1.1.9 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 of these General Conditions. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for the results of interpretations or decisions rendered that are consistent with the Contract Documents.

§ 1.1.11 Provide. When the word "provide" (including derivatives thereof) is used, it shall mean to properly fabricate, complete, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, apparatus, appurtenances, and all items and expenses necessary to properly complete in place ready for operation or use under the terms of the Specifications.

§ 1.1.12 Addenda. Addenda are written or graphic instruments issued prior to the execution of the Agreement that modify or interpret the bidding documents, including the Drawings and Specifications, by additions, deletions, clarification, corrections, or supplementary information.

§ 1.1.13 Furnish. "Furnish" shall mean purchasing and/or fabricate and deliver to the job site or other location when so designated.

§ 1.1.14 Install. "Install" shall mean build-in, mount in position, connect or apply the specified object(s) and, where applicable, adjust and start-in operation.

§ 1.1.15 Alternate. "Alternate" shall mean a variation in the requirements of the Contract on which a separate price is to be received by the Owner as part of the bid. If the Alternate is accepted in writing by the Owner, the variation is then a part of the Contract and the amount of money quoted to be added to or deleted from the base bid is taken into account in determining the Contract Sum.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complimentary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the event of inconsistencies within or between parts of the Contract Documents, the Contractor shall (1) provide a better quality or greater quantity of Work or (2) comply with the more stringent requirements; either or both in accordance with the Architect's interpretation at no additional cost to the Owner. The Contractor shall assume full responsibility and cost for proceeding with such work without obtaining the Architect's interpretations. The terms and conditions of this Subparagraph 1.2.1, however shall not relieve the Contractor of any of the obligations set forth elsewhere in the Contract Documents. All work shall conform to the Contract Documents. No significant change there from shall be made without prior written authorization by the Owner. Where only part of the Work is indicated, similar parts shall be considered repetition. When any detail is shown and the components therefore are fully described, similar details shall be construed and not mentioned in the other shall be of like effect as if shown or mentioned in both. Should the

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Specifications and Drawings fail to particularly describe a product or material shown to be used in any place, the Contractor shall furnish the product that would normally be used in that place.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.1.2 Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. No extra charge or compensation shall be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Architect through the Construction Manager for resolution before proceeding with the Work.

§ 1.2.1.3 If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit through the Construction Manager detailed drawings of such departure for approval by the Architect before making the change.

§ 1.2.1.4 All indications or notations on the Drawings which apply in one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, material or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

§ 1.2.1.5 The Contractor shall provide all labor, materials, equipment, appliances and services necessary to execute and complete all work as required by the Contract Documents and the applicable Building Codes. Whenever any additional materials and/or workmanship not shown or specified are required to complete the Work of the Contract Documents in accordance with the obvious intent thereof, the Contractor shall provide such materials and workmanship at no additional cost to the Owner.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.2.1 The organization of the Specifications into divisions, sections and articles and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of the Work to be performed by any trade. The organization of the Specifications into divisions, sections and articles and arrangement of Drawings is for the purpose of convenience, and ready reference only. The Contractor will be permitted to allocate the work of Subcontractors at his own discretion regardless of the grouping in the Specifications. It shall be the Contractor's responsibility to settle definitely with each Sub-contractor the portions of the Work, which each will be required to perform. The Contractor represents that the Subcontractors, manufacturers, vendors and suppliers engaged or to be engaged by it are and will be familiar with the requirements for the performance by them of their obligations. The Contractor shall provide each item listed, of quality noted and subject to qualifications noted, and shall perform operations prescribed according to the conditions stated, including specified operations, processes or methods, furnishing therefore all necessary labor, materials, equipment and incidentals required to complete the Work.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 All work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

§ 1.2.4.1 The Contractor and all Subcontractors shall refer to all of the Drawings, including those showing primarily the work of the plumbing, heating, ventilation, air conditioning, electrical, and other specialized trades, and to all of the sections of the Specifications, and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results.

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§ 1.2.4.2 It is intended that all mechanical and electrical systems will be complete and in proper operation and that all construction components will be complete and in compliance with accepted construction practice upon completion of the Work. Even if items are missing from the Drawings and/or Specifications but are normally required for proper operation of mechanical and electrical systems, or to complete otherwise incomplete construction or to meet governing code requirements, they shall be included by the Contractor, unless the Contractor sought and received contradictory interpretation or clarification from the Architect.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

§ 1.4 .1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.4.2 The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. The expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

§ 1.4.3 Wherever required by the context, any gender shall include the other gender, the singular shall include the plural, and the plural shall include the singular. Each term defined in the Contract Documents may be used in its singular or plural form whether or not so defined.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8 of these General Conditions, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2 of these General Conditions, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing by (1) depositing the notice in the United States mail addressed to the authorized representative as specified in the Contract (or if no representative is specified for such party at the address stated in the Contract) of the party to be notified, postpaid and registered or certified with return receipt requested, (2) depositing the notice for overnight delivery (prepaid or billed to the party giving notice) with a nationally recognized overnight delivery service (e.g. Federal Express, USPS, UPS, etc.) addressed to the authorized representative of the party to be notified (or if no representative is specified for such party at the address stated in the Contract) or (3) by delivering the notice in person to the said authorized representative of the party (or if no representative is specified for such party at the address stated in the Contract). Notices may be made by the party giving the notice by the party's counsel, the authorized representative of the party as specified in the Contract, or by an officer of the party that has authority to bind the party. Notices are to be sent to the designated representative stated in this Agreement of the party to whom the notice is addressed at the address stated in the Agreement. Notice deposited in the mail in accordance with this Section 1.6.1 shall be effective unless otherwise stated in the Contract from and after the fourth (4th) day following the date deposited in a U.S. mail receptacle or when

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actually received by the party to whom addressed, whichever is earlier. Notices transmitted by overnight delivery shall be effective the first business day (excluding holidays, Saturdays and Sundays) following the day of deposit with the nationally recognized overnight delivery service or when actually received by the party to whom addressed, whichever is earlier. Notice given by delivery in person shall be effective only if and when received by the party to be notified. By giving the other parties at least seven (7) days written notice thereof, the Contractor, Owner, Construction Manager and Architect have the right to change their respective designee and respective address to any address in the United States of America for receipt of notices.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 of these General Conditions shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form.

§ 1.8 Confidentiality

§ 1.8.1 The Contractor warrants and represents that the Contractor shall not knowingly or negligently communicate or disclose at any time to any person or entity any materials or information with respect to the Work or the Project, including without limitation any promotional or marketing media or other material or information related to the Owner, the Work or the Project, except: (1) with prior written consent of the Owner, (2) information that was in the public domain prior to the date of the Agreement, (3) information which becomes part of the public domain by publication or otherwise not due to any unauthorized act or omission of the Contractor, (4) as may be required by the Contract or any applicable law, or (5) for purposes of coordination with other Contractors. The Contractor hereby agrees to indemnify and hold the Owner, the Construction Manager and Architect and their respective employees, consultants, volunteers and agents harmless from and against any cost, damage, liability, loss or claim arising from violation of the foregoing by the Contractor or the Contractor's officers, directors, employees, Subcontractors, Sub-subcontractors and agents.

§ 1.8.2 Upon request of the Owner, the Contractor shall immediately return and surrender to the Owner all copies of any materials, records, notices, memoranda, recordings, drawings, specifications, and mock-ups and any other documents furnished by the Owner, Construction Manager or the Architect to the Contractor.

§ 1.8.3 The Contractor shall specifically cause all Subcontractors or any other person or entity performing any services or furnishing any materials or equipment of the Work to warrant and represent that they will comply with the requirements forth in this Section 1.8.

§ 1.8.4 The indemnities, representations and warranties contained in this Section 1.8 shall be in addition to any other indemnities, representations and warranties provided in the Contract Documents and shall survive the complete performance of the Work or earlier termination of the Contract.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1 of these General Conditions, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

(Paragraph deleted)

§ 2.2 Intentionally omitted

(Paragraphs deleted)

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§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Unless otherwise provided within the Contract Documents, the Owner, assisted by the Construction Manager and the Architect, shall secure and pay for the building permit. Unless otherwise provided within the Contract Documents, the Contractor shall comply with and obtain, at its expense, all other licenses and permits required by Federal, State and local laws, rules, and ordinances necessary for the Work.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 Intentionally Omitted

§ 2.3.5 The Owner shall furnish surveys upon written request of the Contractor and to the extent same exist, describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The Owner, through the Architect or Construction Manager, shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish, through the Architect or Construction Manager, any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services. "Reasonable promptness" shall be measured from the time of the Owner's receipt of written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2 of these General Conditions.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6 of these General Conditions.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 of these General Conditions or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

§ 2.5 Owner's Right to Carry Out the Work

§ 2.5.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a three-day period after receipt of notice from the Owner, Architect or Construction Manager to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, after such three (3) day period and without prejudice to other remedies the Owner may have, correct such default or neglect at Contractor's expense. The Owner's reasonable cost of correcting such default or neglect shall be deducted from payments due the Contractor by Change Order, Construction Change Directive, back charge or other means. The Construction Manager or Architect may, pursuant to Section 9.5.1 of these General Conditions, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies or neglect. The Owner's reasonable costs shall include the cost of labor and materials to complete the correction of such deficiencies or neglect, the Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure, and the Owner's reasonable attorney's fees arising from the Contractor's default, neglect or failure. If current and future payments due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner, the

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Construction Manager or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

§ 2.5.2 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any legal or equitable rights of the Owner or Contractor or of any rights provided to the Owner and Contractor in the Contract Documents.

§ 2.5.3 In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. The Owner assumes no responsibility for liability for the safety of the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work; provided that the Owner shall be responsible for, and the Contractor shall upon discovery notify the Owner of, any unsafe condition created by the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under the Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents. The Contractor shall refer to all of the Drawings and all sections of the Specifications and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results. See also Sub-Sections of Section 1.2 of these General Conditions.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.4 The Contractor shall attend progress meetings with the Construction Manager and such other persons the Owner may wish to have present. The progress meetings shall include Contractor designated representative(s) and representatives of the Contractor's Sub-contractors if requested by the Owner, Construction Manager or Architect.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.1.1 The Contractor shall rely on its own knowledge and its review and interpretation of the Contract Documents and data provided in entering into the Contract and not the representations of the Owner or other persons. The Contractor acknowledges that quantities provided in the Contract Documents are estimates only and Contractor shall not seek additional compensation or adjustment in price based on a variation in actual quantities.

§ 3.2.1.2 Prior to execution of the Contract, the Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools, and equipment, (v) any time restrictions for accessing or working at the Project site, and (6) the storage, handling and trucking of materials to be used on-site.

§ 3.2.1.3 The accuracy of grades, elevations, dimensions or locations given in the Contract Documents or the work installed by other contractors is not guaranteed by the Architect or the Owner. The Contractor shall satisfy itself as to the accuracy of all grades, elevations, dimensions, utilities and locations. Prior to connecting its Work to existing structures or other contractor's work, the Contractor shall verify all dimensions and the suitability of the existing structures or work to receive the Contractor's Work. Any errors due to the Contractor's failure to verify such grades, elevations, dimensions, or locations shall be rectified promptly by the Contractor without any additional cost to the Owner.

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§ 3.2.1.3.1 The locations, depths and data as to underground conditions have been obtained from records, surface indications and data furnished by others. Information furnished is solely for the convenience of the Contractor without any warranty, expressed or implied as to its accuracy or completeness. The Contractor shall verify all existing conditions prior to commencing the Work. The Contractor shall make no claim against the Owner or Architect with respect to the accuracy or completeness of such information if the conditions found after commencement of the Work are different from those as indicated.

§ 3.2.1.4 The Contractor shall be solely responsible for the conditions which develop during construction and in the event any structure is dislocated, or over strained, or damaged so as to affect its usefulness, the Contractor shall correct or repair any dislocations, over strains or damages caused.

§ 3.2.1.5 The Contractor is responsible for restorations and/or repair of utilities, private property, buildings, pavement, walkways, roads, etc. damaged by its activities during the performance of its Work.

§ 3.2.1.6 The Contractor shall be responsible to remove and/or relocate all items that interfere with the new construction at no additional cost to the Owner.

§ 3.2.1.7 The Owner shall not be required to make any adjustment in the Contract Sum or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Section 3.2 of these General Conditions and all of its sub-sections.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work and at frequent intervals during the progress of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5 of these General Conditions, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.2.1 The Contractor shall assume full responsibility for accuracy of measurements obtained at the site. No extra compensation will be allowed because of differences between actual measurements and dimensions indicated on the Drawings, nor for Contractor's failure to coordinate work with actual field measurements.

§ 3.2.2.2 Should the Contractor perform any construction activity knowing it involves an error, inconsistency or omission in the Contract Documents without reporting such error, inconsistency or omission in the Contract Documents to the Construction Manager and Architect, the Contractor shall be solely responsible for such performance and shall bear all costs of correction. No unreported error, inconsistency or omission will provide a basis for additional compensation from the Owner to complete the Contractor's Work or a basis to excuse the Contractor from the completion of its Work.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3 of these General Conditions, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those

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obligations, the Contractor shall not be liable to the Owner, Construction Manager or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and the Contractor shall propose alternative means, methods, techniques, sequences, or procedures that will preserve all applicable warranties, including the Contractor's general warranty. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures. All loss, damage, liability or cost of correcting defective work arising from the employment of specific (including but not limited to alternative) construction means, methods, techniques, sequences or procedures shall be born solely by the Contractor.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.3.1 The Contractor shall be responsible for and coordinate any and all inspections required by any governmental body having jurisdiction over the Project. Failure to obtain any permits, licenses or other approvals because of the failure of the Contractor to conform to this requirement shall not extend the Contract time, and the Contractor shall not be entitled to any increase in the contract sum therefore. In addition, any additional costs and/or expenses of any nature incurred by the Owner as a result of the Contractor's failure to conform to this requirement shall constitute a charge against the Contractor's contract.

§ 3.3.4 It is understood and agreed that the relationship between the Contractor and the Owner shall be that of an independent contractor. Nothing contained in or inferable from the Contract Documents shall be deemed or construed to (1) make the Contractor the agent, servant or employee of the Owner or (2) create any partnership, joint venture or other association between the Owner and Contractor. Any direction or instruction by the Owner regarding the Work shall be given solely to relate the results the Owner desires to obtain from the Work and shall not be construed as affecting the Contractor's independent contractor status.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 of these General Conditions or ordered by the Architect in accordance with Section 7.4 of these General Conditions, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

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After the Agreement has been executed, the Owner and Architect will consider requests for the substitution of products in place of those specified only if the Contractor satisfies the procedural requirements set forth in the General Requirements (Division 01) of the Specifications. By making requests for substitutions, the Contractor.

.1 Represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.

.2 Represents that it will provide the same warranty for the substitution as it would have provided for the product specified;

.3 Certifies that the cost data presented is complete and includes all related costs for the substituted product ad for Work that must be changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that may subsequently be incurred by the Contractor; and

.4 Shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.2.1 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed upon changes in the Drawings and Specifications resulting from such substitutions. The Owner may seek reimbursement pursuant to the procedures set forth in § 9.5.1.

§ 3.4.2.2 The Contractor shall bear all expenses resulting from substitutions including the cost General Conditions as well as any structural, plumbing, mechanical and electrical trade costs made necessary by the substitution.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Owner reserves the right to object to Contractor's use of persons who appear unfit or not skilled in the tasks assigned to them. Should any disorderly, incompetent, unfit or unskilled person be hired or employed by the Contractor, upon or about the premises of the Owner, for any purpose or in any capacity, upon request of the Owner, such person shall be removed from the Project and shall not be reassigned to the Project without the prior written permission of the Owner, through the Construction Manager.

§ 3.4.4 The Contractor shall be responsible for coordinating the work of its own forces and the work of subcontractors engaged by it to perform the Work of the Project on its behalf. The Contractor shall review any specified procedure(s) or installation procedure(s) with its employees and/or subcontractors, including those recommended by any product manufacturer, prior to the commencement of the relevant portion of the Work to be performed.

§ 3.4.5 Each Contractor shall be responsible for complying with applicable union regulations existing under current labor agreements in performing construction work on the Project. The Contractor shall make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Construction Manager, Architect or the Owner, any conflict between the Contractor's Contract with the Owner and any agreements or regulations of any kind at any time in force among members of a trade union or any councils that regulate the activities of a trade. The existing Construction Manager/Owner Contract is an agency contract and all construction contracts will be made directly with the Owner.

§ 3.4.6 The Contractor is solely responsible for managing labor and labor relations with respect to those engaged by it to perform the Work of the Project, including labor disputes or concerted activity, direct or indirect. No delay in the performance of the Work shall be excused by reason of labor problems affecting the Contractor or any subcontractor. There shall be no strikes, picketing, work stoppages, slowdowns or other disruptive activity at the Project sites for any reason by anyone employed or engaged by the Contractor to perform its portion of the Work.

§ 3.4.6.1 Should it become necessary to create a separate entrance for a Contractor involved in a dispute, all costs associated with creating such entrance shall be borne by the Contractor involved in the dispute. Such costs shall include but not be limited to signage, fencing, temporary roads and security personnel.

§ 3.4.6.2 The Contractor shall be liable to the Owner for all damages and additional costs incurred by the Owner as result of strikes, picketing, work stoppages, slowdowns or other disruptive activity at the Project sites.

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§ 3.4.6.3 In the event of strikes or labor disputes by the Contractor's forces or other prime contractors, or separate contractors performing work for the Owner, the Contractor shall continue with its work and provide all necessary manpower as required to maintain the schedule and completion dates of the Project. The Contractor shall ensure that its Work continues uninterrupted during the pendency of a labor dispute.

§ 3.4.7 All products submitted for use and incorporated into this Project shall be asbestos free. The Contractor is obligated, by executing the Contract with the Owner, to ensure that absolutely no asbestos containing material is used in conjunction with the performance of its Work. It is the Contractor's sole responsibility to ensure that no asbestos containing material is built into the construction, or that any equipment or materials used in the construction contain any asbestos containing material. If asbestos containing material is found, at any time during or after the construction is completed, it shall be the responsibility of the Contractor who installed said material to remove it and replace it with new non-asbestos containing material, in accordance with federal, state and local mandates, and to indemnify all their employees, agents, or servants or any third parties including but not limited to the Owner, the Construction Manager and the Architect, and their respective Boards of Education, contractors, consultants, volunteers or employees for any costs or damages incurred on account of the presence, removal and remediation of such asbestos containing material. This provision will be limited only to the extent required by law, is in addition to the indemnities provided in Section 3.18 of these General Conditions and elsewhere in the Contract Documents and shall survive the termination or expiration of the Contract.

§ 3.4.8 Contractor shall furnish the Construction Manager in writing the names, addresses and telephone numbers of the members of Contractor's organization who can be contacted in the event of an off-hours emergency at the Project site.

§ 3.4.9 Unless otherwise specifically agreed in writing by the Owner for a specific purpose, the Owner shall not be responsible for any overtime charges or shift differential charges incurred by the Contractor during the course of this Project. Any and all costs associated with the Work performed at hours requiring the payment of overtime or shift differentials by the Contractor to its workers shall be the Contractor's responsibility. When the Owner specifically agrees in writing to be responsible for overtime costs incurred by the Contract, the Owner shall reimburse the Contractor or its Subcontractor on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period.

§ 3.4.10 Applicable codes and standards for material furnished and work installed shall include all state laws, local ordinances, requirements of governmental agencies having jurisdiction, and requirements of state, federal and industry codes and standards that apply to the Project and its components, including but not limited to:

1. New York State Uniform Fire Prevention and Building Code and amendments thereto.
2. New York State Energy Conservation Construction Code.
3. State Education Department Manual of Planning Standards and 8 N.Y.C.R.R. § 155.5.
4. New York State Department of Transportation, Office of Engineering, Standard Specification, Construction and Materials, dated January 2, 1990, and latest addendum thereto.
5. Life Safety Code – NFPA 101-91.
6. National Electric Code
7. National Board of Fire Underwriters
8. Any other codes or standards referenced in the Specifications and Drawings.

§ 3.4.11 Where specific performance requirements are listed in the Specifications, it is the intent of this specification that all manufacturers, fabricators, suppliers, installers, contractors, subcontractors, specialty and sub-subcontractors will provide services satisfying these requirements whether mentioned by trade or manufacturer's name or submitted for approval as a substitute.

§ 3.4.12 Where no explicit quality or standards for materials or workmanship are established for work, such work shall be of quality consistent with industry standards and of the construction quality established for the Project generally.

§ 3.4.13 Welding. The Contractor shall ensure the safe handling and storage of all welding materials, acetylene and oxygen tanks, and other equipment required for welding and cutting work at the job site. All welding materials and equipment shall be removed promptly from the premises upon completion of the welding and cutting work.

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§ 3.4.13.1 Appropriate fire extinguishing equipment shall be provided where welding or cutting is to be performed. Sprinklers subject to fusing from heat due to welding or cutting shall be temporarily shielded, with valves to remain open. Contractors will be back charged for all fines imposed for false fire alarms.

§ 3.4.13.2 Welding or cutting shall not be performed in or near rooms or locations where flammable gases, liquids or vapors, lint, dust or loose combustible stocks are present unless suitably protected when sparks or hot metal from welding or cutting operations may cause ignition or explosion of such materials.

§ 3.4.13.3 Combustible construction or material shall be wet down or protected by noncombustible shields or covers from possible sparks, hot metal or oxide.

§ 3.4.14 Ventilation During Construction. The General Contractor shall provide ventilation of enclosed areas during construction as may be required to permit proper curing and drying out and to prevent excessive humidity moisture and condensation. Ventilation shall be by natural or artificial means as required by conditions involved.

§ 3.4.15 Broken Glass. Each Prime Contractor shall be responsible for all broken, scratched, or damaged glass, which shall be replaced upon completion of the Work. Said Prime Contractor shall reimburse the General Contractor for replacement costs of all such damaged glass upon completion of the Work. The responsibility for all broken, scratched, or damaged glass, shall terminate upon acceptance of the Work by the Owner, except as provided in the Conditions of Contract (General, Supplementary and Other) and Specifications with respect to defective materials, workmanship, and guarantee/warranty provisions.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good quality, new and of recent manufacture unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective and shall be removed and replaced at the Contractor's expense unless otherwise agreed to by the Owner. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4 of these General Conditions. If not already in the name of the Owner, the Contractor shall assign to the Owner at the time of Substantial Completion of the Work, unless otherwise provided in the Certificate of Substantial Completion, any and all manufacturer's warranties relating to materials, equipment, fixtures and/or labor incorporated into the Work.

§ 3.5.3 The warranties in this Section 3.5 shall be in force for a minimum duration of one (1) year after the date of Final Completion of the Work or designated portion thereof, or after the date for commencement of warranties established in the Certificate of Substantial Completion or by terms of any applicable special or extended warranty required by the Contract Documents or as set forth in the Project Manual's technical specifications for warranties of equipment, whichever duration is longer. The warranty provided by the Contractor in this Section 3.5 is in addition to any warranty provided by equipment and material manufacturers. Notwithstanding anything to the contrary contained in the Contract Documents, all warranties shall be construed in the manner and duration most favorable to the Owner. The warranties in this Section 3.5 shall survive expiration and/or termination of the Contract.

§ 3.5.4 The Contractor shall perform its Work in such a manner as to preserve all manufacturer's warranties on materials, equipment, fixtures and/or labor incorporated into the Work. The Contractor will exercise its best efforts to service and to enforce for the benefit of the Owner all manufacturer's warranties on materials, equipment, fixtures and/or labor incorporated into the Work.

§ 3.5.5 The Contractor warrants good and legal title to all materials, equipment and fixtures installed or incorporated into the Work.

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§ 3.5.6 All corrections to defective or deficient Work, material or equipment shall be made at the convenience of the Owner.

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§ 3.6 Taxes

§ 3.6.1 Owner is exempt from payment of New York State, and Local Sales and Compensation Use Taxes on all supplies and materials incorporated into and becoming an integral component part of the structures, buildings, or real property pursuant to this Contract. Such taxes are therefore not to be included in the Contractor's bid or Contract Sum. This exemption does not apply to machinery, equipment, tools and other items purchased, leased, rented or otherwise acquired for the Contractor's use in part or entirely in connection with the Work and the Contractor and subcontractors shall be responsible for any and all applicable taxes, including sales and use taxes, on such items. The exemption only applies to materials, machinery and equipment fully incorporated into the Work of the Contractor as accepted by the Architect and the Owner. Upon request, Owner will furnish proof of its exemptions to the Contractor.

§ 3.7 Permits, Fees, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, through and with the assistance of the Construction Manager and Architect, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

.1 The Contractor shall promptly deliver copies permits, fees, licenses, and inspections it obtains for its Work and/or the Project to the Construction Manager and Owner.

.2 If in connection with the Project, the Owner has obtained certain permits, licenses or agreements for the Project, the Owner will furnish copies of these documents to the Contractor. It is the Contractor's responsibility to comply with any conditions or limitations placed on the Project by these permits. The Contractor shall fully cooperate with the Owner in meeting the permit requirements and accommodations of regulatory inspections / directives.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor fails to give such notices as applicable to the performance of the Work, the Contractor shall be liable for and shall indemnify and hold harmless the Owner against any and all resulting fines, penalties, judgments or damages, including reasonable attorney fees, imposed on or incurred by the parties indemnified, as a result of such failures by the Contractor.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to (or if Contractor should have known it to be contrary to) applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear all costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 7 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify in writing the Owner, Construction Manager, and Contractor, stating the reasons. If the Contractor disputes the Architect's determination or recommendation, the Contractor may submit a Claim as provided in Article 15.

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§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.7.6 Upon completion of the Work, the Contractor shall deliver to the Architect original copies of all required final certificates of inspection, the Certificate of Occupancy, the other documents evidencing that inspections required by authorities having jurisdiction over the Work have been performed.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order or, absent agreement, by Construction Change Directive. The amount of the Change Order or Construction Change Directive shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 of these General Conditions and (2) changes in Contractor's costs under Section 3.8.2.2 of these General Conditions.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. Such designation shall be in writing and provided to the Architect, Construction Manager, and Owner. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. To the extent Work is being performed contemporaneously at two different facilities of the Owner, the Contractor shall assign different superintendents to each facility.

The Contractor's superintendent shall not be removed from this Project until the Contractor's punch list has been completed and the Contractor's Work has been accepted by the Owner. Unless approved otherwise by the Owner in advance, the Contractor's superintendent shall be assigned solely to this Project and shall not perform any duties or superintendence on any other Project until completion of the Contractor's Work. The superintendent shall not be employed or used on any other project during the course of the work. The Owner shall have no obligation to direct or monitor the Contractor's employees, Subcontractors, or suppliers.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. The Contractor will provide a resume of Contractor's proposed superintendent to the Owner, Architect and Construction Manager. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent, during the

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duration of the Project including the completion of Punch List, unless the superintendent is no longer employed by the Contractor or the prior written consent of the Owner is obtained, which consent shall not unreasonably be withheld or delayed. The superintendent shall be changed upon request of the Owner for good cause shown. In the event of such direction, the Contractor shall, within seven days after notification thereof, replace said individual(s) with an individual satisfactory to Owner.

§ 3.9.4 The Contractor shall coordinate and supervise the work performed by its subcontractors so that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all subcontractors shall afford each trade reasonable opportunity for the installation of their work and the storage of their materials.

§ 3.9.5 It is required of any and all supervisory personnel proposed for use by any Contractor that said personnel be versed in the English language or, said Contractor shall furnish a full-time on-site interpreter to facilitate communications between and with all Contractors, all Subcontractors, the Owner, the Construction Manager and the Architect.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, within five (5) business days after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.1.1 Upon review and acceptance by the Owner and the Construction Manager of the Contractor's construction schedule, including the Milestone Dates therein, the construction schedule shall be deemed part of the Contract Documents. If not accepted by the Owner and the Construction Manager, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Construction Manager and re-submitted for acceptance. Submission of an accepted Construction Schedule shall be a prerequisite to initial payment.

§ 3.10.1.2 The Contractor shall monitor the progress of the Work and shall update Contractor's construction schedule at least once a month or more frequently if requested by the Construction Manager. The Contractor shall promptly advise the Construction Manager and Architect, with a copy to the Owner, of any nonconformance or potential for nonconformance with the construction schedule. The Contractor shall furnish the Owner, the Construction Manager and Architect with sufficient copies of each submitted schedule.

§ 3.10.1.3 In the event that any updated Construction Schedule indicates a projected Substantial Completion date that is more than thirty (30) days after the required Substantial Completion date (as the same may be extended by the Change Order for Excusable Delay), the Owner shall have the right to direct the contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, facilities, (3) rescheduling activities, and (4) other similar measures (hereinafter referred to collectively as "Recovery Measures"). Such Recovery Measures shall continue until the progress of the Work complies with the state of completion required by the Construction Schedule. The Owner's right to require Recover Measures is solely for the purpose of ensuring the Contractor's compliance with the Construction Schedule.

.1 The Contractor shall not be entitled to see an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner, unless they are incurred by the Contractor as directed in writing by the Owner to mitigate or offset an Excusable Delay.

.2 The Owner may exercise the rights furnished to the Owner under or pursuant to this Subparagraph 3.10.1.3 as frequently as is reasonably necessary to ensure that the Contractor's performance of the Work will comply with any milestone date or completion date set forth in the Construction Schedule.

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.3 The Owner reserves the right to withhold payment until such time as the Contractor submits a schedule showing work to be on schedule again in accord with the Project Schedule and the Work is being performed per revised schedule.

§ 3.10.2 The Contractor, within five (5) business days after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

§ 3.10.5 The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of the owner's premises or any tenants or invitee thereof. The Contractor shall, upon the Owner's request, reschedule any portion of the Work affecting operation of the premises to hours when the premises are not in operation. Any postponement, rescheduling or performance of the Work under this Section 3.10.5 may be grounds for an extension of the Contract Time, if permitted under Section 8.3.1 of these General Conditions if: (1) the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents and (2) such rescheduling or postponement is required for the convenience of the Owner.

§ 3.11 Documents and Samples at the Site

§ 3.11.1 The Contractor shall make available, at the Project site, the Contract Documents, including Drawings, Specifications, Addenda, Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, as well as the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, Owner and representatives of any governmental agency with authority over the Project, and shall be delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.11.2 The Contractor shall maintain at the Project site, and shall make available to Owner, Construction Manager, Architect and representatives of any governmental agency with authority over the Project, one record copy of the Drawings (the "Record Drawings", which are also referred to as "As-built Drawings") in good order and marked to indicate field changes and selections made during construction.

§ 3.11.3 Final payment and any retainage shall not be due and owing to Contractor until the Record Drawings are received in a form satisfactory to the Architect, the Constuction Manager and the Owner (and all other closeout requirements are met).

§ 3.12 Shop Drawings, Product Data, and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

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§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12 of these General Conditions. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor represents and warrants that all Shop Drawings shall be prepared by persons and entities possessing knowledge and experience in the trade for which the Shop Drawing is prepared**.** The Contractor shall communicate and supply Shop Drawings to other Contractors to ensure proper coordination.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect. If the Contractor elects to perform work without such approvals, same shall be at the Contractor's own risk and the Contractor will be responsible for all costs of correction.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 Upon the Architect's rejection of the Contractor's Shop Drawings, Product Data, Samples or other similar submittals, the Contractor shall review the rejection and re-submit such Shop Drawing, Product Data, Sample or other similar submittal in accordance with the Architect's instruction. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions which have been made, including revisions not specifically requested by the Construction Manager or Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by a design professional appropriately registered and/or licensed in New York State, whose signature and seal shall appear on all drawings, calculations, specifications,

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certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Construction Manager and Architect at the time and in the form specified by the Architect.

§ 3.12.10.3 When professional certification of performance criteria of materials, systems or equipment is required of the Contractor, the Architect shall be entitled to rely in a reasonable and professional fashion upon the accuracy and completeness of such calculations and certifications, provided, however, if the Architect, in its reasonable and professional judgment considers it advisable, the Architect shall verify the accuracy and completeness of any and all such calculations and/or certifications. In the event any and all such calculations and/or certifications are found to be inaccurate and/or incomplete by the Architect, the Contractor shall assume full responsibility and shall bear all costs attributable or related thereto, including, without limitation, the expense of the Architect's additional services associated with the verification of such calculations and/or certifications and the expense of the Architect's additional services made necessary by the failure of such calculations and/or certifications to be accurate or complete.

§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

.1 Due to the site constraints, only materials and equipment that are to be used in the Work shall be brought to and stored on the Project site by the Contractor. Only vehicles that are absolutely necessary for performing the Work shall be parked or stored within the work areas. After materials, vehicles and equipment are no longer required for the Work, they shall be promptly removed from the Project site.

.2 Protection of materials, vehicles and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall provide all barriers and protection as required to safeguard the work, traffic to and from the site, the public and the occupants of the building during construction. The Contractor shall comply with all fire code regulations during construction. While the Owner may have security guards patrolling its properties, this does not release or otherwise mitigate the Contractor's responsibility to protect material, vehicles and equipment stored or the Project site from theft, damage or other adversity or the Contractor's responsibility to ensure the safety and security of the construction areas.

.3 The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and adjacent areas. The Work shall be performed in such a manner that areas adjacent to the site of the Work shall be free from all debris, building materials and equipment.

.4 The Contractor shall not permit any workers to use existing facilities at the Project site, including, without limitation, lavatories, entrances and parking areas other than those designated and approved by the Owner.

.5 The Contractor shall provide all temporary access walkways, both interior and exterior, temporary partitioning and the like necessary to complete the operations. The Contractor shall maintain in an unobstructed condition all entrances and/or exits from present buildings.

.6 The Contractor shall comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the

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Owner's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the rules and regulations.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.13.3 The Contractor shall be required to perform the Work of the Project with no interruption to the Owner's operations. Any work which will interfere with the Owner's operations shall be performed after regular school hours, and/or during weekends, holidays or other times when the Owner's facilities are not in session for students at no additional cost to the Owner. All costs incurred by the Owner to make the facilities available during those times shall be borne by the Contractor, including time charges incurred for the Owner's own forces and additional charges of the Construction Manager. The Owner reserves to itself the right to determine what work will "interfere" with its operations and said determination shall be final.

§ 3.13.4 The Contractor and any entity for which the Contractor is responsible shall not erect any sign on the Project site without the written consent of the Owner provided through the Construction Manager, which may be withheld in the sole discretion of the Owner.

§ 3.13.5 The Contractor shall repair or replace any existing trees, shrubbery or other planting that are to remain after completion of the Project that are damaged by operations and/or workers employed in performance of its Contract.

§ 3.13.7 The Contractor shall provide full and free access for the Architect, Construction Manager, Owner and/or their representatives and consultants, to inspect job materials, equipment, fabrication facilities, and storage locations, at and away from the site of the Work.

§ 3.13.8 Rules of Conduct

1. In accordance with federal and state law, smoking (including electronic cigarettes), vaping, and the use of tobacco products, as well as any nicotine or cannabis products, are prohibited within all buildings of the Owner and on all school property of the Owner and within 100 feet of all entrances, exits and boundaries of elementary and secondary schools at all times
2. No drinking of alcoholic beverages or use of controlled substances are allowed on Owner's property. No reporting to work impaired by alcohol or controlled substances allowed. The Contractor bears the responsibility of ensuring its, and its subcontractors', employees are not impaired in any manner that would jeopardize the safety of the public, the employees of other Contractors and their Subcontractors, the Owner, Architect, and Construction Manager.
3. All Contractors, subcontractors, suppliers and their employees are to refrain from conversing with the Owner's personnel, volunteers, invitees and students. Any construction employees found doing so will be removed from the site. NO COMMUNICATION BETWEEN WORKERS AND STUDENTS WILL BE TOLERATED.
4. All Contractors, subcontractors, suppliers, and their employees are to refrain from using indecent language. All doing so will be removed from the site. Artwork and decoration found on vehicles belonging to Contractor's or Subcontractor's employees parked on or near the Owner's property that contain indecent language or pictures shall either be covered or removed from the location.
5. All construction personnel shall wear photo ID badges. Photo ID badges are to be provided by the Contractor and receive the approval of the Owner, through the Construction Manager.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors, which consent shall not be unreasonably withheld. The Contractor

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shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.14.3 All cutting and patching work shall be done by the Contractor (or through the appropriate Subcontractor). Patches in finish surfaces shall match the adjacent surfaces in material, finish, detail, and quality. Patches in fire rated construction or construction required to be smoke tight shall be made in conformance with assemblies designed and tested by agencies recognized by governing codes. Any UL rated fire-safing materials, flanges, or other materials required by Code, the Contract Documents, or manufacturer's installation instructions for devices penetrating the work affected shall be applied and installed by an approved firestop subcontractor or qualified personnel from the applicable trade.

§ 3.14.4 Only trades persons skilled and experienced in cutting and patching shall perform such work.

§ 3.15 Cleaning Up

§ 3.15.1 On a daily basis, the Contractor shall keep the Project site and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project. At completion of the Work, the Contractor also shall remove temporary protection and facilities installed for protection of work during construction unless otherwise directed by the Owner, Architect or Construction Manager.

§ 3.15.2 In addition, at the completion of the Work, the Contractor shall perform the following final cleaning:

.1 Remove temporary protection and facilities installed for protection of work during construction unless otherwise directed by the Owner, Architect or Construction Manager
.2 Clean transparent materials including glass in doors and windows.
.3 Replace any damaged glass.
.4 Clean each surface or unit to the condition expected in normal commercial building cleaning in compliance with manufacturer instructions.
.5 Clean exposed finishes to a dust free condition, free of stains, films, fingerprints and similar foreign substances.
.6 Clean floors as recommended by the manufacturers if new, vacuum existing carpeted floors and mop existing wood, ceramic tile and vinyl tile floors.
.7 Wipe surfaces of mechanical and electrical equipment, to remove excess lubrication and other substances.
.8 Clean plumbing fixtures to a sanitary condition.
.9 Clean light fixtures and lamps.

§ 3.15.3 Comply with authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials on Owner's premises. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of them in a lawful manner.

§ 3.15.4 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor(s) who failed to clean. The cost will be divided among each Contractor who has not cleaned their debris and shall include any custodial overtime, Construction Manager's administration fees, etc. If the Owner is not reimbursed for such costs, the Contractor's share of such costs shall be deducted from the next payment to the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner, Construction Manager, and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a

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particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, is believed to exist by or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect and Owner through the Construction Manager.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, Owner's Board of Education, Construction Manager, Architect, and each of their respective officers, directors, consultants, agents and employees from and against claims, damages, losses, judgements, fines, penalties, costs and expenses, including but not limited to attorneys' fees, attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property arising out of or resulting from performance of the Work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, judgement, fine, penalty, cost or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 The Owner's right to indemnification shall in no way be diminished, waived or discharged by the exercise of any other remedy provided by the Contract Documents or by law.

§ 3.18.1.2 The Owner may withhold from an offending Contractor's Contract Sum an amount sufficient to cover any damages sustained by person or entity indemnified by the Contractor pursuant to this Section 3.18 and all expenses and costs associated with the damage sustained.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under this Section 3.18 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor's indemnity obligations under this Section 3.18 shall, but not by way of limitation, specifically include all claims, damages, suits, proceedings, actions, fines, penalties, charges and judgments which may be made against the Owner, the Architect, the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents under any applicable statute, rule, regulation or ordinance, including the New York State Labor Law, the New York State Occupational Safety and Health Act, the Federal Occupational Safety and Hazardous Act and similar laws of other governmental bodies having jurisdiction over the Owner's property or Project due to the method of execution of the Work of the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor.

§ 3.18.4 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Owner's Board of Education, the Architect and the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") of and from any and all liability for violation of any statute, rule, regulation or ordinance applicable to the Contractor's Work and shall defend any claims, proceedings or actions which may be brought against one or more of the Indemnitees as a result thereof.

§ 3.18.5 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, Architect and Construction Manager from any and all claims, damages, losses, suits, obligations, fines, penalties, costs, charges, and expenses which may be imposed upon or incurred by or asserted against any of them by reason of act or omission of such Contractor or any person or firm for whose acts such Contractor may be liable, with respect to such Contract or the performance or failure to perform the Work under such Contract.

§ 3.18.6 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor also shall defend, indemnify and hold harmless the Owner, the Owner's Board of Education, the Architect and the Construction Manager and their respective consultants,

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officers, directors, officials, employees, servants and agents (the "Indemnitees"), at the Contractor's sole expense, against any actions, lawsuits or proceedings brought against the Indemnitees as a result of any and all public improvement liens filed against the payments due the Contractor as well as any other liens filed against the Owner's property or facilities. The Contractor hereby agrees to indemnify and hold harmless the Indemnities against any liability, claims, damages, losses, obligations, fines, penalties, charges, judgments, costs and expenses, including but not limited to attorneys' fees, suffered or incurred by Indemnities as a result of such liens, claims, actions, lawsuits or proceedings.

§ 3.18.7 Whenever any party to the Contract is required in words or substance to indemnify or hold harmless another party, whether or not the following is expressly included in whole or in part in the paragraph or section with regard to such particular indemnification and hold harmless provision, such indemnification and hold harmless provision shall include, but not be limited to, the payment or reimbursement of all judgments, claims, damages, losses, fees costs and expenses and litigation costs and expenses, including but not limited to, the reasonable fees of its attorneys and witnesses.

§ 3.18.8 Whenever the Contractor is required in this Section 3.18 or any other provision of the Contract Documents to defend the Owner, the Owner's Board of Education, the Architect, or the Construction Manager or their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") against any claim, action, or proceeding, in the event the Contractor shall fail or refuse to defend any one or more of the Indemnitees, the Contractor shall be liable to such Indemnitee for all costs such Indemnitee incurs in defending such claim, action or proceeding and all costs of such Indemnitee, including attorneys' fees, incurred to recover such defense costs from the Contractor.

§ 3.18.9 The Contractor's obligations under this Section 3.18 are in addition to and in no way limits or abrogates any other indemnity obligation of the Contractor included in any other provision of the Contract Documents. The Contractor's obligations under this Section 3.18 shall survive the expiration and/or termination of the Contract, in whole or in part.

§ 3.19 Daily Records Clause

§ 3.19.1 The Contractor shall prepare and maintain Daily Inspection Records to document the progress of the work on a daily basis. Such daily records shall include a daily accounting of all labor and all equipment on the site for the Contractor and all subcontractors, at any tier. Such daily records will make a clear distinction between work being performed under Change Order, base scope work and/or disputed work. Such daily records shall be copied and provided to the Owner through the Construction Manager at the end of every week.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 of these General Conditions and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 of these General Conditions and identified as such in the Agreement.

(Paragraph deleted)

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits,

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the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager (1) known deviations from the Contract Documents and from the most recent Project schedule prepared by the Construction Manager, and (2) defects and deficiencies observed in the Work. The Architect will recommend to the Owner what actions are needed to remedy the defects and deficiencies observed in the Work.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor to maintain the Project Schedule or for defects and deficiencies in the Work. The Owner may see reimbursement pursuant to the procedures set forth in Section 9.5.1 of these General Conditions.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect (1) known deviations from the Contract Documents and from the most recent Project schedule, and (2) defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4 of these General Conditions, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications. Except when direct communications have been specifically authorized or emergency circumstances necessitate direct communications, the Owner and Contractor shall endeavor to communicate with each other and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents or the Project. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities.. Except when emergency circumstances necessitate direct communications, communications by and with the Architect's consultants shall be through the Architect. Except when emergency circumstances necessitate direct communications, communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager. Except when emergency circumstances necessitate direct communications, communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager or Architect considers it necessary or advisable, the Construction Manager and Architect individually will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3 of these General Conditions, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager and Architect will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive of these General Conditions, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 of these General Conditions nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

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§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12 of these General Conditions. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4 of these General Conditions. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4 of these General Conditions.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8 of these General Conditions; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10 of these General Conditions. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

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§ 4.2.17 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations or information requested of the Architect shall be furnished in compliance with this Section 4.2 of these General Conditions, then no delay may be claimed by the Contractor based on the failure of the Architect to furnish such interpretations or information if they are provided within 15 days after the Architect's receipt of the request.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions that are consistent with the Contract Documents. Such interpretations may, at the Architect's option, be issued in the form of additional drawings or instructions or both indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be effected by Construction Change Directive or other notice to the Contractor, and provided such drawings and/or instructions are, in the opinion of the Architect, reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings and/or instructions without additional cost or extensions of Contract Time.

§ 4.2.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.22 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

.1 The Contractor's request for information shall be prepared and submitted in accordance with the General Requirements (Division 01 of the Specifications) on the form included therein or as otherwise approved in advance. The Architect will return requests for information that do not conform to requirements of the Contract Documents.

.2 The Architect's response to a request for information (RFI), or issuance of a clarification or interpretation shall be considered an interpretation, clarification, supplemental information or an order for a minor change in the Work not involving an adjustment in Contract Sum or extension of Contract Time and not inconsistent with the intent of the Contract Documents, and shall be binding, unless indicated otherwise in the Architect's response to the RFI.

§ 4.2.23 The Contractor shall maintain a log that lists each request for information. This log shall contain the Drawing reference or Specification section to which the request pertains, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Architect's resolution thereof.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site or to furnish material, equipment, fixtures or other services with respect to a portion of the Work. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a

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Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Construction Manager, for review by the Owner, Construction Manager and Architect, of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor whether the Owner, the Construction Manager or the Architect (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

The listing required by this Section shall be submitted to the Architect no later than 30 days from the date of the Agreement. This list shall include the names of manufacturers, suppliers, and installers proposed for each of the products, equipment, and materials to be incorporated into the Project.

The Contractor shall furnish upon request adequate data on any named entity on the list in order to permit the Architect and the Owner to conduct a proper evaluation. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents and all products furnished by the listed manufacturer must conform to such requirements.

The Contractor shall, prior to any work being performed, obtain and provide to the Owner and Construction Manager, a copy of each Subcontractor's Contractor Certificate of Registration obtained through compliance with Section 220-i of the New York State Labor Law.

§ 5.2.1.1 Subcontractors will not be acceptable unless, when required by the Construction Manager, evidence is furnished that the proposed subcontractor has satisfactorily completed similar subcontracts as contemplated under this prime contract, and has the necessary experience, personnel, equipment, plant, and financial ability to complete the subcontract in accordance with the intent to the Contract Documents.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required. In addition, no increase in the Contract Price or Contract Time shall be allowed where a subcontractor is rejected by the Architect, Construction Manager or Owner who (1) is deemed unqualified to perform the particular work subcontracted by the Contractor, (2) has too many current projects to reasonably be expected to have sufficient personnel to timely perform the subcontracted work, (3) does not have the necessary experience, personnel, equipment, plant and financial ability to complete the subcontract or (4) has a history of poor performance in work of a similar nature.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.2.5 Notwithstanding any other provision of the Contract Documents, Contractor shall perform at least twenty-five percent (25%) of the field work by its own employees. For the purpose of the preceding sentence, any part of the work performed by supervisory personnel (persons above level of foreman) or by the office personnel shall not be

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considered part of the field work performed by the Contractor's employees. Such items as bonds, certificates of insurance, shop drawings and similar items do not count towards the twenty-five percent (25%) requirement.

§ 5.2.6 All Subcontracts over $10,000 shall be in writing. Fully executed copies of all subcontracts shall be provided to the Owner through the Construction Manager, including but not limited to all addenda, appendices and/or exhibits to such subcontracts, including scope of work sheets before work by such subcontractors commences. Upon request, any Purchase Orders for materials, equipment or supplies related to the performance of the Work shall be furnished to the Owner through the Construction Manager.

§ 5.3 Subcontractual Relations

§ 5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. The agreement between the Contractor and Subcontractor shall not provide, nor shall the Contract Documents be deemed to provide, any rights, remedies or redress by the Subcontractor(s) against the Owner.

§ 5.3.2 The Contractor shall not enter into any subcontract, contract, agreement, purchase order or other arrangement for the furnishings of any portion of the materials, services, equipment or Work with any party or entity if such party or entity is an Affiliated Entity, unless such Arrangement has been approved by the Owner through the Construction Manager, after full disclosure of the relationship and all details relating to the proposed Arrangement. The term "Affiliated Entity" means any entity with respect to which the Contractor has direct or indirect ownership or control, including, without limitation,

.1 Any entity owned in whole or in part by the Contractor;

.2 Any holder of more than ten percent (10%) of the issued and outstanding shares of, or the holder of any interest in, the Contractor; or

.3 Any entity in which any officer, director, employee, partner or shareholder or member of the family of any of the foregoing persons) of the Contractor or any entity owned by the Contractor has a direct or indirect interest, which interest includes, but is not limited to, that of a partner, employee, agent or shareholder.

§ 5.3.3 The Contractor shall promptly notify the Owner, the Construction Manager, and Architect of any material defaults by any Subcontractors and/or whether it has terminated its agreement with any of its Subcontractors for any reason.

§ 5.3.4 The Contractor shall check record drawings of its Subcontractors each month. Written confirmation that the record drawings are "up to date" shall be required by the Construction Manager prior to approval of the Contractor's monthly payment requisition.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 of these General Conditions and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

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.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract, except for sums due and owing by Contractor under the subcontract for work performed or material supplied prior to receipt of Owner's notice of its determination to accept the subcontract. Owner shall only be required to compensate the Subcontractor of an accepted subcontract for compensation accruing to such Subcontractor for Work done or materials delivered after the date on which Owner provided notice of its determination to accept the subcontract. All sums due and owing by Contractor to the Subcontractor of an accepted subcontract shall constitute a debt between the Contractor and Subcontractor.

§ 5.4.2 It is agreed and understood that the contingent assignment of subcontracts is part of the consideration to Owner for entering into the Contract with Contractor and may not be withdrawn prior to Final Completion or Termination of all remaining Work of the Contractor pursuant to Section 14.4 hereof. Contractor shall deliver acknowledgement in form and substance satisfactory to Owner from each Subcontractor of the contingent assignment of subcontracts described herein no later than ten (10) days after the date of execution of each subcontract.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4 of these General Conditions, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

§ 5.4.4 Each subcontract shall specifically provide that the Owner shall be responsible to the Subcontractor only for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 All Contractors, including the Owner's Separate Contractors, shall cooperate with each other in the installation and construction of each contractor's work and in such manner as the Owner and/or Construction Manager may direct. All Contractors shall control and coordinate the work of their subcontractors, if any. The award of more than one Contract for the Project requires sequential or otherwise inter-related contractor operations and may involve inherent delays in the progress of any individual Contractor's work. Accordingly, the Owner and/or Construction Manager cannot guarantee the unimpeded operations of any Contractor. Each Contractor acknowledges these conditions and understands that the Contractor shall bear the risk of all ordinary delays caused by the presence or operations of other contractors engaged upon the Project and ordinary delays attended upon the approved Project Schedule.

§ 6.1.3.1 The Contractor shall not interfere with the erection, installation or storage upon the premises of any work, materials, supplies or equipment not included in the Work, but which is to be performed and furnished by other Contractors, and the Contractor shall properly connect and coordinate the work therewith. The Contractor shall be responsible for the coordination and intermeshing of the work of his various sub-contractors and the work of other Contractors with the Work.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Separate Contractors, Construction Manager and other Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

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§ 6.2.1.1 Should any other contractor, who has or shall have, a contract with the Owner for the performance of Work upon the site, sustain any damage through any act or omission of the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor in the performance of the Contract, the Contractor agrees to reimburse the Owner and/or such other Contractor directly for all such damages and to defend the Owner, at the Contractor's sole expense, against any claim brought against the Owner with respect to such damage.

§ 6.2.1.2 In case of interference between the operations of different Contractors, the Architect or Construction Manager, will be sole judge of the rights of each Contractor and shall have the authority to decide in what order the work may proceed, and in all cases such decision shall be final and binding on all parties.

§ 6.2.1.3 The Contractor, including its subcontractors, shall keep informed of the progress of other contractors and shall notify the Construction Manager immediately of the lack of progress on the part of the other Contractors where such delay will interfere with its own operations. Failure of a Contractor to keep informed of the work progressing on the Project and failure to give notice of lack of progress by others shall be construed as acceptance by the Contractor of the status of the work as being satisfactory for proper coordination with the Contractor's own work.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. Failure to provide such reimbursement shall entitle the Owner to deduct such costs from the payment(s) due the Contractor until the Owner has fully recovered such costs. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces, Separate Contractors, or other Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section 10.2.5 of these General Conditions. The Contractor shall promptly correct discrepancies or defects in its Work which have been identified by other contractor(s) as affecting proper execution and results of the Work of such other contractor(s).

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14 of these General Conditions.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible. If the Owner is not reimbursed promptly for such costs, the Contractor's share of such costs shall be deducted from the next payment to the Contractor.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. No course of conduct or dealings between the Contractor and Owner, Construction Manager or Architect, nor express or implied acceptance of alterations or

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additions to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim against the Owner for an increase in the amount due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone. No Change Order or Construction Change Directive shall become effective unless and until it is approved by the Owner in writing.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. A change in the Contract Sum shall be accomplished only by Change Order or, when no agreement can be reached with the Contractor, by a Construction Change Directive. No course of conduct or dealings between the Contractor and Owner, Construction Manager or Architect, nor express or implied acceptance of alterations or additions to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase the amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.2 Change Orders

A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect, and Contractor, stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.1 Unless otherwise agreed to in writing by the Owner and the Contractor, the combined overhead and profit that shall be included in the total cost (or credit) to the Owner for a Change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces:
  a. 15% on the first $25,000 of the change order direct cost of self-performed work,
  b. 10% on the portion of the change order direct cost of self-performed work between $25,000 and $50,000 and
  c. 7.5% on the portion of the change order direct cost of self-performed work between $50,000 and $200,000 and
  d. 5% on the portion of the change order direct cost of self-performed work greater than $200,000.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor five percent (5%) of the amount due the Subcontractor,

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost,

.4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor, and

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7 of these General Conditions and shall be itemized (including labor costs).

§ 7.2.2 A Change Order, when issued, shall be full compensation, or credit, for the extra Work performed, omitted, or substituted. It shall show on its face, any adjustment in time for completion of the Project as a result of the Change in the Work. Each Change Order shall include all costs related thereto, including all overhead, miscellaneous expenses, and incidentals.

§ 7.2.3 Once a Change Order has been signed by the Contractor, Construction Manager, Architect and Owner, it shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contractor's Contract Sum, Contract Time and the construction schedule.

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§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.4 of these General Conditions.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Contract Documents, or if no such amount is set forth in the Contract Documents, a reasonable amount. In such case, and also under Section 7.3.3.3 of these General Conditions, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, rented from others (there shall be no rental payments for the Contractor's own machinery and equipment).

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15. Failure to timely file any claim in accordance with the requirements set forth therein shall constitute a waiver of such claim.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured in accordance with Section 7.1.4 of these General Conditions.

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§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of the Contractor to disagree and assert a Claim in accordance with Article 15 of these General Conditions.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. The work included in such order shall be performed by the Contractor at no additional cost to the Owner and shall not form the basis for a claim for an extension of the Contractor's time to complete its Work. A signed minor change in the Work is not and does not constitute an approved change order. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time. The Contractor shall perform the work included in such orders so as to cause no delay to its Work and/or the work of other contractors engaged by the Owner in connection with the Project.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8 of these General Conditions.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.1.5 The Date of Final Completion of the Work is the date all of the Work required under the Contract Documents is completed, all required materials and documents have been delivered to the Owner, and all applicable licenses, permits, certificates, or approvals have been obtained for the Owner's beneficial use of the Project.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to submitting to the Owner, through the Construction Manager, payment and performance bonds compliant with the Contract Documents and proof of having in effect the insurance required to be furnished by the Contractor pursuant to the Contract Documents.

§ 8.2.2.1 Contractor shall not commence work on the site until certificates of insurance as described in Exhibit A (Insurance and Bonds) to AIA Document A132–2019, attesting that the required coverage is in force, have been received and accepted by the Owner.

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§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2.4 The Contractor may request access to the site during times beyond the work hours permitted. Approval of such a request is solely at the discretion of the Owner. If approval is given, the Contractor is responsible for paying all additional costs incurred by the Owner for providing Project sites to the Contractor during the additional time periods, including but not limited to any costs incurred for the Owner's staff to be present or provide access and additional fees the Owner incurs for services of the Architect and Construction Manager.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner's own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2 of these General Conditions, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the Architect determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

In the event that the Owner, the Contractor or the Architect is delayed or hindered in or prevented from the performance of any act required by the Contract Documents by reason of a fire, failure of power, unusual delay in deliveries, adverse weather conditions not reasonably anticipatable, unavoidable casualties or other causes of a like nature beyond the Owner's, the Contractor's or the Architect's control, the Contractor (or its Subcontractors) shall not be entitled to any additional compensation by Change Order to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and if performance of the Work is not, was not or would not have been delayed by any other cause for which the Contractor is not entitled to an extension in the Contract Time. No extension of time will be granted for changes in the Work for labor disputes, picketing, hand billing, refusal to deliver, work stoppages not authorized or directed by the Owner.

§ 8.3.1.1 An extension of time may be granted in accordance with this Article 8, but only after written application is made by the Contractor for the extension. All claims for additional time shall be supported by documentation which demonstrates to the Architect and the Owner's satisfaction that the critical path of the Work has been significantly altered by the delays to the activities in question, and that the schedule cannot be maintained by re-ordering other activities within the Project at no cost.

§ 8.3.1.2 An extension of time shall be only for the number of days of delay which the Architect may determine to be due solely to the causes set forth in the application for extension of time. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but if at all, only the actual period of delay as determined by the Architect. For each day of delay determined by the Architect, the Contractor shall be allowed to add one day to the time limitation specified for completion of the Work in the Contract Documents.

§ 8.3.1.3 The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (i) is not caused, or could not have been anticipated, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (iii) is of a duration not less than one (1) day and (iv) the Contractor has made all reasonable effort to recover the alleged lost time. No extension of time will be granted for changes in work for labor disputes, picketing, hand billing, refusal to deliver, work stoppages due to material procurement delays or other stoppages not authorized by the Owner.

§ 8.3.2 Claims relating to time shall be made in accordance with this Section 8.3 and applicable provisions of Article 15; however, the Contractor's Claims, if any, for any increase in Contract Time must be made in accordance with the time requirements of this Section. Claims for an increase in Contract Time must be made in writing to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims must be initiated within seven (7) days after the Contractor has notice of the delay (initial notice). Thereafter, the Contractor must provide full details and support documentation with regard to the cause of the delay within twenty-one (21) days of the initial notice of the delay. If either the initial notice or the supporting documentation is not submitted to the Initial Decision Maker with a copy to the Architect, if the Architect is not the Initial Decision Maker, in writing within the time periods prescribed in this Section, the Claim for an increase in Contract Time shall be waived. If the cause for the delay is a continuing one, then only one Claim is necessary. The Contractor's supporting

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documentation to the Initial Decision Maker and/or Architect shall include an estimate of cost, if any, and of the probable effect of the delay on the progress of the Work and the Project Schedule.

§ 8.3.2.1 The Architect will ascertain the facts and extent of the delay and extend the time for completing the Work when in the Architect's judgment the findings of fact justify such an extension. The Architect's determination will be final and binding in any litigation commenced by the Contractor against the Owner that arises out of the denial of an extension of time to the Contractor. Any approval of an extension of the Contractor's time to complete its Work shall be effectuated through a Change Order or, in the absence of an agreement, a Construction Change Directive.

§ 8.3.3 Absent (a) uncontemplated acts of God, war, or terrorism, (b) fires or (c) acts or omissions of the Owner, Construction Manager or Architect that constitute fraud or active interference with the Contractor's performance of the Work that continues after the Contractor furnishes the Owner with three (3) days' written notice of such interference, the Contractor agrees the Owner shall not be liable to the Contractor and/or any subcontractor for claims or damages of any nature caused by or arising out of delays. Absent those circumstances, the sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work, the amount of which shall be subject to the claims procedure set forth herein. Except to the extent, if any, expressly prohibited by law, the Contractor expressly agrees not to make and hereby waives any claim for damages for delay, including, but not limited to, those resulting from increased labor or material costs; directions given or not given by the Owner, Construction Manager or Architect, including scheduling and coordination of the Work; or the Architect's preparation of drawings and specifications or review of shop drawings and requests for instruction(s). The Contractor agrees that its sole right and remedy therefor shall be an extension of time, if appropriate.

§ 8.3.3.1 The Owner's exercise of any of its rights or remedies under the Contract Documents (including, but not limited to, agreeing to change orders, issuance of Construction Change Directives, or directing Extraordinary Measures, or directing correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as active interference with the Contractor's performance of the Work.

§ 8.3.4 When the Contract Time has been extended, as provided under this Section 8.3, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs of other similar reasons.

§ 8.4 Liquidated Damages

§ 8.4.1 Contractor realizes that time is of the essence on this Contract and the Construction Schedule shall be submitted per Section 3.10.1. In the event the Contractor fails to submit a Construction Schedule by said schedule date, the sum per calendar day, of Three Hundred Dollars ($300.00) will be subtracted from the Payment due the Contractor or, if the amount due Contractor as Payment is insufficient, any deficiency shall be paid by the Contractor to the Owner.

§ 8.4.2 Contractor realizes that time is of the essence on this Contract and the completion date (including any applicable Milestone Dates) for any work and the date of Substantial Completion shall be no later than the dates for same indicated in the Contract Documents as modified by any extensions of time effected through a Change Order or Construction Change Directive. The Contractor understands that substantial disruption of the Owner's educational operations will occur if the Project is not completed by the date of Substantial Completion and if any portion of the Project is not completed by the applicable Milestone Date. In the event the Contractor fails to complete any work or substantially complete the work under the Contract by said schedule date, the sum listed below per calendar day will be subtracted from the Payment due the Contractor until final completion (or, if the amount due Contractor as Payment is insufficient, any deficiency shall be paid by the Contractor to the Owner.

Liquidated damages will be assessed in the amount of $1500.00 per day for each and every calendar day AFTER such time allowed for a milestone or substantial completion date.

The said sum per calendar day shall constitute the Liquidated Damages incurred by the Owner for each day of delay beyond the agreed upon milestone dates and date of Substantial Completion. Such Liquidated Damages shall be in addition to any other damages (other than by reason of delay) Owner may incur as a result of Contractor's breach of Contract.

In addition to Liquidated Damages, the Contractor shall be liable for all additional costs incurred by the Owner after the Substantial Completion Date (as well as Milestone Dates) stated in the Contract Documents for its own employees

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to make the Owner's property and facilities accessible to the Contractor and incurred by the Owner for Construction Manager services and Architect services performed for the Project due to the Contractor's failure to complete its work by the Substantial Completion Date (and Milestone Date) stated in the Contract Documents, including but not limited to the additional costs incurred for extending the duration of their services and for performing additional inspections.

All such costs incurred by the Owner as well as the cost of additional inspections, at the hourly rate of each consultant of the Owner (including the Architect and Construction Manager and their respective consultants) times the hours spent per inspection, will be subtracted from payment due the Contractor. If the amount due the Contractor for payment is insufficient, any deficiency shall be paid by the Contractor to the Owner

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.1.3 Each Application for Payment shall include such documentation, information, instruments, evidence, and materials as Owner, Construction Manager and Architect may deem necessary to substantiate the value of completed work for which payment is sought, including, without limitation, such requisition forms, disbursements requests, indemnities (including evidence of All Risk physical damage insurance coverage on materials and equipment stored off-site), and undertaking as they may specify and an estimate of the total labor done and materials stored at the site (or other location approved in writing by Owner) or installed in the building, less cost for which payment has been made, and also less retainage. All applications for Payment shall be made on and in compliance with a form acceptable to Owner and Architect.

§ 9.1.4 Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold any payments, to the Contractor if and for so long as the Contractor fails to perform any of its obligations or otherwise is in default under any of the Contract Documents; provided, however, that any such hold back shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any such default or failure of performance by the Contractor.

§ 9.1.5 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work of the Contractor, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that to which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner or (2) issue through the Construction Manager a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Construction Manager, before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Construction Manager and the Architect. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Construction Manager shall forward to the Architect the Contractor's schedule of values. Any changes to the schedule of values shall be submitted to the Construction Manager and supported by such data to substantiate its accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.2.1 The Contractor and each Subcontractor shall prepare a trade payment breakdown for the work for which it is responsible, such breakdown being submitted on a uniform standardized form reasonably approved by the Architect

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and Owner (AIA G703). The form shall be divided in detail sufficient to exhibit area, floors, and/or sections of the Work, and/or by convenient units and shall be updated as required by either the Owner or the Architect as necessary to reflect (1) description of Work (listing labor and material separately), (2) total value, (3) percent of the Work completed to date, (4) value of the work completed to date, (5) percent of previous amount billed, (6) previous amount billed, (7) current percent completed, and (8) value of Work completed to date. Any trade breakdown that unreasonably fails to include sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (including of normal retainage) to complete the Work.

§ 9.3 Applications for Payment

§ 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2 of these General Conditions, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. Each item listed in the Application for Payment shall have a separate amount for labor and a separate amount for material and other costs.

The form Application for Payment, duly notarized, shall be the most recent authorized edition of AIA Document G702, Application and Certificate for Payment, supported by the most recent authorized edition of AIA Document G703, Continuation Sheet.

§ 9.3.1.1 As provided in Section 7.3.9 of these General Conditions, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 Each Application for Payment shall be submitted electronically and in four (4) hard copies and shall be accompanied by the following, in all form and substance reasonably satisfactory to the Owner, (1) a current conditional Contractor's waiver of claims and liens, and duly executed an acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Contractor from such progress payment together with similar sworn statements from all such subcontractors and material suppliers; (2) duly executed unconditional waivers of claims and liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect or required by the Owner's title insurer.

§ 9.3.1.4 Unless otherwise agreed to in writing, until Substantial Completion, the Owner shall pay the Contractor ninety-five (95%) of the amount due the Contractor.

§ 9.3.1.5 Applications for Payment must be accompanied by any and all releases of liens for previous applications from Contractor and his subcontractors and a sworn and notarized statement that all subcontractors have been paid to at least ninety-five percent (95%) of previously requisitioned sums.

§ 9.3.1.6 Contractors must submit separate Applications for Payment for each facility or per State Education Department Project Number. Only one Application for Payment per State Education Department Project Number may be submitted for payment for each month.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials

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and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. Such payment by the Owner for materials, equipment, fixtures and supplies stored on or off the Site shall not relieve the Contractor of its responsibility to provide reasonable protection of said materials, equipment, fixtures and supplies until their incorporation into the Work.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials and equipment relating to the Work.

§ 9.3.3.1 The Contractor shall save and keep the Contract Sum and the Owner's property free from all liens and claims, legal or equitable, arising out of Contractor's work under the Contract Documents. In the event any such lien is filed by anyone claiming by, through or under the Contractor, the Contractor shall remove and discharge same within ten (10) days of the filing thereof. The Contractor further expressly undertakes to defend the Owner, the Architect and the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") at the Contractor's sole expense against any actions, lawsuits or proceedings brought against Indemnitees as a result of liens filed against the Contract Sum, the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor or any portion of the property of any of the Indemnitees referred to collectively as liens in this Section 9.3.3.1. The Contractor hereby agrees to indemnify and hold Indemnitees harmless against any such liens or claims of lien and agrees to pay any judgment or lien resulting from any such actions, lawsuits or proceedings.

§ 9.3.3.2 The Owner shall release any payments withheld due to lien or claim of lien if the Contractor obtains security acceptable to the Owner or a lien discharge bond that is (1) issued by a surety acceptable to the Owner; (2) in form and substance satisfactory to the Owner, and (3) in an amount required by law to release such lien claim. By posting a lien discharge bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under Section 9.3.3.1 of these General Conditions including without limitation, the duty to defend and indemnify the Owner. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

§ 9.3.4 Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner, Construction Manager and Architect.

§ 9.3.4.1 A current Contractor's lien waiver and duly executed and acknowledged sworn statement showing all Subcontractors and material men with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material men in the requested progress payment and the amount to be paid to the Contractor for all such Subcontractors and material men.

§ 9.3.4.2 Duly executed waivers of mechanic's and material men's liens from all Subcontractors and, when appropriate, from material men and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment.

§ 9.3.4.3 All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner, Construction Manager or the Architect. If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer.

§ 9.3.4.4 All Applications for Payment must be accompanied with certified payrolls for all Contract Work performed. In addition, each Contractor and sub-contractor shall submit to the Owner within thirty days after issuance of its first payroll, and every thirty days thereafter, a transcript of the original payroll record, subscribed and affirmed as true under penalties of perjury. The Owner shall be required to receive and maintain such payroll records. The original payrolls or transcripts shall be preserved for three years from the completion of the Work on the awarded project. An out of state contractor must post a wage rate schedule at the job site.

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§ 9.3.5 Applications for Payment that, when received, are missing information or required documentation will be rejected by the Construction Manager or Architect and will not be considered for payment by the Owner, Architect or Construction Manager until resubmitted with all required information and documents.

§ 9.4 Certificates for Payment

§ 9.4.1 The Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1 of these General Conditions; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Intentionally Omitted.

§ 9.4.2.1 Intentionally Omitted.

§ 9.4.3 The Construction Manager's certification of an Application for Payment shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 of these General Conditions are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 of these General Conditions cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2 of these General Conditions. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss

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for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 of these General Conditions because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor or other Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
.7 failure to carry out the Work in accordance with the Contract Documents, or
.8 any other reasonable grounds for objection or withholding as provided in the agreement or as permitted by law.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The Owner shall not be deemed in default by reason of withholding payment while any conditions described in 9.5.1 remain.

§ 9.5.3 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1 of these General Conditions, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

(Paragraph deleted)

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.2.1 The Contractor shall indemnify and hold the Owner harmless from laborers, mechanics and materialmen liens upon the Owner's Project funds, properties or the premises upon which the work is located, arising out of the work performed or materials furnished by the Contractor or any of its Subcontractors or any material suppliers under the Contract.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner through the Construction Manager or directly has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4 of these General Conditions for payments to Subcontractors.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

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§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. Pursuant to applicable law or court order, when required, the Contractor may substitute a surety bond for the property or Project funds against which the lien or other claim for payment has been asserted.

§ 9.7 Intentionally Deleted

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the date certified by the Architect when the completed Work is code compliant and when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use; provided, however that as a condition precedent to Substantial Completion, the Owner has received all Certificates of Occupancy and any permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

.1 The Architect will perform two (2) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents at no additional cost to the Owner. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections pursuant to Section 9.5.1 of these General Conditions.

§ 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work of all of the Contractors, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any,

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the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers an occupied portion to be substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2 of these General Conditions. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents, nor does it waive the Owner's right to liquidated damages. Further, such occupancy alone shall not determine when Substantial Completion has been reached.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 of these General Conditions as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under the Contract Documents shall be assembled and delivered by the Contractor to the Architect through the Construction Manager as part of the final Application, no final payment will be issued until all warranties and guarantees have been received and accepted by the Owner.

§ 9.10.1.1 The Architect will perform two (2) inspections whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents at no additional cost to the Owner. If the Architect and/or Construction Manager are required to perform additional final inspections because the Work fails to comply with the certifications of the Contractor, the amount of compensation paid to the Architect and/or the Construction Manager by the Owner for additional services for such additional inspections shall be deducted from the final payment to the Contractor.

§ 9.10.1.2 The final payment of retained amount due the Contractor on account of the Contract shall not become due until the Contractor has furnished the Owner, through the Architect, completion documents as enumerated below, or as otherwise required in the Contract Documents.

- **.1** One (1) hard copy and one (1) electronic Record Set of Drawings showing actual construction of all portions of the Work and incorporating all changes and amendments thereto, as redlined against the 100% Construction Drawings.
- **.2** Guarantees and Warranties required by specific Sections of the Specifications.

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.3 Release and Waiver of Claims, conditioned upon Final Payment, by the General Contractor, Subcontractors, Sub-subcontractors and material suppliers.

.4 All mechanical and electrical installation, operating and maintenance manuals called for under the Specifications.

.5 All test reports and certifications required under the mechanical and electrical specifications.

.6 All forms required to be completed by the Contractor by regulatory governmental agencies with two copies delivered to the Architect.

.7 Shop Drawing submittals in accordance with Article 3.

.8 A copy of the unconditional Occupancy Permit or Certificate of Compliance issued by the local Building Inspection Department having Jurisdiction, unless such is not issued for any reason that is not the responsibility of the Contractor under the Contract Documents or is caused by circumstances beyond the Contractor's control.

.9 Manufacturer's current detailed installation instructions for fire dampers, ceiling radiation dampers, smoke dampers, and duct smoke detectors as applicable to the Project.

.10 One (1) copy of the equipment operational and maintenance manuals.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation and assignment of all warranties, including any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) all required procedures manuals, operation and maintenance manuals and spare parts, (7) Contractor Affidavit of Release of Liens, (8) complete set of Record Documents, including but not limited to all Shop Drawings and As-built Drawings, (9) separate release or waivers of liens for each subcontractor, material and/or equipment supplier, and others performing a portion of work and, (10) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents;

.3 terms of special warranties required by the Contract Documents;

.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment; or

.5 faulty or defective work appearing after Substantial Completion.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall provide for the safety and protection of the Project sites, all persons who come in contact with the Work and all real and personnel property located at or adjacent to the Project sites. Without limitation to the foregoing, the Contractor, at its sole cost and expense shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and

.4 construction or operations by the Owner, Separate Contractors, or other Contractors.

Prior to commencement of the Work, the Contractor shall document existing conditions and record existing damage to construction or property that is to remain at the site and notify the Construction Manager and Architect of same in writing.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. The Contractor agrees in working on the Owner's premises to comply with Regulation 155.5 of the NYS Commissioner of Education, the Occupational Safety and Health Act of 1970 (OSHA) as amended, and the Construction Safety Act of 1969 as amended including all standards and regulations that have been since or shall be promulgated by the governmental authorities having jurisdiction over the Project or the Owner's premises, all applicable building and fire codes and any applicable federal, state and/or local laws, rules, regulations and/or executive orders regarding COVID-19.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 of these General Conditions caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 of these General Conditions. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18 of these General Conditions.

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§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

§ 10.3 Hazardous Materials

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a hazardous material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify in writing the Owner, Construction Manager and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. When the material or substance has been rendered harmless, Work in the affected area shall resume. By Change Order, the Contract Time shall be extended appropriately.

§ 10.3.3 Intentionally omitted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and/or negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1 of these General Conditions, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 Intentionally omitted.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7 of these General Conditions.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 Insurance, Refer to AIA Document A132™–2019, Exhibit A, Insurance and Bonds, as revised for this Project.

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§ 11.1.2 Performance Bond and Payment Bond, Refer to AIA Document A132™–2019, Exhibit A, Insurance and Bonds, as revised for this Project.

(Paragraphs deleted)

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability that the Owner usually maintains in the course of its operations as a public school district.

§ 11.2.2 Intentionally omitted.

§ 11.2.3 Intentionally omitted.

§ 11.3 Waivers of Subrogation

§ 11.3.1 To the extent permitted by their respective insurance companies the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 of these General Conditions for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2 of these General Conditions. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the

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Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Construction Manager's, Architect's or any governmental authority's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by any of them, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager, Architect or governmental authority has not specifically requested to examine prior to its being covered, the Construction Manager, Architect or governmental authority may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Construction Manager, Architect for failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion, and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. If the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor in the performance of the Contract uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing and other building systems, machinery, equipment or other mechanical device(s), the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5 of these General Conditions, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1 of these General Conditions, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. In the judgment of the Owner should any material, equipment or systems require corrective work because of defects in material or workmanship within the one-year warranty period, or extended warranty periods, the Contractor shall complete all required corrective work within thirty (30) days of notice. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5 of these General Conditions and recover the costs incurred to do so from the Contractor or offset the costs incurred against any sums the Owner owes the Contractor or the Owner may notify the bonding company to have such work and/or obligations performed at no additional cost to the Owner.

§ 12.2.2.2 For any portion of the Work for which the warranty is to be effective upon Substantial Completion, the one-year period for correction of Work shall be extended with respect to portions of Work first performed after

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Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's Work that is not in accordance with the requirements of the Contract Documents and by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 of these General Conditions shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 of these General Conditions relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules.

§ 13.1.1 In all operations under the Contract, the Contractor agrees that it will comply with all Federal, State and Local Laws, rules and regulations and all policies, rules, regulations and protocols of the Owner, in any manner affecting the Work and all such orders as exist at present and those which may be enacted in the future, by bodies or tribunals having jurisdiction or authority over the Work, including but not limited to OSHA, Sections 220, 220-d, 220-e of the Labor Law. The Contractor shall indemnify and save harmless the Owner and its Board of Education, employees, officers, agents, or servants against any claim or liability arising from, or based on, a violation of any such law, ordinances, regulation, order or decree by the Contractor or the Contractor's officers, directors, employees, Subcontractors and suppliers.

§ 13.1.2 Historical lack of enforcement of any law, rule or regulation local or otherwise, shall not constitute a waiver of Contractor's responsibility for compliance with such law, rule or regulation in a manner consistent with the Contract Document unless and until the Contractor has received written consent for the waiver of such compliance from the Owner and the Agency responsible for enforcement of the law, rule or regulation.

§ 13.1.3 The parties expressly agree that any claim, dispute, or other controversy of any nature arising out of the contract or performance of the Work shall be commenced and maintained in New York State Supreme Court located in Westchester County.

§ 13.1.4 The Contractor and each of its Subcontractors shall comply with Prevailing Wage Rates as issued by the State of New York Department of Labor for the location and duration of this Project and shall comply with all requirements governing its payments to its employees as set forth in Labor Law, Section 220 et seq of the New York State Labor Law.

§ 13.1.5 The Contractor shall comply with all the provisions of the Immigration Reform and Control Act of 1986 and regulations promulgated pursuant thereto and shall require its Subcontractors to comply with same. The Contractor shall and does hereby agree to fully indemnify, protect, defend, and hold harmless the Owner, Owner's Board of

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Education, agents and employees from and against any penalties, fees, costs, liabilities, suits, claims, or expenses of any kind or nature, including reasonable attorney's fees, arising out of or resulting from any violation or alleged violation of the provisions of said laws by Contractor or its Subcontractor(s) in connection with the Work of the Contract Documents.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2 of these General Conditions, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract. The Contractor shall not assign any monies due or to become due to him under the Contract without the previous consent of the Owner.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law or in equity, and such rights and remedies shall survive acceptance of the Work and/or termination of the Contract Documents.

§ 13.3.2 No action or failure to act by the Owner, Construction Manager, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities or utilities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority or utility, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1 of these General Conditions, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3 of these General Conditions, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 of these General Conditions reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense. The Contractor agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work, and the cost of testing services relating to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager for transmittal to the Architect.

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§ 13.4.5 If the Construction Manager or Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Construction Manager or Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.4.7 Upon request the Contractor shall deliver test samples of any of the materials specified in the Specifications to an independent testing agency. The Owner shall pay for the test of samples, which are found to conform to the Specifications. The Contractor shall pay for the tests of samples, which do not conform to the Specifications. This shall not relieve the Contractor of his obligations to perform specific tests described elsewhere in the Specifications.

§ 13.4.8 Where the Specifications require part of the Work to be specially tested and approved, it shall not be covered up before testing without timely notice thereof or consent thereto. Should any part of the work be covered up without notice, approval or consent, such part of the Work shall be uncovered for examination at the Contractor's expense if the Owner, Architect, Construction Manager or governmental authority with jurisdiction over the Contractor, the Work or the Project shall so require.

§ 13.4.9 Should defects appear, they shall be corrected by the Contractor and the test repeated until the installation is acceptable.

§ 13.4.10 When notice of tests is to be given to the Architect, it shall also be given to the Construction Manager.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rateset forth in the Agreement.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- **.3** Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4 of these General Conditions, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3 of these General Conditions, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 of these General Conditions exists, the Contractor may, upon seven days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred directly as a result of such termination. The Owner shall not be liable for loss of anticipated profits for work not performed on account of any termination described in Sections 14.1.1 and 14.1.4 hereof.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with

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respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3 of these General Conditions.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract for cause if the Contractor

- **.1** refuses or fails to supply enough properly skilled workers or proper materials or equipment;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** disregards the instructions of the Architect, the Construction Manager or the Owner, when such instructions are based on the requirements of the Contract Documents;
- **.5** breaches any warranty made by the Contractor under or pursuant to the Contract Documents;
- **.6** fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all of the requirements of the Contract Documents;
- **.7** fails after commencement of the Work to proceed continuously with the construction and completion;
- **.8** fails to keep the Project free from strikes, work stoppages, slowdowns, lockouts or other disruptive activity as required by Section 3.4.3 hereof;
- **.9** fails or neglects to prosecute the Work in such a manner to reasonably assure completion within the Contract Time; or
- **.10** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 of these General Conditions exist, after consultation with the Construction Manager, and the Architect, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4 of these General Conditions; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1 of these General Conditions, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 14.2.4.1 The costs of finishing the Work include, without limitation, all reasonable attorney's fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect and consequential damages incurred by the Owner by reason of the termination of the Contractor as stated herein.

§ 14.2.5 The Owner shall not be responsible for damages or loss of anticipated profits on Work not performed on account of any termination described in Article 14.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine by giving seven (7) day's prior written notice to Contractor, specifying the part of the Work or subcontract to be suspended, delayed, or interrupted, and the effective date of such suspension, delay, or interruption, as the case may be. Contractor shall continue to prosecute the part of the Work not suspended, delayed, or interrupted, and shall properly protect and secure the part of the Work so

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suspended, delayed, or interrupted, so far as is necessary in Owner's reasonable opinion. For the Work that has not been suspended, delayed or interrupted, the Contract Documents shall remain in full force and effect.

§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for reasonable increases in the cost and time of the Work caused by suspension, delay, or interruption under Section 14.3.1 of these General Conditions. Adjustment of the Contract Sum shall not include profit. No adjustment shall be made to the extent:

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract, in whole or in part, for the Owner's convenience and without cause by giving seven (7) days' notice to Contractor, specifying the part of the Work or subcontract to be terminated and the effective date of termination. Contractor shall continue to prosecute the part of the Work not terminated. This right may be exercised by the Owner in its complete and absolute discretion. If the Work or any subcontract is so terminated, Owner shall incur no liability to Contractor by reason of such termination except as set forth in Section 14.4.3 of these General Conditions. For the remainder of the Work that is not terminated, the Contract Documents shall remain in full force and effect. Contractor shall be entitled to no payment for the terminated portion of the Work and waives and forfeits any claim for damages and/or lost profits. Contractor shall be entitled to no payment for the terminated portion of the Work and waives and forfeits any claim for damages and/or lost profits.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders for the portion of the Work that has been terminated; and

.4 proceed to complete the performance of the Work not terminated.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed prior to the date of termination as well as any costs incurred by the Contractor to implement Owner directed work to protect and preserve the work completed by the Contractor prior to the notice of termination less the credits due the Owner and less the sums required by law to be held by the Owner due to any liens on public improvement filed against the Contract Sum that have not been discharged (which sums withheld due to such liens will be paid when such liens are discharged or released). The Contractor shall not be entitled to payment of any other sums. The Contractor shall not be entitled to any payment for the terminated portion of the Work and waives and forfeits any claim for damages, overhead and/or lost profits for the terminated portion of the Work.

§ 14.4.4 The Contractor shall include in each of its subcontracts a clause, similar in effect to the provisions in Paragraph 14.4, allowing the Contractor to terminate the subcontract for its sole convenience, subject only to the payment obligations set forth in Paragraph 14.4.3 of these General Conditions.

§ 14.4.5 Contractor agrees and acknowledges that payments for the work have been obtained through obligations or bonds which have been sold after public referendum. In the event the work is suspended or cancelled as a result of the order of any court, department entity or individual having jurisdiction, or in the event the work is suspended or cancelled due to the fact that a court, agency, department, entity or individual having jurisdiction has issued an order, the result of which is the aforesaid obligations or bond are no longer available for payment for the work, Contractor expressly agrees that it shall be solely entitled to pay for work accomplished until a notice of suspension or cancellation is served upon Contractor. The Contractor expressly waives any and all rights to institute an action, claim, cause of action or similar for any damages it may suffer as a result of the suspension or cancellation of the Work and/or its Contract pursuant to this section.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by the Contractor seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The responsibility to substantiate a Claim shall rest with the Contractor. This Section 15.1.1 does not require the Owner to file its claims

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against the Contractor, including but not limited to a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by the Contractor shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. Such Claims shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the Contractor first recognizes the condition giving rise to the Claim, whichever is later.

(Paragraph deleted)

§ 15.1.3.2 Should any Contractor wish to reserve its rights regarding filing of claims as set forth above, written notice of any event that may give rise to a claim must be given within 21 days of said event, whether or not any impact in time or money has been determined.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision. The Architect will prepare Change Orders and/or Construction Change Directives and will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 of these General Conditions shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4 of these General Conditions. No claim will be permitted for additional costs or time as provided in this Section 15.1, should damages arise from the Contactor's failure to have adequately reviewed the Contract Documents and failure to have reported an error or inconsistency in an expeditious time and manner.

§ 15.1.5.1 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension of the Work or (7) other reasonable grounds, a claim shall be filed in accordance with this Section 15.1 or such claim for additional costs shall be waived.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 of these General Conditions shall be given. The Contractor's Claim shall articulate the reason additional time is requested, articulate the amount of additional time requested and include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary. The Contractor shall accompany the Claim with a written analysis with a proposed revision to the Schedule illustrating the claimed influence of the basis for delay on the critical path of the Work and the applicable deadlines that may be impacted. Contractor will exercise reasonable efforts to mitigate the potential impact of any delay.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The time for performance of this Contract, as set forth in the Construction Schedule, shall include an allowance for delays due to reasonably anticipated adverse weather for the area where the Work is located. For the purpose of establishing that abnormal adverse weather conditions have caused a delay, and determining the extent of delay attributed to such weather conditions, the

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Contractor shall furnish with its claim, National Oceanic and Atmospheric Administration (NOAA) National Weather Service records of climatic conditions during the same time interval for the previous five (5) years for the locality of the Work; the Contractor's daily job site logs/daily construction reports showing weather, job activities, and the effect of weather on the progress of the Work; and an impact schedule showing the effects of the weather event on the critical path of the Contractor's Construction Schedule. Time extension for weather delays and related impact do not entitle the Contractor to extended overhead recovery or to any other monetary compensation associated with that claim unless approved in writing by the Owner.

§ 15.1.6.3 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which have concurrent or interrelated effects on the progress of the Work.

§ 15.1.7
(Paragraphs deleted)
Waiver of Claims.
§ 15.1.7.1 The timelines provided herein for the making of claims shall be a condition precedent to any payment for such claims or the granting of any extension of time. Failure of the Contractor to comply with the time and notice provisions of this Article shall be an absolute bar to making any payment to or extending the time of the Contractor for such claim. All claims of any type seeking any monies, or an extension of time shall be accompanied by full documentation. A claim submittal without full documentation shall be rejected by the Architect and, if not timely resubmitted within the original claim period, as set forth above, shall be waived.

§ 15.1.7.2 The Owner shall not be responsible for damages or for loss of anticipated profits on Work not performed on account of any termination of the Contractor by the Owner or by virtue of the Owner's exercise of its right to take over the Contractor's Work pursuant to the Contract Documents.

§ 15.1.7.3 The Contractor hereby expressly waives any rights it may have in law or in equity to lost bonding capacity as a result of any of the actions of the Owner, Construction Manager or the Architect taken in connection with the Contractor's Work on the Project.

§ 15.2 Initial Decision
§ 15.2.1 Claims by the Contractor, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. An initial decision shall be required as a condition precedent to binding dispute resolution of the Contractor's Claim(s). If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation or binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten (10) business days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

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§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, the Construction Manager, and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, file for mediation.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4 and 9.10.5 of these General Conditions, may be subject to mediation upon mutual agreement of the parties.

§ 15.3.2 A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, file for binding dispute resolution.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

(Paragraphs deleted)

ARTICLE 16 ADDITIONAL CONDITIONS

§ 16.1.1 Contractor agrees and acknowledges that payments for the Work have been obtained through obligations or bonds which have been sold after public referendum. In the event the Work is suspended or canceled as a result of the order of any court, agency, department entity or individual having jurisdiction, or in the event the Work is suspended or canceled due to the fact that a court, agency, department, entity or individual having jurisdiction has issued an order, the result of which is that the afore said obligations or bonds are no longer available for payment for the Work, Contractor expressly agrees that it shall be solely entitled to payment for Work accomplished until a notice of suspension or cancellation is served upon Contractor. Contractor expressly waives any and all rights to institute an action, claim, cause of action or similar for any damages it may suffer as a result of the suspension or cancellation of the Work and /or its contract pursuant to this Section 16.1.

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OUFSD 2024 Bond – New 7-8 Building
300 Van Cortlandt Ave
Ossining, NY 10562

SED No.: 66-14-01-03-0-028-001

CPL Project No,: R24.16941.00

...

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

...

Ossining Union Free School District
400 Executive Boulevard
Ossining, NY 10562

...

CPL Architects, Engineers and Landscape Architect, D.P.C.
d/b/a CPL
26 IBM Road
Poughkeepsie, NY 12601

PAGE 3

§ 1.1.1 The Contract Documents. The Contract Documents ~~are enumerated in~~ consist of the Agreement between the Owner and Contractor ~~(hereinafter the Agreement) and consist of the Agreement,~~ (AIA A132-2019 Standard Form of Agreement as revised for this Project) together with Exhibit A thereto (AIA A132-2019 Exhibit A Insurance and Bonds as revised for this Project) (collectively, hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Instructions to Bidders (AIA A701-2018 as revised for this Project), Supplemental Instructions to Bidders (if any), Addenda issued prior to execution of the ~~Contract,~~ Agreement, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, ~~Instructions to Bidders,~~ sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, ~~the Contractor's bid or proposal, or portions of addenda relating to bidding or proposal requirements.~~or the Contractor's bid or proposal.

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...

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other ~~Contractors,~~ Contractors (including but not limited to other Prime Contractors), and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than ~~the Contractor or~~ Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction ~~Manager.~~ Manager, including but not limited to other Prime Contractors. The term "Contractor" in this Section shall include the Contractor and the Contractor's officers, directors, owners, employees, agents, suppliers, and sub-contractors of any tier.

...

The Specifications may describe (or the Drawings may show) the general placement required of materials or equipment, but the actual required placement may vary depending on the specific material or equipment used by the Contractor or the existing field conditions. The Contractor shall bear all direct and indirect costs associated with such variations.

Some Specifications may be written in a condensed outline form and omitted words shall be included by interference. If the Specifications identify a task, it shall mean the "Contractor shall furnish, install and complete" the identified task unless otherwise stated.

Reference to standard specifications, manuals or codes shall mean reference to the latest standard specification, manual or code in effect at the time of the execution of the Agreement, unless otherwise stated. When reference is made to a manufacturer, trade association, reference standard or similar source (such as ASTM, ASA, AISC, ACI, etc.) the standards or requirements of such entity shall be incorporated into the Specifications and have the force and effect as though they were set forth expressly. Upon entering into the Agreement, the Contactor acknowledges its familiarity with those references, codes, etc. The date of the referenced standard shall be the latest edition in effect at the time of the execution of the Agreement unless otherwise stated.

§ 1.1.10 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section ~~15.2.~~ 15.2 of these General Conditions. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for the results of interpretations or decisions rendered ~~in good faith.~~that are consistent with the Contract Documents.

§ 1.1.11 Provide. When the word "provide" (including derivatives thereof) is used, it shall mean to properly fabricate, complete, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, apparatus, appurtenances, and all items and expenses necessary to properly complete in place ready for operation or use under the terms of the Specifications.

§ 1.1.12 Addenda. Addenda are written or graphic instruments issued prior to the execution of the Agreement that modify or interpret the bidding documents, including the Drawings and Specifications, by additions, deletions, clarification, corrections, or supplementary information.

§ 1.1.13 Furnish. "Furnish" shall mean purchasing and/or fabricate and deliver to the job site or other location when so designated.

§ 1.1.14 Install. "Install" shall mean build-in, mount in position, connect or apply the specified object(s) and, where applicable, adjust and start-in operation.

§ 1.1.15 Alternate. "Alternate" shall mean a variation in the requirements of the Contract on which a separate price is to be received by the Owner as part of the bid. If the Alternate is accepted in writing by the Owner, the variation is then a part of the Contract and the amount of money quoted to be added to or deleted from the base bid is taken into account in determining the Contract Sum.

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§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are ~~complementary,~~ complimentary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the event of inconsistencies within or between parts of the Contract Documents, the Contractor shall (1) provide a better quality or greater quantity of Work or (2) comply with the more stringent requirements; either or both in accordance with the Architect's interpretation at no additional cost to the Owner. The Contractor shall assume full responsibility and cost for proceeding with such work without obtaining the Architect's interpretations. The terms and conditions of this Subparagraph 1.2.1, however shall not relieve the Contractor of any of the obligations set forth elsewhere in the Contract Documents. All work shall conform to the Contract Documents. No significant change there from shall be made without prior written authorization by the Owner. Where only part of the Work is indicated, similar parts shall be considered repetition. When any detail is shown and the components therefore are fully described, similar details shall be construed and not mentioned in the other shall be of like effect as if shown or mentioned in both. Should the Specifications and Drawings fail to particularly describe a product or material shown to be used in any place, the Contractor shall furnish the product that would normally be used in that place.

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§ 1.2.1.2 Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. No extra charge or compensation shall be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Architect through the Construction Manager for resolution before proceeding with the Work.

§ 1.2.1.3 If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit through the Construction Manager detailed drawings of such departure for approval by the Architect before making the change.

§ 1.2.1.4 All indications or notations on the Drawings which apply in one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, material or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

§ 1.2.1.5 The Contractor shall provide all labor, materials, equipment, appliances and services necessary to execute and complete all work as required by the Contract Documents and the applicable Building Codes. Whenever any additional materials and/or workmanship not shown or specified are required to complete the Work of the Contract Documents in accordance with the obvious intent thereof, the Contractor shall provide such materials and workmanship at no additional cost to the Owner.

§ 1.2.2.1 The organization of the Specifications into divisions, sections and articles and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of the Work to be performed by any trade. The organization of the Specifications into divisions, sections and articles and arrangement of Drawings is for the purpose of convenience, and ready reference only. The Contractor will be permitted to allocate the work of Subcontractors at his own discretion regardless of the grouping in the Specifications. It shall be the Contractor's responsibility to settle definitely with each Sub-contractor the portions of the Work, which each will be required to perform. The Contractor represents that the Subcontractors, manufacturers, vendors and suppliers engaged or to be engaged by it are and will be familiar with the requirements for the performance by them of their obligations. The Contractor shall provide each item listed, of quality noted and subject to qualifications noted, and shall perform operations prescribed according to the conditions stated, including specified operations, processes or methods, furnishing therefore all necessary labor, materials, equipment and incidentals required to complete the Work.

§ 1.2.4 All work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

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§ 1.2.4.1 The Contractor and all Subcontractors shall refer to all of the Drawings, including those showing primarily the work of the plumbing, heating, ventilation, air conditioning, electrical, and other specialized trades, and to all of the sections of the Specifications, and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results.

§ 1.2.4.2 It is intended that all mechanical and electrical systems will be complete and in proper operation and that all construction components will be complete and in compliance with accepted construction practice upon completion of the Work. Even if items are missing from the Drawings and/or Specifications but are normally required for proper operation of mechanical and electrical systems, or to complete otherwise incomplete construction or to meet governing code requirements, they shall be included by the Contractor, unless the Contractor sought and received contradictory interpretation or clarification from the Architect.

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~~In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.~~**§ 1.4 .1** In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.4.2 The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. The expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

§ 1.4.3 Wherever required by the context, any gender shall include the other gender, the singular shall include the plural, and the plural shall include the singular. Each term defined in the Contract Documents may be used in its singular or plural form whether or not so defined.

...

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and ~~1.8,~~ 1.8 of these General Conditions, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

...

§ 1.6.1 Except as otherwise provided in Section ~~1.6.2,~~ 1.6.2 of these General Conditions, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing by (1) depositing the notice in the United States mail addressed to the authorized representative as specified in the Contract (or if no representative is specified for such party at the address stated in the Contract) of the party to be notified, postpaid and registered or certified with return receipt requested, (2) depositing the notice for overnight delivery (prepaid or billed to the party giving notice) with a nationally recognized overnight delivery service (e.g. Federal Express, USPS, UPS, etc.) addressed to the authorized representative of the party to be notified (or if no representative is specified for such party at the address stated in the Contract) or (3) by delivering the notice in person to the said authorized representative of the party (or if no representative is specified for such party at the address stated in the Contract). Notices may be made by the party giving the notice by the party's counsel, the authorized representative of the party as specified in the Contract, or by an officer of the party that has authority to bind the party. Notices are to be sent to the designated representative stated in this Agreement of the party to whom the notice is addressed ~~and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.~~at the address stated in the Agreement. Notice deposited in the

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mail in accordance with this Section 1.6.1 shall be effective unless otherwise stated in the Contract from and after the fourth (4th) day following the date deposited in a U.S. mail receptacle or when actually received by the party to whom addressed, whichever is earlier. Notices transmitted by overnight delivery shall be effective the first business day (excluding holidays, Saturdays and Sundays) following the day of deposit with the nationally recognized overnight delivery service or when actually received by the party to whom addressed, whichever is earlier. Notice given by delivery in person shall be effective only if and when received by the party to be notified. By giving the other parties at least seven (7) days written notice thereof, the Contractor, Owner, Construction Manager and Architect have the right to change their respective designee and respective address to any address in the United States of America for receipt of notices.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 of these General Conditions shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.
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The parties shall agree upon ~~written~~ protocols governing the transmission and use ~~of, and reliance on,~~ of Instruments of Service or any other information or documentation in digital form.

§ 1.8 ~~Building Information Models Use and Reliance~~Confidentiality
§ 1.8.1 The Contractor warrants and represents that the Contractor shall not knowingly or negligently communicate or disclose at any time to any person or entity any materials or information with respect to the Work or the Project, including without limitation any promotional or marketing media or other material or information related to the Owner, the Work or the Project, except: (1) with prior written consent of the Owner, (2) information that was in the public domain prior to the date of the Agreement, (3) information which becomes part of the public domain by publication or otherwise not due to any unauthorized act or omission of the Contractor, (4) as may be required by the Contract or any applicable law, or (5) for purposes of coordination with other Contractors. The Contractor hereby agrees to indemnify and hold the Owner, the Construction Manager and Architect and their respective employees, consultants, volunteers and agents harmless from and against any cost, damage, liability, loss or claim arising from violation of the foregoing by the Contractor or the Contractor's officers, directors, employees, Subcontractors, Sub-subcontractors and agents.

§ 1.8.2 Upon request of the Owner, the Contractor shall immediately return and surrender to the Owner all copies of any materials, records, notices, memoranda, recordings, drawings, specifications, and mock-ups and any other documents furnished by the Owner, Construction Manager or the Architect to the Contractor.

§ 1.8.3 The Contractor shall specifically cause all Subcontractors or any other person or entity performing any services or furnishing any materials or equipment of the Work to warrant and represent that they will comply with the requirements forth in this Section 1.8.

§ 1.8.4 The indemnities, representations and warranties contained in this Section 1.8 shall be in addition to any other indemnities, representations and warranties provided in the Contract Documents and shall survive the complete performance of the Work or earlier termination of the Contract.
~~Any use of, or reliance on, all or a portion of a building information model without agreement to written protocols governing the use of, and reliance on, the information contained in the model shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.~~

...

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section ~~4.2.1,~~ 4.2.1 of these General Conditions, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

~~§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such~~

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~~information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~

§ 2.2 ~~Evidence of the Owner's Financial Arrangements~~Intentionally omitted

~~§ 2.2.1~~ ~~Prior to commencement of the Work, and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.~~

~~§ 2.2.2~~ ~~Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.~~

~~§ 2.2.3~~ ~~After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

~~§ 2.2.4~~ ~~Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.~~

§ 2.3.1 ~~Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, assisted by the Construction Manager, shall secure and pay for the building permit.~~Unless otherwise provided within the Contract Documents, the Owner, assisted by the Construction Manager and the Architect, shall secure and pay for the building permit. Unless otherwise provided within the Contract Documents, the Contractor shall comply with and obtain, at its expense, all other licenses and permits required by Federal, State and local laws, rules, and ordinances necessary for the Work.

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§ 2.3.4 ~~If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.~~Intentionally Omitted

§ 2.3.5 The Owner shall furnish surveys upon written request of the Contractor and to the extent same exist, describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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§ 2.3.6 The ~~Owner~~ Owner, through the Architect or Construction Manager, shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also ~~furnish~~ furnish, through the Architect or Construction Manager, any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services. "Reasonable promptness" shall be measured from the time of the Owner's receipt of written request for such information or services.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section ~~1.5.2.~~1.5.2 of these General Conditions.

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section ~~4.2.6.~~4.2.6 of these General Conditions.

...

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 of these General Conditions or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or ~~entity, except to the extent required by Section 6.1.3.~~entity.

...

~~If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect, and the Construction Manager or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.~~**§ 2.5.1** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a three-day period after receipt of notice from the Owner, Architect or Construction Manager to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, after such three (3) day period and without prejudice to other remedies the Owner may have, correct such default or neglect at Contractor's expense. The Owner's reasonable cost of correcting such default or neglect shall be deducted from payments due the Contractor by Change Order, Construction Change Directive, back charge or other means. The Construction Manager or Architect may, pursuant to Section 9.5.1 of these General Conditions, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies or neglect. The Owner's reasonable costs shall include the cost of labor and materials to complete the correction of such deficiencies or neglect, the Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services made necessary by such default, neglect, or failure, and the Owner's reasonable attorney's fees arising from the Contractor's default, neglect or failure. If current and future payments due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner, the Construction Manager or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

§ 2.5.2 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any legal or equitable rights of the Owner or Contractor or of any rights provided to the Owner and Contractor in the Contract Documents.

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§ 2.5.3 In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. The Owner assumes no responsibility for liability for the safety of the Project site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work; provided that the Owner shall be responsible for, and the Contractor shall upon discovery notify the Owner of, any unsafe condition created by the Owner.
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§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under ~~this~~ the Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents. The Contractor shall refer to all of the Drawings and all sections of the Specifications and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results. See also Sub-Sections of Section 1.2 of these General Conditions.

...

§ 3.1.4 The Contractor shall attend progress meetings with the Construction Manager and such other persons the Owner may wish to have present. The progress meetings shall include Contractor designated representative(s) and representatives of the Contractor's Sub-contractors if requested by the Owner, Construction Manager or Architect.

...

§ 3.2.1.1 The Contractor shall rely on its own knowledge and its review and interpretation of the Contract Documents and data provided in entering into the Contract and not the representations of the Owner or other persons. The Contractor acknowledges that quantities provided in the Contract Documents are estimates only and Contractor shall not seek additional compensation or adjustment in price based on a variation in actual quantities.

§ 3.2.1.2 Prior to execution of the Contract, the Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools, and equipment, (v) any time restrictions for accessing or working at the Project site, and (6) the storage, handling and trucking of materials to be used on-site.

§ 3.2.1.3 The accuracy of grades, elevations, dimensions or locations given in the Contract Documents or the work installed by other contractors is not guaranteed by the Architect or the Owner. The Contractor shall satisfy itself as to the accuracy of all grades, elevations, dimensions, utilities and locations. Prior to connecting its Work to existing structures or other contractor's work, the Contractor shall verify all dimensions and the suitability of the existing structures or work to receive the Contractor's Work. Any errors due to the Contractor's failure to verify such grades, elevations, dimensions, or locations shall be rectified promptly by the Contractor without any additional cost to the Owner.

§ 3.2.1.3.1 The locations, depths and data as to underground conditions have been obtained from records, surface indications and data furnished by others. Information furnished is solely for the convenience of the Contractor without any warranty, expressed or implied as to its accuracy or completeness. The Contractor shall verify all existing conditions prior to commencing the Work. The Contractor shall make no claim against the Owner or Architect with respect to the accuracy or completeness of such information if the conditions found after commencement of the Work are different from those as indicated.

§ 3.2.1.4 The Contractor shall be solely responsible for the conditions which develop during construction and in the event any structure is dislocated, or over strained, or damaged so as to affect its usefulness, the Contractor shall correct or repair any dislocations, over strains or damages caused.

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§ 3.2.1.5 The Contractor is responsible for restorations and/or repair of utilities, private property, buildings, pavement, walkways, roads, etc. damaged by its activities during the performance of its Work.

§ 3.2.1.6 The Contractor shall be responsible to remove and/or relocate all items that interfere with the new construction at no additional cost to the Owner.

§ 3.2.1.7 The Owner shall not be required to make any adjustment in the Contract Sum or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Section 3.2 of these General Conditions and all of its sub-sections.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work and at frequent intervals during the progress of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section ~~2.3.5,~~ 2.3.5 of these General Conditions, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.2.1 The Contractor shall assume full responsibility for accuracy of measurements obtained at the site. No extra compensation will be allowed because of differences between actual measurements and dimensions indicated on the Drawings, nor for Contractor's failure to coordinate work with actual field measurements.

§ 3.2.2.2 Should the Contractor perform any construction activity knowing it involves an error, inconsistency or omission in the Contract Documents without reporting such error, inconsistency or omission in the Contract Documents to the Construction Manager and Architect, the Contractor shall be solely responsible for such performance and shall bear all costs of correction. No unreported error, inconsistency or omission will provide a basis for additional compensation from the Owner to complete the Contractor's Work or a basis to excuse the Contractor from the completion of its Work.

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§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or ~~3.2.3,~~ 3.2.3 of these General Conditions, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the ~~Owner, subject to section 15.1.7,~~ Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the ~~Owner~~ Owner, Construction Manager or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

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§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner, the Construction Manager, and the Architect, and the Contractor shall propose alternative means, methods, techniques, sequences, or ~~procedures.~~ procedures that will preserve all applicable warranties, including the Contractor's general warranty. The Architect

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shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures. All loss, damage, liability or cost of correcting defective work arising from the employment of specific (including but not limited to alternative) construction means, methods, techniques, sequences or procedures shall be born solely by the Contractor.

...

§ 3.3.3.1 The Contractor shall be responsible for and coordinate any and all inspections required by any governmental body having jurisdiction over the Project. Failure to obtain any permits, licenses or other approvals because of the failure of the Contractor to conform to this requirement shall not extend the Contract time, and the Contractor shall not be entitled to any increase in the contract sum therefore. In addition, any additional costs and/or expenses of any nature incurred by the Owner as a result of the Contractor's failure to conform to this requirement shall constitute a charge against the Contractor's contract.

§ 3.3.4 It is understood and agreed that the relationship between the Contractor and the Owner shall be that of an independent contractor. Nothing contained in or inferable from the Contract Documents shall be deemed or construed to (1) make the Contractor the agent, servant or employee of the Owner or (2) create any partnership, joint venture or other association between the Owner and Contractor. Any direction or instruction by the Owner regarding the Work shall be given solely to relate the results the Owner desires to obtain from the Work and shall not be construed as affecting the Contractor's independent contractor status.

...

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 of these General Conditions or ordered by the Architect in accordance with Section ~~7.4,~~ 7.4 of these General Conditions, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

After the Agreement has been executed, the Owner and Architect will consider requests for the substitution of products in place of those specified only if the Contractor satisfies the procedural requirements set forth in the General Requirements (Division 01) of the Specifications. By making requests for substitutions, the Contractor.

- **.1** Represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
- **.2** Represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
- **.3** Certifies that the cost data presented is complete and includes all related costs for the substituted product ad for Work that must be changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that may subsequently be incurred by the Contractor; and
- **.4** Shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.2.1 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed upon changes in the Drawings and Specifications resulting from such substitutions. The Owner may seek reimbursement pursuant to the procedures set forth in § 9.5.1.

§ 3.4.2.2 The Contractor shall bear all expenses resulting from substitutions including the cost General Conditions as well as any structural, plumbing, mechanical and electrical trade costs made necessary by the substitution.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly

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skilled in tasks assigned to them. The Owner reserves the right to object to Contractor's use of persons who appear unfit or not skilled in the tasks assigned to them. Should any disorderly, incompetent, unfit or unskilled person be hired or employed by the Contractor, upon or about the premises of the Owner, for any purpose or in any capacity, upon request of the Owner, such person shall be removed from the Project and shall not be reassigned to the Project without the prior written permission of the Owner, through the Construction Manager.

§ 3.4.4 The Contractor shall be responsible for coordinating the work of its own forces and the work of subcontractors engaged by it to perform the Work of the Project on its behalf. The Contractor shall review any specified procedure(s) or installation procedure(s) with its employees and/or subcontractors, including those recommended by any product manufacturer, prior to the commencement of the relevant portion of the Work to be performed.

§ 3.4.5 Each Contractor shall be responsible for complying with applicable union regulations existing under current labor agreements in performing construction work on the Project. The Contractor shall make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Construction Manager, Architect or the Owner, any conflict between the Contractor's Contract with the Owner and any agreements or regulations of any kind at any time in force among members of a trade union or any councils that regulate the activities of a trade. The existing Construction Manager/Owner Contract is an agency contract and all construction contracts will be made directly with the Owner.

§ 3.4.6 The Contractor is solely responsible for managing labor and labor relations with respect to those engaged by it to perform the Work of the Project, including labor disputes or concerted activity, direct or indirect. No delay in the performance of the Work shall be excused by reason of labor problems affecting the Contractor or any subcontractor. There shall be no strikes, picketing, work stoppages, slowdowns or other disruptive activity at the Project sites for any reason by anyone employed or engaged by the Contractor to perform its portion of the Work.

§ 3.4.6.1 Should it become necessary to create a separate entrance for a Contractor involved in a dispute, all costs associated with creating such entrance shall be borne by the Contractor involved in the dispute. Such costs shall include but not be limited to signage, fencing, temporary roads and security personnel.

§ 3.4.6.2 The Contractor shall be liable to the Owner for all damages and additional costs incurred by the Owner as result of strikes, picketing, work stoppages, slowdowns or other disruptive activity at the Project sites.

§ 3.4.6.3 In the event of strikes or labor disputes by the Contractor's forces or other prime contractors, or separate contractors performing work for the Owner, the Contractor shall continue with its work and provide all necessary manpower as required to maintain the schedule and completion dates of the Project. The Contractor shall ensure that its Work continues uninterrupted during the pendency of a labor dispute.

§ 3.4.7 All products submitted for use and incorporated into this Project shall be asbestos free. The Contractor is obligated, by executing the Contract with the Owner, to ensure that absolutely no asbestos containing material is used in conjunction with the performance of its Work. It is the Contractor's sole responsibility to ensure that no asbestos containing material is built into the construction, or that any equipment or materials used in the construction contain any asbestos containing material. If asbestos containing material is found, at any time during or after the construction is completed, it shall be the responsibility of the Contractor who installed said material to remove it and replace it with new non-asbestos containing material, in accordance with federal, state and local mandates, and to indemnify all their employees, agents, or servants or any third parties including but not limited to the Owner, the Construction Manager and the Architect, and their respective Boards of Education, contractors, consultants, volunteers or employees for any costs or damages incurred on account of the presence, removal and remediation of such asbestos containing material. This provision will be limited only to the extent required by law, is in addition to the indemnities provided in Section 3.18 of these General Conditions and elsewhere in the Contract Documents and shall survive the termination or expiration of the Contract.

§ 3.4.8 Contractor shall furnish the Construction Manager in writing the names, addresses and telephone numbers of the members of Contractor's organization who can be contacted in the event of an off-hours emergency at the Project site.

§ 3.4.9 Unless otherwise specifically agreed in writing by the Owner for a specific purpose, the Owner shall not be responsible for any overtime charges or shift differential charges incurred by the Contractor during the course of this

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Project. Any and all costs associated with the Work performed at hours requiring the payment of overtime or shift differentials by the Contractor to its workers shall be the Contractor's responsibility. When the Owner specifically agrees in writing to be responsible for overtime costs incurred by the Contract, the Owner shall reimburse the Contractor or its Subcontractor on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period.

§ 3.4.10 Applicable codes and standards for material furnished and work installed shall include all state laws, local ordinances, requirements of governmental agencies having jurisdiction, and requirements of state, federal and industry codes and standards that apply to the Project and its components, including but not limited to:

1. New York State Uniform Fire Prevention and Building Code and amendments thereto.
2. New York State Energy Conservation Construction Code.
3. State Education Department Manual of Planning Standards and 8 N.Y.C.R.R. § 155.5.
4. New York State Department of Transportation, Office of Engineering, Standard Specification, Construction and Materials, dated January 2, 1990, and latest addendum thereto.
5. Life Safety Code – NFPA 101-91.
6. National Electric Code
7. National Board of Fire Underwriters
8. Any other codes or standards referenced in the Specifications and Drawings.

§ 3.4.11 Where specific performance requirements are listed in the Specifications, it is the intent of this specification that all manufacturers, fabricators, suppliers, installers, contractors, subcontractors, specialty and sub-subcontractors will provide services satisfying these requirements whether mentioned by trade or manufacturer's name or submitted for approval as a substitute.

§ 3.4.12 Where no explicit quality or standards for materials or workmanship are established for work, such work shall be of quality consistent with industry standards and of the construction quality established for the Project generally.

§ 3.4.13 Welding. The Contractor shall ensure the safe handling and storage of all welding materials, acetylene and oxygen tanks, and other equipment required for welding and cutting work at the job site. All welding materials and equipment shall be removed promptly from the premises upon completion of the welding and cutting work.

§ 3.4.13.1 Appropriate fire extinguishing equipment shall be provided where welding or cutting is to be performed. Sprinklers subject to fusing from heat due to welding or cutting shall be temporarily shielded, with valves to remain open. Contractors will be back charged for all fines imposed for false fire alarms.

§ 3.4.13.2 Welding or cutting shall not be performed in or near rooms or locations where flammable gases, liquids or vapors, lint, dust or loose combustible stocks are present unless suitably protected when sparks or hot metal from welding or cutting operations may cause ignition or explosion of such materials.

§ 3.4.13.3 Combustible construction or material shall be wet down or protected by noncombustible shields or covers from possible sparks, hot metal or oxide.

§ 3.4.14 Ventilation During Construction. The General Contractor shall provide ventilation of enclosed areas during construction as may be required to permit proper curing and drying out and to prevent excessive humidity moisture and condensation. Ventilation shall be by natural or artificial means as required by conditions involved.

§ 3.4.15 Broken Glass. Each Prime Contractor shall be responsible for all broken, scratched, or damaged glass, which shall be replaced upon completion of the Work. Said Prime Contractor shall reimburse the General Contractor for replacement costs of all such damaged glass upon completion of the Work. The responsibility for all broken, scratched, or damaged glass, shall terminate upon acceptance of the Work by the Owner, except as provided in the Conditions of Contract (General, Supplementary and Other) and Specifications with respect to defective materials, workmanship, and guarantee/warranty provisions.

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§ 3.5.1 The Contractor warrants to the Owner, Construction Manager, and Architect that materials and equipment furnished under the Contract will be of good ~~quality and new~~ quality, new and of recent manufacture unless the

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Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these ~~requirements may be considered defective.~~ requirements, including substitutions not properly approved and authorized, shall be considered defective and shall be removed and replaced at the Contractor's expense unless otherwise agreed to by the Owner. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section ~~9.8.4.~~9.8.4 of these General Conditions. If not already in the name of the Owner, the Contractor shall assign to the Owner at the time of Substantial Completion of the Work, unless otherwise provided in the Certificate of Substantial Completion, any and all manufacturer's warranties relating to materials, equipment, fixtures and/or labor incorporated into the Work.

§ 3.5.3 The warranties in this Section 3.5 shall be in force for a minimum duration of one (1) year after the date of Final Completion of the Work or designated portion thereof, or after the date for commencement of warranties established in the Certificate of Substantial Completion or by terms of any applicable special or extended warranty required by the Contract Documents or as set forth in the Project Manual's technical specifications for warranties of equipment, whichever duration is longer. The warranty provided by the Contractor in this Section 3.5 is in addition to any warranty provided by equipment and material manufacturers. Notwithstanding anything to the contrary contained in the Contract Documents, all warranties shall be construed in the manner and duration most favorable to the Owner. The warranties in this Section 3.5 shall survive expiration and/or termination of the Contract.

§ 3.5.4 The Contractor shall perform its Work in such a manner as to preserve all manufacturer's warranties on materials, equipment, fixtures and/or labor incorporated into the Work. The Contractor will exercise its best efforts to service and to enforce for the benefit of the Owner all manufacturer's warranties on materials, equipment, fixtures and/or labor incorporated into the Work.

§ 3.5.5 The Contractor warrants good and legal title to all materials, equipment and fixtures installed or incorporated into the Work.

§ 3.5.6 All corrections to defective or deficient Work, material or equipment shall be made at the convenience of the Owner.

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~~The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.~~**§ 3.6.1** Owner is exempt from payment of New York State, and Local Sales and Compensation Use Taxes on all supplies and materials incorporated into and becoming an integral component part of the structures, buildings, or real property pursuant to this Contract. Such taxes are therefore not to be included in the Contractor's bid or Contract Sum. This exemption does not apply to machinery, equipment, tools and other items purchased, leased, rented or otherwise acquired for the Contractor's use in part or entirely in connection with the Work and the Contractor and subcontractors shall be responsible for any and all applicable taxes, including sales and use taxes, on such items. The exemption only applies to materials, machinery and equipment fully incorporated into the Work of the Contractor as accepted by the Architect and the Owner. Upon request, Owner will furnish proof of its exemptions to the Contractor.

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§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, ~~assisted by the Construction Manager,~~ through and with the assistance of the Construction Manager and Architect, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses, and inspections by government agencies

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necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

.1 The Contractor shall promptly deliver copies permits, fees, licenses, and inspections it obtains for its Work and/or the Project to the Construction Manager and Owner.

.2 If in connection with the Project, the Owner has obtained certain permits, licenses or agreements for the Project, the Owner will furnish copies of these documents to the Contractor. It is the Contractor's responsibility to comply with any conditions or limitations placed on the Project by these permits. The Contractor shall fully cooperate with the Owner in meeting the permit requirements and accommodations of regulatory inspections / directives.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor fails to give such notices as applicable to the performance of the Work, the Contractor shall be liable for and shall indemnify and hold harmless the Owner against any and all resulting fines, penalties, judgments or damages, including reasonable attorney fees, imposed on or incurred by the parties indemnified, as a result of such failures by the Contractor.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to (or if Contractor should have known it to be contrary to) applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear ~~the~~ all costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than ~~14~~ 7 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify in writing the Owner, Construction Manager, and Contractor, stating the reasons. If the ~~Owner or~~ Contractor disputes the Architect's determination or recommendation, ~~either party~~ the Contractor may submit a Claim as provided in Article 15.

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§ 3.7.6 Upon completion of the Work, the Contractor shall deliver to the Architect original copies of all required final certificates of inspection, the Certificate of Occupancy, the other documents evidencing that inspections required by authorities having jurisdiction over the Work have been performed.

...

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change ~~Order.~~ Order or, absent agreement, by Construction Change Directive. The amount of the Change Order or Construction Change Directive shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 of these General Conditions and (2) changes in Contractor's costs under Section ~~3.8.2.2.~~3.8.2.2 of these General Conditions.

...

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. Such designation shall be in writing and provided to the Architect, Construction Manager, and Owner. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. To the extent Work is being performed

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contemporaneously at two different facilities of the Owner, the Contractor shall assign different superintendents to each facility.

The Contractor's superintendent shall not be removed from this Project until the Contractor's punch list has been completed and the Contractor's Work has been accepted by the Owner. Unless approved otherwise by the Owner in advance, the Contractor's superintendent shall be assigned solely to this Project and shall not perform any duties or superintendence on any other Project until completion of the Contractor's Work. The superintendent shall not be employed or used on any other project during the course of the work. The Owner shall have no obligation to direct or monitor the Contractor's employees, Subcontractors, or suppliers.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect, through the Construction Manager, of the name and qualifications of a proposed superintendent. The Contractor will provide a resume of Contractor's proposed superintendent to the Owner, Architect and Construction Manager. Within 14 days of receipt of the information, the Construction Manager may notify the Contractor, stating whether the Owner, the Construction Manager, or the Architect (1) has reasonable objection to the proposed superintendent or (2) require additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager, or Architect has made reasonable and timely objection. The Contractor shall not change the ~~superintendent without the Owner's consent, which~~ superintendent, during the duration of the Project including the completion of Punch List, unless the superintendent is no longer employed by the Contractor or the prior written consent of the Owner is obtained, which consent shall not unreasonably be withheld or delayed. The superintendent shall be changed upon request of the Owner for good cause shown. In the event of such direction, the Contractor shall, within seven days after notification thereof, replace said individual(s) with an individual satisfactory to Owner.

§ 3.9.4 The Contractor shall coordinate and supervise the work performed by its subcontractors so that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all subcontractors shall afford each trade reasonable opportunity for the installation of their work and the storage of their materials.

§ 3.9.5 It is required of any and all supervisory personnel proposed for use by any Contractor that said personnel be versed in the English language or, said Contractor shall furnish a full-time on-site interpreter to facilitate communications between and with all Contractors, all Subcontractors, the Owner, the Construction Manager and the Architect.

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§ 3.10.1 The Contractor, ~~promptly~~ within five (5) business days after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

§ 3.10.1.1 Upon review and acceptance by the Owner and the Construction Manager of the Contractor's construction schedule, including the Milestone Dates therein, the construction schedule shall be deemed part of the Contract Documents. If not accepted by the Owner and the Construction Manager, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Construction Manager and re-submitted for acceptance. Submission of an accepted Construction Schedule shall be a prerequisite to initial payment.

§ 3.10.1.2 The Contractor shall monitor the progress of the Work and shall update Contractor's construction schedule at least once a month or more frequently if requested by the Construction Manager. The Contractor shall promptly

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advise the Construction Manager and Architect, with a copy to the Owner, of any nonconformance or potential for nonconformance with the construction schedule. The Contractor shall furnish the Owner, the Construction Manager and Architect with sufficient copies of each submitted schedule.

§ 3.10.1.3 In the event that any updated Construction Schedule indicates a projected Substantial Completion date that is more than thirty (30) days after the required Substantial Completion date (as the same may be extended by the Change Order for Excusable Delay), the Owner shall have the right to direct the contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, facilities, (3) rescheduling activities, and (4) other similar measures (hereinafter referred to collectively as "Recovery Measures"). Such Recovery Measures shall continue until the progress of the Work complies with the state of completion required by the Construction Schedule. The Owner's right to require Recover Measures is solely for the purpose of ensuring the Contractor's compliance with the Construction Schedule.

.1 The Contractor shall not be entitled to see an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner, unless they are incurred by the Contractor as directed in writing by the Owner to mitigate or offset an Excusable Delay.

.2 The Owner may exercise the rights furnished to the Owner under or pursuant to this Subparagraph 3.10.1.3 as frequently as is reasonably necessary to ensure that the Contractor's performance of the Work will comply with any milestone date or completion date set forth in the Construction Schedule.

.3 The Owner reserves the right to withhold payment until such time as the Contractor submits a schedule showing work to be on schedule again in accord with the Project Schedule and the Work is being performed per revised schedule.

§ 3.10.2 The Contractor, ~~promptly~~ within five (5) business days after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

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§ 3.10.5 The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of the owner's premises or any tenants or invitee thereof. The Contractor shall, upon the Owner's request, reschedule any portion of the Work affecting operation of the premises to hours when the premises are not in operation. Any postponement, rescheduling or performance of the Work under this Section 3.10.5 may be grounds for an extension of the Contract Time, if permitted under Section 8.3.1 of these General Conditions if: (1) the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents and (2) such rescheduling or postponement is required for the convenience of the Owner.

~~The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, and Owner, and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.~~**§ 3.11.1** The Contractor shall make available, at the Project site, the Contract Documents, including Drawings, Specifications, Addenda, Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, as well as the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Construction Manager, Architect, Owner and representatives of any governmental agency with authority over the Project, and shall be delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.11.2 The Contractor shall maintain at the Project site, and shall make available to Owner, Construction Manager, Architect and representatives of any governmental agency with authority over the Project, one record copy of the

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Drawings (the "Record Drawings", which are also referred to as "As-built Drawings") in good order and marked to indicate field changes and selections made during construction.

§ 3.11.3 Final payment and any retainage shall not be due and owing to Contractor until the Record Drawings are received in a form satisfactory to the Architect, the Constuction Manager and the Owner (and all other closeout requirements are met).

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§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 ~~through 4.2.12.~~ through 4.2.12 of these General Conditions. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

...

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor represents and warrants that all Shop Drawings shall be prepared by persons and entities possessing knowledge and experience in the trade for which the Shop Drawing is prepared**.** The Contractor shall communicate and supply Shop Drawings to other Contractors to ensure proper coordination.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been reviewed and approved by the Architect. If the Contractor elects to perform work without such approvals, same shall be at the Contractor's own risk and the Contractor will be responsible for all costs of correction.

...

§ 3.12.9 Upon the Architect's rejection of the Contractor's Shop Drawings, Product Data, Samples or other similar submittals, the Contractor shall review the rejection and re-submit such Shop Drawing, Product Data, Sample or other similar submittal in accordance with the Architect's instruction. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions ~~other than those~~ which have been made, including revisions not specifically requested by the Construction Manager ~~and~~ or Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

...

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by ~~an appropriately licensed design professional,~~ a design professional appropriately registered and/or licensed in New York State, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner, the Architect, and the Construction Manager shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in

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the Contract Documents. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

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§ 3.12.10.3 When professional certification of performance criteria of materials, systems or equipment is required of the Contractor, the Architect shall be entitled to rely in a reasonable and professional fashion upon the accuracy and completeness of such calculations and certifications, provided, however, if the Architect, in its reasonable and professional judgment considers it advisable, the Architect shall verify the accuracy and completeness of any and all such calculations and/or certifications. In the event any and all such calculations and/or certifications are found to be inaccurate and/or incomplete by the Architect, the Contractor shall assume full responsibility and shall bear all costs attributable or related thereto, including, without limitation, the expense of the Architect's additional services associated with the verification of such calculations and/or certifications and the expense of the Architect's additional services made necessary by the failure of such calculations and/or certifications to be accurate or complete.

...

.1 Due to the site constraints, only materials and equipment that are to be used in the Work shall be brought to and stored on the Project site by the Contractor. Only vehicles that are absolutely necessary for performing the Work shall be parked or stored within the work areas. After materials, vehicles and equipment are no longer required for the Work, they shall be promptly removed from the Project site.

.2 Protection of materials, vehicles and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall provide all barriers and protection as required to safeguard the work, traffic to and from the site, the public and the occupants of the building during construction. The Contractor shall comply with all fire code regulations during construction. While the Owner may have security guards patrolling its properties, this does not release or otherwise mitigate the Contractor's responsibility to protect material, vehicles and equipment stored or the Project site from theft, damage or other adversity or the Contractor's responsibility to ensure the safety and security of the construction areas.

.3 The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and adjacent areas. The Work shall be performed in such a manner that areas adjacent to the site of the Work shall be free from all debris, building materials and equipment.

.4 The Contractor shall not permit any workers to use existing facilities at the Project site, including, without limitation, lavatories, entrances and parking areas other than those designated and approved by the Owner.

.5 The Contractor shall provide all temporary access walkways, both interior and exterior, temporary partitioning and the like necessary to complete the operations. The Contractor shall maintain in an unobstructed condition all entrances and/or exits from present buildings.

.6 The Contractor shall comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the rules and regulations.

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§ 3.13.3 The Contractor shall be required to perform the Work of the Project with no interruption to the Owner's operations. Any work which will interfere with the Owner's operations shall be performed after regular school hours, and/or during weekends, holidays or other times when the Owner's facilities are not in session for students at no additional cost to the Owner. All costs incurred by the Owner to make the facilities available during those times shall be borne by the Contractor, including time charges incurred for the Owner's own forces and additional charges of the Construction Manager. The Owner reserves to itself the right to determine what work will "interfere" with its operations and said determination shall be final.

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§ 3.13.4 The Contractor and any entity for which the Contractor is responsible shall not erect any sign on the Project site without the written consent of the Owner provided through the Construction Manager, which may be withheld in the sole discretion of the Owner.

§ 3.13.5 The Contractor shall repair or replace any existing trees, shrubbery or other planting that are to remain after completion of the Project that are damaged by operations and/or workers employed in performance of its Contract.

§ 3.13.7 The Contractor shall provide full and free access for the Architect, Construction Manager, Owner and/or their representatives and consultants, to inspect job materials, equipment, fabrication facilities, and storage locations, at and away from the site of the Work.

§ 3.13.8 Rules of Conduct

1. In accordance with federal and state law, smoking (including electronic cigarettes), vaping, and the use of tobacco products, as well as any nicotine or cannabis products, are prohibited within all buildings of the Owner and on all school property of the Owner and within 100 feet of all entrances, exits and boundaries of elementary and secondary schools at all times
2. No drinking of alcoholic beverages or use of controlled substances are allowed on Owner's property. No reporting to work impaired by alcohol or controlled substances allowed. The Contractor bears the responsibility of ensuring its, and its subcontractors', employees are not impaired in any manner that would jeopardize the safety of the public, the employees of other Contractors and their Subcontractors, the Owner, Architect, and Construction Manager.
3. All Contractors, subcontractors, suppliers and their employees are to refrain from conversing with the Owner's personnel, volunteers, invitees and students. Any construction employees found doing so will be removed from the site. NO COMMUNICATION BETWEEN WORKERS AND STUDENTS WILL BE TOLERATED.
4. All Contractors, subcontractors, suppliers, and their employees are to refrain from using indecent language. All doing so will be removed from the site. Artwork and decoration found on vehicles belonging to Contractor's or Subcontractor's employees parked on or near the Owner's property that contain indecent language or pictures shall either be covered or removed from the location.
5. All construction personnel shall wear photo ID badges. Photo ID badges are to be provided by the Contractor and receive the approval of the Owner, through the Construction Manager.

...

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate ~~Contractors. Consent~~ Contractors, which consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.14.3 All cutting and patching work shall be done by the Contractor (or through the appropriate Subcontractor). Patches in finish surfaces shall match the adjacent surfaces in material, finish, detail, and quality. Patches in fire rated construction or construction required to be smoke tight shall be made in conformance with assemblies designed and tested by agencies recognized by governing codes. Any UL rated fire-safing materials, flanges, or other materials required by Code, the Contract Documents, or manufacturer's installation instructions for devices penetrating the work affected shall be applied and installed by an approved firestop subcontractor or qualified personnel from the applicable trade.

§ 3.14.4 Only trades persons skilled and experienced in cutting and patching shall perform such work.

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§ 3.15.1 ~~The~~ On a daily basis, the Contractor shall keep the ~~premises~~ Project site and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and

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surplus materials from and about the Project. At completion of the Work, the Contractor also shall remove temporary protection and facilities installed for protection of work during construction unless otherwise directed by the Owner, Architect or Construction Manager.

§ 3.15.2 ~~If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.~~In addition, at the completion of the Work, the Contractor shall perform the following final cleaning:

.1 Remove temporary protection and facilities installed for protection of work during construction unless otherwise directed by the Owner, Architect or Construction Manager
.2 Clean transparent materials including glass in doors and windows.
.3 Replace any damaged glass.
.4 Clean each surface or unit to the condition expected in normal commercial building cleaning in compliance with manufacturer instructions.
.5 Clean exposed finishes to a dust free condition, free of stains, films, fingerprints and similar foreign substances.
.6 Clean floors as recommended by the manufacturers if new, vacuum existing carpeted floors and mop existing wood, ceramic tile and vinyl tile floors.
.7 Wipe surfaces of mechanical and electrical equipment, to remove excess lubrication and other substances.
.8 Clean plumbing fixtures to a sanitary condition.
.9 Clean light fixtures and lamps.

§ 3.15.3 Comply with authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials on Owner's premises. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of them in a lawful manner.

§ 3.15.4 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor(s) who failed to clean. The cost will be divided among each Contractor who has not cleaned their debris and shall include any custodial overtime, Construction Manager's administration fees, etc. If the Owner is not reimbursed for such costs, the Contractor's share of such costs shall be deducted from the next payment to the Contractor.

...

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, Construction Manager, and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner, Architect, or Construction Manager. However, if an infringement of a copyright or patent is discovered by, is believed to exist by or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect and Owner through the Construction Manager.

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§ 3.18.1 To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, ~~Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them~~ Owner's Board of Education, Construction Manager, Architect, and each of their respective officers, directors, consultants, agents and employees from and against claims, damages, losses, judgements, fines, penalties, costs and expenses, including but not limited to attorneys' fees, ~~arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is~~ attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property ~~(other than the Work itself), but only to the extent caused by the negligent acts or omissions of~~ arising out of or resulting from performance of the Work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, judgement, fine, penalty, cost or expense is caused in part by a

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party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 The Owner's right to indemnification shall in no way be diminished, waived or discharged by the exercise of any other remedy provided by the Contract Documents or by law.
§ 3.18.1.2 The Owner may withhold from an offending Contractor's Contract Sum an amount sufficient to cover any damages sustained by person or entity indemnified by the Contractor pursuant to this Section 3.18 and all expenses and costs associated with the damage sustained.
§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under ~~Section 3.18.1~~ this Section 3.18 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor's indemnity obligations under this Section 3.18 shall, but not by way of limitation, specifically include all claims, damages, suits, proceedings, actions, fines, penalties, charges and judgments which may be made against the Owner, the Architect, the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents under any applicable statute, rule, regulation or ordinance, including the New York State Labor Law, the New York State Occupational Safety and Health Act, the Federal Occupational Safety and Hazardous Act and similar laws of other governmental bodies having jurisdiction over the Owner's property or Project due to the method of execution of the Work of the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor.

§ 3.18.4 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Owner's Board of Education, the Architect and the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") of and from any and all liability for violation of any statute, rule, regulation or ordinance applicable to the Contractor's Work and shall defend any claims, proceedings or actions which may be brought against one or more of the Indemnitees as a result thereof.

§ 3.18.5 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner, Architect and Construction Manager from any and all claims, damages, losses, suits, obligations, fines, penalties, costs, charges, and expenses which may be imposed upon or incurred by or asserted against any of them by reason of act or omission of such Contractor or any person or firm for whose acts such Contractor may be liable, with respect to such Contract or the performance or failure to perform the Work under such Contract.

§ 3.18.6 As an addition to and not a limitation of the indemnity provided in Section 13.18.1 of these General Conditions, to the fullest extent permitted by law, the Contractor also shall defend, indemnify and hold harmless the Owner, the Owner's Board of Education, the Architect and the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees"), at the Contractor's sole expense, against any actions, lawsuits or proceedings brought against the Indemnitees as a result of any and all public improvement liens filed against the payments due the Contractor as well as any other liens filed against the Owner's property or facilities. The Contractor hereby agrees to indemnify and hold harmless the Indemnities against any liability, claims, damages, losses, obligations, fines, penalties, charges, judgments, costs and expenses, including but not limited to attorneys' fees, suffered or incurred by Indemnities as a result of such liens, claims, actions, lawsuits or proceedings.

§ 3.18.7 Whenever any party to the Contract is required in words or substance to indemnify or hold harmless another party, whether or not the following is expressly included in whole or in part in the paragraph or section with regard to such particular indemnification and hold harmless provision, such indemnification and hold harmless provision shall include, but not be limited to, the payment or reimbursement of all judgments, claims, damages, losses, fees costs and expenses and litigation costs and expenses, including but not limited to, the reasonable fees of its attorneys and witnesses.

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§ 3.18.8 Whenever the Contractor is required in this Section 3.18 or any other provision of the Contract Documents to defend the Owner, the Owner's Board of Education, the Architect, or the Construction Manager or their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") against any claim, action, or proceeding, in the event the Contractor shall fail or refuse to defend any one or more of the Indemnitees, the Contractor shall be liable to such Indemnitee for all costs such Indemnitee incurs in defending such claim, action or proceeding and all costs of such Indemnitee, including attorneys' fees, incurred to recover such defense costs from the Contractor.

§ 3.18.9 The Contractor's obligations under this Section 3.18 are in addition to and in no way limits or abrogates any other indemnity obligation of the Contractor included in any other provision of the Contract Documents. The Contractor's obligations under this Section 3.18 shall survive the expiration and/or termination of the Contract, in whole or in part.

§ 3.19 Daily Records Clause

§ 3.19.1 The Contractor shall prepare and maintain Daily Inspection Records to document the progress of the work on a daily basis. Such daily records shall include a daily accounting of all labor and all equipment on the site for the Contractor and all subcontractors, at any tier. Such daily records will make a clear distinction between work being performed under Change Order, base scope work and/or disputed work. Such daily records shall be copied and provided to the Owner through the Construction Manager at the end of every week.

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§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 of these General Conditions and identified as such in the Agreement.

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 of these General Conditions and identified as such in the Agreement.

~~**§ 4.1.3** Duties, responsibilities, and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Construction Manager, Architect, and Contractor. Consent shall not be unreasonably withheld.~~

...

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager (1) known deviations from the Contract Documents and from the most recent Project schedule prepared by the Construction Manager, and (2) defects and deficiencies observed in the Work. The Architect will recommend to the Owner what actions are needed to remedy the defects and deficiencies observed in the Work.

§ 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor to maintain the Project Schedule or for defects and deficiencies in the Work. The Owner may see reimbursement pursuant to the procedures set forth in Section 9.5.1 of these General Conditions.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect (1) known deviations from the Contract Documents and from the most recent Project schedule, and (2) defects and deficiencies observed in the Work.

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§ 4.2.5 The Construction Manager, except to the extent required by Section ~~4.2.4,~~ 4.2.4 of these General Conditions, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

§ 4.2.6 Communications. ~~The Owner shall communicate with the Contractor~~ Except when direct communications have been specifically authorized or emergency circumstances necessitate direct communications, the Owner and Contractor shall endeavor to communicate with each other and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract ~~Documents.~~ Documents or the Project. The Owner and Construction Manager shall include the Architect in all communications that relate to or affect the Architect's services or professional ~~responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Construction Manager otherwise relating to the Project. Communications~~ responsibilities.. Except when emergency circumstances necessitate direct communications, communications by and with the Architect's consultants shall be through the Architect. ~~Communications~~ Except when emergency circumstances necessitate direct communications, communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager. ~~Communications~~ Except when emergency circumstances necessitate direct communications, communications by and with the Owner's own forces and Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

...

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager or Architect considers it necessary or advisable, the Construction Manager and Architect individually will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and ~~13.4.3,~~ 13.4.3 of these General Conditions, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager and Architect will be subject to the provisions of Sections 4.2.18 through 4.2.20 ~~inclusive,~~ inclusive of these General Conditions, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 of these General Conditions nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.
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§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, ~~and 3.12.~~ and 3.12 of these General Conditions. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

...

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section ~~7.4.~~ 7.4 of these General Conditions. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section ~~3.7.4.~~3.7.4 of these General Conditions.

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§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section ~~9.8;~~ 9.8 of these General Conditions; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section ~~9.10.~~ 9.10 of these General Conditions. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.
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§ 4.2.18 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Construction Manager, Owner, or Contractor through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations or information requested of the Architect shall be furnished in compliance with this Section 4.2 of these General Conditions, then no delay may be claimed by the Contractor based on the failure of the Architect to furnish such interpretations or information if they are provided within 15 days after the Architect's receipt of the request.

§ 4.2.19 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions ~~so rendered in good faith.~~that are consistent with the Contract Documents. Such interpretations may, at the Architect's option, be issued in the form of additional drawings or instructions or both indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be effected by Construction Change Directive or other notice to the Contractor, and provided such drawings and/or instructions are, in the opinion of the Architect, reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings and/or instructions without additional cost or extensions of Contract Time.

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§ 4.2.22 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

.1 The Contractor's request for information shall be prepared and submitted in accordance with the General Requirements (Division 01 of the Specifications) on the form included therein or as otherwise approved in advance. The Architect will return requests for information that do not conform to requirements of the Contract Documents.

.2 The Architect's response to a request for information (RFI), or issuance of a clarification or interpretation shall be considered an interpretation, clarification, supplemental information or an order for a minor change in the Work not involving an adjustment in Contract Sum or extension of Contract Time and not inconsistent with the intent of the Contract Documents, and shall be binding, unless indicated otherwise in the Architect's response to the RFI.

§ 4.2.23 The Contractor shall maintain a log that lists each request for information. This log shall contain the Drawing reference or Specification section to which the request pertains, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Architect's resolution thereof.

...

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the ~~site.~~ site or to furnish material, equipment, fixtures or other services with respect to a portion of the Work. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a

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Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or Separate Contractors or the subcontractors of other Contractors or Separate Contractors.
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The listing required by this Section shall be submitted to the Architect no later than 30 days from the date of the Agreement. This list shall include the names of manufacturers, suppliers, and installers proposed for each of the products, equipment, and materials to be incorporated into the Project.

The Contractor shall furnish upon request adequate data on any named entity on the list in order to permit the Architect and the Owner to conduct a proper evaluation. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents and all products furnished by the listed manufacturer must conform to such requirements.

The Contractor shall, prior to any work being performed, obtain and provide to the Owner and Construction Manager, a copy of each Subcontractor's Contractor Certificate of Registration obtained through compliance with Section 220-i of the New York State Labor Law.

§ 5.2.1.1 Subcontractors will not be acceptable unless, when required by the Construction Manager, evidence is furnished that the proposed subcontractor has satisfactorily completed similar subcontracts as contemplated under this prime contract, and has the necessary experience, personnel, equipment, plant, and financial ability to complete the subcontract in accordance with the intent to the Contract Documents.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required. In addition, no increase in the Contract Price or Contract Time shall be allowed where a subcontractor is rejected by the Architect, Construction Manager or Owner who (1) is deemed unqualified to perform the particular work subcontracted by the Contractor, (2) has too many current projects to reasonably be expected to have sufficient personnel to timely perform the subcontracted work, (3) does not have the necessary experience, personnel, equipment, plant and financial ability to complete the subcontract or (4) has a history of poor performance in work of a similar nature.

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§ 5.2.5 Notwithstanding any other provision of the Contract Documents, Contractor shall perform at least twenty-five percent (25%) of the field work by its own employees. For the purpose of the preceding sentence, any part of the work performed by supervisory personnel (persons above level of foreman) or by the office personnel shall not be considered part of the field work performed by the Contractor's employees. Such items as bonds, certificates of insurance, shop drawings and similar items do not count towards the twenty-five percent (25%) requirement.

§ 5.2.6 All Subcontracts over $10,000 shall be in writing. Fully executed copies of all subcontracts shall be provided to the Owner through the Construction Manager, including but not limited to all addenda, appendices and/or exhibits to such subcontracts, including scope of work sheets before work by such subcontractors commences. Upon request, any Purchase Orders for materials, equipment or supplies related to the performance of the Work shall be furnished to the Owner through the Construction Manager.

~~By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor~~

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~~so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.~~**§ 5.3.1** By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. The agreement between the Contractor and Subcontractor shall not provide, nor shall the Contract Documents be deemed to provide, any rights, remedies or redress by the Subcontractor(s) against the Owner.

§ 5.3.2 The Contractor shall not enter into any subcontract, contract, agreement, purchase order or other arrangement for the furnishings of any portion of the materials, services, equipment or Work with any party or entity if such party or entity is an Affiliated Entity, unless such Arrangement has been approved by the Owner through the Construction Manager, after full disclosure of the relationship and all details relating to the proposed Arrangement. The term "Affiliated Entity" means any entity with respect to which the Contractor has direct or indirect ownership or control, including, without limitation,

.1 Any entity owned in whole or in part by the Contractor;

.2 Any holder of more than ten percent (10%) of the issued and outstanding shares of, or the holder of any interest in, the Contractor; or

.3 Any entity in which any officer, director, employee, partner or shareholder or member of the family of any of the foregoing persons) of the Contractor or any entity owned by the Contractor has a direct or indirect interest, which interest includes, but is not limited to, that of a partner, employee, agent or shareholder.

§ 5.3.3 The Contractor shall promptly notify the Owner, the Construction Manager, and Architect of any material defaults by any Subcontractors and/or whether it has terminated its agreement with any of its Subcontractors for any reason.

§ 5.3.4 The Contractor shall check record drawings of its Subcontractors each month. Written confirmation that the record drawings are "up to date" shall be required by the Construction Manager prior to approval of the Contractor's monthly payment requisition.

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.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 of these General Conditions and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

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When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract, except for sums due and owing by Contractor under the subcontract for work performed or material supplied prior to receipt of Owner's notice of its determination to accept the subcontract.

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Owner shall only be required to compensate the Subcontractor of an accepted subcontract for compensation accruing to such Subcontractor for Work done or materials delivered after the date on which Owner provided notice of its determination to accept the subcontract. All sums due and owing by Contractor to the Subcontractor of an accepted subcontract shall constitute a debt between the Contractor and Subcontractor.

§ 5.4.2 ~~Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.~~It is agreed and understood that the contingent assignment of subcontracts is part of the consideration to Owner for entering into the Contract with Contractor and may not be withdrawn prior to Final Completion or Termination of all remaining Work of the Contractor pursuant to Section 14.4 hereof. Contractor shall deliver acknowledgement in form and substance satisfactory to Owner from each Subcontractor of the contingent assignment of subcontracts described herein no later than ten (10) days after the date of execution of each subcontract.

§ 5.4.3 Upon assignment to the Owner under this Section ~~5.4,~~ 5.4 of these General Conditions, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

§ 5.4.4 Each subcontract shall specifically provide that the Owner shall be responsible to the Subcontractor only for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

...

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate ~~Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.~~Contractors.

...

§ 6.1.3 ~~Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.~~All Contractors, including the Owner's Separate Contractors, shall cooperate with each other in the installation and construction of each contractor's work and in such manner as the Owner and/or Construction Manager may direct. All Contractors shall control and coordinate the work of their subcontractors, if any. The award of more than one Contract for the Project requires sequential or otherwise inter-related contractor operations and may involve inherent delays in the progress of any individual Contractor's work. Accordingly, the Owner and/or Construction Manager cannot guarantee the unimpeded operations of any Contractor. Each Contractor acknowledges these conditions and understands that the Contractor shall bear the risk of all ordinary delays caused by the presence or operations of other contractors engaged upon the Project and ordinary delays attended upon the approved Project Schedule.

§ 6.1.3.1 The Contractor shall not interfere with the erection, installation or storage upon the premises of any work, materials, supplies or equipment not included in the Work, but which is to be performed and furnished by other Contractors, and the Contractor shall properly connect and coordinate the work therewith. The Contractor shall be responsible for the coordination and intermeshing of the work of his various sub-contractors and the work of other Contractors with the Work.

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§ 6.2.1.1 Should any other contractor, who has or shall have, a contract with the Owner for the performance of Work upon the site, sustain any damage through any act or omission of the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor in the performance of the Contract, the Contractor agrees to reimburse the Owner and/or such other Contractor directly for all such damages and to defend the Owner, at the Contractor's sole expense, against any claim brought against the Owner with respect to such damage.

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§ 6.2.1.2 In case of interference between the operations of different Contractors, the Architect or Construction Manager, will be sole judge of the rights of each Contractor and shall have the authority to decide in what order the work may proceed, and in all cases such decision shall be final and binding on all parties.

§ 6.2.1.3 The Contractor, including its subcontractors, shall keep informed of the progress of other contractors and shall notify the Construction Manager immediately of the lack of progress on the part of the other Contractors where such delay will interfere with its own operations. Failure of a Contractor to keep informed of the work progressing on the Project and failure to give notice of lack of progress by others shall be construed as acceptance by the Contractor of the status of the work as being satisfactory for proper coordination with the Contractor's own work.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a Separate Contractors or to other Contractors, because of the Contractor's delays, improperly timed activities or defective construction. Failure to provide such reimbursement shall entitle the Owner to deduct such costs from the payment(s) due the Contractor until the Owner has fully recovered such costs. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces, Separate Contractors, or other Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction, or to property of the Owner, Separate Contractors, or other Contractors as provided in Section ~~10.2.5.~~10.2.5 of these General Conditions. The Contractor shall promptly correct discrepancies or defects in its Work which have been identified by other contractor(s) as affecting proper execution and results of the Work of such other contractor(s).

§ 6.2.5 The Owner, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section ~~3.14.~~3.14 of these General Conditions.

...

If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible. If the Owner is not reimbursed promptly for such costs, the Contractor's share of such costs shall be deducted from the next payment to the Contractor.

...

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. No course of conduct or dealings between the Contractor and Owner, Construction Manager or Architect, nor express or implied acceptance of alterations or additions to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim against the Owner for an increase in the amount due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Construction Manager, Architect and Contractor. A Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone. No Change Order or Construction Change Directive shall become effective unless and until it is approved by the Owner in writing.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. A change in the Contract Sum shall be accomplished only by Change Order or, when no agreement can be reached with the Contractor, by a Construction Change Directive. No course of conduct or dealings between the Contractor and Owner, Construction Manager or

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Architect, nor express or implied acceptance of alterations or additions to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase the amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

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§ 7.2.1 Unless otherwise agreed to in writing by the Owner and the Contractor, the combined overhead and profit that shall be included in the total cost (or credit) to the Owner for a Change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces:

a. 15% on the first $25,000 of the change order direct cost of self-performed work,
b. 10% on the portion of the change order direct cost of self-performed work between $25,000 and $50,000 and
c. 7.5% on the portion of the change order direct cost of self-performed work between $50,000 and $200,000 and
d. 5% on the portion of the change order direct cost of self-performed work greater than $200,000.

.2 For the Contractor, for Work performed by the Contractor's Subcontractor five percent (5%) of the amount due the Subcontractor,

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, fifteen percent (15%) of the cost,

.4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor, and

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7 of these General Conditions and shall be itemized (including labor costs).

§ 7.2.2 A Change Order, when issued, shall be full compensation, or credit, for the extra Work performed, omitted, or substituted. It shall show on its face, any adjustment in time for completion of the Project as a result of the Change in the Work. Each Change Order shall include all costs related thereto, including all overhead, miscellaneous expenses, and incidentals.

§ 7.2.3 Once a Change Order has been signed by the Contractor, Construction Manager, Architect and Owner, it shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contractor's Contract Sum, Contract Time and the construction schedule.

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.4 As provided in Section ~~7.3.4.~~7.3.4 of these General Conditions.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the ~~Agreement,~~ Contract Documents, or if no such amount is set forth in the ~~Agreement,~~ Contract Documents, a reasonable amount. In such case, and also under Section ~~7.3.3.3,~~ 7.3.3.3 of these General Conditions, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

...

.3 Rental costs of machinery and equipment, exclusive of hand tools, ~~whether rented from the Contractor or others;~~rented from others (there shall be no rental payments for the Contractor's own machinery and equipment).

...

.5 ~~Costs~~ Additional costs of supervision and field office personnel directly attributable to the change.

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§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15. Failure to timely file any claim in accordance with the requirements set forth therein shall constitute a waiver of such claim.

...

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured ~~on the basis of net increase, if any, with respect to that change.~~in accordance with Section 7.1.4 of these General Conditions.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of ~~either party~~ the Contractor to disagree and assert a Claim in accordance with Article ~~15.~~15 of these General Conditions.

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The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. The work included in such order shall be performed by the Contractor at no additional cost to the Owner and shall not form the basis for a claim for an extension of the Contractor's time to complete its Work. A signed minor change in the Work is not and does not constitute an approved change order. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time. The Contractor shall perform the work included in such orders so as to cause no delay to its Work and/or the work of other contractors engaged by the Owner in connection with the Project.

...

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section ~~9.8.~~9.8 of these General Conditions.

...

§ 8.1.5 The Date of Final Completion of the Work is the date all of the Work required under the Contract Documents is completed, all required materials and documents have been delivered to the Owner, and all applicable licenses, permits, certificates, or approvals have been obtained for the Owner's beneficial use of the Project.

...

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to ~~the effective date of~~ submitting to the Owner, through the Construction Manager, payment and performance bonds compliant with the Contract Documents and proof of having in effect the insurance required to be furnished by the Contractor ~~and Owner.~~pursuant to the Contract Documents.

§ 8.2.2.1 Contractor shall not commence work on the site until certificates of insurance as described in Exhibit A (Insurance and Bonds) to AIA Document A132–2019, attesting that the required coverage is in force, have been received and accepted by the Owner.

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§ 8.2.4 The Contractor may request access to the site during times beyond the work hours permitted. Approval of such a request is solely at the discretion of the Owner. If approval is given, the Contractor is responsible for paying all additional costs incurred by the Owner for providing Project sites to the Contractor during the additional time periods, including but not limited to any costs incurred for the Owner's staff to be present or provide access and additional fees the Owner incurs for services of the Architect and Construction Manager.

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner, Architect, Construction Manager, or an employee of any of them, or of the Owner's own forces, Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by ~~labor disputes,~~ fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section ~~15.1.6.2,~~ 15.1.6.2 of these General Conditions, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts and the ~~Architect, based on the recommendation of the Construction Manager,~~ Architect determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

In the event that the Owner, the Contractor or the Architect is delayed or hindered in or prevented from the performance of any act required by the Contract Documents by reason of a fire, failure of power, unusual delay in deliveries, adverse weather conditions not reasonably anticipatable, unavoidable casualties or other causes of a like nature beyond the Owner's, the Contractor's or the Architect's control, the Contractor (or its Subcontractors) shall not be entitled to any additional compensation by Change Order to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and if performance of the Work is not, was not or would not have been delayed by any other cause for which the Contractor is not entitled to an extension in the Contract Time. No extension of time will be granted for changes in the Work for labor disputes, picketing, hand billing, refusal to deliver, work stoppages not authorized or directed by the Owner.

§ 8.3.1.1 An extension of time may be granted in accordance with this Article 8, but only after written application is made by the Contractor for the extension. All claims for additional time shall be supported by documentation which demonstrates to the Architect and the Owner's satisfaction that the critical path of the Work has been significantly altered by the delays to the activities in question, and that the schedule cannot be maintained by re-ordering other activities within the Project at no cost.

§ 8.3.1.2 An extension of time shall be only for the number of days of delay which the Architect may determine to be due solely to the causes set forth in the application for extension of time. The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but if at all, only the actual period of delay as determined by the Architect. For each day of delay determined by the Architect, the Contractor shall be allowed to add one day to the time limitation specified for completion of the Work in the Contract Documents.

§ 8.3.1.3 The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (i) is not caused, or could not have been anticipated, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (iii) is of a duration not less than one (1) day and (iv) the Contractor has made all reasonable effort to recover the alleged lost time. No extension of time will be granted for changes in work for labor disputes, picketing, hand billing, refusal to deliver, work stoppages due to material procurement delays or other stoppages not authorized by the Owner.

§ 8.3.2 Claims relating to time shall be made in accordance with ~~applicable provisions of Article 15.~~this Section 8.3 and applicable provisions of Article 15; however, the Contractor's Claims, if any, for any increase in Contract Time must be made in accordance with the time requirements of this Section. Claims for an increase in Contract Time must be made in writing to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims must be initiated within seven (7) days after the Contractor has notice of the delay (initial notice). Thereafter, the Contractor must provide full details and support documentation with regard to the cause of the delay within twenty-one (21) days of the initial notice of the delay. If either the initial notice or the supporting documentation is not submitted to the Initial Decision Maker with a copy to the Architect, if the Architect is not the Initial Decision Maker, in writing within the time periods prescribed in this Section, the Claim for an increase in Contract Time shall be waived. If the cause for the delay is a continuing one, then only one Claim is necessary. The Contractor's supporting documentation to the Initial Decision Maker and/or Architect shall include an estimate of cost, if any, and of the probable effect of the delay on the progress of the Work and the Project Schedule.

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§ 8.3.2.1 The Architect will ascertain the facts and extent of the delay and extend the time for completing the Work when in the Architect's judgment the findings of fact justify such an extension. The Architect's determination will be final and binding in any litigation commenced by the Contractor against the Owner that arises out of the denial of an extension of time to the Contractor. Any approval of an extension of the Contractor's time to complete its Work shall be effectuated through a Change Order or, in the absence of an agreement, a Construction Change Directive.

§ 8.3.3 ~~This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.~~Absent (a) uncontemplated acts of God, war, or terrorism, (b) fires or (c) acts or omissions of the Owner, Construction Manager or Architect that constitute fraud or active interference with the Contractor's performance of the Work that continues after the Contractor furnishes the Owner with three (3) days' written notice of such interference, the Contractor agrees the Owner shall not be liable to the Contractor and/or any subcontractor for claims or damages of any nature caused by or arising out of delays. Absent those circumstances, the sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work, the amount of which shall be subject to the claims procedure set forth herein. Except to the extent, if any, expressly prohibited by law, the Contractor expressly agrees not to make and hereby waives any claim for damages for delay, including, but not limited to, those resulting from increased labor or material costs; directions given or not given by the Owner, Construction Manager or Architect, including scheduling and coordination of the Work; or the Architect's preparation of drawings and specifications or review of shop drawings and requests for instruction(s). The Contractor agrees that its sole right and remedy therefor shall be an extension of time, if appropriate.

§ 8.3.3.1 The Owner's exercise of any of its rights or remedies under the Contract Documents (including, but not limited to, agreeing to change orders, issuance of Construction Change Directives, or directing Extraordinary Measures, or directing correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as active interference with the Contractor's performance of the Work.

§ 8.3.4 When the Contract Time has been extended, as provided under this Section 8.3, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs of other similar reasons.

§ 8.4 Liquidated Damages

§ 8.4.1 Contractor realizes that time is of the essence on this Contract and the Construction Schedule shall be submitted per Section 3.10.1. In the event the Contractor fails to submit a Construction Schedule by said schedule date, the sum per calendar day, of Three Hundred Dollars ($300.00) will be subtracted from the Payment due the Contractor or, if the amount due Contractor as Payment is insufficient, any deficiency shall be paid by the Contractor to the Owner.

§ 8.4.2 Contractor realizes that time is of the essence on this Contract and the completion date (including any applicable Milestone Dates) for any work and the date of Substantial Completion shall be no later than the dates for same indicated in the Contract Documents as modified by any extensions of time effected through a Change Order or Construction Change Directive. The Contractor understands that substantial disruption of the Owner's educational operations will occur if the Project is not completed by the date of Substantial Completion and if any portion of the Project is not completed by the applicable Milestone Date. In the event the Contractor fails to complete any work or substantially complete the work under the Contract by said schedule date, the sum listed below per calendar day will be subtracted from the Payment due the Contractor until final completion (or, if the amount due Contractor as Payment is insufficient, any deficiency shall be paid by the Contractor to the Owner.

Liquidated damages will be assessed in the amount of $1500.00 per day for each and every calendar day AFTER such time allowed for a milestone or substantial completion date.

The said sum per calendar day shall constitute the Liquidated Damages incurred by the Owner for each day of delay beyond the agreed upon milestone dates and date of Substantial Completion. Such Liquidated Damages shall be in addition to any other damages (other than by reason of delay) Owner may incur as a result of Contractor's breach of Contract.

In addition to Liquidated Damages, the Contractor shall be liable for all additional costs incurred by the Owner after the Substantial Completion Date (as well as Milestone Dates) stated in the Contract Documents for its own employees to make the Owner's property and facilities accessible to the Contractor and incurred by the Owner for Construction

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Manager services and Architect services performed for the Project due to the Contractor's failure to complete its work by the Substantial Completion Date (and Milestone Date) stated in the Contract Documents, including but not limited to the additional costs incurred for extending the duration of their services and for performing additional inspections.

All such costs incurred by the Owner as well as the cost of additional inspections, at the hourly rate of each consultant of the Owner (including the Architect and Construction Manager and their respective consultants) times the hours spent per inspection, will be subtracted from payment due the Contractor. If the amount due the Contractor for payment is insufficient, any deficiency shall be paid by the Contractor to the Owner

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§ 9.1.3 Each Application for Payment shall include such documentation, information, instruments, evidence, and materials as Owner, Construction Manager and Architect may deem necessary to substantiate the value of completed work for which payment is sought, including, without limitation, such requisition forms, disbursements requests, indemnities (including evidence of All Risk physical damage insurance coverage on materials and equipment stored off-site), and undertaking as they may specify and an estimate of the total labor done and materials stored at the site (or other location approved in writing by Owner) or installed in the building, less cost for which payment has been made, and also less retainage. All applications for Payment shall be made on and in compliance with a form acceptable to Owner and Architect.

§ 9.1.4 Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold any payments, to the Contractor if and for so long as the Contractor fails to perform any of its obligations or otherwise is in default under any of the Contract Documents; provided, however, that any such hold back shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any such default or failure of performance by the Contractor.

§ 9.1.5 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work of the Contractor, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that to which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner or (2) issue through the Construction Manager a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

...

§ 9.2.1 The Contractor and each Subcontractor shall prepare a trade payment breakdown for the work for which it is responsible, such breakdown being submitted on a uniform standardized form reasonably approved by the Architect and Owner (AIA G703). The form shall be divided in detail sufficient to exhibit area, floors, and/or sections of the Work, and/or by convenient units and shall be updated as required by either the Owner or the Architect as necessary to reflect (1) description of Work (listing labor and material separately), (2) total value, (3) percent of the Work completed to date, (4) value of the work completed to date, (5) percent of previous amount billed, (6) previous amount billed, (7) current percent completed, and (8) value of Work completed to date. Any trade breakdown that unreasonably fails to include sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (including of normal retainage) to complete the Work.

§ 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section ~~9.2,~~ 9.2 of these General Conditions, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner, Construction Manager or Architect require, such as copies of requisitions, and releases of waivers of lien from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. Each item listed in the Application for Payment shall have a separate amount for labor and a separate amount for material and other costs.

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The form Application for Payment, duly notarized, shall be the most recent authorized edition of AIA Document G702, Application and Certificate for Payment, supported by the most recent authorized edition of AIA Document G703, Continuation Sheet.

§ 9.3.1.1 As provided in Section ~~7.3.9,~~ 7.3.9 of these General Conditions, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.
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§ 9.3.1.3 Each Application for Payment shall be submitted electronically and in four (4) hard copies and shall be accompanied by the following, in all form and substance reasonably satisfactory to the Owner, (1) a current conditional Contractor's waiver of claims and liens, and duly executed an acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Contractor from such progress payment together with similar sworn statements from all such subcontractors and material suppliers; (2) duly executed unconditional waivers of claims and liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect or required by the Owner's title insurer.

§ 9.3.1.4 Unless otherwise agreed to in writing, until Substantial Completion, the Owner shall pay the Contractor ninety-five (95%) of the amount due the Contractor.

§ 9.3.1.5 Applications for Payment must be accompanied by any and all releases of liens for previous applications from Contractor and his subcontractors and a sworn and notarized statement that all subcontractors have been paid to at least ninety-five percent (95%) of previously requisitioned sums.

§ 9.3.1.6 Contractors must submit separate Applications for Payment for each facility or per State Education Department Project Number. Only one Application for Payment per State Education Department Project Number may be submitted for payment for each month.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. Such payment by the Owner for materials, equipment, fixtures and supplies stored on or off the Site shall not relieve the Contractor of its responsibility to provide reasonable protection of said materials, equipment, fixtures and supplies until their incorporation into the Work.
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§ 9.3.3.1 The Contractor shall save and keep the Contract Sum and the Owner's property free from all liens and claims, legal or equitable, arising out of Contractor's work under the Contract Documents. In the event any such lien is filed by anyone claiming by, through or under the Contractor, the Contractor shall remove and discharge same within ten (10) days of the filing thereof. The Contractor further expressly undertakes to defend the Owner, the Architect and the Construction Manager and their respective consultants, officers, directors, officials, employees, servants and agents (the "Indemnitees") at the Contractor's sole expense against any actions, lawsuits or proceedings brought against Indemnitees as a result of liens filed against the Contract Sum, the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor or any portion of the property of any of the Indemnitees referred to collectively as liens in this Section 9.3.3.1. The Contractor hereby agrees to indemnify and hold Indemnitees harmless against any such liens or claims of lien and agrees to pay any judgment or lien resulting from any such actions, lawsuits or proceedings.

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§ 9.3.3.2 The Owner shall release any payments withheld due to lien or claim of lien if the Contractor obtains security acceptable to the Owner or a lien discharge bond that is (1) issued by a surety acceptable to the Owner; (2) in form and substance satisfactory to the Owner, and (3) in an amount required by law to release such lien claim. By posting a lien discharge bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under Section 9.3.3.1 of these General Conditions including without limitation, the duty to defend and indemnify the Owner. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

§ 9.3.4 Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner, Construction Manager and Architect.

§ 9.3.4.1 A current Contractor's lien waiver and duly executed and acknowledged sworn statement showing all Subcontractors and material men with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material men in the requested progress payment and the amount to be paid to the Contractor for all such Subcontractors and material men.

§ 9.3.4.2 Duly executed waivers of mechanic's and material men's liens from all Subcontractors and, when appropriate, from material men and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment.

§ 9.3.4.3 All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner, Construction Manager or the Architect. If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer.

§ 9.3.4.4 All Applications for Payment must be accompanied with certified payrolls for all Contract Work performed. In addition, each Contractor and sub-contractor shall submit to the Owner within thirty days after issuance of its first payroll, and every thirty days thereafter, a transcript of the original payroll record, subscribed and affirmed as true under penalties of perjury. The Owner shall be required to receive and maintain such payroll records. The original payrolls or transcripts shall be preserved for three years from the completion of the Work on the awarded project. An out of state contractor must post a wage rate schedule at the job site.

§ 9.3.5 Applications for Payment that, when received, are missing information or required documentation will be rejected by the Construction Manager or Architect and will not be considered for payment by the Owner, Architect or Construction Manager until resubmitted with all required information and documents.

§ 9.4.1 ~~Where there is only one Contractor, the~~ The Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section ~~9.5.1;~~ 9.5.1 of these General Conditions; or (3) withhold certification of the entire Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 ~~Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.~~ Intentionally Omitted.

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§ 9.4.2.1 ~~Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1) issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.~~Intentionally Omitted.

§ 9.4.3 The Construction Manager's certification of an Application for Payment ~~or, in the case of more than one Contractor, a Project Application and Certificate for Payment,~~ shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor ~~is, or Contractors are,~~ is entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment ~~or, in the case of more than one Contractor, Project Application and Certificate for Payment,~~ shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor ~~is, or Contractors are,~~ is entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 of these General Conditions are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment ~~or a Project Certificate for Payment~~ will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

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§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment ~~or Project Certificate~~ for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 of these General Conditions cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and ~~9.4.2.~~ 9.4.2 of these General Conditions. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment ~~or a Project Certificate~~ for ~~Payment for~~ the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment ~~or Project Certificate for Payment~~ previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 of these General Conditions because of

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.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; ~~or~~

.7 ~~repeated~~ failure to carry out the Work in accordance with the Contract ~~Documents.~~Documents, or

.8 any other reasonable grounds for objection or withholding as provided in the agreement or as permitted by law.

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§ 9.5.2 When ~~either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.~~the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The Owner shall not be deemed in default by reason of withholding payment while any conditions described in 9.5.1 remain.

§ 9.5.3 ~~When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.~~If the Architect or Construction Manager withholds certification for payment under Section 9.5.1 of these General Conditions, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

~~**§ 9.5.4** If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.~~

...

§ 9.6.2.1 The Contractor shall indemnify and hold the Owner harmless from laborers, mechanics and materialmen liens upon the Owner's Project funds, properties or the premises upon which the work is located, arising out of the work performed or materials furnished by the Contractor or any of its Subcontractors or any material suppliers under the Contract.

§ 9.6.4 The Owner through the Construction Manager or directly has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner, Construction Manager nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and ~~9.6.4.~~9.6.4 of these General Conditions for payments to Subcontractors.
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§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. ~~If approved by the applicable court,~~ Pursuant to applicable law or court order, when required, the Contractor may substitute a surety bond for the property or Project funds against which the lien or other claim for payment has been asserted.

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§ 9.7 ~~Failure of Payment~~

~~If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.~~Intentionally Deleted

...

§ 9.8.1 Substantial Completion is the ~~stage in the progress of the Work~~ date certified by the Architect when the completed Work is code compliant and when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended ~~use.~~ use; provided, however that as a condition precedent to Substantial Completion, the Owner has received all Certificates of Occupancy and any permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

...

.1 The Architect will perform two (2) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents at no additional cost to the Owner. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections pursuant to Section 9.5.1 of these General Conditions.

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§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any ~~stage when such portion is designated by separate agreement with the Contractor,~~ stage, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers ~~a portion~~ an occupied portion to be substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section ~~9.8.2.~~ 9.8.2 of these General Conditions. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

...

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract ~~Documents.~~Documents, nor does it waive the Owner's right to liquidated damages. Further, such occupancy alone shall not determine when Substantial Completion has been reached.

...

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for ~~Payment or Project Application for~~ Payment, to the Architect, who will promptly make such

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inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final ~~Certificate for Payment or Project~~ Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment ~~or Project Certificate for Payment~~ will constitute a further representation that conditions listed in Section 9.10.2 of these General Conditions as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under the Contract Documents shall be assembled and delivered by the Contractor to the Architect through the Construction Manager as part of the final Application, no final payment will be issued until all warranties and guarantees have been received and accepted by the Owner.

§ 9.10.1.1 The Architect will perform two (2) inspections whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents at no additional cost to the Owner. If the Architect and/or Construction Manager are required to perform additional final inspections because the Work fails to comply with the certifications of the Contractor, the amount of compensation paid to the Architect and/or the Construction Manager by the Owner for additional services for such additional inspections shall be deducted from the final payment to the Contractor.

§ 9.10.1.2 The final payment of retained amount due the Contractor on account of the Contract shall not become due until the Contractor has furnished the Owner, through the Architect, completion documents as enumerated below, or as otherwise required in the Contract Documents.

.1 One (1) hard copy and one (1) electronic Record Set of Drawings showing actual construction of all portions of the Work and incorporating all changes and amendments thereto, as redlined against the 100% Construction Drawings.

.2 Guarantees and Warranties required by specific Sections of the Specifications.

.3 Release and Waiver of Claims, conditioned upon Final Payment, by the General Contractor, Subcontractors, Sub-subcontractors and material suppliers.

.4 All mechanical and electrical installation, operating and maintenance manuals called for under the Specifications.

.5 All test reports and certifications required under the mechanical and electrical specifications.

.6 All forms required to be completed by the Contractor by regulatory governmental agencies with two copies delivered to the Architect.

.7 Shop Drawing submittals in accordance with Article 3.

.8 A copy of the unconditional Occupancy Permit or Certificate of Compliance issued by the local Building Inspection Department having Jurisdiction, unless such is not issued for any reason that is not the responsibility of the Contractor under the Contract Documents or is caused by circumstances beyond the Contractor's control.

.9 Manufacturer's current detailed installation instructions for fire dampers, ceiling radiation dampers, smoke dampers, and duct smoke detectors as applicable to the Project.

.10 One (1) copy of the equipment operational and maintenance manuals.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5) documentation and assignment of all warranties, including any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and ~~(6),~~ (6) all required procedures manuals, operation and maintenance manuals and spare parts, (7) Contractor Affidavit of Release of Liens, (8) complete set of Record Documents, including but not limited to all Shop Drawings and As-built Drawings, (9) separate release or waivers of liens for each subcontractor, material and/or equipment supplier, and others performing a portion of work and, (10) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien,

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claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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.3 terms of special warranties required by the Contract Documents; ~~or~~

.4 audits performed by the Owner, if permitted by the Contract Documents, after final ~~payment.~~payment; or

.5 faulty or defective work appearing after Substantial Completion.

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§ 10.2.1 The Contractor shall provide for the safety and protection of the Project sites, all persons who come in contact with the Work and all real and personnel property located at or adjacent to the Project sites. Without limitation to the foregoing, the Contractor, at its sole cost and expense shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

...

.4 construction or operations by the Owner, Separate Contractors, or other Contractors.

Prior to commencement of the Work, the Contractor shall document existing conditions and record existing damage to construction or property that is to remain at the site and notify the Construction Manager and Architect of same in writing.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. The Contractor agrees in working on the Owner's premises to comply with Regulation 155.5 of the NYS Commissioner of Education, the Occupational Safety and Health Act of 1970 (OSHA) as amended, and the Construction Safety Act of 1969 as amended including all standards and regulations that have been since or shall be promulgated by the governmental authorities having jurisdiction over the Project or the Owner's premises, all applicable building and fire codes and any applicable federal, state and/or local laws, rules, regulations and/or executive orders regarding COVID-19.

...

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 of these General Conditions caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and ~~10.2.1.4.~~ 10.2.1.4 of these General Conditions. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section ~~3.18.~~3.18 of these General Conditions.

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When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a hazardous material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify in writing the Owner, Construction Manager and Architect of the condition.

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§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. ~~The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection.~~ When the material or substance has been rendered harmless, Work in the affected area shall ~~resume upon written agreement of the Owner and Contractor.~~ resume. By Change Order, the Contract Time shall be extended ~~appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.~~appropriately.

§ 10.3.3 ~~To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect, their consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.~~Intentionally omitted.

...

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site ~~and~~ and/or negligently handles, or (2) where the Contractor fails to perform its obligations under Section ~~10.3.1,~~ 10.3.1 of these General Conditions, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 ~~If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.~~Intentionally omitted.

...

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article ~~7.~~7 of these General Conditions.

...

§ 11.1.1 ~~The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Construction Manager and Construction Manager's consultants, and the Architect and Architect's consultants, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.~~
Insurance, Refer to AIA Document A132™–2019, Exhibit A, Insurance and Bonds, as revised for this Project.
§ 11.1.2 ~~The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~Performance Bond and Payment Bond, Refer to AIA Document A132™–2019, Exhibit A, Insurance and Bonds, as revised for this Project.

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§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.liability that the Owner usually maintains in the course of its operations as a public school district.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.**Intentionally omitted.**

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice directly to the Contractor, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.**Intentionally omitted.**

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§ 11.3.1 The To the extent permitted by their respective insurance companies the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages

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caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 of these General Conditions for damages caused by fire or other causes of loss covered by this separate property insurance.

...

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. ~~The Owner waives all rights of action against the Contractor, Architect, and Construction Manager for loss of use of the Owner's property, due to fire or other hazards however caused.~~

...

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of ~~Section 11.5.2.~~ Section 11.5.2 of these General Conditions. The Owner shall pay the Construction Manager, Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Construction Manager, Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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§ 12.1.1 If a portion of the Work is covered contrary to the Construction ~~Manager's or Architect's~~ Manager's, Architect's or any governmental authority's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by ~~either,~~ any of them, be uncovered for their examination and be replaced at the Contractor's expense without change in the ~~Contract Time.~~Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Construction ~~Manager or Architect~~ Manager, Architect or governmental authority has not specifically requested to examine prior to its being covered, the Construction ~~Manager or Architect~~ Manager, Architect or governmental authority may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

...

The Contractor shall promptly correct Work rejected by the Construction ~~Manager or Architect or~~ Manager, Architect for failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion, and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. If the Contractor or its Subcontractor(s) or their respective officers, directors, employees, contractors, suppliers, servants, agents or any person or firm directly or indirectly engaged by such Contractor or Subcontractor in the performance of the Contract

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uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing and other building systems, machinery, equipment or other mechanical device(s), the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner

...

§ 12.2.2.1 In addition to the Contractor's obligations under Section ~~3.5,~~ 3.5 of these General Conditions, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section ~~9.9.1,~~ 9.9.1 of these General Conditions, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. In the judgment of the Owner should any material, equipment or systems require corrective work because of defects in material or workmanship within the one-year warranty period, or extended warranty periods, the Contractor shall complete all required corrective work within thirty (30) days of notice. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section ~~2.5.~~2.5 of these General Conditions and recover the costs incurred to do so from the Contractor or offset the costs incurred against any sums the Owner owes the Contractor or the Owner may notify the bonding company to have such work and/or obligations performed at no additional cost to the Owner.

§ 12.2.2.2 ~~The~~ For any portion of the Work for which the warranty is to be effective upon Substantial Completion, the one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

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§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner, Separate Contractors, or other Contractors, whether completed or partially completed, caused by the Contractor's Work that is not in accordance with the requirements of the Contract Documents and by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 of these General Conditions shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 of these General Conditions relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

...

The Contract shall be governed by the law of the place where the Project is located excluding that jurisdiction's choice of law rules. ~~If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~

§ 13.1.1 In all operations under the Contract, the Contractor agrees that it will comply with all Federal, State and Local Laws, rules and regulations and all policies, rules, regulations and protocols of the Owner, in any manner affecting the Work and all such orders as exist at present and those which may be enacted in the future, by bodies or tribunals having jurisdiction or authority over the Work, including but not limited to OSHA, Sections 220, 220-d, 220-e of the Labor Law. The Contractor shall indemnify and save harmless the Owner and its Board of Education, employees, officers, agents, or servants against any claim or liability arising from, or based on, a violation of any such law, ordinances, regulation, order or decree by the Contractor or the Contractor's officers, directors, employees, Subcontractors and suppliers.

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§ 13.1.2 Historical lack of enforcement of any law, rule or regulation local or otherwise, shall not constitute a waiver of Contractor's responsibility for compliance with such law, rule or regulation in a manner consistent with the Contract Document unless and until the Contractor has received written consent for the waiver of such compliance from the Owner and the Agency responsible for enforcement of the law, rule or regulation.
§ 13.1.3 The parties expressly agree that any claim, dispute, or other controversy of any nature arising out of the contract or performance of the Work shall be commenced and maintained in New York State Supreme Court located in Westchester County.

§ 13.1.4 The Contractor and each of its Subcontractors shall comply with Prevailing Wage Rates as issued by the State of New York Department of Labor for the location and duration of this Project and shall comply with all requirements governing its payments to its employees as set forth in Labor Law, Section 220 et seq of the New York State Labor Law.

§ 13.1.5 The Contractor shall comply with all the provisions of the Immigration Reform and Control Act of 1986 and regulations promulgated pursuant thereto and shall require its Subcontractors to comply with same. The Contractor shall and does hereby agree to fully indemnify, protect, defend, and hold harmless the Owner, Owner's Board of Education, agents and employees from and against any penalties, fees, costs, liabilities, suits, claims, or expenses of any kind or nature, including reasonable attorney's fees, arising out of or resulting from any violation or alleged violation of the provisions of said laws by Contractor or its Subcontractor(s) in connection with the Work of the Contract Documents.
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§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section ~~13.2.2,~~ 13.2.2 of these General Conditions, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract. The Contractor shall not assign any monies due or to become due to him under the Contract without the previous consent of the Owner.

...

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by ~~law.~~law or in equity, and such rights and remedies shall survive acceptance of the Work and/or termination of the Contract Documents.

...

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public ~~authorities.~~ authorities or utilities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public ~~authority,~~ authority or utility, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Construction Manager, Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section ~~13.4.1,~~ 13.4.1 of these General Conditions, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. Such costs, except as provided in Section ~~13.4.3,~~ 13.4.3 of these General Conditions, shall be at the Owner's expense.

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§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 of these General Conditions reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses, shall be at the Contractor's expense. The Contractor agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work, and the cost of testing services relating to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

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§ 13.4.7 Upon request the Contractor shall deliver test samples of any of the materials specified in the Specifications to an independent testing agency. The Owner shall pay for the test of samples, which are found to conform to the Specifications. The Contractor shall pay for the tests of samples, which do not conform to the Specifications. This shall not relieve the Contractor of his obligations to perform specific tests described elsewhere in the Specifications.

§ 13.4.8 Where the Specifications require part of the Work to be specially tested and approved, it shall not be covered up before testing without timely notice thereof or consent thereto. Should any part of the work be covered up without notice, approval or consent, such part of the Work shall be uncovered for examination at the Contractor's expense if the Owner, Architect, Construction Manager or governmental authority with jurisdiction over the Contractor, the Work or the Project shall so require.

§ 13.4.9 Should defects appear, they shall be corrected by the Contractor and the test repeated until the installation is acceptable.

§ 13.4.10 When notice of tests is to be given to the Architect, it shall also be given to the Construction Manager.

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the ~~rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~rateset forth in the Agreement.

...

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or

.3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section ~~9.4,~~ 9.4 of these General Conditions, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract ~~Documents; or~~

~~**.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~Documents.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section ~~14.3,~~ 14.3 of these General Conditions, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 of these General Conditions exists, the Contractor may, upon seven days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred ~~by reason of such termination.~~directly as a result of such termination. The Owner shall not be liable for loss of anticipated profits for work not performed on account of any termination described in Sections 14.1.1 and 14.1.4 hereof.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees, or any other persons performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with

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respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section ~~14.1.3.~~14.1.3 of these General Conditions.

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§ 14.2.1 The Owner may terminate the Contract for cause if the Contractor

.1 ~~repeatedly~~ refuses or fails to supply enough properly skilled workers or proper ~~materials;~~materials or equipment;

...

.3 ~~repeatedly~~ disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 disregards the instructions of the Architect, the Construction Manager or the Owner, when such instructions are based on the requirements of the Contract Documents;

.5 breaches any warranty made by the Contractor under or pursuant to the Contract Documents;

.6 fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all of the requirements of the Contract Documents;

.7 fails after commencement of the Work to proceed continuously with the construction and completion;

.8 fails to keep the Project free from strikes, work stoppages, slowdowns, lockouts or other disruptive activity as required by Section 3.4.3 hereof;

.9 fails or neglects to prosecute the Work in such a manner to reasonably assure completion within the Contract Time; or

.10 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 of these General Conditions exist, after consultation with the Construction Manager, and ~~upon certification by the Architect that sufficient cause exists to justify such action,~~ the Architect, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

...

.2 Accept assignment of subcontracts pursuant to Section ~~5.4;~~ 5.4 of these General Conditions; and

...

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section ~~14.2.1,~~ 14.2.1 of these General Conditions, the Contractor shall not be entitled to receive further payment until the Work is finished.

...

§ 14.2.4.1 The costs of finishing the Work include, without limitation, all reasonable attorney's fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect and consequential damages incurred by the Owner by reason of the termination of the Contractor as stated herein.

§ 14.2.5 The Owner shall not be responsible for damages or loss of anticipated profits on Work not performed on account of any termination described in Article 14.

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may ~~determine.~~determine by giving seven (7) day's prior written notice to Contractor, specifying the part of the Work or subcontract to be suspended, delayed, or interrupted, and the effective date of such suspension, delay, or interruption, as the case may be. Contractor shall continue to prosecute the part of the Work not suspended, delayed, or interrupted, and shall properly protect and secure the part of the Work so suspended, delayed, or interrupted, so far as is necessary in Owner's reasonable opinion. For the Work that has not been suspended, delayed or interrupted, the Contract Documents shall remain in full force and effect.

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§ 14.3.2 The Contract Sum and the Contract Time shall be adjusted for reasonable increases in the cost and time of the Work caused by suspension, delay, or interruption under Section ~~14.3.1.~~ 14.3.1 of these General Conditions. Adjustment of the Contract Sum shall not include profit. No adjustment shall be made to the extent:
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§ 14.4.1 The Owner may, at any time, terminate the ~~Contract~~ Contract, in whole or in part, for the Owner's convenience and without ~~cause.~~cause by giving seven (7) days' notice to Contractor, specifying the part of the Work or subcontract to be terminated and the effective date of termination. Contractor shall continue to prosecute the part of the Work not terminated. This right may be exercised by the Owner in its complete and absolute discretion. If the Work or any subcontract is so terminated, Owner shall incur no liability to Contractor by reason of such termination except as set forth in Section 14.4.3 of these General Conditions. For the remainder of the Work that is not terminated, the Contract Documents shall remain in full force and effect. Contractor shall be entitled to no payment for the terminated portion of the Work and waives and forfeits any claim for damages and/or lost profits. Contractor shall be entitled to no payment for the terminated portion of the Work and waives and forfeits any claim for damages and/or lost profits.

...

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; ~~and~~

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase ~~orders.~~orders for the portion of the Work that has been terminated; and

.4 proceed to complete the performance of the Work not terminated.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly ~~executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.~~executed prior to the date of termination as well as any costs incurred by the Contractor to implement Owner directed work to protect and preserve the work completed by the Contractor prior to the notice of termination less the credits due the Owner and less the sums required by law to be held by the Owner due to any liens on public improvement filed against the Contract Sum that have not been discharged (which sums withheld due to such liens will be paid when such liens are discharged or released). The Contractor shall not be entitled to payment of any other sums. The Contractor shall not be entitled to any payment for the terminated portion of the Work and waives and forfeits any claim for damages, overhead and/or lost profits for the terminated portion of the Work.

§ 14.4.4 The Contractor shall include in each of its subcontracts a clause, similar in effect to the provisions in Paragraph 14.4, allowing the Contractor to terminate the subcontract for its sole convenience, subject only to the payment obligations set forth in Paragraph 14.4.3 of these General Conditions.

§ 14.4.5 Contractor agrees and acknowledges that payments for the work have been obtained through obligations or bonds which have been sold after public referendum. In the event the work is suspended or cancelled as a result of the order of any court, department entity or individual having jurisdiction, or in the event the work is suspended or cancelled due to the fact that a court, agency, department, entity or individual having jurisdiction has issued an order, the result of which is the aforesaid obligations or bond are no longer available for payment for the work, Contractor expressly agrees that it shall be solely entitled to pay for work accomplished until a notice of suspension or cancellation is served upon Contractor. The Contractor expressly waives any and all rights to institute an action, claim, cause of action or similar for any damages it may suffer as a result of the suspension or cancellation of the Work and/or its Contract pursuant to this section.

...

§ 15.1.1 Definition. A Claim is a demand or assertion by ~~one of the parties~~ the Contractor seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms ~~of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out~~ of ~~or relating to~~ the Contract. The responsibility to substantiate ~~Claims~~ a Claim shall rest with the ~~party making the Claim.~~ Contractor. This Section 15.1.1 does not require the Owner to file its claims against the Contractor, including but not limited to a Claim in order to impose liquidated damages in accordance with the Contract Documents.

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The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable ~~law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.~~law.

...

§ 15.1.3.1 Claims by ~~either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2,~~ the Contractor shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Architect is not serving as the Initial Decision Maker. ~~Claims by either party under this Section 15.1.3.1~~ Such Claims shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the ~~claimant~~ Contractor first recognizes the condition giving rise to the Claim, whichever is later.

~~**§ 15.1.3.2** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.~~

§ 15.1.3.2 Should any Contractor wish to reserve its rights regarding filing of claims as set forth above, written notice of any event that may give rise to a claim must be given within 21 days of said event, whether or not any impact in time or money has been determined.

...

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's ~~decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect~~ decision. The Architect will prepare Change Orders and/or Construction Change Directives and will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost. If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 of these General Conditions shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under ~~Section 10.4.~~Section 10.4 of these General Conditions. No claim will be permitted for additional costs or time as provided in this Section 15.1, should damages arise from the Contactor's failure to have adequately reviewed the Contract Documents and failure to have reported an error or inconsistency in an expeditious time and manner.

§ 15.1.5.1 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension of the Work or (7) other reasonable grounds, a claim shall be filed in accordance with this Section 15.1 or such claim for additional costs shall be waived.

...

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 of these General Conditions shall be given. The Contractor's Claim shall articulate the reason additional time is requested, articulate the amount of additional time requested and include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary. The Contractor shall accompany the Claim with a written analysis with a proposed revision to the Schedule illustrating the claimed influence of the basis for delay on the critical path of the Work and the applicable deadlines that may be impacted. Contractor will exercise reasonable efforts to mitigate the potential impact of any delay.

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§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The time for performance of this Contract, as set forth in the Construction Schedule, shall include an allowance for delays due to reasonably anticipated adverse weather for the area where the Work is located. For the purpose of establishing that abnormal adverse weather conditions have caused a delay, and determining the extent of delay attributed to such weather conditions, the Contractor shall furnish with its claim, National Oceanic and Atmospheric Administration (NOAA) National Weather Service records of climatic conditions during the same time interval for the previous five (5) years for the locality of the Work; the Contractor's daily job site logs/daily construction reports showing weather, job activities, and the effect of weather on the progress of the Work; and an impact schedule showing the effects of the weather event on the critical path of the Contractor's Construction Schedule. Time extension for weather delays and related impact do not entitle the Contractor to extended overhead recovery or to any other monetary compensation associated with that claim unless approved in writing by the Owner.

§ 15.1.6.3 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which have concurrent or interrelated effects on the progress of the Work.

§ 15.1.7 ~~Waiver of Claims for Consequential Damages.~~ ~~The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes~~

- ~~**.1** damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~
- ~~**.2** damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.~~

~~This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.~~

Waiver of Claims.

§ 15.1.7.1 The timelines provided herein for the making of claims shall be a condition precedent to any payment for such claims or the granting of any extension of time. Failure of the Contractor to comply with the time and notice provisions of this Article shall be an absolute bar to making any payment to or extending the time of the Contractor for such claim. All claims of any type seeking any monies, or an extension of time shall be accompanied by full documentation. A claim submittal without full documentation shall be rejected by the Architect and, if not timely resubmitted within the original claim period, as set forth above, shall be waived.

§ 15.1.7.2 The Owner shall not be responsible for damages or for loss of anticipated profits on Work not performed on account of any termination of the Contractor by the Owner or by virtue of the Owner's exercise of its right to take over the Contractor's Work pursuant to the Contract Documents.

§ 15.1.7.3 The Contractor hereby expressly waives any rights it may have in law or in equity to lost bonding capacity as a result of any of the actions of the Owner, Construction Manager or the Architect taken in connection with the Contractor's Work on the Project.

§ 15.2.1 ~~Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5,~~ Claims by the Contractor, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. ~~Except for those Claims excluded by this Section 15.2.1, an~~ An initial decision shall be required as a condition precedent to ~~mediation of any Claim.~~ binding dispute resolution of the Contractor's Claim(s). If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation ~~and~~ or binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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§ 15.2.2 The Initial Decision Maker will review Claims and within ten (10) business days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

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§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, ~~demand in writing that the other party~~ file for mediation. ~~If such a demand is made and the party receiving the demand fails to file for mediation within 30 days of receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

...

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections ~~9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.~~9.10.4 and 9.10.5 of these General Conditions, may be subject to mediation upon mutual agreement of the parties.

§ 15.3.2 ~~The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement.~~ A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. ~~If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, ~~demand in writing that the other party~~ file for binding dispute resolution. ~~If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.~~

...

~~**§ 15.4 Arbitration**~~

~~**§ 15.4.1** If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

~~**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~

~~**§ 15.4.2** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

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~~**§ 15.4.3** The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

~~**§ 15.4.4 Consolidation or Joinder**~~

~~**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~

~~**§ 15.4.4.2** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~

ARTICLE 16 ADDITIONAL CONDITIONS

§ 16.1.1 Contractor agrees and acknowledges that payments for the Work have been obtained through obligations or bonds which have been sold after public referendum. In the event the Work is suspended or canceled as a result of the order of any court, agency, department entity or individual having jurisdiction, or in the event the Work is suspended or canceled due to the fact that a court, agency, department, entity or individual having jurisdiction has issued an order, the result of which is that the afore said obligations or bonds are no longer available for payment for the Work, Contractor expressly agrees that it shall be solely entitled to payment for Work accomplished until a notice of suspension or cancellation is served upon Contractor. Contractor expressly waives any and all rights to institute an action, claim, cause of action or similar for any damages it may suffer as a result of the suspension or cancellation of the Work and /or its contract pursuant to this Section 16.1.~~**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~

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Certification of Document's Authenticity

AIA® Document D401™ – 2003

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_____

(Signed)

_____

(Title)

_____

(Dated)

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SECTION 007250
ADDITIONAL INSURANCE REQUIREMENTS – CONTRACTOR

PART 1

1.01 SUMMARY

A. In addition to the insurance requirements listed in AIA A132-2019, Exhibit A, Insurance and Bonds, any Contractor doing work in a town of Ossining, NY street shall provide the insurance required by the Town of Ossining for Excavations in Streets, as laid out in the Town of Ossining code at :https://ecode360.com/8408242 . A section of this document is attached here for convenience. It is the responsibility of the contractor to verify that there have not been any updates at the time of bid.

1.02 FORMS

A. The following section from the Town of Ossining Code is appended to this section:
   1. Town of Ossining Code; Part 1. Street Openings, Article I., Excavations in Streets, Section 87-3 Insurance Required.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 007250

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Town of Ossining, NY
Monday, October 19, 2026

Chapter 87. Excavations

Part 1. Street Openings

Article I. Excavations in Streets

§ 87-1. Permit required.

[Amended 3-12-1974 by L.L. No. 2-1974]

A. No person, firm or corporation shall open or cause to be opened, by cutting or excavating, the surface or soil of any street, highway, sidewalk area or public street for any purpose whatsoever, without first obtaining therefor any state and/or county licenses or permits where required and obtaining from the Superintendent of Highways a written permit for street opening and paying to the Town of Ossining the deposit required and without otherwise complying with the provisions of this Article.
[Amended 3-26-1985 by L.L. No. 2-1985]

B. No person, firm or corporation shall make or cause to be made any connection into a sanitary sewer, stormwater drain or water main in any easement or right-of-way across private property, said sanitary sewer, stormwater drain or water main forming a part of the sewer, drainage or water distribution system, respectively, of the Town of Ossining, without first obtaining from the Superintendent of Highways a written permit for street opening.

C. Such permit shall be valid for an effective period not to exceed 30 consecutive calendar days from date of issuance. Such effective period may be extended, if so requested in writing by the permittee prior to expiration thereof, for such additional period as the Superintendent of Highways may, in his discretion, allow.

§ 87-2. Application for permit.

A. Any person, firm or corporation desiring a permit for street opening shall make application therefor to the Superintendent of Highways for each such opening, upon forms to be provided for that purpose.

B. The said application shall contain:

(1) The names and addresses of the applicant and of the owner of the property in front of which or for whom the work is to be performed.

(2) The location of such property and the section, plate, block and lot designation thereof.

(3) The size and purpose of the opening to be made and the maximum size of such opening.

(4) The date or dates when the work is to be performed.

(5) The type of pavement or surface to be disturbed, together with such necessary sketches and additional information as the Superintendent may require.

(6) A signed statement, by the applicant, that the said applicant agrees to perform the work for which the permit is granted strictly in accordance with the conditions of the permit, the provisions of the ordinances of the Town of Ossining and the applicable rules and regulations of the Highway Department.

§ 87-3. Insurance required.

A. No permit for street opening shall be issued by the Superintendent until the applicant therefor shall have first placed on file with the said Superintendent, without cost to the Town, satisfactory evidence of general liability insurance in the amount of not less than $200,000 for any one person and not less than $1,000,000 for any one accident and property damage insurance in the amount of not less than $25,000 for any one accident and $50,000 in the aggregate and satisfactory evidence that the said insurance has been approved as to form, correctness and adequacy by the Town Attorney, to insure the Town and the applicant against any loss, injury or damage arising out of the granting of the permit or from any negligence or fault of said applicant, his agents, servants or employees in connection with the said opening or with any work related thereto.

B. Such insurance shall remain in force throughout the effective period of the permit, as well as any authorized extensions thereof, and shall carry an endorsement to the effect that the insurance company will give at least 10 days' written notice to the Town of Ossining of any modification or cancellation of any such insurance.

§ 87-4. Fees.

[Amended 3-12-1974 by L.L. No. 2-1974; 3-26-1985 by L.L. No. 2-1985; 9-11-2007 by L.L. No. 8-2007]

No permit for street opening shall be issued by the Superintendent of Highways until the applicant therefor shall have first paid to the Town of Ossining, in cash or by check payable to the Town of Ossining, a deposit, to be determined as provided hereunder, and a fee in the amount set by resolution of the Town Board in the Fee Schedule,[1] except that whenever a permittee has filed a bond in lieu of deposit, as may be provided elsewhere in these rules and regulations, the said fee shall be an amount per linear foot of street opening, as provided in the Fee Schedule. Said fee is to cover the cost of issuing and recording the permit and the supervision and inspection of the work done in connection therewith.

[1] *Editor's Note: See Ch.* ***A203****, Fees.*

§ 87-5. Deposits.

A. The amount of deposit for openings shall be computed in accordance with the unit prices for pavements or other areas to be disturbed or work to be done, as determined by the Superintendent, in the amount set by resolution of the Town Board in the Fee Schedule.[1]

[Amended 3-26-1985 by L.L. No. 2-1985; 9-11-2007 by L.L. No. 8-2007]

[1] *Editor's Note: See Ch. **A203**, Fees.*

B. Disposition of deposits.

(1) The amount of deposit shall be retained by the Town for the duration of the period of maintenance as defined hereinbelow.

(2) Upon failure or default by the permittee of any of the terms, agreements, covenants and conditions of the permit on the permittee's part to be done or performed, said deposit may be used by the Town for any expense incurred by the Town by reason of such failure or default on the part of the permittee.

(3) After expenses for such failure or default, as determined and certified by the Superintendent of Highways, have been paid and deducted from the amount of the deposit, any balance left after such deductions shall be refunded to the permittee.

C. Period of maintenance.

(1) The period of maintenance shall be considered as a period of six months after the date of final completion, as determined by the Superintendent of Highways, of the work to be done pursuant to the terms of the permit; except, however, that, in the event that the termination of the six-month period shall fall within the months of December, January, February, March or April, then and in that event the period of maintenance shall be considered as extending until the first day of May thereafter.

(2) The permittee shall be responsible for the entire work and shall keep every portion of said work in perfect order and repair during the entire period of maintenance.

§ 87-6. Public service corporations.

A. Unless otherwise agreed upon between a public service corporation and the Town of Ossining, a public service corporation may, in lieu of a deposit hereinabove specified for street opening, file and keep on file with the Superintendent of Highways a bond in the amount of $5,000, the said bond to be approved as to form, amount and sufficiency of surety by the Town Attorney and the said bond to be retained as security for the faithful performance by the applicant of all the terms, agreements, covenants and conditions of the permit on the applicant's part to be done or performed.

B. A public service corporation may, in lieu of the insurance hereinbefore specified for street opening, file and keep on file with the Superintendent of Highways an agreement, approved as to form by the Town Attorney, to indemnify and save harmless the Town of Ossining from claims, suits, actions, proceedings, losses, injuries, damages and costs of every name and description arising out of or resulting from any act or omission on the part of such public service corporation under any permit granted to it or from any negligence or fault.of such public service corporation, its contractors, agents, servants or employees in connection with sidewalk, curb or driveway work or repairs or street openings or any work related thereto and to also defend on behalf of the Town of Ossining any such suits, actions or proceedings which may be instituted against the Town of Ossining.

C. Any provision of any local law to the contrary notwithstanding, permits for street openings as required by a local law may be issued to any public service corporation who shall pay to the Town of Ossining the amount of the fees therefor quarterly after request for payment is made. No permits for future openings shall be issued until payment is made in full for all outstanding permits as same shall have been billed.
[Added 3-12-1974 by L.L. No. 3-1974]

D. In case of emergency due to breakage of pipes, etc., street openings may be made by a public service corporation prior to obtaining a permit for street opening; provided, however, that the said public service corporation shall have filed the required bond and evidence of insurance or indemnity agreement as specified in this section and in § **87-3** of this Article and provided further that the said public service corporation shall make application for the necessary permit for street opening not later than 24 hours (Saturdays, Sundays and holidays not included) after said opening has been commenced.

SECTION 007343
WAGE RATE REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Wage rates shall apply as shown in the Prevailing Wage Schedule prepared by the New York State Department of labor for this project (the Prevailing Wage Case Number (PRC#) assigned to this project is PRC# 2026006129 - OUFSD 24BD_New 7th & 8th Bldg. The Schedule can be viewed at the following website:

https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1609133

B. The Contractor shall be responsible for completing one copy of Notice of Contract Award (Form PW-16). Upon completion of the form, the Contractor shall submit the form to the Architect. Architect will forward a copy to the New York State Department of Labor.

PART 2 PRODUCTS

PART 3 EXECUTION

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SECTION 011100 – MILESTONE SCHEDULE

PART 1 - GENERAL

1.1. MILESTONE

The following milestone schedule serves as basis for bidding. A Final Construction Schedule will be developed at a general meeting within 20 days of Letter of Intent to Award the Contracts. Contractor will coordinate activities, forward submittals, deliver materials and provide the necessary workforce to meet the milestones listed below.

1.2. MILESTONE SCHEDULE

New 7-8 School Building	Start	Finish
Mobilization & Tree Cutting/Clearing (No Stumping)	2/1/27	3/12/27
Water Service installed from source to New Hydrant at SE corner of the new building adjacent to Transformer Pad.	3/29/27	4/26/27
Site Grading for Staging Area-See Staging & Logistics Plan in Spec. Sec. 15000 (Drawing C231, Area 2A)	3/15/27	4/16/27
Site Grading for Building Pad Ready for GWC (Drawing C231, Area 2B)	4/19/27	5/14/27
Electric Service from source to Switchgear	6/28/27	12/22/27
Concrete Foundation, Structural Steel, Load Bearing Masonry, Decking and Roofing to make Watertight.	5/17/27	1/14/28
Concrete Foundation Complete and Backfilled (stabilized)	---	8/27/27
Remainder of Site Grading (Drawing C231 Area 2 C/D/E) and all Utilities to 5’ outside Building Line.	8/30/27	7/28/28
Temporary Heat	1/28/28	3/31/28
Building Shell Completion with Final Façade, Windows, Entrances & Doors.	---	6/30/28
Sitework complete with the exception of Asphalt Top Course Paving	---	11/17/28
Temporary Heat	11/6/28	3/31/29
Substantial Completion	---	5/7/29
All Remaining and Punchlist work to allow for Occupancy by the Owner	---	6/7/29
CLOSEOUT		
Contractor Closeout (review specifications) 30 days past substantial completion	---	6/7/29

Contractor is specifically notified that they will need to work multiple crews simultaneously in order to meet the production rates to complete the work (M-F work week) by the above completion dates.

1. All Work required by any of the Owner's representatives and consultants, including the Construction Manager, Architect, Architect's consultants, Owner's Attorneys, etc., to execute final the contract beyond Milestone dates, or to execute final closeout after 30 days past substantial completion, if determined to be caused by Contractor, shall result in payment(s) to the Owner for additional services to the Construction Manager, Architect, Architect's consultants, Owner's Attorneys, etc. These costs will then be issued in the form of a Deduct Change Order to the Contractor's contract at the Owner consultant's contractual rate.
2. Due to space limitations at the jobsite, all Prime Contractors are specifically notified that jobsite material lay-down areas will need to be relocated as necessary. All contractors are required to comply with Construction Managers direction and sequencing.
3. Any additional costs incurred by the owner's representatives, including the Construction Manager, Architect, Owner's staff, Owner's consultants and any related costs, due to schedule overruns beyond the milestone dates, if determined to be the contractor's responsibility, will result in a deduct change order at the contractual rate established by the Owner or their representatives.
4. Sufficient manpower shall be provided at all times to maintain progress of the job. A shortage of labor in the industry shall not be accepted as an excuse for not properly manning the job……tied penalty
5. The objective of this project is to complete the overall work in the shortest period of time. Thus, if access is provided to a work area sooner than originally scheduled, each contractor will likewise mobilize their forces earlier to maintain the reduction in overall schedule time.
6. Each Contractor is advised that "Time is of the essence" as per the General Conditions of the contract and they will work with multiple crews of sufficient size as necessary to carry out the work with the utmost speed with good workmanship. If the contractor fails to expedite and pursue any part of the work, the Owner may order the contractor to take "Extraordinary Measures", or hire others to complete the work and adjust their contract amount accordingly as per the General Conditions.
7. Contractors are specifically notified that they must properly staff the project with a competent field superintendent and a sufficient supply of workers to maintain progress and flow of the work as required by the schedule, and to coordinate/install in a timely manner to facilitate the work of other trades.
8. All trades are hereby informed that construction will proceed in phases, requiring temporary disconnection, reconnection, and maintenance of utilities and services as needed. It is imperative to ensure uninterrupted use of essential services (such as mechanical, electrical, fire alarm, and public address systems) to all occupied areas throughout the project

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 011100

SECTION 011200 – SUMMARY OF MULTIPLE CONTRACTS

PART 1 - GENERAL

1.1. PROJECT INFORMATION

A. Project: New 7th & 8th School Building
B. Project Location: 55 Stormytown Road Ossining New York
C. Owner: Ossining Union Free School District
D. Architect: CPL
E. Construction Manager: ACCI: Arris Contracting Company Inc.
F. The overall scope of work includes:
    1. Construction of a new 7th & 8th School Building
G. Contracts:
    1. The project will be constructed under a multiple-prime contract arrangement.
    2. Prime contracts are separate contracts between the Owner and separate contractors, representing significant construction activities. Each prime contract is performed concurrently with and closely coordinated with construction activities performed on the Project under prime contracts. Prime contracts for this Project include:
        a. General Work Contract (GC, GWC, or FSEC)
        b. Mechanical Work Contract (MC, HVAC, or HC)
        c. Electrical Work Contract (EWC, EC)
        d. Plumbing Work Contract (PWC, PC)
        e. Fire Sprinkler Work Contract (FSWC, FSC)
        f. Site Work Contract (SWC, SC)

1.2. DIVISION OF WORK

Each contract shall include all labor materials, plans, tools, equipment and supervision which are required for or incidental to the proper completion of the work as indicated on All drawings and described in the following specifications sections.

1.3. GENERAL REQUIREMENTS – ALL CONTRACTS

<u>DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS</u>

<u>All Sections</u>

<u>DIVISION 01 – GENERAL REQUIREMENTS</u>

<u>All Sections</u>

Special Notes: All Contracts

1. Work hours M-F 7:30 AM – 4:30 PM. Contractor will appropriately provide labor for the project to avoid Saturday and Overtime hours which result in Owner, Construction Manager and Architect additional costs.
2. Delivery black out times- No Contractor trucks/deliveries are allowed during school bus times as indicated by owner approx. 7:30 am-8:30 am or 2:00pm -3:30pm. All construction traffic, deliveries, & construction workers will come and go from the Stormy-town Road School Entrance only. School Speed Limits will be strictly enforced.
3. Contractor is to carry insurance coverages per the Owners Insurance Requirements which are located in the DIV 00 specification. **READ INSURANCE REQUIREMENTS CAREFULLY. THERE WILL BE NO EXCEPTIONS TO THE INSURANCE REQUIREMENTS. ALL INSURANCE CARRIERS MUST BE ADMITTED IN NEW YORK STATE. MAKE 100% CERTAIN INSURANCE REQUIREMENTS ARE REVIEWED AND ACCEPTED BY INSURANCE AGENTS/CARRIERS PRIOR TO BID.**
4. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. Maintaining a clean jobsite is considered a safety issue and will be strictly enforced. Daily Clean-up is mandatory and once a contractor has been given 48 hours-notice to clean-up, the Owner/CM may employ clean-up services and deduct the cost from the contractor. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, the owner will perform the work with others and deduct the cost from the contractor.
5. Each Contractor shall provide suitable rubbish containers device(s) for their own use (both demolition and construction debris), properly maintained and serviced, replaced as required and protected from access by the public. “Fencing in” of rubbish containers may be required or as may be specified herein or approved by the Architect or Construction Manager. (See Staging & Logistics Plan in Spec. Section 015000)

6. Roof Penetrations & Related work is assigned as follows:

   All new blocking for roof top HVAC Units is by the General Work Contractor, Roof Curbs & Rails for HVAC Equipment are by the Mechanical Work Contractor including anchoring, Flashing of Roof Curbs & Rails into the roof system is by the General Work Contractor. Pipe Portals, Pitch Pockets & Boots are supplied by the Contractor requiring the penetration and installed by the GWC. All Contractors are reminded that Pipe Portals, Pitch Pockets & Boots must be compatible with the roof system specified. The Contractor requiring a penetration shall provide all layout required and cutting of the deck. Structural Steel work is by the General Work Contractor. Temporary weather protection of any roof opening is by the Contractor requiring the opening.
7. Each Contractor will provide and install its own required in wall blocking for their work. All blocking must be submitted for approval by the architect.
8. Existing building space may not be used for storage unless approved by Owner/CM. Storage Trailers/Con-Ex boxes are required for storing materials, tools, and equipment. (See Staging/Logistics Plan in Spec. Section 015000)
9. Exterior Concrete Pads and Concrete Housekeeping Pads for Electrical Equipment, for Plumbing Equipment, for Mechanical Equipment and for Fire Sprinkler equipment are by the Contractor needing those pads, whether they are inside the building or outside. Coordinate Concrete Pad work with each Prime Contractor as may be needed.
10. Building Foundation work to be coordinated with required site/building utilities. Concrete wall sleeves/penetrations sizes and locations to be coordinated with all other Contractors. Each Contractor is to provide the GWC sketches of all required foundation penetrations that include exact locations from column lines. These locations must include penetration shape, size, & depth from finished floor.
11. Trenching, excavation, and backfill for the Work of each Contract shall be provided by each Contract for its own Work, unless noted otherwise.

12. Supervision: The Project Manager and Field Superintendent proposed by the Contractor for the project are to have at least five years' experience in the proposed position. Each successful bidder shall submit resumes for the proposed Project Manager and Field Superintendent for the project to the Owner for review. The Field Superintendent will not work with the tools, but rather, coordinate the work of the Contract and any sub-contractors and be on site full time. Should the Project Manager(s) and/or Superintendent(s) prove unqualified for the position at any point in the project, the Owner shall issue a letter stating that the person is to be removed from involvement in the project. Action must be made within seven working days of receipt of such letter.

1.4. GENERAL WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide for proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specifications sections:

Division 03 Concrete in its entirety.
Division 04 Masonry in its entirety.
Division 05 Metals in its entirety.
Division 06 Woods, Plastics, and Composites in its entirety.
Division 07 Thermal & Moisture Protection in its entirety.
Division 08 Openings in its entirety.
Division 09 Finishes in its entirety.
Division 10 Specialties in its entirety.
Division 11 Equipment. Spec Section 114000 Food Service Equipment, as it pertains to purchase, delivery, unpacking, and placement. Spec. Section 115313 Laboratory Fume Hoods and Related Products as it pertains to purchase, delivery, unpacking, and placement.
Division 12 Furnishings in its entirety.
Division 14 Conveying Equipment in its entirety.
Division 31 Earthwork as it pertains to foundation excavation & backfill (& under-slab structural fill).

Special Notes: General Work Contractor:

1. Access doors furnished by trade requiring access; installation by General Work Contractor.
2. The new building pad area will be excavated by the SWC and brought to the elevation that allows the GWC to install the required under-slab structural fill.

3. The SWC shall excavate and provide the building pad 11 inches below Finish Floor Elevation and certify that elevation. Then, the GWC will excavate for the building foundation and backfill same (including 6" structural fill under-slab material-- or as noted otherwise). The extent of excavation and back fill for concrete foundation work (GWC) is shown on drawing S100 and includes haunches and rigid insulation within the building footprint. Any excess soils created by the GWC foundation excavation should be hauled off site. The SWC is responsible for all other site concrete & excavation unless noted otherwise.
4. The SWC is responsible for all other site concrete, including exterior door pads and related frost walls/haunches.
5. The SWC shall place 4" of ¾" crushed stone around the building footprint as indicated in Spec. Section 015000 Temporary Facilities & Controls- Staging & Logistics Plan. The GWC shall maintain and add stone as needed for the duration of the project.
6. GWC will install metal studs, plywood sheathing, & plastic, for weather tight and secure assembly at window and door openings, until permanent windows and doors are installed.
7. GWC is notified that schedule will require multiple mobilizations and multiple crews of certain subcontractors (masonry, steel, roofing, etc.).
8. GWC is reminded that Note 5 on Drawing A300 is part of the GWC Scope.
9. GWC will coordinate exterior wall opening sizes with other Prime Contractors for Louvers, Vents, electrical back-boxes, camera locations, light fixture locations, hose bibs, strobes, fire sprinkler connection, and any and all other wall penetrations. The actual Rough Openings are created by the GWC. Steel lintels by GWC as needed. Supply of louvers & vents are by the MWC. Back boxes, and related products are by the EWC.
10. GWC is reminded that painting, as noted on the reflected ceilings plans, is GWC work. This may include, but not be limited to: painting duct-work, exposed structure, roof deck, plumbing piping, and electrical equipment, and protection (covering) of any exposed wiring, unless noted otherwise.
11. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, the owner will perform the work with others and deduct the cost from the contractor.
12. The GWC is reminded to pay close attention to specification section 114000 Food Service Equipment. The GWC shall purchase, have delivered, unpack/uncrate, and put in place all Food Service Equipment. Any reference to Food Service Equipment Contractor (FSEC) is synonymous with GWC.
13. The following drawings are part of the GC work: All General (G Series) drawings, All Civil (C Series) drawings as they pertain to Foundation Excavation, All Structural-- (S series) drawings, All Architectural (A Series) drawings, All Interiors (I Series) drawings, Theatrical drawings TS101, & TS500, and Food Service (FS Series) drawings.

1.5. MECHANICAL WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide for proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specification sections:

Division 03 Concrete, as it pertains to Housekeeping & Mechanical Pads.
Division 06 Woods, Plastics, and Composites, as it pertains to Temporary Protection of roof openings, and Backerboards for any panels/control panels.
Division 07 Thermal & Moisture Protection, as it pertains to Temporary Protection of roof openings, Spec Section 078400 Fire Stopping, Spec Section 078413 Penetration Fire Stopping, and Spec Section 079200 Joint Sealants.
Division 11 Equipment—Spec. Section 115313 Laboratory Fume Hoods and Related Products, as it pertains to required duct work attached to the Fume Hood.
Division 23 Heating, Ventilating, and Air Conditioning (HVAC), in its entirety.
Division 31 Earthwork, as it pertains to Interior Excavations & Backfill.

Special Notes: Mechanical Work Contractor:

1. Access doors are furnished by Mechanical Contractor and installed by GWC Contractor.
2. The MWC is responsible for all low voltage wiring associated with Mechanical Equipment/Controls. Electrical work is by the EWC.
3. MWC is responsible for making their own through wall and through floor duct and piping penetrations and associated patching/firestopping. Coordinate with GWC during Structural Steel Shop Drawing process for roof and floor openings. Coordinate with GWC for masonry and metal stud wall openings as required.
4. GWC will coordinate exterior wall opening sizes with other Prime Contractors for Louvers, Vents, electrical back-boxes, camera locations, light fixture locations, hose bibs, strobes, fire sprinkler connection, and any and all other wall penetrations. The actual Rough Openings are created by the GWC. Steel lintels by GWC as needed. Supply of louvers & vents are by the MWC. Back boxes, and related products are by the EWC.
5. Disconnects, starters, etc. supplied by MC installed by EC, unless noted otherwise.
6. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, the owner will perform the work with others and deduct the cost from the contractor.
7. The MWC is reminded to pay close attention to specification section 114000 Food Service Equipment, as it pertains to attaching required duct work to the Fume Hood.
8. The following drawings are part of the MC work: All General (G Series) drawings, All Food Service (FS Series) drawings, and All HVAC (H Series) drawings.

1.6. ELECTRICAL WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide the proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specifications sections:

Division 03 Concrete, as it pertains to Concrete Pads/Pre-Cast/Foundations for Generator, Generator Docking Station, Transformer, Switchgear, Site Lighting Pole Bases & Concrete Duct Bank.
Division 06 Woods, Plastics, and Composites, as it pertains to Temporary Protection of roof openings, and Backerboards for any panels.
Division 07 Thermal & Moisture Protection, as it pertains to Temporary Protection of roof openings, Spec Section 078400 Fire Stopping, Spec Section 078413 Penetration Fire Stopping, and Spec Section 079200 Joint Sealants.
Division 11 Equipment, Spec. Section 114000 Food Service Equipment, as it pertains to Electrical Work, Spec., Section 116133 Production Rigging in its entirety. Spec. Section 115313 Laboratory Fume Hoods and Related Products, as it pertains to Electrical Work.
Division 26 Electrical in its entirety.
Division 27 Communications in its entirety.
Division 28 Electronic Safety and Security in its entirety.
Division 31 Earthwork, as it pertains to Electrical Pads/Foundations, Site Lighting & Electrical Service, and sidewalk restoration.
Division 32 Exterior Improvements, as it pertains to Electrical Pads/Foundations, Site Lighting, Electrical Service, and sidewalk restoration, and any other site electrical work shown.

Special Notes: Electrical Work Contractor:

1. Access doors are furnished by EC and installed by GC.
2. VFD's, disconnects, motor starters which are supplied by MC will be installed by EC, unless noted otherwise.
3. MWC is responsible for all low voltage wiring associated with Mechanical Equipment/Controls. Electrical work is by the EWC.
4. EWC is responsible for making their own through wall and through floor conduit penetrations and associated patching/firestopping. Coordinate with GWC & MWC during Structural Steel Shop Drawing process for roof and floor openings.
5. Coordinate exterior wall opening sizes with other GWC for electrical back-boxes, camera locations, light fixture locations, strobes, and any and all other wall penetrations. Steel lintels by GWC.
6. Disconnects, starters, etc. supplied by MC installed by EC, unless noted otherwise.
7. The EWC shall excavate and backfill for all site electrical work, including but not limited to: site lighting/light pole bases & electrical service work. This includes low voltage services as indicated and associated conduit(s). Patching of all disturbed asphalt, concrete curbs & sidewalks,

landscaping, hardscaping, topsoil, and seed is by the EWC, as it pertains to site electrical work only. Any excess soils from site electrical work shall be hauled off site by the EWC. See Drawing C220 Note 4., 4.1 thru 4.4 for more information.

8. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, the owner will perform the work with others and deduct the cost from the contractor.
9. The EWC is reminded to pay close attention to specification section 114000 Food Service Equipment, as it pertains to electrical work & Spec. Section 115313 Laboratory Fume Hoods and Related Products, as it pertains to Electrical Work.
10. See Spec. Section 015000 Temporary Facilities and Controls for Temporary Power Requirements and the Staging & Logistics Plan (Power Requirements).
11. The following drawings are part of the EC work: All General (G Series) drawings, Civil (C Series) drawings as they pertain to Electrical Work. All Theatrical (AL Series, AV Series, TL Series, & TR Series) drawings, All Food Service (FS Series) drawings as they pertain to Electrical Work (including any electrical work for the Ansul system, if any), and All Electrical (E Series) drawings.

1.7. PLUMBING WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide the proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specifications sections:

Division 03 Concrete, as it pertains to Pads for Plumbing Equipment.
Division 06 Woods, Plastics, and Composites, as it pertains to Temporary Protection of roof openings (roof drains), and Backerboards for any panels.
Division 07 Thermal & Moisture Protection, as it pertains to Temporary Protection of roof openings, Spec Section 078400 Fire Stopping, Spec Section 078413 Penetration Fire Stopping, and Spec Section 079200 Joint Sealants.
Division 11 Equipment, Spec. Section 114000 Food Service Equipment, as it pertains to Plumbing Work.
Division 22 Plumbing in its entirety.
Division 31 Earthwork as it pertains to under-slab plumbing roughing & getting 5’ outside Bldg. line.

Special Notes: Plumbing Work Contractor:

1. The PWC shall bring water, sanitary, gas and roof (storm) drains from inside the new building to 5’ outside foundation line. Note: the Gas Line coming from inside the building to the gas meter/regulator needs to be coordinated with Con-Ed.

2. Access doors are furnished by PWC and installed by GWC.
3. PWC is responsible for making their own through wall and through floor piping penetrations and associated patching/firestopping.
4. Coordinate exterior wall opening sizes with other GWC hose bibs and any and all other wall penetrations. Steel lintels by GWC.
5. PWC shall provide temporary roof drains, exiting the building, unless permanent roof drain system can be installed when the roofing is being applied.
6. The PWC shall perform all water chlorination as specified and all testing for piping installed inside the new building.
7. PWC will install faucets, mixing valves and general plumbing for Laboratory Casework. Faucets and mixing valves (materials) for Laboratory Casework by others.
8. Contractor is specifically reminded about their responsibilities for clean-up as per section 017423. In addition to daily cleaning, the contractor is required to hire a professional cleaning company to final clean all areas impacted by the construction. This includes completely cleaning any surfaces/equipment/furniture which has been dusted by the construction work. If the contractor does not properly perform this function when directed by the Owner/CM, the owner will perform the work with others and deduct the cost from the contractor.
9. The PWC is reminded to pay close attention to specification section 114000 Food Service Equipment as it pertains to plumbing work. Including any plumbing that may be required for Ansul System, if any.
10. The following drawings are part of the PC work: All General (G Series) drawings, All Civil (C Series) drawings as they pertain to plumbing work, All Food Service (FS Series) drawings as they pertain to plumbing work, and all Plumbing (P Series) drawings as they pertain to plumbing work.

1.8. FIRE SPRINKLER WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide the proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specifications sections:

Division 03 Concrete as it pertains to any housekeeping pads.

Division 07 Thermal & Moisture Protection, as it pertains to Spec Section 078400 Fire Stopping, Spec Section 078413 Penetration Fire Stopping, and Spec Section 079200 Joint Sealants.

Division 21 Fire Suppression in its entirety.

Division 31 Earthwork as it pertains to getting Piping 5’ outside foundation line.

Special Notes: Fire Sprinkler Work Contractor:

1. Access doors are furnished by FSWC and installed by GWC.

2. FSWC is responsible for making their own through wall and through floor piping penetrations and associated patching/firestopping.
3. Coordinate exterior wall opening sizes with other GWC for fire sprinkler connection, and any and all other wall penetrations. Steel lintels by GWC.
4. The FSWC shall bring Fire Sprinkler Piping from inside the new building to 5' outside foundation line.
5. The following drawings are part of the FSWC work: All General (G Series) drawings, All Plumbing (P Series) drawings as they pertain to Fire Protection work.

1.9. SITE WORK CONTRACT

In addition to Division 00 & Division 01, included in this bid package contractor shall provide the proper completion of work as indicated on all drawings and in accordance with the terms and conditions described in the following specifications sections:

Division 02 Demolition in its entirety.

Division 03 Concrete as it pertains to Outside foundation line.

Division 05 Metals as it pertains to railings or other metals shown on Civil Drawings.

Division 09 Finishes as it pertains to any paint or Finishes shown on Civil Drawings.

Division 31 Earthwork in its entirety.

Division 32 Exterior Improvements in its entirety.

Division 33 Utilities in its entirety.

Division 34 Transportation in its entirety.

Special Notes: Site Work Contractor:

1. The SWC will excavate and provide building pad elevation suitable for the GWC to install required under slab structural fill.
2. The SWC shall excavate and provide the building pad 11 inches below Finish Floor Elevation and certify that elevation. Then, the GWC will excavate for the building foundation and backfill same (including 6" structural fill under-slab material-- or as noted otherwise). The extent of excavation and back fill for concrete foundation work (GWC) is shown on drawing S100 and includes haunches and rigid insulation within the building footprint. Any excess soils created by the GWC foundation excavation should be hauled off site. The SWC is responsible for all other site concrete & excavation unless noted otherwise.
3. The SWC is responsible for all other site concrete, including exterior door pads and related frost walls/haunches.

4. The PWC shall bring water, sanitary, and roof (storm) drains from inside the new building to 5' outside foundation line. The gas line will be brought from inside the new building to the gas meter/regulator just outside the new building.
5. The SWC shall pick up the sanitary from 5' outside foundation line and complete all sanitary sewer work complete including taps, permits, and any fees by the authority having jurisdiction. Patching of all disturbed asphalt, concrete curbs & sidewalks, landscaping, hardscaping, topsoil, and seed is by the SWC.
6. The SWC shall pick up water service from 5' outside foundation line (Domestic/Fire) and complete all water service work complete. This includes all excavation & backfill. See Drawing C220 Note 2., 2.1 thru 2.7 for more information. Patching of all disturbed asphalt, concrete curbs & sidewalks, landscaping, hardscaping, topsoil, and seed is by the SWC. Chlorination and testing of the site water service line is by the SWC.
7. The SWC shall pick up storm water drainage piping/roof drains from 5' outside foundation line and complete all storm water drainage work complete. Patching of all disturbed asphalt, concrete curbs & sidewalks, landscaping, hardscaping, topsoil, and seed is by the SWC. See Drawing C220 Note 3., 3.1 thru 3.3 for more information.
8. The SWC shall excavate, provide and install gas piping as per Con Ed requirements, and backfill as per Con Ed requirements for the gas service from foundation line to source connection. Con-Ed will supply & install the gas meter. The gas tapping is by Con Ed and installation of the gas service must be performed by a Con Ed approved contractor. Contact Con Ed for a listing of approved Con Ed contractors. Patching of all disturbed asphalt, concrete curbs & sidewalks, landscaping, hardscaping, topsoil, and seed is by the SWC. See Drawing C220 Note 5., 5.1 thru 5.5 for more information.
9. The EWC shall excavate and backfill for all site electrical work, including but not limited to: site lighting/light pole bases & electrical service work. This includes low voltage services as indicated and associated conduit(s). Patching of all disturbed asphalt, concrete curbs & sidewalks, landscaping, hardscaping, topsoil, and seed is by the EWC as it pertains to site electrical work only. Any excess soils from site electrical work shall be hauled off site by the EWC. See Drawing C220 Note 4., 4.1 thru 4.4 for more information.
10. All work shown on the Civil Drawings ("C" Drawings) is part of the SWC scope unless noted otherwise herein, including dumpster enclosure(s).
11. Any excess soils created by the SWC shall be hauled off site by the SWC.
12. The SWC shall place 4" of ¾" crushed stone around the building footprint as indicated in Spec. Section 015000 Temporary Facilities & Controls- Staging & Logistics Plan. The GWC shall maintain and add stone as needed for the duration of the project.
13. All Storm Water Protections (SWPPP), including maintenance, shall be by the SWC.
14. Any and all Permanent Fencing & Gates (including swing gates) are by the SWC, including any around MEP concrete pads as may be shown. If Bollards are required at or adjacent to Site Concrete Pads, the Bollards are by the Contractor requiring the concrete pad.
15. All work associated with the Staging area is by the SWC. This includes, but is not limited to: Grading, New Item #4 (NYSDOT Item 4 (304.12), Temp. Fencing, Gates, Scrim, Erosion

Control, & Temporary Signage. Removal of the Staging Area at Project Completion, including topsoil, seed and any landscape required is by the SWC. See Spec. Section 015000 Temporary Facilities & Controls for Staging & Logistics Plan.

16. Snow removal from the Staging Area, Construction Parking Area, Access Roads, and 30' +/- around the building footing print is by the SWC. This includes sanding/ice mitigation to remove ice build-up. DO NOT USE SALT for Ice Mitigation.
17. Final surveyed as-built drawings for all site work is by the SWC. Electrical Site Work final as-built survey is by the EWC.
18. The following drawings are part of the SWC work: General (G Series) drawings G000, G001, & G002. All Civil (C Series) drawings (See above for EC work noted), and All Landscape (L Series) drawings.

1.1. PRIME CONTRACTOR'S USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the work is indicated.

B. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

C. Owner's representative(s) will cover the project for the standard Monday – Friday shift. If a contractor requests additional hours to make up schedule time or weekends, he will need to reimburse Owner for additional coverage or costs (e.g. – Architect, Construction Manager, etc.) at their contractual rate.

D. General: Limitations on site usage as well as specific requirements that impact utilization are indicated on the drawings and by other contract documents. In addition to these limitations and requirements, the Contractor shall administer allocation of available space equitably among the separate sub-contractors and other entities needing access and space, so as to produce the best overall efficiency in performance of the total work of the project. The Contractor shall schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

E. After the equipment is no longer required for the work, it shall be promptly removed from the project site. Protection of construction materials and equipment stored at the project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractors.

F. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.

G. The Contractor(s) and any entity for which the Contractor is responsible shall not erect any sign of the Project site without the prior written consent from the Owner, which may be withheld in the sole discretion of the Owner.

H. The Contractor(s) shall ensure that the work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the work and all adjacent areas. The work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of: Any areas and building adjacent to the site of the work or the building in the event of partial occupancy.

I. Maintain the building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.

J. Each Prime Contractor is responsible for maintaining a safe jobsite. This includes actively reviewing their work areas to ensure that they are in compliance with all required OSHA regulations. It is a contract requirement that each contractor conducts weekly tool-box safety meetings to ensure that their employees are properly educated and utilizing safe work practices. (Copies of these weekly meetings and a list of the attendees will be forwarded to the CM Site Superintendent on a weekly basis). Contractors will comply with all requirements outlined in the General Conditions including providing their employees with PPE (personal protective equipment) such as masks, hand sanitizer, hard hats, proper work boots, safety harness, safety glasses, etc.

K. Smoking, Vaping, drinking alcoholic beverages or open fires will not be permitted on the project site.

L. Utility Outages and Shutdown:
   1. Limit the disruption of utility services to hours the building is unoccupied, weekends or holidays at no additional cost.
   2. Do not disrupt or shut down line safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days' notice to Owner and authorities having jurisdiction.
   3. Prevent accidental disruption of utility services to other facilities.
   4. All costs for manning of temporary shutdowns and utility crossovers, including 24-hour fire watch if necessary, are included in the contractor's bid regardless of weekend, holiday, etc.

1.2. OCCUPANCY REQUIREMENTS

A. Partial Owner Occupancy: The Owner reserves the right to occupy the place and install equipment in completed areas of the work prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work, such placing of equipment and partial occupancy shall not constitute acceptance of the Total Work.

B. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.

C. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.

D. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
E. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

1.3. DEFINITIONS

A. Definitions as applied to “Contractors” involved with the work of this Project:
   1. “The Contractor” or “Contractor” meaning that Respective Prime Contractor normally responsible for that work referenced.
   2. “Respective Prime Contractor" meaning either the – General Contractor, Plumbing, HVAC, Electrical, Sitework, Fire Protection Contractors normally responsible for the referenced work.
   3. “Trade Contractor” meaning that Respective Prime Contractor as above; and such other terms relating to Contractors to be taken in context with respect to the referenced work.
   4. Further, wherein said Division 0 and 1 and respective Sections therein, any reference is made to “General Contractor”, same shall be construed to mean “Contractor for the General Construction, or General Work Contractor”.
B. The Owner cannot guarantee the correctness of the existing conditions shown and assumes no responsibility therefore, it shall be the responsibility of the Contractor to visit the site and verify all existing conditions prior to bid.
C. The Owner will purchase certain items required for the overall operation of this facility through outside vendors.
D. The Contractor(s) will cooperate with said vendors as may be necessary to permit the work to be accomplished.
   1. The cooperation may extend to the receiving, unloading and placement of said equipment if directed by the Owner.
   2. Each Contractor is advised that the Owner may enter into separate contracts as may be in their best interest.
   3. Each Contractor is further advised that there will be a full on-site Project Representative / Construction Manager, whose duties will be defined at the pre-construction meeting.

1.4. ADDITIONAL SECURITY PROVISIONS

A. All Contractor’s employees shall use a single means of access and egress, except in the case of emergency, to be designated by the Construction Manager.
B. Each Contractor and each Subcontractor shall require his employees, while on the job site, to wear, in a conspicuous location, a photo I.D. button bearing the name of the employee and the Contractor. The buttons of each Contractor shall be numbered consecutively. An up-to-

date list of all I.D. buttons, indicating the name and number for each employee, shall be furnished to the Construction Manager.

1.5. ASBESTOS AND LEAD PAINT AWARENESS REQUIREMENTS

A. Contractor agrees not to use or permit the use of any asbestos containing material in or on any property belonging to the Owner.
B. For purposes of this requirement, asbestos free shall mean free from all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite, both in friable and non-friable states and without regard to the purposes for which such material is used.

1.6. CONSTRUCTION TIME AND PHASING REQUIREMENTS

A. Each Contractor is advised the "time is of the essence" of the Contract as defined in the "General Conditions" for the completion of the construction of the facility. It is understood that the work is to be carried through to completion with the utmost speed consistent with good workmanship.
B. Time of Completion shall be as established in the Milestone Schedules (Section 011100).
C. The Contractor shall maintain fences and barricades at all times and shall repair/restore and/or pay for any temporary fence damaged by their work.
D. Maintain at all times, all exits and walkways.
E. Where the barricade is removed for work, the Contractor performing such work shall provide adequate safety personnel to prevent unauthorized persons from approaching the work area.
F. Construction Phasing: The phasing and/or milestone schedule contained in Section 011100 has been established for the overall construction of the project.
G. Electrical and mechanical services to the functioning spaces shall be maintained at all times.
H. Swing-overs to new facilities shall be made so as to cause the least interruption to the facilities' operations.
I. The Contractor shall provide and maintain all required separations between old and new construction to prevent:
    1. Unauthorized entrance to construction areas by others than Architect, Construction Manager, or Owner.
    2. Heat loss from existing building, water (rain or ground) infiltration into existing building.
J. Exterior alteration and restoration, as required, may proceed outside of phasing schedule at the Contractor's option with concurrence from the Architect, Construction Manager and Owner.
K. Site development work shall proceed in such a manner to cause the least amount of disruption to the ongoing operations as possible.

1.7. PROOF OF ORDERS, DELIVERY DATES AND SUPPLY CHAIN TRACKING

[Coordinate with Sections 01 32 16 and 01 33 00.]

A. Within 2 weeks after the approval of shop drawings, samples, product data and the like, the Contractor shall provide copies of purchase orders for all equipment and materials which are not available in local stock. The Contractor shall submit written statements from suppliers confirming the orders and stating promised delivery dates. Failure to provide this critical information will result in Owner holding monthly requisition payments until received.
B. Due to potential disruption of material supply-chains, the Contractor(s) are required to obtain all materials for the project and store them onsite in their individual Conex boxes. This includes general material items typically readily available (piping, conduits, wire, metal studs, etc.) The Owner will pay for these stored items delivered to the jobsite in accordance with Section 01 29 00.
C. This information shall be incorporated within the progress schedules so required as part of Section 01 32 16 and 01 33 00 and shall be monitored so as to ensure compliance with promised dates.

1.8. FIELD MEASUREMENTS

Each Respective Contractor shall take all necessary field measurements prior to fabrication, release and installation of work and shall assume complete responsibility for accuracy of same.

1.9. INITIAL SUBMITTAL REQUIREMENTS

As outlined in Division 01, each Contractor shall provide items noted including – bonds, insurance, emergency telephone numbers, progress scheduling, schedules of submittals, subcontractor listings and the like prior to the start of any work. The Owner will not issue contracts until all bonds and insurance information is received from the Contractor and verified correct.

1.10. SCHEDULES

The milestone schedule presented in the documents is for bidding and general purposes. Due to the nature of the work, it is the intention of the Construction Manager to negotiate actual work periods for the project among various Prime Contractors involved with this bidding process, as well as separate contractors involved with other phases of the work solicited under separate proposals. Each Contractor shall, under terms of the General Conditions, mutually cooperate in the rescheduling of work to permit an uninterrupted use of the facilities by the Owner, without additional cost to the Owner.

General:

A. The objective of this project is to complete the overall work in the shortest period of time and to protect the building and occupants from damages caused by weather and construction during the progress of the work.
B. To meet these objectives, the Contractor shall plan the work, obtain materials, and execute the construction in the most expeditious manner possible in accordance with the requirements listed below.
C. If the Contractor fails to expedite and pursue any part of the work, the Owner may terminate the contract or may carry out the work with others per the General Conditions.
D. The Contractor shall work in coordination with work of other Contractors and Owner.
E. All Contractors are required to comply with proper sequencing of work and provide other Prime Contractors sufficient time to install their work (e.g. – HVAC Contractor provide preassembled roof curbs on roof in time for the GC roofing work.) If Contractor "boxes out" another Prime Contractor, he will be directed to stop work and open if necessary, to enable other trades to complete their work. No compensation for lost time due to stop-work will be provided.

1.11. ADDITIONAL REQUIREMENTS

The following are additional general and special requirements which will govern the work of the projects covered by these documents:

A. If it appears that some of the work cannot be completed by the scheduled date, the Contractor shall increase the work force or increase the hours of work, including evenings and weekends as necessary, and cover any additional costs to the Owner, Architect and Construction Manager.
B. If the work is complete but the area has not been cleaned or debris and equipment remain, the Owner and/or Construction Manager will notify the Contractor of the deficiencies. The Contractor will have up to four hours to clean the specified area(s) to the satisfaction of the Owner and/or Construction Manager. If the Contractor fails to do so, the Owner reserves the right to prepare the area for occupancy using their own resources and deduct the associated costs from the Contract amount.
C. Contractor must plan, provide and maintain his own access, ramping and egress as required into and out of the site, staging of trailer(s), materials, machinery, and equipment in agreement with the Construction Manager's Superintendent. Maintain free and safe access on the jobsite for other related project personnel. Maintain safe pedestrian or vehicular traffic must be regulated by a flagman. Trucking and delivery operation should be coordinated with Construction Manager's Superintendent and all other trades.

D. Contractor is responsible to maintain existing site fencing in its existing condition. Modifications of the fence to better accommodate the contract work can be discussed with the Construction Manager. These changes shall than be handled by this Contractor at his expense and in accordance with the Construction Manager's Superintendent's direction. Any cost incurred as a result of damages shall be changed to this Contractor.
E. Contractor's personnel will not be permitted to use Owners facilities (including toilet, telephone, food services, etc.) for their own benefit. Contractor's Superintendent must explain this to all their field forces.
F. Contractor shall limit his operations including storage of materials and prefabrication to areas within the Contract Limit Lines.
G. Contractor shall coordinate the use of premises with the Owner and Construction Manager and shall move at his own expense any stored products under Contractor's control, including excavated material, which interfere with operations of the Owner or separate Contractors.
H. Contractor shall obtain and pay for off-site storage as needed to maintain the Owner's use of their premises. The costs of any required storage shall not be an additional expense to the Owner.
I. Contractor shall assume full responsibility for the protection and safekeeping of products under this Contract stored on the site and shall cooperate with the Construction Manager to ensure security for the Owner's Property.
J. The intention of the work is to follow a logical sequence; however, the Contractor may be required by Construction Manger to temporarily omit or leave out any section of his work or perform his work out of sequence. All such out of sequence work and come back time to these areas shall be performed at no additional cost.
K. Contractor shall submit a three-week (man-loaded work activity and area) to Construction Manager each week. Contractor's representative shall attend a weekly meeting with all contractors, chaired by Construction Manager, for the purpose of job coordination and sequencing.
L. Contractor is responsible to coordinate the job with other trades and Construction Manager, and to cooperate with other trades in pursuit of the overall project's coordination drawings and actively participate in resolving discrepancies, conflicts, interferences, etc.
M. The Contractor shall take special care in verifying that his equipment matches the characteristics of the power being supplied.
N. Any Contractor personnel including Project Managers, Supervisors, etc. who engage in any personal attacks, belligerent or threatening speech/texts, etc., to the Owner, or any of its agents, will be removed from working on the project.
O. Unsafe practices, horseplay, abusive behavior or language, wanton destruction of property, use of drugs or alcohol, possession of firearms, and solicitation shall not be tolerated. There will be no warnings, and Contractor shall designate a responsible on-site Supervisor to handle any situations that may arise, including termination.

P. Each Contractor is responsible to supply and install all blocking/bracing necessary to properly secure their work. This responsibility includes coordinating the installation in concealed areas without delaying other trades.
Q. Union business shall not be conducted on site. Any Union representative that visits the site must declare what Contractor's personnel they represent, and must be escorted by that Contractor's Union steward at all times. No visitors, sales representatives or non-working personnel shall be permitted on site without prior consent of the Construction Manager. No photographs shall be taken without the Construction Manager's prior approval.
R. Contractor shall provide protection from damage to adjacent and adjoining work and/or structures. Contractor shall clean, repair and/or replace any damage for which this Contractor is responsible.
S. Contractor shall submit hourly rate sheets that would apply to time and material work for all pertinent trades upon Award of Contract.
T. Contractor shall examine surfaces and conditions prior to start of work. Report unacceptable conditions to the Construction Manager. Do not proceed until unacceptable conditions are corrected and acceptable. Starting work implies acceptance of existing conditions.
U. Each Prime Contractor shall include general housekeeping of light debris. All debris from each Prime Contractor will be collected daily and disposed of into their dumpsters. In addition to daily general housekeeping, the General Work Contractor shall provide a weekly broom sweep and damp mop of all areas for the entire duration of the project. The broom sweep shall include debris from all trades working on site.
V. Sleeves and Sleeve Layout – It is the responsibility of the Prime Contractor requiring a sleeve to provide the sleeve and a layout sketch to the Prime Contractor performing the construction activity that the sleeve goes in.
W. Limited site space is available in areas as designated by the Construction Manager. Construction trade parking is not permitted in Owner's employee parking lot.
X. Prior to commencing the work, each Contractor shall provide written acceptance of grades, structures, substrates, and/or systems installed by other Contractors as suitable for installation of his work. Failure to provide this verification prior to commencing work shall constitute acceptance of the existing conditions.
Y. Each Contractor shall coordinate with the Construction Manager for lay down areas, staging areas, and overall use of project site.
Z. All Contractors and their employees, subcontractors and supplier are expressly prohibited from entering the occupied areas of the school building during school hours without prior written permission of the Construction Manager and for using any of its facilities (i.e. restrooms, cafeteria, etc.).
AA. No recycled import fill materials are permitted.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION 011200

SECTION 012100
ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.
   1. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
   1. Unit-cost allowances.
   2. Contingency allowances.

C. Related Sections:
   1. Division 01 Section "Unit Prices" for procedures for using unit prices.

1.02 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.03 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.04 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.05 COORDINATION

A. Coordinate allowance items with other portions of the Work.

1.06 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes.

B. **The Contractor's overhead and profit, including costs for bonds and insurances, supervision, delivery, equipment rental and similar costs, for these allowances shall be included in the values of the general requirements of the base bid contract sum and are not chargeable under allowance disbursement.**

C. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.07 ALLOWANCE DISBURSEMENT "REQUEST FOR PROPOSALS"

A. Submit proposals for changes in the scope in the form of the "Request for Proposal" as described in Division 01, Section "CONTRACT MODIFICATION PROCEDURES".

B. Once all parties have agreed to the terms and methods of the change, a Change Order will be issued.

1.08 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 CONTRACT 1 SITE CONSTRUCTION SCHEDULE OF ALLOWANCES

A. Allowance SC-00, General Allowance: **CONTRACT 1** shall include a contingency allowance totaling **$275,000** for use according to the Owner's instructions.

B. Allowance SC-01, Trench Rock Removal & Replacement Allowance: **CONTRACT 1** shall include in their base bid an allowance of **500 CY** of removal of trench rock and replacement with imported compacted structural fill if encountered.

C. Allowance SC-02, Unsuitable Soil Removal & Replacement Allowance: **CONTRACT 1** shall include in their base bid an allowance of **500 CY** of removal of unsuitable soil and replacement with imported compacted structural fill if encountered.

D. Allowance SC-03, Mass Rock Removal & Replacement Allowance: **CONTRACT 1** shall include in their base bid an allowance of **300 CY** of removal of mass rock and replacement with imported compacted structural fill if encountered.

3.04 CONTRACT 2 GENERAL CONSTRUCTION SCHEDULE OF ALLOWANCES

A. Allowance GC-00, General Allowance:**CONTRACT 2** shall include a contingency allowance totaling **$1,500,000** for use according to the Owner's instructions.

B. Allowance GC-01, Trench Rock Removal & Replacement Allowance: **CONTRACT 2** shall include in their base bid an allowance of **300 CY** of removal of trench rock and replacement with imported compacted structural fill if encountered.

C. Allowance GC-02, Unsuitable Soil Removal & Replacement Allowance: **CONTRACT 2** shall include in their base bid an allowance of **300 CY** of removal of unsuitable soil and replacement with imported compacted structural fill if encountered.

3.05 CONTRACT 3 MECHANICAL WORK CONTRACTOR - SCHEDULE OF ALLOWANCES

A. Allowance MC-00, General Allowance: **CONTRACT 3** shall include a contingency allowance totaling **$400,000** for use according to the Owner's instructions.

3.06 CONTRACT 4 ELECTRICAL WORK CONTRACTOR - SCHEDULE OF ALLOWANCES

A. Allowance EC-00, General Allowance:**CONTRACT 4** shall include a contingency allowance totaling **$400,000** for use according to the Owner's instructions.

B. Allowance EC-01, Trench Rock Removal & Replacement Allowance: **CONTRACT 4** shall include in their base bid an allowance of **300 CY** of removal of trench rock and replacement with imported compacted structural fill if encountered.

C. Allowance EC-02, Unsuitable Soil Removal & Replacement Allowance: **CONTRACT 4** shall include in their base bid an allowance of **300 CY** of removal of unsuitable soil and replacement with imported compacted structural fill if encountered.

D. Allowance EC-03, Mass Rock Removal & Replacement Allowance:**CONTRACT 4** shall include in their base bid an allowance of **100 CY** of removal of mass rock and replacement with imported compacted structural fill if encountered.

3.07 CONTRACT 5 PLUMBING WORK CONTRACTOR - SCHEDULE OF ALLOWANCES

A. Allowance PC-00, General Allowance:**CONTRACT 5** shall include a contingency allowance totaling **$200,000** for use according to the Owner's instructions.

3.08 CONTRACT 6 FIRE SPRINKLER WORK CONTRACTOR - SCHEDULE OF ALLOWANCES

A. Allowance FSC-00, General Allowance: **CONTRACT 6** shall include a contingency allowance totaling **$75.000** for use according to the Owner's instructions.

END OF SECTION 012100

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SECTION 012200
UNIT PRICES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Sections:
   1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
   2. Division 01 Section "Allowances" for procedures in using Unit Prices with Allowances

1.02 DEFINITIONS

A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.03 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: Unit prices, if any, are included on the Form of Proposal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

3.01 SCHEDULE OF UNIT PRICES

A. SITE CONSTRUCTION
   1. **Unit Price SC No. 01: Trench Rock Removal & Replacement**
      a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of trench rock; furnishing approved structural fill; and placing and compacting structural fill in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
      b. Unit of Measurement: Per cubic yard of trench rock measured in place.
      c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.
   2. **Unit Price SC No. 02: Unsuitable Soil Removal & Replacement**
      a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of unsuitable material encountered during unclassified excavation; furnishing approved replacement material; and placing and compacting replacement material in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
      b. Unit of Measurement: Per cubic yard of unsuitable soil measured in place.
      c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.
   3. **Unit Price SC No. 03: Mass Rock Removal & Replacement**

a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of mass rock; furnishing approved structural fill; and placing and compacting structural fill in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
b. Unit of Measurement: per cubic yard of mass rock measured in place.
c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.

B. GENERAL CONSTRUCTION
1. **Unit Price GC No. 01: Trench Rock Removal & Replacement**
a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of trench rock; furnishing approved structural fill; and placing and compacting structural fill in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
b. Unit of Measurement: Per cubic yard of trench rock measured in place.
c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.
2. **Unit Price GC No. 02: Unsuitable Soil Removal & Replacement**
a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of unsuitable material encountered during unclassified excavation; furnishing approved replacement material; and placing and compacting replacement material in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
b. Unit of Measurement: Per cubic yard os unsuitable soil measured in place.
c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.

C. ELECTRICAL CONSTRUCTION
1. **Unit Price EC No. 01: Trench Rock Removal & Replacement**
a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of trench rock; furnishing approved structural fill; and placing and compacting structural fill in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
b. Unit of Measurement: Per cubic yard of trench rock measured in place.
c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.
2. **Unit Price EC No. 02: Unsuitable Soil Removal & Replacement**
a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of unsuitable material encountered during unclassified excavation; furnishing approved replacement material; and placing and compacting replacement material in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.
b. Unit of Measurement: Per cubic yard of unsuitable soil measured in place.
c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.
3. **Unit Price EC No. 03: Mass Rock Removal & Replacement**
a. Description: Unit Price shall include full compensation for excavation, removal, hauling, and legal disposal of mass rock; furnishing approved structural fill; and

placing and compacting structural fill in accordance with the Contract Documents. Unit Price shall be used as an addition to or deduction from Base Bid quantities and/or Bid Allowances, as directed by the Owner.

b. Unit of Measurement: per cubic yard of mass rock measured in place.

c. Basis of Measurement: Measurement shall be based on quantities measured in place and approved by the Engineer prior to excavation.

END OF SECTION 012200

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SECTION 012300
ALTERNATES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.02 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
   2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. GENERAL CONSTRUCTION
   1. **Alternate No. GC-1:** Stainless Steel Interior Guardrails and Handrails at Stairs.
      a. **Base Bid:** Interior guardrails and handrails at Stairs to be standard steel pipe, painted as indicated on the drawings.
      b. **Alternate:** Interior guardrails and handrails at Stairs shall be stainless steel in lieu of standard steel pipe, painted.
   2. **Alternate No. GC-2:** Security Glazing Film
      a. **Base Bid:** Provide security glazing film (SGF1) applied to secure side of glazing at the main office suite exterior windows, Vestibule V10 doors and storefront, Vestibule V13 doors and storefront, and Security Office 118 exterior window as indicated on the drawings.
      b. **Alternate:** Provide security glazing film (SGF1) applied to secure side of glazing at all remaining first floor exterior windows, doors and storefronts.

B. ELECTRICAL CONSTRUCTION
   1. **Alternate No. EC- 1:** Rigging

a. **Base Bid:** Full design as indicated in the documents.
b. **Alternate:** Eliminate installation of all rigging line sets EXCEPT Front-of-House (FOH), 01 Main Valance, 02 Main curtain and 03 #1 Electric line sets as shown on TR series drawings and specification section 116133 Production Rigging, Curtains and Tracks. FOH line set to remain motorized operation, all other line sets are to be dead hung under alternate. Eliminate electric plug strips and related multiconductor cabling associated with eliminating rigging line sets associated with this alternate as indicated on TL series drawings. All empty conduits, "grid iron juction boxes", and "grid iron network boxes" for future installation of #2 electric and #3 electric, per TL series drawings, shall remain included as base bid work.

2. **Alternate No. EC-2:** Production Lighting
   a. **Base Bid:** Full design as indicated in the documents.
   b. **Alternate:** Eliminate installation of all production lighting fixtures, accessories, and cables EXCEPT as indicated on TL series drawings and in specification section 260961 Production Lighting Control and Equipment schedules of quantities.
3. **Alternate No. EC-3:** Audio / Video Systems
   a. **Base Bid:** Full design as indicated in the documents.
   b. **Alternate:** Eliminate installation of all Audio / Video Systems components EXCEPT installation of projection screen, projector, and wiring required for operation of projector and projection screen. All raceways, boxes and blank covers, including empty conduits, for all remaining devices for a future complete and operable system are to remain as base bid work.

END OF SECTION 012300

SECTION 012500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 GENERAL

A. Should the Contractor desire to substitute other articles, materials, apparatus, products or processes than those specified or approved as equal, the Contractor shall apply to the Architect in writing for approval of such substitution. It should be noted that the bid shall not be based on a substituted article, material, apparatus, product or process. With the application shall be furnished such information as required by the Architect to demonstrate that the article, material, apparatus, product or process he wishes to use is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to make the substitution and shall further state what difference, if any, will be made in the construction schedule and the contract price for such substitution should it be accepted; it being the intent hereunder that any savings shall accrue to the benefit of the Owner.

B. The Architect shall reject any such desired substitution as not being specifically named in the contract, or if he shall determine that the adjustment in price in favor of the Owner is insufficient, the Contractor shall immediately proceed to furnish the designated article, material, apparatus, product or process.

C. Request for substitutes shall conform to the requirements of this Article.

D. Requests for substitutions shall, include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.

E. Requests for utilization of substitutes will be reviewed during the course of the project. The impact on the project and the timeliness of submission will be of key consideration.

F. The approval of utilization of a substitute is subject to the sole and final discretion of the Architect.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Sections:
   1. Division 01 Section "Allowances" for products selected under an allowance.
   2. Division 01 Section "Alternates" for products selected under an alternate.
   3. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
   4. Division 01 Section “Submittals” for submittal procedures.
   5. Divisions 02 through 49 Sections for specific requirements and limitations for substitutions.

1.03 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
   2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

B. Substitute Items (Or Equal): If in Architect/Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item it will be considered a proposed substitute item.

1.04 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use form provided in Project Manual.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
      h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      i. Research reports evidencing compliance with building code in effect for Project, from Building Code of New York State.
      j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
      k. Cost information, including a proposal of change, if any, in the Contract Sum.
      l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
      m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
      n. See additional requirements in Article 2.3 DETAILED SUBSTITUTION PROCEDURES
   3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within (5) five days of receipt of a request for substitution. Construction Manager will notify Contractor of acceptance or rejection of proposed substitution within (10) ten days of receipt of request, or (5) days of receipt of additional information or documentation, whichever is later.
      a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
      b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.05 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 PRODUCTS

2.01 SUBSTITUTION PROCEDURES (GENERAL)

A. Conditions: After the 'Notice of Award" and prior to the Contractor entering into a Formal Contract with the Owner, the Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   1. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   2. Substitution results in substantial cost savings to the Owner or substantial performance improvements.
   3. Substitution request is fully documented and properly submitted.
   4. Requested substitution will not adversely affect Contractor's construction schedule.
   5. Requested substitution has received necessary approvals of authorities having jurisdiction.
   6. Requested substitution is compatible with other portions of the Work.
   7. Requested substitution has been coordinated with other portions of the Work.
   8. Requested substitution provides specified warranty.
   9. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
   10. The substation is submitted in compliance with Article 2.3 DETAILED SUBSTITUTION PROCEDURES

B. If the Contractor does not present 'Substitutions" in the time frame noted above any future requests to substitute products will not be considered, unless the substitution is for cause.

C. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

2.02 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than (20) twenty days prior to time required for preparation and review of related submittals.
   1. Architect will consider Contractor's request for substitution when the following conditions are present.
      a. The specified product is not available
      b. The specified product cannot be delivered in the time frame required under the Project Schedule.
   2. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
      a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      b. Substitution request is fully documented and properly submitted.
      c. Requested substitution will not adversely affect Contractor's construction schedule.
      d. Requested substitution has received necessary approvals of authorities having jurisdiction.
      e. Requested substitution is compatible with other portions of the Work.

f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received prior to award of contract and based on the following
1. The proposed product substitution will result in a significant cost savings to the Owner.
2. The proposed product has substantial performance improvements.
3. The proposed product can be provided much earlier in the schedule enhancing the project completion date.
4. The proposed product warranty is superior to the specified item.

2.03 DETAILED SUBSTITUTION REVIEW PROCEDURES

A. The Architect in addition to the requirements listed above will require compliance with the following requirements and procedures.
1. Requests for approval of substitutions will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.
2. If the materials and equipment submitted are offered as substitutions to the Contract Documents or approved equal, the Contractor shall advise the Owner and the Architect of the requested substitutions and comply with the requirements hereinafter specified in this Article.
3. Where the acceptability of substitution is conditioned upon a record of and the proposed substitution does not fulfill this requirement, the Architect, at the Architect's sole discretion, may accept the substitution if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the Owner for any failure occurring within a specified time. The substitution item must meet all other technical requirements contained in the Specification.
4. The Contractor shall furnish such information as required by the Architect to demonstrate that the equal article, material, apparatus, product or process is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended and/or that it offers substantial benefits to the Owner in saving of time and/or cost. The Contractor shall set forth the reasons for desiring to make this substitution.
5. Contractor shall submit:
a. For each proposed request for approved substitute sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Architect to determine if the proposed request for approval should be granted, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.
b. Certified tests, where applicable, by an independent laboratory attesting to the performance of the substitute.
c. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.
d. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.
6. Where the approval of a substitute requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Architect.

7. In the event that the Architect is required to provide additional services, then the Architect's charges for such additional services shall be paid by the Contractor to the Owner.
8. Any modifications in the Work required under other contracts to accommodate the changed design will be incorporated in the appropriate contracts and any resulting increases in contract prices will be charged to the Contractor by the Owner who initiated the changed design.
9. In all cases, the Architect shall be the judge as to whether a proposed substitute is to be approved. The Contractor shall be bound by the Architect's decision. No substitute items shall be used in the Work without written approval of the Architect.
10. In making request for approval of substitute, Contractor represents that:
    a. Contractor has investigated proposed substitute and determined that it is equal to or superior in all respects to the product, manufacturer or method specified or offers other specified advantages to the Owner.
    b. Contractor will provide the same or better warranties or bonds for proposed substitute as for product, manufacturer or method specified.
    c. Contractor waives all claims for additional costs or extension of time related to proposed substitute that subsequently may become apparent.
    d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Architect in considering a substitute proposed by the Contractor or by reason of failure of the Architect to approve a substitute proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of a substitute shall be the sole responsibility of the Contractor requesting the substitute and it shall arrange its operations to make up the time lost.
11. Proposed substitute will not be accepted if:
    a. Acceptance will require substantial revision of Contract Documents.
    b. Acceptance will substantially change design concepts or Technical Specifications.
    c. Acceptance will delay completion of the Work, or the Work of other Contractors.
    d. If the Substitute item is not accompanied by formal request for approval of substitute from Contractor.
12. The Architect reserves the right to disapprove, for aesthetic reasons, any material or equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.
13. All requests for approval of substitutes of materials or other changes from the contract requirements shall be accompanied by an itemized list of all other items affected by such substitution or change. The Architect shall have the right, if such is not done, to rescind any approvals for substitutions and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the substitution to the Contractor.
14. Approval of a substitute will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.
15. In the event that the Architect is required to provide additional services as a result of a request for approval of a substitute results in changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Architect is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Architect's charges in connection with such additional services shall be paid by the Contractor.
16. Structural design shown on the Drawings is based upon the configuration of and maximum loading for major items of equipment as indicated on the Drawings and as

specified. If the substituted equipment furnished differs from said features, the Contractor shall pay to the Owner all costs of redesign and for any construction changes required to accommodate the equipment furnished, including the Architect's charges in connection therewith.

B. The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within two (2) submissions. All costs to the Architect involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be paid by the Contractor to the Owner, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted for, all costs involved in the reviewing and approval process will likewise be back charged to the Contractor unless determined by the Architect that the need for such substitution and/or deviation from Contract Documents is beyond the control of the Contractor.

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 012500

SECTION 012519
EQUIVALENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Requirements set forth herein pertain to products specified in divisions included in project manual.

1.02 DEFINITIONS:

A. For the purpose of this contract, the words "similar", "equal to", "or equal", "equivalent" and such other words of similar content and meaning, shall be deemed to mean similar and equal to one of named products.

B. For the purpose of bidding documents, the word "products" shall be deemed to include the words "articles", "materials", "items", "equipment" and "methods". Whenever in contract documents one or more products are specified, words "similar, equivalent, and equal to" shall be deemed inserted.

1.03 EQUIVALENTS:

A. Where, in these specifications or on drawings, certain kinds, types, brands, or manufacturers of materials are named, they shall be regarded as required standard of quality. Where two or more are named these are presumed to be equal, and Contractor may select one of those items.

B. If Contractor desires to use any kind, type, brand, or manufacturer of material other than those named in specification, he may submit the request for approval to the Architect well in advance of the bid date.

C. Requests for approval of proposed equivalents will be received by Architect only from the Contractor.

D. If the Architect approves a proposed equivalent prior to receipt of Bids, such approval will be set forth in an Addendum.

E. After the bid opening the apparent low bidder or bidders will be notified by the Architect or Owner and shall submit to the Architect in writing, within ten (10) calendar days what equivalent kind, type, brand, or manufacture is included in bid in lieu of specified items. No equivalents will be considered after this submission.

F. Contractor shall have burden of proving, at Contractor’s own cost and expense, to satisfaction of Owner/Architect, that proposed product is similar and equal to named product. In making such determination Owner/Architect will be sole judge of objective and appearance criteria that proposed product must meet in order for it to be approved.
   1. Supporting data on equivalency is responsibility of bidder. For each equivalent to base specification, included in products list, submit information describing in specific detail -
      a. Wherein it differs from quality and performance required by base specification.
      b. Changes required in other elements of work because of equivalent.
      c. Effect on construction schedule.
      d. Any required license fees or royalties.
      e. Availability of maintenance service, and source of replacement materials.
      f. Such other information as may be required by Owner.

G. Owner, through Architect, shall be judge of acceptability of proposed equivalents. Risk of whether bid equivalents will be accepted is borne by Contractor.

1.04 CONTRACTOR'S REPRESENTATION:

A. Submission of an equivalent product and/or material constitutes a representation that Contractor:
   1. Has investigated proposed product and determined it is equal to or superior in all respects to that specified.
   2. Will provide same warranties or bonds for equivalent as for product specified.
   3. Will coordinate installation of an accepted equivalent into work and make such other changes as may be required to make work complete in all respects.
   4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
   5. Will provide, at own cost and expense, any different quantity and/or arrangement of ductwork, piping, wiring, conduit or any part of work from that specified, detailed or indicated in Contract Documents if required for proper installation of an approved equivalent.
   6. Will provide, at own cost and expense, all such revision and redesign and all new drawings and details required by Architect for approval if proposed equivalent product requires a revision or redesign of any part of work covered by this contract.
   7. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
      a. Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
      b. Copies of current, independent third-party test data of salient product or system characteristics.
      c. Samples where applicable or when requested by Architect.
      d. Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      e. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      f. Research reports, where applicable, evidencing compliance with building code in effect for Project, from the Building Code of New York State.
      g. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
   8. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
   9. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

1.05 EQUIVALENT CERTIFICATION:

A. Contractor must sign the “Equivalent Certification” following this specification section and deliver it to the Architect along with a complete list of proposed equivalents within ten (10) calendar days after notification from the Architect or Owner. This is mandatory and must be done prior to award of contracts.

EQUIVALENT CERTIFICATION

Project Name:
Project Address:
Project No.:

REVIEWED MATERIAL:

AIA A701-2018 Instructions to Bidders
AIA A201-2017 or A232(CMa) General Conditions of the Contract
Specification Section: 012519 - Equivalents
Specification Section: 012500 - Substitution Procedures
Specification Section: 016000 - Product Requirements

CHECK THE FOLLOWING THAT APPLIES:

	No equivalents are proposed.
	Proposed equivalents are attached with supporting data as per Section 012519.

ALL EQUIVALENTS ARE HEREBY PRESENTED TO ARCHITECT AND OWNER FOR APPROVAL. NO FUTURE EQUIVALENTS WILL BE CONSIDERED.

Contractor Signature:
Printed Name of Contractor:
Date:

Signature of Reviewer:
Printed Name of Reviewer:
Approved as Noted Date:

END OF SECTION 012519

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SECTION 012600 – CONTRACT MODIFCATION

PART 1 – PROCEDURES - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
   1. Provisions of this Section apply to the work of each prime contractor.
B. Related Sections: the following Sections contain requirements that relate to this Section:
   1. Division 1 Section “Submittals” for requirements for the Contractor’s Construction Schedule.
   2. Division 1 Section “Applications for Payment” for administrative procedures governing Applications for Payment.
   3. Division 1 Section “Substitutions” for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. The Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on AIA Form G710, Architect’s Supplemental Instructions.

1.4 CHANGE ORDER PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or reviewed Drawings and Specifications.
   1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
   2. Within 7 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner’s review.
      a. Include an itemized list of quantities of products required and unit costs, with the total amount of purchases to be made. Furnish survey data and backup invoices, quotes paperwork to substantiate.
      b. Separate labor hours by trade and indicate labor rate. (Submit attached labor rate worksheet notarized for each trade / classification.)
      c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

d. Include an updated Contractors Construction Schedule that indicates the effect of the change, including but not limited to; changes in activity duration, start and finish times, and activity relationship. Use available float before requesting an extension of contract time.

B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
   1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
   2. Include an itemized list of quantities of products required and unit costs, with the total amount if purchases to be made. Furnish survey data to substantiate quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts. Include labor rate breakdown sheets for each trade.
   3. Comply with requirements in Section "Product Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.
   4. Include an updated Contractors Construction Schedule that indicates the effect of the change, including but not limited to; changes in activity duration, start and finish times, and activity relationship. Use available float before requesting an extension of contract time.

C. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.

1.5 ALLOWANCES

A. Allowance Adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
   1. Include installation costs in the purchase amount only were indicated as part of the allowance.
   2. When requested, prepare explanations and documentation to substantiate the margins claimed.
   3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.

      Separate labor hours by trade and indicate labor rate. (Submit attached labor rate worksheet notarized for each trade / classification.)

   4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
   5. Contractor's overhead and profit, including all supervision, costs for bonds & insurances, for these allowances shall be included in the values of the general requirements of contract sum and are not chargeable under allowance disbursement.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or the Contractor's handling, labor, installation, overhead, and profit. Submit claims within 15 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 15 days.
   1. Do not include the Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in Contract Documents.
   2. No change to the Contractor's indirect expense is permitted for selection of higher or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714/CMa. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Architect or Construction Manager will issue a Change Order for signatures of the Owner, Architect, Construction Manager, and the Contractor on AIA Form G701.

B. Contractor cannot requisition for any allowance or change order work until the paperwork has been fully executed by the Contractor, CM, Architect and Owner.

C. Requests for changes in bond fees, if any, will be analyzed at the conclusion of the project. Contractors bonding company to submit substantiation letter. (Bond amount based on total adjusted contract value)

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

Arris Contracting Company, Inc.
189 Smith Street
Poughkeepsie, NY 12601

LABOR RATE WORKSHEET

Project No. _____

Contractor Name: _____ County: _____ Date: _____
Address: _____
Telephone Number: _____

Trade: _____
(Provide separate sheet for each trade, foreman/journeyman, etc.)

	*	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR					
BENEFITS (* Identifies benefits paid directly to the Employee.)					
Vacation and Holiday					
Health and Welfare					
Pension					
Annuity					
Education / Apprentice Training					
Supplemental Unemployment					
Security Fund					
Industry Advancement					
UBC-Appr., Health, Safety, Educ.					
Labor Management Fund					
B. TOTAL BENEFITS PER HOUR					

PAYROLL TAXES AND INSURANCE	
F.I.C.A. / Social Security (up to the maximum required by law)	%
Medicare	%
Federal Unemployment (up to a maximum of $56.00 per employee per year)	%
State Unemployment (up to 1st $8,500 of base salary paid per employee per year)	%
Workers' Compensation Code: _____	%
Disability	%

C. TOTAL TAXES AND INSURANCE PER HOUR

All Benefits are paid directly to Employee. _____ x _____ % =
Only benefits identified by * are paid directly to Employee.

D. TOTAL LABOR RATE (A + B + C) =

E. DOCUMENTATION
For General Liability and Workers Compensation, provide policy renewal page from insurance carrier (with contractor name, address, and insurance agent) for substatiation purposes.

F. CONTRACTOR'S CERTIFICATION
I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true cost incurred.

_____
Signature

_____
Print Name of Authorized Representative

_____
Print Title

Sworn before me this _____ day
of _____, 20 _____.

_____
Notary Public

END OF SECTION 012600

SECTION 01 29 00 – PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements governing each prime contractor's Applications for Payment.
   1. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, Submittal Schedule, and List of Subcontracts.
B. Related Sections: The following Sections contain requirements that relate to this Section.
   1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

A. Coordination: Contractor shall coordinate preparation of its Schedule of Values for the Work with preparation of the Contractors' Construction Schedule.
   1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
      a. Contractor's Construction Schedule
      b. Application for Payment forms, including Continuation Sheets
      c. List of subcontractors
      d. Schedule of allowances
      e. Schedule of alternates
      f. Schedule of submittals
   2. Submit the Schedule of Values (SOV) to the Construction Manager within 10 days of receipt of the Letter of Intent but no later than 10 days before the date scheduled for submittal of the initial Applications for Payment. (SOV's received after the 15th of the month, will not be allowed to requisition until the following month, due to input time for CM & Owner into their computer systems).
B. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.
   1. Identification: Include the following Project identification on the Schedule of Values:
      a. Project name and location.
      b. Name of the Architect.
      c. Project SED number.
      d. Contractor's name and address.
      e. Date of Submittal
   2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.
    1. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items as requested by the Construction Manager. Multiple line items will be provided for amounts in excess of five percent of the contract sum, broken out into subcomponents equaling not greater than five percent each. Separate all line items by material & labor.
    a. Breakdown shall be separated between additions, renovations and sitework with subtotals for each with its own stand-alone front-end sections as outlined in item 4 below. Each will have their own subtotal, so that the owner can easily see the value to date without needing to add columns.
    b. Breakdown will be separated by school (and SED number) each with its own stand-alone front-end sections as outlined in item 4 below. Each will have their own subtotal, so that the owner can easily see the value to date without needing to add columns.
4. In addition to the breakdown of specification sections, separate line items will be required for the following front-end line items:
    a. Bonds & OCP insurances shall be listed as separate line items. (Substantiation letters required from bonding & insurance company for any amount higher than industry standard of 2.0% of contract sum). Only OCP insurance is allowed for insurance line item. All other insurance costs must be distributed by contractor evenly throughout the various sections.
    b. Supervision – include a minimum of 1% of contract sum.
    c. Project Administration – include a minimum of 1% of contract sum.
    d. Project meetings (appropriate value for weekly attendance for entire duration of project – see Section 01 31 19 Project Meetings for amount)
    e. Punchlist – include a minimum of 2.5% of contract sum
    f. Closeout: separate lines for demobilization, Operation & maintenance manuals, closeout paperwork, demonstration & training (total for closeout minimum 2% percent of contract value)
    g. Continuous Clean-up and Final Clean-up values each at minimum of 2% of contract sum.
    h. General Contractor to add line item for Broom sweep/damp mopping at minimum of .5% of contract sum.

5. Round amounts to the nearest whole dollar; the total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
    a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing.
7. Provide separate line items on the Schedule of Values for the initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Unit-Cost Allowances: Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents. Allowances to be listed at the end of the Schedule of Values.
9. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.
10. Schedule of Values Updating: Update and resubmit the Schedule of Values with the next Applications for Payment when Approved Change Orders or Executed Construction Change Directives and Approved Allowance Disbursements.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
    1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
B. Payment Application Times: Each progress-payment date is indicated in the Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
C. Payment-Application Times:
    1. Submit the initial Payment Application to the Construction Manager and the Architect by the twenty fifth of the month for that month. The Construction Manager and the Architect will provide final comments within three business days of receipt on the twenty fifth of the month. If submitted later than the twenty fifth of the month, review times may be as long as five days from receipt.
    2. All required documents, including the final version of the Application for Payment, based on the comments provided by the Construction Manager and the Architect, must be received by the Construction Manager no later than the first business day of the month following the twenty fifth due date. This will allow for final review by the Construction Manager for accuracy and completeness of submitted documents. If comments are provided to the

contractor, the contractor must submit a new complete package including all required corrections/updates.

3. All final, complete, Payment Applications will be paid in accordance with the terms of the Standard Form of Agreement Between Owner and Contractor.
4. If a complete package is submitted late to the Construction Manager, the contractor will be paid as per the terms of the Standard Form of Agreement Between Owner and Contractor.

D. Payment-Application Forms: Use AIA Document G732/CMA (provide a line for the Construction Manager's signature) and Continuation Sheets G703 as the form for Applications for Payment.

1. Separate Continuation Sheets shall be provided for work which takes place on each building and per NYSED project number indicated on drawings and specifications, which will detail that portion of the contract which is attributable to the specific building and NYSED project number indicated on drawings and specifications.

E. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Construction Manager will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions are made.
2. Include amounts of Change Orders and Allowances issued prior to the last day of the construction period covered by the application. (No Change Order or Allowance requisitions can be made or listed on the requisition, unless the formal CO/AD paperwork has been fully executed by Contractor, Construction Manager, Architect, and Owner).
3. Provide digital copies of payrolls which are signed and notarized (Blue Ink) documenting compliance with prevailing wage laws. Payroll for contractors is required from the 25th of the previous month to the 24th of the current month. Payroll for subcontractors is required from the 15th of the previous month to the 14th of the current month.
4. Provide copies of lien waivers for the previous payment (or anticipated payment.) Include certificate of monthly payment for subcontractors for the previous month.
5. Provide OSHA 10 certificates for all workers on site.
6. Payment for stored materials (whether onsite but not installed, or offsite in a secure warehouse) will require a bill of lading showing the exact value and photographs. In no case shall more than 90% be approved for uninstalled stored materials. An insurance certificate must be provided, specifically to the materials stored with the appropriate dollar value (for onsite or offsite materials).

F. Transmittal: Submit 1 signed and notarized digital copy (blue ink signature) of each Application for Payment to the Construction Manager by a method ensuring receipt within 24 hours. The digital copy shall be complete and attached as a single file to include all waivers of lien, certified payrolls and similar attachments.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect and Construction Manager.

G. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
   1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. The owner reserves the right to designate which entities involved in the Work must submit waivers.
      a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
   4. Waivers Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following. The initial payment application will not be processed until all of these actions and submittals have been received by the Construction Manager. When preliminary submissions are received with the initial application (items 4 and 7), the final submission for these items must be received and approved by the Construction Manager prior to submission of the second application for payment.
   1. List of subcontractors.
   2. List of principal suppliers and fabricators
   3. Schedule of Values.
   4. Contractor's Construction Schedule (preliminary if not final).
   5. Schedule of principal products.
   6. Schedule of unit prices.
   7. Submittal Schedule (preliminary if not final).
   8. List of Contractor's staff assignments.
   9. Certificates of insurance and insurance policies.
   10. Performance and payment bonds.
   11. Data needed to acquire the Owner's insurance.
   12. Initial settlement survey and damage report, if required.

I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
   1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
   2. Administrative actions and submittals that shall precede or coincide with this application include:
      a. Occupancy permits and similar approvals.
      b. Warranties (guarantees) and maintenance agreements.
      c. Test/adjust/balance records.
      d. Maintenance instructions.

e. Meter readings.
f. Startup performance reports.
g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
h. Final cleaning.
i. Application for reduction of retainage and consent of surety.
j. Advice on shifting insurance coverages.
k. Final progress photographs.
l. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

J. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Transmittal of required Project construction records to the Owner.
4. Removal of temporary facilities and services.
5. Removal of surplus materials, rubbish, and similar elements.

PART 2 – PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 No retainage release will be approved by owner until all closeout documents (Closeout paperwork, as-builts, O&M manuals, AIA release forms, warranties, material turnover receipts, etc.) are received and verified complete.

END OF SECTION 01 29 00

Section 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1. Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2. Summary

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
  1. General project coordination procedures.
  2. Conservation.
  3. Coordination Drawings.
  4. Administrative and supervisory personnel.
  5. Cleaning and protection.

B. Related Sections: The following Sections: the following Sections contain requirements that relate to this Section:
  1. Division 1 Section “Project Meetings” for progress meetings, coordination meetings, and pre-installation conferences.
  2. Division 1 Section “Construction Progress Schedule” for preparing and submitting the Contractor’s Construction Schedule.
  3. Division 1 Section “Material and Equipment” for coordinating general installation.
  4. Division 1 Section “Execution and Closeout Requirements” for coordinating contract closeout.

1.3. Coordination

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection and operation.
  1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
  3. Make provisions to accommodate items scheduled for later installation.
  4. Contractor is required to coordinate with their subcontractors, other Prime Contractors and the Construction Manager, sufficiently ahead of the work progressing.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining specials procedures required for coordination. Include such items as require notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Processing of submittals and photocopying/delivery to affected contractors.
4. Progress meetings
5. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the work.

1.4. Submittals

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components. (e.g. – sub-slab piping, ceiling spaces, etc.)

1. Show the relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section "Submittals."
4. HVAC Contractor will begin coordination drawing process within 15 calendar days of award of Contract by providing ¼" scale drawings indicating locations of all ductwork layout, piping layout, Bottom of duct etc. Electronic copies will then be submitted to Electrical Contractor for lighting fixtures, main feeders and clearances. Finally, to the General Contractor for ceiling information (Each contractor shall complete their review and mark-ups within 5 days)
5. A coordination meeting with all Contractors and subcontractors to review completed coordination drawings will be held within 45 days of Contract award.

B. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. Electronic CAD Files of Project Base Plan Drawings; May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
2. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
   a. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Document. In

the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Contract Drawings and Specifications. CAD Files do not necessarily represent the latest Contract Documents, existing conditions and as-builts conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.

b. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.

c. Receiver shall not be hold Architect/ Engineer responsible for data or file clean- up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.

d. Receiver shall understand that even through Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.

1. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses or damage caused by presence of computer virus in file or media.

3. Upon request to the Architect, and at the Architect's sole discretion, Base Plan Drawings only may be provided to the Prime Contractor in electronic format (for example, AutoCAD format) by the Architect at charge rate to cover the architect's cost for producing.

4. Prior to the Architect's dispensing of documents in electronic format, the Contractor shall execute and deliver an "Electronic Media Release Agreement," provided upon request by Architect, along with said payment.

C. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1. General Coordination Provisions

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2. Cleaning and Protection

A. Prime Contractor is to clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: Supervise Construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. High-speed operation.
20. Improper lubrication.
21. Unusual wear or other misuse.
22. Contact between incompatible materials.
23. Destructive testing.
24. Misalignment.
25. Excessive weathering.
26. Unprotected storage.
27. Improper shipping or handling.
28. Theft or vandalism.

3.3. Requests for Interpretation (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI and forward to the Construction Manager via the internet web-based service.

B. RFI'S shall originate with Contractor. RFI's submitted by entities other than Contractor will be returned with no response.

1. Coordinate and submit RFI's in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

C. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project Name.
2. Date.
3. Name of Contractor.
4. Name of Architect and Construction Manager.
5. RFI number, numbered sequentially. Use prefix based on Contract (i.e. MC, EC).
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate
9. Contractor's suggested solution(s). If Contractor solution(s) impact the Contract Time or the Contract Sum, Contractor shall state the impact in the RFI.
10. Contractors Signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings and other information necessary to fully describe items needing interpretation.

a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies and attachments.

D. Architect's Action: Architect will review each RFI, determine action required, and return it.

1. The following RFIs will be returned without action:

a. Requests for approval substitutions.
b. Requests for coordination information already indicated in the Contract Documents.
c. Requests for adjustments in the Contract Time or the Contract Sum.
d. Requests for interpretation of Architect's actions on submittal.
e. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."

a. If Contractors believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.

E. On receipt of Architect's and Construction Manager's action, immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

3.4. Deficiency Reports

A. If the Owner, Architect, or Construction Manager notes a deficiency in an installation, material, etc., they will issue a deficiency report via the internet web-based service to the appropriate contractor. The contractor has the designated time listed to correct the deficiency and upon completion must respond back in the internet web-based service. The A/E will then perform a follow-up inspection to confirm that the deficiency was adequately corrected.

3.5. Department of Labor Overtime Request

A. The DOL overtime request form shall be filled out and forwarded by each contractor to the Construction Manager prior to the start of any onsite work. Contractors will not be allowed to work Weekends or after hours unless the DOL has been properly notified.

END OF SECTION 013100

SECTION 013119 – PROJECT MEETINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1. Preconstruction conferences.
2. Preinstallation conferences.
3. Progress meetings.
4. Coordination meetings.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Coordination” for procedures for coordinating project meetings with other construction activities.
2. Division 1 Section “Submittals” for submitting Contractor’s Construction Schedule.

1.3 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference will be scheduled before starting construction, at a time convenient to the Owner, Construction Manager and the Architect, but no later than 15 days after issuance of the Letter of Intent. The conference will be held at the Project Site or another convenient location.

B. Attendees: Authorized representatives of the Construction Manager, Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress, including the following:
1. Tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders.

5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data, and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Parking availability.
11. Office, work, and storage areas.
12. Equipment deliveries and priorities.
13. Safety procedures.
14. First aid.
15. Security.
16. Housekeeping.
17. Working hours.

D. Reporting: Construction Manager shall prepare and issue minutes to attendees and interested parties.

1.4 PREINSTALLATION CONFERENCES

A. Conduct a pre-installation conference at the Project Site before each construction activity that requires coordination with other construction.

B. Attendees: The Installer and representatives of the Prime Contractor, manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Construction Manager and Architect of scheduled meeting dates.
   1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for the following:
      a. Contract Documents.
      b. Options.
      c. Related Change Orders.
      d. Purchases.
      e. Deliveries.
      f. Shop Drawings, Product Data, and quality-control samples.
      g. Review of markups.
      h. Possible conflicts.
      i. Compatibility problems.
      j. Time schedules.
      k. Weather limitations.
      l. Manufacturer’s recommendations.
      m. Warranty requirements.

n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities.
q. Space and access limitations.
r. Governing regulations.
s. Safety.
t. Inspecting and testing requirements.
u. Required performance results.
v. Recording requirements.
w. Protection.

2. Record significant discussion and agreements and disagreements of each conference and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.
4. Reporting: Prime Contractor or Installer shall issue minutes to attendees, CM, Owner and Architect.

1.5 PROGRESS MEETINGS

A. Progress meetings will be held at the Project Site at regular intervals (typically weekly) as determined by the Construction Manager.

B. Attendees: In addition to representatives of the Owner, Construction Manager, and the Architect, each Prime Contractor shall be represented at these meetings. Attendance is mandatory at meetings and contractor will include in their bid a sum of $250.00 per meeting (figure 35 meetings) to have an authorized individual in attendance capable of making decisions and providing direction. This amount will be listed as a separate line item on the contractor's Schedule of Values. If the contractor misses a meeting without prior written authorization from the Construction Manager, they will be issued a deduct change order in the amount of $250.00 per occurrence. Subcontractors, suppliers, or other entities will be invited at the discretion of the Owner, Construction Manager, and the Architect. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time

or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:
   a. Interface requirements.
   b. Time.
   c. Sequences.
   d. Status of submittals.
   e. Deliveries.
   f. Off-site fabrication problems.
   g. Access.
   h. Site utilization.
   i. Temporary facilities and services.
   j. Hours of work.
   k. Hazards and risks.
   l. Housekeeping.
   m. Quality and work standards.
   n. Change Orders.
   o. Documentation of information for payment requests.

D. Reporting: Approximately 5 days after each meeting, CM will prepare and distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1.6 COORDINATION MEETINGS

A. Conduct project coordination meetings at regular intervals convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.

B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.

C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

D. The CM's Field Manager will conduct daily meetings with the prime contractors and major subcontractors' foremen. The purpose of the meetings is to provide the opportunity for each contractor to communicate to the Field Manager any items relating to their respective construction activity for that day (request for shutdown, deliveries, etc.) The meetings will commence from 7:00 o'clock am until 7:30 o'clock am. These meetings are generally informal. The CM's Field Manager will keep minutes of these meetings when appropriate and will be available upon request.

1.7 SAFETY MEETINGS

A. Each Contractor will be responsible to conduct their own safety meetings on a regular basis (but not less than four times during any thirty-day period.)

B. Minutes of the Safety Meeting must be maintained by each contractor onsite and must be made available upon request. Failure to conduct and submit meeting minutes will be grounds to reject the Prime Contractor's progress payment.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 013119

SECTION 013200
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Start-up construction schedule.
   2. Contractor's construction schedule.
   3. Daily construction reports.
   4. Field condition reports.
   5. Special reports.

B. Related Sections:
   1. Division 01 Section "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.
   2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
   3. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.02 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format[s]:
   1. Electronic PDF files.

B. Start-up construction schedule.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

D. Daily Construction Reports: Submit at weekly intervals.

E. Field Condition Reports: Submit at time of discovery of differing conditions.

F. Special Reports: Submit at time of unusual event.

1.03 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
   1. Review software limitations and content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss phasing.
   4. Review delivery dates for Owner-furnished products.
   5. Review schedule for work of Owner's separate contracts.
   6. Review time required for review of submittals and resubmittals.
   7. Review requirements for tests and inspections by independent testing and inspecting agencies.
   8. Review time required for completion and startup procedures.
   9. Review and finalize list of construction activities to be included in schedule.
   10. Review submittal requirements and procedures.
   11. Review procedures for updating schedule.

1.04 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
   1. Secure time commitments for performing critical elements of the Work from entities involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities and days
   2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
   4. Startup and Testing Time: Include not less than 15 days for startup and testing.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
   6. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.

C. Schedule Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work under More Than One Contract: Include a separate activity for each contract.
   3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   6. Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    a. Submittals.
    b. Purchases.
    c. Mockups.
    d. Sample testing.
    e. Deliveries.
    f. Installation.
    g. Tests and inspections.
    h. Adjusting.
    i. Startup and placement into final use and operation.
8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    a. Structural completion.
    b. Permanent space enclosure.
    c. Completion of mechanical installation.
    d. Completion of electrical installation.
    e. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed and Substantial Completion.

E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
2. Unanswered RFIs.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.

F. Recovery Schedule: When periodic update indicates the Work is (14) fourteen or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.02 START-UP CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit start-up horizontal bar-chart-type construction schedule within seven days of date established for approval. Schedule to start from the Notice of Award.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: From the approved Bar Chart Schedule submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within [30] [or insert number] days Base schedule on the approved startup construction schedule and additional information received since the start of Project.

2.04 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   1. List of Prime contractors at Project site.
   2. List of subcontractors at Project site.
   3. Approximate count of personnel at Project site.
   4. Equipment at Project site.
   5. Material deliveries.
   6. High and low temperatures and general weather conditions, including presence of rain or snow.
   7. Accidents.
   8. Meetings and significant decisions.
   9. Unusual events (refer to special reports).
   10. Stoppages, delays, shortages, and losses.
   11. Meter readings and similar recordings.
   12. Emergency procedures.
   13. Orders and requests of authorities having jurisdiction.
   14. Change Orders received and implemented.
   15. Construction Change Directives received and implemented.
   16. Services connected and disconnected.
   17. Equipment or system tests and startups.
   18. Partial completions and occupancies.
   19. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.05 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within (1) one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to A**rchitect, Construction Manager,** Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

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SECTION 013216 – CONSTRUCTION PROGRESS SCHEDULE

1.1. DESCRIPTION

A. Each Contractor shall develop a full schedule, in sufficient detail and clarity of form and technique so that the contractor can plan and control his work properly and the Construction Manager/Owner can readily monitor and follow the progress for all portions of the work. The Contractor shall complete the detailed schedule and submit to the CM within 20 days after contract award.

B. The schedule shall comply with the various limits imposed by the scope of work an by any contractually intermediate milestone and completion dates included in the contract.

C. The activities identified in the schedule shall be analyzed in detail to determine activity time durations in units of whole working days. All durations shall be the results of definitive manpower and resource planning by the Contractor. The Contractor will provide specific manpower loading information/crew size to support the duration proposed. (e.g. – 4-man crew get 1,000 sf/day project has 11,000 sf: thus, duration was identified as 11 days).

D. The activity data shall include activity codes to facilitate selection, sorting and preparation of summary reports and graphic. Activity codes shall be developed for:
   1. Area: Subdivision of the site into logical modules or blocks and levels.
   2. Responsibility: contractor or subcontractor responsible for the work.
   3. Specifications: 33 Division CSI format
   4. System: Division of the work into building systems or summary purposes.
   5. Milestone: Work associated with completion of interim completion dates or milestones.
   6. Pay Item: Work identified with a pay item on the Schedule of Values.

1.2. REPORTS

A. For initial submittal and each update, the contractor shall prepare the following standard report:
   1. Tabular Schedule Report sorted by Activity code and Early Start.

1.3. GRAPHICS

A. For initial submittal the contractor shall prepare the following graphic:
   1. Pure logic diagram (Precedence Format) of entire data, not time scaled, grouped by Activity code
   2. Detailed bar chart sorted by Activity Code with Early Start and Early Finish
   3. Summary bar chart summarizing by Activity Code with Early Start and Early Finish.

B. For each update the contractor shall prepare the following graphic:
   1. Bar Chart showing work activities with Early Start in the next 40 work days sorted by Activity Code and Early Start.
   2. Summary Bar Chart summarizing by Activity Code showing progress with Early Start and Early Finish.

C. For each Change Order involving adjustment in the contract time for performance the contractor shall prepare a pure logic diagram showing the changed work with all predecessor and successor activities (Fragnet).

1.4. SUBMITTALS

A. In no case shall first application for payment be approved prior to submission of acceptable preliminary schedule, detailed submittal schedule, and schedule of values.
B. Monthly updates, required schedules and graphics shall be submitted to the Construction Manager/ Owner within five working days following the end of the preceding month. Monthly updates, schedules and graphics shall be submitted electronically.
C. If any of the required submissions are returned to the Contractor (10) calendar days after the return date. Resubmittals shall be in the same quantities as noted above. Review and response by the Construction Manager/ Owner will be given within (10) calendar days after resubmission.

1.5. PAYMENT WITHHELD

A. If the contractor fails to submit the required schedule information as indicated in this section within the time prescribed or revision thereof within the requested time, the Construction Manager/ Owner may withhold approval of Progress Payment Estimates until such time as the Contractor submits the required information.

1.6. UPDATES

A. Updates of the Schedule shall be made every two weeks reflecting actual or reasonably anticipated progress as of the last working day of the month. Monthly updates of the Detailed Schedule will be made each month until all work is substantially complete.
B. The Contractor will meet with the Construction Manager/ Owner at the end of the updated period to review information in draft form before preparation of the required schedules and graphics. The Contractors will present data, prepared in advance, for review and approval of the Construction Manager/ Owner including:
    1. Actual Start Dates
    2. Actual Completion Date
    3. Activity percent complete and /or Remaining Duration
    4. Revised logic, changes in activity duration’s or resource assignments.
    5. Narrative report discussing progress through the update period; changes delay or other circumstance affecting progress; status of the project with respect to completion schedule; any efforts by the Contractor to improve progress.
C. The update meeting will establish the values to be submitted for payment and will be directly related to the schedules of values in the application for payment.
D. The Contractor shall prepare a report of the meeting and make all changes, additions or corrections to the data resulting from the review. The contractor shall promptly prepare the monthly submittal following the update meeting.

1.7. CHANGES, DELAYS AND EXTENSIONS OF TIME

A. When changes or delays are experienced, the Contractor shall submit to the Construction Manager/Owner a Time Impact Analysis illustrating the influence of each change or delay on the current Contract scheduled completion date. Each time analysis shall include a Fragnet (network analysis) demonstrating how the Contractor proposed to incorporate the change or delay into the Detailed Schedule. Additionally, the analysis shall demonstrate the time impact based on the date the change was given to the Contractor, the status of construction at the point in time, and activity duration of all effected activities. The activity duration used in this analysis shall be those included in the latest update of the Detailed Schedule, closest to the time of delay or as adjusted by mutual agreement.

B. Each Time Impact Analysis shall be submitted within ten (10) calendar days after a delay occurs or a notice of change order is given to the Contractor. In cases where the Contractor does not submit a Time Impact Analysis for a specific change or delay with a specified period of time, it shall be mutually agreed that no time extension is required. Final evaluation of each Time Impact Analysis by the Construction Manager/ Owner shall be made within fourteen (14) calendar days after receipt unless subsequent meetings and negotiations are necessary. Adjustments in the Contract time for performance shall be made only by written change order approved by the Owner. Upon approval of the Owner, Fragnets illustrating the influence of changes and delays shall be incorporated into the Detailed Schedule by the contractor during the first update after agreement is reached.

C. The time difference between the Early Finish date and the Late Finish date is defined as “float.” The “float” belongs to the Project and may be used by the Construction Manager/ Owner to benefit the Project. Changes or delays that influence activities in the network with “float” and do not extend the Critical Path (the network of activities with zero days “float”) shall not be justification for an adjustment in Contract time for performance.

END OF SECTION 013216

SECTION 013300
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. This specification describes the procedures for submission of submittals and shop drawings.
   1. The Contractor will be required to use the Construction Manager's file exchange application (Sage Project Center) for the transfer of Submittals, Shop Drawings and RFI's. There will be **no exceptions** to this requirement. The contractor will be given a login and password free of charge. For more information follow the procedure below.
      a. Information and instructions for use are available for review by the contractor by contacting the Construction Manager. The Contractor is to provide an email address for the file to be sent. A PDF file will be emailed to requesting contractor.

C. Related Requirements:
   1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
   2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list.
   3. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
   4. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
   5. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   6. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.02 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.03 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
   2. Delegated Design must be done by qualified professional, licensed to practice in the State of New York.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the

responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.04 SUBMITTAL GENERAL ADMINISTRATIVE REQUIREMENTS

A. The Contractor shall prepare a Submittal Log containing the information required to be submitted under the Submittal article from each respective Specification Section. With each item listed the Contractor shall provide anticipated dates for submission to the Architect. The Architect will review and accept or request that corrections be made for subsequent acceptance. This acceptance will constitute an approval for the submittal, shop drawings and sample submissions to commence. **No Submittals or Shop Drawings will be reviewed by the Architect until an approved Submittal Schedule is in place.**

B. The contractor shall prepare expected submittals in Sage Project Center that correspond to all submittals listed on the submittal schedule at the time of submission of the submittal log. These expected submittals are to follow the naming conventions laid out in section “1.5 Submittal Schedule” and “1.6 Submittal Identification”

C. The Contractor is responsible for all costs for creating electronic files for the submittal process. The Architect will not provide this service.
   1. The Submittal Cover Sheet located in Specification Section 006000 Project Forms shall be used for all Submittals.
      a. An electronic form of the submittal cover is available from the Architect.
   2. The Submittal Cover sheet when scanned to a .PDF shall be the first page viewed in the individual file.
      a. Each product submitted within a specification section shall have a Submittal Cover sheet attached. Combined submittals with one cover page will not be accepted
      b. Each Submittal Cover sheet shall be filled in completely. **Files that are sent with the Submittal Cover Sheet missing or not filled in correctly will not be reviewed**. The Architect will send a notice that the submittal is missing information. If the Contractor fails to correct or provide the proper submittal within (15) fifteen days, notice will be provided, and the submittal will be REJECTED.
   3. The Contractor(s) will be provided with a link to upload files to the Sage Project Center. The site address and a “log in” will be provided to the Contractor(s) free of charge.
   4. A read only Record Submittal Log and RFI Log will be available from the Sage Project Center for the Contractors reference in checking the status of the submittals and shop drawings.

D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
   4. Coordinate transmittals of different types of submittals from related section for parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received. Delays associated with the above are the not the Architects responsibility and rests solely with the Contractor.

E. Architect's Digital Data Files: For Projects where Project Building Information Modeling Protocol is NOT executed. Provide digital PDF's only.
   1. Architect will not furnish Contractor with digital drawings for the preparation of shop drawings.
   2. The Architect will provide digital PDF's of Contract Drawings for the purpose of producing project record drawings**.**
      a. Contract documents are graphic representations of approximate locations of materials. Therefore, information contained within these files should not be assumed to be accurate and users of the Files accept full responsibility for verifying the accuracy and completeness of the Files with field conditions and the contract documents.
   3. Document Transfer Agreement - For Projects where Architect's work files are not a deliverable: The Contractor shall execute an Electronic Document Transfer Agreement for all electronic transfers of files, other than PDFs. The contractor must provide acknowledgement, accept the information regarding drawings, ownership and Limitations of Liability. Agreement is found with Project Forms.
      a. The following plot files will by furnished for each appropriate discipline:
         1) Floor plans.
         2) Reflected ceiling plans.

1.05 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
   1. Submit a preliminary if not final Submittal Schedule for approval a minimum of (15) fifteen days after award of contract. Failure to submit a submittal schedule within the required time frame will result in the refusal by the Architect to review any submittals. Delays associated with failure to receive the Submittal Schedule are the not the Architects responsibly and rest solely with the Contractor.

B. The information is required to be submitted under the Submittal article from each respective Specification Section. With each item listed the Contractor shall provide anticipated dates for submission to the Architect. The Architect will review and accept or request that corrections be made for subsequent acceptance. This acceptance will constitute a review for the submittal, shop drawings and sample submissions may commence. No Submittals or Shop Drawings will be reviewed by the Architect until an approved Submittal Schedule is in place.
   1. The Submittal Schedule shall be coordinated with the overall Project Schedule to ensure that submittals are submitted and reviewed so as not to delay the Project Schedule.
   2. The Architect will not be responsible for ensuring that all required Shop Drawings, Product Data, Samples or similar submittals that are required to be submitted and reviewed under the Contract Documents are submitted by the Contractor. Submissions of Shop Drawings, Product Data, Samples or similar submittals are the Contractor's sole responsibility. Delays associated with the contractor's failure to provide the required submittals are the Contractors responsibility.
   3. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
   4. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 30 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

5. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
6. Format: Arrange the following information in a tabular format:
    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal Category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled date of fabrication.
    i. Scheduled dates for installation.

1.06 SUBMITTAL IDENTIFICATION

A. Submittal Cover Sheet: Attach one cover sheet for each product, shop drawing or sample. **DO NOT** combine submittals together with one cover sheet for multiple items. They will not be reviewed.

B. Submittal Information: Include the following information in each submittal. Use the submittal cover form found in specification section 006000 Project Forms. An electronic form can be sent to the contractor upon request
1. Contractor, Address, Phone/fax and or Email
2. Contractors Submittal Number.
3. Architects Project Number.
4. Project Name (if not filled in by the Architect)
5. Type of submittal being sent (select box)
6. Product Identification including the following: Provide one submittal cover sheet for each product within a specification section
    a. Specification Section Number
    b. Contract Drawing Number
    c. Product Name
    d. Specification Reference: Part/Paragraph
    e. Detail Reference
    f. Manufacturer
7. Contractors Approval: The contractor must acknowledge that they have reviewed the submittal for conformance with the Contract Documents and must sign and date the approval.
8. Deviation from the Contract Documents: Where the submittal may not meet all of the requirements of the specified item. The contractor must indicate how the submitted item differs from the specified item.
9. Contractor Comments: Any additional comments by the contractor should be indicated in this space. (Provide an attachment sheet for any other information required that will not fit on the cover sheet.)

C. Deviations and Additional Information: On each individual submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information, revisions, line by line comparison and other information requested by Architect. Indicate by highlighting on each submittal or noting on attached separate sheet. Identify options requiring selection by Architect.

D. File Naming (for uploading): Each submittal or shop drawing file uploaded to the project on the Sage Project Center, shall have in the file name, the specification section number followed by

the submittal number, the submittal abbreviation and the specification section name. For re-submissions an R1 would be added following submittal number. The file name must include the following information:

Example:

Spec Section	Submittal No.	Submittal Abbr	Specification Name
081416	001	PD	Flush Wood Doors

File to Read: 081416-001 PD - Flush Wood Doors

Re-submission to Read:081416-001-R1-Flush Wood Doors

Submittal Abbr. required to be used in the file name on submittals are as follows:

CD - Coordination Drawings

CERT - Certification(s)

CLC - Calculations

DD - Design Data

EJ - Engineer's Judgement

LEED - LEED or PD/LEED

O&M - Operations and Maintenance Manuals

PD - Product Data

PHOTO - Photo

QD - Qualification Data

RPT - Report

SAMP - Sample

SCH - Schedule

SEL - Make A Selection

SD - Shop Drawing(s)

STDY - Study

TR - Test Results

WAR - Warranty

E. When uploading submittals or RFI's to the Sage Project Center, complete the online transmittal. The information required is derived from the contractor's submittal cover sheet or RFI. Instructions using the Sage Project Center are available from the Construction Manager. These instructions can be emailed to the contractor.

1.07 SUBMITTAL DATA AND TESTING REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment. Each product within a specification section shall have a separate submittal cover.
   1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable. Send full submittals for each product. Partial submittals will not be reviewed until all

required submittal information is received. The architect will not be responsible for project delays due to the contractor's failure to submit the required submittal information in a complete package.

3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams that show factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

B. Shop Drawings: Prepare project-specific information for each shop drawing. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted].
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Identification of products.
      b. Schedules.
      c. Compliance with specified standards.
      d. Notation of coordination requirements.
      e. Notation of dimensions established by field measurement.
      f. Relationship and attachment to adjoining construction clearly indicated.
      g. Description any conflicts with other trades.
      h. Seal and signature of professional engineer if specified.

C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
   1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package. If samples are delivered with product data, only the samples will be reviewed. The Product Data must be uploaded to the Sage Project Center. A duplicate submittal cover sheet is to be uploaded to the Sage Project Center as a record of sample delivery.
      a. The Product Data is to be loaded concurrent with the delivery of samples. Samples may be delivered/given to the Architect. In the remarks column of the transmittal place "given to the Architect"
   2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
      a. Project name and submittal number.
      b. Generic description of Sample.
      c. Product name and name of manufacturer.
      d. Sample source.
      e. Number and title of applicable Specification Section.
      f. Specification paragraph number and generic name of each item.

g. In addition to all hard copy and physical samples submitted, duplicate digital submittal is to be produced for review, record and tracking purposes through Sage Project Center. Include same information as above as well as a high resolution, color, digital image of all samples with labeled information clearly visible for each physical sample.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit (1) one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit (3) three sets of Samples. Architect will retain (2) two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least (3) three sets of paired units that show approximate limits of variations.

D. Information requirements for each submittal: Where submittal is requiring Schedules, Product Data, Qualification Data, Design Data, Certificates and Tests use the following protocol.
   1. Schedules: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   2. Product Data. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
      a. Manufacturer and product name, and model number if applicable.
      b. Number and name of room or space.
      c. Location within room or space.
   3. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
   4. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

5. Certificates:
   a. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
   b. Insert definition of Contractor certificates here if required by individual Specification Sections. See the Evaluations.
   c. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
   d. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
   e. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
   f. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
   g. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
   h. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
   i. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
   j. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
   k. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
6. Test and Research Reports:
   a. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
   b. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
   c. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
   d. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
   e. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

f. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1) Name of evaluation organization.
   2) Date of evaluation.
   3) Time period when report is in effect.
   4) Product and manufacturers' names.
   5) Description of product.
   6) Test procedures and results.
   7) Limitations of use.

E. Submit the following submittals: Within 15 days of contract award.
   1. Submittal Schedule including dates of anticipated review and approval.
      a. No submittals will be reviewed without an approved Submittal Schedule in place.
   2. Subcontractor List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
      a. Name, address, telephone number and email address of entities performing subcontract or supplying products.
      b. Number and title of related Specification Section(s) covered by subcontract.
   3. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
   4. Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

F. Submit with in the first 30 days after Contract Award
   1. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014329 "Special Inspections."
   2. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
   3. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

G. Submit Field Test Reports during construction within 15 days of the testing date and as follows:
   1. Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

H. Submit a minimum 30 days prior to Project Closeout:
   1. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
   2. Maintenance Data: Comply with requirements specified in Division 01 Section 017823 "Operation and Maintenance Data."

1.08 SUBMITTAL PROCESSING

A. Processing Time: Allow time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.

B. The architect will not be responsible for project delays due to the contractor's failure to submit the required submittal information in time to allow for review based on the stipulated review time and to meet the project schedule.

C. Initial Review: Allow 10 Calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

D. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

E. Re-submittal Review: Allow 10 Calendar days for review of each re-submittal.

F. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 Calendar days for initial review of each submittal.

G. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 Calendar days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

H. Where submittal are required to be approved that are part of an assembly or for items such as finishes where color selections are required. The submittal will be retained until all of the information related to these systems and color selections is provided and accepted.

I. Products with multiple submittals may be held until all necessary information has been submitted for architect to make a complete review. Submittals dependent on coordinating information from related or dependent products; or products with critical interface with other products may be held until all information is submitted for architect to make a complete review and coordinate all required information. (example door frames will not be reviewed without door hardware)

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with reviewed notation from Architect's action stamp.

K. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

1.09 SUBMITTAL PROCEDURES

A. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

B. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

C. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

D. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

E. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

F. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

G. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

H. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

I. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturers' names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

J. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

K. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

L. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

M. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

N. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

O. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

1.10 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractors Approval: Provide Contractor's approval signature and date on the Submittal Cover sheet certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1.11 ARCHITECT'S ACTION

A. Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will respond to each submittal indicating one of the following actions required:
   1. No Exceptions Taken: Architect takes no exception to the submittal. This part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
   2. Furnish as Corrected: No exceptions taken except what is identified by the Architect. The part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance. Furnish any additional related information as requested.
   3. Revise and Re-Submit: Revise the submittal based on the Architects comments and resubmit the submittal. Do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
      a. Do not permit submittals marked “Revise and Resubmit” to be used at the Project Site, or elsewhere where Work is in progress.
   4. Rejected: The submittal is rejected. See Architects comments on why submittal was rejected.
      a. Submittal has not been reviewed by the Contractor and so noted.
      b. Submittal has been prepared without due regard for information called for or logically implied by the Contract Documents.
      c. Information is not sufficiently complete or accurate to verify that work represented is in accordance with the Contract Documents.
      d. Do not permit submittals marked “Rejected” to be used at the Project Site, or elsewhere where Work is in progress.
   5. No Action Taken: The submittal is not required and will not be reviewed.

B. Submittals by Sage Project Center: Architect and Construction Manager will indicate, on Sage Project Center, the appropriate action.

C. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. The Architects action will be noted in the Sage Project Center.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect. The Architects action will be noted in the Sage Project Center and noted as a partial review until a full submittal can be received.

E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for re-submittal without review.

F. Submittals not required by the Contract Documents will not be reviewed and will receive no action.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 013300

SECTION 014119
REGULATORY REQUIREMENTS - NYS EDUCATION DEPARTMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. "Uniform Safety Standards for School Construction and Maintenance Projects" for maintaining a Certificate of Occupancy during construction.

1.02 REFERENCES

A. Section 155.5 of the Regulations of the New York State Commissioner of Education "Uniform Safety Standards for School Construction and Maintenance Projects".

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 GENERAL REQUIREMENT

A. The occupied portion of any school building shall always comply with the minimum requirements necessary to maintain a certificate of occupancy.

3.02 HAZARDOUS BUILDING MATERIALS

A. Surfaces that will be disturbed during renovation or demolition have been tested for lead and asbestos. Results of the testing are available, upon request, from the Owner.

3.03 GENERAL SAFETY AND SECURITY STANDARDS FOR CONSTRUCTION

A. General safety and security standards for construction projects include the following:
   1. All construction materials shall be stored in a safe and secure manner.
   2. Fences around construction supplies or debris shall be maintained.
   3. Gates shall always be locked unless a worker is in attendance to prevent unauthorized entry.
   4. During exterior renovation work, overhead protection shall be provided for any sidewalks or areas immediately beneath the work site or such areas shall be fenced off and provided with warning signs to prevent entry.
   5. Workers shall be required to wear photo-identification badges at all times for identification and security purposes while working at occupied sites.

3.04 SEPARATION OF CONSTRUCTION AREAS FROM OCCUPIED AREAS

A. Construction areas which are under the control of a contractor and therefore not occupied by district staff or students shall be separated from occupied areas. Provisions shall be made to prevent the passage of dust and contaminants into occupied parts of the building. Periodic inspection and repairs of the containment barriers must be made to prevent exposure to dust or contaminants. Gypsum board must be used in exit ways or other areas that require fire rated separation. Heavy duty plastic sheeting may be used only for a vapor, fine dust or air infiltration barrier, and shall not be used to separate occupied spaces from construction areas.
   1. A specific stairwell and/or elevator should be assigned for construction worker use during work hours. In general, workers may not use corridors, stairs or elevators designated for students or school staff.
   2. Large amounts of debris must be removed by using enclosed chutes or a similar sealed system. There shall be no movement of debris through halls of occupied spaces of the building. No material shall be dropped or thrown outside the walls of the building.
   3. All occupied parts of the building affected by renovation activity shall be cleaned at the close of each workday. School buildings occupied during a construction project shall

maintain required health, safety and educational capabilities at all times that classes are in session."

3.05 MAINTAINING EXITING DURING CONSTRUCTION

A. The Contractor will prepare a plan detailing how exiting required by the applicable building code will be maintained during construction. The plan shall indicate temporary construction required to isolate construction equipment, materials, people, dust, fumes, odors, and noise during the construction period. Temporary construction details shall meet code-required fire ratings for separation and corridor enclosure. At a minimum, required exits, temporary stairs, ramps, exit signs, and door hardware shall be provided at all times.

3.06 MAINTAINING VENTILATION DURING CONSTRUCTION

A. The Contractor will prepare a plan detailing how adequate ventilation will be maintained during construction. The plan shall indicate ductwork that must be rerouted, disconnected, or capped in order to prevent contaminants from the construction area from entering the occupied areas of the building. The plan shall also indicate how required ventilation to occupied spaces affected by the construction will be maintained during the project.

3.07 NOISE ABATEMENT DURING CONSTRUCTION

A. Construction and maintenance operations shall not produce noise in excess of 60 dba in occupied spaces or shall be scheduled for times when the building or affected building spaces are not occupied or acoustical abatement measures shall be taken

B. Noise level measurements (dba) shall be taken with a type 2 sound level meter in the occupied space in a location closest to the source of noise.

C. Each prime contractor shall have a type 2 sound level meter available on the project site at all times for use by the architect/engineer for the entire duration of the construction project.

3.08 CONTROL OF CHEMICAL FUMES, GASES AND OTHER CONTAMINANTS DURING CONSTRUCTION

A. The contractor shall be responsible for the control of chemical fumes, gases, and other contaminates produced by, including but not limited to, welding, gasoline or diesel engines, roofing, paving, or painting, to ensure they do not enter occupied portions of the building or air intakes.
   1. Contractors shall provide a plan indicating how and where welding, gasoline engine, roofing, paving, painting or other fumes will be exhausted from the work site. Contractors shall provide all temporary means to assure that fresh air intakes do not draw in such fumes.
   2. If any portion of the work will generate toxic gases that cannot be contained in an isolated area, the work shall be done when school classes and programs are not in session. The contractor shall include costs associated with this requirement in his bid. The building shall be properly ventilated and, the material shall be given proper time, as recommended by the manufacturer, to cure “off-gas” before re-occupancy.
   3. The contractor shall maintain all manufacturers’ Material Safety Data Sheets (MSDS) at the site for all products used in the project. Copies of the MSDS sheets shall be given to the Architect and to the School District. MSDS sheets shall be provided to anyone who requests them.

3.09 CONTROL OF OFF-GASSING DURING CONSTRUCTION

A. The contractor shall be responsible to ensure that activities and materials which result in "off-gassing" of volatile organic compounds such as glues, paints, furniture, carpeting, wall covering, drapery, etc. are scheduled, cured or ventilated in accordance with manufacturers recommendations before a space can be occupied.

1. Contractor shall provide, in their schedules for work of the construction, proper time for “off-gassing” or volatile organic compounds introduced during construction before occupancy is allowed. Specific attention is warranted for activities including glues, adhesives, paint, furniture, carpeting, wall coverings, and drapery. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of the space can be assured. The contractor shall include the above-mentioned information and shall clearly highlight the information, as part of the shop drawing submittal.
2. Building materials or furnishings which “off-gas” chemical fumes, gases, or other contaminants shall be aired out in a well ventilated heated warehouse before it is brought to the project for installation or, the manufacturer’s recommended “off-gassing” periods must be scheduled between installation and use of the space.
3. The contractor shall maintain all manufacturers’ Material Safety Data Sheets (MSDS) at the site for all products used in the project. Copies of the MSDS sheets shall be given to the Architect and to the School District. MSDS sheets shall be provided to anyone who requests them.

3.10 ASBESTOS-CONTAINING BUILDING MATERIALS

A. Large and small asbestos abatement projects as defined by 12NYCRR56 shall not be performed while the building is occupied. The term "building", as referenced in this section, means a wing or major section of a building that can be completely isolated from the rest of the building with sealed noncombustible construction. The isolated portion of the building must contain exits that do not pass through the occupied portion and ventilation systems must be physically separated and sealed at the isolation barrier.

B. Exterior work such as roofing, flashing, siding, or soffit work may be performed on occupied buildings provided proper variances are in place as required, and complete isolation of ventilation systems and at windows is provided. Care must be taken to schedule work so that classes are not disrupted by noise or visual distraction.

C. For clearance sampling, the air sampling technician shall provide aggressive air sampling per Rule 56 and as follows: First direct the exhaust of a leaf blower, against all walls, ceilings, floors, ledges, and other surfaces in the work area. Continue agitation for at least five minutes per every 1,000 sf of floor space. Following this aggressive agitation, the air-sampling technician shall use at least one 20-inch fan per 10,000 cubic feet of work area space for continuous agitation. The fan shall be operated on low speed and pointed toward the ceiling. Sampling pumps shall be started after the fans are started and stopped before the fans are stopped.
   1. Samples shall be logged on a permanently bound logbook at the laboratory. No whiteout will be used to make corrections.
   2. All lab counts, data and analysis shall be recorded on a lab summary sheet for each sample.
   3. Per the requirements of the New York State Education Department all Final Air Clearance Samples shall be (TEM) Transmission Electron Microscopy methodology.

3.11 LEAD-CONTAINING BUILDING MATERIALS

A. Surfaces that will be disturbed by reconstruction have been tested for the present of lead based paint materials. This information is provided in order that proper measures are taken, to train and protect workers per OSHA regulations. Refer to Division 0 Existing Hazardous Material Information for testing results.

B. Projects which disturb surfaces that contain lead shall have in the specifications a plan prepared by a certified Lead Risk Assessor or Supervisor which details provisions for occupant

protection, worksite preparation, work methods, cleaning and clearance testing which are in general accordance with the HUD Guidelines.

END OF SECTION 014119

SECTION 014120
WORK RESTRICTIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
   1. Owner Occupancy: Allow for Owner occupancy of the entire site and building. The Owner's educational programs shall continue throughout the duration of construction.
   2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.03 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.

B. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of all buildings, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
   1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
   2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
   3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.
   4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 014120

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SECTION 014200
REFERENCES

PART 1 - GENERAL

1.01 KEY DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.02 DEFINITIONS

A. Air Handling Unit: A blower or fan used for the purpose of distributing supply air to a room, space or area.

B. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved according to the requirements established in this Section and as required by the Code Official having jurisdiction over this project.

C. Architect: Other terms including “Architect/Engineer” and “Engineer” have the same meaning as "Architect".

D. Company Field Adviser: An employee of the Company which lists and markets the primary components of the system under the name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation, and serving of the required products. Personnel involved solely in sales do not qualify.

E. Concealed Location: A location that cannot be accessed without damaging permanent parts of the building structure or finish surface. Spaces above, below or behind readily removable panels or doors shall not be considered as concealed.

F. Concealed Piping: Piping that is located in a concealed location. (See "concealed location".)

G. Connect: A term contraction and unless otherwise specifically noted is to mean " The labor and materials necessary to join or attach equipment, materials or systems to perform the functions intended".

H. Construction Manager: Arris Contracting Company, Inc.

I. Drain: Any pipe that carries wastewater or water-borne wastes in a building drainage system.

J. Drainage Fittings: Type of fitting or fittings utilized in the drainage system. Drainage fittings are similar to cast-iron fittings, except that instead of having a bell and spigot, drainage fittings are recessed and tapped to eliminate ridges on the inside of the installed pipe.

K. Drainage System: Piping within a public or private premise that conveys sewage, rainwater or other liquid wastes to a point of disposal. A drainage system does not include the mains of a public sewer system or a private or public sewage treatment or disposal plant.
   1. Building Gravity: A drainage system that drains by gravity into the building sewer.
   2. Sanitary: A drainage system that carries sewage and excludes storm, surface and ground water.
   3. Storm: A drainage system that carries rainwater, surface water, condensate, cooling water or similar liquid wastes.

L. Duct: A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

M. Duct System: A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

N. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

O. Headroom: Minimum clearance between the floor and the underside of the point of lowest installed mechanical construction above. In case of stairways and walkways, the minimum clearance between the step or surface of the walkway and the lowest installed mechanical construction above the stairway or the walkway.

P. Include: When used in any form other than “inclusive”, is non-limiting and is not intended to mean “all-inclusive.”

Q. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

R. Inspection Certificate: Identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency.

S. Installer: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
   1. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
   2. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in

those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

3. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

T. Label: An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency.

U. Location:
1. Damp Location: Partially protected locations under canopies, marquees, roofed open porches and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns and some cold-storage warehouses.
2. Dry Location: A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.
3. Wet Location: Installations underground or in concrete slabs or masonry in direct contact with the earth and locations subject to saturation with water or other liquids, such as vehicle-washing areas, and locations exposed to weather and unprotected.

V. Manufacturer’s Designation: Identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection Certificate," "Label" and "Mark").

W. Mark: An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection Certificate," "Label" and "Manufacturer's Designation").

X. Mechanical: Other terms including “HVAC”, “Plumbing”, “Sprinkler”, “Laboratory Equipment”, “Food Service Equipment”, “Laundry Equipment”, and “Refrigeration” have the same meaning as "Mechanical".

Y. Owner: Ossining Union Free School District.

Z. Piping: This term includes pipe, tube and appurtenant fittings, flanges, valves, traps, hangers and supports.

AA. Piping, Concealed: Piping built into construction and not accessible without removal of construction Work such as masonry, plaster or other finish material, and piping installed in floors, furred spaces, suspended ceilings, non-walk-in tunnels, conduits, and behind removable panels and cabinet doors.

Piping, Distribution: Domestic water supply piping, starting with a connection to service piping, and continuing throughout the building to point of connection to equipment and fixture supply piping.

BB. Piping, Exposed: Piping directly accessible by normal accesses without removal of any construction Work or material.

CC. Piping, Service: Underground domestic water supply piping with a connection to a water main or supply as noted, and continuing to and into a building and terminating with the exposed fitting inside the building.

DD. Piping, Tunnel: Piping installed in walk-in or non-walk-in tunnels or conduits up to first shut-off valve inside building.

EE. Plumbing System: Includes the water supply and distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; and sanitary and

storm sewers and building drains, in addition to their respective connections, devices and appurtenances within a structure or premises.

FF. Product: As used includes materials, systems and equipment.

GG. Registered Design Professional: An individual who is a registered architect (RA) in accordance with Article 147 of the New York State Education Law or a licensed professional engineer (PE) in accordance with Article 145 of the New York State Education Law.

HH. Space, Finished: A space which has a finishing material applied to walls or ceilings, such as paint, plaster, ceramic tile, enamel glazing, face brick, vinyl wall covering, etc. to provide a finished appearance or which will have such finishes applied under a related Contract.

II. Space, Unfinished: A space which does not meet the definition of a finished space.

JJ. Special Inspection: Inspection as herein required of the materials, installation, fabrication, erection, or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards.

KK. Steam-Heating Boiler: A boiler operated at pressures not exceeding 15 psi for steam.

LL. Supplier: Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design.

MM. Utility: Any gas, steam, water, sanitary sewer, storm sewer, electrical or other such service.

NN. Water Supply System: The water service pipe, water distribution pipes, and the necessary connecting pipes, fittings, control valves and all appurtenances in or adjacent to the structure or premises.

1. Chilled: Water-cooled by refrigeration.
2. Cold: Water with at temperature between 33 degrees F and 80 degrees F and which is neither cooled nor heated mechanically.
3. Domestic: Water for use in buildings, except water used in connection with space heating and space cooling.
4. High Temperature: Water with a supply water temperature above 350 degrees.
5. Hot: Water at a temperature greater than or equal to 110ºF.

1.03 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.04 ABBREVIATIONS AND ACRONYMS

AA	Aluminum Association, Inc. (The)
AABC	Associated Air Balance Council
AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	ACI International (American Concrete Institute)
ACPA	American Concrete Pipe Association
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (part of CPA)
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute

AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
ARI	Air-Conditioning & Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International
AWCMA	American Window Covering Manufacturers Association (WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
CBM	Certified Ballast Manufacturers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CISCA	Ceilings & Interior Systems Construction Association

CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CTI	Cooling Technology Institute
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association
FM Approvals	Factory Mutual Approvals
FSA	Fluid Sealing Association
GA	Gypsum Association
GANA	Glass Association of North America
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute

HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood & Veneer Association
ICEA	Insulated Cable Engineers Association, Inc
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
IPCEA	Insulated Power Cable Engineer Associates
ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LEED	Leadership in Energy and Environmental Design
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.

MFMA	Metal Framing Manufacturers Association, Inc.
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International
NADCA	National Air Duct Cleaners Association
NAIMA	North American Insulation Manufacturers Association
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council

NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NWWDA	National Wood Window and Door Association (WDMA)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute

SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc.

1.05 FEDERAL GOVERNMENT AGENCIES:

A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission

DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FDA	Food and Drug Administration
GSA	General Services Administration
HUD	Department of Housing and Urban Development
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PHS	Office of Public Health and Science
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

B. Codes, Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines
BCNYS	Building Code of New York State
CFR	Code of Federal Regulations

DOD	Department of Defense Military Specifications and Standards
FS	Federal Specification
MILSPEC	Military Specification and Standards

1.06 NEW YORK STATE GOVERNMENT AGENCIES:

A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

DASNY	Dormitory Authority of the State of New York
DEC	Department of Environmental Conservation
DHCR	Division of Housing and Community Renewal
DOH	Department of Health
NYSDOL	New York State Department of Labor
DOS	Department of State
DOT	Department of Transportation
NYSPA	New York State Power Authority
OGS	Office of General Services
OCFS	Office of Children and Family Services
OMRD	Office of Mental Retardation and Developmental Disabilities
OPRHP	Office of Parks, Recreation and Historic Preservation
NYSED	New York State Education Department (Department of Education)

SHPO	State Historic Preservation Office
SUCF	State University Construction Fund
SUNY	State University of New York

1.07 NEW YORK STATE CODES

A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

BCNYS	Building Code of New York State
9-NYCRR	New York State Dept. of Labor Title 9 State Building Code
10-NYCRR	New York State Dept. of Labor Title 10 State Hospital Code
19-NYCRR	Charter XXXIII, Sub Charter A, Uniform Fire Prevention and Building Code

B. Where references these references are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

BCNYS	Building Code of New York State
ECCNYS	Energy Conservation Code of New York State
PCNYS	Plumbing Code of New York State
MCNYS	Mechanical Code of New York State
FGCNYS	Fuel Gas Code of New York State
FCNYS	Fire Code of New York State

1.08 OTHER TERMS OR ACRONYMS:

A. Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name in the following list.

ACM	Asbestos Containing Materials
ACT	Acoustical Tile
ICRA	Infection Control Risk Assessment
RVT	Resilient Vinyl Tile
SAT	Suspended Acoustical Tile
SFRM	Spray on Fire Resistive Materials
TSI	Thermal Systems Insulation
VAT	Vinyl Asbestos Tile
VCT	Vinyl Composition Tile

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 014200

SECTION 014500 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1. Section Includes

A. Requirements for monitoring the quality of the constructed project.
B. Work of this Section also includes services of an independent testing laboratory for quality assurance testing.

1.2. Related Sections

A. The following Sections contain requirements that relate to this Section:
   1. Division 1 Section “Testing Laboratory Services” specifies requirements for coordination and notification of any owner-tested items.
   2. Division 1 Section “Submittals” specifies requirements for development of a schedule of required tests and inspections.
   3. Division 1 Section “Special Inspections & Structural Testing”

1.3. Quality Assurance- Control of Installation

A. Each Prime Contractor shall continually monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
B. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or workmanship that is more precise
C. Perform work by persons qualified and skilled to produce workmanship of specified quality.
D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
E. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
F. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum. The actual installation may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision.
   1. Contractor Responsibilities:
      a. Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum unless specifically identified as provided by others.
      b. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor’s responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.

c. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services.
d. Where individual Sections specifically indicate that certain inspections, tests and other quality-control services are the Owner's responsibility, the Owner will engage the services of a qualified independent testing agency to perform those services. Payment for these services will be made from the Inspection and Testing Allowance, as authorized by Change Orders.

1.4. Mock Up

A. Tests will be performed under provisions identified in this section and identified in This Section and identified in the respective product specification sections**.**
B. Assemble and erect specified mock-ups with specified attachment and anchorage devices, flashing, seals, and finishes.
C. Accepted mock-ups shall be a comparison standard for the remaining work.
D. Where a mock-up has been accepted by the Engineer/Architect and is specified to be removed, then the Contractor shall remove the mock-up and the clear area when directed to do so by the Engineer/Architect.

1.5. Quality Assurance - Testing Laboratory

A. In order to establish compliance with the Contract Documents, materials shall be tested, examined and evaluated before they are incorporated into the work. During and after installations, additional tests, examinations, and evaluations shall be made to determine continued compliance throughout the course of the work.
B. Testing laboratory shall be a reputable, experienced firm that is capable of performing all of the required testing and authorized to operate in the state in which the project is located.
C. Perform all sampling and testing in accordance with specified procedures and use the materials, instruments, apparatus, and equipment required by the codes, regulations and standards. Where specific testing requirements or procedures are not described, perform the testing in accordance with all pertinent codes and regulations and with recognized standards for testing.
D. in the event that samples and test specimens are not properly taken, handled, stored or delivered or if other requirements of this Section are not complied with, Engineer/Architect reserves the right to delegate any or all of this work to others, or to take whatever action deemed necessary to ensure that sampling and testing are properly accomplished, for which all costs shall be borne by Contractor.
E. Construction Manager/Architect reserves the right to disapprove the use of a specific testing laboratory, even after prior approval, if the laboratory fails to meet or comply with the requirements of this Section. If this should occur, immediately discharge the testing laboratory and retain the services of a different laboratory acceptable to Engineer/Architect.
F. The testing laboratory shall meet the following criteria:
    1. Be capable of performing all of the required tests.

2. Be regularly engaged in performing the types of services required.
3. Have adequate facilities, materials, equipment, and personnel to perform the services.
4. Have an adequately trained, experienced and qualified staff.
5. Have at least one registered professional engineer licensed in the state in which the project is located who shall be capable of performing field tests, supervising laboratory testing and interpreting test results. The professional engineer shall be thoroughly knowledgeable in materials, soils, asphalt paving and concrete.
6. Shall be able to be on the Project site within two hours after being notified.
7. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.6. Reference Standards

A. Conform to reference standards by the date that the project was last bid.
B. Obtain copies of standards when required by contract Documents.
C. Should specified reference standards conflict with Contract Documents, request clarification from Engineer/Architect before proceeding.
D. The contractual relationship of the parties of the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.7. Submittals

A. Within fifteen (15) calendar days from the date of the Notice to Proceed, submit documentation from three (3) testing laboratories that clearly indicates experience, location, qualifications of staff, and descriptions of any limitations or restriction of the firm.
B. Certified copies of each test report shall be mailed directly to the Engineer/Architect. The Contractor shall arrange with the laboratory to secure copies.
C. Each report shall be in writing and shall include the testing method used, the test results, the specified results, the exact location of where the test specimens were taken, the date taken, Project identification, Contractor's name and other pertinent information required for a complete and meaningful test report,
D. Each report shall be signed and certified by the responsible officer of the testing laboratory.
E. Mail reports directly to the Engineer/Architect within 24 hours after the sample is taken, except in those instances when tests cannot be immediately performed because of required curing, incubation periods, or lengthy testing procedures.
F. The laboratory shall verbally communicate test results when requested by the Engineer/Architect. This does not eliminate nor replace the requirements for a written report.

1.8. Scheduling- Laboratory Services

A. Except where otherwise specified, the Architect/Construction Manager will determine the number of samples to be taken, the date and time samples will be taken and tests made, the

number and type of tests to be performed, who will collect the samples, how they will be handled and stored and when laboratory personnel are required on site.

B. Architect/Construction Manager will notify Contractor of his decision to take samples and/or have tests made and provide him with the pertinent information. Contractor is responsible for notifying the testing laboratory and for having the testing performed, on schedule.
C. In addition to the above, Contractor shall make his own arrangements for the sampling and testing of materials he proposes to incorporate into the work. This shall not be paid for out of cash allowance.
D. Notify Architect/Construction Manager at least 48 hours in advance of the times at which scheduled samples or tests will be conducted.
E. If samples and/or tests cannot be taken or performed when required, delay the work until such time that they can be accomplished. Where possible, any work that has been installed but has not been sampled or tested as required, shall be tested by other means. Upon Architect/Construction Manager request, uncover any work, which has been buried or covered, and perform special tests designated. If the work cannot be tested by other means, Architect/Construction Manager may declare the work unacceptable. All cost associated with noncompliance and for special testing shall be borne by the Contractor and not be paid for out of the cash allowance.
F. Should the testing laboratory be scheduled to take or collect samples or to perform tests, and finds that it is unable to do so as a result of delays in construction, inclement weather, or any other reason, reschedule the tasks for a date acceptable to Architect/Construction Manager. Costs associated with times testing laboratory is unable to perform scheduled services shall be borne by the Contractor and will not be paid for under the allowance.
G. Plan all work and operations to allow for the taking and collection of samples and allow adequate time for the performance of tests. Delay the progress of questionable work until the receipt of the certified test reports.

1.9. Testing Requirements

A. Refer to Special Inspection Specifications

1.10. Testing Schedule

A. Refer to Special Inspections Specifications

1.11. Field Observation of Contractor's Work

A. The Architect/ Construction Manager will provide periodic observation of the Contractor's work in accordance with the General Conditions of the Contract.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1. Examination

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions. Verify that the existing substrate is capable of structural support or attachment of new Work being applied or attached. Examine and verify specific conditions described in individual specification sections. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2. Preparation

A. Clean substrate surfaces prior to applying next material or substance. Seal cracks or openings of substrate prior to applying next material or substance.
B. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3. Field Quality Control

A. Allow representative of the testing laboratory access to the work at all time. Provide all equipment, labor, materials and facilities required by the laboratory to properly perform its functions. Cooperate with and assist laboratory personnel during the performance of their work.
B. Test specimens and samples shall be taken by the person (s) designated in other Sections, or as directed by Architect/Construction Manager. Conduct field sampling and testing in the presence of Architect/Construction Manager. Provide all materials, equipment, facilities and labor for securing samples and test specimens and for performing all field-testing.

END OF SECTION 014500

SECTION 014533
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 003119 - Existing Condition Information: Soil investigation data.

C. Document 007100 - General Conditions: Inspections and approvals required by public authorities.

D. Section 012100 - DO NOT USE BSD Allowances: Allowance for payment of testing services.

E. Section 013300 Submittal Procedures: Submittal procedures.

F. Section 014000 - BSD Quality Requirements.

G. Section 014200 - Reference Standards.

H. Section 016000 - Product Requirements: Requirements for material and product quality.

1.03 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authority having jurisdiction.

B. IAS: International Accreditation Service, Inc.

C. NIST: National Institute of Standards and Technology.

1.04 DEFINITIONS

A. Code or Building Code: ICC (IBC)-2018, Edition of the International Building Code and specifically, Chapter 17 - Special Inspections and Tests.

B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

C. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.05 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).

B. AISC 341 - Seismic Provisions for Structural Steel Buildings; 2022.

C. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2025).

D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.

F. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2025.

G. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2026.

H. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2025.

I. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing of Soil and Rock as Used in Engineering Design and Construction; 2026.

J. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

K. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2026.

L. ASTM E605/E605M - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2019 (Reapproved 2023).

M. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2019 (Reapproved 2023).

N. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2024.

O. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2024.

P. ASTM E2570/E2570M - Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage; 2007 (Reapproved 2025).

Q. AWCI 117 - Technical Manual 12-B; Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire-Resistive Materials; an Annotated Guide; 2014.

R. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

S. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).

T. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).

U. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2025.

V. IAS AC291 - Accreditation Criteria for Special Inspection Agencies AC291; 2025, with Editorial Revision.

W. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

X. ICC (IBC)-2009 - International Building Code; 2009.

Y. ICC (IBC)-2012 - International Building Code; 2012.

Z. ICC (IBC)-2015 - International Building Code; 2015.

AA. ICC (IBC)-2018 - International Building Code; 2018.

BB. SDI QA/QC - Standard for Quality Control and Quality Assurance for Installation of Steel Deck; 2022.

CC. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.

DD. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.06 SUBMITTALS

A. See Section 013300 Submittal Procedures, for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Special Inspection Agency is acceptable to AHJ.
   4. Submit documentation that Special Inspection Agency is accredited by IAS according to IAS AC291.

C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Testing Agency is acceptable to AHJ.
   4. Submit documentation that Testing Agency is accredited by IAS according to IAS AC89.

D. Smoke Control Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit documentary evidence that agency has appropriate credentials and documented experience in fire protection engineering, mechanical engineering and HVAC air balancing.
   3. Submit certification that Testing Agency is acceptable to AHJ.
   4. Submit documentation that Testing Agency is accredited by IAS according to IAS AC89.

E. Manufacturer's Qualification Statement: Manufacturer is required to submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.

F. Fabricator's Qualification Statement: Fabricator is required to submit documentation of fabrication facilities and methods as well as quality control procedures. Include documentation of AHJ approval.

G. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.

1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of Special Inspector.
    d. Date and time of special inspection.
    e. Identification of product and specifications section.
    f. Location in the Project.
    g. Type of special inspection.
    h. Date of special inspection.
    i. Results of special inspection.
    j. Compliance with Contract Documents.
2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.

H. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to AHJ.
1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of Special Inspector.
    d. Date and time of special inspection.
    e. Identification of fabricated item and specification section.
    f. Location in the Project.
    g. Results of special inspection.
    h. Verification of fabrication and quality control procedures.
    i. Compliance with Contract Documents.
    j. Compliance with referenced standard(s).

I. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of inspector.
    d. Date and time of sampling or inspection.
    e. Identification of product and specifications section.
    f. Location in the Project.
    g. Type of test or inspection.
    h. Date of test or inspection.
    i. Results of test or inspection.
    j. Compliance with Contract Documents.

J. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.

K. Manufacturer's Field Reports: Submit reports to Architect and AHJ.

1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

L. Fabricator's Field Reports: Submit reports to Architect and AHJ.
1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.07 SPECIAL INSPECTION AGENCY

A. Owner or Architect will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.

C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 TESTING AND INSPECTION AGENCIES

A. Owner or Architect may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.09 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:
1. Independent firm specializing in performing testing and inspections of the type specified in this section.
2. Accredited by IAS according to IAS AC291.

B. Testing Agency Qualifications:
1. Independent firm specializing in performing testing and inspections of the type specified in this section.
2. Accredited by IAS according to IAS AC89.

C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.

2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

3.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC)-2018.

B. Cold-Formed Steel Deck: Comply with quality assurance inspection requirements of SDI QA/QC.

C. Open-Web Joists and Joist Girders: Comply with requirements of ICC (IBC)-2018, Table 1705.2.3.
   1. End Connections - Welding or Bolted: Comply with requirements of SJI 100; periodic.
   2. Bridging - Horizontal or Diagonal:
      a. Standard Bridging: Comply with requirements of SJI 100; periodic.
      b. Bridging That Differs From the SJI Specifications: Periodic inspection.

D. Cold-Formed Steel Trusses Spanning 60 feet or Greater: Special Inspector is required to verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

E. High-Strength Bolt, Nut and Washer Material:
   1. Verify identification markings comply with ASTM standards specified in the approved contract and to AISC 360, Section A3.3; periodic.
   2. Submit manufacturer's certificates of compliance; periodic.

F. High-Strength Bolting Installation: Verify items listed below comply with AISC 360, Section M2.5.
   1. Snug tight joints; periodic.
   2. Pretensioned and slip-critical joints with matchmarking, twist-off bolt or direct tension indicator method of installation; periodic.
   3. Pretensioned and slip-critical joints without matchmarking or calibrated wrench method of installation; continuous.

G. Structural Steel and Cold Formed Steel Deck Material:
   1. Structural Steel: Verify identification markings comply with AISC 360, Section M3.5; periodic.
   2. Other Steel: Verify identification markings comply with ASTM standards specified in the approved Contract Documents; periodic.
   3. Submit manufacturer's certificates of compliance and test reports; periodic.

H. Weld Filler Material:
   1. Verify identification markings comply with AWS standards specified in the approved Contract Documents and to AISC 360, Section A3.5; periodic.
   2. Submit manufacturer's certificates of compliance; periodic.

I. Welding:
   1. Structural Steel and Cold Formed Steel Deck:
      a. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      b. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      c. Single Pass Fillet Welds Less than 5/16 inch Wide: Verify compliance with AWS D1.1/D1.1M; periodic.
      d. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M; continuous.

e. Single Pass Fillet Welds 5/16 inch or Greater: Verify compliance with AWS D1.1/D1.1M; continuous.
f. Floor and Roof Deck Welds: Verify compliance with AWS D1.3/D1.3M; continuous.

J. Steel Frame Joint Details: Verify compliance with approved Contract Documents.
1. Details, bracing and stiffening; periodic.
2. Member locations; periodic.
3. Application of joint details at each connection; periodic.

K. Cold-formed steel trusses spanning 60 feet or more; periodic.

3.03 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION

A. Reinforcement, Including Prestressing Tendons, and Verification of Placement: Verify compliance with ACI 318, Chapters 20, 25.2, 25.3, 26.6.1-26.6.3; periodic.

B. Anchors Cast in Concrete: Verify compliance with ACI 318; periodic.

C. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI 318.
1. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
2. Other Mechanical and Adhesive Anchors: Verify as per Chapter 17.8.2; periodic.

D. Design Mix: Verify plastic concrete complies with the design mix in approved Contract Documents and with ACI 318, Chapter 19, 16.4.3, 26.4.4; periodic.

E. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M and ACI 318, Chapter 26.5, 26.12, and record the following, continuous:
1. Slump.
2. Air content.
3. Temperature of concrete.

F. Concrete and Shotcrete Placement: Verify application techniques comply with approved Contract Documents and ACI 318, Chapter 26.5; continuous.

G. Specified Curing Temperature and Techniques: Verify compliance with ACI 318, Chapter 26.5.3 through 26.5.5; periodic.

H. Precast Concrete Members: Verify erection techniques and placement comply with approved Contract Documents and ACI 318, Chapter 26.9; periodic.

I. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI 318, Chapter 26.11.1.2(b); periodic.

J. Materials: If the Contractor cannot provide sufficient data or documentary evidence that concrete materials comply with the quality standards of ACI 318, the AHJ will require testing of materials in accordance with the appropriate standards and criteria in ACI 318, Chapters 19 and 20.

3.04 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

A. Masonry Structures Subject to Special Inspection:
1. Masonry construction when required by the quality assurance program of TMS 402/602.
2. Engineered masonry in structures classified as "Standard Hazard" (Category II.)
a. Perform inspections in accordance with Level B Quality Assurance.

B. Verify each item below complies with approved Contract Documents and the applicable articles of TMS 402/602.

1. Inspections and Approvals:
   a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
   b. Verify approval of submittals required by Contract Documents; periodic.
2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.
3. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
4. Joints and Accessories: When masonry construction begins, verify:
   a. Proportions of site prepared mortar; periodic.
   b. Construction of mortar joints; periodic.
   c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
   d. Prestressing technique; periodic.
   e. Grade and size of prestressing tendons and anchorages; periodic.
5. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
   a. Size and location of structural elements; periodic.
   b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.
   c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
   d. Welding of reinforcing bars; continuous.
   e. Preparation, construction and protection of masonry against hot weather above 90 degrees F and cold weather below 40 degrees F; periodic.
   f. Application and measurement of prestressing force; continuous.
6. Grouting Preparation: Prior to grouting, verify:
   a. Grout space is clean; periodic.
   b. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
   c. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
   d. Correctly constructed mortar joints; periodic.
7. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.

C. Engineered Masonry in Buildings Designated as "Essential Facilities": Verify compliance of each item below with approved Contract Documents and the applicable articles of TMS 402/602.
   1. Inspections and Approvals:
      a. Perform inspections in accordance with Level C Quality Assurance.
      b. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
      c. Verify approval of submittals required by Contract Documents; periodic.
   2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction and upon completion of each 5,000 square feet increment of masonry erected during construction; periodic.
   3. Preblended Mortar and Grout: Verify proportions of materials upon delivery to site; periodic.
   4. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.

5. Engineered Elements, Joints, Anchors, Grouting, Protection: Verify compliance of each item below with approved Contract Documents and referenced standards.
   a. Proportions of site prepared mortar; periodic.
   b. Placement of masonry units and construction of mortar joints; periodic.
   c. Placement of reinforcement, connectors, prestressing tendons, anchorages, etc.; periodic.
   d. Grout space prior to grouting; continuous.
   e. Placement of grout; continuous.
   f. Placement of prestressing grout; continuous.
   g. Size and location of structural elements; periodic.
   h. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; continuous.
   i. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
   j. Welding of reinforcing bars; continuous.
   k. Preparation, construction and protection of masonry against hot weather above 90 degrees F and cold weather below 40 degrees F; periodic.
   l. Application and measurement of prestressing force; continuous.
6. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; continuous.

3.05 SPECIAL INSPECTIONS FOR SOILS

A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
   1. Design bearing capacity of material below shallow foundations; periodic.
   2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
   3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
   4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

B. Testing: Classify and test excavated material; periodic.

3.06 SPECIAL INSPECTIONS FOR SPRAYED FIRE RESISTANT MATERIALS

A. Sprayed Fire Resistant Materials, General:
   1. Verify compliance of sprayed-fire resistant materials with specific fire-rated assemblies indicated in approved Contract Documents, and with applicable requirements of the building code.
   2. Perform special inspections after rough installation of electrical, mechanical, plumbing, automatic fire sprinkler and suspension systems for ceilings.

B. Physical and visual tests: Verify compliance with fire resistance rating.
   1. Condition of substrates; periodic.
   2. Thickness of sprayed fire resistant material; periodic.
   3. Density of sprayed fire resistant material in pounds per cubic foot; periodic.
   4. Bond strength (adhesion and cohesion); periodic.
   5. Condition of finished application; periodic.

C. Structural member surface conditions:

1. Inspect structural member surfaces before application of sprayed fire resistant materials; periodic.
2. Verify preparation of structural member surfaces complies with approved Contract Documents and manufacturer's written instructions; periodic.

D. Application:
1. Ensure minimum ambient temperature before and after application complies with the manufacturer's written instructions; periodic.
2. Verify area where sprayed fire resistant material is applied is ventilated as required by the manufacturer's written instructions during and after application; periodic.

E. Thickness: Verify that no more than 10 percent of thickness measurements taken from sprayed fire resistant material are less than thickness required by fire resistance design in approved Contract Documents. In no case shall the thickness of the sprayed fire resistant material be less than the minimum below.
1. Minimum Allowable Thickness: Tested according to ASTM E605/E605M, periodic.
   a. Design thickness 1 inch or greater: Design thickness minus 1/4 inch.
   b. Design thickness greater than 1 inch: Design thickness minus 25 percent.
2. Floor, Roof and Wall Assemblies: Test thickness according to ASTM E605/E605M with no less than four measurements per 1,000 square feet of sprayed area on each story of the structure or portion thereof; periodic.
   a. Cellular Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area.
   b. Fluted Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area and include one example each of valley, crest and sides. Report the average of the four measurements.
3. Structural Members: Test according to ASTM E605/E605M. Test no less than 25 percent of structural members on each story of the structure or portion thereof; periodic.
   a. Beams and girders: Make nine thickness measurements around beam or girder at each end of a 12 inch by 12 inch length.
   b. Joists and trusses: Make seven thickness measurements around joist or truss at each end of a 12 inch by 12 inch length.
   c. Wide flanged columns: Make twelve thickness measurements around column at each end of a 12 inch by 12 inch length.
   d. Hollow structural sections and pipe columns: Make four thickness measurements around hollow structural section or pipe column at each end of a 12 inch by 12 inch length.

F. Density: Verify density of sprayed fire resistant material is no less than density required by the fire resistance design in the approved Contract Documents.
1. Floor, Roof and Wall Assemblies: Test according to ASTM E605/E605M with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.
2. Beams, Girders, Trusses and Columns: Test according to ASTM E605/E605M with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.

G. Bond Strength: Verify adhesive and cohesive bond strength of sprayed fire resistant materials is no less than 150 pounds per square foot when in-place samples of the cured material are tested according to ASTM E736/E736M and as described below.
1. Floor, roof and wall assemblies: Test no less than one sample per each 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.

2. Structural members: Test no less than one sample from each type of structural member in each 2,500 square feet of each story of the structure or portion thereof; periodic.
3. Primer, paint and encapsulant bond tests: When sprayed fire resistant material is applied to a primed, painted or encapsulated surface for which acceptable material to substrate performance has not been determined, conduct bond test.

3.07 SPECIAL INSPECTIONS FOR MASTIC AND INTUMESCENT FIRE RESISTANT COATINGS

A. Verify mastic and intumescent fire resistant coatings comply with AWCI 117 and the fire resistance rating indicated on approved Contract Documents.

3.08 STRUCTURAL OBSERVATIONS FOR STRUCTURES

A. Provide Observations: For structure where one or more of the following conditions exist:
1. The structure is classified as Risk Category IV.
2. The structure is a high-rise building.
3. Such observation is required by the registered design professional responsible for the structural design.
4. Such observation is specifically required by AHJ.

3.09 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:
1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified reference standards.
4. Ascertain compliance of materials and products with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
6. Perform additional tests and inspections required by Architect.
7. Attend preconstruction meetings and progress meetings.
8. Submit reports of all tests or inspections specified.

B. Limits on Special Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.10 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
1. Test samples submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
6. Perform additional tests and inspections required by Architect.
7. Attend preconstruction meetings and progress meetings.
8. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.11 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
3. Provide incidental labor and facilities:
   a. To provide access to work to be tested or inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
   c. To facilitate tests or inspections.
   d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Retain special inspection records.

B. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

C. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

3.12 MANUFACTURER'S AND FABRICATOR'S FIELD SERVICES

A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment and _____ as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
   1. Observer subject to approval of Architect.
   2. Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.13 STATEMENT OF SPECIAL INSPECTIONS

A. Refer to attached form, “Statement of Special Inspections”, at the end of this section.

B. Refer to attached, “Schedule of Special Inspections”, at the end of this section.

3.14 SPECIAL INSPECTION REPORTS

A. Report Requirement: Special Inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the code enforcement official, and to the registered design professional in responsible charge.
   1. Reports shall indicate that work inspected was done in conformance to approved construction documents.
   2. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the code enforcement official and to the registered design professional in responsible charge prior to the completion of that phase of the work.

B. Periodic Report: On the first day of each month, the special inspector shall furnish to the Architect five copies of the combined progress reports of the special inspector's observations. These progress reports shall list all special inspections of construction or reviews of testing performed during that month, note all uncorrected deficiencies, and describe the corrections made both to these deficiencies and to previously reported deficiencies.
   1. Each monthly report shall be signed by all special inspectors who performed special inspections of construction or reviewed testing during that month, regardless of whether they reported any deficiencies.
   2. Each monthly report shall be signed by the Contractor.

C. Final Report: At completion of construction, each special inspector shall prepare and sign a final report attesting that all work they inspected and all testing and test reports they reviewed were completed in accordance with the approved construction documents and that deficiencies identified were satisfactorily corrected.
   1. The Special Inspector shall submit a combined final report containing the signed final reports.
   2. The Contractors shall sign the combined final report attesting that all final reports of special inspectors that performed work to comply with these construction documents are contained therein, and that the Contractor has reviewed and approved all of the individual inspector's final reports.
   3. Refer to attached form, “Special Inspections Report”, attached at the end of this section.

STATEMENT OF SPECIAL INSPECTIONS

Name of Project:	
Address or Legal **Description:**	
Owner's Name:	
AUTHORITY HAVING JURISDICTION:	
Signed:	
I , as the structural engineer of record, certify that I have prepared the following special inspections program as required by the **XXXX** Building Code for the construction project located at the site listed above.	
Printed Name:	
	Seal Signature: Date:
List of work requiring special inspections: See following schedule.	

SPECIAL INSPECTIONS REPORT

Report Type: ____Continuous ____Periodic ____Final
Work/Material Inspected:
Project Name:
Address or Legal Description:
Owner's Name:
Phone:
email:
Approved Inspection Agency:
Address:
Phone:
email:
Authority Having Jurisdiction:
Address:
Phone:
email:
Registered Design Professional of Record:
Address:
Phone:
email:
Statement of Conformance:
Discrepancies:
____None
Contractor review:
Contractor signature:
Contractor correction:
Outstanding Discrepancies:
____None
Authority Having Jurisdiction review:
Registered Design Professional review:

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1704.2.5 INSPECTION OF FABRICATORS				
Verify fabrication / quality control procedures	In-plant review		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.1.1 SPECIAL CASES				
1. Work that is unusual in its nature, such as, but not limited to:				
A. Construction materials and systems that are alternatives to materials and systems prescribed by the Building Code	Submittal review, shop[3] and / or field inspection		Y	Periodic
B. Unusual design applications of materials described in the Building Code	Submittal review, shop[3] and / or field inspection		Y	Periodic
C. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in the Building Code or in standards referenced by the Building Code	Submittal review, shop[3] and / or field inspection		Y	Periodic
2. Inspection of anchors post-installed in solid grouted masonry per research reports including verification of:				
A. Anchor type and dimensions	Field inspection		Y	Periodic
B. Hole dimensions and cleaning procedures	Field inspection		Y	Periodic
C. Anchor spacing and edge distances	Field inspection		Y	Periodic
D. Masonry unit, grout, masonry compressive strength	Field inspection		Y	Periodic
E. Anchor embedment and tightening torque	Field inspection		Y	Periodic
3. Aggregate piers				
A. Prior to construction:				

a. Review of aggregate pier designer's use of soil parameters as presented in the project soils report	Field inspection		N	Periodic
B. During construction:				
a. Verification of aggregate properties	Field inspection		N	Periodic
b. Type and number of lifts of aggregate	Field inspection		N	Periodic
c. Verify compliance of with design results of qualitative tests on production aggregate pier elements such as modulus load testing, uplift pull-out testing, bottom stabilization tests and dynamic cone penetration tests	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.2 STEEL CONSTRUCTION				
1. Fabricator and erector documents	Submittal review	AISC 360, Section N3.2	Y	Each submittal
2. Material verification of structural steel	Shop[3] and field inspection		Y	Periodic
3. Structural steel welding:				
A. Inspection tasks prior to welding:				
Observe, or perform for each welded joint or member in accordance with QA tasks	Shop[3] and field inspection	AISC 360, Table N5.4-1	Y	Observe or Perform as noted[4]
B. Inspection tasks during welding:				
Observe, or perform for each welded joint or member in accordance with QA tasks	Shop[3] and field inspection	AISC 360, Table N5.4-2	Y	Observe[4]
C. Inspection tasks after welding:				
Observe, or perform for each welded joint or member in accordance with QA tasks	Shop[3] and field inspection	AISC 360, Table N5.4-3	Y	Observe or Perform as noted[4]
D. Nondestructive testing (NDT) of welded joints:				
a) Complete penetration groove welds 5/16" or greater in risk category III or IV	Shop[3] or field ultrasonic testing - 100%		Y	Periodic

b) Complete penetration groove welds 5/16" or greater in risk category II	Shop[3] or field ultrasonic testing - 10% of welds minimum		Y	Periodic
c) Welded joints subject to fatigue when required	Shop[3] or field radiographic or Ultrasonic testing	AISC 360, Appendix 3, Table A3.1	Y	Periodic
d) Fabricator's NDT reports when fabricator performs NDT	Verify reports		Y	Periodic
4. Structural steel bolting:	Shop[3] and field inspection			
a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection, in accordance with QA tasks		AISC 360, Table N5.6-1	Y	Observe or Perform as noted[4]
b. Inspection tasks During Bolting in accordance with QA tasks		AISC 360, Table N5.6-2	Y	Observe[4]
1) Pre-tensioned and slip-critical joints:				
a) Turn-of-nut with matching markings			Y	Periodic
b) Direct tension indicator			Y	Periodic
c) Twist-off type tension control bolt			Y	Periodic
d) Turn-of-nut without matching markings			Y	Continuous
e) Calibrated wrench			Y	Continuous
2) Snug-tight joints			Y	Periodic
Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks		AISC 360, Table N5.6-3	Y	Perform[4]
5. Visual inspection of exposed cut surfaces of galvanized structural steel main members and exposed corners of the rectangular HSS for cracks subsequent to galvanizing	Shop[3] or field inspection		Y	Periodic
6. Embedments (Verify diameter, grade, type, length, embedment. See 1705.3 for anchors)	Field inspection		Y	Periodic
7. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents	Field inspection		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.2.2 COLD FORMED STEEL DECK				
1. Manufacturer documents (Verify reports and certificates with Paragraphs 2.1 and 2.2 for compliance with construction documents)		SDI QA/QC Section 2	Y	
2. Material verification of steel deck, mechanical fasteners and welding materials	Shop[3] and field inspection		Y	Periodic
3. Cold-formed steel deck placement:	Shop[3] and field inspection			
a. Inspection tasks Prior to Deck Placement (Perform the QA tasks)		SDI QA/QC, Appendix 1, Table 1.1	Y	Perform[4]
b. Inspection tasks After Deck Placement (Perform the QA tasks)		SDI QA/QC, Appendix 1, Table 1.2	Y	Perform[4]
4. Cold-formed steel deck welding:	Shop[3] and field inspection			
a. Inspection tasks Prior to Welding (Observe the QA tasks)		SDI QA/QC, Appendix 1, Table 1.3	Y	Observe[4]
b. Inspection tasks During Welding (Observe the QA tasks)		SDI QA/QC, Appendix 1, Table 1.4	Y	Observe[4]
c. Inspection tasks After Welding (Perform the QA tasks)		SDI QA/QC, Appendix 1, Table 1.5	Y	Perform[4]
5. Cold-formed steel deck mechanical fastening:	Shop[3] and field inspection			
a. Inspection tasks Prior to Mechanical Fastening (Observe the QA tasks)		SDI QA/QC, Appendix 1, Table 1.6	Y	Observe[4]
b. Inspection tasks During Mechanical Fastening (Observe the QA tasks)		SDI QA/QC, Appendix 1, Table 1.7	Y	Observe[4]
c. Inspection tasks After Mechanical Fastening (Perform the QA tasks)		SDI QA/QC, Appendix 1, Table 1.8	Y	Perform[4]

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.2.3 OPEN-WEB STEEL JOISTS AND JOIST GIRDERS				
1. Installation of open-web steel joists and joist girders.				
a. End connections - welding or bolted.	per SJI CJ or SJI 100		Y	Periodic
b.. Bridging - horizontal or diagonal.				
1) Standard bridging.	per SJI CJ or SJI 100		Y	Periodic
2) Bridging that differs from the specifications listed in SJI CJ or SJI 100.			Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.2.4 COLD-FORMED STEEL TRUSSES SPANNING 60 FEET OR GREATER				
Verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package	Field Inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.3 CONCRETE CONSTRUCTION				
1. Inspect reinforcement, including prestressing tendons, and verify placement.	Shop[(3)] and field inspection	ACI 318: 20, 25.2, 25.3, 26.6.2-26.6.3	Y	Periodic
2. Reinforcing bar welding:				
a. Verification of weldability of bars other than ASTM A706.		AWS D1.4	N	Periodic
b. Inspection of single-pass fillet welds 5/16 or less in size.		ACI 318: 26.6.4	N	Periodic

c. Inspection of all other welds.			N	Continuous
3. Inspection of anchors cast in concrete.	Shop[3] and field inspection		Y	Periodic
4. Inspection of anchors post-installed in hardened concrete members per research reports, or, if no specific requirements are provided, requirements shall be provided by the registered design professional and approved by the building official, including verification of anchor type, anchor dimensions, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, concrete minimum thickness, anchor embedment and tightening torque	Field inspection		Y	Periodic or as required by the research report issued by an approved source
a. Adhesive anchors installed in horizontal or upward-inclined orientation that resist sustained tension loads.	Field inspection	ACI 318: 17.8.2.4	Y	Continuous
b. Mechanical and adhesive anchors note defined in 4a.	Field inspection	ACI 318: 17.8.2	Y	Periodic
5. Verify use of approved design mix	Shop[3] and field inspection	ACI 318: 19, 26.4.3, 26.4.4	Y	Periodic
6. a. Prior to placement, fabricate specimens for strength tests, fresh concrete sampling, perform slump or slump flow, and air content density tests, and determine temperature of concrete.	Shop[3] and field inspection	ASTM C172, ASTM C31, ACI 318: 26.5, 26.12	Y	Continuous
6. b. Verify that concrete specimens for strength tests are maintained in the required initial curing and laboratory curing environment, and that the maximum and minimum temperatures during the initial curing period are reported.	Shop[3] and field inspection		Y	Continuous
7. Inspection of concrete and shotcrete placement for proper application techniques	Shop[3] and field inspection	ACI 318: 26.5	Y	Continuous
8. Verify maintenance of specified curing temperature and techniques	Shop[3] and field inspection	ACI 318: 26.5.3-26.5.5	Y	Periodic
9. Inspection of prestressed concrete:	Shop[3] and field inspection			
a. Application of prestressing force		ACI 318: 26.10	N	Continuous

b. Grouting of bonded prestressing tendons		ACI 318: 26.10	N	Continuous
10. Inspect erection of precast concrete members		ACI 318: 26.9	Y	Periodic
11. Verification of in-situ concrete strength, prior to stressing of tendons in post tensioned concrete and prior to removal of shores and forms from beams and structural slabs	Review field testing and laboratory reports	ACI 318: 26.11.2	N	Periodic
12. Inspection of formwork for shape, lines, location and dimensions	Field inspection	ACI 318: 26.11.1.2(b)	Y	Periodic
13. Concrete strength testing and verification of compliance with construction documents	Field testing and review of laboratory reports		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.4 MASONRY CONSTRUCTION				
MINIMUM VERIFICATION REQUIREMENTS				
(A) Level A, B and C Quality Assurance:				
1. Prior to construction, verification of compliance of submittals	Submittal Review	TMS 602: 1.5	Y	Prior to Construction
(B) Level B and C Quality Assurance:				
1. Prior to construction verification of f'm and f'_{AAC} except where specifically exempted by the code	Testing by unit strength method or prism test method	TMS 602: 1.4B	Y	Prior to Construction
2. During construction, verification of proportions of materials as delivered to the project site for premixed or pre-blended mortar, prestressing grout, and grout other than self-consolidating grout.	Testing by unit strength method or prism test method		Y	Periodic
(C) Level C Quality Assurance:				
1. During construction, verification of f'm and f'_{AAC} for every 5,000 SF	Testing by unit strength method or prism test method	TMS 602: 1.4B	Y	Periodic
2. During construction, verification of proportions of materials as delivered to the project site for premixed or pre-blended mortar, prestressing grout, and grout other than self-	Field inspection		Y	Periodic

consolidating grout.				
MINIMUM SPECIAL INSPECTION REQUIREMENTS				
(D) Levels B and C Quality Assurance:				
1. As masonry construction begins, verify that the following are in compliance:				
a. Proportions of the site-prepared mortar	Field inspection	TMS 602: 2.1, 2.6A	Y	Periodic
b. Grade and size of prestressing tendons and anchorages	Field inspection	TMS 602: 2.4B, 2.4H	Y	Periodic
c. Grade, type, and size of reinforcement, anchor bolts, and prestressing tendons and anchorages	Field inspection		Y	Periodic
d. Prestressing technique	Field inspection	TMS 602: 3.6B	N	Periodic
e. Properties of thin-bed mortar for AAC masonry (b) Required for the first 5,000 square feet (c) Required after the first 5,000 square feet	Field inspection	TMS 602: 2.1C	N	Level B - Continuous[(b)] Level B - Periodic[(c)]
			N	Level C - Continuous
f. Sample panel construction	Field inspection		Y	Level B - Periodic
			Y	Level C - Continuous
2. Prior to grouting, verify that the following are in compliance:				
a. Grout space	Field Inspection	TMS 602: 3.2D, 3.2F	Y	Level B - Periodic
			Y	Level C - Continuous
b. Placement of prestressing tendons and anchorages	Field Inspection		Y	Periodic
c. Placement of reinforcement, connectors, and anchor bolts	Field Inspection		Y	Level B - Periodic
			Y	Level C - Continuous
d. Proportions of site-prepared grout and pre-stresssing grout for bonded tendons	Field Inspection		Y	Periodic
3. Verify compliance of the following during construction:				
a. Materials and procedures with the approved submittals	Field inspection		Y	Periodic
b. Placement of masonry units and mortar joint construction	Field inspection		Y	Periodic
c. Size and location of structural members	Field inspection	TMS 602: 3.3F	Y	Periodic

d. Type, size, location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction	Field inspection	TMS 402: 1.2.1(e), 6.1.4.3, 6.2.1	Y	Level B - Periodic
			Y	Level C - Continuous
e. Welding of reinforcement	Field inspection	TMS 402: 8.1.6.7.2, 9.3.3.4, 11.3.3.4(b)	N	Continuous
f. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F)	Field inspection	TMS 602: 1.8C, 1.8D	Y	Periodic
g. Application and measurement of prestressing force	Field testing	TMS 602: 3.6B	N	Continuous
h. Placement of grout and prestressing grout for bonded tendons is in compliance	Field inspection	TMS 602: 3.5, 3.6C	N	Continuous
i. Placement of AAC masonry units and construction of thin-bed mortar joints (b) Required for the first 5,000 square feet (c) Required after the first 5,000 square feet	Field inspection	TMS 602: 3.3B.9, 3.3F.1.b	Y	Level B - Continuous[b] Level B - Periodic[c]
			Y	Level C - Continuous
4. Observe preparation of grout specimens, mortar specimens, and/or prisms	Field inspection	TMS 602: 1.4B.2.a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, 1.4B.4	Y	Level B - Periodic
			Y	Level C - Continuous

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.5 WOOD CONSTRUCTION				
1. For prefabricated wood structural elements, inspection of the fabrication process and assemblies in accordance with Section 1704.2.5.	In-plant review[3]		Y	Periodic
2. For high-load diaphragms, verify grade and thickness of structural panel sheathing agree with approved building plans.	Field inspection		Y	Periodic

3. For high-load diaphragms, verify nominal size of framing members at adjoining panel edges, nail or staple diameter and length, number of fastener lines, and that spacing between fasteners in each line and at edge margins agree with approved building plans	Field inspection		Y	Periodic
4. Metal-plate-connected wood trusses:				
a. Verification that permanent individual truss member restraint/bracing has been installed in accordance with the approved truss submittal package when the truss height is greater than or equal to 60".	Field inspection		Y	Periodic
b. For trusses spanning 60 feet or greater: verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package	Field inspection		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.5.3 MASS TIMBER CONSTRUCTION				
1. Inspection of anchorage and connection of mass timber construction to timber deep foundation systems.	Field inspection		N	Periodic
2. Inspect erection of mass timber construction.	Field inspection		N	Periodic
3. Inspection of connections where installation methods are required to meet design loads.				
a. Threaded Fasteners				
1) Verify use of proper installation equipment.	Field inspection		N	Periodic
2) Verify use of pre-drilled holes where required.	Field inspection		N	Periodic
3) Inspect screws, including diameter, length, head type, spacing, installation angle, and depth.	Field inspection		N	Periodic

b. Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads.	Field inspection		N	Periodic
c. Other adhesive anchors.	Field inspection		N	Periodic
d. Bolted connections.	Field inspection		N	Periodic
e. Concealed connections	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.6 SOILS				
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	Field inspection		Y	Periodic
2. Verify excavations are extended to proper depth and have reached proper material.	Field inspection		Y	Periodic
3. Perform classification and testing of compacted fill materials.	Field inspection		Y	Periodic
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill	Field inspection		Y	Continuous
5. Prior to placement of controlled fill, inspect subgrade and verify that site has been prepared properly	Field inspection		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.7 DRIVEN DEEP FOUNDATIONS				
1. Verify element materials, sizes and lengths comply with requirements	Field inspection		N	Continuous
2. Determine capacities of test elements and conduct additional load tests, as required	Field inspection		N	Continuous
3. Inspect driving operations and maintain complete and accurate	Field inspection		N	Continuous

records for each element				
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element	Field inspection		N	Continuous
5. For steel elements, perform additional inspections per Section 1705.2	See Section 1705.2		N	See Section 1705.2
6. For concrete elements and concrete-filled elements, perform tests and additional inspections per Section 1705.3	See Section 1705.3		N	See Section 1705.3
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge	Field inspection		N	In accordance with construction documents

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.8 CAST-IN-PLACE DEEP FOUNDATIONS				
1.Inspect drilling operations and maintain complete and accurate records for each element	Field inspection		N	Continuous
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes	Field inspection		N	Continuous
3. For concrete elements, perform tests and additional inspections in accordance with Section 1705.3	See Section 1705.3		N	See Section 1705.3

SCHEDULE OF SPECIAL INSPECTION SERVICES	
PROJECT	

MATERIAL / ACTIVITY	SERVICE	REFERENCED STANDARD	APPLICABLE	
			Y/N	FREQUENCY
1705.9 HELICAL PILE FOUNDATIONS				
Verify installation equipment, pile dimensions, tip elevations, final depth, final installation torque and other installation data as required by construction documents.	Field inspection		N	Continuous

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.10 FABRICATED ITEMS				
1. List of fabricated items requiring special inspection during fabrication:	Shop inspection		Y	As noted in each applicable shop activity
Open-web steel joists				
Joist Girders				
Structural steel fabricator				
2. List of fabricated items to be fabricated on the premises of a fabricator approved to perform such work without special inspection (including name of approved agency providing periodic auditing):	Shop inspection		Y	As noted in each applicable shop activity
Open-web joists				
Joist girders				
Structural steel fabricator				

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.11.1 STRUCTURAL WOOD SPECIAL INSPECTIONS FOR WIND RESISTANCE				
1. Inspection of field gluing operations of elements of the main wind force-resisting system	Field inspection		N	Continuous
2. Inspection of nailing, bolting, anchoring and other fastening of	Shop[(3)] and field inspection		N	Periodic

components within the main wind force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.				

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.11.2 COLD-FORMED STEEL SPECIAL INSPECTIONS FOR WIND RESISTANCE				
1.Inspection during welding operations of elements of the main wind force-resisting system	Shop[3] and field inspection		N	Periodic
2. Inspection of screw attachment, bolting, anchoring and other fastening of components within the main wind force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.	Shop[3] and field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.11.3 WIND-RESISTING COMPONENTS				
1. Roof covering, roof deck and roof framing connections.	Shop[3] and field inspection		N	Periodic
2. Exterior wall covering and wall connections to roof and floor diaphragms.	Shop[3] and field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.1 STRUCTURAL STEEL SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
1. Seismic force-resisting systems in SDC B, C, D, E, or F.	Shop[3] and field inspection		N	In accordance with AISC 341
2. Structural steel elements in SDC B, C, D, E, or F other than those in Item 1.	Shop[3] and field inspection		N	In accordance with AISC 341

including struts, collectors, chords and foundation elements.				

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.2 STRUCTURAL WOOD SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
1. Field gluing operations of elements of the seismic-force resisting system for SDC C, D, E or F.	Shop(3) and field inspection		N	Continuous
2. Nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system including wood shear walls, wood diaphragms, drag struts, shear panels and hold-downs for SDC C, D, E or F.	Shop(3) and field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.3 COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
1. During welding operations of elements of the seismic-force-resisting system for SDC C, D, E or F.	Shop(3) and field inspection		N	Periodic
2. Screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs for SDC C, D, E or F.	Shop(3) and field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.4 DESIGNATED SEISMIC SYSTEMS VERIFICATION SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				

For SDC C, D, E or F, inspect and verify that that the component label, anchorage or mounting conforms to the certificate of compliance in accordance with ASCE 7 Section 13.2.2.	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.5 ARCHITECTURAL COMPONENTS SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
1. For SDC D, E or F, inspection during the erection and fastening of exterior cladding and interior or exterior veneer more than 30 feet above grade or walking surface and weighing more than 5 psf.	Field inspection		N	Periodic
2. For SDC D, E or F, inspection during the erection and fastening of interior nonloadbearing walls more than 30 feet above grade or walking surface and weighing more than 15 psf.	Field inspection		N	Periodic
3. For SDC D, E or F, inspection during the erection and fastening of exterior nonloadbearing walls more than 30 feet above grade or walking surface.	Field inspection		N	Periodic
4. For SDC D, E or F, inspection during anchorage of access floors	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.6 PLUMBING, MECHANICAL AND ELECTRICAL COMPONENTS SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
1. Inspection during the anchorage of electrical equipment for emergency or standby power systems in SDC C, D, E or F	Field inspection		N	Periodic
2. Inspection during the anchorage of other electrical equipment in SDC E or F	Field inspection		N	Periodic

3. Inspection during installation and anchorage of piping systems designed to carry hazardous materials, and their associated mechanical units in SDC C, D, E or F	Field inspection		N	Periodic
4. Inspection during the installation and anchorage of HVAC ductwork designed to contain hazardous materials in SDC C, D, E or F	Field inspection		N	Periodic
5. Inspection during the installation and anchorage of vibration isolation systems in SDC C, D, E or F where nominal clearance of 1/4 inch or less is required by the approved construction documents	Field inspection		N	Periodic
6. Inspection during installation of mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic fire sprinkler systems are installed in structures assigned to SDC C, D, E, or F to verify one of the following unless flexible sprinkler hose fittings are used:				
a. Minimum required clearances have been provided.	Field inspection	ASCE/SEI 7: 13.2.3	N	Periodic
b. A three inch or greater nominal clearance has been provided between fire protection sprinkler system drops and sprigs and: structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping.	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.7 STORAGE RACKS SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE				
Inspection during the anchorage of storage racks 8 feet or greater in height in structures assigned to SDC D, E or F.	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.8 SEISMIC ISOLATION SYSTEMS				
Inspection during the fabrication and installation of isolator units and energy dissipation devices used as part of the seismic isolation system in structures assigned to SDC B, C, D, E or F.	Shop[3] and field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.12.9 COLD-FORMED STEEL SPECIAL BOLTED MOMENT FRAMES				
Inspection of installation of cold-formed steel special bolted moment frames in the seismic force-resisting systems in structures assigned to SDC D, E or F.	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.1 STRUCTURAL STEEL TESTING FOR SEISMIC RESISTANCE				
1. Nondestructive testing of structural steel in the seismic force-resisting systems in accordance with AISC 341 in structures assigned to SDC B, C, D, E or F.	Field test		N	Periodic
2. Nondestructive testing of structural steel elements in the seismic force-resisting systems not covered in 1 above including struts, collectors, chords and foundation elements in accordance with AISC 341 in structures assigned to SDC B, C, D, E or F.	Field test		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.2 SEISMIC CERTIFICATION ON NON-STRUCTURAL COMPONENTS				
Review certificate of compliance for designated seismic system components in structures assigned to SDC B, C, D, E or F.	Certificate of compliance review		N	Each submittal

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.3 SEISMIC CERTIFICATION OF DESIGNATED SEISMIC SYSTEMS				
Review certificate of compliance for designated seismic system components in structures assigned to SDC C, D, E or F	Certificate of compliance review		N	Each submittal

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.4 SEISMIC ISOLATION SYSTEMS				
Test seismic isolation system in structures assigned to SDC B, C, D, E or F.	Prototype testing	ASCE 7: 17.8	N	Per ASCE 7

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.14 SPRAYED FIRE-RESISTANT MATERIALS				
1. Verify surface condition preparation of structural members	Field inspection		N	Periodic

2. Verify minimum thickness of sprayed fire-resistant materials applied to structural members	Field inspection		N	Periodic
3. Verify density of the sprayed fire-resistant material complies with approved fire-resistant design	Field inspection		N	Per Section 1705.14.5
4. Verify the cohesive/adhesive bond strength of the cured sprayed fire-resistant material	Field inspection		N	Per Section 1705.14.6
5. Condition of finished application	Field inspection		N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.15 MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS				
Inspect and test mastic and intumescent fire-resistant coatings applied to structural elements and decks	Field inspection and testing	AWCI 12-B	N	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.16 EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)				
Inspection of water-resistive barrier over sheathing substrate	Field inspection		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.17 FIRE-RESISTANT PENETRATIONS AND JOINTS				
1. Inspect penetration firestop systems	Field testing		Y	Per ASTM E2174
2. Inspect fire-resistant joint systems	Field testing		Y	Per ASTM E2393

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.18 SMOKE CONTROL SYSTEMS				
1. Leakage testing and recording of device locations prior to concealment	Field testing		Y	Periodic
2. Prior to occupancy and after sufficient completion, pressure difference testing, flow measurements, and detection and control verification	Field testing		Y	Periodic

SCHEDULE OF SPECIAL INSPECTION SERVICES				
PROJECT				
MATERIAL / ACTIVITY	**SERVICE**	**REFERENCED STANDARD**	**APPLICABLE**	
			Y/N	**FREQUENCY**
1705.13.19 SEALING OF MASS TIMBER CONSTRUCTION				
1. Inspect sealants and adhesives to resist passage of air in buildings of Type IV-A, IV-B, and IV-C.	Field testing		N	Periodic
a. At abutting edges and intersections of mass timber building elements required to be fire-resistance rated.	Field testing		N	Periodic
b. At abutting intersections of mass timber building elements and building elements of other materials where both are required to be fire-resistance rated.	Field testing		N	

*** INSPECTION AGENTS**

FIRM NO.	**ADDRESS**	**TELEPHONE**
1.		
2.		
3.		
4.		

Notes:

1. The inspection and testing agent(s) shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official prior to commencing work. The qualifications of the Special Inspector(s) and/or testing agencies may be subject to the approval of the Building Official and/or the Design Professional.

2. The list of Special Inspectors may be submitted as a separate document, if noted so above.

3. Shop Inspections of fabricated items are not required where the fabricator is approved in accordance with IBC Section 1704.2.5.1 and listed in activity 1709.2.
4. Observe: Observe on a random basis, operations need not be delayed pending these inspections. Perform: These tasks shall be performed for each welded joint, bolted connection, or steel element.
5. NDT of welds completed in an approved fabricator's shop may be performed by that fabricator when approved by the AHJ. Refer to AISC 360, N6.

Are Special Inspections for Seismic Resistance included in the Statement of Special Inspections? **Yes** **No**

Are Special Inspections for Wind Resistance included in the Statement of Special Inspections? ***Yes*** ***No***

DATE: _ _ _ _ _ _ _ _ _ _

END OF SECTION 014533

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SECTION 015000 – TEMPORARY FACILITIES & CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
B. Temporary utilities include, but are not limited to, the following:
   1. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
   2. Ventilation.
   3. Electric power service.
   4. Lighting.
   5. Temporary Heating.
C. Security and protection facilities include, but are not limited to, the following:
   1. Environmental protection
   2. Tree and plant protection
   3. Site enclosure fence.
   4. Security enclosure and lockup.
   5. Barricades, warning signs, and lights.
   6. Temporary enclosures.
   7. Temporary partitions.
   8. Fire protection.
D. Unless work of this section is indicated to be provided under a specific contract, each Prime Contractor must provide, maintain and remove required temporary facilities necessary to perform his own construction activities.
E. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1

1.2 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations
   4. Police, fire department and rescue squad rules.
   5. Environmental protection regulations.
   6. NYS SED 155.5

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”, ANSI A10 Series standards for “Safety Requirements for Construction and Demolition”, and NECA Electrical Design Library “Temporary Electrical Facilities”.
   1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code”.
C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.3 PROJECT CONDITIONS

A. Temporary Utilities: Each contractor will prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-preventative measures. Do not allow hazardous waste, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

1.4 DIVISION OF RESPONSIBILITIES

A. General: These Specifications assign the Contractor responsibilities:
B. Each Prime Contractor is responsible for the following:
   1. Installation, operation, maintenance and removal of each temporary facility considered as its own normal construction activity, as well as the costs and use charges except as listed below.
   2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
   3. Its own storage, Conex boxes and fabrication sheds. (Locate/ Move as directed by CM)
   4. Hoisting requirements, including hoisting loads in excess of 2 tons, hoisting material or equipment into spaces below grade, and hoisting requirements outside the building enclosure. (Rigging insurance must be provided when contractor is hoisting equipment.)
   5. Collection and disposal of its own hazardous, dangerous, unsanitary and all waste material.
   6. Secure lock-up of its own tools, material and equipment

7. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
8. Maintaining temporary facilities provided by Contractor.
9. Complying with the regulations of the Commissioner of Education- 8 NYCRR 155.5 - Uniform Safety Standards for School Construction and Maintenance Projects specified in Division 1 Section "Uniform Safety Standards for School Construction."
10. Containers for non-hazardous waste and debris generated by their own demolition and construction operations.

1.5 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to Owner, Architect or Construction Manager and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including but not limited to the following:
   1. The Architect and Construction Manager
   2. Other Contractors
   3. Owners' construction forces, including testing agencies
   4. Personnel of Authorities having jurisdiction
B. Water service: Use water from water system to be installed by SWC with metering, as may be required by the authority having jurisdiction. See "Temporary Water" below.
C. Electric Power Service: Temporary electric power including set up and maintenance is the responsibility of the Electrical Work Contractor. Use charges by Owner.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Architect / CM the Contractor may use undamaged, previously used material in good condition. Provide materials suitable for use intended.
B. Lumber and Plywood:
   1. For signs and directory boards, provide exterior-type, Grade B-B high density concrete form overlay plywood of sizes and thicknesses indicated
   2. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8-inch-thick exterior plywood.
C. Paint: Paint surfaces exposed to view from the Owner-occupied areas.
D. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For Temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire- retardant tarpaulins.
E. Temporary Roofing: minimum ½" gypsum sheeting and 30 mil reinforced EPDM membrane.

2.2 EQUIPMENT

A. Water Hoses: Provide ¾ inch, heavy duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

B. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

PART 3 – EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

A. Used qualified personnel for installation of temporary facilities. Locate facilities where they will serve to protect adequately and results in minimum interference with performance of the work. Relocate and modify facilities as required.

B. Contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

1. Arrange with the utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

3.2 CONTRACTOR FIELD OFFICES

A. Contractor may with permission from the architect and construction manager establish a field office for their own use. Said office for the individual prime contractor, subcontractors, specialty contractors and the like shall be of such size and design as approved by the owner and architect and shall be located where directed by the Owner/CM. Each representative contractor will arrange for telephone service, internet service, and electric service, if required, directly with utility company. (No field offices or storage trailers will be allowed by the buildings.)

B. Maintain, in the contractor's field office, all articles for First Aid treatment. The contractor shall also establish standing arrangements for the immediate removal and hospital treatment of any employees and other persons on the job site who may be injured or who may become ill during the course of the work.

3.3 TEMPORARY AND PERMANENT SERVICES, GENERAL

A. The Contractor's use of any permanent system or service of the building or portions thereof shall be subject to the Owners approval.
B. The Contractor shall be responsible for any and all damage to permanent services used, and shall make good any and all damage to the satisfaction of the owner, prior to final completion and acceptance.
C. NOTE - In accordance with OSHA and other applicable regulations, the representative Contractors performing erection of "skeleton" type work are solely responsible for the netting, guard rail protection and such other safety device as deemed necessary to protect the workers and public from harm

3.4 TEMPORARY LIGHT AND POWER

A. Temporary Electric Power Service: Electrical Work Contractor shall provide and pay all costs to provide a weatherproof, grounded electric power service and distribution system of sufficient size, capacity and power characteristics to accommodate performance of work during the construction period.
    1. Responsibility: All work under this section to be provided by the Electrical Work Contractor.
    2. Applicability: This section applies to all renovation and new construction work areas for this Project.
    3. Electrical Work Contractor shall make arrangements with utility company for temporary and permanent services immediately after award of contract.
    4. Temporary or permanent services for temporarily or permanently installed building equipment such as sump pumps, boilers, cabinet heating and/ or cooling units and fans shall be furnished, installed, operated and maintained so that the said equipment may be operated for drainage and temporary heat when required and/ or when so ordered by the Architect/ Construction Manager.
    5. Electrical Work Contractor shall maintain all parts of the electrical system (temporary and permanent) active and in-service at all times through the contract duration. All temporary lighting is to be controlled by standard switches per code (outside of power panels.)
    6. Electrical Work Contractor shall provide temporary generator power to maintain power during any electric service switch over. This includes all electric service in the building (power, fire alarm, lighting, communication, information technology, kitchen freezers/coolers, heating units, etc.) Contractor shall assume generator(s) and temporary panels as necessary. Generators shall be located at the building exterior. Provide feeder cables, adequately sized, in accordance with NEC to feed temporary panels or existing sub- panels. Contractor shall include required fuel for operation.

7. Electrical Work Contractor shall maintain power during the hours established by Construction Manager.
8. Temporary Services: Install service and grounding in compliance with the National Electric Code (NFPA 70). Include necessary meters, transformers, overload protected disconnect and main distribution switch gear. Comply with all NECA, NEMA and UL Standards.
9. Provide temporary service with an automatic ground- fault interrupter feature, activated from the circuits of the system.
10. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead. Rise vertically where wiring will be least exposed to damage from construction operations.
11. Provide metal conduit, tubing or armored cable for protection of temporary power wiring, where exposed to possible damage during construction operations. Where permitted by code, wiring of circuits not exceeding 110-120 Volts 20 Amp rating and wiring of lighting circuits may be non- metallic sheathed cable in areas were located overhead and exposed. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide metal enclosures or boxes for wiring devices.
12. Provide overload- protected disconnect switch as required by code.
13. Maintain all existing systems, including but not limited to power, lighting, fire alarm, intercom, etc. within the existing building operational at all times for Owner occupancy and construction.

B. Temporary Electrical & Internet:
1. Temporary Power Source: For the New Building area, the EWC will bring electrical power distribution system from Stormytown Road to the job-site location, including the Staging Area, via pole/masts. Anticipate a 400 AMP service. See Staging & Logistics plan at end of this section. The EWC will pay for all Con-Ed applications, permits, metering, and any related fees. The Con-Ed application process (by the EWC) will begin immediately after contract award. Internet will also be brought in using the same poles/masts and all permits and fees are part of the EWC work. Connect Internet wire to CM Trailer.
2. Owner’s Requirements: Do not disrupt the Owner’s needs for continuous power.
3. Electrical Work Contractor shall provide temporary power and lighting facilities for use of all trades. All temporary light and power shall be in accordance with the required Codes and Safety Standards.
4. Electrical Work Contractor will include in their base bid: Construction Manager Trailer electrical hook up and internet hook-up at Staging area. Lines will be run using utility poles as necessary.
5. All other contractor trailer use/ connection charges for power & internet, are to be paid for by the respective contractor. Temporary Electrical Service (by the EWC) to the Staging Area shall be able to power 6 office trailers, one double headed exterior rated flood light & 2 post mounted quad outlets at a minimum.

C. Receptacle Requirements
   1. General Requirements: Provide temporary receptacle outlets as required. Minimum Required: Provide a minimum of one quad 120 Volt receptacle per 2500 square feet of building floor area, with maximum spacing of 50 feet on center for operation of portable tools and appliances during the construction period. For power hand tools and task lighting, provide temporary 4- gang outlets at each floor level, spaced so that a 100-foot extension cord can reach each work area. Provide separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).
   2. Branch Circuits: All temporary receptacle branch circuits to be rated 20 amps with a maximum of (3) duplex receptacles per circuit. Temporary receptable branch circuits shall be independent of temporary lighting circuits.

D. Lighting Requirements
   1. General Requirements: Electrical Work Contractor shall provide both interior and exterior lighting at areas where existing lighting has been removed and/or at new construction areas, as required to provide adequate illumination for safe and proper construction operations and Project Site security.
   2. Minimum Requirements: Provide illumination levels adequate for construction operations and safe traffic conditions. As a minimum provide one 200-watt lamp per 400 square feet of building floor area, with maximum spacing of 20 feet. Any rooms in excess of 500 sf will receive one 400-watt metal halide fixture for each 1000 sf of area.
   3. Stairways: Provide one 200-watt lamp per landing at each stairway and covered walkway.
   4. Supplemental Lighting: If required, supplemental lighting beyond minimum requirements shall be provided via suitable portable lighting units with cords and plugs, and shall be paid for by the Contractor or Subcontractor requiring such additional lighting.
   5. Restrictions: Do not use permanent lighting system for temporary construction lighting purposes.

E. Maximum Loads
   1. General: Lighting and power loads connected to the temporary power distribution system shall be limited the following maximum individual loads:
      a. Load type Maximum
      b. 120 volt, 1-phase 1.5 KVA
      c. 208 volt, 1-phase 2.5 KVA
      d. 208 volt, 3-phase 5.0 KVA
   2. General: The temporary power distribution system shall be sufficiently sized to provide temporary power as required within these sections. Meter and Meter connections to be part of Electrical Work Contractor’s base bid.

F. Electrical Welders
   1. Separate Power Sources Required: Power for electric welders and for other loads larger than the maximum allowable sizes shall be taken from portable power sources provided, paid for and operated by the Contractor or Subcontractor requiring the use of such equipment. Remove such power sources when no longer needed.

G. Electrical Energy Costs
   1. Paid by the Owner: Chargers for electrical energy usage for temporary power and lighting will be paid by the Owner. Contractor and Subcontractors shall exercise measures to conserve energy usage. Use of Owner electric for items not specific to project (e.g. heating constructions shanties, etc.) will not be permitted.

3.5 TEMPORARY TOILET FACILITIES

A. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations which will best serve the project's needs. Existing facilities should not be used.
B. The Site Work Contractor is responsible for temporary sanitary facilities and their maintenance, cleaning and supplies for use by all trades, in sufficient quantity/locations to properly handle the number of workers onsite. (Once the SWC mobilizes and until 4/30/27)
C. The General Work Contractor is responsible for temporary sanitary facilities and their maintenance, cleaning and supplies for use by all trades, in sufficient quantity/locations to properly handle the number of workers onsite. (Once the GWC mobilizes but no later than 4/30/27)
D. Supply and maintain toilet tissue, paper towels, paper cups and other disposable materials as appropriate for each facility, including Owner's Representative's temporary offices for full contract duration. Provide covered waste containers for used material.
E. Provide separate toilet facilities for male and female construction personnel.

3.6 TEMPORARY HEATING

A. The Mechanical Work Contractor will maintain 60-degree temperature in all areas via temporary heating.
B. The Mechanical Work Contractor will submit a detailed plan including sketches indicating their proposed temporary heating system for Owner/Architect and Construction Manager approval within 4 weeks of contract award. The Electrical Work Contractor will provide permanent or temporary power for Mechanical Work Contractor's units for temporary heating. The fuel, equipment, materials, operating personnel and methods used therefore shall be at all times satisfactory to the Owner, Architect and Construction Manager and adequate for the purpose intended. The use of electric heaters is not acceptable.
C. The Contractor shall maintain the critical installation temperatures provided in the technical provisions of the specifications herein for all work in those areas where same is being performed.
D. The maintenance of proper heating, ventilation and adequate drying out of the work is the responsibility of the contractor and any work damaged by dampness, insufficient or abnormal heating, shall be replaced to the satisfaction of the Architect by and at the sole expense of the contractor.
E. Before and during the placing of the gypsum and the application of other interior finishes, taping, varnishing, painting, etc. and until final acceptance by the Owner of all work covered by the Contract, the contractor shall, unless otherwise specified in the contract documents, maintain a temperature of 65 degrees F. Coordinate with Division 9 of the Technical Specifications.
F. Use of the permanent system if approved by engineer and owner permission granted, shall not shorten, or negate any equipment, or system guarantees required under this contract. (The warranty period starts upon date of substantial completion.) Two additional filter changes are to be provided by Mechanical Work Contractor. A program of use, maintenance and restoration will be submitted with request for use of systems of temporary services.

3.7 TEMPORARY WATER

A. The Site Work Contractor, beginning 3/29/27, shall install the permanent water service line at least up to, and including, the hydrant adjacent to the new Transformer Pad. (Southeast Corner of new building). This work shall be completed by 4/26/27.
B. The Plumbing Work Contractor shall install and maintain (for the duration of the project) water usage devices at this hydrant adjacent to the transformer pad (Southeast Corner of new building) including any metering (and other requirements) required by the authority having jurisdiction.

3.8 STORAGE FACILITIES

A. Each Contractor shall provide temporary storage shanties, tool houses and other facilities as required for their own use. Temporary structures shall be located at the Construction Manager's designated staging area, and shall be removed upon completion of the work or when directed. See Staging & Logistics Plan attached to this Spec Section.
B. Materials delivered to the site shall be safely stored and adequately protected against loss or damage in watertight, environmentally controlled, lockable, Conex boxes. Particular care shall be taken to protect humidity/temperature sensitive materials (e.g.- wood doors, casework, ceiling tile, etc.) in the proper climate-controlled environment. All cost for properly storing materials is paid for by applicable contractor in their base bid.
C. Due to limited on site storage space, each Contractor shall coordinate delivery of materials with the Construction Manager who will determine when large deliveries shall be made, and shall designate storage locations on site for delivered materials. All stored materials must be stored in locked, watertight trailers, paid for by applicable contractor.

3.9 SCAFFOLDING AND STAGING

A. All scaffold, staging and appurtenances thereto shall comply in total to the requirements of Safety and Health Regulations for Construction Chapter XVII of OSHA, Part 1926 and all related amendments.

3.10 RUBBISH CONTAINER

A. Each Contractor shall provide suitable rubbish container device(s) for his own use (both demolition and construction debris) properly maintained and serviced, replaced as required and protected from access by the public fencing as may be specified herein or approved by the Architect or Construction Manager.
B. Contractor and Subcontractor shall sweep up and gather together daily, all his own rubbish and removed materials and place it in containers.
C. See Staging & Logistics Plan at end of this section.

3.11 CONSTRUCTION FENCING

A. Construction fencing and barriers shall be provided by the Site Work Contractor, enclosing all work and storage areas as outlined in staging & logistics plan(s) at the end of section and in addition to specified below. Temporary construction fencing shall be of good quality and neat in appearance; 6' high chain link fencing, 9 ga fabric on stanchions with vision barrier screening fabric securely fastened. (Post driven installation, where approved by CM) Open-Mesh Chain Link Fencing: Provide 0.120-inch thick, galvanized steel posts, and 2.875" dia. Gate posts. Provide lockable gates and combination Lock for all gates. (Lock Codes to owner, Architect and CM) Included Privacy Screening as noted or shown.
B. Site access gates shall be provided as required, complete with all operating hardware and security devices.
C. Should fencing be required to be relocated or modified during the course of the project due to additional access needed by any contractor. It shall be done at the expense of the SWC contractor.

3.12 JANITORIAL SERVICE/DAILY CLEANUP

A. Each Contractor shall furnish daily janitorial services for the project and perform any required maintenance of facilities as deemed necessary by the Architect and Construction Manager during the entire life of the contract. If any contractor fails to keep the site safe and broom clean within 4 hours of being notified by CM, either verbally or in writing, the construction manager will have the cleanup work performed by the others and the contractors will be back charged accordingly.

3.13 BURNING

A. Burning will not be permitted.

3.14 FIRE PREVENTION CONTROL

A. Each Contractor shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining of the work and, particularly, in connection with any cutting or welding performed as part of the work.

3.15 TEMPORARY FIRE PROTECTION

A. Each Contractor shall take all possible precautions for the prevention of fires.
   1. Where flame cutting torches, blow torches, or welding tools are required to be used, their use shall be as approved by the Construction Manager at the site.

2. When welding tools or torches of any type are in use, have available in the immediate vicinity of the work a fire extinguisher(s). It shall be provided and maintained by the Contractor doing such work.

B. Fuel for cutting and heating torches shall be gas only and shall be contained in Underwriters laboratory approved containers.

C. No volatile liquids shall be used for cleaning agents or as fuels for motorized equipment or tools within a building except with the express approval of the Owner and / or Architect and in accordance with local codes. On-site bulk storage of volatile liquids shall be outside the buildings at locations directed by the Owner, who shall determine the extent of volatile liquid allowed within the building at any given time.

D. Each Contractor shall comply with the following requirements relating to compressed gas:
   1. Where compressed gas of any type is used for any purpose at the site, it shall be contained in cylinders complying with ICC regulations. Gases of different types shall not be stored together except when in use and when such proximity is required.
   2. All persons required to handle gas cylinders or to act as temporary fireman (Fire Watchers) shall be able to read, write and understand the English language; they shall also be required by the Contractor to read Part 3 of Pamphlet P-1 " Safe Handling of Compressed Gases" published by the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

E. Each Contractor shall comply with the following requirements relating to welding and cutting:
   1. All cutting and/ or welding (electric or gas) must be done only by skilled, certified and licensed personnel.
   2. During welding or cutting operations, a contractor's employee shall act as a fire watcher. The fire watcher shall have proper eye protection and suitable firefighting equipment including fire extinguisher (bearing current inspection Certificate), protective gloves and any other equipment deemed necessary.
   3. Tanks supplying gases for welding or cutting are to be placed in an upright position securely fastened, and close as practical to the operation. Tanks, actives or spares, shall be protected from excess heat and shall not be placed in stairway, hallways or exits. When not in use, protective valve cap shall be screwed on the cylinder.
   4. Adequate fire extinguishing equipment shall be maintained at all welding or cutting operations.

3.16 VENTILATION AND HUMIDITY CONTROL FOR CONSTRUCTION

A. General Work Contractor will provide temporary ventilation as required for protecting the building from any adverse effects of high humidity during abatement and construction activities. Select dehumidification and ventilating equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements and have sufficient quantity of units to produce necessary ambient conditions.

1. Each Contractor shall be responsible for his own temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity.
2. Ventilate enclosed area to dissipate humidity, and to prevent accumulation of dust, fumes, vapors or gases.
3. Provide equipment as necessary for air and fresh exchange for the work area per OSHA Standards.
4. General Work Contractor will provide negative air machines with filtration of sufficient size/ qty to fully ventilate the square footage of work areas and exhaust any dust/fumes through flexible duct hose to exterior top eliminate any odors/smoke.
5. Any contractor whom allows water infiltration to building is responsible for cleanup and commercial dehumidifiers of sufficient size /qty to prevent mold growth. Failure to immediately address (4 hours notice) will result in the Owner hiring others and back charging in order to insure a safe environment.

3.17 TEMPORARY ROADS AND PERMANENT PAVED AREAS

A. Site Work Contractor shall construct and maintain temporary road areas adequate to support loads and to withstand exposure to traffic during construction period.
   1. Temporary roads/staging areas will consist of one-layer soil separation fabric, 8” of compacted New Item #4 (NYSDOT Item 4 (304.12). Contractor will maintain and field dress with additional material as necessary to prevent ruts and potholes.
   2. This shall include access for delivery through staging area to building work areas and to equipment and storage areas and sheds.
   3. Provide dust control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.
   4. Road Cleaning: Maintain roads and walkways in an acceptably clean condition. This includes the removal of debris daily, if required, and/or a minimum of twice a week due to all project traffic. Road cleaning equipment to be wet/vacuum type. The Site Work Contractor will clean roads for debris from building-related activities.
   5. Staging Areas: Temporary parking by construction personnel shall be allowed only in areas so designated.

3.18 DE-WATERING FACILITIES AND DRAINS

A. Each Prime Contractor is directly responsible for de-watering of their excavations. The responsibility of de-watering of the site as to facilitate the work will be responsibility of the Site Work Contractor, coordinate with Construction Manager.
B. Comply with requirements in applicable Division 31 Sections for temporary drainage and de-watering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.
C. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.
D. Remove snow and ice as required to minimize accumulations.

3.19 ROOF PROTECTIONS

A. All contractors shall provide temporary protection on the roof surface when it is necessary for work to the place on completed sections. (Minimum 2” poly-iso insulation and plywood.)
B. Upon such notification as required in subparagraph A, the Contractor shall assume responsibility for damages, if any, to the roofing system caused by the work of other trades, except that financial liability for any and all damages rests with the offending trade.

3.20 TEMPORARY SITE SAFETY AND DIRECTIONAL SIGNS

A. The Contractors shall provide signs as required below. Install signs where required or indicated to inform public and persons seeking entrance to project. All signage and posts become the property of the owner at the conclusion of the project.
B. Construct signs in accordance with section 619 of the NYS DOT standard specifications (MUTCD overall sign size, letter size, metal signage). Support on breakaway metal posts or attach to fencing; do not attach signs to buildings or permanent construction.
C. Include relocating temporary site safety and directional signs as many times as required or directed.
D. For construction traffic control/flow at entrances/exits as designated by the Owner. Three Large sign 4’x 4’ Orange with Black Letters (“Construction Entrance Only”) by SWC.
E. To direct visitors (4 required) by SWC.
F. For Construction parking (3 required) by SWC.
G. To direct deliveries (4 required) by SWC.
H. Emergency egress only - Construction area (2 required) by SWC.
I. For “No Smoking” safe work site at multiple locations (15 required) by SWC.
J. Construction Area - Do Not Enter (30) mount on fence by SWC.
K. No Trespassing (30) mount on fence by SWC.

L. A premobilization meeting to establish location and quantities of all signage will be reviewed/ approved by the Construction Manager.

3.21 STORMWATER CONTROL

A. The Site Work Contractor shall provide earthen embankments, silt fence, haybales, and similar barriers in around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains during sitework activities.

3.22 BARRICADES, WARNING SIGNS AND LIGHT

A. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard.
   1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch –(16-mm-) thick exterior plywood.

3.23 TEMPORARY ENCLOSURES

A. Mechanical Work Contractor will provide temporary watertight enclosures for protection of Mechanical roof related openings, from exposure, foul weather and safety. Close openings in roof deck with load bearing wood framed construction, ¾” plywood and watertight membrane.
B. The GWC shall enclose the entire building envelope, once the roof is watertight, with Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. Provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire- retardant tarpaulins. Secure tarpaulins as needed with appropriate bracing/framing etc. Maintain/Install tarpaulins until exterior wall construction is such that tarpaulins are no longer needed (Sheeting/Block is installed). Coordinate tarpaulins with other trades & with scaffolding.
C. General Work Contractor will provide temporary 2” x 4” wood framing, 2” polyiso insulation, ½” plywood, and cover with 6 mil plastic; for any open exterior window, wall, door entrance locations, etc. created as part of their contract for weather and security protection at the end of each workday.
D. Any other temporary enclosures for specific openings for a contractor to perform their work are the responsibility of the contractor creating the opening and shall be installed to protect the building from exterior elements, security issues, odors/ noise resulting from construction.

3.24 TEMPORARY PARTITIONS AND FLOOR PROTECTIONS

A. General Work Contractor shall erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate work areas from fumes.
   1. Construct dustproof, floor to underside of structure partitions of not less than 3-5/8" – 20 ga. studs, 16" on center, 1 layer of 6 mil poly sheet inside/outside, sound batt insulation, 5/8" gypsum each side taped and painted (where occupied). Acoustical caulk sealed perimeter to prevent dust migrations. Partition to extend from Floor to underside of Roof /Floor Deck or structure above. Equip partitions with dustproof doors and security locks as needed (as shown). Provide sound curtains similar to "Sound Curtains" by Sound Seal G BSC 25, each shall be hung on the Construction Side with overlapping seams by 6".
   2. Cover floor with 2-layer poly and extend up the side 18". Overlap and tape full length joints.
   3. In addition to any temporary partition locations shown on drawings, General Work Contractor will include in his base bid (4) ea. 10' x 16' temporary partitions meeting the above criteria for use where directed.
   4. Temporary Floor Protections - Shall be "Ram- Board" Heavy Duty with taped joints or equivalent. All Finish Flooring (new or existing to remain) will be fully covered by GWC. Areas of isolated MEP work will be protected with Ram-Board by the individual prime contractor.

3.25 AREAS OF SPECIAL PROTECTION

A. In the event of an emergency (designated by the sounding of an air horn) all construction activities must immediately cease. Contractor's work force will evacuate themselves from work areas and remain outside of work areas until the "all clear" is given.

3.26 SNOW REMOVAL

A. The Site Work Contractor shall provide snow/ice removal from the staging area and general work area including access/egress from the building and access roads. Removal of snow/ice offsite will be required due to the space limitations. DO NOT USE SALT for ice mitigation. See also Summary of Multiple Contracts Spec Section 011200.
B. The GWC shall clear all snow from inside the footprint of the new building and the SWC shall move the snow that the GWC has cleared from the building footprint.

3.27 ENVIRONMENTAL PROTECTION

A. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.28 OPERATION, TERMINATION, AND REMOVAL

A. Supervisions: Enforced strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended use to minimize waste and abuse.

B. Termination and Removal: Unless the Architect/ Construction Manager requests that it be maintained longer, remove each temporary facility when the need has ended or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been affected because of interference with the temporary facility. Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are the Contractors' property.
   2. At Substantial Completion, clean and renovate permanent facilities used during the construction period.

3.29 See attached "Staging and Site Logistics Plan"

END OF SECTION 015000

SEE SHEET C202 FOR DETAILED SITE PLAN

6' CONSTRUCTION FENCE WITH SCREENING TO PROVIDE COMPLETE SITEWORK AREA ENCLOSURE

6' CONSTRUCTION FENCE WITH SCREENING TO PROVIDE COMPLETE SITEWORK AREA ENCLOSURE

CONTRACTOR STAGING/PARKING AREA SEE 015000.3.17.A.1

4" OF 3/4" (703-0201 Crushed Bedrock-ASTM #57-3/4" Clean Crushed Stone) STONE AROUND BUILDING ONCE FOUNDATION IS COMPLETED

TEMPORARY WATER SERVICE AT HYDRANT

CONSTRUCTION ENTRANCE, TYP

20' WIDE TEMPORARY ROAD 015000.3.17.A.1 PRIOR TO FOUNDATION

CONTRACTOR STAGING

NEW 7TH / 8TH GRADE BUILDING PAD

ENTRANCE GATE (limited Use)

PARKING LOT TO REMAIN OPEN FOR DISTRICT USE AT ALL TIMES

CONTRACTOR PARKING

CM

20' WIDE TEMPORARY ROAD 015000.3.17.A.1 PRIOR TO FOUNDATION

PARKING AND OFFICE TRAILERS

PARKING LOT TO REMAIN OPEN FOR DISTRICT USE AT ALL TIMES

6' CONSTRUCTION FENCE WITH SCREENING

TEMPORARY ELECTRICAL SERVICE WITH POLE MOUNTED TRANSFORMER. SECONDARY, METER AND DISCONNECT WITH EXTERIOR PANEL AT GRADE

TEMPORARY UTILITY POLES WITH OVERHEAD PRIMARY SERVICE (Protect Sidewalk/Curb)

ENTRANCE GATE. INCLUDING CONTRUCTION ENTRANCE SIGNAGE, TYP

AMD DRIVEWAY TO REMAIN OPEN FOR DISTRICT USE AT ALL TIMES.

CONTRUCTION ENTRANCE SIGNAGE, TYP. ALL DELIVERIES TO USE THIS ENTRANCE

Deliveries (Blue Arrows)

Place Site Safety Signs and Directional Signage as directed. See 015000 3.20 A thru L.

EXISTING CON ED UTILITY POLE

STAGING AND SITE LOGISTICS PLAN

Section 01 56 00 CONSTRUCTION DUST CONTROL

PART 1: General - General Work Contractor shall provide Construction Dust Control and IAQ Plan

1.1. Related Documents

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Divisions -1 Specification Sections, apply to work specified in this section.

1.2. Summary

A. Section Includes:

1. Airborne construction dust/ containment control in:

a. Buildings occupied during remolding

b. Existing building temporarily unoccupied

c. Finished spaces that are unoccupied and construction dust/airborne containments are still being generated (i.e. punch list completion)

B. Related Sections:

1. Division 1 – Cutting and Patching

2. Division 1 – Electronic Submittal Procedures dust/airborne contaminants.

3. Division 1 – Temporary Facilities & Controls

4. Division 2 – Selective Demolition

1.3. Policy

A. Airborne contaminants control is critical in all areas noted in Paragraph 1.2A. Contractor shall limit dissemination of airborne contaminants produced by construction-related activities, including dust, chalk, powders, aerosols, fumes, fibers and other similar materials, in order to provide protection of persons and equipment.

1. Construction activities causing disturbance of existing dust, or other airborne contaminants, must be conducted in tight enclosures cutting any flow particles into occupied areas.

2. Ceilings, walls in Project area must be secure at all time.

1.4. Submittals

A. Progress Schedules: Submit work areas and procedure schedules for containment of construction dust/airborne contaminants.

B. Construction Indoor Air Quality Plan (IAQ): Narrative, Drawings and detail of extent of enclosures, construction of necessary temporary dust barriers and negative exhaust fans, and description of procedures to be used to achieve and maintain control of construction-related airborne contaminants.

1.5. General Access Procedures

A. No work is to be performed in Occupied Areas.

B. Duct Control Preconstruction Meeting: Before any construction on site beings, Contractor and workers are required to attend a mandatory dust control preconstruction orientation session held by Construction Manager/Architect for training and instruction on precautions to be taken.

1. Conditions in construction area may be presumed to be in a condition similar to other existing surfaces or a survey of work area to record pre-existing damage may occur at this time.

C. Notification; Contractor shall notify Construction Manager / Architect a minimum of 48 hours prior to starting construction activity which might be expected to produce excessive construction dust and airborne contaminants in occupied areas so that additional precautions may be taken.

1.6. Testing

A. The Owner may provide the following test and observations:

1. Air Samples: Baseline particles count and conduct periodic air sampling of Project Areas during construction to monitor effectiveness of containment procedures.

2. Air Pressure: Using visual indicators, the maintenance of negative air pressure in Containment Area relative to Project Areas will be verified on a daily basis.

1.7. Definitions

A. Containment producing activities include, but are not limited to:

1. Demolition and removal of walls, floors, ceilings and other finish materials.

2. Demolition of plumbing, mechanical and electrical systems and equipment.

3. Finish operations such as saw cutting, shot blasting/grinding, sanding, painting, and application of special surface coatings.

B. Containment Areas: Includes area of construction, adjacent staging and storage areas, and passage, as well as areas connected to construction area by mechanical system air intake, exhaust and ductwork.

C. Project Areas: Includes occupied areas adjacent to Project Area, either occupied or used for passage as well as areas connected to construction area by mechanical air system air intake, exhaust and ductwork.

PART 2: Products

2.1. Materials

A. Carpet or Mats: Provide carpets or mats at both sides of the containment entrances, vacuumed or change as often as necessary (minimum daily) to prevent accumulation of dust. All vacuuming outside areas not under negative pressure shall be with a certified HEPA-filtered vacuum.

B. Dust Caps: Block off all existing ventilation ducts within the construction area. Method of capping ducts shall be dust tight, withstand airflow and potential damage from construction activities.

C. Portable Enclosure: Whenever work is done outside existing barricaded work areas, provided 4 mil portable polyethylene enclosure capable of sealing off opening fitted tight to ceiling, or provide prefabricated unit.

D. Polyethylene: Polyethylene shall be fire retardant type listed by Fire Underwriter's Laboratories, Griffolyn #T55R WITH Griffolyn fire retardant tape, or equal.

E. Exhaust Fans / Negative Air Fans: Maintain continuous uninterrupted operation. Fans to have standard construction filtration prior to exiting the building. Filters to be maintained, cleaned and or replaced on a daily basis

PART 3: Execution

3.1. Inspection

A. Before any demolition or construction begins, a complete field review of all Project Areas (airborne contaminant control areas) and policies will be conducted and work plan revised if required. Initial work plan shall be presented at dust control preconstruction meeting.

3.2. Containment Enclosures and Barriers

A. Air Quality Contaminant Control: Fasten windows shut, ventilate partitioned construction areas by use of fans to the outside of building.

1. Maintain a minimum negative airflow of 3 Air Changes per hour with door fully open at construction entrance by use of negative air fans vented to outside of building.

2. Secure operable exterior windows and doors/windows not required for construction access as required to maintain negative airflow.

3. Provide additional local exhaust during welding.

B. Contractor shall install dustproof enclosures for work as submitted on work plan.

1. Construction must be conducted in tight enclosures cutting off any flow of dust particles into occupied areas.

2. The contractor shall provide additional dustproof enclosures as requested by the Owner when enclosure locations are not adequately containing the dust.

3. Provide all barricades, warning signs, and warning lights to protect the Occupants, the existing building, storage areas and materials or equipment.

C. Dust Partitions: See 015000 Temporary Partitions and Floor Protections - Full height, noncombustible construction, with minimum 5/8 inch type x gypsum board both sides with 3-1/2-inch R -11 insulation batts. Seal top, bottom, and all seams to prevent spread of dust to occupied areas, including above ceiling.

1. Doors as shown: 3'-0" minimum width (pair of 3'-0" wide doors as required by plans), solid core wood with metal frame and hardware, panic hardware if within occupied areas requiring such, hold open tied to Fire Alarm Systems, including closer, tightly weather-stripped to prevent flow of dust. Locate as directed and swing out of construction are (unless directed otherwise by fire marshal). Keep barriers locked outside of working hours. Provide signage at each door "Keep Door Closed." Three keys for emergency access shall be furnished to the Owner.
2. Seal all penetrations, ductwork, piping, conduit, structure and miscellaneous penetrations in enclosure barricades.
3. Materials for barricade shall be precut in unoccupied areas.

D. Enclosure outside of work area (including spaces above ceilings): Whenever work is necessary outside of the construction area the space where work is being done, including ladders, shall be contained within full height enclosure. Contractor may use prefabricated unit.
1. All work performed outside the construction barricade shown on drawings including all work in corridors and lobbies shall be performed outside of normal working hours and shall be schedule in advance with Owner except where specified otherwise.
2. At no time shall any construction equipment or material be stored outside the construction area.

E. Furniture and Equipment Protection:
1. Cover all furniture and equipment remaining in the space with polyethylene. Seal with tape to prevent dust/dirt from reaching the furniture and equipment.

3.3. Procedures

A. General Work Contractor shall provide and maintain the Construction Indoor Air Quality Plan including all barriers, negative air systems, filters, ventilation, walk-off mats and cleaning and removal procedures as detailed in the work plan.
1. Traffic between work areas into Occupied areas is not allowed. Instruct workers to refrain from opening windows or doors allowing construction dust/airborne contaminants into adjacent occupied or finished areas. Any dust tracked outside of construction area shall be cleaned up immediately. Contractor shall have the necessary manpower and equipment (HEPA vacuum cleaners, dust and wet mops, brooms, buckets and clean wiping rags) to keep adjacent occupied areas clean at all time. Keep door to such areas closed at all times. Transport materials and refuse into an area from an external site without violating occupied areas by transporting in covered containers.
2. Provide negative pressure in construction area by use of negative air system to the outside of the building. Block supply and return ventilation as to not recirculate air from

construction area to air handlers suppling occupied areas. Rebalance air handling equipment to maintain correct airflow to occupied area.

a. Provide adequate forced ventilation of enclosed areas to cure installed materials, to prevent excessive humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases in the building.

b. Direct exhaust from equipment away from building air intakes and operable windows; assure that filters on building air intakes are operational and protected from excessive amounts of airborne contaminants. Cover intakes of air handling equipment not in operation in proximity to exhaust locations.

B. Sealing of Openings: Use tape or other impenetrable sealant to seal barrier wall seams, crack around window and door frames, exhaust system ductwork, pipes, floor penetrations, joints and ducts. Seal or filter all open return and exhaust ductwork.

C. Dust Control: The Contractor shall take appropriate steps throughout the term of the Project to prevent airborne dust due to work under this contract. Water shall be applied wherever practical to settle and hold dust to a minimum particularly during demolition and moving of materials. No chemical palliatives shall be used without permission of the Owner's Representative.

1. Spray surfaces with water mist during dust- producing interior demolition activities. Hard surface floors in work area, adjacent hallways and passage areas require vacuuming with HEPA- Filtered vacuum cleaners and frequent wet-mopping during demolition and construction; project adjacent carpeted areas with plastic and plywood and vacuum with HEPA-filtered vacuum cleaners.

2. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent airborne dust from dispersing into atmosphere.

D. Whenever access panels are opened in occupied areas, for work above ceilings, provide portable enclosure ladder and sealing off opening, fitted tight to ceilings.

E. Provide thorough cleaning of existing surfaces which become exposed to dust, before start of Owner's occupancy.

3.4. Final Cleaning

A. Removal of construction barriers shall be done carefully, and when necessary, outside of normal work hours. Remove all tape residue from existing/new surfaces. HEPA vacuum and clean all surfaces free of dust after the removal prior to Owner's occupancy.

B. Rebalance existing HVAC systems to restore modified systems back to the original design intent

3.5. Enforcement

A. Failure to maintain containment areas will result in issuance of written warning: if situation is not corrected within Four (4) hours of receipt of warning, Owner will have cause to stop the work as provided in the General Conditions of the Contract for Construction. All costs associated with Owner's written order to stop the Work and remobilization shall be borne by the Contractor.

CONSTRUCTION INDOOR AIR QUALITY (IAQ) PLAN

The **General Work Contractor** shall complete and submit this Plan no later than thirty (30) days after receipt of Notice to Proceed and not less than 15 days from the start of work.

General Work Contractor:

Name:_____ Title: _____

Telephone:_____ Fax:_____

Email:_____

I have read and understood and will implement the following Construction IAQ Plan

Signature: _____Date:_____

I. CONSTRUCTION DUST CONTROL AND VENTILATION

Provide a written narrative and plan associated with the required dust control and ventilation	
Required	• Dust Partitions as per the phasing and logistics plans included with specification section 015000

	• Modify and/or Add Partitions as shown withing phasing and logistics plan • Floor Protections as required • Temporary ventilation/Negative Air Environment will be provided during all dust producing activities. See item I Construction Ventilation above. All supply air diffusers and return air grilles will be covered. • Negative Air Ventilation with filtration to provide no less than three air changes per hour. Negative Air Fans and System per floor or Work Area as needed. Ventilation will be continuous for a period no less than 72 hours after completion of installation of any VOC emitting materials.

END OF SECTION 01 56 00

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:
   1. Section 012100 "Allowances" for products selected under an allowance.
   2. Section 012300 "Alternates" for products selected under an alternate.
   3. Section 012500 "Substitution Procedures" for requests for substitutions.
   4. Section 012519 “Equivalents” for equivalent products submitted prior to Contract award.
   5. Section 014200 "References" for applicable industry standards for products specified.

1.02 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.03 ACTION SUBMITTALS

A. Comparable Product Requests, if allowed: After award of contract submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
   2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within (10) ten days of receipt of request, or (7) seven days of receipt of additional information or documentation, whichever is later.
      a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
      b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.04 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
   1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
   4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
   5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
   6. Protect stored products from damage and liquids from freezing.
   7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.06 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
   1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
   2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 PRODUCTS

2.01 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
   a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered**.**
   b. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
   b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.02 EQUIVALENT PRODUCTS

Retain this Article if equivalent products are to be submitted prior to contract award.

A. Conditions for Consideration: Architect will consider Contractor's request for equivalent product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
   1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
   2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   3. Evidence that proposed product provides specified warranty.
   4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
   5. Samples, if requested.

B. Refer to specification section 012519 Equivalents for additional equivalent product requirements required to be furnished by the contractor prior to execution of the contract.

PART 3 EXECUTION (NOT USED)

END OF SECTION 016000

SECTION 017300
EXECUTION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Cutting and patching.
   5. Coordination of Owner-installed products.
   6. Progress cleaning.
   7. Starting and adjusting.
   8. Protection of installed construction.

B. Related Requirements:
   1. Division 01 "Summary" for limits on use of Project site.
   2. Division 01 "Submittal Procedures" for submitting surveys.
   3. Division 01 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
   4. Division 02 "Selective Demolition" for demolition and removal of selected portions of the building.
   5. Division 07 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.02 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least (10) ten days prior to the time cutting and patching will be performed. Include the following information:
   1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
   3. Products: List products to be used for patching and firms or entities that will perform patching work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
      a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

E. Certified Surveys: Submit (2) two copies signed by land surveyor.

1.04 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
    a. Operational elements include the following:
        1) Primary operational systems and equipment.
        2) Fire separation assemblies.
        3) Air or smoke barriers.
        4) Fire-suppression systems.
        5) Mechanical systems piping and ducts.
        6) Control systems.
        7) Communication systems.
        8) Fire-detection and -alarm systems.
        9) Conveying systems.
        10) Electrical wiring systems.
        11) Operating systems of special construction.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Other construction elements include but are not limited to the following:
    1) Water, moisture, or vapor barriers.
    2) Membranes and flashings.
    3) Exterior curtain-wall construction.
    4) Sprayed fire-resistive material.
    5) Equipment supports.
    6) Piping, ductwork, vessels, and equipment.
    7) Noise- and vibration-control elements and systems.
5. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before

fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.03 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.04 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect and Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of (2) two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.05 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.06 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      b. Restore damaged pipe covering to its original condition.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall

coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch extending to an inside or outside corner of a wall. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.07 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.08 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   a. Use containers intended for holding waste materials of type to be stored.
4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.09 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017329 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1. SUMMARY

A. This section includes procedural requirements for cutting and patching.

B. Related sections include the following:

1. Division 02 through 28 sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.
    a. Requirements in this Section also apply to Mechanical and Electrical installations associated with this project.

C. Division of Responsibilities for Cutting and Patching Work: Each Prime Contractor shall perform cutting and patching required for its portion of the work.

1.2. DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other work.

1.3. SUBMITTALS

A. Cutting and Patching Plan: Where approval of procedures for cutting and patching is required before proceeding (see Article 1.4 below), submit a proposed plan describing procedure at least 14 days before the time cutting and patching will be performed requesting approval to proceed. Include the following information, as applicable, in the proposal:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to existing construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in buildings appearance and other significant visual elements.
3. Products: List products to be sued and firms or entities that will perform the work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involved adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architects Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4. QUALITY ASSURANCE

A. Minimize cutting and patching of work by properly coordinating construction sequences with Architect.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
   1. Obtain Architect's approval before cutting and patching any structural work that is not indicated on drawings.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
   1. Obtain Architect's approval before cutting and patching any operational element that is not indicated on drawings.

D. Miscellaneous Elements: Do not cut and patching the following elements or related components, that are not indicated on drawings, in a manner that could change their load-carrying capacity, that results in increased maintenance or decreased operation life or safety.
   1. Water, moisture, or vapor barriers.
   2. Membranes and flashings.
   3. Equipment supports.
   4. Piping, ductwork, vessels, and equipment.
   5. Noise and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCT

2.1. MATERIALS

A. General: Comply with requirements specified in other sections of these specifications.

B. OSHA approved systems, equipment, scaffolding, PPE, lanyards, rigging, etc.

C. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1. EXAMINATION AND SAFETY

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates including compatibility with existing finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions are corrected.

3.2. PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Roof Water Tightness – Contractor must ensure that proper weather, protections, and manpower are present prior to cutting existing roof areas. Contractor is responsible for any interior damages with any direct/indirect costs which accrue if they fail to maintain water tightness.

C. Protection: Protect existing construction during cutting and patching to prevent damage. Provide Protection for any portions of project that might be damaged/soiled during cutting and patching operations.

3.3. PERFORMANCE

A. General: Each trade shall employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasibly time and complete without delay.
   1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
   2. Related Electrical and Mechanical work will be performed by licensed subcontractors.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Mechanical and Electrical Services: By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Each trade shall patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements

specified in other sections of these specifications. Utilize workers who are authorized/skilled in the discipline to be patched (e.g.-mason, carpenter, painter, etc.)

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where portions of walls or partitions that are removed extend on finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch, from wall-to-wall or corner-to-corner. Provide additional coats until patch blend with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide and even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.4. CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely: paint, mortar, oils, putting and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 017329

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 013300 - Submittal Procedures: Additional requirements for submittal procedures.

B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

A. See Section 013300 for additional requirements for submittal procedures.

B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
1. Prebid meeting.
2. Preconstruction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
1. Provide containers as required.
2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified

materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 017419

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SECTION 017423 – CLEANING UP

PART 1 - GENERAL

1.1. DESCRIPTION OF THE WORK

A. The work of this section relates to the following:
   1. Maintain all premises and public properties/roadways free from accumulation of waste, debris, dirt, mud and rubbish caused by operations on a daily basis.
   2. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight exposed surfaces; leave project clean and ready for occupancy.
   3. Remove all overspray caused by construction operations from adjacent construction, surfaces and vehicles

B. Related Requirements Specified Elsewhere
   1. Summary of work: Section 011000
   2. Cleaning for Specific Products or Work: the respective sections of the specifications.

1.2. SAFETY REQUIREMENTTS

A. Standards: Maintain project in accord with safety and insurance standards.

B. Hazard Control/Cleaning Products
   1. Store volatile waste in covered metal container and remove from premises daily.
   2. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
   1. Do not burn or bury rubbish and waste materials on project site.
   2. Do not dispose of volatile waste such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3. Do not dispose of waste into streams or waterways.

PART 2 - PRODUCTS

2.1. MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

PART 3 – EXECUTION

3.1. REQUIREMENTS DURING CONSTUCTION

A. Execute daily cleaning to ensure that building, grounds, and public properties and roadways are maintained free from accumulations of waste materials, rubbish, dirt, mud and dust.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

C. Each day, all contractors shall adhere to the following:
   1. Areas of intense activity, such as cutting and sawing must be swept clean and reorganized at the end of each day. Utilize dust control methods such as plastic containment, containment hut and/or wetting of surfaces.

2. Areas of moderate activity such as installation of plumbing, ductwork, electrical work must be returned to good order at the end of each day.
3. Debris below scaffolds (and shoring/re-shoring) must at all time, be kept sufficiently consolidated to keep walkways free of tripping hazards. These work areas must also be swept clean immediately upon removal of scaffolds.
4. All swept up debris, waste materials, and packing must be removed and placed in the dumpster by the end of the workday.
5. All stored material must be protected and kept in good order.
6. As portions of the work are completed, all used and excess materials must be removed promptly.
7. Daily clean-up and good housekeeping is the responsibility of each contractor individually and will be monitored by the Construction Manager. If any contractor fails to perform cleaning when directed or does not properly clean within 4 hours of being notified by Construction Manager, the owner will hire others and charge contractor(s) accordingly.
8. Contractors shall promptly comply with requests to organize scattered materials.

D. Each Contractor is responsible for furnishing all dumpsters or other such containers as required for collection, storage and legal disposal of all debris and rubbish resultant from their construction operations. The Construction Manager shall locate and request to move such containers as necessary and legally dispose of waste as containers are filled. Separate and recycle as required authorities and regulations.
E. Vacuum clean areas when ready to receive finish painting, and continue vacuum cleaning on an as needed basis until building is ready for Substantial Completion or occupancy
F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
G. Schedule cleaning operations so that dust and other containment resulting from cleaning process will not fall on wet, newly painted surfaces.

3.2. FINAL CLEANING

A. Each Contractor shall:
1. Employ professional cleaners for final cleaning.
2. In preparation for substantial completion or occupancy, conduct final inspection of sign exposed interior and exterior surfaces, and of concealed spaces.
3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surface so designated to shine finish
4. Maintain cleaning until project, or portion thereof, is occupied by owner.
5. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

6. If the contractor fails to perform final cleaning when directed or does not properly clean within 4 hours of being notified by Construction Manager, the owner will hire others and charge contractor accordingly.

B. General Contractor shall complete the following restoration operations before requesting inspection for certification of Substantial Completion for entire Project or portion of Project:
   1. Restoration of any lawn and walk/curb areas disturbed by construction operations. This includes repairs of any ruts / damage created by Heavy Equipment, Lulls, Cranes, etc.
   2. Hire professional cleaning company (not construction tradesmen) to thoroughly clean all surfaces, including glass, floors, carpeting, ceramic tile, doors, windows, casework, etc.
   3. Clean and wax Resilient floors using the exact same products / coats as the owner's custodial staff for compatibility purposes. Vacuum all carpet areas.
   4. Power sweep all asphalt areas using a commercial street sweeper (water method).
   5. Remove any stickers, protective coverings, etc.
   6. Clean all materials & equipment etc. inside and out.

C. Mechanical Contractor shall complete the following cleaning operations before requesting final inspection for certification of Substantial Completion for entire Project or portion of Project:
   1. Clean all mechanical units, including removal of any stickers, protective covering. Wipe down all of surface.
   2. Vacuum out all ductwork, grills / louvers to insure there is no construction debris or dust.
   3. Replace all air filters at no additional cost immediately prior to owner occupancy.

D. Electrical Contractor shall complete the following cleaning operations before requesting final inspection for certification of Substantial Completion for entire Project or portion of Project:
   1. Clean surfaces of all electrical equipment from any dust. Remove any labels or protective films.
   2. Replace any burned out or non-functioning bulbs.

3.3. RUBBISH REMOVAL

A. Contractors shall comply with all Local, State and Federal Laws, Codes and Requirements regarding recycling and trash or rubbish removal.

END OF SECTION 017423

SECTION 017700 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections apply to this section.

1.2. SUMMARY

A. This section includes administrative and procedural requirements for contract closeout including but not limited to, the following:
  1. Substantial Completion & Inspection procedures.
  2. Project record documents.
  3. Operation and maintenance manual submittal.
  4. Start-up and adjustments.
  5. Spare Parts.
  6. Demonstration & Training.

B. Closeout requirements for specific construction activities are included in the appropriate Sections.

C. Multiple Prime Contracts: Provisions of this section apply to the construction activities of all Prime Contractors.

1.3. SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for Certification of Substantial Completion, complete the following. List exceptions in the request.
  1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete.
    a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
  2. Advise the Owner of pending insurance changeover requirements.
  3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
  4. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instructions of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements. Startup of existing removed/replaced rooftop HVAC units will include written confirmation from contractor's mechanical subcontractor that all systems are adjusted and functioning properly.
9. Complete final cleanup requirements, including touch-up painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

B. Initial Inspection: Conducted between Construction Manager and Contractor, once all incomplete items identified are completed, a request for review by the Architect shall be made.

C. Inspection Procedures: On receipt of a Request for Inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect will conduct a re-inspection upon request, provided the work is substantially complete. If multiple inspections are required due to the contractor's failure to complete the work, the resulting costs will be charged to the Owner and deducted from the contractor through a change order.
2. Results of the complete inspection will form the basis of requirements for final acceptance.

1.4. FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for Certification of Final Acceptance and Final Payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. All items in the Construction Checklist must be received and approved prior to any retainage reduction.

B. Re-Inspection Procedure: The Architect will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been complete except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of re-inspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. Note that multiple inspection due to Contractor not being complete will result in a charge to the Owner in which the amount shall be deducted from said Contractor via change order.
2. If necessary, re-inspection will be repeated, but may be chargeable to the Owner and back-chargeable to the Contractor in conditions within his control.

END OF SECTION 017700

SECTION 017701 – CHECKLIST FOR PROJECT CLOSEOUT AND PROCESSING OF FINAL PAYMENT

PART 1 - GENERAL

1.1. FINAL PAYMENT

Final payment will not be processed until all items indicated are received in accordance with Section 017701 – Checklist for Project Closeout.

1.2. **CLOSE-OUT SUBMITTALS**

One (1) bound, hard cover, 3-ring binder:

[ ] Contractor's Affidavit of Payment of Debts and Claims: AIA G706.
[ ] Contractor's Affidavit of Release of Liens: AIA G706A with:
[ ] Separate AIA G706A for subcontractors, suppliers, and others with lien rights against the property of owner, together with a list of those parties.
[ ] Consent of Surety to Final Payment: AIA G707.
[ ] Operation and Maintenance Manuals for all equipment installed on the project.
[ ] As-Built Drawings (1 full-size hard copy).
[ ] Fully executed Certificate of Substantial Completion: AIA G734.
[ ] Contractor's written warranty and extended warranties as required by the Contract.

Two (2) complete electronic copies (thumb drives) of the following:

[ ] All items listed above.
[ ] Typed or printed instructions covering the care and operations of equipment and systems furnished and installed.
[ ] Manufacturers instruction books, diagrams, spare parts lists covering all equipment.
[ ] Instruction of Owner's Representative in care and maintenance of new equipment.
[ ] All approved shop drawings.
[ ] Certificates of compliance and inspection (where applicable – electrical, elevator, etc.).
[ ] Spare parts and Maintenance Materials (receipt signed by ACCI & Owner).
[ ] Evidence of compliance with requirements of governing authorities (Certificates of Inspection, Waste Manifests).
[ ] Certificates of insurance for products and completed operations.
[ ] Notarized statement that only non-asbestos materials were installed on this project.
[ ] Maintenance bond as per the requirements of the Contract.
[ ] Project Record Documents.

NOTE: Retainage reduction are allowed as outlined in the Contract.

END OF SECTION 017701

SECTION 017719 – PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1. SUMMARY

A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and project specifications.
B. All Contractors, Subcontractors, Sub-Subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2. REQUIREMENTS

A. Project Record Drawings
B. Record Drawing Certification

1.3. PROJECT RECORD DRAWINGS

A. The purpose of the project drawings is to record the actual location of the work in place including but not limited to underground lines, concealed piping within buildings, concealed valves and control equipment, and to record changes in the work.
B. In addition to the above, these drawings shall be "color-coded", by each trade, on a daily basis to indicate progress of the work. Color legend will be assigned by the Architect.
C. In addition to the sets of contract drawings that are required by the Contractor on the site to perform the work, the Contractor shall maintain, at the site, one (1) copy of all drawings, specifications and addenda that are part of the Contract as awarded.
D. Each of these documents should be clearly marked "Project Record Copy", maintained in a clean and neat condition available at all times for inspections by the Owner, Construction Manager or the Architect, and shall not be used for any other purpose during the progress of the work.
E. The Construction Manager will be the custodian on the project record documents until the end of the Project.
F. Project Record Requirements
  1. The Contractor shall mark-up the "Project Record Copy" to show:
    a. Approved changes in the work.
    b. Location of underground work and completed work.
    c. Details not shown in the original Contract Documents.
    d. Any relocation of work including piping, conduits, ducts and the like.
    e. All changes in dimensions.
    f. All access doors and "tack" location access points in accessible ceilings.
    g. Location of all plumbing, heating, ventilating, air conditioning or electrical assemblies, whether existing to remain or newly installed.

h. Revisions to any electrical circuitry.

2. Such information shall include, but shall not be limited to:

a. Footing depth in relation to finished grade elevations.

b. Any change in floor elevations.

c. Any structural changes.

d. Any substitutions

e. Elevations and locations of all underground utilities, services, or structures referenced to permanent above ground structures and monuments.

f. Designation of all utilities as to the size and use of such utilities.

g. All invert elevations of manholes.

h. The location of all utilities, services and appurtenances concealed in building structures that have been installed differently from that required by the Contract.

i. Any approved change order.

j. Other such data as required by the Architect and/or Owner so as to establish a complete record of "As-Constructed" conditions.

G. The Contractor shall keep the project record documents up-to-date from day to day as the work progresses. Appropriate documents are to be updated promptly and accurately; no work is to be permanently concealed until all required information has been recorded.

H. The project record drawings are to be submitted by the Contractor to the Architect through the Construction Manager when all the work is completed and is approved by the Owner and the Architect before the Contractor may request final payment.

I. If the project record drawings as submitted are found to be unacceptable due to incompleteness or inaccurate information, the drawings shall be returned to the offending Contractor for corrective action and resubmitted for approval prior to the release of final payment.

FINAL PAYMENT IS CONTINGENT UPON DELIVERY OF FINAL PROJECT RECORD DRAWINGS TO THE OWNER AND ARCHITECT ON A SET OF FULL-SIZE PLTS AND ELECTRONIC FILES IN .DQG AND .PDF FORMATS.

J. In addition to the drawings required as mentioned above, the Contractor shall submit a list of all approved Shop Drawings of the Work as installed.

K. From this list the Architect will select the drawings desired for the permanent records. The Contractor shall furnish these in a bound set to the Owner as part of the closeout requirements.

1.4. RECORD DRAWING CERTIFICATION

A. The record drawings required under the terms and conditions of this Section shall be reviewed and processed by each of the Prime Contractors as part of their overall contractual responsibility.

B. This certification may be issued for individual trades as a collective document to cover the entire record drawing requirements of the project.

The format of this certification shall be as follows:

The record drawings prepared by:

_____

for _____ have been reviewed by the undersigned and:

Appears to be an accurate representation of the work incorporated within the project and are accepted as submitted in accordance with the technical documents.

This record document review made by this office is for determination of compliance to the requirements of the Contract Documents.

Firm Name: _____

Review Date: _____ By: _____

END OF SECTION 017719

SECTION 017823 – OPERATION AND MAINTENANCE REQUIREMENTS

PART 1 - GENERAL

1.1. SUMMARY

A. Requirements set forth herein are in addition to and shall be considered as complementary to the General Conditions of the Contract and the project specifications.
B. All Contractors, Subcontractors, Sub-Subcontractors, Vendors and the like shall be required to familiarize themselves with said provisions.

1.2. REQUIREMENTS

A. Startup and Demonstration
B. Parts List
C. Operation and Maintenance Data

1.3. STARTUP AND DEMONSTRATION

A. The work required herein consists of starting up and demonstrating all systems and equipment to operating personnel and includes training of said operating personnel.
B. The respective Trade or Subcontractor shall make arrangements, via the Construction Manager and/or the Owner (with notification to the Architect), as to whom the instructions are to be given in the operation of the basic and auxiliary systems and the period of time in which they are to be given.
C. As specified in individual sections, furnish the services of instructors to train designated personnel in adjustment, operation, maintenance, and safety requirements of equipment and systems. If procedures are not specified for specific items of equipment, follow that recommended by the item manufacturer.
D. Instructors shall be thoroughly familiar with the equipment and systems and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given after the equipment or system has been accepted and turned over to the Owner. The duration of instruction shall be as specified in individual sections but shall be not less than two (2) days of each portion of operating mechanical/electrical systems. Use Operating and Maintenance Data as a training guide.
E. The Architect shall be completely satisfied that the representative of the Owner has been thoroughly and completely instructed in the proper operation of all systems and equipment before final payment is made. If the Architect determines that complete and thorough instructions have not been given by the Contractor to the Owner's Representative, then the offending Contractor shall be directed by the Architect to provide whatever instructions are necessary until the intent of this paragraph of the Specification has been complied with as determined by the Architect.

1.4. PARTS LIST

A. As required the respective Trade or Subcontractor shall furnish three (3) typed sets of instructions for the ordering and stocking of spare parts for all equipment installed. The lists shall include parts numbered and suggested supplier. Each set shall also include an itemized list of component parts that should be kept on hand and where such parts can be purchased.

1.5. OPERATION AND MAINTENANCE DATA

A. The Contractor shall submit to the Architect for approval three (3) typed sets, bound neatly in hard backed loose-leaf binders, of all instructions for the installation, operation, care and maintenance of all equipment, fixtures and systems.
- **1.** Provide typed or printed label identifying binder as operating and maintenance data. List title of project, contract number, and location of equipment.
- **2.** Furnish manufacturer's printed data or sheets neatly typewritten on 8-1/2 inch by 11 inch, 20 pound minimum white paper. Provide indexed tabs.
- **3.** Drawings: Bind in with text. Provide reinforcement rings. Fold larger drawings to the size of the text pages.
- **4.** Information shall indicate possible problems with equipment and suggested corrective action.

1.6. CONTENT OF MANUAL FOR EQUIPMENT AND SYSTEMS

A. The instructions shall contain information deemed necessary by the Architect and include but not be limited to the following:
- **1.** Introduction:
  - **a.** Explanation of Manual and its use.
  - **b.** Summary description of all mechanical and electrical and equipment operating systems.
  - **c.** Purpose of systems.
  - **d.** Maintenance scheduling summary analysis, sheets and software operating instructions and diskette(s).
- **2.** System:
  - **a.** Detailed description of all systems.
  - **b.** Illustrations, schematics, block diagrams, photographs and other exhibits.
  - **c.** Complete wiring diagrams, tabulations and installation drawings.
  - **d.** Valve tag charts and control diagrams.
  - **e.** ½ size reduced copy of "Record Drawings"
- **3.** Operations:

a. Complete detailed, step-by-step, sequential description of all phases of operation for portion of the systems, including startup, shutdown, adjusting and balancing, and emergency procedures. Include all posted instruction charts.

4. Maintenance:
- **a.** Parts list and parts number.
- **b.** Maintenance, lubrication and replacement charts and Contractor's recommendations for preventative maintenance.
- **c.** Troubleshooting charts for systems and components.
- **d.** Instructions of testing each type of part.
- **e.** Recommended list of on-hand spare parts.
- **f.** Complete calibration instructions for all parts and entire systems.
- **g.** Instructions for charging, filling, draining and purging.
- **h.** General or miscellaneous maintenance notes.

5. Manufacturer's Literature:
- **a.** Complete listing for all parts with names, addresses and telephone numbers.
- **b.** Care and operation.
- **c.** All and other pertinent brochures, illustrations, drawings, cuts, bulletins, technical data, certified performance charts and other literature with the model actually furnished to be clearly and conspicuously identified.
- **d.** Internal wiring diagrams and engineering data sheets for all items and/or equipment to be furnished.
- **e.** Guarantee and warranty data.

6. Instruction for lubricating each piece of equipment installed. Instructions shall state type of lubricant, where and how frequently lubrication is required.

7. Frame all instructions under glass and hang in the Mechanical Room or other location as directed by Architect.

1.7. MANUALS FOR PRODUCTS, MATERIALS, AND FINISHES

A. Submit three (3) copies of complete manual.

B. Content: Provide complete information for Architectural products, applied materials, and finishes.
- **1.** Manufacturer's data, including catalog number, size, composition, color and texture designations, and information for reordering.
- **2.** Instructions for care and maintenance, including manufacturer's recommendations for cleaning agents and methods; cautions detrimental cleaning agents and methods; and recommended schedule for cleaning and maintenance.

END OF SECTION 017823

SECTION 017900
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training video recordings.

1.02 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.03 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit (2) two copies within (7) seven days of end of each training module.
   1. Identification: On each copy, provide an applied label with the following information:
      a. Name of Project.
      b. Name and address of videographer.
      c. Name of Architect.
      d. Name of Construction Manager.
      e. Name of Contractor.
      f. Date of video recording.
   2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
   3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.04 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
   1. Inspect and discuss locations and other facilities required for instruction.
   2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
   3. Review required content of instruction.
   4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.05 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

1.06 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.
      b. Performance and design criteria if Contractor is delegated design responsibility.
      c. Operating standards.
      d. Regulatory requirements.
      e. Equipment function.
      f. Operating characteristics.
      g. Limiting conditions.
      h. Performance curves.
   2. Documentation: Review the following items in detail:
      a. Emergency manuals.
      b. Operations manuals.
      c. Maintenance manuals.
      d. Project record documents.
      e. Identification systems.
      f. Warranties and bonds.
      g. Maintenance service agreements and similar continuing commitments.
   3. Emergencies: Include the following, as applicable:
      a. Instructions on meaning of warnings, trouble indications, and error messages.
      b. Instructions on stopping.
      c. Shutdown instructions for each type of emergency.
      d. Operating instructions for conditions outside of normal operating limits.
      e. Sequences for electric or electronic systems.
      f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.
5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

1.07 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.08 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
1. Schedule training with Owner with at least (7) seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.09 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video: Provide minimum 1080 video resolution converted to a format file type acceptable to Owner, on electronic media.
1. Electronic Media: Read-only format compact disc with commercial-grade graphic label or flash drive as acceptable to Owner,
2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
    a. Name of Contractor/Installer.
    b. Business address.
    c. Business phone number.
    d. Point of contact.
    e. E-mail address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
1. Film training session(s) in segments not to exceed 15 minutes.
    a. Produce segments to present a single significant piece of equipment per segment.
    b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 017900

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SECTION 019113
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

1.02 SUMMARY

A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.

B. Related Sections:
   1. Section 230800 "Commissioning of HVAC" for commissioning process activities for HVAC&R systems, assemblies, equipment, and components.

1.03 DEFINITIONS

A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

B. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

C. CxA: Commissioning Authority.

D. OPR: Owner's Project Requirements. A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

E. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.04 COMMISSIONING TEAM

A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of **[each]** Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members Appointed by Owner:
   1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
   2. Representatives of the facility user and operation and maintenance personnel.
   3. Architect and engineering design professionals.

1.05 OWNER'S RESPONSIBILITIES

A. Provide the OPR documentation to the CxA and each Contractor for information and use.

B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

C. Provide the BoD documentation, prepared by Architect and approved by Owner, to the CxA and each Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.06 [EACH] CONTRACTOR'S RESPONSIBILITIES

A. **[Each]** Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
   1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
   2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
   3. Attend commissioning team meetings held on a **biweekly** basis.
   4. Integrate and coordinate commissioning process activities with construction schedule.
   5. Review and accept construction checklists provided by the CxA.
   6. Complete **electronic** construction checklists as Work is completed and provide to the Commissioning Authority on a **weekly** basis.
   7. Review and accept commissioning process test procedures provided by the Commissioning Authority.
   8. Complete commissioning process test procedures.

1.07 CXA'S RESPONSIBILITIES

A. Provide commissioning plan.

B. Convene commissioning team meetings.

C. Provide Project-specific construction checklists and commissioning process test procedures.

D. Verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, the CxA will report the failure in the Issues Log.

E. Prepare and maintain the Issues Log.

F. Prepare and maintain completed construction checklist log.

G. Witness systems, assemblies, equipment, and component startup.

H. Compile test data, inspection reports, and certificates; include them in the systems manual and commissioning process report.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 019113

SECTION 024100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.

B. Selective demolition of building elements for alteration purposes.

C. Removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 003119 - Existing Condition Information: Existing building survey conducted by Owner; information about known hazardous materials.

C. Section 003132 - Geotechnical Data: Testing of sub-surface soil conditions conducted by Owner.

D. Section 011000 - SUMMARY: Limitations on Contractor's use of site and premises, sequencing and staging requirements, description of items to be removed by Owner and description of items to be salvaged or removed for re-use by Contractor.

E. Section 011200 - Summary of Multiple Contracts: Responsibilities of each contract for the Work and coordination between each contract.

F. Section 015001 - Temporary Facilities and Controls - Multiple Prime Contracts: Site fences, security, protective barriers, and waste removal.

G. Section 016000 - Product Requirements: Procedural requirements for product, material, and equipment selection and handling; warranties and comparable products.

H. Section 017300 - Execution: General requirements for product installation; cutting and patching; protection of bench marks, survey control points, and existing construction to remain; field engineering; temporary bracing and shoring and progress cleaning.

I. Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL: Limitations on disposal of removed materials; requirements for recycling.

J. Section 017700 - Closeout Procedures: Contract closeout including Substantial Completion and Final Completion procedures, warranties, and final cleaning.

K. Section 311000 - Site Clearing: Vegetation and existing debris removal; earth stripping and stockpiling.

L. Section 312200 - Grading: Rough and fine grading.

M. Section 312323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

N. Section 329219 - Seeding: Seeding for new grass.

O. Section 329300 - Plants: Relocation of existing trees, shrubs, and other plants.

P. Section 329300 - Plants: New plant installation.

1.03 DEFINITIONS

A. Demolition / Demolish: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and legally dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Extract: Detach or dismantle items from existing construction in a manner to prevent damage, then perform one of the following as indicated on drawings:
   1. Clean, package, label extracted items and deliver them to Owner.
   2. Clean and prepare items for reuse and reinstall them where indicated.

F. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 REFERENCE STANDARDS

A. ANSI A10.6 - Safety & Health Program Requirements for Demolition Operations - American National Standard for Construction and Demolition Operations; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control.

C. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with start and end dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services: Indicate how long utility services will be interrupted.
   3. Coordination of shutoff, capping and continuation of utility services.
   4. Coordination with Owner's occupancy prior to, during and after the Work.

D. Site Plan: Indicate:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

E. Demolition Plan: Submit demolition plan as required by OSHA and local AHJ's.
   1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
   2. Summary of safety procedures.
   3. Demolition firm qualifications.

F. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.07 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA regulations prior to beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

1.08 PROJECT CONDITIONS

A. Owner will occupy building(s) immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings prior to proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If suspected hazardous materials are encountered, do no disturb; immediately notify Architect and Owner. Hazardous materials will then be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is prohibited.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: See Section 312323.

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove paving and curbs required to accomplish new work.

B. Remove all other paving and curbs as indicated on drawings.

C. Within area of new construction, remove existing stone walls as indicated on drawings.

D. Remove manholes and manhole covers, curb inlets and catch basins.

E. Remove fences and gates.

F. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 312200.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 017300 and 017700.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
9. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings.

F. Do not begin removal until receipt of notification to proceed from Owner.

G. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.

H. Protect existing structures and other elements to remain in place and not removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

I. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

K. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

I. Verify that utilities have been disconnected and capped before starting selective demolition operations.

3.04 PREPARATION FOR SELECTIVE DEMOLITION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

3.05 SELECTIVE DEMOLITION - GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   2. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   3. Dispose of demolished items and materials promptly.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.06 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
   1. Verify construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from areas that remain occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 .

C. Remove existing work as indicated and required to accomplish new work.
   1. Remove items indicated on drawings.

D. Existing Services/Systems to Be Removed, Relocated, or Abandoned: (Including but not limited to Plumbing, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/plumbing/electrical systems serving areas to be selectively demolished.
   2. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   3. Maintain existing active systems that are to remain in operation and protect them from damage; maintain access to equipment and operational components.
      a. Comply with requirements for existing services/systems interruptions specified in Division 1 "Summary."
   4. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   5. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   6. See Section 011000 - Summary, for limitations on outages and required notifications.
   7. Verify that abandoned services serve only abandoned facilities before removal.
   8. Remove abandoned pipe, ducts, conduits, and equipment; remove back to source of supply where possible, otherwise cap or plug stub with same or compatible materials and tag with identification.
      a. Drain piping prior to abandonment.

E. Protect existing work to remain.
   1. Prevent movement of structure. Provide shoring and bracing as required.
   2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch to match new work.

3.07 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.08 DEBRIS AND WASTE REMOVAL

A. General: Except for items or materials indicated to be reused, salvaged, extracted, reinstalled or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Remove all Work related debris, junk, and trash from Owner's property and legally dispose them.

C. Remove materials not to be reused on site; do not burn or bury.

D. Leave site in clean condition, ready for subsequent work and/or Owner occupancy.

E. Clean up spillage and wind-blown debris from public and private lands adjacent to Work site.

3.09 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by structure and/or selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024100

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SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Concrete for composite floor construction.

C. Elevated concrete slabs.

D. Floors and slabs on grade.

E. Concrete foundation walls and footings.

F. Concrete reinforcement.

G. Joint devices associated with concrete work.

H. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.

I. Concrete curing.

J. Concrete repair materials.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 079200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

F. ACI 305R - Guide to Hot Weather Concreting; 2010.

G. ACI 306R - Guide to Cold Weather Concreting; 2016.

H. ACI 308R - Guide to External Curing of Concrete; 2016.

I. ACI 318 - Building Code Requirements for Structural Concrete; 2019 (Reapproved 2022).

J. ACI 347R - Guide to Formwork for Concrete; 2014 (Reapproved 2021).

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.

L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2020.

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2020.

P. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2020a.

Q. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

R. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.

S. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

T. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

U. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

V. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.

W. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 2020.

X. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019.

Y. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2019.

Z. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.

AA. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2015.

BB. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

CC. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

DD. ASTM C1202 - Standard Test Method for Electrical Indication of Concrete’s Ability to Resist Chloride Ion Penetration; 2025.

EE. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

FF. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2025.

GG. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

HH. ASTM C1708/C1708M - Standard Test Methods for Self-leveling Mortars Containing Hydraulic Cements; 2019.

II. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.

JJ. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018.

KK. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction; 2017.

LL. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.

MM. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

NN. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.

OO. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

PP. NSF 61 - Drinking Water System Components - Health Effects; 2024.

QQ. NSF 372 - Drinking Water System Components - Lead Content; 2016.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.

D. Samples: Submit samples of under slab vapor barrier to be used.

E. Test Reports: Submit report for each test or series of tests specified.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

G. Reinforcement Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices

H. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.06 WARRANTY

A. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
   1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
   2. Provide warranty by admixture manufacturer matching terms of flooring adhesive or primer manufacturer's material defect warranty.

B. Moisture Emission-Reducing Curing and Sealing Compound, Membrane-Forming: Provide warranty to cover cost of flooring delamination failures for 10 years.
   1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

C. Moisture Emission-Reducing Curing and Sealing Compound, Penetrating: Provide non-prorated warranty to cover cost of flooring delamination failures for 20 years.
   1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Steel.
   2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
   3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).

B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: As noted on drawings.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Lightweight Aggregate: ASTM C330/C330M.

D. Fly Ash: ASTM C618, Class C or F.

E. Calcined Pozzolan: ASTM C618, Class N.

F. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

G. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

A. General: Concrete supplier(s) permitted to select and use chemical admixtures indicated in this Section in concrete mix designs to enhance the placement, workability, and other characteristics of the wet concrete properties. Concrete supplier(s) shall review project schedule and coordinate the use of accelerators, barriers, etc. as necessary to facilitate concrete placement in accordance with Hot Weather and/or Cold Weather concreting practice guidelines. Concrete contractor shall also review compatibility of all admixtures selected for use in each individual mix design submitted.

B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

C. Air Entrainment Admixture: ASTM C260/C260M.

D. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

F. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

G. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

H. Accelerating Admixture: ASTM C494/C494M Type C.

I. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs). Closes capillary systems formed during concrete curing to reduce moisture vapor emission and transmission. Reduces concrete shrinkage with no adverse effect on concrete properties or applied flooring.
   1. Provide admixture in slabs to receive adhesively applied flooring or roofing.
   2. Products:
      a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture (MVRA-CPS) : www.barrierone.com/#sle.
      b. Hycrete, Inc: www.hycrete.com/#sle.
      c. ISE Logik Industries, Inc; MVRA 900: www.iselogik.com/#sle.
      d. Specialty Products Group; Vapor Lock 20/20: www.spggogreen.com/#sle.

J. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
   1. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.

2. Products:
    a. Aquafin, Inc: www.aquafin.net/#sle.
    b. Euclid Chemical Company; Eucon Vandex AM-10: www.euclidchemical.com/#sle.
    c. Kryton International, Inc; Krystol Internal Membrane (KIM): www.kryton.com/#sle.
    d. Penetron, Inc.; Penetron Admix.: www.penetron.com
    e. Sika USA; Sika WT-240P: www.usa.sika.com
    f. Xypex Chemical Corporation; XYPEX Admix C-500: www.xypex.com/#sle.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Barrier:
    1. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
    2. Products:
        a. Fortifiber Building Systems Group ; Moistop Ultra 10: www.fortifiber.com/#sle.
        b. ISI Building Products; Viper VaporCheck II 10-mil (Class A): www.isibp.com/#sle.
        c. Stego Industries, LLC10-mil: www.stegoindustries.com/#sle.
        d. W. R. Meadows, Inc; PERMINATOR Class A - 10 mils (0.25 mm): www.wrmeadows.com/#sle.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
    1. Grout: Comply with ASTM C1107/C1107M.
    2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
        a. Maximum: Plus 4 percent.
        b. Minimum: Plus 1 percent.
    3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch (48 MPa).

C. Architectural Concrete Floor Topping and Resurfacer:
    1. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 6,000 pounds per square inch (41 MPa).
    2. Compressive Strength: Minimum 5000 pounds per square inch (34.5 MPa), tested per ASTM C472.

D. Self-Leveling Cementitious Concrete Floor Topping:
    1. Minimum Compressive Strength at 28 Days, ASTM C1708/C1708M: 7,000 pounds per square inch (48 MPa).
    2. Products:
        a. LATICRETE International, Inc; LATICRETE SUPERCAP SC650-MC: www.laticrete.com/#sle.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Epoxy Bonding System:
    1. Complying with ASTM C881/C881M and of Type required for specific application.

C. Waterstops: PVC, complying with COE CRD-C 572.

D. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.

E. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.

F. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness, with removable top section that will form 1/2 inch (13 mm) deep sealant pocket after removal.
   1. Material: ASTM D1751, cellulose fiber.

G. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.

H. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

I. Dowel Sleeves: Plastic sleeve for smooth, round, steel load-transfer dowels.

J. Plate Dowel System: Steel plate dowel and plastic dowel sleeve; with integral fasteners for attachment to formwork.

2.07 CURING MATERIALS

A. Resin Curing Compound: Solvent-based liquid, membrane-forming.
   1. Comply with ASTM C309, Types 1 and 1D, Classes A and B.
   2. VOC Content: Less than 350 g/L.
   3. Products:
      a. Euclid Chemical Company: KUREZ DR-100: www.euclidchemical.com/#sle.
      b. Euclid Chemical Company: KUREZ DR-VOX: www.euclidchemical.com/#sle.
      c. Euclid Chemical Company: Tammscure WB: www.euclidchemical.com/#sle..

B. Curing and Sealing Compound, Moisture Emission-Reducing, Membrane-Forming: Clear, liquid sealer for application to newly-placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.
   1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
   2. Comply with ASTM C309 and ASTM C1315 Type I Class A.
   3. VOC Content: Less than 100 g/L.

C. Curing and Sealing Compound, Moisture Emission-Reducing, Penetrating: Clear, water-based, non-film-forming curing agent; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission, moisture vapor emission, and alkalinity.
   1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
   2. Compressive Strength of Treated Concrete: Equal to or greater than strength after 28-day water cure when tested according to ASTM C39/C39M.
   3. Chloride Ion Resistance of Treated Concrete: Equal to or greater than strength after 28-day water cure when tested according to ASTM C1202.
   4. Comply with ASTM C309 and ASTM C1315 Type I Class A.
   5. Products:

a. Green Umbrella Architectural Concrete Systems, Inc. 20 Jetview Dr. Rochester, NY 14624, basis of design manufacturer. Technical and Architectural Support:(844) 200-7336, info@greenumbrellasystems.com.

D. Moisture-Retaining Sheet: ASTM C171.
1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch (0.102 mm).

2.08 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109.

2.09 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations. Normal weight concrete (145 PCF +/- 5) shall be provided with all cement conforming to ASTM C150, Type I.
1. Where noted, lightweight slab concrete (110 PCF +/- 5) shall be provided with all cement conforming to ASTM C330, Type I.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete: Footings and Buried Foundations. (Exposure Category F0)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa).

2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Cement Content: Minimum 540 pounds per cubic yard.
4. Water-Cement Ratio: Maximum 50 percent by weight.
5. Total Air Content: 6 percent (+/- one percent), determined in accordance with ASTM C173/C173M.
6. Maximum Slump: 3 1/2 inches (+/- one inch)
7. Maximum Aggregate Size: 1 inch.
8. Provide crystaline waterproofing admixture in elevator footings and foundation walls.

E. Normal Weight Concrete: Exposed Foundations and Retaining Walls (Exposure Category F3)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 5,000 pounds per square inch (34.5 MPa).
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Cement Content: Minimum 660 pounds per cubic yard.
4. Water-Cement Ratio: Maximum 40 percent by weight.
5. Total Air Content: Minimum 6 percent, determined in accordance with ASTM C173/C173M. for all exposed concrete.
6. Maximum Slump: 3 1/2 inches (+/- one inch.)
7. Maximum Aggregate Size: 1 inch for footings, 3/4" for walls, grade beams and slabs.

F. Normal Weight Concrete: Slab-on-Grade (interior). (Exposure Category F0)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa).
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Cement Content: Minimum 590 pounds per cubic yard.
4. Water-Cement Ratio: Maximum 50 percent by weight.
5. Maximum Slump: 3 1/2 inches (+/- one inch.)
6. Maximum Aggregate Size: 3/4 inch (19 mm).
7. Provide Moisture Vapor Reducing Admixture (MVRA) admixture in slabs to receive adhesively applied flooring.

G. Normal Weight Concrete: Exterior Slabs. (Exposure Category F3)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 5,000 pounds per square inch (34.5 MPa).
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Cement Content: Minimum 660 pounds per cubic yard.
4. Water-Cement Ratio: Maximum 40 percent by weight.
5. Total Air Content: Minimum 6 percent, determined in accordance with ASTM C173/C173M.
6. Maximum Slump: 3 1/2 inches (+/- one inch.)
7. Maximum Aggregate Size: 3/4 inch (19 mm).

H. Structural Light Weight Concrete: Interior slabs on deck. (Exposure Category F0)

I. Structural Light Weight Concrete (Pump Mix): Interior slabs on deck. (Exposure Category F0)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa).
2. Water-Cement Ratio: Maximum 45 percent by weight.

3. Total Air Content: 6 percent (+/- one percent), determined in accordance with ASTM C173/C173M.
4. Maximum Slump: 7 inches (+/- one inch) with High Range Water Reducer.
5. Maximum Aggregate Size: 1/2 inch (13 mm).
6. Provide Moisture Vapor Reducing Admixture (MVRA) admixture in slabs to receive adhesively applied flooring.

J. Structural Normal Weight Concrete: Toppings and Fill for Stair Pans. (Exposure Category F0)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch (27.6 MPa).
2. Cement Content: Minimum 590 pounds per cubic yard.
3. Water-Cement Ratio: Maximum 45 percent by weight.
4. Total Air Content: 5 percent (+/- one percent), determined in accordance with ASTM C173/C173M.
5. Maximum Slump: 4 inches (+/- one inch.)
6. Maximum Aggregate Size: 3/8 inch.

K. Structural Normal Weight Concrete: Site Slip-form Curbs. (Exposure Category F3)
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 5,000 pounds per square inch.
2. Cement Content: Minimum 675 pounds per cubic yard.
3. Water-Cement Ratio: Maximum 45 percent by weight.
4. Total Air Content: Minimum 6 percent, determined in accordance with ASTM C173/C173M.
5. Maximum Slump: 1 inch (+/- one-half inch.)
6. Maximum Aggregate Size: 5/8 inch (16 mm).

L. Controlled Low Strength Material (CLSM)
1. Permanent Material.
a. Material shall meet the requirements of ACI 229R with a minimum compressive strength of 400 lb./sq. in
2. Removable Material.
a. Material shall meet the requirements of ACI 229R with a minimum compressive strength of 50 to 100 lb./sq. in.

2.10 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

C. Do not use shrinkage-reducing admixture (SRA) in same concrete batch with MVRA or PIA.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent. Coat contact surfaces of forms with form-release agent before placing reinforcement.

C. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

F. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for smooth-formed finished surfaces.
   2. Class C, 1/2 inch for rough-formed finished surfaces.

G. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

H. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

I. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

J. Chamfer exterior corners and edges of permanently exposed concrete.

K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

L. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

M. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

N. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.

O. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
   2. Use latex bonding agent only for non-load-bearing applications.

P. Interior Slabs on Grade: Install vapor barrier under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor barrier before covering.

3.03 INSTALLING REINFORCEMENT, ANCHOR RODS, AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
   1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.
   2. Allow six hours between completion of reinforcement installation and placement of concrete for special inspection.

B. Bend steel reinforcement in accordance with ACI 318.
   1. Do not heat steel reinforcement for bending. Bend or straighten bars cold.
   2. Do not bend partially embedded steel reinforcement, except as approved.

C. Clean reinforcement of dirt, grease, scale, loose rust, oil, paint and other foreign matter prior to installation.

D. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

E. Splicing of Reinforcement: Conform to ACI 318 Chapter 25 for wired lap splices and embedment lengths.

F. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

G. Install welded wire reinforcement in maximum possible lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Splice laps with tie wire.

H. "Wet Sticking", "Hooking-up" or "Walking-in" of any reinforcement will not be permitted.

I. Maintain required concrete cover dimensions indicated. Coordinate placement of conduit and inserts with reinforcement. Protect installed reinforcement from damage or displacement prior to and during concrete placement.

J. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

K. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303. Misplaced or damaged anchor rods shall be subject to re-engineering fees.
   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
   3. Install dovetail anchors in concrete structures as indicated.

3.04 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
   1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.05 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R. Verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed and corrections made.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
      a. Supplement mechanical consolidation by hand, spading, rodding, or tamping.
   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Place concrete for floor slabs in accordance with ACI 302.1R. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

F. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

G. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

H. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.06 JOINTING

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Provide waterstops as indicated, and at all construction joints below grade adjacent to usable spaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness or a minimum of 1-inch as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
3. Spacing of joints shall not exceed 30 times (24 times for exposed concrete floor surface) the thickness of the slab nor 15 feet on center. All panels should be square or nearly so. Joints shall typically isolate columns and run between columns, with intermediate joints located at equal spaces between column lines.

4. Joints produced using conventional processes shall be made within 4 or 12 hours after the slab in that area has been finished- within 4 hours in hot weather and within 12 hours in cold weather.
5. Joints produced using early-entry dry-cut saws shall be made within 1 or 4 hours after the slab in that area has been finished- within 1 hour in hot weather and within 4 hours in cold weather.
6. Hand tooled joints shall be done immediately following edging, or at the same time.
7. For floors to be covered with quarry tile, ceramic tile, or terrazzo, the joints shall be aligned with joints in the rigid floor coverings.

D. Contraction Joints in Walls: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Provide adequate shear reinforcement as indicated or directed. Construct contraction joints as follows:
1. Joints shall be constructed to provide for the installation of watertight joint and sealant, and filled with sealant.
2. Provide waterstops as indicated, and at all joints below grade adjacent to usable spaces.
3. Spacing of joints shall be located 4 feet from corners and intersections, and then at 25 feet on center thereafter.

E. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

F. Anchor joint fillers and devices to prevent movement during concrete placement.

G. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

H. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch (5 mm) thick blade and cut at least 1 inch (25 mm) deep but not less than one quarter (1/4) the depth of the slab.

3.07 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
1. Exposed Concrete Floors: 1/8 inch (3 mm) in 10 feet (3 m).
2. Under Seamless Resilient Flooring: 1/16 inch in 10 feet (3 m).
3. Under Carpeting: 1/8 inch (3 mm) in 10 feet (3 m).

B. Correct the slab surface if tolerances are less than s pecified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

3.08 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

C. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   2. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.09 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-fog spray or saturated burlap.
      a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
      b. Spraying: Spray water over floor slab areas and maintain wet.
      c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
   3. Final Curing: Begin after initial curing but before surface is dry.
      a. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - BSD Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

G. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.11 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

3.12 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 042000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.
B. Concrete building brick.
C. Precast Concrete Sills and Headers.
D. Clay facing brick.
E. Mortar and grout.
F. Reinforcement and anchorage.
G. Flashings.
H. Accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Section 033000 - CAST-IN-PLACE CONCRETE: Installation of dovetail slots for masonry anchors.
C. Section 055000 - METAL FABRICATIONS: Loose steel lintels.
D. Section 061000 - Rough Carpentry: Nailing strips built into masonry.
E. Section 072100 - Thermal Insulation: Insulation for cavity spaces.
F. Section 072500 - Weather Barriers: Water-resistive barriers or air barriers applied to the exterior face of the backing sheathing or masonry.
G. Section 076200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
H. Section 078400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
I. Section 079200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.
D. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
E. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016, with Editorial Revision (2018).

F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

G. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012 (Reapproved 2019).

H. ASTM C55 - Standard Specification for Concrete Building Brick; 2017.

I. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2016a.

J. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.

K. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.

L. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

M. ASTM C150/C150M - Standard Specification for Portland Cement; 2020.

N. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

O. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2019.

P. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019.

Q. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.

R. ASTM C476 - Standard Specification for Grout for Masonry; 2019.

S. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

T. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

U. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.

V. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.

W. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009, with Editorial Revision (2022).

X. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

Y. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

B. Fire Rated Assemblies: Comply with applicable code for all requirements for fire rated masonry construction. Reference UL Assembly Numbers indicated on drawings.

C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet(2.4 m) long by 6 feet (1.8 m) high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
   2. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
   3. Non-Loadbearing Units: ASTM C129.
      a. Hollow block, as indicated.
      b. Lightweight.

B. Precast Concrete Sills and Headers
   1. Precast Concrete Units: Factory-fabricated, high-density cementitious units made from cement, crushed stone, sand, and polymer reinforced with fiberglass strands.
      a. Freeze-Thaw Resistance: Demonstrated by laboratory testing in accordance with ICC-ES AC219.
      b. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet(6 meters).
      c. Color: Selected by Architect from manufacturer's full range.
      d. Remove cement film from exposed surfaces before packaging for shipment.
   2. Shapes: Provide shapes indicated on drawings.
      a. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch (3 mm) or length divided by 360, whichever is greater, but not more than 1/4 inch(6 mm).
      b. Unless otherwise indicated on drawings, provide:

1) Wash or slope of 1:12 on exterior horizontal surfaces.
2) Drips on projecting components, wherever possible.

3. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI-318.
   a. Pieces More than 24 inches (610 mm) in Any Dimension: Provide full length two-way reinforcement of cross-sectional area not less than 0.25 percent of unit cross-sectional area.

C. Concrete Brick:
1. Size: As indicated on drawings.
2. Concrete Building Brick: ASTM C55; lightweight, solid, for interior or concealed use.

2.02 BRICK UNITS

A. Manufacturers:
1. Belden Brick: www.beldenbrick.com/#sle.
2. Endicott Clay Products Co: www.endicott.com/#sle.
3. Watsontown Brick; https://watsontownbrick.com/.
   a. Watsontown Delaware (a.k.a Mohican) Molded Flashed Modular Brick

B. Facing Brick: ASTM C216, Type FBS Rough, Grade SW.
1. Color and texture: to match existing adjacent brick as selected by Architect from manufacturer's standards.
2. Nominal size: As indicated on drawings.
3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.03 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type S.

B. Portland Cement: ASTM C150/C150M, Type I.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
1. Blok-Lok Limited: www.blok-lok.com/#sle.
2. Hohmann & Barnard, Inc: www.h-b.com/#sle.
3. WIRE-BONDwww.wirebond.com/#sle.
4. Heckmann Building Products www.heckmannbuildingprods.com.
5. Substitutions: See Section 016000 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 60,000 psi, deformed billet bars; galvanized.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss or ladder.

2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483 inch (3.8 mm)side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.

E. Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss.
2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483 inch side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

F. Strap Anchors: Bent steel shapes, 1-1/2 inch (38 mm) width, 0.105 inch (2.7 mm) thick, 24 inch (610 mm)length, with 1-1/2 inch (38 mm) long, 90 degree bend at each end to form a U or Z shape or with cross pins, hot dip galvanized to ASTM A153/A153M Class B.

G. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch (16 mm) of mortar coverage from masonry face.

H. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch (4.8 mm) thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A153/A153M, Class B, sized to provide not less than 5/8 inch (6 mm) of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 inch(32 mm).

I. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A153/A153M, Class B.
1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
3. Vertical adjustment: Not less than 3-1/2 inches.

J. Break-away Melt-away Firewall Anchors: Anchors designed to be used in a firewall that will provide structural capability by detaching during a fire.
1. FERO Break Away Fire Release Connectors
   a. Manufacturered by FERO Corp. in Edmonton Alberta, Canada.
   b. Slotted Steel support angle with fusible nylon washer against a grooved edge.
   c. Size:
      1) Steel support with dimensions, configuration and spacing as indicated on drawings.

2.05 FLASHINGS

A. Metal Flashing Materials: Copper, as specified in Section 076200.

B. Metal Flashing Materials:
1. Copper Flashing: ASTM B370, 060 soft annealed; 20 oz/sq ft 0.03 inch thick; natural finish.

C. Combination Non-Asphaltic Flashing Materials - Copper:

1. Copper/Polymer Film or Fabric Flashing: 3 oz/sq ft (0.915 kg/sq m) copper sheet laminated between two sheets of polyethylene film. Minimum Puncture Resistance of 780 psi(5.38 MPa), when measured in accordance with ASTM E154/E154M.
    a. Manufacturers:
    b. Hohmann & Barnard, Inc; Copper-Fabric NA: www.h-b.com/#sle.
    c. STS Coatings, Inc: www.stscoatings.com/#sle.
    d. WIRE-BOND; www.wirebond.com/#sle.
    e. York Manufacturing, Inc; Multi-Flash 500 Series: www.yorkmfg.com/#sle.
    f. Substitutions: See Section 016000 - Product Requirements.

D. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.
    1. Manufacturers:
        a. Mortar Net Solutions; Metal Drip Edges: www.mortarnet.com/#sle.
        b. Substitutions: See Section 016000 - Product Requirements.

E. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.06 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
    1. Manufacturers:
        a. Blok-Lok Limited: www.blok-lok.com/#sle.
        b. Hohmann & Barnard, Inc: www.h-b.com/#sle.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
    1. Manufacturers:
        a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
        b. WIRE-BOND: www.wirebond.com/#sle.

C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
    1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
        a. Manufacturers:
            1) Advanced Building Products, Inc; Mortar Break DT: www.advancedbuildingproducts.com/#sle.
            2) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.

D. Nailing Strips: Softwood lumber, preservative treated; as specified in Section 061000.

E. Weeps:
    1. Type: Polyester mesh.
    2. Color(s): As selected by Architect from manufacturer's full range.
    3. Manufacturers:
        a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
        b. Blok-Lok Limited: www.blok-lok.com/#sle.
        c. CavClear/Archovations, Inc: www.cavclear.com/#sle.

d. Mortar Net Solutions; WeepVent: www.mortarnet.com/#sle.

F. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Masonry below grade and in contact with earth: Type S.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. New Mortar for Old Brick: Proportion by volume only; no more than 20 percent of the total volume of Portland cement and lime combined to be Portland cement.
1. Repointing Mortar: Use proportions from 1 part lime to 2 parts sand with no Portland cement, up to 2 parts Portland cement to 3 parts lime to 6 parts sand.

D. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

E. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees Fahrenheit prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees Fahrenheit prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

D. Brick Units:

1. Bond: Running.
2. Coursing: Three units and three mortar joints to equal 8 inches.
3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

F. Interlock intersections and external corners, except for units laid in stack bond.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

3.07 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.

E. Lap joint reinforcement ends minimum 6 inches.

F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 16 inches vertically.

G. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

C. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.10 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Terminate flashing up 8 inches minimum on vertical surface of backing:
   1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
   2. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
   3. Anchor vertical leg of flashing into backing with a termination bar and sealant.

C. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.

3.11 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

D. Form expansion joint as detailed on drawings.

3.12 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.13 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.

F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.14 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.

3.15 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - BSD Quality Requirements.

3.16 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

3.17 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 051200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Structural steel support members and struts.

C. Base plates, shear stud connectors.

D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 052100 - STEEL JOIST FRAMING.

C. Section 053100 - STEEL DECKING: Support framing for small openings in deck.

D. Section 055000 - METAL FABRICATIONS: Steel fabrications affecting structural steel work.

E. Section 078100 - APPLIED FIRE PROTECTION: Fireproof protection to framing and metal deck systems.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; 2023, with Errata (2025).

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022, with Errata (2025).

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

I. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

J. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.

K. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.

L. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2024.

M. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a (Reapproved 2023).

N. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

O. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025a.

P. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; 2018.

S. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.

T. SSPC-SP 3 - Power Tool Cleaning; 2024.

U. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
   2. Connections not detailed.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

E. Designer's Qualification Statement.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator's years of experience performing this type of work and provide list of minimum five (5) previous projects.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is certified by the American Institute of Steel Construction (AISC) Fabricator Certification Program for Structural Steel Buildings in accordance with AISC 207-20.

D. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. All steel details and connections shall be in accordance with the requirements of "Specification for Structural Steel Buildings" . AISC-Load and resistance factor design.

B. All connections, unless indicated as being completely designed on the structural drawings shall be designed and detailed by a professional engineer licensed in the state of New York. The design and detailing shall comply with all applicable codes and specification sections.

C. The steel fabricator and erector shall be AISC certified for steel structures and comply with the applicable provisions of AISC's "Code of Standard Practice for Steel Buildings and Bridges".

D. All welding shall conform to the requirements of the structural welding code, ANSI/AWS D1.1 latest edition. All weld sizes shall be the larger of the size required by connection forces, the minimum size per ANSI/AWS D1.1 or 3/16 inch minimum fillet weld UON. Any weld sizes shown on the design drawings are considered effective weld sizes and shall be increased in accordance with AWS are required by gaps of skews between components.

2.02 MATERIALS

A. Steel Angles and Plates: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Hot-Formed Structural Tubing: ASTM A501/A501M, seamless or welded.

F. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

G. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M Class C.

H. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

I. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.

J. Un-headed Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563/A563M nuts and ASTM F436/F436M Type 1 washers.

K. Headed Anchor Rods: ASTM F1554 Grade 36, plain.

L. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.

M. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

N. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).
   3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.

O. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction. test

2.03 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Space shear stud connectors as indicated on framing plan(s).

C. Fabricate connections for bolt, nut, and washer connectors.

2.04 FINISH

A. Prepare structural component surfaces in accordance with SSPC-SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

2.05 SOURCE QUALITY CONTROL

A. Provide shop testing and analysis of structural steel.

B. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts," testing at least 20 percent of bolts at each connection.

C. Welded Connections: Visually inspect all shop-welded connections

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed. Verify elevations of concrete and masonry bearing surfaces, and locations of anchor rods, bearing plates and other embedments for compliance with construction documents.

B. Verify that concrete in the footings, piers and walls or the mortar in the masonry piers and walls has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, 75 percent of its design compressive design strength before commencement of steel erection.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide temporary shores, guys, braces and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections and bracing are in place unless otherwise directed.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.03 ERECTION

A. Erect structural steel in compliance with AISC 303.

B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components and shear studs indicated on shop drawings.

D. Do not field cut or alter structural members without approval of Architect.

E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

F. Provide temporary shores, guys, braces and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections and bracing are in place unless otherwise directed.
   1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees. Protect grout and allow to cure.

H. Align and adjust various members that form part of a complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference in temperature at time of erection and mean temperature when structure is completed and in service.

I. Splice members only where indicated.

J. Do not use thermal cutting during erection unless approved by architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

K. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.04 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint.
   1. Joint Type: Snug tightened, except slip critical at wind frames and moment connections.

B. Welded Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welded work..
   1. Comply with AISC 303 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
   2. Remove backing bars or runoff tabs, back gouge and grind steel smooth.
   3. Assemble and weld built-up sections by methods that will maintaintrue alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mil material.

3.05 TOLERANCES

A. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

B. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

C. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.06 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - BSD Quality Requirements.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts," testing at least 20 percent of bolts at each connection.

END OF SECTION

SECTION 051223
STRUCTURAL STEEL THERMAL BREAKS

GENERAL

1.01 SECTION INCLUDES

A. Structural thermal breaks for bolted structural steel connections.

1.02 RELATED REQUIREMENTS

A. Section 05 12 23 – Structural Steel for Buildings: Bolted structural steel connections.

1.03 REFERENCE STANDARDS

A. ASTM International (ASTM) (www.astm.org):
   1. ASTM C 177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
   2. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics.
   3. ASTM D 695 – Standard Test Method for Compressive Properties of Rigid Plastics.
   4. ASTM D 696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer.
   5. ASTM D 732 – Standard Test Method for Shear Strength of Plastics by Punch Tool.
   6. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
   7. ASTM D 2863 – Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).

B. International Organization for Standardization (ISO) (www.iso.org):
   1. ISO 9001 – Quality management systems – Requirements.

1.04 PREINSTALLATION MEETINGS

A. Convene preinstallation meeting 2 weeks before start of Work of this Section.

B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, Structural Engineer, and installer.

C. Review the Following:
   1. Materials.
   2. Installation.
   3. Adjusting.
   4. Protection.
   5. Coordination with other Work.

D. Contact manufacturer with any questions.

1.05 SUBMITTALS

A. Submittals: Comply with Division 01.

B. Product Data: Submit manufacturer’s product literature, including connection design examples.

C. Shop Drawings: Submit drawings, indicating:

1. Dimensions and locations of structural thermal break plates, structural thermal break washers, and bushings.
2. Size and location of holes in structural thermal break plates.
3. OD and ID for structural thermal break washers and bushings.
4. Structural steel connection details, including bolt and washer sizes.

D. Samples: Submit manufacturer's samples of the following:
1. Structural Thermal Break Plates: Minimum 2 inches by 2 inches.
2. Thermal break washers.
3. Thermal break bushings.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Warranty Documentation: Submit manufacturer's standard warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
1. Manufacturer regularly engaged in the manufacturing of structural thermal breaks of similar type to that specified for a minimum of 10 years.
2. ISO 9001 certified company.

B. Installer's Qualifications:
1. Installer regularly engaged in erection of structural steel framing of similar type to that specified for a minimum of 5 years.
2. Use persons trained for erection of structural steel framing.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and installation locations if needed.

B. Storage and Handling Requirements:
1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Store materials in clean, dry area indoors.
4. Do not store materials directly on floor or ground.
5. Store materials out of direct sunlight.
6. Keep materials from freezing.
7. Protect materials during storage, handling, and installation to prevent damage.

1.08 AMBIENT CONDITIONS

A. Do not install materials under ambient conditions outside manufacturer's limits.

PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Fabreeka International, Inc., 1023 Turnpike Street, Stoughton, Massachusetts 02072. Toll Free 800-322-7352. Phone 781-341-3655. Fax 781-341-3983. www.fabreeka.com. info@fabreeka.com.

B. Substitutions: [Not permitted] [Comply with Division 01].

C. Single Source: Provide materials from single manufacturer.

2.02 STRUCTURAL THERMAL BREAKS

A. Structural Thermal Breaks: "Fabreeka-TIM".
   1. Description:
      a. Load-bearing, structural thermal break/insulation material to prevent thermal bridging between flanged, bolted, structural steel framing members at connections.
      b. Maintains structural integrity of connections while reducing energy loss.
   2. Material: Fiberglass-reinforced laminate composite.
   3. ICC Certified:
      a. US: ESL-1164.
      b. Canada: ESL-1165.
   4. RoHS II compliant.
   5. Thickness: 1/2 inch (12.7 mm). Locations indicated on the Drawings.
   6. Ultimate Mechanical Properties, Nominal:
      a. Tensile Strength, ASTM D 638: 11,000 psi (75.8 MPa).
      b. Flexural Strength, ASTM D 790: 25,000 psi (172.4 MPa).
      c. Compressive Strength, ASTM D 695: 38,900 psi (268.2 MPa).
      d. Compressive Modulus, ASTM D 695:
         1) 1/2-Inch (12.7 mm) Thickness: 291,194 psi (2,007.7 MPa).
         2) 1-Inch (25.4 mm) Thickness: 519,531 psi (3,582.0 MPa).
      e. Shear Strength, ASTM D 732: 15,000 psi (103.4 MPa).
      f. Operating Temperature Range: Minus 20 degrees F to 250 degrees F (Minus 29 degrees C to 121 degrees C).
         1) Loss in Ultimate Strength at 250 degrees F (121 degrees C): 30 percent.
   7. Flame Resistance, Nominal:
      a. Oxygen Index, ASTM D 2863: 21.8 percent.
   8. Thermal Properties, Nominal:
      a. Coefficient of Thermal Expansion, ASTM D 696: 2.2 in/in/degree C x 10^{-5}.
      b. Thermal Conductivity, ASTM C 177: 1.8 BTU/hr/ft^2/in/degree F (0.259 W/m* degree K).
      c. Heat Flow Resistance, R-Value:
         1) 1/4-Inch (6.4 mm) Thickness: 0.14.
         2) 1/2-Inch (12.7 mm) Thickness: 0.28.
         3) 1-Inch (25.4 mm) Thickness: 0.56.
   9. Density: 107.83 pcf (1,727 kg/m^3).
   10. Coefficient of Friction:
      a. "Fabreeka-TIM" to Steel:
         1) Compression Load 5,000 psi (34.5 MPa): 0.27 µs.
         2) Compression Load 10,000 psi (69 MPa): 0.26 µs.

2.03 ACCESSORIES

A. Thermal Break Washers: "Fabreeka-TIM" washers.
   1. Material: Same as "Fabreeka-TIM" structural thermal break plates.
   2. Thickness: 1/4 inch (6.4 mm).
   3. OD and ID: Determined by structural bolt diameter. Refer to Recommended Washer and Bushing Sizes in manufacturer's product data.

B. Thermal Break Bushings: "Fabreeka" bushings.
   1. Material: Elastomeric material.
   2. Length: Determined by thickness of steel end plate.
   3. OD and ID: Determined by structural bolt diameter. Refer to Recommended Washer and Bushing Sizes in manufacturer's product data.

EXECUTION

3.01 EXAMINATION

A. Examine locations to receive structural thermal breaks.

B. Notify Architect or Structural Engineer of conditions that would adversely affect installation or subsequent use.

C. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install structural thermal breaks in accordance with Structural Engineer's instructions at locations indicated on the Drawings.

B. Install sizes of structural thermal break plates, washers, and bushings as indicated on the Drawings.

C. Install hardened USS Grade 8 flat washers on both sides of thermal break washers in accordance with Structural Engineer's instructions.
   1. Steel Washer OD: Greater than or equal to thermal break washer OD.

D. Install bushings into oversized holes in steel end plates to accept OD of bushings.

E. Bolted Structural Steel Connections: Install bolted structural steel connections as specified in Section 05 12 23.
   1. Bolt torque values are provided by Structural Engineer and are determined by required clamping force, proper tension of bolts, and long-term creep.

3.03 ADJUSTING

A. Remove and replace with new material, damaged components that cannot be successfully repaired, as determined by Architect or Structural Engineer.

3.04 PROTECTION

A. Protect Work of this Section from damage until Substantial Completion.

END OF SECTION

SECTION 052100
STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.

B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.

C. Supplementary framing for floor and roof openings greater than 18 inches (450 mm).

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 051200 - STRUCTURAL STEEL FRAMING: Grouting base plates and bearing plates. Superstructure framing.

C. Section 055000 - METAL FABRICATIONS: Non-framing steel fabrications attached to joists.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

E. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

F. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2022.

G. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry; 2018.

H. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.

I. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2024.

J. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025a.

K. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

M. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; 2018.

N. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Designer's Qualification Statement.

C. Manufacturer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 3 years documented experience.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Joists:
1. Canam Group Inc: www.canam-steeljoists.ws
2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
3. New Millennium Building Systems (Subsidiary of Steel Dynamics, Inc.): www.newmill.com

2.02 MATERIALS

A. Open Web Joists: SJI Type K Joists:
1. Provide bottom chord extensions.
2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
3. Minimum End Bearing on Concrete or Masonry Supports: 4 inches.

B. Open Web Joists: SJI 100 Type LH Joists:
1. Provide bottom chord extensions as indicated.
2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards.
3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards.

C. Open Web Joists: SJI 100 Type DLH Joists:
1. Provide bottom chord extensions as indicated.
2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards.
3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards.

D. Anchor Bolts, Nuts and Washers: ASTM A307 hot-dip galvanized per ASTM A153/A153M Class C.

E. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

F. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

G. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.03 FABRICATION

A. Drill holes in chords for attachment of wood nailers where indicated.

2.04 FINISH

A. Galvanize joists as specified.
   1. Do not prime surfaces that will be fireproofed.
   2. Galvanize steel ledge angles.

2.05 SOURCE QUALITY CONTROL

A. Provide shop testing of steel components as follows:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 ERECTION

A. Erect joists with correct bearing on supports.

B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.

D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.

E. Install supplementary framing for floor and roof openings greater than 18 inches.

F. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.

G. Do not field cut or alter structural members without approval of joist manufacturer.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm).

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - BSD Quality Requirements.

B. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.

4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

SECTION 053100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof deck.

B. Composite floor deck.

C. Supplementary framing for openings up to and including 18 inches (450 mm).

D. Bearing plates and angles.

E. Stud shear connectors.

F. Acoustical insulation in roof deck flutes.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete topping over metal deck.

C. Section 042000 - UNIT MASONRY: Placement of anchors for bearing plates embedded in unit masonry assemblies.

D. Section 051200 - STRUCTURAL STEEL FRAMING: Support framing for openings larger than 18 inches and shear stud connectors.

E. Section 051200 - STRUCTURAL STEEL FRAMING: Placement of embedded steel anchors for bearing plates in cast-in-place concrete.

F. Section 052100 - STEEL JOIST FRAMING: Support framing for openings larger than 18 inches and shear stud connectors.

G. Section 055000 - METAL FABRICATIONS: Steel angle concrete stops at deck edges.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.

C. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel; 2025.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.

E. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.

I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; 2018.

J. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2022.

K. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).

L. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

M. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

N. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittals procedures.

B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Submit manufacturer's installation instructions.

F. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

G. Designer's Qualification Statement.

H. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck:
   1. Canam Steel Corporation: www.canam-steeljoists.ws.
   2. New Millennium Building Systems (subsidiary of Steel Dynamics, Inc.): www.newmill.com.
   3. Nucor-Vulcraft Group: www.vulcraft.com/#sle.

2.02 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.
   2. Maximum Vertical Deflection of Floor Deck: 1/360 of span.
   3. Maximum Lateral Deflection of Diaphragms: 1/500 of the height of the wall.

B. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Minimum Base Metal Thickness: 18 gauge or 20 gauge – where indicated on plans.
   4. Nominal Height: 1-1/2 inch (38 mm) or 3 inch (76mm) – where indicated on plans.
   5. Profile: Fluted; SDI WR.
   6. Formed Sheet Width: 36 inch (900 mm).
   7. Side Joints: Lapped, welded. or sidelap screws placed at 18 inches on center.
   8. End Joints: Lapped, welded.

C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Span Design: Triple.
   4. Minimum Base Metal Thickness: 18 gauge, 0.0478 inch (1.214 mm).
   5. Nominal Height: as shown on drawings.
   6. Profile: Fluted; SDI NR.
   7. Formed Sheet Width: 24 inch (600 mm).
   8. Side Joints: Lock seam.

2.03 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.

C. Welding Materials: AWS D1.1/D1.1M.

D. Fasteners: Galvanized hardened steel, self tapping.

E. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
   1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
   2. Material: Steel; ASTM A510/A510M.
      a. Hardness: Rockwell C 54.5, minimum.
      b. Tensile Strength: 285 kips per square inch (1965 MPa), minimum.
      c. Shear Strength: 175 kips per square inch (1205 MPa), minimum.
      d. Washers:
         1) Steel Bar Joist Framing Applications: 0.472 inch (12 mm) diameter, minimum.

2) Exposed Roof Deck Applications: 0.591 inch (15 mm) diameter, minimum.

e. Corrosion Resistance:

1) Steel Bar Joist Framing Applications: ASTM B633, SC1, Type III zinc electroplate..

3. Products:

a. Simpson Strong-Tie: www.strongtie.com/#sle.

F. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.

1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.

G. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.

H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

J. Flute Closures: Closed cell foam rubber, 1 inch (25 mm) thick; profiled to fit tight to the deck.

K. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft (18 kg/cu m) density; profiled to suit deck.

2.04 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gauge, 0.0359 inch (0.91 mm) thick sheet steel; of profile and size as indicated; finished same as deck.

B. Floor Drain Pans: Formed sheet steel, 14 gauge, 0.0747 inch (1.90 mm) minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm)below floor deck surface, bearing flange 3 inches (75 mm) wide, sealed watertight.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On concrete and masonry surfaces provide minimum 4 inch (100 mm) bearing.

C. On steel supports provide minimum 1-1/2 inch (38 mm) bearing.

D. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.

1. Welding: Use fusion welds through weld washers.
2. Place and secure special deep fluted sections for integral concrete bridging.

E. Clinch lock seam side laps.

F. At mechanically fastened male/female side laps fasten at 24 inches (600 mm) on center maximum.

G. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.

H. At welded male/female side laps weld at 18 inches (450 mm) on center maximum.

I. Weld deck in accordance with AWS D1.3/D1.3M.

J. At deck openings from 6 inches to 18 inches (450 mm) in size, provide 2 by 2 by 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.

K. At deck openings greater than 18 inches (450 mm) in size, provide steel angle reinforcement. as specified in Section 051200and on plans.

L. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch (150 mm) minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches (300 mm) on center maximum.

M. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

N. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

O. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.

P. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

Q. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

R. Weld stud shear connectors through steel deck to structural members below.

S. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

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SECTION 055000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Placement of metal fabrications in concrete.

C. Section 042000 - UNIT MASONRY: Placement of metal fabrications in masonry.

D. Section 053100 - STEEL DECKING: Bearing plates for metal deck bearing, including anchorage.

E. Section 055100 - Metal Stairs.

F. Section 055213 - PIPE AND TUBE RAILINGS.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

I. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

J. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025a.

K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

L. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

N. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

P. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

Q. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
      a. Include the following, as applicable:
         1) Design criteria.
         2) Engineering analysis depicting stresses and deflections.
         3) Member sizes and gauges.
         4) Details of connections.
         5) Support reactions.
         6) Bracing requirements.

C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.05 QUALITY ASSURANCE

A. Design under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Stainless Steel, General: ASTM A666/A666M, Type 304.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

H. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

I. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

J. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

L. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

E. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

C. Lintels: As detailed; galvanized finish.

D. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

E. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.

F. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

G. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

H. Stainless Steel Finish: No. 4 Bright Polished finish.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 055113
METAL PAN STAIRS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Preassembled steel stairs with concrete-filled treads.
   2. Steel tube railings attached to metal stairs.
   3. Steel tube handrails attached to walls adjacent to metal stairs.

B. Related Requirements:
   1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
   2. Section 033000 "Cast-in-Place Concrete" for concrete fill for stair treads and platforms.
   3. Section 055213 "Pipe and Tube Railings" for pipe and tube railings.

1.02 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

1.03 SUBMITTALS – GENERAL

A. See Section 013300 – Submittal Procedures, for submittal procedures.

1.04 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:
   1. Prefilled metal-pan-stair treads.
   2. Precast concrete treads.
   3. Epoxy-resin-filled stair treads.
   4. Nonslip aggregates and nonslip-aggregate finishes.
   5. Abrasive nosings.
   6. Paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For stairs, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Uniform Load: 100 lbf/sq. ft..
   2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
   3. Uniform and concentrated loads need not be assumed to act concurrently.
   4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
   5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 75 lbf/ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Infill of Guards:
      a. Concentrated load of 75 lbf applied horizontally on an area of 1 sq. ft..
      b. Infill load and other loads need not be assumed to act concurrently.

2.02 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

C. Steel Plates, Shapes, and Bars: ASTM A 36/

D. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513.

E. Cast Iron: Either gray iron, ASTM A 48, or malleable iron, ASTM A 47 unless otherwise indicated.

F. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.

G. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011, either commercial steel, Type B, or structural steel, Grade 30, unless another grade is required by design loads.

2.03 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
   1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for.

D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.04 MISCELLANEOUS MATERIALS

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

D. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

E. Welded Wire Reinforcement: ASTM A 185/A 185M, 6 by 6 inches, W1.4 by W1.4, unless otherwise indicated.

2.05 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
   1. Join components by welding unless otherwise indicated.
   2. Use connections that maintain structural value of joined pieces.

B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. Weld connections to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Weld exposed corners and seams continuously unless otherwise indicated.
   5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 4 welds: good quality, uniform undressed weld with minimal splatter.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.

2.06 STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.

B. Stair Framing:
   1. Fabricate stringers of steel channels.
      a. Provide closures for exposed ends of channel stringers.
   2. Construct platforms of steel channel headers and miscellaneous framing members as needed to comply with performance requirements indicated.
   3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
   4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
   1. Steel Sheet: Uncoated cold-rolled steel sheet.
   2. Directly weld metal pans to stringers; locate welds on top of subtreads where they are concealed by concrete fill. Do not weld risers to stringers.
   3. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
   4. Shape metal pans to include nosing integral with riser.
   5. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
      a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

2.07 STAIR RAILINGS

A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings."

B. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

C. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint as shown in NAAMM AMP 521.

D. Form changes in direction of railings as follows:
   1. By bending or by inserting prefabricated elbow fittings.

E. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

F. Close exposed ends of railing members with prefabricated end fittings.

G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

H. Connect posts to stair framing by direct welding unless otherwise indicated.

I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
   1. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
   2. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

J. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.08 FINISHES

A. Finish metal stairs after assembly.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized or stainless steel finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 EXECUTION

3.01 INSTALLING METAL PAN STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."
   1. Install abrasive nosings with anchors fully embedded in concrete. Center nosings on tread width.

3.02 INSTALLING RAILINGS

A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
   1. Anchor posts to steel by welding to steel supporting members.
   2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with post installed anchors and bolts.

B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:
   1. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
   2. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.03 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

END OF SECTION

SECTION 055133
METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop-fabricated metal ladders.

B. Prefabricated ladders.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055113 - Metal Pan Stairs.

C. Section 055213 - PIPE AND TUBE RAILINGS.

D. Section 099000 - Painting and Coating: Paint finish.

1.03 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

I. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.

J. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2023.

K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

L. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

N. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

O. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).

P. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

R. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data; For the following:
   1. Paint products.

C. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

E. Designer's Qualification Statement.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

G. Specimen warranty.

H. Executed warranty.

1.06 QUALITY ASSURANCE

A. Design ladder(s) under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for material and workmanship. Complete forms in Owner's name and register with manufacturer.

1.08 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal ladders by field measurements before fabrication.

PART 2 PRODUCTS

2.01 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.02 MANUFACTURERS

A. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.03 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.

C. Plates, Shapes and Bars: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, plain.

G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.04 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B211/B211M, 6005 alloy, T5 temper.

B. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M6005 alloyT5 temper.

C. Aluminum-Alloy Bars: ASTM B211/B211M, 6005 alloy, T5 temper.

D. Bolts, Nuts, and Washers: Stainless steel.

E. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.05 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.06 SHOP FABRICATED LADDERS

A. General:

1. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
2. Side Rails: 3/8 by 2 inches members spaced at 20 inches.
3. Rungs: One inch diameter solid round bar spaced 12 inches on center.
4. Space rungs 7 inches from wall surface.
5. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
6. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
    a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
        1) IKG Industries; Mebac: www.ikg.com/#sle.
        2) Slipnot Metal Safety Flooring; SlipNOT: www.slipnot.com/#sle.
        3) Substitutions: See Section 016000 - Product Requirements.
7. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.
8. Galvanize exterior ladders, including brackets and fasteners.

2.07 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
    1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
    2. Materials: Aluminum; 6005 alloy, T5 temper.
    3. Finish: Powder coat; color to be selected by Architect from manufacturer's standard range.
    4. Manufacturers:
        a. Precision Ladders, LLC; Fixed Aluminum Wall Ladder: www.precisionladders.com/#sle.
        b. Substitutions: See Section 016000 - Product Requirements.

2.08 FINISHES - STEEL

A. Prime paint steel items.
    1. Do not prime surfaces in direct contact with concrete.
    2. Do not prime surfaces where field welding is required.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.09 FINISHES - ALUMINUM

A. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.

B. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.10 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on shop drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized , except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 055133

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SECTION 055213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Steel tube railings.
   2. Wall mounted handrails.
   3. Stair railings and guardrails.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - Cast in Place Concrete: Placement of anchors in concrete

C. Section 055113 - Metal Pan Stairs: Attachment plates for handrails specified in this section.

D. Section 099000 - Painting and Coating.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design: 2010.

B. AISC 207 - Standard for Certifications Programs 2023

C. ASTM A53/A53M - Standard specification for pipe, steel, black and hot dipped, zinc coated welded and seamless; 2022.

D. ASTM A123/A123M - Standard specification for Zinc (Hot Dipped Galvanized) coating on iron and steel products; 2017

E. AWS D1.1/D1.1M - Structural Welding Code - Steel ; 2010.

F. AWS D1.6/ D1.6M - Structural Welding Code - Stainless Steel 2017 with Amendment (2021)

1.04 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For the following:
   1. Manufacturer's product lines of mechanically connected railings.
   2. Railing brackets.
   3. Grout, anchoring cement, and paint products.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Indicated welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include the design engineer's seal and signature on each sheet of the shop drawings.

D. Samples: For each type of exposed finish required.
   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
   2. Fittings and brackets.
   3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
      a. Show method of connecting members at intersections.

E. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.06 INFORMATIONAL SUBMITTLS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.07 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.09 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.

2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Steel Pipe and Tube Railings:
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Wagner, R & B, Inc.

B. Stainless-Steel Pipe and Tube Railings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Blum, Julius & Co., Inc.
      b. Wagner, R & B, Inc.

2.03 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Distributed Load: Uniform load of 75 lbf/ ft. applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.
      b. Concentrated load of 200 lbf applied in any direction. Test in accordance with ASTM E935.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Infill of Guards:
      a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
      b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F, ambient; 180 deg F.

D. Dimensions: See drawings for configurations and heights.
   1. Top rails and wall rails: 1-1/2" diameter round.
   2. Intermediate Posts: 1-1/2" diameter round
   3. Posts: 1-1/2" diameter round.
   4. Balusters: 3/4" square solid bar.

E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

F. Welded and Brazed Joints: Make visible joints butt tight, flush and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
   1. Ease exposed edges to small uniform radius.
   2. Welded Joints:
      a. Carbon Steel; Perform welding in accordance with AWS D1.1/ D1.1M

b. Stainless Steel: Perform welding in accordance with AWS D1.6/ D1.6M

2.04 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

2.05 STEEL AND IRON

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

B. Tubing: ASTM A 500 (cold formed).

C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
   1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A 36/A 36M.

E. Woven-Wire Mesh: Intermediate-crimp, square pattern, 2-inch woven-wire mesh, made from 0.135-inch nominal diameter wire complying with ASTM A 510.

F. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

2.06 STAINLESS STEEL

A. Tubing: ASTM A 554, Grade MT 304.

B. Plate and Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

C. Stainless Steel Woven-Wire Mesh: Intermediate-crimp, 2-inch woven-wire mesh, square pattern.
   1. Product Wagner BWL 62.

2.07 ACCESSORIES

A. Handrail Brackets
   1. Manufacturer: Wagner
      a. MB3251W Stainless Steel Handrail Bracket
         1) Locations: Stair Handrails
      b. MB3251P Stainless Steel Handrail Bracket
         1) Locations: Post mount handrail bracket.
      c. GB3251 Stainless Steel Handrail Bracket
         1) Locations: Ramp

B. Flanges:
   1. Manufacturer: Wagner
      a. Model: Flat Base Flange w/ 4 holes #636 with Stainless flange cover #1534.

2.08 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:
   1. Stainless-Steel Components: Type 304 stainless-steel fasteners.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:
   1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
   2. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

2.09 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

2.10 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form Changes in Direction as Follows:
   1. By bending or by inserting prefabricated elbow fittings.

J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

N. Woven-Wire Mesh Infill Panels: Were indicated fabricate infill panels from woven-wire mesh crimped into 1-by-1/2-by-1/8-inch metal channel frames. Make wire mesh and frames from same metal as railings in which they are installed.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.11 STEEL AND IRON FINISHES

A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
   1. Shop prime uncoated railings with universal shop primer unless indicated.

D. Provide Electrostatically applied finishes to all steel and iron components

2.12 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

C. Run grain of directional finishes with long dimension of each piece.

D. Dull Satin Finish: No. 6.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.02 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
   1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
   2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
   3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
   1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

3.03 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.04 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, attached to post with set screws.

3.05 ATTACHING RAILINGS

A. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets and railing end flanges to building construction as follows:
   1. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.

3.06 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.07 TOLERANCES

A. Maximum Variation from Plumb: 1/4" per floor level, non-cumulative.

B. Maximum offset from true alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.08 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

SECTION 060660
RESIN PANEL SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the Plastic Fabrication as shown and specified in the described system(s):
   1. Wall and Ceiling Panels.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking and supports.

1.03 REFERENCE STANDARDS

A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020)

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

C. ASTM - American Society for Testing and Materials; Current.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's product data; include product description, fabrication information, and compliance with specified performance requirements.

C. Submit product test reports from a qualified independent 3rd party testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this project.
   1. Test reports required are:
      a. Rate of Burning ASTM D635.
      b. Density of Smoke ASTM D2843.
      c. Flame Spread and Smoke Developed testing ASTM E84.
      d. Extent of Burning UL 94.
      e. Impact strength ASTM D 3763.
      f. Passes NFPA 269/ASTM1678 for Combustion Product Toxicity

D. Shop Drawings: Include plans, elevations, sections, panel dimensions, details, and attachments to other work.

E. Samples for Verification:
   1. Submit minimum 4-inch by 4-inch sample for each type, texture, pattern and color of solid plastic fabrication.

F. Maintenance Data: Submit manufacturer's care and maintenance data, including care, repair and cleaning instructions. Include in Project closeout documents.

1.05 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Materials and systems shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least five (5) consecutive years and which can show evidence of those materials being satisfactorily

used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been successful for use five (5) years or longer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver Plastic Fabrications, systems and specified items in manufacturer's standard protective packaging.

B. Do not deliver Plastic Fabrications, system, components and accessories to Project site until areas are ready for installation.

C. Store materials in a flat orientation in a dry place that is not exposed to exterior elements.

D. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent damage or staining following installation for duration of project.

E. Before installing Plastic Fabrications, permit them to reach room temperature.

1.07 WARRANTY

A. New Warranties:
   1. See Section 017700 - Closeout Procedures, for additional warranty requirements.
   2. Correct defective work within a [5-year] period after Date of Substantial Completion.
   3. Manufacturer's Warranty: Include coverage for degradation of color finish. Complete form in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.
   3. Subject to compliance with all specified requirements, provide products by one of the following, for each type of product listed, or equivalent:

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Provide Basis-of-Design product as listed on drawings, or comparable by one of the following:

B. **Basis of Design:** 3form: www.3-form.com

C. Substitutions: See Section 016000 - Product Requirements.

2.03 MATERIALS

A. Resin Sheet
   1. Sheet Size: As shown in drawings .
   2. Thickness: 3/8 inch.
   3. Finish: Sandstone.
   4. Style: As shown in drawings.
   5. Product:
      a. 3form; Varia Ecoresin: www.3-form.com

B. Interlayer Materials: Compatible with bonding process to create a monolithic sheet of material when complete.

C. Sheet minimum performance attributes:

1. Rate of Burning ASTM D635. Material must attain CC1 Rating for a nominal thickness of 1.5 mm (0.060 inch.) and greater.
2. Self-Ignition Temperature ASTM D1929. Material must have a Self-ignition temperature greater than 650°F.
3. Density of Smoke ASTM D2843. Material must have a smoke density less than 75%.
4. Flame spread and Smoke developed testing ASTM E84. Material must be able to meet a level of Class A (Flame spread less than 25 and smoke less than 450) at thickness of 1/8",3/16" and 1".
5. Extent of Burning UL 94. Must submit UL card.
6. Impact strength. Minimum impact strength test as measured by ASTM D 3763 of 20 feet lbs. (for durability, shipping, installation, and use).
7. NFPA 269/ASTM 1678 test for toxicity: Product must have a best predicted LC50 value ≤ 80.8 g/m3 Product must have a best predicted corrected for post-flashover conditions LC50 value ≤ 19.0 g/m3
8. Panels must be produced from a minimum of 40% pre-consumer recycle content. This recycle content must be certified by a recognized 3rd party certification group, such as Scientific Certification Systems (SCS).

2.04 FABRICATION

A. General: Fabricate Plastic Fabrications to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes, profiles and other characteristics are indicated on the drawings.

B. Comply with manufacturer's written recommendations for fabrication.

C. Machining: Acceptable means of machining are listed below. Ensure that material is not chipped or warped by machining operations.
   1. Sawing: Select equipment and blades suitable for type of cut required.
   2. Drilling: Drills specifically designed for use with plastic products.
   3. Milling: Climb cut where possible.
   4. Routing

D. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.

2.05 MISCELLANEOUS MATERIALS

A. General: Provide products of material, size, and shape required for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaner: Type recommended by manufacturer.

C. Fasteners: Use screws designed specifically for plastics. Self-threading screws are acceptable for permanent installations. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

D. Bonding Cements: May be achieved with solvents or adhesives, suitable for use with product and application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions where installation of Plastic Fabrications will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

3.02 INSTALLATION

A. General: Comply with manufacturer's written instructions for the installation of Plastic Fabrications.

B. Manufacturer's shop to fabricate items to the greatest degree possible.

C. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.

D. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.

E. Form field joints using manufacturer's recommended procedures. Locate seams in panels so that they are not directly in line with seams in substrates.

3.03 CLEANING AND PROTECTION

A. Protect surfaces from damage until date of substantial completion. Repair work or replace damaged work, which cannot be repaired to Architect's satisfaction.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheathing.
B. Roof-mounted curbs.
C. Preservative treated wood materials.
D. Fire retardant treated wood materials.
E. Miscellaneous framing and sheathing.
F. Communications and electrical room mounting boards.
G. Concealed wood blocking, nailers, and supports.
H. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Section 072500 - WEATHER BARRIERS: Water-resistive barrier over sheathing.
C. Section 077200 - Roof Accessories: Prefabricated roof curbs.
D. Section 092116 - GYPSUM BOARD ASSEMBLIES: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
B. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2026.
C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.
D. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2024).
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.
F. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021.
G. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
H. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).
I. PS 1 - Structural Plywood; 2022.
J. PS 2 - Performance Standard for Wood Structural Panels; 2019.
K. PS 20 - American Softwood Lumber Standard; 2025.
L. SPIB (GR) - Standard Grading Rules; 2021.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.
B. Product Data: Provide technical data on wood preservative materials and application instructions.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Air-barrier and water-resistant glass-mat gypsum sheathing.

D. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

E. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

F. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

G. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a two-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as Basis-Of-Design, other manufacturers shall be considered for bidding as an equivalent when the BIDDER provides a written request for equivalency to the Architect prior to bidding.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness 15 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness unless otherwise indicated.

2.03 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: Kiln-dry or MC15.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.04 CONSTRUCTION PANELS

A. Wall Sheathing: PS 2 type.
   1. Bond Classification: Exterior.
   2. Grade: Structural I Sheathing.
   3. Span Rating: 24.
   4. Performance Category: 5/16 PERF CAT.
   5. Edge Profile: Square edge.

B. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.

C. Wall Sheathing, For exterior rainscreen system: Glass mat faced gypsum, ASTM C1177/C1177M, 5/8 inch Type X fire resistant.
   1. Edges: Square.
   2. Products:

D. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

E. Other Applications:

1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   a. Thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.05 ACCESSORIES

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or as appropriate for the substrate.

C. Metal and Finish of Fasteners:
   1. Fire-Retardant-Treated Wood:
      a. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
   2. Preservative-Treated Wood:
      a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
   3. Untreated Wood: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.

D. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.

E. Fasteners and Anchors; Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture:
   1. Nails, Brads, and Staples: ASTM F1667.
   2. Power-Driven Fasteners: NES NER-272.
   3. Wood Screws: ASME B18.6.1.
   4. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   5. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117.
   6. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   7. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.

2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature, low hygroscopic type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. Treat rough carpentry items as indicated.

C. Preservative Treatment:
   1. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Application: Treat all miscellaneous carpentry unless otherwise indicated.
         1) Wood blocking, plywood, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

D. Install plywood backing panels by fastening to studs or block; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

E. Securely attach to substrate by fastening as indicated, complying with the following:
   1. Chapter 23, "Fastening Schedule" in Building Code of New York State.

F. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

G. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

H. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

I. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

J. Select material sizes to minimize waste.

K. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

L. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

M. Securely attach carpentry work to substrate by anchoring and fastening as indicated

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

C. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

D. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.

E. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

F. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

G. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

H. Provide nonstructural framing and blocking to support the following:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Markerboards and Tackboards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.
   10. Other wall- or ceiling-mounted items indicated on drawings.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.06 AIR-BARRIER AND WATER-RESISTANT GLASS-MAT GYPSUM SHEATHING (EXTERIOR WALLS)

A. Install accessory materials according to sheathing manufacturer's written instructions and details to form a seal with adjacent construction, to seal fasteners, and ensure continuity of air and water barrier.

B. Connect and seal sheathing material continuously to air barriers specified under other Sections as well as to exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges

D. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip, so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
   1. Transition Strip: Roll firmly to enhance adhesion.

E. Seal top of through-wall flashings to sheathing with an additional 6 inch wide, transition strip.

F. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

G. Repair punctures, voids, and deficient lapped seams in strips and transition strips extending 6 inches beyond repaired areas in strip direction.

H. Inspections: Air-barrier and water-resistant glass-mat gypsum sheathing, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
   1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
   2. Termination mastic has been applied on cut edges.
   3. Strips and transition strips have been firmly adhered to substrate.
   4. Compatible materials have been used.
   5. Transitions at changes in direction and structural support at gaps have been provided.
   6. Connections between assemblies (sheathing and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
   7. All penetrations have been sealed.

3.07 FIELD QUALITY CONTROL

A. See Section 014500 - Quality Requirements, for additional requirements.

B. Coordination of ABAA Tests and Inspections:
   1. Provide testing and inspection required by ABAA QAP.

2. Notify in ABAA writing of schedule for air barrier work. Allow adequate time for testing and inspection.
3. Cooperate with ABAA testing agency.
4. Allow access to air barrier work areas and staging.
5. Do not cover air barrier work until tested, inspected, and accepted.

3.08 CLEANING

A. Waste Disposal: See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 061000

SECTION 062000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Upholstery for carpentry items.

1.02 RELATED REQUIREMENTS

A.

B. Section 061000 - ROUGH CARPENTRY: Support framing, grounds, and concealed blocking.

C. Section 064100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. PS 1 - Structural Plywood; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.
   2. Provide data on fire retardant treatment materials and application instructions.
   3. Provide instructions for attachment hardware and finish hardware.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
   2. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   3. Include certification program label.

D. Samples: Submit two samples of finish plywood, 6 x 6 inch in size illustrating wood grain and specified finish.

E. Samples: Submit two samples of wood trim 6 inch long.

F. Samples: Submit two samples of upholstery.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Quality Certification:
   1. Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear oak; prepare for stained finish.
   2. Stairs, Balustrades, and Handrails: Clear oak; prepare for stained finish.
   3. Loose Shelving: Birch plywood; prepare for paint finish.
   4. Bench Seats and Backs: As indicated on drawings.

2.02 LUMBER MATERIALS

A. Hardwood Lumber: White oak species, quarter sawn, maximum moisture content of 6 percent; with flat grain , of quality suitable for transparent finish.

2.03 SHEET MATERIALS

A. Hardwood Plywood: Face species as indicated, quarter cut, book matched, medium density fiberboard core; HPVA HP-1 Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

B. Particleboard: ANSI A208.1 Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

C. Pegboard: Pressed wood fiber with resin binder, standard grade; 1/8 inch thick, with holes spaced at 1 inch on center in both directions.

2.04 PLASTIC LAMINATE MATERIALS

A. High Pressure Laminate: NEMA LD 3; color as indicated; finish as selected.
   1. Products: Basis of Design as indicated on I000 Finish Schedule.
      a. Panolam Industries International, Inc: www.panolam.com/#sle.
      b. Wilsonart: www.wilsonart.com/#sle.
      c. Formica: www.formica.com/#sle.

d. Substitutions: See Section 016000 - Product Requirements.

2.05 UPHOLSTERY

A. PVC Free Coated Textiles (UPH-1)
1. Products : Basis of Design oas indicated on I000 Finish Schedule.
a. Substitutions: See Section016000-Product Requirements.
2. Railroaded: No
3. Backing: Post Consumer Recycled Polyester
4. Durability: 500,000 double rubs.
5. Flame Resistance: CA Bulletin 117 2013, UFAC Class 1, NFPA 260 Class 1
6. ASTM D3690 02: Grade A
7. Color Fastness: A5 - AATCC 16 opt 3, Class 5
8. Product:
a. Momentum; Kepler Print: www.momentumco.com/#sle.

2.06 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.

C. Fasteners: Of size and type to suit application; stainless steel finish in concealed locations and satin stainless steel finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

E. Metal Z-Shaped Support Clips: Paired, cleated, structural anchorage components applied to back of finish carpentry items and walls for mounting.
1. Material: Extruded aluminum.
2. Stand-Off: 3/16 inch.
3. Lift-Off: 5/8 inch.
4. Products:
a. Eagle Aluminum; Eagle Z-Clips: www.eagle-aluminum.com/#sle.
b. Monarch Metal Inc; Monarch Z-Clips: www.monarchmetal.com.
c. Substitutions: See Section 016000 - Product Requirements.

2.07 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Trim: Extruded flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness; color as selected.

C. Aluminum Trim and Mouldings: Extruded, alloy 6063 T5.
1. Type: As indicated on drawings.
2. Finish: Clear anodized.
3. Products:
a. Eagle Aluminum: www.eagle-aluminum.com/#sle.
b. Flannery, Inc: www.flannerytrim.com/#sle.
c. **Basis of Design:** Fry Reglet; Trim and Reveal Systems: www.fryreglet.com/#sle.
d. Substitutions: See Section 016000 - Product Requirements.

D. Primer: Alkyd primer sealer.

E. Wood Filler: Solvent base, tinted to match surface finish color.

2.08 WOOD TREATMENT

A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

B. Provide identification on fire retardant treated material.

C. Redry wood after pressure treatment to maximum 6 percent moisture content.

2.09 SITE FINISHING MATERIALS

A. Stain, Varnish, and Finishing Materials: Comply with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.10 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Cap exposed plastic laminate finish edges with material of same finish and pattern.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

2.11 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 4, Latex Acrylic, Water-based.
      b. Stain: As selected by Architect.
      c. Sheen: Satin.

E. Back prime woodwork items to be field finished, prior to installation.

F. Refer to Section 099000 - Painting and Coating for items indicated on drawings for opaque coatings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 099000.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

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SECTION 064100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Hardware.

1.02 RELATED REQUIREMENTS

A. Section 061000 - ROUGH CARPENTRY: Support framing, grounds, and concealed blocking.

B. Section 123600 - Countertops.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

D. BHMA A156.9 - Cabinet Hardware; 2020.

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   2. Include certification program label.

C. Product Data: Provide data for hardware accessories.

D. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
   5. Replace, repair, or rework all work for which certification is refused.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design : As indicated on I000 Finish Schedule
   1. Substitutions: See Section 016000 - Product Requirements.

2.02 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Wood Veneer Faced Cabinet:
   1. Exposed Surfaces: HPVA HP-1 Grade A, Ash, plain sliced, random-matched.
   2. Semi-Exposed Surfaces: HPVA HP-1 Grade B, Ash, plain sliced, random-matched.
   3. Concealed Surfaces: Manufacturer's option.

C. Plastic Laminate Faced Cabinets: Custom grade.

D. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Decorative laminate.
   2. Finish - Exposed Interior Surfaces: Decorative laminate.
   3. Finish - Semi-Exposed Surfaces: Decorative laminate
   4. Finish - Concealed Surfaces: Manufacturer's option.
   5. Casework Construction Type: Type A - Frameless.
   6. Adjustable Shelf Loading: 50 psf.
   7. Cabinet Style: Flush overlay.
   8. Cabinet Doors and Drawer Fronts: Flush style.
   9. Drawer Side Construction: Multiple-dovetailed.
   10. Drawer Construction Technique: Dovetail joints.

2.03 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.04 PANEL CORE MATERIALS

A. Particleboard: Composite panel composed of cellulosic particles, additives, and bonding system; comply with ANSI A208.1.
   1. Grade: M-2; moisture resistance: MR10.
   2. Panel Thickness: 3/4 inch.

2.05 HARDWOOD PLYWOOD PANELS

A. Hardwood Plywood: Plywood manufactured for nonstructural decorative applications; consisting of faces and backs applied to a variety of core types; comply with HPVA HP-1.

2.06 THERMALLY FUSED LAMINATE PANELS

A. Thermally Fused Laminate (TFL): Melamine-resin-saturated decorative papers; for fusion to composite wood substrates under heat and pressure.
   1. Test in accordance with NEMA LD 3 Section 3.
   2. Panel Core Substrate: Particleboard.
   3. Color: White.

2.07 LAMINATE MATERIALS

A. Manufacturers: Basis of Design: As indicated on finish drawings
   1. Formica Corporation: www.formica.com/#sle.

2. Panolam Industries International, Inc: www.panolam.com/#sle.
3. Wilsonart LLC: www.wilsonart.com/#sle.
4. Substitutions: See Section 016000 - Product Requirements.

B. High Pressure Decorative Laminate (HPL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as indicated.
1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors as indicated, finish as indicated.
2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, colors as indicated, finish as indicated.

2.08 COUNTERTOPS

A. Countertops: See Section 123600.

2.09 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: Extruded PVC, flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
1. Color: As selected by Architect from manufacturer's full range.
2. Use at all exposed edges.
3. Thickenss: 2mm.
4. Use at all exposed edges.

C. Vinyl Countertop Edge: PVC anchor type tee-molding edging in width to match thickness of countertop.
1. Color: As selected by Architect from manufacturer's full range.
2. Shape: Flat.
3. Finish: Smooth.
4. Thickness: 3mm.
5. Used at all exposed edges.
a. Fasteners: Size and type to suit application.
b. Concealed Joint Fasteners: Threaded steel.
c. Grommets: Standard painted metal grommets for cut-outs, in color to match adjacent surface.

2.10 HARDWARE

A. Cabinet Hardware: Comply with BHMA A156.9 for hardware types and grades indicated below:
1. Hardware Types: As indicated on drawings.
2. Product Grade: Grade 2.

B. Adjustable Shelf Supports: Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, aluminum with satin finish, 4 inch centers.

D. Keyed Cabinet Locks: Keyed cylinder, two keys per lock, keyed alike per room, master keyed, steel with satin finish.

E. Cabinet Catches and Latches:
1. Type: Magnetic catch.
2. Manufacturers:
a. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
3. Substitutions: See Section 016000 - Product Requirements.

F. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Bottom mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.
   6. Manufacturers:
      a. Knape & Vogt Manufacturing Company; Heavy-Duty Drawer Slides: www.knapeandvogt.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

G. Soft-Close, Door and Drawer Adjustable Dampers:
   1. Manufacturers:
      a. Titus Cabinet Hardware: www.titusplus.com/us/en/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

H. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
   1. Manufacturers:
      a. Titus Cabinet Hardware; T-Type Concealed Hinge: www.titusplus.com/us/en/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.11 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

D. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

E. Secure cabinets to floor using appropriate angles and anchorages.

3.03 ADJUSTING

A. Test installed work for rigidity and ability to support loads.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

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SECTION 068316
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

1.02 RELATED REQUIREMENTS

A. Section 092116 - Gypsum Board Assemblies

B. Section 099000 - Painting and Coating

1.03 REFERENCE STANDARDS

A. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation; current edition.

B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.

C. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.

D. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2025.

E. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

F. ASTM D3359 - Standard Test Methods for Rating Adhesion by Tape Test; 2023.

G. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2025.

I. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.

J. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.

K. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 2019.

L. ISO 2812-1 - Paints and Varnishes -- Determination of Resistance to Liquids -- Part 1: Immersion in Liquids Other than Water; 2017.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Verification Samples: Submit two samples 12 inch by 12 inch inch in size illustrating material and surface design of panels.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Panels: Quantity equal to 5 percent of total installed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store panels and trim lying flat, under cover and protected from the elements. Allow panels and adhesive to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.06 FIELD CONDITIONS

A. Environmental Limitations: Building(s) are to be fully enclosed prior to installation with heat (70° or similar room temperature) and ventilation consistent with good working conditions for finish work.

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation by adhesive manufacturer.

C. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Fiberglass Reinforced Plastic Panels:
   1. Marlite, Inc: www.marlite.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL SYSTEMS

A. Wall Panels: Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D5319.
   1. Panel Size: 4 by 8 feet .
   2. Panel Thickness: 0.09 inch.
   3. Surface Design: As indicated on drawings.
   4. Color: As selected by Architect.
   5. Finish: Satin.
   6. Attachment Method: Adhesive only, with trim and sealant in joints.
   7. Scratch Resistance: 28 per ASTM D2583.
   8. Impact Strength: 6.0 ft. lbs/in per ASTM D256 AST.
   9. Water Absorption: 0.15% per ASTM D570.
   10. Cross-Cut Ahesion: 0 removed per ASTM D3359.
   11. Mold & Mildew: Passes per ASTM D3273.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
   2. Class 1 fire rated when tested in accordance with FM 4880.
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   4. Sanitation and Cleanability: Comply with 9 CFR 416.2.
   5. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
   6. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.

B. Trim: Aluminum; For use at top edges, inside and outside corners.

C. Adhesive: Type recommended by panel manufacturer.

D. Sealant: Type recommended by panel manufacturer; clear.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Place trim on panel before fastening edges, as required.

G. Fill channels in trim with sealant before attaching to panel.

H. Install trim with adhesive and screws or nails, as required.

I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION 068316

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SECTION 071400
FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modified-polymer elastomeric waterproofing.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete substrate.

C. Section 072100 - Thermal Insulation: Insulation used for protective cover.

1.03 REFERENCE STANDARDS

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2018 (Reapproved 2022).

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

E. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Warranty Documentation:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's documentation that installation complies with warranty conditions for the field-applied waterproofing.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 FIELD CONDITIONS

A. Maintain ambient temperatures above 30 degrees F for 24 hours before and during application and until cured.

B. Do not install membrane if rainfall is forecast or imminent within 12 hours.

C. Do not apply to frozen concrete.

D. Membrane can be applied to green concrete.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Installer Warranty: Provide 2-year warranty for waterproofing failing to resist penetration of water commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Modified-Polymer Elastomeric Waterproofing:
   1. W.R. Meadows, Inc; Mel-Rol LM: www.wrmeadows.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 FLUID-APPLIED WATERPROOFING APPLICATIONS

A. Modified-Polymer Elastomeric Waterproofing:
   1. Location: For use at below grade foundation walls..

2.03 FLUID-APPLIED WATERPROOFING MATERIALS

A. Modified-Polymer Elastomeric Waterproofing:
   1. Single-component, polymer-modified, cold-applied, liquid waterproofing membrane.
      a. Color: Black
      b. Solids: 70%
      c. Total Cure Time: 16-24 hours
      d. Shore “00” Hardness, ASTM C836/C836M: Passes
      e. Adhesion to Concrete, ASTM C836/C836M: Exceeds
      f. Low Temperature Flex and Crack Bridging, ASTM C836/C836M: Passes
      g. Stability, ASTM C836/C836M: Exceeds
      h. Elongation, ASTM D412 ASTM D412: 1500%
      i. Water Absorption, ASTM D1970/D1970M: 0.7%
      j. Water Vapor Transmission, ASTM E96/E96M (Method B): 0.03 perms

2.04 ACCESSORIES

A. Concrete Repair Materials:
   1. MEADOW-PATCH™ 5 and 20 Concrete Repair Mortars, as manufactured by W.R. Meadows or equivalent.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Rolled Matrix Drainage System: Drainage layer with geotextile filter fabric on earth side as manufactured by W.R. Meadows or equivalent.
   1. MEL-DRAIN™.
   2. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.

C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.

D. Verify that items penetrating surfaces to receive waterproofing are securely installed.

E. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.

F. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.

C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.

D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

F. Prepare building expansion joints at locations as indicated on drawings.

G. Concrete surfaces must be clean, relatively smooth, and free of standing water.

H. Patch all holes and voids and smooth out any surface misalignments.

I. Remove and patch all concrete form ties.

J. Apply primer coat of membrane diluted 4:1 with water if necessary, as determined by manufacturer’s representative, to reduce blistering on concrete surfaces at a coverage rate of 100-150 ft.2/U.S. gal (13.9 m2/3.78 L) by spraying or rolling.

K. Allow primer coat to dry before proceeding to membrane application.

3.03 INSTALLATION

A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.

B. Apply membrane by spray, roller, or brush at a minimum coverage rate of 20-25 ft.2/U.S. gal (1.9-2.3 m2/3.78L) providing a thickness of 60 wet mils. Cured thickness of membrane shall be 45 mils dry.

C. Frequently inspect surface area with a wet mil gauge to ensure consistent thickness.

D. Work material into any fluted rib forming indentations.

E. Do not use products that contain tars, solvents, pitches, polysulfide polymers, or PVC materials that may come into contact with waterproofing membrane system.

F. Apply extra thickness of waterproofing material at corners, intersections, and angles.

G. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL

A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward, and scribe and cut boards around projections, penetrations, and interruptions.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Owner will provide testing services, and Contractor to provide temporary construction and materials for testing.

3.06 PROTECTION

A. Backfill immediately using care to avoid damaging waterproofing membrane system.

END OF SECTION 071400

SECTION 072100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation and integral vapor retarder at underside of floor slabs and exterior wall behind exterior wall finish.

B. Board insulation with concrete facing at perimeter foundation walls.

C. Batt insulation and vapor retarder in exterior wall construction.

D. Batt insulation for filling crevices in exterior wall and roof.

E. Acoustic glass fiber batt insulation in stud framed walls to reduce sound transmission from one room to another.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 DEFINITIONS

A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
   1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
   2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
   3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.04 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2025.

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

F. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.

G. ASTM C764 - Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation; 2025.

H. ASTM C1029 - Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation; 2025.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

J. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

K. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2026.

L. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2025.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Shop Drawings: Submit drawings that indicate location of joint or termination detail conditions.

D. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

G. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

H. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

1.06 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
   1. Installer Qualification: Use accredited contractors, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protection during installation.

B. Protect foam-plastic board insulation as follows:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
   3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

1.08 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.09 WARRANTY

A. Manufacturer's standard Lifetime Limited Warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain insulation materials from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.

B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board with concrete facing.

C. Insulation Over Metal Stud Framed Walls, Continuous: Extruded polystyrene (XPS) board.

D. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.

E. Sound Batt Insulation in Metal or Wood framed walls.

2.03 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type V, 100 psi (690 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value: Type V, 5.0, (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
   5. Board Edges: Square.
   6. Type and Water Absorption: Type V, 0.3 percent by volume, maximum, by total immersion.
   7. Products:
      a. DiversiFoam Products; CertiFoam: www.spi-co.com/#sle.
      b. Dow Chemical Company (The); www.dow.com/#sle.
      c. **(Basis of Design)** Owens Corning Corporation; FOAMULAR type 1000 Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
      d. Substitutions: See Section 016000 - Product Requirements.

B. Extruded Polystyrene (XPS) Board Insulation with concrete facing: Complies with ASTM C578, rigid, closed cell, with integral high density skin, with inegral 5/16 inch thick latex-modified concrete facing.
   1. Products:
      a. (**Basis of Design**): WallGUARD concrete faced insulated perimeter wall panels by T. Clear Corporation, www.tclear.com.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Construction:
      a. Type: Type IV.
      b. Board Size: 2x4 feet x 2-5/16 or 3-5/16 inches thick (refer to drawings for required insulation thickness).
      c. Edges: Tongue-and-grooce sides, square ends.
      d. Thermal Resistance: Long term ages R-value of 5 per inch, tested to ASTM C518.
      e. Foam Compressive Strength: Minimum 35 PSI, tested to ASTM D1621.
      f. Compressice Strength: Minimum 40 PSI, tested to ASTM D1621.
      g. Water Absorption: Maximum 0.7 percent by volume, tested to ASTM D2842.

h. Water Vapor Permeance: 0.8, tested to ASTM E96/E96M.
i. Coefficient of Lineal Thermal Expansions: 3.5 x 10-5 inches per inch x degree F, tested to ASTM D696.

3. Accessories:
   a. Metal cap flashing: 24 gage galvanized steel J-channel; 2-1/4 inches wide, 4 inch long lef and 2-1/4 inch short leg; prefinished, color to be selected.
   b. PVC cap flashing: Ultraviolet stabalized PVC, 0.060 inch thick, Z-shaped, with drip edge, gray.
   c. Clips and fasteners: Corrosion-reistant, sized to suit application; as supplied by insulation manufacturer.
4. Coating / Finish:
   a. Elastomeric, emulsion-based coating:(**Basis of Design**) Horizon Foundation Finishing System by Tremco.
      1) Color: Grey.
      2) Film Thickness: 40 mils dry at 25 square feet per gallon.
      3) Elongation: 150% per ASTM D2370.
      4) Water Vapor Permeance: 6 perms per ASTM E96.

2.04 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.

B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   4. Formaldehyde Content: Zero.
   5. Facing: Unfaced.
   6. Products:
      a. CertainTeed Corporation: www.certainteed.com/#sle.
      b. Guardian Building Products, Inc.
      c. Johns Manville: www.jm.com/#sle.
      d. Knauf Insulation: www.knaufnorthamerica.com.
      e. **(Basis of Design)** Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
      f. Substitutions: See Section 016000 - Product Requirements.

C. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C612; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   4. Formaldehyde Content: Zero.
   5. Facing: Aluminum foil, flame spread 25 rated; one side.
   6. Products:
      a. CertainTeed Corporation: www.certainteed.com/#sle.
      b. Guardian Building Products, Inc.
      c. **(Basis of Design)** Johns Manville; Min Wool Curtain Wall 80: www.jm.com/#sle.

d. Knauf Insulation: www.knaufnorthamerica.com.
e. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
f. Substitutions: See Section 016000 - Product Requirements.

D. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
4. Products:
a. Industrial Insulation Group, LLC.
b. ROCKWOOL (ROXUL, Inc): www.rockwool.com/#sle.
c. Thermafiber, Inc: www.thermafiber.com/#sle.
d. Substitutions: See Section 016000 - Product Requirements.

E. Acoustic Glass Fiber Batt Insulation (Sound Attenuation Batts) - Metal Framed Walls.
1. Type: Unfaced glass-fiber acoustical insulation, complying with ASTM C665, Type I.
a. Width: 16 to 24 inches.
b. Length: 96 inches.
2. Surface Burning Characteristics: ASTM E84.
a. Maximum flame spread: <25
b. Maximum smoke developed: <50
3. Combustion Characteristics: Passes ASTM E136.
4. Fire Resistance Ratings: Part of ASTM E119 fire tested wall assemblies.
5. Sound Transmission Class: ASTM C423, STC based on manufacturer's published data on thickness and wall assembly.
6. Dimensional Stability: Linear Shrinkage less than 0.1%
7. Products:
a. Owens Corning Corporation; PINK Next Gen SOUND ATTENUATION BATTS (SAB): www.ocbuildingspec.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.

F. Safing Insulation
1. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics and made with no formaldehyde.
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1) CertainTeed Corporation.
2) Guardian Building Products, Inc.
3) **(Basis Of Design)** Johns Manville; a Berkshire Hathaway company; Min Wool.
4) Knauf Insulation.
5) Owens Corning.

2.05 ACCESSORIES

A. Insulation for Miscellaneous Voids:
1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
   1. Adhesives shall have a VOC content of 70 g/L or less.
   2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
   1. Application: Sealing of interior circular penetrations, such as pipes or cables.
   2. Width: Are required for application.

D. Flashing Tape: Special reinforced film with high performance adhesive.
   1. Application: Window and door opening flashing tape.
   2. Width: As required for application.
   3. Primer: Tape manufacturer's recommended product.

E. Insulation Fasteners:
   1. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
      a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         1) AGM Industries, Inc.
         2) Gemco.
      b. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
      c. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
   2. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.
      a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
         1) AGM Industries, Inc.
         2) Gemco.

F. Protection Board for Below Grade Insulation: Cementitious, 1/4 inch thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

B. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.

C. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.03 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inches wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
   1. Tape seal joints.
   2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:
   1. Three continuous beads per board length.
   2. Full bed 1/8 inch thick.

C. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Extend boards over expansion joints, unbonded to foundation on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

F. Immediately following application of board insulation, install elastomeric, emulsion-based coating over exposed concrete facing.

3.04 BOARD INSTALLATION AT EXTERIOR WALLS

A. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
   1. Tape seal joints between sheets.
   2. Extend sheet full height of joint.

B. Install rigid insulation directly to steel studs or exterior grade sheathing at 16 inches on center with manufacturer recommended mechanical fasteners, and tape joints with manufacturer's minimum 4 inches wide sealant tape; comply with ASTM E2357.

C. Install boards horizontally on walls.
   1. Install in running bond pattern.
   2. Butt edges and ends tightly to adjacent boards and protrusions.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

E. Place 6 inches wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.

F. Tape insulation board joints.

3.05 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.06 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane between framing members.

F. Tape insulation batts in place.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

H. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over face of member

I. Tape seal tears or cuts in vapor retarder.

J. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.

3.07 FIELD QUALITY CONTROL

A. See Section 014500 - Quality Requirements, for additional requirements.

B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
   1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).
   2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.

3.08 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 072100

SECTION 072726
FLUID-APPLIED VAPOR PERMEABLE MEMBRANE AIR BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied membrane air barriers.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete substrate.

C. Section 054000 - COLD-FORMED METAL FRAMING: Exterior metal stud walls.

D. Section 061000 - ROUGH CARPENTRY: Exterior sheathing.

E. Section Section 074246 - Rainscreen System.

F. Section 076200 - Sheet Metal Flashing and Trim: Metal flashing.

G. Section 079200 - Joint Sealants: Sealants applied to adjacent work.

1.03 DEFINITIONS

A. Air Barrier: Air tight barrier made of material that is virtually air-impermeable but water vapor permeable, both to amount as specified, with seams and joints sealed to adjacent surfaces.

1.04 REFERENCE STANDARDS

A. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2016 (Reapproved 2024).

B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

D. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.

E. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

F. ASTM D2369 - Standard Test Method for Volatile Content of Coatings; 2024.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

I. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

J. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).

K. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before commencing work of this section.

1. Require attendance of parties directly affecting work of this section, including the Owner's Representative, Contractor, Architect, Installation Subcontractor, and Membrane System Manufacturer's Representative.
2. Contractor to notify Architect at least seven days before this meeting.
3. Contractor to record minutes of meeting and distribute to attending parties.
4. Review the following topics:
   a. Surface preparation.
   b. Substrate condition and pretreatment.
   c. Minimum curing duration.
   d. Special details and sheet flashing.
   e. Sequence of construction, responsibilities, and schedule for subsequent operations.
   f. Installation procedures.
   g. Inspection procedures.
   h. Protection and repair procedures.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures for submittal procedures.

B. Product Data: Provide data on membrane and accessory material types, technical and test data, composition, descriptions and properties, installation instructions, and substrate preparation requirements.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

G. Testing agency's qualification statement.

H. Executed warranty.

I. VOC Certification: Submit certification that furnished products comply with local regulations controlling use of volatile organic compounds.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.08 MOCK-UPS

A. See Section 014000 - BSD Quality Requirements for additional requirements.

B. Construct air barrier mock-up, 8 feet long by 8 feet wide, indicating backup wall, cladding, window, door frame, sill, penetrations, insulation, and flashing.

C. Allow at least 72 hours for inspection and testing of mock-up before proceeding with additional related work.

D. Coordinate construction of mock-up to allow for inspection by Architect and Owner's Representative before start of installation.

E. Locate where directed.

F. Mock-up may remain as part of work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver materials to project site in original packaging with seals unbroken and properly labeled.

C. Store materials in their original undamaged packaging within a clean, dry, and protected location at a temperature above freezing and less than 90 degrees F.

D. Sequence deliveries to avoid delays and minimize on-site storage.

1.10 FIELD CONDITIONS

A. Ambient Conditions:
   1. Apply primer within temperature range between 40 to 100 degrees F.
   2. Apply filler within temperature range between 32 to 110 degrees F.
   3. Apply silicone sealant extrusion within temperature range between 40 to 100 degrees F.
   4. Apply sealant adhesive within temperature range between 32 to 110 degrees F.

B. Maintain substrate temperature and humidity and other conditions affecting performance requirements as recommended by materials manufacturers before, during, and after installation.

C. Perform work only when existing and forecasted weather conditions are within the limits as established by material manufacturer.

D. Proceed with installation only when substrate construction and other preparation work are completed and in acceptable condition for air barrier material.

E. Do not apply to frozen substrate; allow adequate time for substrate to thaw, if freezing conditions exist before application.

F. Ultraviolet (UV) Exposure: Do not expose air barrier materials to sunlight and weather longer than recommended by material manufacturer.

1.11 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for defective material. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with all specified requirements, provide products by one of the following, for each type of product listed, or equivalent:

B. Fluid-Applied Membrane Air Barriers:
   1. **(Basis of Design)** PROSOCO, Inc: www.prosoco.com/#sle.
      a. Location: Lawrence, KS.
      b. Phone: (800) 255-4255.
   2. Henry, a Carlisle Company: www.henry.com.
      a. Location 999 N. Sepulveda Blvd Ste 800 El Segundo CA 90245
   3. GCP Applied Technologies: www.gcpat.com.

C. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Comply with physical and performance requirements as indicated:
   1. Provide building envelope with a continuous air- and water-resistive barrier that controls air leakage, avoids condensation in interior wall assembly, and prevents water intrusion.
   2. Provide watertight and airtight joints; seal penetrations and paths of water and air infiltration.
   3. Provide system that withstands positive and negative combined wind, stack effect, and static pressure in HVAC on building envelope without damage or displacement.
   4. Provide system that is airtight and flexible, allowing for relative movement of systems due to thermal and moisture variations.

2.03 FLUID-APPLIED MEMBRANE AIR BARRIERS

A. Applications:
   1. Concrete Walls:
      a. See Section 033000 for concrete.
   2. Exterior Sheathing on Steel Stud Walls:
      a. See Section 054000 for steel studs.
      b. See Section 061000 for exterior sheathing.
      c. See Section 079200 for joint sealants applied to adjacent work.
   3. Rain Screen Wall Panel System:
      a. See Section 074246 - Rainscreen System.

B. Vapor-Permeable Membrane Air Barrier, Fluid Applied: Prevents air and water leakage and is specially formulated for exterior sheathing behind open-jointed or vented pressure-equalized rain screen construction for conditions ranging from everyday weather to drenching rains and 155 mph winds of Category 5 hurricane, and other above-grade wall assemblies complying with ICC-ES AC212.
   1. Material: Limestone, propylene glycol, and silyl-terminated polymer (STP).
   2. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   3. Water Vapor Transmission Rate: At least 14 perms, when tested in accordance with ASTM E96/E96M using Water Method, at 73.4 degrees F.
   4. Tensile Bond: 15 psi, minimum, when tested in accordance with ASTM C297/C297M.
   5. Surface Burning Characteristics: Flame spread index of 25 or less, smoke-developed index of 450 or less, Class A when tested in accordance with ASTM E84.
   6. Comply with NFPA 285 requirements for fire propagation characteristics of exterior non-load-bearing wall assembly.
   7. Fastener Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
   8. VOC Content: Less than 4 fl oz/gal.
   9. Products:
      a. **(Basis of Design)** PROSOCO, Inc; R-GUARD Cat 5 Rain Screen: www.prosoco.com/#sle.
      b. HENRY Co. Air-Bloc All Weather STPE: www.henry.com
      c. GCP Applied Technologies: Perm-A-Barrier VPL and Perm-A-Barrier VPL Low Temperature
      d. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.

B. Thinners and Cleaners: As recommended by material manufacturer.

C. Metal Flashing: See Section 076200.

D. Primer for Gypsum Wallboard Edges: Brush-on, breathable liquid primer with glue-like viscosity; used to seal cut edges of gypsum wallboard where exposed in rough openings for windows and doors; sealed edge provides compatible surface for application of liquid-applied, fiber-reinforced fill coat and seam treatment for through-wall components.
   1. Color: Light blue.
   2. Total Solids: 16 percent, in accordance with ASTM D2369 test method.
   3. VOC Content: Less than 13.3 fl oz/gal.
   4. Products:
      a. PROSOCO, Inc; R-GUARD PorousPrep: www.prosoco.com/#sle.
      b. HENRY Aquatec Primer: www.henry.com

E. Joint and Seam Filler: Silyl-terminated polymer (STP); single-component, fiber-reinforced gun-grade adhesive and detailing compound with silicone and polyurethane properties.
   1. Color: Pale red.
   2. Water Vapor Transmission Rate: At least 19 perms at 20 mil, 0.020-inch thickness, when tested in accordance with ASTM E96/E96M.
   3. Tensile Strength: 70 psi, minimum, when tested in accordance with ASTM D412.
   4. Elongation at Break: Greater than 180 percent when tested in accordance with ASTM D412.
   5. Total Solids: 99 percent.
   6. VOC Content: Less than 4 fl oz/gal.
   7. Products:
      a. PROSOCO, Inc; R-GUARD Joint & Seam Filler: www.prosoco.com/#sle.
      b. HENRY Co., 925 BSE Sealant: www.henry.com
      c. Substitutions: See Section 016000 - Product Requirements.

F. Liquid-Applied Flashing: Single-component silyl-terminated polymer (STP) waterproofing, adhesive, and detailing compound with silicone and polyurethane properties which produces durable, seamless elastomeric membrane to flash rough openings of structural walls, to counterflash waterproofing and air barrier components, and to treat joints, seams, and cracks.
   1. Application: Gun-grade, spread-and-tool, or roller-applied.
   2. Color: Red.
   3. Water Vapor Transmission Rate: At least 21 perms when tested in accordance with ASTM E96/E96M.
   4. Tensile Strength: 150 psi, minimum, when tested in accordance with ASTM D412.
   5. Elongation at Break: Greater than 350 percent, when tested in accordance with ASTM D412.
   6. Total Solids: 99 percent.
   7. VOC Content: Less than 4 fl oz/gal.
   8. Products:
      a. PROSOCO, Inc; R-GUARD FastFlash: www.prosoco.com/#sle.
      b. HENRY Co. Air-Bloc LF Liquid-Applied Flashing
      c. GCP Applied Tech: Perm-A-Barrier NPS Detail Membrane
      d. Substitutions: Not permitted.

G. Waterproofing Sealant: Single-component, gun-grade, waterproofing sealant that has silicone and polyurethane properties; silyl-terminated polymer (STP) produces durable seals, and stops movement of moist air through cracks surrounding windows and doors.
   1. Color: White paste.
   2. Tensile Strength: 85 psi, minimum, when tested in accordance with ASTM D412.
   3. Elongation at Break: Greater than 1,000 percent, when tested in accordance with ASTM D412.

4. Peel Strength: 25 pli when tested in accordance with ASTM C794.
5. Total Solids: 98 percent.
6. VOC Content: Less than 4 fl oz/gal.
7. Products:
    a. PROSOCO, Inc; R-GUARD AirDam: www.prosoco.com/#sle.
    b. HENRY Co. 925 BES Sealant: www.henry.com
    c. Substitutions: See Section 016000 - Product Requirements.

H. Backer Rod: Closed-cell, suitable for deep joints.

I. Preformed Silicone Sealant Extrusion: Extruded, elastomeric, precured silicone material that provides a continuous transition and bridges windows and door frames at curtain wall, storefront, expansion joints, skylights, and roof to air barrier materials.
1. Roll Size: 3 inches wide by 100 feet long.
2. Corner Size: 4-inch outside corner.
3. Tensile Strength: 700 psi, minimum, when tested in accordance with ASTM D412.
4. Shore Hardness, Type A: 50 to 65 when tested in accordance with ASTM D2240.
5. Elongation: Greater than 400 percent, when tested in accordance with ASTM D412.
6. Joint Movement Capacity: Greater than 200 percent elongation and 75 percent compression.
7. Ultraviolet (UV) Resistance: No degradation of material when exposed to UV.
8. Products:
    a. PROSOCO, Inc; R-GUARD SureSpan EX: www.prosoco.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

J. Silicone Sealant Extrusion Adhesive: Single-component, gun-grade adhesive that has silicone and polyurethane properties; silyl-terminated polymer (STP) is easy to gun, spread, and tool.
1. Color: Gray.
2. Tensile Strength: 150 psi, minimum, when tested in accordance with ASTM D412.
3. Shore Hardness, Type A: 40 to 50 when tested in accordance with ASTM D2240.
4. Elongation at Break: Greater than 200 percent, when tested in accordance with ASTM D412.
5. Total Solids: 99 percent.
6. VOC Content: Less than 4 fl oz/gal.
7. Products:
    a. PROSOCO, Inc; R-GUARD SureSpan Adhesive: www.prosoco.com/#sle.
    b. GCP Applied Tech: Perm-A-Barrier Universal Flashing and Sealant
    c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready for work in this section.

B. Verify surfaces are sound, clean and free of voids, surface oxidation, dirt, loose aggregate, sharp protrusions, excess mortar, or other contaminants such as grease, oil, and wax that are detrimental to application.

C. Where existing conditions are the responsibility of another installer, notify Architect of unsatisfactory conditions.

D. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surface to receive adhesives and sealants in accordance with manufacturer's installation instructions.

C. Treat joints in substrate and between dissimilar materials in accordance with manufacturer's installation instructions.

D. Fill or bridge damaged surfaces, voids, or gaps larger than 1 inch.

E. Fill voids and gaps measuring 1 inch or less with liquid-applied fill coat and seam filler as necessary to ensure continuity.

F. Exterior Sheathing:
   1. Ensure that sheathing is properly installed with ends, corners, and edges properly fastened; remove and replace damaged sheathing.
   2. Set mechanical fasteners flush with sheathing; spot overdriven fasteners with liquid-applied fill coat and seam filler.
   3. Seal cut edges of gypsum wallboards exposed in rough openings for windows and doors at corners, as recommended by manufacturer.
   4. Where exterior masonry veneer is being installed, install masonry anchors before installing air barrier over masonry; provide airtight seal around anchors.

G. Masonry and Concrete Substrates:
   1. Ensure that masonry head and bed joints are filled and tooled.
   2. Mechanically remove loose mortar fins, mortar accumulations and protrusions, and debris.
   3. Fill cracks, joints, and gaps with liquid-applied fill coat and seam filler.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with seams and joints sealed to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Backer Rod: Control sealant depth by installing closed-cell backer rod, with diameter 25 percent greater than joint width; do not puncture backer rod.

E. Fluid-Applied Membranes:
   1. Apply bead or trowel coat of mastic sealant with minimum thickness of 1/4 inch along coating seams, rough cuts, and as recommended by manufacturer.
   2. Use flashing to seal adjacent construction and to bridge joints in coating substrate.
   3. Apply liquid-applied fill coat and filler for seams, joints, cracks, gaps, primed rough edges at gypsum sheathing, and rough openings in accordance with manufacturer’s written instructions.
   4. Rate of Application: Spray apply air barrier to substrate at ratings recommended by manufacturer to provide pinhole-free surface and uniform color.
      a. Concrete Masonry Unit (CMU) Substrate:
         1) STP-Based Membrane: 50 to 80 sq ft/gal per coat; provide at least two coats.
      b. Exterior Gypsum Board, Oriented Strand Board (OSB), and Plywood Substrate: 50 to 100 sq ft/gal per coat; provide additional material for uniform surface where substrate porosity varies.
   5. Cap and seal top edge of fluid-applied air barrier where it comes in contact with roofing system to eliminate water intrusion.

F. Openings and Penetrations in Exterior Air Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. Apply liquid flashing membrane over surfaces to seal and waterproof rough openings in accordance with manufacturer's written instructions.
      a. Spread wet product to create an opaque, monolithic flashing membrane that surrounds the rough opening and extends 4 to 6 inches over face of structural wall or sheathing. Apply additional coats as necessary to provide a void-free and pinhole-free surface.
   3. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
   4. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide and covering entire depth of framing.
   5. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
   6. At interior face of openings, seal gap between window and/or door frame, and rough framing, using joint sealant over backer rod.
   7. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Owner will provide testing and inspection services, and Contractor to provide temporary construction and materials for testing.

C. Do not cover installed air barriers until required inspections have been completed.

D. Obtain approval of installation procedures from air barrier manufacturer based on installed-in-place mock-up before proceeding with remainder of installation.

E. Take digital photographs of each portion of installation before covering up air barriers.

3.05 PROTECTION

A. Do not leave installed materials exposed to sunlight and weather longer than recommended by manufacturer.

END OF SECTION 072726

SECTION 074213
METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for soffit panels, with accessory components.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 054000 - COLD-FORMED METAL FRAMING: Wall panel substrate.

C. Section 072500 - WEATHER BARRIERS: Weather barrier under wall panels.

D. Section 079200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.

C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, and methods of anchorage.

D. Samples: Submit two samples of soffit panel, illustrating finish color, sheen, and texture.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of experience.

B. Installer Qualifications: Company specializing in installing products specified in this section with minimum three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

C. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

D. Prevent contact with materials that may cause discoloration or staining of products.

1.07 FIELD CONDITIONS

A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.08 WARRANTY

A. See Section 017700-Closeout Procedures for additional warranty requirements.

B. Finish Warranty: Provide 15-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

C. Special Warranty: Provide 2-year warranty covering water tightness and integrity of seals of metal wall panels. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. General:
   1. Source Limitations: Obtain specified products from single source from single manufacturer.
      a. The manufacturer and model number(s) or series listed below are Basis-of-Design.
      b. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Metal Soffit Panels:
   1. Drexel Metals; DMC FWQ100: www.drexelmetals.com
   2. Metal Roofing Systems, Inc; Flush Seam Soffit Panels: www.metalroofingsystems.com.
   3. Petersen Aluminum Corporation; Flush Soffit: www.pac-clad.com.
   4. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL WALL PANEL SYSTEM

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Provide soffit panels.
   2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
   3. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   4. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
   5. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
   6. Corners: Factory-fabricated in one continuous piece with minimum 2-inch returns.
   7. Provide continuity of weather barrier seal at building enclosure elements in accordance with requirements; see Section 072500.

B. Soffit Panels:
   1. Profile: Style as indicated, with venting provided.
   2. Color: As selected by Architect from manufacturer's standard line.

C. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

D. Anchors: Galvanized steel.

2.03 MATERIALS

A. Precoated Aluminum Sheet: ASTM B209/B209M, 3105 alloy, O temper, with smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 FINISHES

A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.

B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.

C. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss as selected by Architect from manufacturer’s standard line.
   1. Products:
      a. Arkema, Inc; Kynar 500: www.arkema.com/#sle.
      b. Beckers Group; Beckry Fluor: www.beckers-group.com/#sle.
      c. PPG; Duranar: www.ppgmetalcoatings.com/#sle.
      d. Sherwin-Williams Company; Fluropon: www.coil.sherwin.com.
      e. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing members are ready to receive panels.

B. Verify weather barrier, see Section 072500, has been installed over wall panel substrate; see Section 054000.

3.02 PREPARATION

A. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

3.03 INSTALLATION

A. Install panels on soffits in accordance with manufacturer's instructions.

B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to soffit panel installation.

C. Fasten panels to structural supports; aligned, level, and plumb.

D. Locate joints over supports.

E. Lap panel ends 2 inches, minimum.

F. Use concealed fasteners unless otherwise indicated by Architect.

G. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.04 TOLERANCES

A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch, maximum.

B. Variation from Plane or Location As Indicated on Drawings: 1/8 inch, maximum.

3.05 CLEANING

A. Remove site cuttings from finish surfaces.

B. Remove protective material from wall panel surfaces.

C. Upon completion of installation, thoroughly clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

3.06 PROTECTION

A. Protect metal soffit panels until completion of project.

B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

END OF SECTION 074213

SECTION 074233
SOLID PHENOLIC RAINSCREEN WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior solid phenolic rainscreen wall panels with thermally isolated supporting substructure which is part of the rainscreen system.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections apply to this Section.

B. Related Sections:
   1. Section 054000 - Cold-Formed Metal Framing: In-wall blocking as needed for attachment of rainscreen substructure.
   2. Section 061000 - Rough Carpentry: In-wall blocking as needed for attachment of rainscreen substructure.
   3. Section 061000 - Rough Carpentry: Installation of wall sheathing behind rain-screen wall panel system and in-wall blocking as needed for attachment of rainscreen substructure.
   4. Section 072100 - Thermal Insulation: Insulation installed behind rain-screen wall panel system.
   5. Section 072500 - Weather Barriers: Water and air resistant barrier, which is an integral part of rainscreen design.
   6. Section 074800 - Rainscreen Attachment System: Support system for rainscreen wall panels.

1.03 SYSTEM DESCRIPTION

A. Exterior Rainscreen Assembly: Solid phenolic core, fire-retardant, exterior grade rainscreen wall panels, substructure, concealed fastening system components, air/vapor barrier membrane, continuous exterior insulation, and all accessories necessary for a complete rear-ventilated, weathertight exterior rainscreen wall system. Furnish fastenings and flashings as required to complete rainscreen system.

1.04 PERFORMANCE REQUIREMENTS

A. General Performance: Solid phenolic exterior rainscreen wall panel system, aluminum substructure, and attachment accessories shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Delegated Design Engineering: Design solid phenolic exterior rainscreen wall panel system, including comprehensive engineering analysis by a qualified professional engineer, licensed in the project locations State, using performance requirements and design criteria indicated.
   1. Design shall be inclusive of support structure system and all attachment accessories.
   2. Design shall be inclusive of solid phenolic exterior rainscreen wall panel manufacturing and shall conform to Manufacturer’s recommended installation procedures.

C. Structural Performance: Provide solid phenolic exterior wall panel system capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated based on Manufacturer’s most current testing standards:
   1. Wind Loads: Provide exterior rainscreen wall panel system, including aluminum support structure, capable of withstanding wind loads calculated according to requirements of authorities having jurisdiction or as determined based on the following minimum design wind pressures, whichever are more stringent:

a. Uniform pressure as indicated on Drawings.
b. As determined by the American Society of Civil Engineers' ASCE 7, Analytical Procedure.

D. Deflection Limits: support structure and exterior phenolic rainscreen panel system shall be designed in accordance with the Manufacturer's recommended maximum deflection when tested under positive and negative design wind gust loads and shall withstand wind gust loads with horizontal deflections no greater than the Manufacturer's allowable span.

E. Thermal Movements: Exterior solid phenolic rainscreen panel system shall allow for thermal movements from ambient air and surface temperature changes by preventing buckling, opening of joints, over-stressing of components, failure of connections and other detrimental effects. Base calculations on surface temperature changes of materials due to both solar heat gain and nighttime-sky heat loss.
1. Panel shall remain stable for temperature Change (Range): -112° F, ambient: 356° F, material surfaces.

F. Support Sub-Structure: Provide thermally isolated aluminum support structure capable of the following:
1. Design and install ZAM or G90 coated support structure to accommodate expected construction tolerances and misalignment, deflection of building structural components and openings in the building enclosure as designed.

1.05 REFERENCE STANDARDS

A. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rainscreen Wall Cladding Systems; 2022.

B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

G. BS EN 178 - Plastics — Determination of flexural properties; Current Edition.

H. BS EN 438-4 - High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates), Part 4; Current Edition.

I. BS EN 438-6 - High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) Part 6: Classification and specifications for Exterior-grade compact laminates of thickness 2 mm and greater; Current Edition.

J. ISO 4892-2 - Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps; Current Edition.

K. ISO 4892-3 - Plastics - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps; Current Edition.

L. ISO 9001 - Quality Management Systems — Requirements; 2026.

M. ISO 14001 - Environmental Management Systems — Requirements with Guidance for Use; 2015, with Amendment (2024).

N. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2022.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of product indicated. Include Manufacturer's written installation instructions, including recommendations for evaluating, preparing, and treating substrate, rainscreen panel technical data, material descriptions, and finishes and tested physical and performance properties.

C. Shop Drawings: Show fabrication and installation layouts of solid phenolic exterior rainscreen panel, details of support structure conditions, anchorages for support structure, attachment system for panels, allowances for thermal expansion, trim, flashings, closures, corners, and accessories as required, and all special job specific details.

D. Samples: For each type of exposed finish required, provide samples of size and type indicated below for approval:
   1. Rainscreen Wall Panels: Two, four by four inches minimum, including fasteners and other wall panel accessories as required.
   2. Support Structure: Two, 12” long including fasteners and other accessories. Submit samples demonstrating materials, colors, and fastener attachment type.
   3. For exposed fastening systems submit color matched exterior stainless steel Torx head fasteners for each panel color specified. If riveted fastening is selected by architect provide color matched rivets for each panel color specified.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Delegated Design Documents: Drawings and calculationssealed by Professional Engineer, licensed in the project locations State.

G. Professional Engineer's qualification statement.

H. Manufacturer's qualification statement.

I. Installer's qualification statement: Provide certification or letter signed by solid phenolic rainscreen panel Manufacturer certifying that the installer complies with requirements to perform the work specified in this Section.

J. Engineering Design Certification: From solid phenolic rainscreen panel Manufacturer, provide certification of acceptance of final shop drawings and acceptance of qualifications for installer. Certification must be provided before start of the Work.

K. Operation and Maintenance Data: Operation and maintenance manuals including methods for maintaining installed products, replacing damaged panels, and precautions against cleaning materials and methods detrimental to finishes and performance.

L. Warranty: Sample of Manufacturer’s standard 10-year material and labor warranty for solid phenolic exterior rainscreen wall panel system.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of Professional Engineer, experienced in design of this type of work and licensed in the project locations State.

B. Fabricator Qualifications: Company specializing in fabricating products specified in this section, with at least five years of documented experience, whose finished products have a record of successful in-service performance and approved by the Manufacturer.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience, whose work has resulted in applications with a record of successful in-service performance and approved by Manufacturer.

D. Source Limitations: Obtain solid phenolic rainscreen panels and all auxiliary materials from a single-source Manufacturer who has a minimum of 25 years' experience in the manufacture of exterior rainscreen wall systems or an accessory Manufacturer who is certified by the solid phenolic rainscreen panel Manufacturer. Panels shall be manufactured in accordance with ISO 9001 and ISO 14001.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of solid phenolic rainscreen wall panels to be performed according to Manufacturer's written installation instructions and warranty requirements.

B. Field Measurements: Verify actual panel measurements/openings by field measurement before fabrication to accommodate site tolerances and changes in construction.

C. Comply with Manufacturer's stated ordering, lead-time, and manufacturing requirements to avoid construction delays.

1.09 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver solid phenolic panel materials, support structure, and other manufactured accessory materials in Manufacturer's original, unopened, and undamaged containers with identification labels intact and visible. Package solid phenolic rainscreen panels for protection during transportation and handling. Comply with Manufacturer's and Distributor's written delivery and handling guidelines.

C. Store solid phenolic rainscreen panels horizontally, covered with suitable weathertight and ventilated covering to prevent exposure to UV light and to ensure dryness with positive slope for drainage. Do not store panels in contact with ground or with materials that might cause staining, damage, scratching, or other surface damage.

D. Phenolic panel installer shall notify the General Contractor immediately upon discovery of any issues with the substrate, i.e. improper framing, walls out of plumb, windows not properly aligned, etc. These issues shall be appropriately addressed prior to continuation of panel system installation.

E. Remove damaged and waste panel material from site and legally dispose of according to authorities having jurisdiction.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 10 year manufacturer warranty for material and labor. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 RAINSCREEN WALL PANELS

A. Equivalent or substituted products must be manufactured using a high-pressure laminate press process that meet all requirements of BS EN 438-4. Products manufactured as a low-pressure lamination to a phenolic core will not be accepted.

B. Product Description:
   1. Material: Solid phenolic resin, fire-retardant, exterior grade rainscreen panel.
   2. Panel Finish: as selected by Architect from Manufacturer's standard color range.
   3. Panel Core: Standard brown core.
   4. Panel Thickness: Standard 5/16".
   5. Panel Sizes: As indicated on drawings.

C. Physical Properties:
   1. Smoke Development Index: Less than 450 per ASTM E84.
   2. Flame Spread Index: Less than 25 per ASTM E84.
   3. NFPA 268 Surface Ignition test: Pass.
   4. Panels shall have UV and weather resistance performance with a grey scale rating minimum of 4-5 per ISO 4892-2 and ISO 4892-3.
   5. Panels shall be impact resistant per BS EN 178.
   6. Panels shall be hail impact resistant: 2-3/4" ice ball at a velocity of 98'-5"/second (approximately 65 mph) with no breakage, discoloration or tearing per Austrian APBIC.
   7. Panels shall be scratch resistant per BS EN 438-6.
   8. Manufacturer:
      a. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.
      b. (**Basis of Design**) Fundermax North America; Max Compact Exterior F Quality: www.fundermax.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

2.03 THERMALLY ISOLATED SUPPORTING SUBSTRUCTURE

A. General:
   1. Concealed Clip System: Manufacturer's standard system consisting of starter tracks, panel clips, corner clips, sealant backers, and spacers.
   2. Non-continuous, self-shimming bracket and rail assembly to accomodate out of plumb conditions.
   3. Provide all rain screen attachment system components from a single source.

B. Materials:
   1. Sigma Brackets
      a. Made from 300 series stainless steel.
      b. Mill finish
      c. Brackets must be self-shimming for out of plumb conditions, with at least 1.5 inch of built in adjustability. External shims are not acceptable.
      d. Brackets must be compatible for use in both horizontal and vertical applications.
      e. Thermal isolator pads to attach to brackets must be included.
   2. Rail Components:
      a. Made from 6000 series architectural grade aluminum.
      b. Mill finish
   3. Fasteners:
      a. Minimum 304 series stainless steel fasteners and anchors of type, size and spacing required for type of substrate and project conditions, to meet performance requirements specified and as indicated in design calculations and shop drawings.
   4. The following characteristics are not acceptable:

a. Continuous framing profiles
b. Components made from galvanized steel or galvalume.
c. Components made from FRP or figerglass materials.

5. Thermal Barrier
   a. Material:
      1) Injection molded polypropylene copolymer.
      2) Injection molded polyoxymethylene copolymer (POM) non-fiber reinforced.

C. Manufacturer:
   1. ECO Cladding; Sigma VCI.40 concealed system. www.ECOcladding.com.
   2. Substitutions: See Section 016000 - Product Requirements.

2.04 FABRICATION

A. General: Fabricate solid phenolic rainscreen wall panels and accessory materials in accordance with Manufacturer's written instructions and approved submittals, and at a fabrication facility trained and approved by Manufacturer. Comply with indicated profiles and within dimensional and structural requirements.

B. Dimensional Tolerances:
   1. Overall panel dimensions within 1mm of panel width and height.
   2. Squareness within 0.5 mm per meter.

2.05 ACCESSORIES

A. Trim: Same material and texture as panel.

B. Metal Trim: Extruded aluminum, ASTM B221, color anodized.
   1. Dimensions, Profile, and Layout: As indicated on drawings.
   2. Anodized Color: As selected by Architect.

C. Flashing: See Section 076200.

D. Sealant: ASTM C920, Class 35; elastomeric, polyurethane, silyl-terminated polyether, or silyl-terminated polyurethane.

2.06 SOURCE QUALITY CONTROL

A. See Section 014500 - Quality Requirements, for additional requirements.

B. Testing of Drainable and Back-Ventilated (D/BV) Rain Screen Panel System: Submit results in accordance with AAMA 509 for D/BV wall panel system similar to system specified.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements, installation tolerances of structural substrate, support structure, solid phenolic rainscreen panel, and other conditions affecting performance.
   1. Verify that substrate conditions, wall framing, and other structural panel support members and anchorages installed under other sections are acceptable for product installation and have been installed within acceptable tolerances in accordance with Manufacturer's written instructions.
   2. Verify that air and weather resistant barrier has been installed over structural sheathing in accordance with air barrier Manufacturer's recommend installation instructions and terminated properly at openings to prevent air infiltration or water penetration.
   3. Examine rough-in installation for components and systems adjacent to and penetrating into solid phenolic rainscreen panels to verify actual locations of penetrations relative to joint locations of panels prior to panel installation.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect surrounding areas and adjacent surfaces from damage during execution of work.

B. Support Sub-structure: Install clips, channels, fillers, and other components in accordance with approved Shop Drawings and Manufacturer's recommended installation instructions.

C. Install support structure framing level and plumb and within tolerances of the completed system as approved and recommend by Manufacturer and in accordance with approved Shop Drawings.

D. Ensure air and water barrier is properly installed per air and water barrier Manufacturer's approved rainscreen wall panel installation instructions and is protected from UV light deterioration at panel open joint locations or is otherwise UV stable. Pay close attention to manufacturer's recommendations for treating penetrations in the membrane.

E. Notify Architect immediately upon discovery of any tears, holes, or other damage to the membrane weather barrier.

3.03 INSTALLATION

A. Rainscreen attachment system:
   1. Install rain screen attachment system in accordance with manufacturer's instructions and approved shop drawings.
   2. Establish level lines for panel coursing and position of brackets and rails.
   3. Attach brackets with engineered fasteners to accomplish performance requirements.
   4. Attach horizontal or vertical rails with engineered fasteners to accomplish performance requirements.
      a. Provide 1/2" to 1" space between end of adjacent profiles.
   5. Install exterior insulation to fit between wall brackets prior to installing vertical support rails.
   6. Attach support rails with engineered fasteners to accomplish performance requirements.
      a. Provide 1/2" to 1" space between end of adjacent profiles.

B. Install solid phenolic rainscreen panel's plumb and level and accurately spaced per Manufacturer's written installation instructions and in accordance with approved Shop Drawings.

C. Install wall panels minimum 6 inches above surface of ground and minimum 1 inch away from surfaces where water may collect.

D. Ensure supports for cladding and continuous insulation are plumb and plane.

E. Control and Expansion Joints: Install as recommended by wall panel manufacturer.

F. Sheet Metal Flashing: Install in accordance with wall panel manufacturer's instructions.

G. Fasten solid phenolic rainscreen wall panels to aluminum substructure with fasteners approved for use with adjoining construction and in accordance with approved Shop Drawings for color matching and to confirm compliance with wind load and engineering design requirements.

H. Accessory Rainscreen System Materials: Install corner profiles, gaskets, trims, and joint closure strips as required with fasteners and adhesive appropriate for use with adjoining construction as indicated on Shop Drawings and as recommended by Manufacturer.

I. Erection Tolerances: Install aluminum support structure within the required installation tolerances as recommended by Manufacturer and in accordance with approved Shop Drawings.

J. See Section 079200 for installation of sealants and backers around penetrations and between wall panels and adjacent construction.

1. Do not apply sealant to solid phenolic rainscreen panel joinery unless otherwise indicated on Drawings or in accordance with Manufacturer's recommended installation instructions.

3.04 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Upon completion of solid phenolic rainscreen wall panel installation clean finished surfaces as recommended by panel Manufacturer prior to Owners' acceptance.

C. Legally dispose of all surplus materials off site.

3.05 PROTECTION

A. Protect installed products until Date of Substantial Completion.

END OF SECTION 074233

SECTION 075323
ELASTOMERIC (EPDM) MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered roof system with ethylene propylene diene monomer (EPDM) roofing membrane.
B. Underlayment board.
C. Vapor barrier.
D. Polyiscocyanurate insulation flat and tapered.
E. Overlayment board.
F. Adhesives and cleaners.
G. Fasteners and plates.
H. Auxiliary Materials.
I. Fascia and coping systems.
J. Roofing walkway pads.

1.02 SUMMARY

A. Project consists of installation of a new fully adhered EPDM roofing system with a 25 year Total Systems Warranty as specified herein.
B. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of a 0.060 inch thick non-reinforced EPDM membrane, Fully Adhered Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
C. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
D. Extent and location(s) of fully adhered EPDM membrane roofing work is indicated on drawings and by provisions of this section.
E. Assure that areas to receive new roofing materials are clean, smooth, free of projections or other defects that would interfere with proper installation of system.
F. Coordinate installation of vapor barrier, insulation and overlayment with installation of roofing membrane.
G. Install new roofing systems in accordance with manufacturer's reviewed shop drawings and printed instruction.
H. Provide wood blocking, nailers and plywood including anchors and/or fasteners required for proper installation, as specified in Division 6.
I. Provide fascia, coping and metal flashing as specified.
J. Upon completion of work, leave premises clean, free from scraps and debris. Dispose of all debris legally away from site.
K. Metal Deck Areas:
    1. Install new roofing system over new metal deck as indicated on drawings, as specified herein and as follows:
        a. Mechanically fasten new underlayment board to new metal deck.
        b. Install new vapor barrier over new underlayment board.

c. Fully adhere base layer of insulation to new vapor barrier, then fully adhere subsequent layers of new insulation.
d. Fully adhere new overlayment board to new insulation.
e. Fully adhere new 0.060” EPDM membrane to new overlayment board.
f. Install new membrane flashings as indicated on drawings.

1.03 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 053100 - STEEL DECKING.

C. Section 076200 - Sheet Metal Flashing and Trim: Counterflashing.

1.04 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM C209 - Standard Test Methods for Cellulosic Fiber Insulating Board; 2020.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

D. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

E. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).

F. ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging; 2025.

G. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

J. CAN-ULC-S770 - Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams; 2020 Reaffirmed.

K. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2026).

L. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).

M. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.06 SUBMITTALS

A. See Section 013300 Submittal Procedures, for submittal procedures.

B. Product Data: Provide manufacturer's written information listed below.
1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, and fasteners.

2. Preparation instructions and recommendations.
3. Storage and handling requirements.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and walkway pad layout and identification of materials.

D. Samples, if requested by Architect:
1. EPDM membrane material: 6" x 6".
2. Flashing material: 6" x 6".
3. Insulation material: 4" x 4".
4. Tapered insulation material: 4" x 4".
5. Underlayment: 4" x 4".
6. Overlayment: 4" x 4".
7. Vapor barrier: 12" x 12".
8. Metal Fascia and Coping: 12” long.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and other supplementary instructions.

G. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, special procedures, and perimeter conditions requiring special attention.

H. Specimen Warranty: For approval.

I. Warranty:
1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.
3. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the Architect prior to the issuance of the manufacturer's warranty.

J. Manufacturer's Qualification Statement.

K. Installer's Qualification Statement.
1. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system.

1.07 QUALITY ASSURANCE

A. Fully adhered (fire retardant) membrane roofing: Classified by Underwriter's Laboratories, Inc. (U.L.), as a Class "A" sheathing material.

B. Roof Installation Acceptances:
1. Roofing system shall be designed to meet or exceed the uplift pressures calculated, and as indicated on drawings.

C. Materials used in conjunction with fully adhered EPDM membrane roofing and flashing systems specified herein shall be a product of, or approved in writing by, roofing materials' manufacturer furnishing roofing and related flashing warranty for this project. (Roofing and flashing system shall include all materials specified herein used in conjunction with roofing work.)

D. Provide materials that are compatible with specified membrane roofing systems and other materials with which they come in contact.

E. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.

F. Installer Qualifications: Company specializing in performing work of this section:
   1. With minimum ten years documented experience.
   2. Approved by membrane manufacturer.

G. It is the roofing applicator's responsibility to adhere to all applicable building codes (local and national) for roofing system installation requirements and limitations in their local area.

H. Electrical Work:
   1. All electrical devices and wiring used on project shall be approved and listed by Underwriters' Laboratories, Inc. and shall bear U.L. designation of acceptance.
   2. Performed by experienced personnel, actively engaged in type of work encountered.

I. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

J. Inspection: Upon completion of installation, an inspection shall be made by technical representative of roofing materials manufacturer to ascertain that roofing system has been installed in accordance with reviewed instructions and shop drawings. He will determine whether or not corrective work will be required before the warranty will be issued.

1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

C. Deliver materials in sufficient quantity to allow continuity of work.

D. During loading, transporting and unloading, exercise care to prevent damage to materials.

E. Do not cut, tear or puncture elastomeric sheets.

F. Select and operate material handling equipment so as not to damage other construction or applied roofing.

G. Store materials required for roof thermal barrier, vapor barrier and insulation work at least 4 inches above ground and completely cover with tarpaulins. Make necessary arrangements to provide 1 foot 0 inch air space between top of roofing materials and tarpaulins. In addition, handling and storage procedures for insulation shall conform to local, state and other applicable code requirements and manufacturer's recommendations.
   1. Provide continuous protection of materials against wetting and moisture absorption.
   2. Protect materials against damage by construction traffic.

H. Protect foam insulation from direct exposure to sunlight.

I. Materials used in conjunction with membrane installation, other than EPDM membrane: Store in enclosures or under protective coverings maintaining temperatures between 60°F and 80°F. Should materials be exposed to lower temperatures, restore to room temperature prior to use.
   1. Assure that materials are kept clean and dry. Store cardboard containers in dry area.

J. Remove all wet and unacceptable materials from project site.

K. Do not use materials damaged in handling or storage.

L. Keep Safety Data Sheets (SDS) at the project site at all times during transportation, storage, and installation of materials.

M. Comply with requirements from Owner to prevent overloading or disturbance of the structure when loading materials onto the roof.

1.09 FIELD CONDITIONS

A. Environmental Requirements:
   1. Apply roofing system in dry weather to dry surfaces.
      a. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
   2. Observe job condition, including caution and warning requirements of material manufacturers.
   3. The Contractor must coordinate with the Owner's representative to shut down and cover any air intake and/or ventilator units that can potentially allow fumes into the building. The Contractor is also responsible for coordinating with the Owner's representative to keep windows closed in the area which will be worked on that day.
   4. Do not expose materials vulnerable to water or sun damage or sun damage in quantities greater than can be weatherproofed the same day.

B. Proceed with work so new roofing materials are not subject to construction traffic as work progresses.

C. Protection:
   1. Roofing Contractor shall assume responsibility for providing necessary protection at all times as required to keep existing deck substrate free from exposure to moisture in any form and to prevent infiltration of moisture and/or water to interior of building. Areas, building contents and/or materials damaged as a result of work required shall be restored to their original condition at no extra cost to Owner.
   2. Maintain protection until new roofing membrane installation is complete and roof areas are made watertight.
   3. Where roof mounted equipment is reinstalled after membrane roofing application has been completed, provide adequate protection to prevent damage of any type to roofing membrane, flashings, or any other related roofing materials.
   4. Upon completion of installation of roof mounted equipment and removal of required protective materials, inspect roofing membrane and associated roofing materials to assure that damage of any type has not been inflicted that would affect roofing warranty in any manner.
   5. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.
   6. Take precautions to prevent drains from clogging during the roofing application. Remove debris at the completion of each day's work and clean drains, if required.

D. Special Conditions:
   1. Select types of equipment to accommodate safe loading capacities for working loads imposed to accomplish work required.
   2. Do not apply loads, vibration, techniques or initiate any action that would be detrimental to or weaken existing roof deck substrate system.
   3. Repair at no additional cost to Owner, any portion of roof deck and/or structure damaged by reason of work required on this project.
   4. Notify Architect, in writing, pertaining to any questionable conditions which exist, prior to starting of work.
   5. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
   6. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

7. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
8. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
9. Provide protection, such as 3/4-inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
10. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
11. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.10 SAFETY

A. The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

1.11 WORKMANSHIP

A. Applicators installing the new roof, flashing and related work shall be factory trained and approved by the membrane manufacturer.

B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.

C. There shall be a supervisor on the job site at all times while work is in progress.

1.12 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 10 years after installation.

C. System Warranty: Provide manufacturer's 20 year Total System Warranty, including fascias and copings, agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. The maximum wind speed coverage shall be peak gusts of 90 mph, measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
   2. For repair and replacement include costs of both material and labor, with no dollar limitation, in warranty.

D. 32 hours of Accidental Puncture.

E. Certification of the manufacturer's warranty reserve.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. Fully adhered membrane roofing system components, methods and materials specified herein are products of Carlisle SynTec, Inc. or accepted as compatible product. Products of the following manufacturers subject to compliance with requirements will be acceptable:

2.02 MANUFACTURERS

A. **(Basis of Design)** Carlisle SynTec Systems: www.carlisle-syntec.com/#sle.

B. Versico Roofing Systems, Inc.: www.versico.com/#sle.

C. Johns Manville - Commercial Roofing Systems: www.jm.com/#sle.

D. Substitutions: See Section 016000 - Product Requirements.

2.03 ROOFING APPLICATIONS

A. Roofing Assembly Performance Requirements and Design Criteria:
   1. Roof Covering External Fire Resistance Classification: Class A when tested per UL 790.
   2. Wind Uplift:
      a. Designed to withstand wind uplift forces calculated with ASCE 7.
      b. Design Wind Speed: In accordance with local building code and authorities having jurisdiction (AHJ).
   3. Insulation Thermal Resistance (R-Value): Provide R-Value over entire roof deck in accordance with local building code requirements and as indicated on drawings.
   4. Drainage: No standing water within 48 hours after precipitation.

2.04 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Ethylene propylene diene monomer (EPDM); ASTM D4637/D4637M, Type I (non-reinforced).
   2. Thickness: 60 mil, 0.060 inch, minimum.
   3. Sheet Width: Factory fabricated into largest sheets possible.
      a. When a 10-foot wide membrane is to be used, the membrane shall be manufactured in a single panel with no factory splices to reduce splice intersections with 6 inch factory applied tape.
   4. Color: Black.
   5. Products:
      a. Carlisle SynTec Systems; Sure-Seal.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Vapor Retarder: Equivalent to Carlisle 725 TR Air and Vapor Barrier. Vapor barrier is a 40 mil composite, consisting of 35 mils of self-adhering, rubberized asphalt, laminated to a 5 mil skid resistant polyethylene film. The underlayment board shall be primed with Carlisle CCW-702 Primer in accordance with manufacturer's specifications.; compatible with roofing and insulation materials.
   1. Fire-retardant adhesive.

D. Flexible Flashing Material: Same material as membrane.

E. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.05 DECK SUBSTRATE AND COVER BOARDS

A. Deck Substrate and Cover Board: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 1/2 inch thick.
   1. Flame Spread: 5 per ASTM E84.
   2. Smoke Development: 0 per ASTM E84.

3. Product:
   a. Georgia-Pacific Gypsum LLC; Dens-Deck Prime, distributed by Carlisle SynTec Systems: www.buildgp.com/#sle.
   b. **(Basis of Design)** United States Gysum Corp.; Securock Gypsum-Fiber Roof Board: www.usg.com/#sle.

2.06 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: ASTM C1289, Type II, Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of the core foam; Grade 2.
   1. Flat Insulation: Thickness as indicated on drawings.
      a. "R" value = 5.6 per inch.
   2. Tapered Insulation: Slope and thickness as indicated on drawings.
   3. Total **minimum** "R" value shall be R-33 for the flat and/or tapered insulation system.
   4. Compressive Strength: .
   5. Conform to following minimum properties:

PROPERTY	TEST METHOD	
Water absorption	ASTM C209	<1% volume
Dimensional stability	ASTM D2126	2% maximum 7 days
Compressive strength	ASTM D1621	20 psi minimum (Grade 2)
Moisture vapor transmission	ASTM E96/E96M	<1 perm

   6. Flame spread (foam core) ASTM E84 50
   7. Smoke developed (foam core) ASTM E84 200
   8. Thermal Values: Long-term thermal resistance (LTTR) values determined in accordance with CAN-ULC-S770, ASTM C1289.
   9. Insulation transitions/step offs greater than ½" will require a transition board such as a wood fiberboard tapered edge strip.
   10. Product:
      a. Carlisle SynTec Systems; Insulbase: www.carlislesyntec.com/#sle.

2.07 ACCESSORIES

A. All products shall be furnished by the membrane manufacturer and specifically formulated for the intended purpose.

B. Prefabricated Flashing Accessories:
   1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
      a. Carlisle SynTec Systems; Sure-Seal (black) Pressure-Sensitive Inside/Outside Corner: 60 mil, 0.060 inch thick, 7 by 9 inches precut, uncured EPDM with 35 mil, 0.035 inch factory-applied tape.
      b. Carlisle SynTec Systems; Sure-Seal Fully Pressure-Sensitive Curb Flashing: 60 mil, 0.060 inch thick, cured EPDM with 35 mil, 0.035 inch thick, 6 inches or 12 inches wide factory-applied tape along one edge.
      c. Carlisle SynTec Systems; Sure-Seal Pressure-Sensitive Overlayment Strip: 40 mil, 0.040 inch thick, semi-cured EPDM laminated to 35 mil, 0.035 inch factory-applied tape.
   2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
      a. Carlisle SynTec Systems; Sure-Seal Pressure-Sensitive Pipe Seals; with factory-applied tape on deck flange.
   3. Carlisle SynTec Systems; Sure-Seal Pressure-Sensitive Reinforced Universal Securement Strip (RUSS):

C. Insulation & Overlayment Adhesive: Two component polyurethane, expanding foam.
   1. Insulation adhesive must be a 2 part low rise foam adhesive with 100% adhesion or Ribbon method at 4 inches o.c.
   2. Product:
      a. Carlisle SynTec Systems; Flexible FAST.

D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self-adhering.

E. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
   2. HP Fastener: Threaded, E-coat, square head fastener for insulation attachment to steel, wood plank, plywood or oriented strand board decks.
   3. HP-X Fastener: #15 threaded fastener with #3 Phillips drive. Use with Carlisle SynTec Systems Piranha Fastening Plate for mechanically fastened membrane systems on steel or plywood decks.
   4. Piranha Plate: 3-inch diameter, barbed metal fastening plate. Use with Carlisle HP-X, CD-10 or HD 14-10 Fasteners to secure membrane or insulation in mechanically fastened membrane systems.
   5. RUSS (Reinforced Universal Securement Strip): a 6 inch wide, 100 foot long strip of reinforced EPDM membrane.
   6. The 6 inch wide RUSS shall be utilized horizontally or vertically (in conjunction with Seam Fastening Plates) below the EPDM membrane for additional membrane securement.
   7. All fasteners and plates must be approved by membrane manufacturer.

F. Membrane Adhesive: As recommended by membrane manufacturer.
   1. Cav-Grip III: Multipurpose contact adhesive and primer.

G. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

H. Splice Tape and Primer.
   1. Carlisle SynTec Systems; Sure-Seal 6 inch SecurTAPE and EPDM Primer.

I. Sealants: As recommended by membrane manufacturer.
   1. Carlisle SynTec Systems; Sure-Seal Lap Sealant: Butyl-based contact cement.

J. Sealer.
   1. Carlisle SynTec Systems; Sure-Seal Pourable Sealer

K. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
   1. Carlisle SynTec Systems; Sure-Seal Splice Cleaner.

L. Primer: Manufacturer's recommended product.
   1. Products:
      a. Carlisle CAV-GRIP III Primer/Adhesive.

2.08 FASCIA AND COPING SYSTEMS

A. Quality Assurance: High performance roof edge/gravel stop shall be **certified** by the roof edge/gravel stop manufacturer to comply with ANSI/SPRI Standard ES-1-98. Roof edge/gravel stop shall meet performance design criteria according to the following test standards:
   1. ANSI/SPRI ES-1-98, Test Method RE-1 for Roof Edge Termination of Single-Ply Roofing Membranes. The fascia system shall be tested to secure the membrane to minimum 100 lbs/ft in accordance with the ANSI/SPRI ES-1-98 Test Method RE-1. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

2. ANSI/SPRI ES-1-98Test Method RE-2 Pull-Off Test for Fascia: The fascia system shall be tested in accordance with the ANSI/SPRI ES-1-98 Test Method RE-2. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
3. FMRC Loss Prevention Data Sheet 1-49 “Perimeter Flashing.” The fascia product shall be listed in current Factory Mutual Research Corporation Approval Guide.

B. Carlisle SynTec Systems; SecurEdge 2000 Fascia: A snap on edge system consisting of an extruded retainer and 0.050 inch thick aluminum fascia. Metal fascia color shall match existing or as selected by Architect from manufacturer’s full range.

C. Carlisle SynTec Systems; SecurEdge 300 Coping: 20 gauge anchor cleat with 4 pre-slotted holes, a concealed joint cover and 10 foot continuous sections of coping cap; can accommodate minimum 5 inch wide parapet walls. Metal coping shall be .050 aluminum and color shall match existing or as selected by Architect from manufacturer’s full range.

D. Termination Bar: 1 inch wide and .098 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations. The required metal edge detail for this project shall be Carlisle Detail U-9A.

E. Counter Flashing: Shop fabricated from 0.040 mill finish aluminum.

2.09 AUXILIARY MATERIALS

A. Tapered Edge Strip:
1. Wood particles blended with selected binders.
   a. Comply with ASTM C-208, Grade 2.
   b. Accepted by FM Research Corporation for Class I Construction.
2. Thickness: Suit conditions.

B. Preservative Treated Wood Blocking/Nailers: As specified in Division 6 Sections.

C. Sealant: As recommended by roofing system manufacturer.

D. Safing Insulation: Equivalent to USG "Thermafiber" Safing Insulation.
1. Conform to F.S. HH-I-558B, Class 1 and 2.
2. Rated non combustible per NFPA Standard 220 when tested in accordance with ASTM E-136.
3. Surface burning characteristics per ASTM E-84:
   a. Flame spread: 15.
   b. Smoke developed: 0.

E. Walkway Pads: Equivalent to Carlisle SynTec Sure-Seal Walkway Pads (30" x 30" molded black rubber with factory rounded corners) adhered to the EPDM membrane roof with Splice Tape.

F. Flashings:
1. 0.060 inch thick EPDM Membrane.
2. Pre-molded pipe flashings.
3. Pre-molded inside/outside corners.

G. Daily Seal: As recommended and furnished by roofing system manufacturer, compatible with materials with which used.

H. Water Stop: As recommended and furnished by roofing system manufacturer, compatible with materials with which used.

I. Expansion Joints:
1. Compressible tubing: Size to suit conditions.

2. Metal bar anchor with approved fasteners.
3. Joint cover: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 GENERAL

A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions. All roofing products must be installed complete each day. Phased applications are not acceptable.

B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.02 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.03 PREPARATION, GENERAL

A. Prepare roof deck and surfaces to receive flashings, to smooth surface, free of projections or other defects that interfere with proper installation of vapor barrier, insulation and/or roofing membrane.

B. Clean substrate thoroughly prior to roof application.

C. Do not begin work until other work that requires foot or equipment traffic on roof is complete.

3.04 METAL DECK PREPARATION

A. Install deck sheathing (underlayment board) on metal deck:
   1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
   2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
   3. Tape joints.

B. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual FM DS 1-28 recommendations and roofing manufacturer's instructions.
   1. Over entire roof area, fasten sheathing using six fasteners with washers per sheathing board.

3.05 INSPECTION

A. Examine surfaces scheduled to receive roofing system to assure they are smooth, dry, free of fins, sharp edges, loose and foreign material, oil, grease and other conditions that will adversely affect execution, permanence or quality of work.

B. Assure that new wood nailers have been properly and securely installed conforming to Factory Mutual Loss Prevention Data Sheet 1-49 in locations as required and that preservative treatment of wood nailers is compatible with roofing system materials.

C. Assure that curbs have been properly installed.

D. Do not install EPDM membrane until other work that penetrates membrane has been completed unless approved by Architect and Owner. In such case the Roofing Contractor shall remain responsible for flashing work that penetrates the membrane.

E. Notify Architect, in writing, of any defects in surfaces which will affect proper installation of roofing system materials and do not proceed with installation until such defects have been corrected.

3.06 CAUTIONS

A. Exercise cautions stipulated by roofing system material manufacturer pertaining to use of non-compatible materials, processes and safety requirements.

B. Avoid creating excessive loading on building structural elements in handling and placing roofing system materials and equipment.

3.07 FASTENER WITHDRAWAL RESISTANCE TESTS

A. Prior to starting application of new materials to new deck substrates, conduct field tests for fastener withdrawal resistance using fasteners approved for application to conditions encountered.
   1. Steel deck 22 ga. or heavier shall have a minimum of 300 lbs. pullout resistance.
   2. The following minimum trial fastener samples shall be installed and tested over the deck at each level.
      a. For each roof level of 20,000 square feet or less, conduct a minimum of 5 pullouts.
      b. Trial fastener installations shall be tested in various locations of roof deck as recommended by membrane manufacturer.

B. Designate results of pullout tests on a roof plan indicating areas at which tests were conducted and forward to membrane manufacturer and Architect for review.

C. Conduct tests in presence of Architects and roofing system manufacturer's authorized representatives.

3.08 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

F. Refer to system manufacturer's requirements for additional securement at perimeters and corners.

G. Coodination:
   1. Coordinate installation of underlayment, vapor barrier, roof insulation and overlayment with installation of wood blocking, and any other related materials.
   2. Coordinate roof insulation and overlayment with membrane roofing work so that at no time will insulation be exposed to elements.
   3. At completion of day's work, seal exposed edges and ends of insulation and overlayment in such manner so as to prevent moisture from contacting insulation and overlayment. Completely remove seal barrier from edge before continuing with installation.

4. Remove material that has been installed and has become wet and replace with dry material. Roofing installed over insulation and overlayment exposed to moisture will not be accepted.

3.09 UNDERLAYMENT BOARD INSTALLATION ON NEW METAL DECK

A. Underlayment Board (thermal barrier):
   1. Underlayment board shall be mechanically fastened.
      a. Install underlayment board with long edge perpendicular to steel roof deck direction.
      b. Locate end joints over crests of steel deck.
   2. Stagger end joints two feet in adjacent rows.
   3. Leave underlayment board smooth, free of debris and ready to receive vapor barrier.

3.10 VAPOR RETARDER INSTALLATION

A. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
   1. Extend vapor retarder under cant strips and blocking to deck edge.
   2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

3.11 INSULATION INSTALLATION

A. General Requirements.
   1. Install insulation butting all edges to maintain full contact but do not force panels in place.
   2. Taper insulation around roof drains to provide a smooth transition from roof surface to drain clamping ring.
   3. Do not install more insulation than can be completely covered with finished roofing membrane on same day, or before insulation is exposed to moisture in any form.
   4. Upon completion of installation:
      a. Joints in insulation shall not exceed 1/4 inch in width. Fill joints wider than 1/4 inch with appropriate insulation.
      b. Leave top surface of insulation clean, dry, ready for installation of adhered roofing membrane.

B. Attachment of Insulation on metal decks:
   1. Mechanically fasten first layer of insulation to metal deck in accordance with roofing manufacturer's instructions and Factory Mutual FM DS 1-29 requirements.
   2. Embed second, and subsequent) layer(s) of insulation into full bed of adhesive in accordance with roofing and insulation manufacturer's instructions.

C. Do not install wet, damaged, or warped insulation boards.

D. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.

E. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

F. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

G. Tape joints of insulation in accordance with roofing and insulation manufacturers instructions.

H. Do not apply more insulation than can be completely waterproofed in the same day.

3.12 OVERLAYMENT BOARD INSTALLATION

A. Install overlayment, butting all edges to maintain full contact but do not force panels in place.

B. Do not apply more overlayment than can be completely covered and properly capped in any one working day.

C. Stagger all joints from joints below.

D. Leave overlayment smooth, free of debris, ready to receive membrane.

E. Install in insulation adhesive at 4” on centers everywhere.

3.13 MEMBRANE INSTALLATION

A. Roll out membrane, free from wrinkles, tears. Place sheet into place without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.

B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
   1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
   2. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

C. Install adjoining membrane sheets in the same manner, overlapping edges approximately 4 inches. Do not apply bonding adhesive to the splice area.

D. Shingle joints on sloped substrate in direction of drainage.

E. Fully Adhered Application: Apply adhesive at manufacturer's recommended rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

F. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

G. Membrane Splicing: 6 inch pre-applied Splice Tape is required. All details and splice procedures as per 20 Year Warranty specifications.
   1. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
   2. Fold the top sheet back and clean the dry splice area (minimum 6 inches wide) of membrane with Sure-Seal Primer as required by the membrane manufacturer.
   3. Apply Primer to the EPDM sheet. Press Membrane and tape onto the sheet using hand pressure.
   4. Remove the release film and press the top sheet onto the tape using hand pressure.
   5. Roll the seam toward the splice edge with a 2 inch wide steel roller.
   6. Splice intersections are to be overlaid with a layer of 6” X 6” uncured and a layer of 12” X 12” semi-cured Pressure-Sensitive flashing. All field and flashing are to be sealed with Lap Sealant.

H. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 6 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

I. Coordinate installation of roof drains and sumps and related flashings, locate field splices away from low areas and roof drains, and lap upslope sheet over downslope sheet.

J. Install walkway pads as indicated on drawings. Space pad joints to permit drainage.

K. Daily Seal: Install daily seal per manufacturer's instructions at the end of each workday. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.14 FLASHING INSTALLATION

A. Provide 0.060 inch thick EPDM membrane flashing in accordance with system manufacturer's approved details and instructions.

B. Provide 0.060 inch thick uncured flashing in accordance with system manufacturer's approved details and instructions.

C. Provide pre-molded flashings at pipes and conduits passing through membrane. Use pre-molded pipe flashings where possible, field fabricate pipe flashings where pre-molded pipe flashings are not applicable.

D. Provide pre-molded cured inside/outside corners where possible in accordance with system manufacturer's approved details and instructions.

E. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.

F. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.15 FASCIA AND COPING SYSTEM INSTALLATION

A. General: Comply with manufacturer's written installation instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive work of this section, with vapor barriers, roof insulation, roofing membrane, flashing, and wall construction; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weather tight. Anchor products included in this section securely to structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

B. Isolation: Where metal surfaces of units are installed in contact with dissimilar metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation as recommended by aluminum producer.

C. Remove and discard of protective poly film after installation.

3.16 WALKWAY PAD INSTALLATION

A. Install walkways around perimeter of motorized rooftop equipment, roof hatches, roof access doors, top and bottom of rooftop ladders or where indicated on drawings. Install as specified for seam tape and caulk. Walkways shall be considered a maintenance item and not warranted by system's manufacturer after one (1) year.

3.17 DAILY SEAL

A. When the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.18 FIELD QUALITY CONTROL

A. See Section 014500 - Quality Requirements for general requirements for field quality control and inspection.

B. Require site attendance of roofing and insulation material manufacturers daily during installation of this work.

3.19 INSPECTION

A. Upon completion of installation, arrange for required inspection by roofing system manufacturer's technical representative. Correct any defects or unsuitable conditions as required to obtain specified warranty without additional cost to Owner.

3.20 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.

C. Remove adhesives, sealants, cements and any other foreign matter from surfaces other than those requiring same in installation.

D. Remove all debris caused by reason of work specified herein and dispose of legally away from site.

E. Remove bituminous markings from finished surfaces.

F. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

G. Repair or replace defaced or damaged finishes caused by work of this section.

3.21 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 075323

SECTION 076200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet metal flashing and trim.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.04 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ASTM B32 - Standard Specification for Solder Metal; 2020.

D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2022.

F. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

G. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.

H. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2025.

I. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2024).

J. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.

K. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement; 2025.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

C. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
   1. Identification of material, thickness, weight, and finish for each item and location in Project.
   2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
   3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   4. Details of termination points and assemblies, including fixed points.
   5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
   6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   7. Details of special conditions.
   8. Details of connections to adjoining work.

D. Qualification Data: For qualified fabricator.

E. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

F. Warranty: Sample of special warranty.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Copper Sheet Metal Standard: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 or H01 temper.
   1. Non-Patinated Exposed Finish: Mill.

C. Aluminum Sheet: ASTM B209/B209M, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
   1. As-Milled Finish: Standard two-side bright finish.
   2. Surface: Smooth, flat.

D. Stainless-Steel Sheet: ASTM A240/A240M or ASTM A666/A666M, Type 304, dead soft, fully annealed.
   1. Finish: 2B (bright, cold rolled).
   2. Surface: Smooth, flat.

2.03 UNDERLAYMENT MATERIALS

A. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
   1. Thermal Stability: ASTM D1970/D1970M; stable after testing at 240 deg F (116 deg C).
   2. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F (29 deg C).
   3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
      b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
      c. Henry Company; Blueskin PE200 HT.
      d. Owens Corning; WeatherLock Metal High Temperature Underlayment.

C. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

2.04 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
   1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
      a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
      b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
   2. Fasteners for Copper Sheet: Copper, hardware bronze or Series 300 stainless steel.
   3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
   4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
   1. For Copper: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead.
   2. For Stainless Steel: ASTM B32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

I. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.

2.05 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
   1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
   2. Obtain field measurements for accurate fit before shop fabrication.
   3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
   4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

H. Do not use graphite pencils to mark metal surfaces.

2.06 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Flashing: Fabricate from the following materials:
   1. Copper: 16 oz./sq. ft. (0.55 mm thick) weight (thickness).
   2. Aluminum: 0.032 inch thick.
   3. Stainless Steel: 0.019 inch thick.

2.07 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:
   1. Stainless Steel: 0.019 inch (0.48 mm) thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
   1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.03 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
   4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
   5. Install sealant tape where indicated.
   6. Torch cutting of sheet metal flashing and trim is not permitted.
   7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
   1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
   2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as required for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
   2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
   1. Do not solder aluminum sheet.
   2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
   3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
   4. Copper Soldering: Tin edges of uncoated copper sheets using solder for copper.

3.04 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in existing mortar joints, reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner.

C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.05 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.06 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.07 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

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SECTION 077200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof Curbs.

B. Equipment rails.

C. Roof penetrations mounting curbs.

D. Roof hatches and Vents.
   1. Heat and Smoke Vents.

E. Non-penetrating rooftop supports/assemblies

F. Non-penetrating pedestals.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 053100 - STEEL DECKING.

C. Section 055133 - Metal Ladders

D. Section 075320 - EPDM Roofing.

E. Section 076200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

F. Section 077100 - Roof Specialties: Other manufactured roof items.

1.03 REFERENCE STANDARDS

A. ANSI/SPRI ES1 - Wind Test Design Standard For Edge Systems Used With Low Slope Roofing Systems.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

1.04 SUBMITTALS

A. See Section 013300 Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
   1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings, sealed and signed by a Professional Engineer experienced in design of this type and licensed in the state of New York.
   2. Submit shop drawings sealed and signed by a Professional Engineer experienced in design of this type of work and licensed in the State of New York.

D. Warranty Documentation:
   1. Submit manufacturer warranty.

2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.06 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a One year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 ROOF CURBS

A. Manufacturers:
1. AES Industries Inc: www.aescurb.com/#sle.
2. **(Basis of Design)** The Pate Company: www.patecurbs.com/#sle.
3. Substitutions: See Section 016000 - Product Requirements.

B. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
1. Applications: Roof curbs used for roof penetrations/openings as indicated on drawings.
2. Roof Curb Mounting Substrate: Curb substrate consists of steel roof deck.
3. Sheet Metal Material:
   a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
      1) Finish: Mill finish.
4. Provide layouts and configurations indicated on drawings.

C. Curbs Adjacent to Roof Openings: Provide curb on each side of opening, with top of curb horizontal for equipment mounting.
1. Provide preservative treated wood nailers along top of curb.
2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
3. Height Above Finished Roof Surface: 8 inches, minimum.

D. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.
1. Provide preservative treated wood nailers along top of rails.
2. Height Above Finished Roof Surface: 8 inches, minimum.
3. Manufacturers:
   a. MKT Metal Manufacturing; Equipment Rails: www.mktduct.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

2.03 ROOF HATCHES AND VENTS

A. Heat and Smoke Vent Manufacturers:
   1. **(Basis of Design)** Babcock-Davis; ThermalMAX Smoke Vent, Type BSVT: www.babcockdavis.com/#sle.
   2. BILCO Company: www.bilco.com/#sle.
   3. Nystrom, Inc; ThermalMAX Smoke Vent, Type SVT: www.nystrom.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Heat and Smoke Vent Product Information:
   1. Certification: Smoke vent to have official UL label for testing to UL 793 Smoke and Heat Vents.
   2. Performance:
      a. Loads: 40-lbf/sq. ft. (1.9 kPa) live load with a maximum deflection of 1/150th of the span 90 lbf/sq. (4.3 kPa) double door wind uplift.
      b. When release is actuated lid shall open against 10 lbf/sq. (0.5 kPa) snow load
   3. Door Options:
      a. Double Door: 48 by 96 inches.
   4. Hatch Material:
      a. Cover: 0.0907-inch (2.3 mm) aluminum cover. Interior and exterior surfaces shall be thermally broken to minimize heat transfer and to resist condensation. Cover shall have a heavy extruded EPDM acoustical rated gasket bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
      b. Cover insulation: Foil faced Single layer 3-inch (76 mm) rigid polyisocyanurate insulation covered by 0.0907-inch (2.3 mm) aluminum liner. (R-value = 20.3) (U=0.284 W/m2K).
      c. Curb: 0.0907-inch (2.3 mm) aluminum with a single wall curb, integral metal cap flashing of the same gauge and material as the curb, fully welded at the corners. EZ tab counterflash, 9 inches (228 mm) on center, to be bent inward to hold single ply roofing membrane securely in mounting flange continuous around base of frame. Pre-drilled nailing and bolt mounting holes.
      d. Curb insulation: Foil faced Single layer 3 inch (76 mm) continuous rigid polyisocyanurate insulation. (R-value = 20.3) (U=0. 284 W/m2K).
   5. Finish: Mill finish
   6. Latch Positive hold zinc plated steel rotary latch assembly. Upon latch releases, vent covers are closed manually at rooftop level.
      a. Latch released automatically by UL 33 listed fusible melt-out link at temperature of 165 deg F (74 deg C).
   7. Springs: Gas spring with integrated damper.
   8. Hinge: Pintle type with stainless steel hinge pin.
   9. Hold Open Device: Automatic hold open arm with red vinyl grip handle release.
   10. Weather Stripping: Extruded EPDM adhesive backed gasket seal continuous around perimeter of cover.

2.04 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
   1. Design Loadings and Configurations: As required by applicable codes.
   2. Height: Provide minimum clearance of 8 inches under supported items to top of roofing.
   3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
   4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.
6. Manufacturers:
   a. Portals Plus: www.portalsplus.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

B. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
1. Bases: High density polypropylene.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
4. Manufacturers:
   a. Portals Plus; Pedestal Plus: www.portalsplus.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 077200

SECTION 078100
APPLIED FIRE PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Applied fire protection of interior structural steel not exposed to damage or moisture.

B. Applied fire protection of structural steel exposed to damage or moisture.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 051200 - STRUCTURAL STEEL FRAMING.

C. Section 053100 - STEEL DECKING.

D. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

B. ASTM E605/E605M - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2019 (Reapproved 2023).

C. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2019 (Reapproved 2023).

D. ASTM E760/E760M - Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2023).

E. ASTM E937/E937M - Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 1993 (Reapproved 2023).

F. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with placement of mechanical component hangers and electrical components.

B. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 DEFINITIONS

A. SFRM: Sprayed fire-resistive material.

B. Concealed: Fire-resistive materials applied to surfaces that are concealed from view behind other construction when the Work is completed or that are exposed in mechanical rooms.

C. Exposed: Fire-resistive materials applied to surfaces that are exposed to view when the Work is completed and that are identified as exposed on Drawings.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittals procedures.

B. Product Data: Provide data indicating product characteristics, performance criteria, and limitations of use.

C. Manufacturer's Certificate: Certify that applied fireproofing products meet or exceed requirements of Contract Documents.

D. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, as follows:

1. Bond strength.
2. Bond impact.
3. Compressive strength.
4. Fire tests using substrate materials similar those on project.

E. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

F. Field Quality Control Submittals: Submit field test report.

G. Manufacturer Reports: Indicate environmental conditions that applied fireproofing materials were installed.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience and approved by manufacturer

1.08 FIELD CONDITIONS

A. Do not apply fireproofing when temperature of substrate material and surrounding air is below 40 degrees F or when temperature is predicted to be below said temperature for 24 hours after application.

B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.

C. Provide temporary enclosure to prevent spray from contaminating air.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.
1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
2. Reinstall or repair failures that occur within warranty period.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Applied Fire Protection:
1. GCP Applied Technologies; Monokote MK-6 Series: www.gcpat.com/#sle.
2. (**Basis of Design**) Isolatek International Corp; Cafco 300 / Isolatek Type 300: www.isolatek.com/#sle.
3. Southwest Fireproofing Products Company, a Carboline company; Type 5GP: www.southwestfireproofing.com/#sle.
4. Substitutions: See Section 016000 - Product Requirements.

2.02 APPLIED FIRE PROTECTION ASSEMBLIES

A. Provide assemblies as indicated on drawings.

B. Provide a fire rated assembly rating of 1 hour for roof deck assembly to UL Design No. D710 and 1 hour for typical floor assembly to UL Design No. D710.

C. Provide fire resistance ratings for following building elements as required by local building code:
   1. Floor construction, including supporting beams and joists, 1 hour.
   2. Roof construction, including supporting beams and joists, 1 hour.

D. Provide fire-rated assembly ratings to UL Design Nos. as follows:
   1. Interior steel beams: One hour; UL No. D710.
   2. Interior floor deck: One hour; UL No. D710.
   3. Interior roof deck: One hour; UL No. D710.

2.03 MATERIALS

A. Applied Fire Protection Material for Interior Applications, Exposed to View and Not to Damage: Manufacturer's standard factory mixed material, which when combined with water is capable of providing indicated fire resistance, and complying with following requirements:
   1. Bond Strength: 150 pounds per square foot, minimum, when tested in accordance with ASTM E736/E736M when set and dry.
   2. Dry Density: Minimum average density of 15 lb/cu ft, with minimum individual density of any test sample of 14 lb/cu ft, when tested in accordance with ASTM E605/E605M.
   3. Compressive Strength: 8.33 pounds per square inch, minimum.
   4. Effect of Impact on Bonding: No cracking, spalling or delamination, when tested in accordance with ASTM E760/E760M.
   5. Corrosivity: No evidence of corrosion, when tested in accordance with ASTM E937/E937M.
   6. Surface Burning Characteristics: Maximum flame spread index of 0 (zero) and maximum smoke developed index of 0 (zero), when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Primer Coating: Of type recommended by applied fire protection manufacturer.

B. Water: Clean, potable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive fireproofing. Repair existing fireproofing using same method as original installation or trowel installation techniques recommended by manufacturer.

B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.

C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.

D. Verify that voids and cracks in substrate have been filled.

E. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

3.02 PREPARATION

A. Perform tests as recommended by fireproofing manufacturer in applications where adhesion of fireproofing to substrate is in question.

B. Remove incompatible materials that could effect bond by scraping, brushing, scrubbing, or sandblasting.

C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.

D. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.

E. Close off and seal duct work in areas where fireproofing is being applied.

3.03 APPLICATION

A. Apply primer adhesive and primer coating in accordance with manufacturer's instructions.

B. Apply fireproofing in uniform thickness and density as necessary to achieve required ratings.

C. In exposed locations, trowel surface smooth and form square edges, using tools and procedures recommended by fireproofing manufacturer.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 014000 - Quality Requirements.

B. Inspect installed fireproofing after application and curing for integrity, prior to its concealment.
   1. Submit field test reports promptly to Contractor and Architect.

C. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings and requirements of authorities having jurisdiction (AHJ).

D. Repair or replace applied fireproofing at locations where test results indicate fireproofing does not meet specified requirements.

E. Re-inspect installed fireproofing for integrity of fire protection, after installation of subsequent Work.

3.05 CLEANING

A. Remove excess material, overspray, droppings, and debris.

B. Remove fireproofing from materials and surfaces not required to be fireproofed.

C. At exposed fireproofing, clean surfaces that have become soiled or stained, using manufacturer's recommended procedures.

END OF SECTION 078100

SECTION 078400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 017300 - Execution: Cutting and patching.

C. Section 078100 - APPLIED FIRE PROTECTION.

D. Section 092116 - GYPSUM BOARD ASSEMBLIES: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.

D. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2024.

E. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus; 2025.

F. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2024.

G. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a.

H. FM (AG) - FM Approval Guide; Current Edition.

I. FM 4991 - Approval Standard of Firestop Contractors; 2013.

J. ITS (DIR) - Directory of Listed Products; Current Edition.

K. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

L. UL (DIR) - Online Certifications Directory; Current Edition.

M. UL (FRD) - Fire Resistance Directory; Current Edition.

N. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

O. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD) will be considered as constituting an acceptable test report.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Trained by manufacturer.
   2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
   3. Verification of minimum five years documented experience installing work of this type.
   4. Verification of at least five satisfactorily completed projects of comparable size and type.
   5. Licensed by local authorities having jurisdiction (AHJ).

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with all specified requirements, provide products by one of the following, for each type of product listed, or equivalent:

C. Firestopping Manufacturers:
   1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
   2. Hilti, Inc: www.us.hilti.com/#sle.
   3. RectorSeal, a CSW Industrials Company; Metacaulk 150+ General Purpose Firestop Sealant: www.rectorseal.com/firestop-solutions/#sle.
   4. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.

C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

D. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

B. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.

C. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.04 FIRESTOPPING FOR PERIMETER CONTAINMENT

A. Perimeter Joint Systems That Have Not Been Tested For Movement Capabilities (Static-S):
   1. 2 Hour Construction: UL System CW-S-2015; RectorSeal MetaCaulk 1200 Spray.
   2. 2 Hour Construction: UL System CW-S-2017; RectorSeal MetaCaulk 1200 Spray.

B. Perimeter Joint Systems That Have Movement Capabilities (Dynamic-D):
   1. 2 Hour Construction: Intertek System BP-120-03; RectorSeal MetaCaulk 1200 Spray.
   2. 2 Hour Construction: Intertek System BP-120-05; RectorSeal MetaCaulk 1200 Spray.
   3. 2 Hour Construction: Intertek System BP-120-09; RectorSeal MetaCaulk 1200 Spray.
   4. 2 Hour Construction: Intertek System BP-120-12; RectorSeal MetaCaulk 1200 Spray.
   5. 2 Hour Construction: UL System CW-D-2014; RectorSeal MetaCaulk 1200 Spray.
   6. 2 Hour Construction: UL System CW-D-2016; RectorSeal MetaCaulk 1200 Spray.
   7. 2 Hour Construction: UL System CW-D-2018; RectorSeal MetaCaulk 1200 Spray.
   8. 2 Hour Construction: UL System CW-D-2047; RectorSeal MetaCaulk 1200 Spray.
   9. 2 Hour Construction: UL System CW-D-2049; RectorSeal MetaCaulk 1200 Spray.

2.05 FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

A. Concrete and Concrete Masonry Walls and Floors:
   1. Floor-to-Floor Joints:
      a. 4 Hour Construction: UL System FF-D-0023; RectorSeal MetaCaulk 150+.
      b. 3 Hour Construction: UL System FF-D-1024; RectorSeal MetaCaulk 1200 Spray.
      c. 3 Hour Construction: UL System FF-D-1027; RectorSeal MetaCaulk 150+.
      d. 3 Hour Construction: UL System FF-D-1077; RectorSeal MetaCaulk 835+.
      e. 2 Hour Construction: UL System FF-D-0024; RectorSeal MetaCaulk 150+.
      f. 2 Hour Construction: UL System FF-D-0053; RectorSeal MetaCaulk Joint Strip.
      g. 2 Hour Construction: UL System FF-D-0084; RectorSeal MetaCaulk Joint Strip.
      h. 2 Hour Construction: UL System FF-D-1013; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      i. 2 Hour Construction: UL System FF-D-1085; Tremco, TREMstop Acrylic Firestop Sealant.
   2. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
      a. 2 Hour Construction: UL System HW-D-0058; RectorSeal MetaCaulk 1200 Spray.

b. 2 Hour Construction: UL System HW-D-0149; RectorSeal MetaCaulk 150+.
c. 2 Hour Construction: UL System HW-D-0181; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
d. 2 Hour Construction: UL System HW-D-1037; Hilti CFS-SP WB Firestop Joint Spray and CP 672.

3. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Floor:
   a. 3 Hour Construction: UL System HW-D-1058; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 3 Hour Construction: UL System HW-D-0166; RectorSeal MetaCaulk 1200 Spray.
   c. 2 Hour Construction: UL System HW-D-0268; Hilti CP 606 Flexible Firestop Sealant.
   d. 2 Hour Construction: UL System HW-D-0312; Specified Technologies Inc. SIL Silicone Sealant.
4. Concrete/Concrete Masonry Wall-to-Wall Joint Systems That Have Not Been Tested For Movement Capabilities (Static-S):
   a. 2 Hour Construction: UL System WW-S-1025; RectorSeal MetaCaulk 835+.
   b. 2 Hour Construction: UL System WW-S-1038; RectorSeal MetaCaulk 835+.
5. Concrete/Concrete Masonry Wall-to-Wall Joint Systems That Have Movement Capabilities (Dynamic-D):
   a. 4 Hour Construction: UL System WW-D-0054; RectorSeal MetaCaulk Joint Strip.
   b. 3 Hour Construction: UL System WW-D-0023; RectorSeal MetaCaulk 1200 Spray.
   c. 3 Hour Construction: UL System WW-D-0095; RectorSeal MetaCaulk 150+.
   d. 3 Hour Construction: UL System WW-D-1028; RectorSeal MetaCaulk 1200 Spray.
   e. 2 Hour Construction: UL System WW-D-0025; RectorSeal MetaCaulk 1200 Spray.
   f. 2 Hour Construction: UL System WW-D-0027; RectorSeal MetaCaulk 150+.
   g. 2 Hour Construction: UL System WW-D-0110; RectorSeal MetaCaulk 150+.
   h. 2 Hour Construction: UL System WW-D-1077; Tremco, TREMstop Acrylic Firestop Sealant.
   i. 2 Hour Construction: UL System WW-D-0017; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   j. 2 Hour Construction: UL System WW-D-0032; Hilti CP 606 Flexible Firestop Sealant.

B. Gypsum Board Walls:
1. Wall-to-Wall Joints That Have Not Been Tested For Movement Capabilities (Static-S):
   a. 2 Hour Construction: UL System WW-S-0089; RectorSeal MetaCaulk 150+.
2. Wall-to-Wall Joints That Have Movement Capabilities (Dynamic-D):
   a. 3 Hour Construction: UL System WW-D-0101; RectorSeal MetaCaulk 150+.
   b. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
   c. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
3. Head-of-Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
   a. 2 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
4. Head-of-Wall Joints at Underside of Flat Concrete:
   a. 4 Hour Construction: UL System HW-D-0108; RectorSeal MetaCaulk 1200 Spray.
   b. 2 Hour Construction: UL System HW-D-0798; RectorSeal Blaze Foam.
   c. 2 Hour Construction: UL System HW-D-1068; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   d. 2 Hour Construction: UL System HW-D-0757; Hilti CFS-TTS Top Track Seal.
   e. 2 Hour Construction: UL System HW-D-0016; Tremco, TREMstop Acrylic Firestop Sealant.

f. 2 Hour Construction: UL System HW-D-0017; Tremco, TREMstop Acrylic Firestop Sealant.
g. 2 Hour Construction: UL System HW-D-1072; Tremco, TREMstop Acrylic Firestop Sealant.
h. 1 Hour Construction: UL System HW-D-1068; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
i. 1 Hour Construction: UL System HW-D-0757; Hilti CFS-TTS Top Track Seal.
j. 1 Hour Construction: UL System HW-D-0016; Tremco, TREMstop Acrylic Firestop Sealant.

5. Head-of-Wall Joints at Concrete Over Metal Deck:
   a. 2 Hour Construction: UL System HW-D-0144; RectorSeal MetaCaulk 150+.
   b. 2 Hour Construction: UL System HW-D-0256; Tremco, TREMstop Acrylic Firestop Sealant.
   c. 1 Hour Construction: UL System HW-D-0256; Tremco, TREMstop Acrylic Firestop Sealant.
6. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Parallel to Ribs:
   a. 2 Hour Construction: UL System HW-D-0049; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 2 Hour Construction: UL System HW-D-0184; Hilti CP 606 Flexible Firestop Sealant.
   c. 1 Hour Construction: UL System HW-D-0049; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   d. 1 Hour Construction: UL System HW-D-0184; Hilti CP 606 Flexible Firestop Sealant.
7. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Cut to Fit Ribs:
   a. 2 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
   b. 1 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
8. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Not Cut to Fit:
   a. 2 Hour Construction: UL System HW-D-0042; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   b. 2 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
   c. 1 Hour Construction: UL System HW-D-0042; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   d. 1 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.

2.06 FIRESTOPPING FOR FLOOR-TO-WALL MOVABLE JOINTS

A. Floor-To-Wall Joint System That Have Movement Capabilities (Dynamic-D):
   1. 2 Hour Construction: UL System FW-D-1069; Tremco, TREMstop Acrylic Firestop Sealant.

2.07 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Blank Openings:
   1. In Floors or Walls:
      a. 4 Hour Construction: UL System C-AJ-0042; RectorSeal MetaCaulk Fire Rated Mortar.
      b. 4 Hour Construction: UL System C-AJ-0088; RectorSeal MetaCaulk Composite Sheet.
      c. 3 Hour Construction: UL System C-AJ-0045; RectorSeal MetaCaulk Fire Rated Putty.
      d. 2 Hour Construction: UL System C-AJ-0090; Hilti FS-ONE MAX Intumescent Firestop Sealant.

B. Penetrations Through Floors or Walls By:
   1. Multiple Penetrations in Large Openings:
      a. 3 Hour Construction: UL System C-AJ-8047; RectorSeal MetaCaulk 1000.
      b. 3 Hour Construction: UL System C-AJ-8099; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      c. 3 Hour Construction: UL System C-AJ-8110; Hilti CFS-BL Firestop Block.
      d. 3 Hour Construction: UL System C-AJ-8133; RectorSeal Fire Rated Mortar.
      e. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      f. 2 Hour Construction: UL System C-AJ-8042; RectorSeal MetaCaulk 1000.
      g. 2 Hour Construction: UL System C-AJ-8129; RectorSeal MetaCaulk 1200 Spray.
      h. 2 Hour Construction: UL System C-AJ-8149; RectorSeal MetaCaulk 1000.
      i. 2 Hour Construction: UL System C-AJ-8171; RectorSeal MetaCaulk Wrap Strip.
   2. Bathtub Drains:
      a. Up to 3 Hour Construction: UL System F-A-1037, F-A-1038, F-A-2094, or F-A-2095; Hilti CP 681 Tub Box Kit.
   3. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 3 Hour Construction: UL System C-AJ-1076; RectorSeal MetaCaulk 950.
      b. 3 Hour Construction: UL System C-AJ-1184; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      c. 3 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      d. 3 Hour Construction: UL System C-AJ-1261; RectorSeal MetaCaulk 1000.
      e. 3 Hour Construction: UL System C-AJ-1320; RectorSeal MetaCaulk 1000.
      f. 3 Hour Construction: UL System C-AJ-1421; Hilti FS-ONE MAX Intumescent Firestop Sealant or CP 604 Self-Leveling Firestop Sealant.
      g. 3 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
      h. 2 Hour Construction: UL System C-AJ-1036; RectorSeal MetaCaulk 950.
      i. 2 Hour Construction: UL System C-AJ-1090; Specified Technologies Inc. SSP Firestop Putty.
      j. 2 Hour Construction: UL System C-AJ-1186; RectorSeal MetaCaulk 950.
      k. 2 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      l. 2 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
      m. 1 Hour Construction: UL System C-AJ-1039; RectorSeal MetaCaulk 950.
   4. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
      a. 3 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
      b. 3 Hour Construction: UL System C-AJ-2151; RectorSeal MetaCaulk 1200.
      c. 3 Hour Construction: UL System C-AJ-2220; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      d. 3 Hour Construction: UL System C-AJ-2342; Hilti CP-E/S Firestop Wrap Strip.
      e. 3 Hour Construction: UL System C-AJ-2661; RectorSeal MetaCaulk 1000.
      f. 2 Hour Construction: UL System C-AJ-2047; RectorSeal MetaCaulk 1000.
      g. 2 Hour Construction: UL System C-AJ-2167; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      h. 2 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
      i. 2 Hour Construction: UL System C-AJ-2348; RectorSeal MetaCaulk 150+.
      j. 2 Hour Construction: UL System C-AJ-2707; RectorSeal MetaCaulk 1000.
      k. 2 Hour Construction: UL System C-BJ-2021; Hilti CP 643N Firestop Collar.

5. Electrical Cables Not In Conduit:
   a. 3 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 3 Hour Construction: UL System C-AJ-3208; Hilti CP 618 Firestop Putty Stick.
   c. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
   d. 2 Hour Construction: UL System C-AJ-3283; Hilti CP653 Speed Sleeve.
   e. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit.
   f. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
   g. 2 Hour Construction: UL System W-J-3198; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
   h. 2 Hour Construction: UL System W-J-3199; Hilti CFS-SL SK Firestop Sleeve Kit.
6. Cable Trays with Electrical Cables:
   a. 3 Hour Construction: UL System C-AJ-4093; Hilti CFS-BL Firestop Block.
   b. 2 Hour Construction: UL System C-AJ-4094; Hilti CFS-BL Firestop Block.
7. Electrical Busways:
   a. 3 Hour Construction: UL System C-AJ-6017; Hilti FS-ONE MAX Intumescent Firestop Sealant.
8. Insulated Pipes:
   a. 3 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-5048; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CP 601S Elastomeric Firestop Sealant, CP 604 Self-Leveling Firestop Sealant or CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
   c. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX Intumescent Firestop Sealant.
9. HVAC Ducts, Uninsulated:
   a. 3 Hour Construction: UL System C-AJ-7051; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE MAX Intumescent Firestop Sealant.

C. Penetrations Through Floors By:
1. Multiple Penetrations in Large Openings:
   a. 4 Hour Construction: UL System F-A-0019; RectorSeal Cast-in-Place Firestop Device.
   b. 3 Hour Construction: UL System F-A-1023; Hilti CP 680-P/M Cast-In Device.
   c. 2 Hour Construction: UL System F-A-0021; RectorSeal Cast-in-Place Firestop Device.
   d. 2 Hour Construction: UL System F-A-8012; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
   a. 3 Hour Construction: UL System F-A-1017; Hilti CP 680-P/M Cast-In Device.
   b. 2 Hour Construction: UL System F-A-1016; Hilti CP 680-P/M Cast-In Device.
   c. 2 Hour Construction: UL System F-A-1110; Specified Technologies Inc. CID Cast-In Device.
   d. 2 Hour Construction: UL System F-A-1129; Specified Technologies Inc. Closet Flange Firestop Gasket.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 3 Hour Construction: UL System F-A-2054; Hilti CP 680-P Cast-In Device.
   b. 3 Hour Construction: UL System F-A-2066; Hilti CP 680-P Cast-In Device.

c. 3 Hour Construction: UL System F-A-2213; Hilti CFS-DID Drop-In Device.
d. 2 Hour Construction: UL System F-A-2065; Hilti CP 680-P Cast-In Device.
e. 2 Hour Construction: UL System F-A-2213; Hilti CFS-DID Drop-In Device.
f. 2 Hour Construction: UL System F-A-2053; Hilti CP 680-P Cast-In Device.

4. Electrical Cables Not In Conduit:
   a. 3 Hour Construction: UL System F-A-3033; Hilti CP 680-P/M Cast-In Device.
   b. 2 Hour Construction: UL System F-A-3033; Hilti CP 680-P/M Cast-In Device.
5. Electrical Busways:
   a. 3 Hour Construction: UL System C-AJ-6017; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
   b. 2 Hour Construction: UL System F-A-6002; Hilti CP 604 Self-Leveling Firestop Sealant.
6. Insulated Pipes:
   a. 3 Hour Construction: UL System F-A-5016; Hilti CP 680-P Cast-In Device.
   b. 3 Hour Construction: UL System F-A-5018; Hilti CP 680-P Cast-In Device.
   c. 2 Hour Construction: UL System F-A-5015; Hilti CP 680-P/M Cast-In Device.
   d. 2 Hour Construction: UL System F-A-5017; Hilti CP 680-P/M Cast-In Device.

D. Penetrations Through Walls By:
1. Uninsulated Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 1 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.
2. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
3. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
4. HVAC Ducts, Uninsulated:
   a. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE MAX Intumescent Firestop Sealant, or CP 606 Flexible Firestop Sealant.
5. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-J-7112; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.08 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

A. Blank Openings:
1. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
2. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

B. Penetrations By:
1. Multiple Penetrations in Large Openings:
   a. 2 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.

b. 2 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
c. 2 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
d. 2 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
e. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
f. 1 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
g. 1 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
h. 1 Hour Construction: UL System W-L-8073; Specified Technologies Inc. Composite Sheet.
i. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2. Uninsulated Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.
   d. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   e. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   f. 1 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
   b. 2 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
   d. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
   b. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
   c. 2 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
   d. 2 Hour Construction: UL System W-L-3395; Hilti CP653 Speed Sleeve.
   e. 2 Hour Construction: UL System W-L-3395; Hilti CFS-SL SK Firestop Sleeve Kit.
   f. 2 Hour Construction: UL System W-L-3395; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
   g. 2 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.
   h. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
   i. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
   j. 1 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
   k. 1 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.

5. Cable Trays with Electrical Cables:
   a. 2 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   b. 2 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   d. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
6. Insulated Pipes:
   a. 2 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
7. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.09 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.04 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 078400

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SECTION 078413
PENETRATION FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Penetrations in fire-resistance-rated walls.

B. Penetrations in horizontal assemblies.

1.02 RELATED REQUIREMENTS:

A. Section 078446 "Fire-Resistive Joint Systems" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.

D. FM 4991 - Approval Standard of Firestop Contractors; 2013.

E. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. ACTION SUBMITTALS
   1. Product Data: For each type of product indicated.
   2. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
      a. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. INFORMATIONAL SUBMITTALS
   1. Qualification Data: For qualified Installer.
   2. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
   3. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM 4991 or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."
   1. Be a member in good standing of the Fire Stop Contractors International Association
   2. Licensed by a state or local authority , where applicable
   3. Approved by the Universities Fire Marshal for each specific Job
   4. Shown to have successfully completed not less than 5 comparable size projects.

B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
    a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
    b. Classification markings on penetration firestopping correspond to designations listed by the following:
        1) UL in its "Fire Resistance Directory."

C. Preinstallation Conference: Conduct conference at Project site.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.07 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. **Basis-of-Design**: Subject to compliance with requirements, provide Hilti, Inc. or equivalent.

2.03 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
1. Fire-resistance-rated walls include fire-barrier walls.
2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
   1. Horizontal assemblies include floors.
   2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
   3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D, (EPA Method 24):
   1. Sealants: 250 g/L.
   2. Sealant Primers for Nonporous Substrates: 250 g/L.
   3. Sealant Primers for Porous Substrates: 775 g/L.

H. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

I. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
   1. Permanent forming/damming/backing materials, including the following:
      a. Slag-wool-fiber or rock-wool-fiber insulation.
      b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      c. Fire-rated form board.
      d. Fillers for sealants.
   2. Temporary forming materials.
   3. Substrate primers.
   4. Collars.
   5. Steel sleeves.

2.04 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.05 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.03 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

D. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   1. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing and inspecting agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.05 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections.

B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.

C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.06 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

3.07 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

A. Firestop Systems with No Penetrating Items: Comply with the following:
   1. Available UL-Classified Systems:
      a. C-AJ-0001-0999.
      b. W-L-0001-0999.
   2. Type of Fill Materials: One or more of the following:
      a. Latex sealant.

b. Silicone sealant.
c. Intumescent putty.
d. Mortar.

B. Firestop Systems for Metallic Pipes, Conduit, or Tubing: Comply with the following:
1. Available UL-Classified Systems:
a. C-AJ-1001-1999.
b. W-L-1001-1999.
2. Type of Fill Materials: One or more of the following:
a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Mortar.

C. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing: Comply with the following:
1. Available UL-Classified Systems:
a. C-AJ-2001-2999.
b. W-L-2001-2999.
2. Type of Fill Materials: One or more of the following:
a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Intumescent wrap strips.
e. Firestop device.

D. Firestop Systems for Electrical Cables: Comply with the following:
1. Available UL-Classified Systems:
a. C-AJ-3001-3999.
b. W-L-3001-3999.
2. Type of Fill Materials: One or more of the following:
a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Silicone foam.

E. Firestop Systems for Cable Trays: Comply with the following:
1. Available UL-Classified Systems:
a. C-AJ-4001-4999.
b. W-L-4001-4999.
2. Type of Fill Materials: One or more of the following:
a. Latex sealant.
b. Intumescent putty.
c. Silicone foam.

F. Firestop Systems for Insulated Pipes: Comply with the following:
1. Available UL-Classified Systems:
a. C-AJ-5001-5999.
b. W-L-5001-5999.
2. Type of Fill Materials: One or more of the following:
a. Latex sealant.
b. Intumescent putty.
c. Silicone foam.
d. Intumescent wrap strips.

G. Firestop Systems for Miscellaneous Electrical Penetrants: Comply with the following:
   1. Available UL-Classified Systems:
      a. C-AJ-6001-6999.
      b. W-L-6001-6999.
   2. Type of Fill Materials: One or more of the following:
      a. Latex sealant.
      b. Intumescent putty.
      c. Mortar.

H. Firestop Systems for Miscellaneous Mechanical Penetrations: Comply with the following:
   1. Available UL-Classified Systems:
      a. C-AJ-7001-7999.
      b. W-L-7001-7999.
   2. Type of Fill Materials: One or both of the following:
      a. Latex sealant.
      b. Mortar.

I. Firestop Systems for Groupings of Penetrations: Comply with the following:
   1. Available UL-Classified Systems:
      a. C-AJ-8001-8999.
      b. W-L-8001-8999.
   2. Type of Fill Materials: One or more of the following:
      a. Latex sealant.
      b. Mortar.
      c. Intumescent wrap strips.
      d. Firestop device.
      e. Intumescent composite sheet.

J. Smoke-stop Systems
   1. For all non-rated partitions required to control smoke only provide the following:
      a. Mineral wool
      b. Fire and smoke stopping sealant

END OF SECTION 078413

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SECTION 079200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

C. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. ACTION SUBMITTALS
   1. Product Data: For each joint-sealant product.
   2. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
   3. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
   4. Joint-Sealant Schedule: Include the following information:
      a. Joint-sealant application, joint location, and designation.
      b. Joint-sealant manufacturer and product name.
      c. Joint-sealant formulation.
      d. Joint-sealant color.

C. INFORMATIONAL SUBMITTALS
   1. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.
   2. Sample Warranties: For special warranties.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.06 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.07 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
   1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
   1. Architectural sealants shall have a VOC content of 250 g/L or less.
   2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
   3. Sealants and sealant primers for nonporous substrates shall have a VOC content of 775 g/L or less.

C. Low-Emitting Interior Sealants: Sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Colors of Exposed Joint Sealants: Match Architect's samples.

2.03 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

1. Basis of design Manufacturer: Dow Corning
    a. Product: 756 SMS Building Sealant

2.04 MILDEW-RESISTANT JOINT SEALANTS

A. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
    1. Basis of design Manufacturer: Dow Corning
        a. Product: 786 Silicone Sealant

2.05 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
    1. Manufacturer: Pecora Corporation
        a. AC-20 + Silicone.

2.06 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
    1. Manufacturer: BASF

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.07 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
    1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.
   c. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

G. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.04 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.06 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
   1. Joint Locations:
      a. Control joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
      c. Other joints as indicated on Drawings.
   2. Joint Sealant: Acrylic latex.
   3. Joint-Sealant Color: Match Architects Sample.

B. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
   1. Joint Locations:
      a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
      b. Tile control and expansion joints where indicated.
      c. Other joints as indicated on Drawings.
   2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
   3. Joint-Sealant Color: Match Architects Sample

END OF SECTION 079200

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SECTION 079513.13
INTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Architectural joint systems for building interiors.

1.03 DEFINITIONS

A. Maximum Joint Width: Widest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

B. Minimum Joint Width: Narrowest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

C. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint.

D. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

1.04 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications; 2018, with Editorial Revision (2024).

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Shop Drawings: Provide the following for each joint system specified and obtain approval prior to fabrication and shipment of materials to the job site:
   1. Placement Drawings: Include line diagrams showing plans, elevations, sections, details, splices, blockout requirement, entire route of each joint system, and attachments to other work. Where joint systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

C. Product Data: Submit copies of manufacturer’s latest published literature for materials specified herein for approval, and obtain approval before materials are fabricated and delivered to the site. Data to clearly indicate movement capability of cover assemblies and suitability of material used in exterior seal for UV exposure.

D. Samples for Initial Selection: For each type of joint system indicated.
   1. Include manufacturer's color charts showing the standard range of colors and finishes available for each exposed metal and elastomeric seal material.

E. Certificates – Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-rated expansion joint assemblies with requirements indicated.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Approved by manufacturer and having experience installing joint systems that are similar in design complexity.

B. Source Limitations: Obtain all architectural joint systems through one source from a single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated. Refer to Division 01 Section "Product Requirements."

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Loading Characteristics: Standard loading refers to covers that are capable of withstanding up to 500 lb. point loads. Heavy duty refers to covers that are capable of withstanding up to 2000 lb. point loads.

E. Fire-Test-Response Characteristics: Where indicated, provide architectural joint system and fire-barrier assemblies identical to those of assemblies tested for fire resistance per UL 2079 and/or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction. Fire rating not less than the rating of adjacent construction.

F. Manufacturer to provide 5 year warranty for all joint covers.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.

1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MATERIALS

A. Aluminum: ASTM B221, Alloy 6063-T5, 6063-T6, 6063-T52, 6061-T5, 6061-T6, 6061-T51, 6105-T5, 6105-T6, 6005-T5, 6005A-T5, 6005A-T61 for extrusions; ASTM B209/B209M, Alloy 6061-T6, 3003-H14, 5005-H34 for sheet and plate.

1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
2. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

B. Elastomeric Seals: Preformed elastomeric membranes or extrusions to be installed in metal frames.

C. Compression Seals: ASTM D2000; preformed rectangular elastomeric extrusions having internal baffle system and designed to function under compression.

D. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required rating period.

E. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.03 ARCHITECTURAL JOINT SYSTEMS, GENERAL

A. General: Provide architectural joint systems of design, basic profile, materials, and operation indicated. While specified joint systems establish the function and aesthetic intent, it may be necessary for the manufacturer to modify the joint systems to accommodate the movement requirements as scheduled in the contract documents. Such modifications should be made without significant changes to the aesthetic or functional intent of the joint systems. Provide units with capability to accommodate variations in adjacent surfaces.

B. Design architectural joint systems for the following size and movement characteristics:
   1. Nominal Joint Width: As indicated on Drawings.

2.04 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING INTERIORS

A. Basis of Design Manufacturer: Construction Specialties, Inc., 6696 Route 405 Highway, Muncy, PA.

B. Wall-to-Wall Joint Systems:
   1. Basis-of-Design Product: Construction Specialties, Inc. Model ASM.
   2. Type: Snap-on cover.
      a. Exposed Metal: Aluminum.
         1) Finish: Class II, clear anodic.
   3. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

C. Wall Corner Joint Systems:
   1. Basis-of-Design Product: Construction Specialties, Inc. Model ASMC
   2. Type: Snap-on cover.
      a. Exposed Metal: Aluminum.
         1) Finish: Class II, clear anodic.
   3. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

D. Floor-to-Floor Joint Systems:
   1. Basis-of-Design Product: INPRO Architectural Products. 300 Series.
   2. Type: Snap-on cover.
      a. Exposed Metal: Aluminum.
         1) Finish: Anodized Aluminum
   3. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

2.05 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces and blockouts where architectural joint systems will be installed for installation tolerances and other conditions affecting performance of work.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to architectural joint system manufacturer's written instructions.

B. Repair concrete slabs and blockouts using manufacturer's recommended repair grout of compressive strength adequate for anticipated structural loadings.

C. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.

D. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

3.03 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing architectural joint assemblies and materials unless more stringent requirements are indicated.

B. Metal Frames: Perform cutting, drilling, and fitting required to install joint systems.
   1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
   2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper joint installation and performance.
   3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
   4. Locate in continuous contact with adjacent surfaces.
   5. Standard-Duty Systems: Shim to level where required. Support underside of frames continuously to prevent vertical deflection when in service.
   6. Heavy-Duty Systems: Repair or grout blockout as required for continuous frame support and to bring frame to proper level. Shimming is not allowed.
   7. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
   1. Provide in continuous lengths for straight sections.
   2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
   3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

D. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer before installing compression seals.

E. Terminate exposed ends of joint assemblies with field- or factory-fabricated termination devices.

F. Fire-Resistance-Rated Assemblies: Coordinate installation of architectural joint assembly materials and associated work so complete assemblies comply with assembly performance requirements.
   1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

3.04 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary

protection over joints. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION 079513.13

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SECTION 079513.16
EXTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section includes exterior building expansion joint cover assemblies.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. ACTION SUBMITTALS
   1. Product Data: For each type of product.
      a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.
   2. Shop Drawings: For each expansion joint cover assembly.
      a. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
      b. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
   3. Samples: For each exposed expansion joint cover assembly and for each color and texture specified, full width by 6 inches long in size.
   4. Samples for Initial Selection: For each type of exposed finish.
      a. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.
   5. Samples for Verification: For each type of expansion joint cover assembly, full width by 6 inches long in size.
   6. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
      a. Manufacturer and model number for each expansion joint cover assembly.
      b. Expansion joint cover assembly location cross-referenced to Drawings.
      c. Nominal, minimum, and maximum joint width.
      d. Movement direction.
      e. Materials, colors, and finishes.
      f. Product options.
      g. Fire-resistance ratings.

C. INFORMATIONAL SUBMITTALS
   1. Product Test Reports: For each fire-resistance-rated expansion joint cover assembly, for tests performed by manufacturer and witnessed by a qualified testing agency.
   2. Manufacturer's Qualification Statement.
   3. Installer's Qualification Statement.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.03 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 by a qualified testing agency.

2.04 EXTERIOR EXPANSION JOINT COVERS

A. Exterior Elastomeric-Seal Joint Cover Assembly consisting of elastomeric seal anchored to surface-mounted frames fixed to sides of joint gap.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Balco, Inc.
      b. **(Basis of Design)** Construction Specialties, Inc.
         1) Model: VF (Not Rated), VFR (Fire Rated)
      c. MM Systems Corporation.
      d. Watson Bowman Acme Corp.
   2. Application: Wall to wall.
   3. Installation: Recessed.
   4. Fire-Resistance Rating: Not less than that of adjacent construction.
   5. Seal: Preformed elastomeric membrane or extrusion.
      a. Color: As selected by Architect from manufacturer's full range.

2.05 MATERIALS

A. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.

B. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to comply with performance criteria for required fire-resistance rating.

C. Moisture Barrier: Manufacturer's standard, flexible elastomeric material.

2.06 ACCESSORIES

A. Moisture Barriers: Manufacturer's standard continuous, waterproof membrane within joint and attached to substrate on sides of joint.
   1. Provide where indicated on Drawings.

B. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.

B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

3.03 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

B. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
   1. Provide in continuous lengths for straight sections.
   2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
   3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

C. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.

D. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

E. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.
   1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

F. Moisture Barrier Drainage: If indicated, provide drainage fitting and connect to drains.

3.04 CONNECTIONS

A. Transition to Roof Expansion Joint Covers: Coordinate installation of exterior wall and soffit expansion joint covers with roof expansion joint covers specified in Section 077129 "Manufactured Roof Expansion Joints." Install factory-fabricated units at transition between exterior walls and soffits and roof expansion joint cover assemblies.

3.05 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections.

END OF SECTION 079513.16

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SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Hollow metal borrowed lites glazing frames.

E. Accessories, including glazing and matching panels.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 087100 - Door Hardware.

C. Section 088000 - Glazing: Glass for doors and borrowed lites.

D. Section 099000 - Painting and Coating: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. HMMA: Hollow Metal Manufacturers Association.

D. NAAMM: National Association of Architectural Metal Manufacturers.

E. NFPA: National Fire Protection Association.

F. SDI: Steel Door Institute.

G. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.

F. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames; 2026.

G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

I. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2022.

J. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

L. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

M. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

N. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

O. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

P. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

Q. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.

R. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.

S. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

T. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

U. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

V. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

W. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies; 2022.

X. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

Y. UL (DIR) - Online Certifications Directory; Current Edition.

Z. UL 9 - Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.

AA. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

BB. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.05 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.06 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.07 SUBMITTALS

A. See Section 013300 - Submittal Procedures,for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, temperature-rise ratings, core descriptions and finishes{CH#47328}.

C. Shop Drawings; include the following:
   1. Elevations of each door type.
   2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

E. Samples: Submit two samples of metal, 2 by 2 inches in size, showing factory finishes, colors, and surface texture.

F. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

G. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

H. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

I. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

J. Manufacturer's Qualification Statement.

K. Installer's Qualification Statement.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

C. Protect with resilient vented packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

D. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

E. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturers and model numbers or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.

2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. The manufacturers and model numbers or series listed below are Basis-of-Design.
   1. Subject to compliance with all specified requirements, provide products by one of the following, for each type of product listed, or equivalent:

D. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. **(Basis of Design)** Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Steelcraft, an Allegion brand: www.allegion.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Smoke- and Draft-Control Assemblies: Provide assemblies with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
   2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

C. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Type: As indicated in the Door Schedule on the drawings.
      d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
      e. Edge Construction: Type 2, Seamless.
   2. Door Core Material: Fiberglass insulation and vertical steel stiffeners.
   3. Door Thickness: 1-3/4 inches, nominal.
   4. Door Face Sheets: Flush.
   5. Door Finish: Factory primed and field finished.
   6. Manufacturers:
      a. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
      b. (Basis Of Design): Curries, an Assa Abloy Group company; 747 Series: www.assaabloydss.com/#sle.
      c. National Custom Hollow Metal Doors and Frames; : www.nationalcustomhollowmetal.com.
      d. Substitutions: See Section 016000 - Product Requirements.

B. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Type: As indicated in the Door Schedule on the drawings.
      d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
      e. Edge Construction: Type 2, Seamless.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR).
      a. Attach fire rating label to each fire rated unit.
   4. Door Core Material: Fiberglass insulation and vertical steel stiffeners.
   5. Door Thickness: 1-3/4 inches, nominal.
   6. Door Face Sheets: Flush.
   7. Door Finish: Factory primed and field finished.
   8. Manufacturers:
      a. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
      b. (Basis Of Design): Curries, an Assa Abloy Group company; 747 Series: www.assaabloydss.com/#sle.
      c. National Custom Hollow Metal Doors and Frames; : www.nationalcustomhollowmetal.com.
      d. Substitutions: See Section 016000 - Product Requirements.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
   1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
   2. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.

3. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
4. Frame Finish: Factory primed and field finished.
5. Weatherstripping: Integral, recessed into frame edge.
6. Products:
   a. **(Basis of Design)** Curries, an Assa Abloy Group company; Mercury 3 Series: www.assaabloydss.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

C. Interior Door Frames, Non-Fire Rated: Slip-on type at gypsum board walls, and knock-down type at masonry walls.
1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
2. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
3. Frame Finish: Factory primed and field finished.
4. Products:
   a. **(Basis of Design)** Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
      1) Standard Frames (single egress):
         (a) Stud and Gypsum Board Walls: CM Series.
         (b) Masonry Walls: M Series.
      2) Standard Frames (double egress):
         (a) DEM Series.
   b. Substitutions: See Section 016000 - Product Requirements.

D. Door Frames, Fire-Rated: Slip-on type at gypsum board walls, and knock-down type at masonry walls.
1. Fire Rating: Same as door, labeled.
2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
3. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
4. Frame Finish: Factory primed and field finished.
5. Products:
   a. **(Basis of Design)** Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
      1) Stud and Gypsum Board Walls: CM Series.
      2) Masonry Walls: M Series.
   b. Substitutions: See Section 016000 - Product Requirements.

E. Sound-Rated Door Frames: {CH#47489}.

F. Borrowed Lites Glazing Frames:
1. Construction and face dimensions to match door frames, and as indicated on drawings.
2. Fire Rating: As indicated on drawings.
3. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Glazing: Comply with requirements in Section 088000 "Glazing."

2.06 FRAME ANCHORS

A. Materials: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
   1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M, hot-dip galvanized according to ASTM A153/A153M, Class B.

B. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
   2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
   3. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
   4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8 inch diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

C. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
   1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

D. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

2.07 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.08 ACCESSORIES

A. Door Window Frames: Door window frames with glazing securely fastened within door opening.
   1. Size: As indicated on drawings.
   2. Frame Material: 18 gauge, 0.0478 inch, galvanized steel.

B. Glazing: As specified in Section 088000.

C. Astragals for Double Doors: Specified in Section 087100.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:
   1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
   2. Fire Door Cores: As required to provide fire-protection ratings indicated.
   3. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
   4. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
   5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
   6. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
   7. Fire Door Labeling: All fire rated doors shall receive an applied label. Embossing of door edge to indicate fire rating of door is not acceptable.
      a. At all doors to receive continuous hinges the fire label of the frame shall be affixed to the top of the door as not to be obscured by the continuous hinge.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
   1. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
   2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
   3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
   4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
   5. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
   1) Three anchors per jamb from 60 to 90 inches high.
   2) Four anchors per jamb from 90 to 120 inches high.
b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
   1) Four anchors per jamb from 60 to 90 inches high.

6. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
7. Fire Door Frame Labeling: All fire rated frames shall receive an applied label. Embossing of frames to indicate fire rating of frames is not acceptable.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in ANSI/SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Verify that finished walls are in plane to ensure proper door alignment.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

B. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.03 INSTALLATION

A. General: Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
1. Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 or NAAMM HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
   a. At fire-rated openings, install frames according to NFPA 80.

b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
c. Install frames with removable stops located on secure side of opening.
d. Install door silencers in frames before grouting.
e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

C. Install fire rated units in accordance with NFPA 80.
1. Coordinate frame anchor placement with wall construction.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
6. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

D. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.
d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

E. Install door hardware as specified in Section 087100.
1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Glazing: Comply with installation requirements in Section 088000 and with hollow-metal manufacturer's written instructions.

G. Coordinate installation of electrical connections to electrical hardware items.

H. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Remove grout and other bonding material from hollow-metal work immediately after installation.

B. Adjust for smooth and balanced door movement.

C. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

D. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

E. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

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SECTION 081416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid-core, flush wood doors with wood-veneer faces; flush and flush glazed configuration; fire-rated and non fire-rated.

B. Factory finishing flush wood doors.

C. Factory fitting flush wood doors to frames and factory machining for hardware.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - Unit Masonry: Installation of frames and doors in masonry walls.

C. Section 081113 - HOLLOW METAL DOORS AND FRAMES: Installation of wood doors in hollow metal frames.

D. Section 087100 - Door Hardware.

E. Section 088000 - GLAZING .

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI A208.1 - American National Standard for Particleboard; 2022.

C. AWI (QCP) - Quality Certification Program; Current Edition.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

F. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

H. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

I. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

J. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

K. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 PRE-INSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data; For each type of door: Indicate door core materials, edge construction and trim; veneer species, type and characteristics. Include factory-finishing specifications.

C. Shop Drawings shall include the following: Door elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts and holes for hardware, glazing and other details, requirements for veneer matching and fire protection ratings for fire rated doors.

1. Provide information as required by AWI/AWMAC/WI (AWS).
2. Include certification program label.

D. Samples of Construction: Submit two samples of door construction, approximately eight by ten inches in size cut from top corner of door, with door faces and edges representing actual materials to be used.
   1. Provide Samples for each species of veneer and solid lumber required.
   2. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

E. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

F. Samples for Verification: Submit three samples of door veneer, approximately eight by ten inches for each material and finish. For each wood species and transparent finish, provide samples illustrating wood grain, stain color, and sheen to be expected in finished work.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Manufacturer's Installation Instructions: Indicate special installation instructions.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

K. Specimen warranty.

L. Warranty, executed in Owner's name and registered with door manufacturer.

1.06 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

B. Vendor/Supplier Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than five years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

D. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience.

E. Woodwork Quality Assurance Program:
   1. Comply with AWI (QCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section; www.awiqcp.org/#sle.
   2. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.
   3. Provide designated labels on shop drawings as required by quality assurance program.
   4. Provide designated labels on installed products as required by quality assurance program.
   5. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors individually with resilient packaging and sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

D. Mark each door on bottom rail with opening number used on Shop Drawings.

1.08 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
   1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain flush wood doors and accessories from single source and from single manufacturer.

B. The manufacturers and model numbers or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Wood Veneer Faced Doors:
   1. Algoma Hardwoods Inc., distributed by Jersey Architectural Door & Supply Co.: www.jerseyarchitectural.com/#sle.
   2. Eggers Industries, a VT Industries, Inc. company: www.vtindustries.com/#sle.
   3. Marshfield Doors, Inc., a Forte Opening Solutions company: www.www-marshfielddoors.com.
   4. **(Basis of Design)** Forte Opening Solutions; Aspiro Select Wood Veneer Doors: www.forteopenings.com/#sle.

2.02 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S. 1A, "Architectural Wood Flush Doors."

B. WDMA I.S. 1A Performance Grade:
   1. Heavy Duty unless otherwise indicated.
   2. Extra Heavy Duty: Classrooms, Public Toilet Rooms, Janitor's Closets, and Assembly Spaces.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

2. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
4. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
5. Pairs: Provide formed-steel edges and astragals with intumescent seals.
    a. Finish steel edges and astragals to match door hardware (locksets or exit devices).

D. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-2, made with binder containing no urea-formaldehyde.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
    a. 5-inch top-rail blocking, in doors indicated to have closers.
    b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
    c. 5-inch midrail blocking, in doors indicated to have exit devices.
3. Provide doors with structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

E. Mineral-Core Doors:
1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
    a. 5-inch top-rail blocking.
    b. 5-inch bottom-rail blocking, in doors indicated to have protection plates.
    c. 5-inch midrail blocking, in doors indicated to have armor plates.
    d. 5 inch midrail blocking, in doors indicated to have exit devices.
3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
    a. Screw-Holding Capability: 475 lbf per WDMA T.M.-10.

2.03 DOORS

A. Doors: See drawings for locations and additional requirements.
1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
1. Provide solid core doors at each location.
2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
3. Wood veneer facing with factory transparent finish.

2.04 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.05 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Red oak, HPVA Grade AA, plain sliced (flat cut), with book match between leaves of veneer, center balance match of spliced veneer leaves assembled on door or panel face.
   1. "Running Match" each pair of doors and doors in close proximity to each other.
   2. "Pair Match" each door in same opening or when doors are separated only by mullions.

2.06 LIGHT FRAMES AND LOUVERS

A. Metal Frames for Light Openings in Fire-Rated Doors and Non-Fire Rated Doors: Manufacturer's standard frame formed of 0.048 inch thick, cold-rolled steel sheet; factory primed for field paint finish; and approved for use in doors of fire-protection rating indicated.

2.07 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.
   1. Comply with NFPA 80 requirements for fire-rated doors.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3.
   1. Comply with final hardware schedules, door and/or frame Shop Drawings, BHMA A156.115W, and hardware templates.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.08 FINISHES - WOOD VENEER DOORS

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 11, Polyurethane, Catalyzed.
      b. Sheen: Semigloss.

D. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
   1. Transparent:
      a. System - TR-6, Catalyzed Polyurethane.
      b. Sheen: Semigloss.

E. Factory finish doors in accordance with approved sample.

2.09 ACCESSORIES

A. Hollow Metal Door Frames: See Section 081113.

B. Glazed Openings:
   1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
   2. Fire-Protection-Rated Glass: Safety Certification, 16 CFR 1201, Category II.

C. Door Window Frames: Door window frames with glazing securely fastened within door opening.
   1. Size: As indicated on drawings.
   2. Frame Material: 18 gauge, 0.0478 inch, galvanized steel.
   3. Metal Finish: Beige polyester powder coating.
   4. Glazing: As indicated on drawings.

D. Glazing: See Section 088000.

E. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

F. Door Hardware: See Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.
   1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
   2. Reject doors with defects.

B. Verify existing conditions before starting work.

C. Verify that opening sizes and tolerances are acceptable.

D. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions, referenced quality standards and as indicated.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
   2. Install smoke and draft control doors in accordance with NFPA 105 requirements.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Rehang or replace doors that do not swing or operate freely.

C. Adjust closers for full closure.

END OF SECTION 081416

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SECTION 081743
FRP/ ALUMINUM HYBRID DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. FRP/ Aluminum Hybrid Door installed in Thermally Broken Aluminum Framing.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 REFRENCE STANDARDS

A. AAMA 1304 – Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.

B. AAMA 1503-98 – Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.

C. ANSI A250.4 – Test Procedure and Acceptance Criteria for Physical Endurance of Steel Doors and Hardware Reinforcing.

D. ASTM-B117 – Standard Practices for Operating Salt Spray (Fog) Apparatus.

E. ASTM-B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

F. ASTM-B221 – Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

G. ASTM-C518 – Standard test Method for Steady-State Thermal Transmission Properties by Means of Heat Flow Meter Apparatus.

H. ASTM-D256 – Standard Test Methods for Determining the Pendulum Impact Resistance of Plastics.

I. ASTM-D570 – Standard Test Method for Water Absorption of Plastics.

J. ASTM-D638 – Standard Test Method for Tensile Properties of Plastics.

K. ASTM-D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

L. ASTM-D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

M. ASTM-D1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics.

N. ASTM-D1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.

O. ASTM-D2126 – Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

P. ASTM-D2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

Q. ASTM-D3029 – Test Methods for Impact Resistance of Flat Rigid Plastic Specimens by Means of a Tup (Falling Weight) (Withdrawn 1995) (Replaced by ASTM-D5420).

R. ASTM-D5116 – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/ Products.

S. ASTM-D5420 – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

T. ASTM-D6670 – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/ Products.

U. ASTM-E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

V. ASTM-E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

W. ASTM-E283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

X. ASTM-E330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

Y. ASTM-E1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.

Z. ASTM-E1996 – Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.

AA. ASTM-F476 – Standard Test Methods for Security of Swinging Door Assemblies.

BB. ASTM-F1642-04 – Standard Test Method for Glazing Systems Subject to Air Blast Loading.

CC. NWWDA T.M. 7-90 – Cycle Slam Test Method.

DD. NFRC 100 – Procedure for Determining Fenestration Products U-Factors.

EE. NFRC 400 – Procedure for Determining Fenestration Products Air Leakage.

FF. TAS 201 – Impact Test Procedures.

GG. TAS 202 – Criteria for Testing Impact & Nonimpact Resistant Building Envelope Components Using Uniform Static Air Pressure.

HH. TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.
   1. Product Data.
      a. Submit manufacturer’s product data sheets, catalog pages illustrating the products, description of materials, components, fabrication, finishes, installation instructions, and applicable test reports.
   2. Shop Drawings.
      a. Submit manufacturer’s shop drawings, including elevations, sections, and details indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
   3. Samples.
      a. Submit manufacturer’s door sample composed of door face sheet, core, framing and finish.
      b. Submit manufacturer’s sample of standard colors for door face and frame.
   4. Testing and Evaluation Reports.
      a. Submit testing reports and evaluations provided by manufacturer conducted by and accredited independent testing agency certifying doors and frames comply with specified performance requirements listed in Section 2.04.
   5. Manufacturer Reports.
      a. Manufacturer’s Project References.
         1) Submit list of successfully completed projects including project name, location, name of architect, type, and quantity of doors manufactured.

B. Closeout Submittals.
   1. See Section 017700 - Closeout Procedures, for further instructions.
   2. Operation and Maintenance Manual.

a. Submit manufacturer's maintenance and cleaning instructions for doors and frames, including maintenance and operating instructions for hardware.

3. Warranty Documentation.
   a. Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications.
   1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 25 years concurrent successful experience.
   2. Door and frame components must be fabricated by same manufacturer.
   3. Evidence of a documented complaint resolution quality management system.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery.
   1. Deliver materials to site in manufacturer's original, unopened, containers and packaging.
   2. Labels clearly identifying opening, door mark, and manufacturer.

B. Storage.
   1. Store materials in a clean, dry area, indoors in accordance with manufacturer's instructions.

C. Handling.
   1. Protect materials and finish from damage during handling and installation.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Warrant doors, frames, and factory installed hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.

C. Standard Period.
   1. Ten years starting on date of Substantial Completion.

D. Limited lifetime
   1. Covers failure of corner joinery, core deterioration, and delamination or bubbling of door skin and corrosion of all-fiberglass products.

E. Finish
   1. 10 years.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 FRP/ALUMINUM HYBRID DOORS

A. Manufacturer **(Basis of Design)**:
   1. Special-Lite, Inc.
      a. PO Box 6, Decatur, Michigan 49045.
      b. Toll Free (800) 821-6531, Phone (269) 423-7068, Fax (800) 423-7610.
      c. Web Site www.special-lite.com.

d. E-Mail info@special-lite.com.

2.03 DESCRIPTION

A. Model.
1. SL-17 Pebble Grain FRP/ Aluminum Hybrid Door.

B. Door Opening Size.
1. As indicated on Door Schedule.

C. Construction.
1. Door Thickness: 1-3/4".
2. Stiles & Rails.
a. Aluminum extrusions made from 6063 aluminum alloys with a minimum temper of T5.
b. Minimum 2-5/16” deep one-piece extrusion with have integral reglets to accept face sheet on both interior and exterior side of door which secure face sheet into place and permit flush appearance.
c. Screw or snap in place applied caps are not acceptable.
d. Top rails must have integral legs for interlocking continuous extruded aluminum flush cap.
e. Bottom rails must have integral legs for interlocking continuous weather bar with single nylon brush weather stripping or manually adjustable SL-301 door bottom with two nylon brush weather stripping.
f. Meeting stiles to include integral pocket to accept pile brush weather seal.
3. Corners.
a. Mitered.
b. Secured with 3/8” diameter full-width steel tie rod through extruded splines top and bottom which are integral to standard tubular shaped rails.
c. 1-1/4” x 1-1/4” x 3/16” 6061 aluminum angle reinforcement at corner to give strong, flat surface for locking hex nut to bear on.
d. Weld, glue, or other methods of corner joinery are not acceptable.
4. Core.
a. Poured-in-place polyurethane foam.
b. Laid in foam cores are not acceptable.
c. Foam Plastic Insulated Doors: IBC 2603.4.
1) Foam plastic shall be separated from the interior of a building by an approved thermal barrier.
2) Approved thermal barrier must meet the acceptance criteria of the Temperature Transmission Fire Test and Integrity Fire Test as stated in NFPA 275.
3) IBC 2603.4.1.7 foam plastic insulation, having a flame spread index less than 75 and a smoke developed index of not more than 450 shall be permitted as a door core when the face is metal minimum 0.032” aluminum or 0.016” steel.
4) Standard door assembly can be tested to show it meets these requirements without the use of thermal barrier. If no independent testing conducted all doors with foam plastic core must have a thermal barrier.
5. Face Sheet.
a. Exterior
1) 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
2) Color as selected by Architect from manufacturer’s full range of standard colors.
b. Interior
1) 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
2) Class A.
c. Attachment of face sheet.

1) Extruded stiles and rails to have integral reglets to accept face sheet on both interior and exterior side of door which secure face sheet into place and permit flush appearance.
2) Use of glue to bond face sheet to core or extrusions is not acceptable.

6. Cutouts.
   a. Manufacture doors with cutouts for required vision lites, louvers, and panels.
7. Hardware.
   a. Pre-machine doors in accordance with templates from specified hardware manufacturers.
   b. Surface mounted closures will be reinforced for but not prepped or installed at factory.
   c. Factory install door hardware.
8. Reinforcements.
   a. Aluminum extrusions made from 6061 or 6063 aluminum alloys.
   b. Sheet and plate to conform to ASTM-B209.
   c. Alloy and temper to be selected by manufacturer for strength, corrosion resistance, and application of required finish, and control of color.
   d. Bars and tubes to meet ASTM-B221.

2.04 FRAMING

A. Framing
1. Thermally Broken Aluminum Framing.
   a. Model: SL-600TB
   b. Materials.
      1) See 2.05.A.
   c. Perimeter Frame Members.
      1) Storefront frame with thermally broken pocket filler.
      2) Factory fabricated.
      3) Open-back framing is not acceptable.
   d. Thermal Strut.
      1) Fiber reinforced plastic, no other materials will be accepted.
   e. Applied Door Stops.
      1) 5/8” x 1-1/4” or 5/8” x 1-3/4”, 0.125” wall thickness, with screws and weather-stripping.
      2) Provide solid ½” aluminum bar behind door stop for closer shoe attachment.
      3) Pressure gasketing for weathering seal.
      4) Counterpunch fastener holes in door stop to preserve full-metal thickness under fastener head.
      5) Minimum ½” aluminum bar reinforcement under doorstop for required hardware attachments, aluminum to meet ASTM-B221.
   f. Caulking.
      1) Caulk joints before assembling frame members.
   g. Frame Member to Member Connections.
      1) Secure joints with fasteners.
      2) Provide hairline butt joint appearance.
      3) Shear block construction only, no screw spline allowed.
   h. Hardware
      1) Pre-machine and reinforce frame members for hardware in accordance with manufacturer's standards and door hardware schedule.
      2) Surface mounted closures will be reinforced for but not prepped or installed at factory.

3) Factory install door hardware.

i. Anchors:

1) Anchors appropriate for wall conditions to anchor framing to wall materials.
2) Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.
3) Secure head and sill members of transom, side lites, and similar conditions.

2. Capping.
   a. Model: SL-70.
   b. Materials.
      1) See 2.05.A.
      2) Size as indicated on drawings.

2.05 PERFORMANCE

A. Face Sheet.
   1. Standard Interior and Exterior Class C 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
      a. Flexural Strength, ASTM-D790: 21 x 10^3 psi.
      b. Flexural Modulus, ASTM-D790: 0.7 x 10^6 psi.
      c. Tensile Strength, ASTM-D638: 13 x 10^3 psi.
      d. Tensile Modulus, ASTM-D638: 1.2 x 10^6 psi.
      e. Barcol Hardness, ASTM-D2583: 55.
      f. Izod Impact, ASTM-D256: 14.0 ft-lb/in.
      g. Gardner Impact Strength, ASTM-D5420: 120 in-lb.
      h. Water Absorption, ASTM-D570: 0.20%/24hrs at 77°F.
      i. Surface Burning, ASTM-E84: Flame Spread ≤ 200, Smoke Developed ≤ 450.
      j. Taber Abrasion Resistance, Taber Test: 0.007% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.
      k. Chemical Resistance.
         1) Excellent Rating.
            (a) Acetic Acid, Concentrated.
            (b) Acetic Acid, 5%.
            (c) Bleach Solution.
            (d) Detergent Solution.
            (e) Distilled Water.
            (f) Ethyl Acetate.
            (g) Formaldehyde.
            (h) Heptane.
            (i) Hydrochloric Acid, 10%.
            (j) Hydrogen Peroxide, 3%.
            (k) Isooctane.
            (l) Lactic Acid, 10%.
      l. USDA/FSIS Requirements.
         1) FRP face sheet with surfaseal is a finished outer surface material that is rigid; durable; non-toxic; non-corrosive; moisture resistant; a light, solid color such as white; easily inspected; smooth or an easily cleaned texture.
         2) FRP face sheet with surfaseal does not contain any known carcinogen, mutagen, or teratogen classified as hazardous substances; heavy metals or toxic substances; antimicrobials; pesticides or substances with pesticidal characteristics.
   2. Interior Face Only Class A 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
      a. Flexural Strength, ASTM-D790: 13 x 10^3 psi.

b. Flexural Modulus, ASTM-D790: 0.57 x 10^6 psi.
c. Tensile Strength, ASTM-D638: 6.8 x 10^3 psi.
d. Tensile Modulus, ASTM-D638: 0.90 x 10^6 psi.
e. Barcol Hardness, ASTM-D2583: 40.
f. Izod Impact, ASTM-D256: 12.0 ft-lb/in notched.
g. Gardner Impact Strength, ASTM-D3029: 45 in-lb.
h. Water Absorption, ASTM-D570: 0.32%/24hrs at 77°F.
i. Surface Burning, ASTM-E84: Flame Spread ≤ 25, Smoke Developed ≤ 450.
j. Taber Abrasion Resistance, Taber Test: 0.02% Max Wt. Loss, cs-17 wheels, 1000g. Wt., 25 cycles.

B. Door Core.
1. Density, ASTM-D1622: ≤ 5.0 pcf.
2. Compressive Properties, ASTM-D1621: Compressive Strength ≥ 60 psi, Compressive Modulus ≥ 1948 psi.
3. Tensile and Tensile Adhesion Properties, ASTM-D1623: Tensile Adhesion, 3” x 3” FRP Facers ≥ 53 psi, Tensile Adhesion, 1” x 1” Foam ≥ 104 psi.
4. Thermal and Humid Aging, ASTM-D2126: Volume Change at 158 °F, 100% humidity, 14 days ≤ 13%.
5. Thermal Conductivity, ASTM-C518, Thermal Resistance ≥ 0.10 m^2K/W.

C. Door Panel.
1. Thermal Transmittance, AAMA 1503-98: U-Factor = 0.29 Btu/hr·ft²·°F, CRFp = 55.
2. Indoor Air Quality, ASTM-D5116, ASTM-D6607: GreenGuard, GreenGuard Gold.

D. Door and Thermally Broken Aluminum Frame Assembly.
1. Thermal Transmittance, NFRC 100.
a. Opaque Swinging Door (< than 50% glass)
1) U-Factor = 0.31 Btu/hr·ft²·°F.
b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
1) U-Factor = 0.64 Btu/hr·ft²·°F.
2. Air Leakage, NFRC 400, ASTM-E283.
a. Opaque Swinging Door (< than 50% glass)
1) 0.01 cfm/sqft @ 1.57 psf.
2) 0.01 cfm/sqft @ 6.24 psf.
b. Commercially Glazed Swinging Entrance Door (> than 50% glass)
1) 0.38 cfm/sqft @ 1.57 psf.
2) 0.73 cfm/sqft @ 6.24 psf.
3. Sound Transmission, ASTM-E90: STC = 30, OITC = 29.

2.06 MATERIALS

A. Aluminum Members.
1. Aluminum extrusions made 6061 or 6063 aluminum alloys.
2. Sheet and plate to conform to ASTM-B209.
3. Alloy and temper to be selected by manufacturer for strength, corrosion resistance, and application of required finish, and control of color.

B. Fiberglass.
1. See 2.02.C.5.

C. Fasteners.
1. All exposed fasteners will have a finish to match material being fastened.
2. 410 stainless steel or other non-corrosive metal.
3. Must be compatible with items being fastened.

2.07 FABRICATION

A. Factory Assembly.
   1. Door and frame components from the same manufacturer.
   2. Required size for door and frame units, shall be as indicated on the drawings.
   3. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
   4. All cut edges to be free of burs.
   5. Welding of doors or frames is not acceptable.
   6. Maintain continuity of line and accurate relation of planes and angles.
   7. Secure attachments and support at mechanical joints with hairline fit at contact surfaces.

B. Shop Fabrication
   1. All shop fabrication to be completed in accordance with manufactures process work instructions.
   2. Quality control to be performed before leaving each department.

2.08 FINISHES

A. Door.
   1. Aluminum.
      a. Mill.
         1) AA-M10C22A21-Flash.
      b. Paint.
         1) Aluminum.
            (a) KYNAR®.
               (1) Topcoat: 70% KYNAR or HYLAR 5000 Coating, meets or exceeds all AAMA 2605 specifications, 2.5 to 4.0 wet mils, 1.00 to 1.20 dry mils.
               (2) Color: As selected by Architect from manufacturer's full range of colors.
   2. FRP Face Sheets
      a. Through color.
         1) Color: As selected by Architect from manufacturer's full range of colors.

B. Frame
   1. Aluminum.
      a. Mill.
         1) AA-M10C22A21-Flash.
      b. Paint.
         1) Aluminum.
            (a) KYNAR®.
               (1) Topcoat: 70% KYNAR or HYLAR 5000 Coating, meets or exceeds all AAMA 2605 specifications, 2.5 to 4.0 wet mils, 1.00 to 1.20 dry mils.
               (2) Color: As selected by Architect from manufacturer's full range of colors.

2.09 ACCESSORIES

A. Vision Lites.
   1. Factory Glazing.
      a. Model: FL Standard.
      b. Glazing Thickness: 1".
      c. Rectangular Lites.
         (a) Size, as indicated on drawings.

B. Hardware.

1. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
2. Factory install hardware.
3. Hardware Schedule: See Section 08 7100.

C. Architectural Panels.
1. FRP Panels.
a. SL-37.
1) Size, as indicated on drawings.
2) Thickness: 1-3/4".
3) Face Sheet.
(a) Material.
(1) Standard exterior and interior face, Class C 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
(2) Interior face, Class A 0.120” thick, pebble texture, through color with integral surfaseal film FRP sheet.
(b) Color: As selected by Architect from manufacturer's full range of standard colors.
4) Performance.
(a) Face Sheet.
(1) See 2.02.C.5.
(b) 1-3/4” Thick Panel.
(1) Wood or aluminum frame perimeter.
(2) Poured-in-place Polyurethane Foam Core.
(3) Thermal Performance, AAMA 1503-98: U-Factor = 0.10 Btu/hr·ft²·°F; CRFp=87.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas to receive doors.

B. Notify architect of conditions that would adversely affect installation or subsequent use.

C. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.03 ERECTION

A. Install doors in accordance with manufacturer’s instructions.

B. Install doors plumb, level, square, true to line, and without warp or rack.

C. Anchor frames securely in place.

D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by architect.

E. Set thresholds in bed of mastic and back seal.

F. Install exterior doors to be weathertight in closed position.

G. Repair minor damages to finish in accordance with manufacturer’s instructions and as approved by architect.

H. Remove and replace damaged components that cannot be successfully repaired as determined by architect.

3.04 FIELD QUALITY CONTROL

A. Manufacture's Field Services.
   1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

3.05 ADJUSTING

A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.06 CLEANING

A. Clean doors promptly after installation in accordance with manufacturer's instructions.

B. Do not use harsh cleaning materials or methods that would damage finish.

3.07 PROTECTION

A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION 081743

SECTION 083100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - Unit Masonry: Anchoring and grouting access door frames set in masonry construction.

C. Section 087100 - Door Hardware: Mortise cylinder and core hardware.

D. Section 092116 - Gypsum Board Assemblies: Anchoring access doors frames installed in stud and gypsum board walls.

E. Section 099000 - Painting and Coating: Field paint finish.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

C. NACE No. 1 - Joint Surface Preparation Standard White Metal Blast Cleaning; Current Edition.

D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

E. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

F. NFPA 288 - Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies; 2022.

G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

H. SSPC-SP 5 - White Metal Blast Cleaning; 2007.

I. SSPC-SP 8 - Pickling; current edition.

J. UL (FRD) - Fire Resistance Directory; Current Edition.

K. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of access door and frame indicated, provide sizes, types, fire ratings, materials, individual components, profiles, finishes, hardware, scheduled locations, and details of connections at adjoining work.

C. Access Door and Frame Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

D. Shop Drawings: Indicate exact position of each access door and/or panel unit.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Detail fabrication and installation of access doors and frames for each type of substrate.

E. Samples: For each door face material, submit two units, 3 by 5 inchesin size indicating specified finish.

F. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Speciment warranty.

J. Project Record Documents: Record actual locations of each access unit.

1.06 QUALITY ASSURANCE

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Size Variations: Obtain Architect's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

D. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience.

1.07 WARRANTY

A. Manufacturer's standard warranty against manufacturing defects and workmanship.

B. Manufacturer's standard 1 year warranty against premature deterioration due to weathering.

C. Fill out forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MATERIALS

A. Steel Sheet: Uncoated cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Surface Preparation for Steel Sheet, Plates, Shapes and B: Clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.

2. Factory-Primed Finish: Apply shop primer immediately after cleaning and pretreating.

D. Drywall Beads: Edge trim formed from 0.0299 inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

2.03 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
   2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.04 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units:
   1. Location: As indicated on drawings.
   2. Panel Material: Steel, hot-dipped zinc or zinc-aluminum-alloy coated.
   3. Size: As indicated on drawings.
   4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
   5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
   6. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

B. Wall-Mounted Units in Wet Areas:
   1. Location: As indicated on drawings.
   2. Panel Material: Stainless steel, Type 304.
   3. Size: As indicated on drawings.
   4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
   5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
   6. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

C. Fire-Rated Wall-Mounted Units:
   1. Wall Fire-Rating: As indicated on drawings.
   2. Panel Material: Steel, hot-dipped zinc, or zinc-aluminum-alloy coated.
   3. Size: As indicated on drawings.
   4. Door/Panel: Insulated double-surface panel.

2.05 WALL- AND CEILING-MOUNTED ACCESS UNITS

A. Manufacturers:
   1. Milcor, a Duravent Group Company: www.milcorinc.com/#sle.
      a. Wall or Ceiling Units, non fire rated: Milcor, Series DW.
      b. Wall or Ceiling Units, fire rated: Milcor, Series UFR DW.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Dry Location Material: Steel, hot-dipped zinc or zinc-aluminum-alloy coated.
   2. Wet Location Material: Stainless steel, Type 304.
   3. Style: Exposed frame with door surface flush with frame surface.

4. Door Style, Non Fire Rated: Single thickness with rolled or turned in edges.
5. Door Style, Fire Rated: Double-skinned hollow panel with 2 inch mineral fiber insulation.
6. Frames: 16-gauge, 0.0598-inch minimum thickness.
7. Single Steel Sheet Door Panels: 16-gauge, 0,0625-inch minimum thickness.
8. Double-Skinned Hollow Steel Sheet Door Panels: 20-gauge, 0.0396-inch minimum thickness, on both sides and along each edge.
9. Insulation: Non-combustible mineral wool or glass fiber.
10. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
    a. Provide products listed by UL (FRD) as suitable for purpose indicated.
    b. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
11. Stainless Steel Finish: No.4 brushed finish.
12. Primed and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
13. Door/Panel Size: As indicated on the drawings.
14. Hardware:
    a. Hardware for Fire-Rated Units: As required for listing.
    b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
    c. Handle: No handle.
    d. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
        1) Mortise cylinder and core as specified in Section 087100.
    e. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.
    f. Gasketing: Extruded neoprene, around perimeter of door panel.

2.06 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

D. Position units to provide convenient access to concealed equipment when necessary.

3.04 ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083100

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SECTION 083313
COILING COUNTER DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated coiling counter doors and operating hardware.

B. Automatic closing, smoke/fire-rated coiling counter doors and operating hardware.

C. Electric motor operation; wiring from electric circuit disconnect to operator to control station.

D. Products That May Be Supplied, But Are Not Installed Under This Section:
   1. Control station.
   2. Electrical disconnect.
   3. Annunciators.
   4. Primary and control wiring.
   5. Conduit and fittings.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Provide doors with UL label for the fire rating classification, 3/4 hr.
   2. Provide doors with UL label for “Leakage Rated Assembly” or “S” label demonstrating product tested to UL 1784.
   3. For counter fire doors up to 10’ wide and 6’ high, provide guides with integral and invisible guide brush seal.

1.03 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055000 - METAL FABRICATIONS: Miscellaneous steel supports.

C. Section 061000 - ROUGH CARPENTRY: Rough openings.

D. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

E. Section 083100 - Access Doors and Panels.

F. Section 092116 - GYPSUM BOARD ASSEMBLIES: Rough openings.

G. Division 26 Sections: Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring and connection to alarm system.

H. Section 260583 - Wiring Connections: Power to disconnect.

I. Section 284600 - Fire Detection and Alarm: Fire alarm interconnection.

1.04 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

D. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test; 2022.

E. ISO 9001 - Quality Management Systems — Requirements; 2026.

F. NEMA MG 00001 - Motors and Generators; 2024.

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

H. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

I. UL (DIR) - Online Certifications Directory; Current Edition.

J. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

K. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit manufacturer's standard literature showing materials, individual components, details of construction and finish for each type of coiling counter door and accesory indicated.
   1. Include data of automatic closing devices and testing and re-setting instructions.

C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details, including special components not dimensioned or detailed in manufacturer's product data.
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
   4. Show locations of controls, locking devices, detectors or replaceable fusible links, and other accessories.
   5. Include diagrams for power, signal, and control wiring.

D. Samples: Two slats, 4 inches long, illustrating shape, color, and finish texture.

E. Provide proof of manufacturer ISO 9001:2015 registration.

F. Manufacturer's Installation Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Specimen warranty.

J. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

K. Certificate stating that installed materials meet or exceed the requirements of this specification.

L. Project Record Documents: Include as-built electrical diagrams for electrical operation and connection to fire alarm system.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001:2015 registered company, specializing in manufacturing the products specified in this section with minimum five years of documented experience.
   1. ISO 9001:2015 registered

B. Installer Qualifications: Company specializing in performing work of type specified and with at least five years documented experience and approved by manufacturer.

C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

D. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing firm acceptable to authorities having jurisdiction as suitable for the purpose specified in this section and indicated on the drawings.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for counterbalance shaft assembly. Complete forms in Owner's name and register with manufacturer.

C. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

D. Maintenance: Submit for owner’s consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturers and model numbers or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Coiling Counter Doors (non fire rated):
1. **(Basis Of Design)** Cornell Iron Works, Inc.Model ESC10 Uninsulated: www.cornelliron.com.
2. Substitutions: See Section 016000 - Product Requirements.

B. Coiling Counter Fire Doors:
1. Clopay: www.clopaydoor.com/#sle.
2. Cookson: www.cooksondoor.com/#sle.
3. **(Basis Of Design)** Cornell Iron Works, Inc.; Model ERC11 Smoke and Fire Rated: www.cornelliron.com.
4. Substitutions: See Section 016000 - Product Requirements.

2.03 COILING COUNTER DOORS

A. General:
1. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.
2. Obtain coiling counter doors from single source from single manufacturer.
3. Obtain operators and controls from coiling counter door manufacturer.

B. Coiling Counter Doors, Non-Fire-Rated: Galvanized steel slat curtain.
1. Mounting: Interior face mounted.
2. Slats:
a. No. 1F, interlocked flat-faced slats, 1-1/2 inches high by 1/2 inch deep, minimum 22 gauge ASTM A653/A653M, Commercial Quality, galvanized steel with extruded tubular aluminum bottom bar with continuous lift handle and vinyl astragal
3. Finish, Galvanized Steel:ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and baked-on polyester enamel finish coat .

a. Color: As selected by Architect from manufacturer's full range.

4. Guides: Formed track; same material and finish as slats, unless otherwise indicated.
5. Hood Enclosure: Manufacturer's standard; primed steel.
6. Electric operation. Motor shall have an integrated interlock system to prevent damage to door, motor and operator when mechanical door locking devices are provided.
7. Locking Devices: Slide bolt on inside.

C. Coiling Counter Metal Doors, Fire-Rated: Galvanized steel slat curtain.
1. Mounting: Interior face mounted.
2. Fire Rating: 3/4 hour; comply with NFPA 80.
   a. Provide product listed and labeled by UL (DIR) as suitable for the purpose specified and indicated.
3. Slats:
   a. No. 1F, interlocked flat-faced slats, 1-1/2 inches high by 1/2 inch deep, minimum 22 gauge ASTM A653/A653M, commercial quality, galvanized steel with plain steel bottom bar and vinyl astragal
4. Finish, Galvanized Steel: ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and baked-on polyester enamel finish coat.
   a. Color: As selected by Architect from manufacturer's standard colors.
5. Guides:
   a. Minimum 12 gauge formed shapes.
   b. Finish: Zirconium treatment followed by baked-on polyester powder coat with color matching fasteners, color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D3363 pencil hardness: H or better.
   c. Color: As selected by Architect from Manufacturer's full range.
6. Brackets:
   a. Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
   b. Finish: Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D3363 pencil hardness: H or better.
7. Hood Enclosure: 24 gauge galvanized steel; galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets as required to prevent excessive sag.
8. UL 1784 Listed (S labeled counter fire doors):
9. Bottom Bar (Motor Operated Units):
   a. Combination UL 10B listed smoke seal/sensing edge.
10. Guides:
    a. Integrated and invisible UL listed brush seals for doors up to 10’ wide and 6’ high.
11. Header:
    a. UL listed brush seal.
12. Manual hand crank lift operation:
    a. AlarmGard Advanced Manual Crank Fire Door Operators:
       1) Electrically activated, manually operated, 115 volt AC system with planetary gear reduction, a transformer with 24v secondary output and an internal failsafe release mechanism
       2) Door assembly to be manually operated by chassis style crank.
       3) Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.

4) Electrically activate automatic closure by notification from central alarm system or notification from local detectors.
5) Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
6) Delay automatic closure after notification for no more than ten seconds.
7) Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.
8) Maintain automatic closure speed at an average of 12” (304mm) per second.
9) Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human supervision.
10) Provide minimum #50 roller chain from operator output shaft to the door drive shaft.
11) Install system only with manufacturer supplied or specified fasteners.
12) Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.
13) Notify electrical contractor to supply and install the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.
14) Drop test and reset door system twice by all means of activation and comply fully with NFPA 80, Section 5.

2.04 COMPONENTS

A. Metal Curtain Construction: Interlocking, single-thickness slats.
   1. Slat Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
   2. Curtain Bottom: Fitted with tube to provide reinforcement and positive contact in closed position.
   3. Steel Slats: ASTM A653/A653M galvanized steel sheet, with minimum G90/Z275 coating; minimum thickness 22 gauge, 0.03 inch.

B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
   1. Guides for Galvanized Curtains: ASTM A36/A36M steel angles, size as indicated, hot-dip galvanized per ASTM A123/A123M.

C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.

D. Lock Hardware:
   1. For motor operated units, additional lock or latching mechanisms are not required.
   2. Slide Bolt: Provide on both-jamb sides, extending into slot in guides, with padlock on one side.

E. Counterbalance Shaft Assembly:
   1. Barrel:
      a. Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width.
   2. Spring Balance:
      a. Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque

2.05 ACCESSORIES

A. Locking Mechanism: None required.

2.06 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction (AHJ) as suitable for purpose specified and indicated.
   1. Provide interlock switches on motor operated units.

B. Electric Operators:
   1. Mounting: Front, Right Side Mounted.
   2. Motor Enclosure: NEMA MG 00001.
   3. Motor Rating: 1/2 hp; continuous duty.
   4. Motor Voltage: 110-120 VAC, single phase, 60 Hz.
   5. Opening Speed: 12 inches per second.

C. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each electrical operator.
   1. Controls: 24 VAC circuit.
   2. Wall Mounting: Recessed.

D. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to reverse operator upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that adjacent construction is suitable for door installation and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Verify that electrical services have been installed and are accessible.

D. Verify that door opening is plumb, header is level, and dimensions are correct.

E. Notify Architect of any unacceptable conditions or varying dimensions.

F. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 INSTALLATION

A. Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

B. Install units in accordance with manufacturer's instructions.

C. Install fire-rated doors in accordance with NFPA 80 NFPA 10

D. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

E. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

F. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

G. Coordinate installation of electrical service with Section 260583.

H. Complete wiring from disconnect to unit components.

I. Install perimeter trim as indicated.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.05 FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.06 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

C. Remove surplus materials and debris from the site.

3.07 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION 083313

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SECTION 083323
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior coiling doors.

B. Fire-rated coiling doors.

C. Electric operators and control stations.

D. Wiring from electric circuit disconnect to operators and control stations.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055000 - Metal Fabrications: Miscellaneous steel supports.

C. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

D. Section 083100 - Access Doors and Panels.

E. Section 260533.13 - Conduit for Electrical Systems: Conduit from electric circuit to operator and from operator to control station.

F. Section 260533.13 - Conduit for Electrical Systems: Conduit from fire alarm system.

G. Section 260583 - Wiring Connections: Power to disconnect.

H. Section 284600 - Fire Detection and Alarm: Fire alarm interconnection.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2025.

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

F. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test; 2022.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

H. ITS (DIR) - Directory of Listed Products; Current Edition.

I. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

J. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

K. NEMA MG 00001 - Motors and Generators; 2024.

L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

M. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

N. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

O. UL (DIR) - Online Certifications Directory; Current Edition.

P. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

Q. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

R. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
   1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
   2. Rated capacities, operating characteristics, and furnished accessories.
   3. For fire-rated doors, description of fire-release system including testing and resetting instructions.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Show locations of replaceable fusible links.

D. Quality Assurance/Control Submittals:
   1. Provide manufacturer ISO 9001:2015 registration.
   2. Certificate stating that installed materials comply with this specification.

E. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
   1. Include similar Samples of accessories involving color selection.

F. Samples: Two slats, 2 inches by 6 inches inches in size illustrating shape, color and finish texture.

G. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Maintenance Data: Include lubrication requirements and frequency, periodic adjustments required, and maintenance manuals.

K. Specimen warranty.

L. Operation and Maintenance Manual.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

B. Manufacturer Qualifications:
   1. Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

2. ISO 9001:2015 registered.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years documented experience and approved by manufacturer.

D. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

E. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

1.06 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Standard Warranty: Two years from date of shipment against defects in material and workmanship.

C. Maintenance Warranty: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturers and model numbers or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Overhead Coiling Metal Doors:
1. Clopay: www.clopaydoor.com/#sle.
2. **(Basis of Design)** Cornell Iron Works, Inc; Thermiser Max, Model No. ESD30 (exterior/insulated): www.cornelliron.com/#sle.
3. Overhead Door Corporation: www.overheaddoor.com/#sle.
4. Raynor Garage Doors: www.raynor.com/#sle.
5. Substitutions: See Section 016000 - Product Requirements.

D. Overhead Coiling Fire Doors:
1. Clopay: www.clopaydoor.com/#sle.
2. **(Basis of Design)** Cornell Iron Works, Inc; Firemiser, Model No. ERD21 (interior/fire/smoke rated): www.cornelliron.com/#sle.
3. Overhead Door Corporation: www.overheaddoor.com/#sle.
4. Raynor Garage Doors: www.raynor.com/#sle.
5. Substitutions: See Section 016000 - Product Requirements.

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.
1. Capable of withstanding positive and negative wind loads of 20 psf without undue deflection or damage to components.
2. Sandwich Slats: Manufacturer's standard, with core of foamed-in-place polyurethane insulation; minimum R-value of 8.0.
   a. Total Slat Thickness: 15/16" with 7/8" foamed-in-place polyurethane insulation
   b. Flame Spread Index of 0 and Smoke Developed Index of 10 as tested per ASTM E84.
   c. Nominal Slat Size: 3 inches wide by required length.

3. Finish: Factory powder coat painted, color as selected by Architect from manufacturers full range; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D3363 pencil hardness: H or better.
4. Bottom Bar:
    a. Insulated Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4” tall x 1-1/16” thickness.
    b. Finish: Exterior and Interior to match slats.
    c. Affix air infiltration certification label to bottom bar.
5. Guide, Angles: Stainless steel, minimum 3/16" thick, #4 type 304 finish.
    a. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.
6. Brackets: Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
    a. Finish: To match slats.
7. Hood Enclosure: Manufacturer's standard; primed and factory finished, color to match door.
8. Weatherstripping:
    a. Bottom Bar:
        1) Motor Operated Doors: Sensing/weather edge with neoprene astragal extending full width of door bottom bar.
        2) Guides: Replaceable vinyl strip on guides sealing against both sides of curtain.
        3) Lintel Seal: Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.
        4) Hood: Neoprene/rayon baffle to impede air flow above coil.
9. Electric operation with emergency manual chain hoist backup operation during power outages.
    a. Motor:
        1) Standard Use, Industrial Duty Gear Head: operator must not extend above or below the door coil when mounted front-of-coil. Rated for a maximum of 20 cycles per hour. Comply with UL requirements in The United States. Totally Enclosed Non Ventilated gear head operator(s) rated 1/2 hp. ____Volts, ____Phase.
        2) Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist and control station(s). Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with #50 roller chain. Provide an integral Motor Mounted Interlock system to prevent damage to door and operator when mechanical door locking devices are provided. Operator shall be capable of driving the door at a speed of up to 9” per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station(s) and supply the appropriate

disconnect switch, all conduit and wiring per the overhead door wiring instructions.

10. Mounting: Face of wall mounted.
11. Control Station:
    a. Surface Mounted: "Open/Close/Stop" push buttons; NEMA 1.
    b. Control Operation: Constant pressure to close.
    c. Sensing/Weather Edge: Automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.
        1) Electric Sensing Edge Device: Provide a wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator.

B. Fire-Rated Coiling Doors: Steel slat curtain; complying with NFPA 80.
1. 3/4 hour fire rating.
2. Provide products listed and labeled by UL (DIR) as suitable for purpose specified and indicated on drawings.
3. Oversized Openings: Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated units and operating hardware assembly.
4. Nominal Slat Size: 3 inches wide by required length.
5. Sandwich Slats: Manufacturer's standard, with core of mineral wool insulation; minimum R-value of 5.3.
    a. Total Slat Thickness: 1 inch with 7/8 inch mineral wool insulation.
    b. Slat Material: No. 6M, face slat with Stainless Steel back cover: minimum 22 gauge AISI type 304 stainless steel.
    c. Mineral Wool Core Material: 7/8 inch (22 mm) thick fire retardant mineral wool, ASTM C665-95 or ASTM C612-93.
    d. Flame Spread Index of 0 and Smoke Developed Index of 0 as tested per ASTM E84.
6. Finish: No. 4 - Brushed, type 304 stainless steel.
7. Bottom Bar:
    a. Stainless Steel Angles: 2 AISI 300 series stainless steel angles minimum 2”x2”x1/8”.
    b. Finish: To match slats.
    c. Affix air/smoke infiltration certification label to bottom bar.
8. Guides, Angles: Stainless steel, minimum 3/16" thick, #4 type 304 finish.
    a. Minimum 1/4 inch structural steel angles. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 ½” of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
    b. Finish: Zirconium treatment with baked-on polyester powder coat. Color as selected by Architect from manufacturer's standard color range of over 180 colors. Minimum 2.5 mils cured film thickness; ASTM D3363 pencil hardness: H or better.
9. Brackets: Fabricate from minimum 1/4 inch (6.35 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
    a. Finish: Zirconium treatment with baked-on polyester powder coat. Color as selected by Architect from manufacturer's standard color range of over 180 colors. Minimum 2.5 mils cured film thickness; ASTM D3363 pencil hardness: H or better.
10. Hood Enclosure: Minimum 24 gauge stainless steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets; #4 type stainless steel with 304 finish, to match door.
11. Combination Weather/Smoke Seals:
    a. Bottom Bar (motor operated doors): Combination smoke seal/sensing edge.

b. Guides and Head: Replaceable, UL listed, nylon brush smoke seals sealing against fascia side of curtain.

12. Fire Alarm Release Mechanism: Electric-motor operated from fire alarm system and local heat or smoke detectors.
    a. Provide resettable device without replacement of parts, except when release triggered by exposure to local heat.
13. Electric operation with emergency manual chain hoist backup operation during power outages.
    a. Motor:
        1) UL listed NEMA 1 enclosure, horsepower as recommended by manufacturer, 115v single phase service. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.
            (a) FireGard™ Fire Door Motor Operation, by Cornell Iron or equivalent.
        2) Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
        3) Equip operator with an emergency manual chain hoist assembly that provides emergency operation during non-alarm power failure.
        4) Activate automatic closure by separation of a fusible link, notification from central alarm system, or notification from local detectors.
        5) Delay automatic closure for no more than ten seconds when electrically notified.
        6) Control automatic closure speed with a variable rate centrifugal governor without the use of electrical pulsation, oscillation type or constant rate viscosity governors.
        7) Maintain automatic closure speed at an average of 12” (304mm) per second.
        8) Ensure that electrical sensing edge and key operated control station are inoperable during automatic closure.
        9) Reset door system by reconnecting fusible links or by re-engaging failsafe release device from floor level.
        10) Provide minimum #50 roller chain for drive connection from operator output shaft to the door drive shaft.
        11) Ensure that manual resetting of spring tension or mechanical dropouts will not be required.
        12) Install system only with manufacturer supplied or specified fasteners.
        13) Coordinate with electrical contractor to mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.
        14) Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5.
14. Mounting: Face of wall mounted.
15. Control Station:
    a. Flush Mounted: "Open/Close" key switch with "Stop" push button; NEMA 1B.
    b. Control Operation: Constant pressure to close.
        1) 2 wire, electric sensing edge seal extending full width of door bottom bar. Provide a retracting safety cord and reel connection to control circuit.

2.03 MATERIALS

A. Metal Curtain Construction: Interlocking slats.
    1. Slat Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.

2. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
3. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
4. Smoke Seals: Provide brush or gasket type weatherstripping seals to prevent passage of smoke and hot gases in compliance with UL 1784 testing requirements.
5. Steel Slats: Minimum thickness, 24 gauge, 0.028 inch, grade 40; ASTM A653/A653M galvanized steel sheet with zinc coating.
6. Stainless Steel Slats: Minimum thickness, 22 gauge, complying with ASTM A 666, Type 304, rollable temper.

B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

C. Guides - Angle: ASTM A36/A36M metal angles, size as indicated.
1. Stainless Steel: ASTM A 666, Type 304, rollable temper.

D. Hood Enclosure and Trim: Internally reinforced to maintain rigidity and shape.
1. Minimum thickness; 24 gauge, 0.028 inch; ASTM A653/A653M galvanized steel sheet.
2. Provide reinforced top and bottom edges.
3. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
4. Prime painted and factory finished. Color to match slats.

E. Counterbalance Shaft Assembly:
1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width.
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
1. Provide interlock switches on motor operated units.

B. Electric Operators:
1. Mounting: Side mounted.
2. Motor Enclosure:
a. Exterior Coiling Doors: NEMA MG 00001, Type 4; open drip proof.
3. Motor Rating: 1/2 HP; continuous duty.
4. Motor Voltage: 120 volts, single phase, 60 Hz.
5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA EN 10250, Type 4.
7. Opening Speed: 9 inches per second.
8. Brake: Manufacturer's standard type, activated by motor controller.
9. Manual override in case of power failure.
10. See Section 260583 for electrical connections.

C. Control Station: Provide standard three button, or key operated, 'Open-Close-Stop' continuous-constant control device for each operator complying with UL 325.
1. 24 volt circuit.
2. Surface mounted at interior door jamb of exterior/insulated coiling door(s) and flush mounted at interior door jamb of interior/fire rated coiling door(s).
3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.

a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.
b. Secondary Device: Provide electric sensing edge with wireless edge kit or non-monitored safety edge as an option along with continuous-constant control device.

D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that adjacent construction is suitable for door installation.

B. Verify that electrical services have been installed and are accessible.

C. Verify that door opening is plumb, header is level, and dimensions are correct.

D. Notify Architect of any unacceptable conditions or varying dimensions.

E. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install fire-rated doors in accordance with NFPA 80.

C. Install smoke door assemblies in accordance with NFPA 105.

D. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

E. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

F. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

G. Coordinate installation of electrical service with Section 260583.

H. Complete wiring from disconnect to unit components.

I. Complete wiring from fire alarm system.

J. Install enclosure and perimeter trim.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet straight edge.

3.04 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.05 FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.06 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

C. Remove surplus materials and debris from the site.

3.07 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative

B. Instruct Owner's Representative in maintenance procedures

END OF SECTION 083323

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SECTION 083343
OVERHEAD COILING SMOKE CURTAINS FOR ELEVATOR DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead Coiling Smoke Curtains for Elevator Doors.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 142100 – Electric Traction Elevators.

C. Section 211300 - Fire-Suppression Sprinkler Systems.

D. Section 260533.13 - Conduit for Electrical Systems.

E. Section 260583 - Wiring Connections.

F. Section 284600 - Fire Detection and Alarm.

1.03 REFERENCE STANDARDS

A. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2025.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ICC-ES AC77 - Acceptance Criteria for Smoke-Containment Systems Used with Fire-Resistance-Rated Elevator Hoistway Doors and Frames and at the Intersection of Elevator Lobby and Corridor; 2021.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

G. UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.

H. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate smoke curtain assemblies with power, signal, fire-alarm, and smoke-detection systems specified in Division 26 and Division 28.
   2. Coordinate elevator smoke-protective curtain assemblies with elevator hoistway door frames specified in Division 14.
   3. Coordinate smoke-protective curtain assemblies with ceilings for operational clearances and maintenance access requirements.

4. Coordinate smoke-protective curtain assemblies with walls for support requirements, rating continuity above ceilings, and recessed wall switches.
5. Coordinate requirements for metal supports required for smoke-protective curtain assemblies.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's product information and data sheets for each product specified in this section.

C. Shop Drawings:
1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.
2. Coordinate with locations indicated on drawings.

D. Certificate: Certify that products of this section meet or exceed specified requirements.

E. Evaluation Service Reports: Show compliance with specified requirements.

F. Manufacturer's Instructions:
1. Substrate preparation instructions and recommendations.
2. Installation means and methods.
3. Recommendations and requirements for proper storage and handling.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Testing agency's qualification statement.

J. Operation and Maintenance Data: For smoke-protective curtain assemblies to include in emergency, operation, and maintenance manuals.

K. Field quality-control reports for required testing.

L. Specimen warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least seven years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience and approved by manufacturer.

C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions, shop drawings, and reference standard documents containing execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver, store and handle materials and products in accordance with the manufacturer's instructions and recommendations and industry standards.

C. Store all materials in the manufacturer’s original packaging until ready for installation. Protect all products from damage or exposure to adverse weather conditions.

1.08 FIELD CONDITIONS

A. Prior to fabrication, verify that dimensions are consistent with those found in the construction drawings. Where discrepancies exist, confirm the proper dimensions with the Architect before proceeding with work.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 1-year manufacturer warranty for parts and labor costs to repair or replace part that fail to perform, commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. **(Basis of Design)** Smoke Guard, A CSW Industrials Company; Model M200: www.smokeguard.com/#sle.

B. U.S. Smoke and Fire; SD60GS Elevator Smoke Containment with side guides (UL 1784, ICC AC77): www.ussmokeandfirecurtain.com/#sle.

C. Substitutions: See Section 016000 - Product Requirements.
   1. Substitution Limitations:
      a. Single manufacturer to provide, from a single source, a fully integrated smoke-and-draft containment system consisting of smoke-and-draft-protective curtains and the following components:
         1) Smoke-and-Draft-Protective Curtain Operators.
         2) Smoke-and-Draft-Protective Curtain Controls.

2.03 SMOKE-PROTECTIVE CURTAIN ASSEMBLIES FOR ELEVATOR ENTRANCES

A. Alarm-activated transparent-film smoke curtain assembly complying with ICC-ES AC77 and NFPA 105.

B. Smoke-Protective Curtain Assemblies: Provide smoke-protective curtains listed and labeled with the letter "S" by a qualified testing agency for smoke- and draft-control based on testing in accordance with UL 1784 without an artificial bottom seal; with maximum air-leakage rate of 3.0 cfm/sq. ft. (0.01524 cu. m/s x sq. m) of opening at 0.10 inch wg (24.9 Pa) for both ambient and elevated temperature tests in accordance with ICC-ES AC77.

C. Curtain Materials: Provide manufacturer's standard curtain complying with each of the following:
   1. Flame-Spread and Smoke-Developed Indexes: No greater than 25 and 50, respectively, when tested in accordance with ASTM E84.
   2. Transparent-Film Curtain: Provide curtain of transparent film in compliance with vision panel requirements of ASME A17.1.
   3. Screen Reinforcement: Provide film with reinforcement to limit deflection or tearing.

D. Curtain Egress: Provide curtain that is operable from the egress side without use of keys, tools, special knowledge, or effort in excess of the opening force requirements of authorities having jurisdiction.
   1. Egress Switch: Include switch to rewind screen into housing to comply with egress requirements of ASME A17.1.
      a. Switch Size and Color: Provide switch no less than 4 by 4 inches and in contrasting color with curtain.
      b. Switch Operation: Provide switch operable with a closed fist or a loose grip, not requiring finger movements in compliance with the requirements of authorities having jurisdiction.
      c. Switch Location: Between 15 and 48 inches above finished floor level in compliance with forward reach requirements of authorities having jurisdiction.
   2. Manual Egress: Provide curtain allowing fail-safe manual egress with less than 15 pounds release pressure in the direction of travel.
      a. Opening Size: Provide curtain with manual egress opening of at least 32 inches in compliance with the requirements of authorities having jurisdiction.

E. Curtain Attachment: Provide curtain that forms a pressure-resisting seal by magnetic adhesion with flexible multi-pole magnetic strips attached to longitudinal edges of film with low modulus silicone adhesive.
   1. Curtain Installation: Provide curtain attachment systems that do not require modification of the elevator jamb including direct or mechanical attachment.
   2. Elevator Door Frames: Type 430 ferritic stainless steel elevator door frames to create seal with curtain by magnetic adhesion.
      a. Auxiliary Rails: Provide 16-gauge ASTM A240/A240M, Type 430, ferritic stainless steel vertical rails above elevator door head to create seal with curtain by magnetic adhesion no less than 2 inches (51 mm) wide, 1 inch (25 mm) deep.
   3. Auxiliary Rails: Provide vertical rails to create seal with curtain by magnetic adhesion.
      a. Material: 16-gauge ASTM A240/A240M, Type 430, ferritic stainless steel.
      b. Size: At least 2 inches (51 mm) wide, 1 inch (25 mm) deep.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Curtain Housing: Provide sheet metal housings containing support rollers and associated electronics.
   1. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
   2. Housing includes electrical junction box that does require the removal of any part of the building in accordance with NFPA 70.
   3. Provide electrical junction box access through housing in the open condition.
   4. Curtain housing to contain all components required for operation.
   5. Housing Finish: Manufacturer's standard powder coat finish in white.

H. Curtain Operation: Controlled descent automatically by fail-safe, gravity-closing deployment and motorized rewind.

1. Curtain deploys on activation of one of the following:
   a. Local Smoke Detector.
   b. Testing Key Switch
2. Release Mechanism: Labelled as defined by UL 864.

2.04 SOURCE QUALITY CONTROL

A. See Section 014500 - Quality Requirements for additional requirements.

B. Coordination of Other Tests and Inspections: Provide access to accommodate tests and inspections by independent testing agency employed by Owner.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates upon which work will be installed.
   1. Verify related work performed under other sections is complete and in accordance with Shop Drawings.
   2. Verify wall surfaces and elevator door frames are acceptable for installation of smoke containment system components.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Verify that locations of concealed reinforcements have been clearly marked for the installer.

E. Locate reinforcement points and clearly mark their locations if not already done.

3.02 PREPARATION

A. Protect all adjacent construction from damage during installation of smoke containment system.

B. Clean surfaces prior to installation.

C. Prepare surfaces as recommended by the manufacturer for achieving optimal results.

3.03 INSTALLATION

A. Install in accordance with manufacturer's written instructions and industry recognized best practices.

B. Install in accordance with all code bodies having jurisdiction.

3.04 REPAIR

A. Damaged products must be repaired or replaced prior to substantial completion.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - BSD Quality Requirements for additional requirements.

B. Field Test: Follow manufacturer’s cycle test procedures.
   1. Notify Owner’s Representative, local Fire Marshal, alarm sub-contractor and elevator sub-contractor or service company minimum one week in advance of scheduled testing.
   2. Complete maintenance service record.

3.06 SYSTEM STARTUP

A. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.

3.07 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Clean and remove all stains, grime, or other soils using soap and water. Only use detergents approved by the manufacturer for use on the finishes specified. Do not use acid solutions, steel wool, and other harsh abrasives.

3.08 CLOSEOUT ACTIVITIES

A. See Section 017700 - Closeout Procedures, for additional submittals.

B. See Section 017900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated personnel.

D. Training: Train Owner's personnel on operation and maintenance of system.
   1. Training Reference: Operation and maintenance manual and additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Manufacturer's training personnel.

3.09 PROTECTION

A. Protect installed products until completion of work specified in this section and from subsequent construction operations until substantial completion.

3.10 DEMONSTRATION

A. Demonstrate required testing and maintenance procedures to Owner’s Representative.

B. Reference Section 017900 - Demonstration and Training for demonstration and training requirements.

3.11 MAINTENANCE AND TESTING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Perform minimum semi-annual maintenance and testing on each smoke containment system as required by the manufacturer’s warranty, code agency evaluation reports, and as required by local authority having jurisdiction.
   1. Retain permanent record of tests.

C. Future Painting: Paint elevator door frame and/or auxiliary rails in accordance with Operation and Maintenance Manual.

D. Fire Event: Owner shall engage a qualified inspector to assess unit(s) after exposure to a fire event.

END OF SECTION 083343

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SECTION 084313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Infill panels of insulated metal and glass.

C. Aluminum doors.

D. Weatherstripping.

E. Door hardware.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 051200 - STRUCTURAL STEEL FRAMING: Steel attachment members.

C. Section 072500 - WEATHER BARRIERS: Sealing framing to water-resistive barrier installed on adjacent construction.

D. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

E. Section 084413 - GLAZED Aluminum Curtain Walls.

F. Section 085113 - ALUMINUM WINDOWS: Operable sash within glazing system.

G. Section 087100 - Door Hardware: Hardware items other than specified in this section.

H. Section 088000 - Glazing: Glass and glazing accessories.

1.03 DEFINITIONS

A. For fenestration industry standard terminology and definitions, refer to the Fenestration & Glazing Industry Alliance (FGIA) Glossary (AAMA AG-13).

1.04 REFERENCE STANDARDS

A. AAMA 501.4 - Recommended Static Test Method for Evaluating Window Wall, Curtain Wall and Storefront Systems Subjected to Seismic and Wind-Induced Inter-Story Drift; 2018.

B. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2024.

C. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

E. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

J. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

K. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

L. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2026.

M. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

N. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

O. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).

P. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of aluminum-framed storefront system indicated, include the following: Component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details, installation instructions and installation instr

C. Shop Drawings to include the following:
1. Plans.
2. Elevations.
3. Sections.
4. Details.
5. Hardware.
6. Attachment to other work.
7. Framed opening requirements and tolerances.
8. Operational clearances.
9. Installation details.

D. Samples: Submit two samples 3 inch x 3 inch inches in size illustrating finished aluminum surface, glass, glazing materials.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents. Reference Section 087100 - Door Hardware.

H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

K. Specimen warranty.

1.07 QUALITY ASSURANCE

A. Obtain aluminum-framed storefront system from one source and single manufacturer.

B. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

D. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.
      b. Equivalent independent third-party ANSI accredited certification.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

A. Field verify opening sizes

B. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified product(s) from single source and from single manufacturer.

B. The manufacturer(s) and model numbers or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.

2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Aluminum-Framed Storefront Manufacturers:
   1. **(Basis of Design)** Kawneer North America: www.kawneer.com/#sle.
   2. Tubelite, Inc: www.tubeliteinc.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

D. Entrance Doors:
   1. Kawneer North America: www.kawneer.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. General Performance:
   1. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, as determined by testing of aluminum storefront systems representing those indicated for this project.
   2. Aluminum storefront systems shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
   3. Failure includes any of these events:
      a. Thermal stresses transferring to building structure
      b. Glass breakage
      c. Loosening or weakening of fasteners, attachments, and other components
      d. Failure of operating units

B. Delegated Design:
   1. Design aluminum storefront systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Wind Loads:
   1. The storefront system shall include anchorage that is capable of withstanding the following wind load design pressures:
      a. Inward: + 24 psf
      b. Outward: -31 psf
   2. The design pressures are based on the 2022 NYS Building Code.

D. Air Leakage:
   1. The test specimen shall be tested in accordance with ASTM E283/E283M.
   2. With interior seal, air leakage rate shall not exceed 0.06 cfm/ft2 (0.3 l/s · m2) at a static air pressure differential of 6.2 psf (300 Pa).
   3. Without interior seal, air leakage rate shall not exceed 0.06 cfm/ft2 (0.3 l/s · m2) at a static air pressure differential of 1.6 psf (75 Pa).
   4. CSA A440 Fixed Rating

E. Water Resistance:
   1. The test specimen shall be tested in accordance with ASTM E331.
   2. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.

F. Uniform Structural Load:
   1. A static air design load of 35 psf (1680 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330/E330M.
   2. There shall be no deflection in excess of L/175 of the span of any framing member.

3. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

G. Seismic:
1. When tested toAAMA 501.4, system must meet design displacement (elastic) of 0.010 x the story height and ultimate displacement (inelastic) of 1.5 x the design displacement.

H. Thermal Movements:
1. Allow for thermal movements resulting from the following:
a. 0°F (-18 C) to 180°F (82 C) maximum change (range) in ambient and surface temperatures
b. 75°F (24 C) test interior ambient air temperature
2. Test performance shows no buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.

I. Thermal Transmittance (U-factor):
1. Thermal transmittance test results are based upon 1" (25.4 mm) clear high-performance insulating glass [1/4" (e=0.035, #2), 1/2" warm edge spacer and argon fill gas, 1/4"].
2. When tested to AAMA 1503, the thermal transmittance (U-factor) shall not be more than 0.32.

J. Condensation Resistance Factor (CRF) or Condensation Index (CI):
1. If using CRF: When tested to AAMA 1503, the CRF shall not be less than 68_{frame} and 68_{glass} (low-e).
2. If using CI: When tested to CSA A-440, the CI shall not be less than 60_{frame} and 62_{glass} (low-e).

K. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC):
1. Sound transmission loss test results in accordance with AAMA 1801 are based upon 1" (25.4 mm) clear double laminated insulating glass with PVB interlayer (1/8", 0.030", 1/8", 1/2" AS, 1/8", 0.030", 1/8").
2. Ratings shall not be less than STC 37 and OITC 30.

L. Impact Resistance Performance:
1. The test specimen shall be tested in accordance with ASTM E 1886, information in ASTM E 1996 and TAS 201/203.
2. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade.
3. Small-Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade.

2.03 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Thermally-Broken:
1. (Basis of Design): Kawneer; Trifab 451UT: www.kawneer.com/#sle.

B. Substitutions: See Section 016000 - Product Requirements.
1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.04 BASIS OF DESIGN -- SWINGING DOORS

A. Wide Stile, Insulating Glazing, Thermally-Broken:
1. Basis of Design: Kawneer North America; Series 500 Standard Entrance: www.kawneer.com/#sle.
2. Thickness: 1-3/4 inches.

B. Substitutions: See Section 016000 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.05 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Finish: Class I color anodized.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
   2. Finish Color: Black.
   3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Design Wind Loads: Comply with requirements of ASCE 7.
      b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

2.06 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Glazing Stops: Flush.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: See Section 088000.

C. Infill (Metal) Panels: Insulated, aluminum, with edges formed to fit glazing channel and sealed.
   1. Total Nominal Thickness: 1 inch.
   2. Exterior Face Sheet: Embossed Aluminum; 0.0403 inch(18 gauge) thick.
   3. Exterior Substrate: Manufacturer's standard reinforced thermoset plastic (ABS); 0.079 inch thick.
   4. Core: Polyisocyanurate insulation core with R-value of 6.11.
   5. Interior Substrate: Manufacturer's standard hardboard; 1/8 inch thick.
   6. Interior Face Sheet: Smooth Aluminum; 0.0403 inch(18 gauge) thick.

7. Finish: Same as storefront.
8. Products:
   a. **(Basis of Design)** Mapes Industries; Mapes R: https://mapes.com/#sle.
   b. Nudo Products, Inc: www.nudo.com/#sle.
   c. Substitutions: See Section 016000 - Product Requirements.

D. Infill (Spandrel) Panels: Insulated, spandrel glass and sealed.
1. Total Nominal Thickness: 1 inch.
2. Exterior Face Sheet: Spandrel Glass; 1/4 inch thick.
3. Exterior Substrate: Manufacturer's standard reinforced thermoset plastic (ABS); 0.079 inch thick.
4. Core: Polyisocyanurate insulation core with R-value of 6.11.
5. Interior Substrate: Manufacturer's standard hardboard; 1/8 inch thick.
6. Interior Face Sheet: Smooth Aluminum; 0.0403 inch(18 gauge) thick.
7. Finish: Same as storefront.
8. Products:
   a. **(Basis of Design)** Mapes Industries; MapeSpan: https://mapes.com/#sle.
   b. Nudo Products, Inc: www.nudo.com/#sle.
   c. Substitutions: See Section 016000 - Product Requirements.

E. Swing Doors: Glazed aluminum.
1. Thickness: 1-3/4 inches.
2. Top Rail: five inches wide.
3. Vertical Stiles: five inches wide.
4. Bottom Rail: 10 inches wide.
5. Glazing Stops: Square.
6. Finish: Same as storefront.

2.07 MATERIALS

A. Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish

B. Not less than 0.070" (1.8 mm) wall thickness at any location for the main frame

C. Extruded Aluminum complying with ASTM B221 (ASTM B221M).

D. Sheet Aluminum: ASTM B209/B209M.

E. Fasteners: Stainless steel.

F. Anchors, Clips, and Accessories:
1. Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating.
2. Anchors, clips, and accessories shall provide sufficient strength to withstand the design pressure indicated.

G. Reinforcing Members:
1. Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating.
2. Reinforcing members must provide sufficient strength to withstand the design pressure indicated.

H. Sealant:
1. For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

I. Tolerances:
   1. References to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

K. Glazing Accessories: See Section 088000.

2.08 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

B. Color: As selected by Architect from manufacturer's standard range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.09 HARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Other Door Hardware: See Section 087100.

C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

2.10 FABRICATION

A. Fabricate framing member components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations
   2. Accurately fitted joints that are flush, hairline, and weatherproof
   3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior
   4. Physical and thermal isolation of glazing from framing members
   5. Accommodations for thermal and mechanical movements of glazing and framing that maintain required glazing edge clearances
   6. Provisions for field replacement of glazing
   7. Fasteners, anchors, and connection devices that are concealed from view to the greatest extent possible

B. Mechanically Glazed Framing Members:
   1. Fabricate for flush glazing without projecting stops.

C. Structural-Sealant-Glazed Framing Members:
   1. Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

D. Storefront Framing:
   1. Fabricate components for assembly using manufacturer’s standard installation instructions.

E. After fabrication, clearly mark components to identify their locations in project according to shop drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. With installer present, examine openings, substrates, structural support, anchorage, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work:
   1. Verify rough opening dimensions.
   2. Verify levelness of sill plate.
   3. Verify operational clearances.
   4. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components for proper water management.
   5. Masonry Surfaces:
      a. Masonry surfaces must be visibly dry and free of excess mortar, sand, and other construction debris.
   6. Wood Frame Walls:
      a. Wood frame walls must be dry, clean, sound, well nailed, free of voids, and without offsets at joints.
      b. Ensure that nail heads are driven flush with surfaces in opening and within 3" (76.2 mm) of opening.
   7. Metal Surfaces:
      a. Metal surfaces must be dry and clean (free of grease, oil, dirt, rust, corrosion, and welding slag).
      b. Ensure that metal surfaces are without sharp edges or offsets at joints.

B. Proceed with installation only after correcting unsatisfactory conditions.

C. Verify dimensions, tolerances, and method of attachment with other work.

D. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. Provide services of storefront manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 014500 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.

C. Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured.

D. Conduct tests for air infiltration and water penetration with manufacturer’s representative present.

E. Tests that do not meet the specified performance requirements and units that have deficiencies shall be corrected as part of the contract amount.

F. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 6.2 psf.
      a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
   4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
      a. Maximum allowable rate of air leakage is 0.09 cfm/sq ft.

G. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Clean glass immediately after installation.
   1. Comply with glass manufacturer's written recommendations for final cleaning and maintenance.
   2. Remove non-permanent labels and clean surfaces.

C. Clean aluminum surfaces.

D. Avoid damaging protective coatings and finishes.

E. Remove excess sealants, glazing materials, dirt, and other substances.

F. Repair or replace damaged installed products.

G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.

H. Remove construction debris from project site and legally dispose of debris.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 084313

SECTION 084413
GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and infill panels of insulated metal and glass.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 051200 - STRUCTURAL STEEL FRAMING: Steel attachment members.

C. Section 055000 - METAL FABRICATIONS: Steel attachment devices.

D. Section 072500 - WEATHER BARRIERS: Sealing framing to water-resistive barrier installed on adjacent construction.

E. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

F. Section 084313 - ALUMINUM-Framed Storefronts: Entrance framing and doors.

G. Section 085113 - ALUMINUM WINDOWS: Operable sash within glazing system.

H. Section 088000 - Glazing.

1.03 DEFINITIONS

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.04 REFERENCE STANDARDS

A. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2025.

C. AAMA 501.4 - Recommended Static Test Method for Evaluating Window Wall, Curtain Wall and Storefront Systems Subjected to Seismic and Wind-Induced Inter-Story Drift; 2018.

D. AAMA 501.6 - Recommended Dynamic Test Method for Determining the Seismic Drift Causing Glass Fallout from Window Wall, Curtain Wall and Storefront Systems; 2018.

E. AAMA 501.8 - Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Behavioral Care Applications; 2023.

F. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2024.

G. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

H. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

I. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

J. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

K. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

M. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

N. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

O. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

P. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

Q. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2026).

R. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

S. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2026.

T. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

U. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

V. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).

W. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

X. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems; 2014 (Reapproved 2023).

Y. FBC TAS 201 - Impact Test Procedures; Testing Application Standard; 1994.

Z. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.

AA. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.

BB. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

CC. TDI (PED) - Product Evaluation Directory - Texas Department of Insurance; Current Edition.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide component dimensions, describe materials and components within assembly, anchorage and fasteners, internal drainage details, glazing, finishes, and infill.

C. Shop Drawings: Plans indicating system dimensions, elevations, full-size details and attachments to adjacent construction. Indicated framed opening requirements and tolerances,

affected related Work, expansion and contraction joint location and details, and field welding required.

D. Samples for Initial Selection:
   1. Provide samples for units with factory-applied color finishes.

E. Samples for Verification:
   1. Provide a verification sample for each type of exposed finish required, in manufacturer's standard sizes.

F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall system, made from 12" lengths of full-sized components and showing details of the following:
   1. Joinery.
   2. Glazing.

G. Product Test Reports:
   1. Provide test reports for glazed aluminum curtain walls.
   2. Test reports must be based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency.
   3. Test reports must indicate compliance with performance requirements.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

J. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

K. Designer's Qualification Statement.

L. Manufacturer's Qualification Statement.

M. Installer's Qualification Statement.

N. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Source Limitations: Obtain aluminum curtain wall system through one source from single manufacturer

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five years of documented experience.

D. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.
      b. Equivalent independent third-party ANSI accredited certification.

E. Product Options:
   1. Information on drawings and in specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

2. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

F. Pre-installation Conference:
1. Conduct conference at project site to comply with requirements in Division 01 Project Management and Coordination Section.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Handle products of this section in accordance with AAMA CW-10.

C. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

D. Storage and Protection:
1. Store materials so that they are protected from exposure to harmful weather conditions.
2. Handle material and components to avoid damage.
3. Protect material against damage from elements, construction activities, and other hazards before, during, and after installation.

1.09 FIELD CONDITIONS

A. Field Measurements:
1. Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication.
2. Indicate measurements on shop drawings.

B. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a two year period after Date of Substantial Completion.

C. Manufacturer Warranty: Provide 2-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with installer.

D. Finish Warranty: Provide 2-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Glazed Aluminum Curtain Walls Manufacturers:
1. **(Basis of Design)** Kawneer North America; 1600UT System 1: www.kawneer.com/#sle.
2. Substitutions: See Section 016000 - Product Requirements.

2.03 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Outside glazed, with pressure plate and mullion cover.
   2. Finish: Class I color anodized.
      a. Finish Color: Black.
      b. Factory finish surfaces that will be exposed in completed assemblies.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   3. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   6. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and heel bead of glazing compound.
   7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Cross-Section: As indicated on drawings.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: See Section 088000.

C. Infill (Metal)Panels: Insulated, aluminum, with edges formed to fit glazing channel and sealed.
   1. Exterior Face Sheet: Embossed Aluminum; 0.0403 inch(18 gauge) thick.
   2. Exterior Substrate: Manufacturer's standard reinforced thermoset plastic (ABS); 0.079 inch thick.
   3. Core: Polyisocyanurate insulation core with R-value of 6.11.
   4. Interior Substrate: Manufacturer's standard hardboard; 1/8 inch thick.
   5. Interior Face Sheet: Smooth Aluminum; 0.0403 inch(18 gauge) thick.
   6. Finish: Same as storefront.
   7. Products:
      a. **(Basis of Design)** Mapes Industries; Mapes R: https://mapes.com/#sle.
      b. Nudo Products, Inc: www.nudo.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

D. Infill (Spandrel) Panels: Insulated, spandrel glass and sealed.
   1. Total Nominal Thickness: 1 inch.
   2. Exterior Face Sheet: Spandrel Glass; 1/4 inch thick.
   3. Exterior Substrate: Manufacturer's standard reinforced thermoset plastic (ABS); 0.079 inch thick.
   4. Core: Polyisocyanurate insulation core with R-value of 6.11.
   5. Interior Substrate: Manufacturer's standard hardboard; 1/8 inch thick.
   6. Interior Face Sheet: Smooth Aluminum; 0.0403 inch(18 gauge) thick.
   7. Finish: Same as storefront.

8. Products:
    a. **(Basis of Design)** Mapes Industries; MapeSpan: https://mapes.com/#sle.
    b. Nudo Products, Inc: www.nudo.com/#sle.
    c. Substitutions: See Section 016000 - Product Requirements.

2.05 MATERIALS

A. Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish.

B. Not less than 0.070" (1.8 mm) wall thickness at any location for the main frame.

C. Extruded Aluminum: Comply with ASTM B221, 6063-T6 alloy and temper.

D. Sheet Aluminum: Comply with ASTM B209/B209M.

E. Fasteners: Non-Magnetic Stainless steel; type as required or recommended by curtain wall manufacturer.

F. Anchors, Clips, and Accessories:
1. Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM ASTM B633 for SC 3 severe service conditions or other suitable zinc coating.
2. Anchors, clips, and accessories shall provide sufficient strength to withstand the design pressure indicated.

G. Pressure Plate:
1. Pressure plate shall be aluminum.
2. Pressure plate shall be fastened to the mullion with stainless steel screws.

H. Reinforcing Members:
1. Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating.
2. Reinforcing members must provide sufficient strength to withstand the design pressure indicated.

I.
1. For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

J. Thermal Barrier:
1. Thermal barrier consists of 1" (25.4 mm) separation between the interior and exterior metal members in a typical condition.
2. Thermal barrier assembly shall be tested to the thermal cycling requirements of ASTM E2692 and show no sign of degradation following the test.

K. Tolerances:
1. References to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

L. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

M. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements and shall comply with ASTM C864.

N. Glazing Accessories: See Section 088000.

O. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

2.06 CURTAIN

A. Framing Members:
   1. Manufacturer's standard extruded framing members of thickness required and reinforced as required to support imposed loads.
   2. Glazing System: Four-sided captured.
   3. Glazing Plane: Front.

B. Glass:
   1. 1" and 1-3/4" insulating glass. See Section 088000 - Glazing.

C. Brackets and Reinforcements:
   1. Manufacturer's standard high-strength aluminum with non-staining, non-ferrous shims for aligning system components.

D. Framing Sealants:
   1. Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.

E. Fasteners and Accessories:
   1. Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories must be compatible with adjacent materials.
   2. Where exposed, fasteners and accessories shall be stainless steel.

F. Perimeter Anchors:
   1. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

2.07 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following.
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Loosening or weakening of fasteners, attachments, and other components.
      d. Failure of operating units.

B. Delegated Design:
   1. Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, licensed in the State of New York, using performance requirements and design criteria indicated.

C. Wind Loads:
   1. The curtain wall system shall include anchorage that is capable of withstanding the following wind load design pressures:
   2. The design pressures are based on the New York State Building Code, Latest Edition.

D. Air Leakage:
   1. Maximum air leakage through fixed glazing and framing areas of 0.06 cfm/ft^2 (0.31 l/s·m^2) of fixed wall area as determined according to ASTM E283/E283M and FBC TAS 202 at a minimum static-air-pressure differential of 6.2 psf (300 Pa).

E. Water Resistance:
   1. Static:
      a. The test specimen shall be tested in accordance with FBC TAS 202 and ASTM E331.
      b. There shall be no leakage at a minimum static air pressure differential of 15 psf (720 Pa) as defined in AAMA 501.
   2. Dynamic:
      a. The test specimen shall be tested in accordance with AAMA 501.1.
      b. There shall be no leakage at an air pressure differential of 15 psf (720 Pa) as defined in AAMA 501.

F. Structural-Test Performance:
   1. Test according to ASTM E330/E330M and FBC TAS 202.
   2. When tested at positive and negative wind load design pressures, assemblies do not evidence deflection exceeding L/175 of clear span.
   3. A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction.
      a. When tested at 150% of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2% percent of clear span.
      b. Minimum test duration according to ASTM E330/E330M is 10 seconds.

G. Deflection of Framing Members at Design Wind Pressure:
   1. Deflection Normal to Wall Plane:
      a. Limited to edge of glass in a direction perpendicular to glass plane not exceeding L/175 of the glass edge length for each individual glazing lite, or an amount that restricts edge deflection of individual glazing lites to 3/4" (19 mm), whichever is less.
      b. Limit deflection of clear span of framing members to L/175 for spans less than or equal to 13'-6" (4.11 meters) and L/240 + 1/4" for spans greater than 13'-6" (4.11 meters).
   2. Deflection Parallel to Glazing Plane:
      a. Operable Units - Provide a minimum 1/16-inch (1.6 mm) clearance between framing members and operable units.
      b. Limited to L/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
      c. Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).
   3. Cantilever Deflection:
      a. Where framing members overhang an anchor point, limit deflection to two times the length of cantilevered member, divided by 175.

H. Thermal Movements:
   1. Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
      a. Temperature Change (Range): 0 °F (-18 °C); 180 °F (82 °C).
      b. Test Interior Ambient Air Temperature: 75 °F (24 °C).
      c. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.

I. Seismic:
   1. When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 times the story height and ultimate displacement (inelastic) of 1.5 times the design displacement.

2. When tested to AAMA 501.6, system must meet dynamic seismic drift causing glass fallout (∆Fallout) of 4.9" or 0.0300 times the story height.

J. Thermal Transmittance (U-factor), Physical Test:
1. Thermal transmittance test results in accordance with AAMA 1503 are based upon argon-filled 1" (25.4 mm) or 1-3/4" (44.4 mm) clear low-emissivity coated glass with warm edge spacer.
2. For 1" (25.4 mm) low-emissivity coated glass: When tested using AAMA 1503, the thermal transmittance (U-factor) shall not be more than 0.33 Btu/(hr·ft^2·°F).

K. Condensation Resistance Factor (CRF):
1. Condensation resistance test results in accordance with AAMA 1503 or CSA A440 are based upon argon-filled 1" (25.4 mm) or 1-3/4" (44.4 mm) clear low-emissivity coated glass with warm edge spacer.
2. For 1" (25.4 mm) glass: When tested using AAMA 1503 AAMA 1503, the CRF_{frame} and CRF_{glass} shall not be less than 79 and 76 respectively.

L. Temperature Index (I):
1. 1600UT System™1 Curtain Wall with aluminum pressure plate,
   a. For 1" (25.4 mm) double glazed low-emissivity coated glass: when tested to CSA-A440-00, the TI_{frame} and TI_{glass} shall not be less than 71 and 67 respectively.
2. 1600UT System™1 Curtain Wall with fiberglass pressure plate.
   a. For 1" (25.4 mm) double glazed low-emissivity coated glass: when tested to CSA-A440-00, theTI_{frame} and TI_{glass} shall not be less than 76 and 68 respectively.

M. Sound Transmission Loss:
1. When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:
   a. STC 31 or OITC 25 based upon 1" (25.4 mm) insulating glass (1/4", 1/2" AS, 1/4")
   b. STC 33 or OITC 27 based upon 1-3/4" (44.4 mm) triple insulating glass (1/4", 1/2" AS, 1/4", 1/2" AS, 1/4").

N. Human Impact: Shall be tested to meet AAMA 501.8.

2.08 FABRICATION

A. Extrude or form aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing that maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to the greatest extent possible.
7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
8. Double seal design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

C. Curtain Wall Framing:
1. Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.
2. After fabrication, clearly mark components to identify their locations in project according to shop drawings.

2.09 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

B. Color: To be selected by Architect from manufacturer's standard range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. With installer present, examine areas for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

B. Verify dimensions, tolerances, and method of attachment with other related work.

C. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.

D. Verify that anchorage devices have been properly installed and located.

E. Proceed with installation only after correcting unsatisfactory conditions.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide support and anchor in place.

F. Dissimilar Materials:
   1. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

G. Glazing:
   1. Glass shall be outside-glazed.
   2. Glass shall be held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners that are spaced no more than 9" (228.6 mm) on center.

H. Water Drainage
   1. Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations.
   2. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

I. Provide thermal isolation where components penetrate or disrupt building insulation.

J. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet noncumulative or 0.5 inches per 100 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 REPAIR OR REPLACEMENT

A. Repair or replace products damaged during handling, shipping or installation.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.

3.05 FIELD QUALITY CONTROL

A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 014500 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.

C. Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter-caulked, and cured.

D. Conduct tests for air infiltration and water penetration with manufacturer’s representative present.

E. Tests that do not meet the specified performance requirements and units that have deficiencies shall be corrected as part of the contract amount.

F. Water Infiltration Tests: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

G. Provide field testing of installed curtain wall system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 8 psf.
      a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
   4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
      a. Maximum allowable rate of air leakage is 0.09 cfm/sq ft.

H. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

I. Manufacturer's Field Services:
   1. Upon owner’s written request, provide periodic site visit by manufacturer’s field service representative.

3.06 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures for additional requirements.

B. Remove protective material from pre-finished aluminum surfaces.

C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.

D. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610, prior to Owner's acceptance.

E. Remove construction debris from project site and legally dispose of debris.

3.07 PROTECTION

A. Protect installed products from damage until date of substantial completion.

B. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

END OF SECTION 084413

SECTION 085113
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extruded aluminum windows with fixed sash and operating sash.

B. Factory glazing.

C. Operating hardware.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055000 - METAL FABRICATIONS: Steel lintels.

C. Section 061000 - ROUGH CARPENTRY: Wood perimeter shims.

D. Section 072500 - WEATHER BARRIERS: Sealing frame to water-resistive barrier installed on adjacent construction.

E. Section 079200 - Joint Sealants: Sealing joints between window frames and adjacent construction.

F. Section 084313 - Aluminum Framed Storefronts.

G. Section 084413 - Glazed Aluminum Curtainwalls.

H. Section 088000 - GLAZING.

1.03 DEFINITIONS

A. For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.04 REFERENCE STANDARDS

A. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2021.

B. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

C. AAMA 701/702 - Performance Specification for Pile Weatherstrips (AAMA 701) and Polymer Weatherseals (AAMA 702); 2023.

D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

E. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections; 2021.

F. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

G. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022, with Errata (2023).

H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

J. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

K. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

L. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2026).

M. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

N. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2026.

O. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

P. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).

Q. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

R. ASTM E1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation; 2022.

S. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017 (Reapproved 2023).

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
   3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
   4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
   5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Include component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

C. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.

D. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.

E. Samples for Verification: For aluminum windows and components required.

F. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

G. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification.
   2. Evidence of WDMA Certification.

3. Evidence of CSA Certification.
4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

H. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

I. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

J. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

K. Manufacturer's qualification statement.

L. Installer's qualification statement.

M. Specimen warranty.

1.07 QUALITY ASSURANCE

A. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Do not install sealants when ambient temperature is less than 40 degrees F.

C. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Manufacturer Warranty: Provide 2 year manufacturer warranty, from the Date of Substantial Completion, against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Aluminum Windows Manufacturers:
   1. **(Basis of Design)** Kawneer; AA 4325 Ultra Thermal Windows : www.kawneer.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 BASIS OF DESIGN - AW PERFORMANCE CLASS WINDOWS

A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 having Performance Class of AW, and Performance Grade at least as high as specified design pressure.

B. Fixed, Thermally-Broken:
   1. **(Basis of Design)** Kawneer [AA 4325 Ultra Thermal Windows]: www.kawneer.com/#sle.

C. Projected (Project-Out (Awning)), Face of Sash and Frame in Approximately Same Plane:
   1. **(Basis of Design)** Kawneer; AA 4325 Ultra Thermal Windows: www.kawneer.com/#sle.

D. Outswinging Casement, Thermally Broken.
   1. **(Basis of Design)** Kawneer; AA 4325 Ultra Thermal Windows: www.kawneer.com/#sle.

E. Substitutions: See Section 016000 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 ALUMINUM WINDOWS

A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
   1. Frame Depth: 3-1/4 inch (82.6 mm).
   2. Provide factory-glazed units.
   3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
   4. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   5. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
   6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Fixed, Non-Operable Type:
   1. Construction: Thermally broken.
   2. Glazing: Double; clear; low-e.
   3. Exterior Finish: Class I color anodized.
   4. Interior Finish: Class I color anodized.

C. Projected, Project-Out (Awning) Type:
   1. Construction: Thermally broken
   2. Glazing:Double ; clear; low-e.
   3. Exterior Finish: Class I color anodized.
   4. Interior Finish: Class I color anodized.

D. Outswinging Casement Type:
   1. Construction: Thermally broken.
   2. Glazing: Double; clear; low-e.
   3. Exterior Finish: Class I color anodized.
   4. Interior Finish: Class I color anodized.

2.04 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
   1. Performance Class (PC) and Grade (PG): AW-PG70-FW (fixed windows), AW-PG70-C (casement windows) and AW-PG70-AP (awning windows).

C. Design Pressure (DP): In accordance with applicable codes.

D. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

E. Water Leakage (fixed or operable windows): No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 15.0 psf.

F. Air Leakage (fixed or operable windows): 0.1 cfm/sq ft, at a static air pressure differential of 6.24 psf (300 Pa) maximum leakage per unit area of outside window frame dimension when tested in accordance with ASTM E283/E283M.

G. Condensation Resistance Factor of Frame: 77 (frame) and 72 (glass) (fixed windows), 71 (frame) and 69 (glass) (operable windows), measured in accordance with AAMA 1503.

H. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.43 Btu/sq. ft. x h x deg F (operable windows), 0.30 Btu/sq. ft. x h x deg F (fixed windows).

I. Acoustic Performance: Minimum outdoor-indoor transmission class (OITC) rating of 32(fixed windows) and 28 (operable windows) when tested in accordance with AAMA 1801, ASTM E90 and ASTM E1332.

J. Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.

K. Thermal Barrier Test: Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

2.05 COMPONENTS

A. Frames: 3 1/4 inch deep profile; thermally broken with interior portion of frame insulated from exterior portion; flush glass stops of screw fastened type.

B. Glazing: See Section 088000.
   1. Glazing System: Glazing method shall be a dry type in accordance with manufacturer's standards. Exterior glazing shall be TPE gasket. Interior glazing shall be snap-in type glazing beads with an interior TPE gasket in accordance with AAMA 701/702 or ASTM C864.

C. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to achieve effective weather seal.

D. Fasteners: Stainless steel.

E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.
   1. See Section 079200 for additional requirements.

2.06 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8) wall thickness at any location for the main frame and sash members.

B. Thermal Barrier: The thermal barrier shall consist of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.07 HARDWARE

A. Sash lock: Lever handle with cam lock.

B. Operator: Lever action handle fitted to projecting sash arms with limit stops.

C. Projecting Sash Arms: Zinc plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.

2.08 ACCESSORIES

A. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

B. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

C. Sealants and joint fillers for joints at perimeter of window system as specified in Division 7 Section “Joint Sealants”.

D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

E. Optional Interior Trims: Extruded aluminum, 6063-T6 alloy and temper, extruded to profiles and details indicated.

F. Interior Trims: The interior face trim minimum wall thickness shall be 0.062". The face trim shall snap-fit onto concealed mounting clip. Exposed fasteners shall not be accepted. The mounting clip shall be extruded aluminum of 6063-T6 alloy and temper. The minimum wall thickness shall be 0.062". The trim clips shall be provided in 4" lengths and spaced a maximum of 18" center to center.

G. Coupling Mullions: Shall be extruded aluminum of 6063-T6 alloy and temper of profile and dimensions indicated on drawings. Mullions shall provide structural properties to resist wind pressure required by performance criteria and standards.

2.09 FABRICATION

A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fit joints; make joints flush, hairline and weatherproof.
   3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
   4. Physical and thermal isolation of glazing from framing members.
   5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   6. Provisions for field replacement of glazing.

7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

B. Window Framing: Fabricate components for assembly using manufacture's standard installation instructions.

C. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

D. Thermally Improved Construction: Fabricate aluminum window framing with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
   1. Thermal Barrier: The thermal barrier shall be consist of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.

2.10 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42, integrally colored anodic coating not less than 0.7 mil thick.

B. Finish Color: Black.

C. Apply one coat of bituminous coating to concealed aluminum and steel surfaces in contact with dissimilar materials.

D. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings and adjoining water-resistive barrier materials are ready to receive aluminum windows; see Section 072500.

B. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
   1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
   2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches of opening.
   3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 WINDOW INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

B. Install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

D. Install aluminum framed window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

E. Install sill and sill end angles.

F. Set sill members and sill flashing in continuous bead of sealant.

G. Install aluminum framed window system and components to drain condensation, water penetrating joints, and moisture migrating within system to the exterior.

H. Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

I. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Install operating hardware not pre-installed by manufacturer.

K. Install glass in accordance with requirements; see Section 088000.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.

3.04 FIELD QUALITY CONTROL

A. Provide services of aluminum window manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 014500 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.

C. Provide field testing of installed aluminum windows by AAMA accredited independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
   1. Perform tests on five individual windows in designated locations as directed by Architect.
      a. Selected window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer’s representative present.
   2. Conduct tests on individual windows prior to 5 percent, 50 percent, and 90 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.
   4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.

D. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating sashes, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

3.06 CLEANING AND PROTECTION

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for additional requirements.

B. Remove protective material from factory finished aluminum surfaces.

C. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

D. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

E. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

F. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 085113

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SECTION 085653
SECURITY WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security transaction windows with pass-through device.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - UNIT MASONRY: Installation of anchorage items embedded in masonry.

C. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.03 REFERENCE STANDARDS

A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

C. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017 (Reapproved 2023).

D. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2021.

E. SSPC-Paint 33 - Coal Tar Mastic Coating, Cold-Applied; 2023.

F. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Prior to start of installation arrange a meeting on site to familiarize installer and installers of related work with requirements relating to this work.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of framing and glass, including Manufacturer's published data showing materials, construction details, dimensions of components, finishes and recommended installation instructions.

C. Shop Drawings: Drawings prepared specifically for this project, showing plans, elevations, sections, details of construction, anchorage to other work, hardware, and glazing.
   1. For new work show required opening dimensions and allowance for field deviation.

D. Test Reports: Test reports for specific window model and glazing to be furnished, showing compliance with specified requirements; window and glazing may be tested separately, provided window test sample adequately simulates the glazing to be used.
   1. Include testing agency qualifications.
   2. For structural, forced entry, and ballistic tests, provide details on method of anchorage to test frame.

E. Samples of Color Anodized Finishes: Frame member sections showing range of color to be expected in finished work.

F. Samples:
   1. Actual sections of frame members, at least 12 inch long, showing finish, weatherstripping, and fasteners.

G. Coordination Drawings: For each window opening, show locations and details of items necessary to anchor windows that must be installed by others, in sufficient detail that installer of those items can do so correctly without reference to the actual window itself.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements for additional provisions.

K. Specimen warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with at least 5 years experience in the manufacture of windows of the type specified and able to provide test reports showing that their standard manufactured products meet the specified requirements; custom designed products not acceptable.

B. Testing Agency Qualifications: Independent testing agency able to show experience in conducting tests of the type specified.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

D. Welder Qualifications: Qualified in accordance with AWS procedures for type of welding required.

1.07 DELIVERY, STORAGE AND HANDLING

A. Refer to Section 016000 - Product Requirements.

B. Protect windows and accessories in accordance with AAMA CW-10 "Care and Handling of Architectural Aluminum from Shop to Site" until Substantial Completion.

C. Deliver materials to the project site with the manufacturer’s UL Listed Labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations provided by manufacturer. Do not install products stored in conditions outside manufacturer’s recommended limits.

D. Do not begin installation of products until inadequate conditions have been corrected.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Provide manufacturer's warranty agreeing to repair or replace windows and window components that fail within three years after Date of Substantial Completion due to, but not limited to, the following:
   1. Structural failure, failure of welds, and deterioration of metals and finishes beyond that expected under detention use and normal weathering.
   2. Failure of glazing due to excessive deflection of supporting members under wind load.
   3. Finish Warranty: Manufacturer’s warranty against deterioration of factory finishes for the period of 5 years from the date of substantial completion.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.

1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Security Transaction Windows with Pass-Through Device:
1. Armortex; : www.armortex.com/#sle.
2. **(Basis of Design)** Total Security Solutions; TSS BR Transaction Window - Hole and Backer Talk Thru: www.tssbulletproof.com.
3. Substitutions: See Section 016000 - Product Requirements.

2.03 ASSEMBLIES

A. Security and Detention Windows:
1. Dimensions, profiles, features, and performance specified and indicated on drawings are required; do not deviate unless specifically approved by Architect under substitution procedures; see Section 016000.
2. Design to fit openings indicated on drawings; design to accommodate deviation of actual construction from dimensions indicated on drawings.
3. Fabricate frames and sash with corners mitered or coped full depth with concealed welded joints.
4. Design anchorages to provide performance equivalent to that required for window unit; provide anchorages at least equivalent to those by which the tested units were anchored to the test frame.
5. Design interface between frame and adjacent construction so that gap between them has at least the equivalent performance as specified for window; coordinate with anchorage requirements; custom testing is not required.
6. Separate dissimilar metals to prevent corrosion by galvanic action by painting contact surfaces with primer or with sealant or tape recommended by manufacturer for the purpose.
7. Weld components before finishing and in concealed locations, to greatest extent possible; minimize distortion and discoloration of finish; remove residue of welding; grind exposed welds smooth and finish to match.
8. Label units to indicate which side is which, such as inside/outside or secure/non-secure; use labels that are removable after installation but durable enough not to be lost during delivery, storage, handling, and installation.

2.04 PERFORMANCE REQUIREMENTS

A. Though the design, manufacturing techniques and material application the TSS Hole and Backer Transaction Window shall be of the “non-ricochet” type.

B. The design is intended to permit the capture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.

C. The assembly shall provide single transaction positions utilizing an acrylic backer configuration.

D. The design shall employ an acrylic voice port in transaction glazing to complete the Hole and Backer design.

E. Each transaction position may have a stainless steel dip tray as shown on the drawings.

F. Components shall be manufactured in strict accordance with the specifications, design, and details.

G. All vision panels shall be cut to size with all exposed edges polished.

H. Necessary holes shall be predrilled and tapped where required.

I. Stainless Steel assembly screws and acrylic spacers shall be provided.

J. Clear anodized angles and channels shall be provided.

K. Anchor screws shall be provided by the installer.

L. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect.

M. Standard manufacturing tolerances shall be +/- 1/16".

N. Materials shall meet or exceed UL 752 requirements.

2.05 SECURITY TRANSACTION WINDOWS WITH PASS-THROUGH DEVICE

A. Security Transaction Windows with Pass-Though Device:
   1. Location: Built within interior wall, as indicated on drawings.
   2. Type of Use: Walk-up.
   3. Forced Entry Resistance: Tested to meet ASTM F588, Grade 10 for window type and ASTM F1233, Class Achieved 1.0 for security glazing.
   4. Window Type: Fixed.
   5. Glazing: Bullet Resistant (level 3), 1-1/4" All Poly 1250, clear, and forced entry resistant.
   6. Pass-Through Device: Deal tray built into window sill.
      a. Operation: Manual.
      b. Transaction tray Size: Manufacturer's standard size.
      c. Material: 18 Gauge, #4 finish Stainless steel.
   7. Communication: Standard talk-through portal.

2.06 ASSEMBLY COMPONENTS

A. Formed Steel Framing: ASTM A1008/A1008M, Designation CS (commercial steel), cold-rolled steel sheet; 18 gauge, 0.0478 inch minimum thickness.

B. Bullet resistant composite frame liner.

C. Frame Anchors: Mild steel plates, shapes, or bars, concealed in completed construction; provide anchorage devices as necessary to securely fasten windows to adjacent construction; use security fasteners for exposed anchors.
   1. Provide minimum of two anchors per side of window plus one additional anchor for each 18 inches or fraction thereof more than 36 inches in height or width.

D. Glazing Seals: Factory installed; molded EPDM or neoprene compressible gaskets and compression strips.

E. Security Fasteners: Operable only by tools produced by fastener manufacturer or manufacturer's licensee; head style appropriate to installation conditions, strength, and finish of materials being fastened; use countersunk heads wherever possible.

F. Deal Trays: Formed stainless steel, recessed into counter or sill for mounting under glazing frame.
   1. Style: Ricochet-resistant, with recessed bullet trap on secure side.
   2. Clear Opening Height: 1-1/2 inches.
   3. Tray Dimensions: 12 by 8 inches, wide by deep.
   4. Listed and labeled by UL as bullet resisting to UL 752 Level 1.

G. Bituminous Paint: Cold-applied asbestos-free asphalt mastic, complying with SSPC-Paint 33; 30 mils, 0.030 inch minimum thickness per coat.

2.07 FINISHES

A. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that window openings are ready for installation of windows.

B. Verify that correct embedded anchors are in place and in proper location; repair or replace anchors as required to achieve satisfactory installation.

C. Notify Architect if conditions are not suitable for installation of windows; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and drawing details.

B. Install windows in correct orientation (inside/outside or secure/non-secure).

C. Anchor windows securely in manner so as to achieve performance specified.

D. Separate metal members from concrete and masonry using bituminous paint.

E. Set sill members and sill flashing in continuous bead of sealant.

3.03 CLEANING

A. Clean exposed surfaces promptly after installation without damaging finishes.

B. Remove and replace defective work.

END OF SECTION 085653

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SECTION 087100
DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"
   c. "Stile and Rail Wood Doors"
   d. "Interior Aluminum Doors and Frames"
   e. "Aluminum-Framed Entrances and Storefronts"
   f. "Special Function Doors"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies

4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:
   a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
   b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
   c. Indicate complete designations of each item required for each opening, include:
      1) Door Index: door number, heading number, and Architect's hardware set number.
      2) Quantity, type, style, function, size, and finish of each hardware item.
      3) Name and manufacturer of each item.
      4) Fastenings and other pertinent information.
      5) Location of each hardware set cross-referenced to indications on Drawings.
      6) Explanation of all abbreviations, symbols, and codes contained in schedule.
      7) Mounting locations for hardware.
      8) Door and frame sizes and materials.
      9) Degree of door swing and handing.
      10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:
   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:

a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Final approved hardware schedule edited to reflect conditions as installed.
   d. Final keying schedule
   e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
   f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
   b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

4. Accessibility Requirements:
   a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.07 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.

1.08 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

B. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

C. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.

3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series

2. Acceptable Manufacturers and Products:
   a. Stanley

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins

9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Select
   b. Roton

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Von Duprin EPT-10

2. Acceptable Manufacturers and Products:
   a. Securitron CEPT-10
   b. Precision EPT-12C

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns

b. DCI

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series

2. Acceptable Manufacturers and Products:
   a. Sargent 11-Line
   b. Corbin-Russwin CL3100 series

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide escutcheon with lock status indicator window on top of lockset rose:
   a. Escutcheon height (including rose) 6.05 inches high by 3.68 inches wide.

b. Indicator window measuring a minimum 3.52-inch by .60 inch with 1.92 square-inches of front facing viewing area and 180-degree visibility with a total of .236 square-inches of total viewable area.
c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
d. Provide messages color-coded with full text and symbol, as scheduled, for easy visibility.
e. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.

3. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.
9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.

2.09 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 99/33A series

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide grooved touchpad type exit devices, fabricated from brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match the balance of door hardware.
4. Touchpad must extend a minimum of one-half of the door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with a deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices at pool gates with weather-resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturers’ approved strikes.
9. Provide exit devices cut to the door width and height. Install exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.

10. Mount the mechanism case flush on the face of the doors or provide spacers to fill gaps behind the devices. Where glass trim or molding projects off the face of the door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non-fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide a type that can be removed by use of a keyed cylinder, which is self-locking when reinstalled.
13. Provide factory-drilled weep holes for exit devices used in full exterior applications, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors, eliminating the requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
    a. Provide levers that return to within 1/2 inch (13 mm) of the door face.
17. Provide exit devices with PA filler.
18. Accessibility: Require not more than 5 lb. to retract the latchbolt, per CBC 2019 11B-404.2.7 and 11B-309.4.
    a. Mechanical method: Von Duprin AX feature, where touchpad directly retracts the latchbolt with 5 lb. or less of force. Provide testing lab certification confirming that the mechanical device is independent third-party tested to meet this 5 lb. requirement.
    b. Electrical method: Von Duprin's RX-QEL feature, where lightly pressing the touchpad with 5 lb. or less of force closes an electric switch, activating quiet electric latch retraction.

2.10 EXIT DEVICES – BAR TYPE

A. Manufacturer and Product:

1. Scheduled Manufacturer:
   a. Von Duprin 55/88 series

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide bar type exit devices, cast or forged of brass, bronze, or stainless steel, plated to standard architectural finishes to match balance of the door hardware.
4. Latch Bolt Throw: 3/4 inch (19 mm) for rim and mortise devices, 5/8 inch (16 mm) for surface and concealed vertical rod devices.
5. Mechanism Case: One piece without cover plate. Mount flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
6. Provide UL labeled fire exit devices for fire rated openings.
7. Provide manufacturer's standard strikes.

8. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
10. Provide electrified options as scheduled in the hardware sets.
11. Furnish all necessary wood door kits and cover plates, for proper installation of exit device.
12. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.11 ELECTRONIC ACCESS CONTROL LOCKSETS AND EXIT DEVICE TRIM

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Schlage AD Series

B. Requirements:

1. Provide adaptable electronic access control products that comply with the following requirements:
   a. Listed, UL 294 - The Standard of Safety for Access Control System Units.
   b. Compliant with ANSI/BHMA A156.25 Grade 1 Operation and Security.
   c. Certified to UL10C, FCC Part15, Florida Building Code Standards TAS 201 large missile impact, TAS 202 and TAS 203.
   d. Compliant with ASTM E330 for door assemblies.
   e. Compliant with ICC / ANSI A117.1, NFPA 101, NFPA 80, and Industry Canada IC.

2. Functions: Provide functions as scheduled that are field configurable without taking the adaptable electronic product off the door.
3. Emergency Override: Provide mechanical key override; cylinders: Refer to "KEYING" article, herein.
4. Levers:
   a. Provide non-handed lever trim that operates independently of non-locking levers.
   b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

5. Features:
   a. Audible feedback that can be enabled or disabled.
   b. Tamper-Resistant Screws: Tamper torx screws on inside escutcheon for increased security.
   c. Visual tri-colored LED indicators that indicate activation, additional PIN code credential required, operational systems status, system error conditions and low power conditions.
   d. Door Position Switch
   e. Interior Cover Tamper Guard
   f. Mechanical Key Override
   g. Request to Exit

h. Request to Enter
i. Lock/Unlock Status

6. Credential Reader
   a. Credential Reader Configuration: Provide credential reader modules in the following configurations as indicated in door hardware sets.
   b. Credential Reader Capabilities: Provide credential readers capable of operating with the following integrated software partners.
      1) 13.56 MHz Smart card credentials:
         a) Secure section (Multi-Technology and Smartcard): Schlage MIFARE Classic, Schlage MIFARE DESFire EV1/EV3, PIV and PIV-I Compatible
         b) 13.56 MHz Serial number only (Multi-Technology and Smartcard): MIFARE, DESFire, HID iClass, MIFARE DESFire EV1/EV3
         c) 125 kHz Proximity card credentials: Schlage, XceedID, HID, GE/CASI ProxLite and AWID.
      2) Multi-Technology readers that read both 13.56 MHz Smart Cards and 125 kHz Prox cards.
      3) Dual credential reading capabilities credential card or fob and PIN.
      4) 12 button keypad with backlit buttons.
      5) Magnetic Card Reader:
         a) Full insertion or swipe reader capable of reading information along full length of magnetic stripe.
         b) Magnetic card triple track reader capable of reading tracks 1, 2 or 3 per configuration in field.

7. Operation:
   a. Offline – access control rights stored on device
      1) Provide adaptable electronic access control products with the ability to be configured at door by handheld programming device the length of time device is unlocked upon access grant.
      2) Provide adaptable electronic access control products with the ability to communicate identifying information such as firmware versions, hardware versions, serial numbers, and manufacturing dates by handheld programming device.
   b. Networked – wireless
      1) Adaptable electronic access control product system interface:
      2) Adaptable electronic access control products to have real-time bidirectional communication between access control system and lock.
      3) Remote Commanding By Partner Integrated Access Control Network Software: Battery-powered lockset shall have "Wake on Radio" feature causing activation of remote, wireless access control devices, enabling activated devices to be configured, locked or unlocked from a centralized location within 10 seconds or less without user interface at the device.
      4) Local Commanding: Provide adaptable electronic access control product with the ability to be configured, locked or unlocked locally by handheld programming device, in real-time.
      5) When Utilized with Access Control Network Software with Remote Commanding Capability: Provide adaptable electronic access control product with the ability to be remotely locked down or unlocked within 10 seconds or less while battery powered without user interface at the device.

6) Real-time response of battery powered device capable of being configured at door by handheld programming device and remotely by Partner integrated software.
7) Upon Loss of Power to Device: Provide adaptable electronic access control product with the ability to manage access control offline in one of three methods below that can be configured in the field at device by handheld programming device and remotely by Partner integrated software:
   a) Fail locked (secured)
   b) Fail unlocked (unsecured)
   c) Fail As-Is
8) Upon Loss of Communication Between Device and Network: Provide adaptable electronic access control product with the ability to manage access control offline in one of four methods below that can be configured in the field at lockset by handheld programming device and remotely by Partner integrated software:
   a) Fail locked (secured)
   b) Fail unlocked (unsecured)
   c) Fail As-Is
   d) Fail to Degraded/cache mode utilizing cache memory with following selectable options:
      i. Grant access up to the last 1,000 unique previously accepted User IDs.
      ii. Grant access up to the last 1,000 unique previously accepted facility/site codes
      iii. Remove from cache previously stored User IDs or facility/site codes that have not been presented to lock within the last 5 days.
9) Provide adaptable electronic access control product with the ability to be configured at door by handheld programming device and remotely by Partner integrated software the length of time device is unlocked upon access grant.
10) Provide adaptable electronic access control product with the ability to communicate identifying information such as firmware versions, hardware versions, serial numbers, and manufacturing dates by handheld programming device and remotely by Partner integrated software.
11) Wireless Transmission:
    a) Modulation: 900 MHz spread spectrum, direct sequence, 10 channels.
    b) Encryption: AES-128-bit Key minimum.

C. Components

1. Provide Panel Interface for adaptable electronic access control products.

2.12 ELECTRIC STRIKES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 6000 Series

2. Acceptable Manufacturers and Products:
   a. Folger Adam 300 Series
   b. HES 1006 Series

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.13 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Schlage to match existing master key system

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide cylinders/cores to match Owner’s existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.

2.14 KEYING

A. Scheduled System:

1. Existing factory registered system:
   a. Provide cylinders/cores keyed into Owner’s existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
   a. Replaceable Construction Cores.
      1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
         a) 3 construction control keys
         b) 12 construction change (day) keys.
      2) Owner or Owner’s Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:
   a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
      1) Master Keying system as directed by the Owner.
   b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.

c. Provide keys with the following features:
   1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
d. Identification:
   1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
   2) Identification stamping provisions must be approved by the Architect and Owner.
   3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
   5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
e. Quantity: Furnish in the following quantities.
   1) Permanent Control Keys: 3.
   2) Master Keys: 6.
   3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
   4) Key Blanks: Quantity as determined in the keying meeting.

2.15 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Telkee

2. Acceptable Manufacturers:
   a. HPC
   b. Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
   a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
   b. Provide hinged-panel type cabinet for wall mounting.

2.16 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4010/4110/4020 series

2. Acceptable Manufacturers and Products:

a. No substitute

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.17 ELECTROMECHANICAL CLOSER/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. LCN SEM7800 Series

2. Acceptable Manufacturers:
   a. Norton
   b. Rixson

B. Requirements:

1. Provide single-point or multi-point hold-open electromechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
3. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.

5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.18 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Elmes
   b. Burns

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.19 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.20 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
   a. Glynn-Johnson

2. Acceptable Manufacturers:
   a. Rixson
   b. ABH

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.21 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.22 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
   a. Zero International
   b. No Substitute
   c. National Guard
   d. Reese

e. Pemko

3. Omit where gasketing is specified.

2.23 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

B. Scheduled Manufacturer:

1. Zero International

C. Seals and Gasketing: Provide continuous gasketing on exterior openings, to the head and jambs, forming a continuous seal between the door and the frame. Provide smoke, light, or sound gasketing on interior doors where indicated.

1. Provide self-tapping fasteners for aluminum extruded gasketing being applied to hollow metal frames.
   a. Provide non-corrosive fasteners for all exterior applications.
   b. Provide security fasteners where indicated.

2. Provide neoprene, EPDM, silicone, or nylon brush inserts as specified in hardware sets. Provide non brush inserts of solid or sponge cell, as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

D. Smoke Labeled Gasketing: At all smoke labeled openings, provide smoke listed perimeter gasketing assemblies complying with NFPA 105 listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for smoke control ratings indicated based on testing according to UL 1784.

E. Fire Listed Gasketing: Assemblies complying with NFPA 80 that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction for fire ratings indicated based on testing according to UL-10C.

1. Where frame-applied intumescent seals are required by the manufacturer, provide gaskets that comply with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies and UBC 7-2, Fire Tests of Door Assemblies.

F. Sound-Rated Gasketing: Provide acoustic gasketing to meet Sound Transmission Class (STC) rating required.

G. Meeting-Stile Gasketing: Provide meeting-stile gasketing that fastens to the meeting stiles forming a continuous seal when doors are closed.

H. Door Sweeps or Shoes: Apply to the bottom of the door to close the gap between the door bottom and finished floor or saddle threshold.

1. Provide solid neoprene, EPDM, silicone, or nylon brush type of seal as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

I. Automatic Door Bottoms:

1. Provide closed cell sponge, bulb neoprene. or EPDM type of seal as specified in hardware sets.
2. Door bottom to be mortised, semi mortised, or surface mount as with a minimum thickness as specified in hardware sets.

J. Rain Drips:

1. Provide overhead rain drips for out-swinging hollow metal doors that are not covered against 45 degree blowing rain. Aluminum extrusion to be a minimum of .088 inches thick and extend 2.50 inches from the face of the frame, in anodized finish to match door.
2. Door sweeps or shoes with integral rain drip must meet ADA requirements

K. Thresholds: Provide threshold units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, and fabricated to accommodate door hardware and fit door frames.

1. Threshold extrusion to be a minimum thickness as specified in hardware sets.

2.24 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. LCN

2. Acceptable Manufacturers:
   a. Rixson
   b. Sargent

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.25 DOOR POSITION SWITCHES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Schlage

2. Acceptable Manufacturers:
   a. GE-Interlogix
   b. Sargent

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Connections to panel interface modules, controllers, and gateways.
6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds:

1. Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
2. Aluminum thresholds to be cut-in, and scribed around mullions, frame members, and stops. Do not butt to thresholds. Provide a continuous surface across full width of opening from jamb to jamb.
3. Where aluminum panic-type (rabbeted) thresholds with neoprene inserts are specified, undercut doors as required to properly mate with seal in threshold.

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing:

1. Apply to head and jamb, forming seal between door and frame.
2. Install gasketing in a manner eliminating need to cut any seal to install surface mounted hardware. Install compatible mounting bracket for surface mounted hardware unless minimum 1/4 inch thick solid aluminum seals are provided for mounting of surface applied hardware.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

Abbreviation	Name
GLY	Glynn-Johnson Corp
IVE	H.B. Ives
KNC	K.N. Crowder Mfg. Inc.
LCN	LCN Commercial Division
SCE	Schlage Electronic Security
SCH	Schlage Lock Company
VON	Von Duprin
ZER	Zero International Inc

148493 OPT0474488 Version 3

Hw# 00

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
	EA	OPENING	NOT FOUND		

Hw# 01-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR	626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM	626	SCH
1	EA	SURFACE CLOSER	4111 CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hw# 01-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	OH STOP & HOLDER	90H		652	GLY
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 01-3

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 01-4

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 01-5

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 01-6

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112HD EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	✓	689	VON
1	EA	STOREROOM LOCK	ND80TD TLR RX CON	✓	626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	ELECTRIC STRIKE	4211 FSE 12/24 VDC	✓	630	VON
1	EA	LOCK GUARD	LG1		630	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
1	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED	✓		SCH
1	EA	WIRE HARNESS	CON-6W	✓		SCH
1	EA	CARD READER	BY SECURITY	✓		
1	EA	POWER SUPPLY	BY SECURITY	✓		

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 01-9

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 02

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	OH STOP	90S		652	GLY
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 02-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 02-3

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR BOTTOM	360AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
1	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 02-4

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR BOTTOM	360AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
1	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 02-5

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR BOTTOM	360AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
1	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 02-6

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	SET	CAM LIFT HINGES	BY STC MANUFACTURER		630	
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR SWEEP	52A		A	ZER
1	EA	THRESHOLD	164A-223		A	ZER
1	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 03

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 03-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 03-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	ELEC OFFICE/CLASSROOM LOCK	AD-400-CY-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 04

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S TLR OS-OCC	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hw# 04-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S TLR OS-OCC	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hw# 06

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 06-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 06-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	OH STOP	90S		652	GLY
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 06-4

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hw# 06-5

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 06-6

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 06-7

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM LOCK	ND70TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER
1	EA	DOOR BOTTOM	355AA		AA	ZER

Hw# 07

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	SET	CAM LIFT HINGES	BY STC MANUFACTURER		630	
1	EA	PANIC HARDWARE	LD-99-L-BE-03		626	VON
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS13		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR SWEEP	52A		A	ZER
1	EA	THRESHOLD	164A-223		A	ZER
2	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 07-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	SET	CAM LIFT HINGES	BY STC MANUFACTURER		630	
1	EA	PANIC HARDWARE	LD-99-L-BE-03		626	VON
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS13		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	DOOR SWEEP	52A		A	ZER
1	EA	THRESHOLD	164A-223		A	ZER
2	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 08

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112HD			628	IVE
1	EA	PANIC HARDWARE	LD-99-EO			626	VON
1	EA	SURFACE CLOSER	4111 SCUSH			689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER				
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A			A	ZER
1	EA	DOOR CONTACT	7764		✓	628	SCE

Hw# 10

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5			652	IVE
2	EA	MANUAL FLUSH BOLT	FB358			626	IVE
1	EA	DUST PROOF STRIKE	DP2			626	IVE
1	EA	STOREROOM LOCK	ND80TD TLR			626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM			626	SCH
2	EA	OH STOP	90S			652	GLY
2	EA	SILENCER	SR64			GRY	IVE

Hw# 10-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5			652	IVE
1	EA	AUTO FLUSH BOLT	FB33			630	IVE
1	EA	ELEC STOREROOM LOCK	AD-400-CY-70-MT-TLR-J 4AA BATTERY		✓	626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM			626	SCH
1	EA	FSIC CORE	23-030 ICX			ORG	SCH
1	EA	COORDINATOR	COR X FL			628	IVE
2	EA	SURFACE CLOSER	4011			689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS			630	IVE
2	EA	FLOOR STOP	FS13			626	IVE
1	EA	GASKETING	188SBK PSA			BK	ZER

Hw# 10-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	AUTO FLUSH BOLT	FB33		630	IVE
1	EA	STOREROOM LOCK	ND80TD TLR		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB1F		689	IVE
2	EA	SURFACE CLOSER	4111 CUSH ST-1496 SPEC		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 11

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	99-NL-OP-F-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 12

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
2	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
2	EA	PANIC HARDWARE	99-L-BE-03		626	VON
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 12-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
2	EA	FIRE EXIT HARDWARE	9927-L-BE-F-LBRAFL-03-499F		626	VON
1	EA	FIRE/LIFE CLOSER	4040SE WMS AC/DC	↗	689	LCN
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7840 AS REQ (12/24/120V AC/DC TRI-VOLT)	↗	689	LCN
1	EA	GASKETING	188SBK PSA		BK	ZER

OPERATIONAL DESCRIPTION: HOLD OPEN CLOSER AND MAGNET TIED INTO FIRE ALARM SYSTEM TO RELEASE UPON FIRE ALARM ACTIVATION.

Hw# 12-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
2	EA	FIRE EXIT HARDWARE	9927-L-BE-F-LBRAFL-03-499F		626	VON
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7840 AS REQ (12/24/120V AC/DC TRI-VOLT)	↗	689	LCN
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 12-4

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	SET	CAM LIFT HINGES	BY STC MANUFACTURER		630	
1	EA	PANIC HARDWARE	CD-9927-EO-LBR		626	VON
1	EA	PANIC HARDWARE	CD-9927-L-BE-LBR-03		626	VON
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	FLOOR STOP	FS13		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	MEETING STILE	155AA		AA	ZER
2	EA	DOOR BOTTOM	360AA		AA	ZER
1	EA	MEETING STILE	55AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
3	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 13

Provide each DE door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
2	EA	FIRE EXIT HARDWARE	9927-L-BE-F-LBRAFL-03-499F		626	VON
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7840 AS REQ (12/24/120V AC/DC TRI-VOLT)	✓	689	LCN
2	EA	MAGNET PART	SEM7810-517		689	LCN
1	EA	GASKETING	188SBK PSA		BK	ZER

OPERATIONAL DESCRIPTION: HOLD OPEN CLOSER TIED INTO FIRE ALARM SYSTEM TO RELEASE UPON FIRE ALARM ACTIVATION.

Hw# 14

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	REMOVABLE MULLION	KR4854 STAB		689	VON
1	EA	ELEC PANIC HARDWARE	CD-RX-LC-99-EO		626	VON
1	EA	ELEC PANIC HARDWARE	CD-RX-LC-99-NL-OP-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX FOR TRIM		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037 FOR MULLION		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037 FOR DOGGING		626	SCH
4	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE (SPECIFY VOLTAGE)		630	VON
1	EA	DOOR PULL	VR910 DT STD		630	IVE
1	EA	DOOR PULL	VR910 NL STD		630	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
2	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED			SCH
2	EA	WIRE HARNESS	CON-6W			SCH
1	EA	CARD READER	BY SECURITY			
2	EA	DOOR CONTACT	7764		628	SCE
1	EA	POWER SUPPLY	BY SECURITY			

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 14-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	ELEC PANIC HARDWARE	LD-RX-LC-99-EO		626	VON
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037 FOR MULLION		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037 FOR DOGGING		626	SCH
3	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
2	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED			SCH
2	EA	WIRE HARNESS	CON-6W			SCH
2	EA	DOOR CONTACT	7764		628	SCE
1	EA	POWER SUPPLY	BY SECURITY			

Hw# 14-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-99-EO-F		626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-99-NL-OP-F-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX FOR TRIM		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037 FOR MULLION		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037 FOR DOGGING		626	SCH
4	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE (SPECIFY VOLTAGE)		630	VON
1	EA	DOOR PULL	VR910 DT STD		630	IVE
1	EA	DOOR PULL	VR910 NL STD		630	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED			SCH
2	EA	WIRE HARNESS	CON-6W			SCH
1	EA	CARD READER	BY SECURITY			
1	EA	DESK MOUNT BUTTON	660-PB LOCATE DESK MOUNTED BUTTON AS DIRECTED BY ARCHITECT		628	SCE
2	EA	DOOR CONTACT	7764		628	SCE
1	EA	POWER SUPPLY	BY SECURITY			

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 14-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD		628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	PANIC HARDWARE	LD-99-EO		626	VON
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
2	EA	DOOR CONTACT	7764		628	SCE

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 14-4

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	ELEC FIRE EXIT HARDWARE	RX-LC-99-EO-F		626	VON
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037 FOR MULLION		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
2	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED			SCH
2	EA	WIRE HARNESS	CON-6W			SCH
2	EA	DOOR CONTACT	7764		628	SCE
1	EA	POWER SUPPLY	BY SECURITY			

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 14-5

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	REMOVABLE MULLION	KR4854 STAB		689	VON
1	EA	ELEC PANIC HARDWARE	CD-RX-LC-99-EO-4'		626	VON
1	EA	ELEC PANIC HARDWARE	CD-RX-LC-99-NL-OP-4'-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX FOR TRIM		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037 FOR MULLION		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037 FOR DOGGING		626	SCH
4	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE (SPECIFY VOLTAGE)		630	VON
1	EA	DOOR PULL	VR910 DT STD		630	IVE
1	EA	DOOR PULL	VR910 NL STD		630	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A		A	ZER
2	EA	WIRE HARNESS	CON-XX-P LENGTH AS REQUIRED			SCH
2	EA	WIRE HARNESS	CON-6W			SCH
1	EA	CARD READER	BY SECURITY			
2	EA	DOOR CONTACT	7764		628	SCE
1	EA	POWER SUPPLY	BY SECURITY			

OPERATIONAL DESCRIPTION:
1. IMMEDIATE EGRESS ALWAYS ALLOWED
2.ACCESS BY KEY OR CREDENTIAL
3. KEY UNLOCKS LOCKSET
4. CARD READER RELEASES ELECTRIC STRIKE
5. DOOR CONTACT CONNECTED TO BUILDING SECURITY SYSTEM.

Hw# 15

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F		626	VON
1	EA	FIRE EXIT HARDWARE	99-NL-OP-F-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
2	EA	MOUNTING BRACKET	MB1F		689	IVE
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 16

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S TLR	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hw# 17

Provide each BF door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	BIFOLD KIT	C-180HD	626	KNC
1	FT	TRACK	C-975 (LENGTH AS REQUIRED)		KNC
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	FLUSH PULL	960	626	IVE

Hw# 18

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD		628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	PANIC HARDWARE	99-L-BE-03		626	VON
1	EA	MORTISE CYLINDER	20-061 ICX 36-083 36-082-037		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	PERIMETER GASKETING	BY DOOR MANUFACTURER			

Hw# 19

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	9947-EO-F-LBRAFL		626	VON
1	EA	FIRE EXIT HARDWARE	9947-NL-OP-F-LBRAFL-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 19-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	99-NL-OP-F-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	FSIC CORE	23-030 ICX		ORG	SCH
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407 CCV/CVX AS REQUIRED		626	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

Hw# 19-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	PANIC HARDWARE	CD-9927-EO-LBR		626	VON
1	EA	PANIC HARDWARE	CD-9927-NL-OP-LBR-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY	✓	626	SCE
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037		626	SCH
3	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	FLOOR STOP	FS13		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	MEETING STILE	155AA		AA	ZER
2	EA	DOOR BOTTOM	360AA		AA	ZER
1	EA	MEETING STILE	55AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
3	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 19-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	SET	CAM LIFT HINGES	BY STC MANUFACTURER		630	
1	EA	PANIC HARDWARE	CD-9927-EO-LBR		626	VON
1	EA	PANIC HARDWARE	CD-9927-NL-OP-LBR-110MD		626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-50-MT-TLR-J 4AA BATTERY		626	SCE
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
2	EA	MORTISE CYLINDER	20-061 X XQ11-948 36-083 36-082-037		626	SCH
3	EA	FSIC CORE	LARGE FORMAT IC CORE TO MATCH EXISTING SYSTEM		626	SCH
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS13		626	IVE
1	SET	GASKETING	170AA-S		AA	ZER
1	EA	MEETING STILE	155AA		AA	ZER
2	EA	DOOR SWEEP	52A		A	ZER
1	EA	MEETING STILE	55AA		AA	ZER
1	EA	THRESHOLD	164A-223		A	ZER
3	EA	MOUNTING BRACKET	770SPB			ZER

Hw# 20

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	FIRE EXIT HARDWARE	99-NL-OP-F-110MD		626	VON
1	EA	SURFACE CLOSER	4111 CUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	188SBK PSA		BK	ZER

END OF SECTION

Legend:
↯ Electrified Opening

Door#	HwSet#
100↯	02-1
100A	06
100B	01-4
101↯	02
101A	06-4
101B↯	03
101C	17
101D	06-2
101E	06-5
101F↯	03
101G	06
102↯	02
102A↯	03
102B↯	03
102C↯	03
102D↯	03-2
102E↯	03-2
102F↯	03
102G↯	03
102H↯	03
102J	06
102K	16
103	01-5
104↯	14-5
104A↯	14-5
104B↯	12-2
104C↯	12-2
104D↯	14-5
105↯	02
105A↯	02
105B↯	02-1
105C	06
105D	01-3
105E↯	02
105F↯	14
106↯	02-1
107↯	02-1
108↯	02-1

Door#	HwSet#
108A↯	08
109↯	02-1
109A↯	08
110↯	02-1
111↯	02-1
112↯	02-1
113↯	02-4
113A	01-9
113B	01-5
113C↯	14-1
114↯	02-4
114B↯	01-6
115↯	02-3
116↯	02-3
117↯	02-1
118↯	02
119↯	02-1
119A	01-3
120↯	15
120A	10
120B↯	15
120C↯	14-5
120D↯	14
120E↯	14
121↯	03-1
121A↯	03-1
122	06
122A	06
123	06
123A	06
124↯	03-1
124A↯	03-1
125B	10
125C↯	14
125D	01-9
125E↯	19-2
125F↯	19-2
125G	01-9

Door#	HwSet#
125H↯	19-2
125K↯	02-5
125L	06-2
125M	01-4
125N↯	02-5
125O	07
125P	12-4
125Q	12-4
125R	07-2
125S	07
125T↯	19-3
~~125U~~	~~07~~
~~125V~~	~~07~~
125W↯	02-6
200↯	02-1
201↯	02-1
202↯	02-1
203↯	02-1
204↯	19
204A	06
204B	06-7
204C↯	19-1
205↯	02
206↯	02-1
207↯	02-1
208↯	02-1
209↯	02-1
210↯	02-1
211↯	02-1
212↯	02-1
213↯	02-1
214↯	02-1
215↯	02-1
216↯	02-1
217↯	02-1
218↯	02-1
218A	01-1
219↯	02-1

Door#	HwSet#
220	02-1
220A	04
220B	01-1
221	02-1
300	02-1
301	02
302	02-1
303	02-1
304	02-1
305	02-1
306	02-1
307	02-1
308	02-1
309	02-1
309A	06-2
310	02-1
310A	06-2
311	02-1
312	02-1
313	02-1
314	02-1
314A	01-4
315	02-1
315A	01-4
316	02-1
317	02-1
318	02-1
319	02-1
320	02-1
320A	01-1
321	02-1
C11	13
C12A	01-6
C12B	02-1
C13	12-2
C13A	14
C14	13
C15	12-1
C15A	12-1
C16	12
C16A	14

Door#	HwSet#
C21	13
C23	12-2
C24	13
C30A	02
C31	13
C33	12-2
C34	13
M10	01-5
M11	01-5
M12	01-5
M13	01-5
M14	01-5
M15	10-1
M15A	06-1
M15B	14
M16	11
M16A	14-3
M16B	20
M17	02-1
M17A	01-6
M18A	10-2
M18B	10-2
M20	01-5
M21	01-5
M22	01-5
M23	01-5
M24	01-5
M25	01-5
M30	01-5
M31	01-5
M32	01-5
M33	01-5
M34	01-2
M35	01-5
S1	12-2
S1A	12-2
S1B	12-2
S1C	01-5
S1D	00
S2	12-2
S2A	08

Door#	HwSet#
S2B	12-2
S2C	12-2
S3	12-2
S3A	08
S3B	12-2
S3C	12-2
T10	04
T11	04
T12A	04-1
T12B	04-1
T13A	06-6
T13B	01-5
T13C	06-6
T14A	06-6
T14B	01-5
T14C	06-6
T15A	04-1
T15B	04-1
T15C	01-4
T16A	06-6
T16B	01-5
T16C	06-6
T17A	04
T17B	04
T18	04
T20A	04-1
T20B	04-1
T21A	06-6
T21B	01-5
T21C	06-6
T22	04
T23A	06-6
T23B	01-5
T23C	06-6
T30A	04-1
T30B	04-1
T31A	06-6
T31B	01-5
T31C	06-6
T32A	06-6
T32B	01-5

Door#	HwSet#
T32C	06-6
V10↙	14
V10A↙	14-1
V10B↙	14-2
V10C↙	14-4
V11↙	14
V11A	18
V12↙	14
V12A↙	14-1
V12B	18
V12C	18
V13↙	14-1
V13A↙	14
V13B↙	14-4
V13C↙	14-2

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SECTION 088000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Bullet resistant (Level 3) glazing units

D. Plastic films.

E. Laminated glass interlayers.

F. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 072500 - WEATHER BARRIERS.

C. Section 079200 - Joint Sealants: Sealants for other than glazing purposes.

D. Section 081113 - HOLLOW METAL DOORS AND FRAMES: Glazed lites in doors and borrowed lites.

E. Section 081416 - FLUSH WOOD DOORS: Glazed lites in doors.

F. Section 084313 - ALUMINUM-Framed Storefronts: Glazing provided as part of storefront assembly.

G. Section 084413 - GLAZED Aluminum Curtain Walls: Glazing provided as part of wall assembly.

H. Section 085113 - ALUMINUM WINDOWS: Glazing provided by window manufacturer.

I. Section 085653 - SECURITY WINDOWS: Glazing provided as part of security assembly.

J. Section 102800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2026).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

F. ASTM C1036 - Standard Specification for Flat Glass; 2025.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024, with Editorial Revision (2025).

I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.

L. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

M. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2021.

N. GANA (GM) - GANA Glazing Manual; 2022.

O. GANA (SM) - GANA Sealant Manual; 2008.

P. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).

R. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

S. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

T. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2026.

U. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Samples: Submit one samples 12 by 12 inch in size of insulated units and fire rated units..

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.
      b. Equivalent independent third-party ANSI accredited certification.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Insulating Glass Units: Provide a 20 year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified product(s) from single source and from single manufacturer.
   1. Subject to compliance with all specified requirements, provide products by one of the following, for each type of product listed, or equivalent:

B. Glass Fabricators:
   1. **(Basis of Design)** Guardian Glass, LLC: www.guardianglass.com
   2. Viracon, Inc.: www.viracon.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

C. Float Glass Manufacturers:
   1. **(Basis of Design)** Cardinal Glass Industries: www.cardinalcorp.com/#sle.
   2. Guardian Glass, LLC: www.guardianglass.com/#sle.
   3. Pilkington North America Inc: www.pilkington.com/na/#sle.
   4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

D. Laminated Glass Manufacturers:
   1. **(Basis of Design)** Cardinal Glass Industries: www.cardinalcorp.com/#sle.
   2. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

E. Spandrel Glass Manufacturers:
   1. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

F. Obscure Glass Manufacturers:
   1. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure:
      a. Positive Design Pressure: As indicated on drawings.
      b. Negative Design Pressure: As indicated on drawings.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7
   4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   5. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
   1. In conjunction with weather barrier related materials described in other sections, as follows:
      a. Water-Resistive Barriers: See Section 072500.
   2. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   5. Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
   6. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
   7. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category II impact test requirements.
   2. Laminated Bullet Resistant Glass: Complies with UL 752 - Level 3 bullet resistance.
   3. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
   1. **(Basis of Design)** Guardian Glass, LLC: www.guardianglass.com/#sle.

2. Pilkington North America Inc: www.pilkington.com/na/#sle.Pilkington North America Inc: www.pilkington.com/na/#sle.
3. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
5. Substitutions: See Section 016000 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
4. Spacer Color: Black.
5. Edge Seal:
   a. Single-Sealed System: Provide silicone, polysulfide, or polyurethane sealant as seal applied around perimeter.
   b. Color: Black.
6. Purge interpane space with dry air, hermetically sealed.

D. Type IGU-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with argon.
3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
4. Coating on second : Basis of Design: Guardian Glass Sunguard SNX 51/23
   a. Tint: Clear.
   b. Coating: Sunguard SNX 51/23, on #2 surface.
5. Metal edge spacer.
6. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
7. Total Thickness: 1 inch.
8. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.27, nominal.
9. Visible Light Transmittance (VLT): 51% percent, nominal.
10. Solar Heat Gain Coefficient (SHGC): 0.23, nominal.
11. Visible Light Reflectance, Outside: 14% percent, nominal.
12. Glazing Method: Dry glazing method, gasket glazing.

E. Type IGU-2 - Insulating Glass Units: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
2. Space between lites filled with argon.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
   b. Coating: Same as on vision units, on #2 surface.
4. Metal edge spacer.
5. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
   a. Tint: Clear.
   b. Opacifier: Ceramic frit, on #4 surface.
      1) Opacifier Color: Gray.
6. Total Thickness: 1 inch.
7. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.27, nominal.
8. Visible Light Reflectance, Outside: 14% percent, nominal.

9. Glazing Method: Dry glazing method, gasket glazing.

F. Type IGU-3 - Insulating Glass Units: Safety glazing.
   1. Applications:
      a. Glazed lites in exterior doors.
      b. Glazed sidelights and panels next to doors.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on drawings.
   2. Space between lites filled with argon.
   3. Glass Type: Same as Type IGU-1 except use fully tempered float glass for both outboard and inboard lites.
   4. Tint: Clear.
   5. Total Thickness: 1 inch.
   6. Metal edge spacer.
   7. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.27, nominal.
   8. Visible Light Transmittance (VLT): 51% percent, nominal.
   9. Solar Heat Gain Coefficient (SHGC): 0.23, nominal.
   10. Visible Light Reflectance, Outside: 14% percent, nominal.
   11. Glazing Method: Dry glazing method, gasket glazing.

G. Type IGU-4 - Insulating Glass Units: Vision glass, double glazed (Gymnasium Windows).
   1. Applications: Exterior glazing unless otherwise indicated.
   2. Space between lites filled with argon.
   3. Outboard Lite: Fully tempered, obscured float glass, 1/4 inch thick, minimum.
   4. Coating on second : Basis of Design: Guardian Glass Sunguard SNX 51/23.
      a. Tint: Gray.
      b. Coating: Sunguard SNX 51/23, on #2 surface.
   5. Metal edge spacer.
   6. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
      a. Tint: Gray.
      b. Type SGF1 - Security Glazing (window) Film, on #4 surface.
         1) Reference Section 088723 - Safety and Security Films.
         2) Film shall be factory or shop installed.
   7. Total Thickness: 1 inch.
   8. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.27, nominal.
   9. Visible Light Transmittance (VLT): 51% percent, nominal.
   10. Solar Heat Gain Coefficient (SHGC): 0.23, nominal.
   11. Visible Light Reflectance, Outside: 14% percent, nominal.
   12. Glazing Method: Dry glazing method, gasket glazing.

2.05 GLAZING UNITS

A. Type G2, G3, G4, and G6 - Fire-Resistance-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and blocks radiant heat, as required to achieve indicated fire-rating period exceeding 45 minutes.
   1. See Glazing Types schedule on Architectural drawings for "Type" locations and "markings" requirements.
   2. Applications:
      a. Glazing in fire-rated door assembly.
      b. Glazing in fire-rated window assembly.
      c. Glazing in sidelites, borrowed lites, and other glazed openings in fire-rated wall assemblies.
      d. Other locations as indicated on drawings.

3. Glass Type: Multi-laminate annealed glass with intumescent fire retardant interlayers.
4. Provide products listed by UL (DIR) and approved by authorities having jurisdiction.
5. UL Design Number: As indicated on drawings.
6. Safety Glazing Certification: 16 CFR 1201 Category II.
7. Glazing Method: As required for fire rating.
8. Fire-Rating Period: As indicated on drawings.
9. Markings for Fire-Resistance-Rated Glazing Assemblies: Provide permanent markings on fire-resistance-rated glazing in compliance with authorities having jurisdiction and New York State Building Code.
    a. "W" - meets wall assembly criteria of ASTM E119 or UL 263 fire test standards.
    b. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
    c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire test standards.
    d. "T" - meets temperature rise of not more than 450 degrees F above ambient at end of 30 minutes fire exposure in accordance with NFPA 252, UL 10B, or UL 10C fire test standards.
    e. "XXX" - placeholder that represents fire-rating period, in minutes.
10. Manufacturers:
    a. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite II-XL 60 and 90, where indicated on drawings: www.safti.com/#sle.
    b. **(Basis of Design)** Technical Glass Products; Pilkington Pyrostop 60 and 90, where indicated on drawings: www.fireglass.com/#sle.
    c. Vetrotech North America; : www.vetrotechusa.com/#sle.
    d. Substitutions: See Section 016000 - Product Requirements.

B. Type G1 and G5 - Fire-Protection-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve fire-doors indicated fire-rating period .
1. Glass Type: Safety ceramic glass.
2. Manufacturers:
    a. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite I: www.safti.com/#sle.
    b. **(Basis of Design)** Technical Glass Products; Firelite Plus: www.fireglass.com/#sle.
    c. Substitutions: See Section 016000 - Product Requirements.

C. Type TG-1 - Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
    a. Glazed lites in doors, except fire doors.
    b. Glazed sidelights to doors, except in fire-rated walls and partitions.
    c. Glazed view windows and panels in partitions enclosing athletic activity rooms, except in fire-rated walls and partitions.
    d. Other locations required by applicable federal, state, and local codes and regulations.
    e. Other locations indicated on drawings.
2. Glass Type: Fully tempered safety glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.
5. Glazing Method: Dry glazing method, gasket glazing.

D. Type BR-1 - Bullet Resistant Glazing: Laminated glass, multi-ply.
1. Applications: Locations as indicated on drawings.
2. Tint: Clear.
3. Thickness: 1-1/4 inch.
4. Outer Lite: Tempered glass.

5. Interlayer: Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
6. Middle Lite: Tempered glass.
7. Interlayer, Inboard Side : Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
8. Inside Lite: Polycarbonate.
9. Performance Criteria:
   a. Bullet Resistance: Pass ASTM F1233 tests in compliance with ballistic criteria class and weapon description indicated; Level 3.

2.06 PLASTIC FILMS

A. Type SGF-1 - Safety and Security Plastic Film: Polyester type.
   1. Reference Section 088723 - Safety and Security Films.
   2. Application: Locations as indicated on drawings.
   3. Color: Clear.
   4. Thickness Without Liner: 0.023 inch.

2.07 GLAZING COMPOUNDS

A. Type GC-1 - Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; gray color.

B. Type GC-2 - Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

C. Type GC-3 - Polysulfide Sealant: Two component; chemical curing, nonsagging type; ASTM C920 Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

D. Type GC-4 - Polyurethane Sealant: Single component, chemical curing, nonstaining, nonbleeding; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

E. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

F. Manufacturers:
   1. BASF Corporation: www.basf.com/#sle.
   2. Bostik Inc: www.bostik-us.com/#sle.
   3. Dow Corning Corporation: www.dowcorning.com/construction/#sle.Dow Corning Corporation: www.dowcorning.com/construction/#sle.
   4. Pecora Corporation: www.pecora.com/#sle.
   5. Tremco Commercial Sealants & Waterproofing; Proglaze: www.tremcosealants.com/#sle.
   6. Substitutions: See Section 016000 - Product Requirements.

2.08 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1. Width: As required for application.

2. Thickness: As required for application.
3. Spacer Rod Diameter: As required for application.
4. Manufacturers:
   a. Tremco Global Sealants: www.tremcosealants.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

E. Glazing Clips: Manufacturer's standard type.

F. Rescue Window/Glazing Unit Markings: Adhesive backed markings affixed to manually operable windows in classrooms to identify units intended for emargency evacuation of students in comliance with New York State Requirements.

2.09 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

F. Carefully trim protruding tape with knife.

3.06 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)

A. Application - Interior Glazed: Set glazing infills from the interior of the building.

B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

E. Place glazing tape on free perimeter of glazing in same manner described above.

F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

G. Carefully trim protruding tape with knife.

3.07 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Place setting blocks at 1/4 points and install glazing pane or unit.

C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

D. Fill gaps between glazing and stops with manufacturer recommended type sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.08 INSTALLATION - WET GLAZING METHOD (COMPOUND AND COMPOUND)

A. Application - Interior Glazed: Set glazing infills from the interior of the building.

B. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.

C. Locate and secure glazing pane using glazers' clips.

D. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.09 INSTALLATION - WET/DRY GLAZING METHOD (PREFORMED TAPE AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.

C. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.

D. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

E. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

F. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.
   1. Place glazing tape on glazing pane of unit with tape flush with sight line.

G. Fill gap between glazing and stop with manufacturer recommended type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.

H. Apply cap bead of manufacturer recommended type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.10 INSTALLATION - WET/DRY GLAZING METHOD (TAPE AND SEALANT)

A. Application - Interior Glazed: Set glazing infills from the interior of the building.

B. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

E. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.

F. Fill gaps between pane and applied stop with manufacturer recommended type sealant to depth equal to bite on glazing, to uniform and level line.

G. Carefully trim protruding tape with knife.

3.11 INSTALLATION - PLASTIC FILM

A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

B. Place without air bubbles, creases or visible distortion.

C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required. Do not score the glass.

3.12 FIELD QUALITY CONTROL

A. See Section 014000 - BSD Quality Requirements for additional requirements.

B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

C. Monitor and report installation procedures and unacceptable conditions.

3.13 CLEANING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, for additional requirements.

B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

C. Remove nonpermanent labels immediately after glazing installation is complete.

D. Clean glass and adjacent surfaces after sealants are fully cured.

E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.14 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 088000

SECTION 088723
SAFETY AND SECURITY FILMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glazing film applied to new glazing assemblies.

B. New Glazing: Factory or shop install film to glazing before installation in frames.

C. Glazing assemblies to receive film are indicated on drawings.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 081113 - HOLLOW METAL DOORS AND FRAMES: New or existing hollow metal doors with glazing to receive film.

C. Section 081416 - Flush Wood Doors: New or existing flush wood door glazing to recieve film.

D. Section 084313 - Aluminum Framed Storefronts: New or existing storefront glazing to receive film.

E. Section 084413 - GLAZED Aluminum Curtain Walls: New or existing curtain wall glazing to receive film.

F. Section 085113 - ALUMINUM WINDOWS: New or existing window glazing to receive film.

G. Section 088000 - Glazing: New glazing to receive film.

1.03 ABBREVIATIONS AND ACRONYMS

A. CFR - Code of Federal Regulations.

B. GSA - General Services Administration.

1.04 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

C. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2023.

D. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.

E. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics; 2021.

F. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2025.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

H. ASTM F3561 - Standard Test Method for Forced-Entry-Resistance of Fenestration Systems After Simulated Active Shooter Attack; 2023.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Record of product certification for safety requirements.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.

4. Installation methods.

C. Shop Drawings: Detailing installation of film, anchoring accessories, and sealant.

D. Samples: For each film product to be used, minimum size 4 inches by 6 inches, representing actual product, color, and patterns.

E. Manufacturer's Instructions:
1. Completed work inspection procedure and guidelines.
2. Post-Installation Agreement:
a. Curing time and expectations.
b. Cleaning guidelines.
c. Other manufacturer specific information.

F. Test Reports: Detailed reports of full-scale chamber tests to specified criteria, using assemblies identical to those required for this project.

G. Specimen Warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Glazing film manufacturer specializing in manufacture of safety glazing films with minimum 10 years successful experience.

B. Installer Qualifications: Manufacturer Approved Installer.

C. Film application and performance:
1. Certify that installed security film meets or exceeds the requirements of the Contract Documents.
2. All installed film locations shall be subject to inspection of structural sealant to ensure complete attachment to window or door frames.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of authorities having jurisdiction.

1.08 FIELD CONDITIONS

A. Coordinate installation with Owner's schedule and adjacent work.

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Provide 10 year manufacturer's replacement warranty to cover film against peeling, cracking, discoloration, and deterioration.

C. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. **(Basis of Design)** Armoured One, LLC; 23 mil Shooter Attack Security Film: www.armouredone.com/#sle.

D. Substitutions: See Section 016000 - Product Requirements.

2.02 SAFETY AND SECURITY GLAZING FILM

A. Safety Glazing: Install at new glazing assemblies with new film to provide impact resistance complying with ANSI Z97.1 and 16 CFR 1201, Category II.
   1. New, 1/4 inch thick, clear fully tempered glass.
   2. Surface applied film.
   3. Requiring no supplemental anchoring devices.
   4. Requires installation of structural sealant.

2.03 MATERIALS

A. Glazing Film: Transparent polyester film for permanent bonding to glass.
   1. Thickness: 23 mil (0.023 inch), minimum.
   2. Color: Clear.
   3. Construction: Micro-layered.
   4. Adhesive Type: Pressure sensitive as recommended by film manufacturer.
   5. Performance Requirements:
      a. Comply with ASTM F3561.
      b. Tensile Strength: 32,000 psi minimum when tested in accordance with ASTM D882.
      c. Breaking Strength: 640 lbs / inch when tested in accordance with ASTM D882.
      d. Elongation at Break: ASTM D882, 230%.
      e. Haze: ASTM D1003, <4%.
      f. Color b: ASTM D2244, 4.2.
      g. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84 (Class A).
      h. Light Transmission of Film Applied on 1/4 inch Thick Clear Tempered Glass:

B. Accessory Materials: As recommended or required by film manufacturer.

C. Structural Silicone Sealant: Self-priming, elastomeric adhesive complying with ASTM C1184.
   1. Products:
      a. **(Basis of Design)** Dow; DOWSIL 995, Structural Silicone Sealant: www.dow.com/#sle.
      b. General Electric Co.; GE SCS 2000, Silpruf Structural Silicone Sealant.
      c. Substitutions: See Section 016000 - Product Requirements.

D. Cleaners, Primers and Sealers: As recommended by glazing film manufacturer.

PART 3 EXECUTION

3.01 GENERAL

A. At new glazed openings, install security film to provide impact resistance and forced attack resistance complying with FTD-SA-C1, ANSI Z97.1 and CPSC 16 CFR 1201 Category II.

3.02 EXAMINATION

A. Factory or Shop -Applied Film: Verify that existing conditions are adequate for proper application and performance of film.

B. Examine glass and frames. Verify that existing conditions are adequate for proper application and performance of film.

C. Verify glass is not cracked, chipped, broken, or damaged.

D. Verify that frames are securely anchored and free of defects.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.03 PREPARATION

A. Clean glass of dust, dirt, paint, oil, grease, mildew, mold and other contaminants that would inhibit adhesion.

B. Immediately prior to applying film, thoroughly wash glass with neutral cleaning solution.

C. Protect adjacent surfaces.

D. Do not begin installation until substrates have been properly prepared.

3.04 INSTALLATION

A. Do not apply glazing film when surface temperature is less that 40 degrees F or if precipitation is imminent.

B. Install in accordance with manufacturer's instructions, without air bubbles, wrinkles, streaks, bands, thin spots, pinholes, or gaps, as required to achieve specified performance.

C. Accurately cut film with straight edges to required sizes allowing 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required by anchorage method.

D. Seams: Seam film only as required to accommodate material sizes; form seams vertically without overlaps and gaps; do not install with horizontal seams.

E. Apply bead of specified sealant overlapping 3/8 inch to 1/2 inch of the exposed edge of film and overlapping equally onto the glazing system frame. Allow to cure before cleaning.

F. Clean glass and anchoring accessories following installation. Remove excess sealants and other glazing materials from adjacent finished surfaces.

G. Remove labels and protective covers. Do not encapsulate any materials under film.

3.05 POST INSTALLATION REQUIREMENTS

A. Contractor shall verify that film installed meets the requirements of this specification. Three pieces of randomly chosen glass shall be removed, with film applied, and tested to verify that film installed meets required specifications. Film may need to be replaced, at no additional cost to Owner, as part of verifcation process.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.
   1. Bubbles or haze during curing period is not considered grounds for replacement.

3.07 CURING

A. Allow film to cure undisturbed for a smooth, clear finish.

B. Allow film to cure for six weeks prior to inspection for bubbles or haze.

C. If after six months of curing, bubbles or haze persist, replace film at no additional cost to Owner.

END OF SECTION 088723

SECTION 090561
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile.
   2. Carpet tile.
   3. Thin-set ceramic tile.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Patching compound.

F. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 012100 - Allowances

C. Section 014500 - Quality Control: Additional requirements relating to testing agencies and testing.

D. Section 033000 - CAST-IN-PLACE CONCRETE: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2024.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2026.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Visual Observation Report: For existing floor coverings to be removed.

C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's qualification statement.
   2. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
   3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   4. Manufacturer's installation instructions.
   5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

E. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Submit report to Architect.
   7. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.

G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
   2. Acceptable Testing Agencies:
      a. Independent Floor Testing & Inspection, Inc. (IFTI): www.ifti.com/#sle.
      b. Substitutions: See Section 016000.

C. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.
   5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

D. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at

least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
      a. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
      b. Products:
         1) ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
         2) CMP; Level-1, Self Leveling Underlayment: www.cmpsp.com/#sle.
         3) Laticrete; NXT LEVEL Cement Based Underlayment: www.laticrete.com/#sle
         4) Substitutions: See Section 016000 - Product Requirements.

D. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
      b. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.

c. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.
d. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
1. New concrete slabs:
a. Preliminary cleaning.
b. Moisture vapor emission tests by others; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
c. Internal relative humidity tests by others; in same locations as moisture vapor emission tests, unless otherwise indicated.
d. Alkalinity (pH) tests by others; in same locations as moisture vapor emission tests, unless otherwise indicated.
e. Specified remediation, if required.
f. Patching, smoothing, and leveling, as required.
g. Other preparation specified.
h. Adhesive bond and compatibility test.
i. Protection.

C. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

C. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

C. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

B. Furnish and install floor coating throughout the entire slab scheduled to recieve new flooring.

3.09 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

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SECTION 092116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General: Gypsum board assemblies for chase enclosures, horizonatal enclosures, and other enclosures as indicated.

B. Performance criteria for gypsum board assemblies.

C. Metal stud wall framing.

D. Metal channel ceiling framing.

E. Acoustic insulation.

F. Gypsum sheathing.

G. Cementitious backing board.

H. Framing Accessories.

I. Gypsum wallboard.

J. Joint treatment and accessories.

K. Acoustic (sound-dampening) wall and ceiling board.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 054000 - COLD-FORMED METAL FRAMING: Structural steel stud framing.

C. Section 061000 - ROUGH CARPENTRY: Wood blocking product and execution requirements.

D. Section 072100 - Thermal Insulation: Acoustic insulation.

E. Section 072500 - WEATHER BARRIERS: Water-resistive barrier over sheathing.

F. Section 078400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.

G. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

H. Section 093000 - Tiling: Tile backing board.

1.03 REFERENCE STANDARDS

A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.

B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.

C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

G. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.

H. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

I. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2024.

J. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

K. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.

L. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.

M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

N. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).

O. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2025.

P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

Q. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2024.

R. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

S. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

T. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

U. ASTM E413 - Classification for Rating Sound Insulation; 2022.

V. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

W. GA-600 - Fire Resistance and Sound Control Design Manual; 2024.

X. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Y. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

B. Preinstallation Meeting: Conduct a preinstallation meeting, at project site, one week prior to the start of the work of this section, to comply with requirements in Division 01 Section "Project Management and Coordination."; require attendance by all affected installers.
   1. Review methods and procedures for installing gypsum board wall, shaft-wall, and ceiling assemblies including, but not limited to, the following:
      a. Fasteners proposed for anchoring nonstructural steel framing to building structure.
      b. Wiring devices in wall, shaft-wall, and ceiling.
      c. Doors and other items penetrating wall assemblies.
      d. Items supported by wall, shaft-wall, and ceiling assembly framing.
      e. Mechanical work enclosed within wall, shaft-wall, and ceiling assemblies.

C. Sequencing: Install service utilities in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of gypsum board wall, shaft-wall, and ceiling assembly indicated.
   1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

D. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, indicating finish color and texture.

E. Steel Framing Industry Association (SFIA) Certification:
   1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.
   2. Submit current documentation of contractor and fabricator accreditation. Keep copies of each on-site during and after installation, and present upon request.

F. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

G. Evaluation Service Reports: Show compliance of grid suspension systems with specified requirements.

H. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.

I. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Provide materials and construction identical to those of assemblies with fire-resistance ratings determined according to ASTM E119 by a testing and inspecting agency as indicated on the Drawings.

B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E90 and classified according to ASTM E413 by a testing and inspecting agency as indicated on the Drawings.

C. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com/#sle.

D. Manufacturer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

E. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

F. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, shop drawings, and reference standard documents containing execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier. Provide protection from the weather/elements during delivery.

C. Store gypsum products and accessories indoors, under cover, and keep above freezing. Keep products and accessories dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

D. Elevate boards above floor or slab, on level nonwicking supports, to prevent sagging and in accordance with manufacturer's recommendations.

E. Store metal products to prevent corrosion, under cover and above grade.

1.08 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.03 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Sound-Rated: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. Fire-Resistance-Rated Ceilings and Soffits: Fire rating as indicated on drawings.
   2. Fire-Resistance-Rated Area Separation Walls: UL listed assembly No. As indicated on drawings.
   3. ICC IBC Item Numbers: Comply with applicable requirements of ICC IBC for the particular assembly.
   4. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
   5. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.04 METAL FRAMING MATERIALS

A. Material and Product Requirements Criteria: AISI S201.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.

C. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. **(Basis of Design)** MarinoWARE: www.marinoware.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

D. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.

E. Framing System Component Thickness: 20 Gauge (0.04 inch), unless indicated otherwise on drawings.
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.
   3. Furring Members: Hat-shaped sections complying with ASTM C645.
      a. Minimum metal thickness of 0.033 inch.
      b. Depth as indicated on drawings; minimum 7/8".

F. Area Separation Wall Studs and Accessories: AISI S220; galvanized sheet steel, of size and properties necessary to comply with specified performance requirements.

G. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging both sides.

H. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
   1. Products:
      a. **(Basis of Design)** ClarkDietrich; BlazeFrame Firestop Deflection Track: www.clarkdietrich.com/#sle.
      b. Fire Trak Corp.; FIRETRAK System: www.firetrak.com/#sle.
      c. Grace Construction Products; FlameSafe FlowTrak: www.hcpat.com.

2.05 FRAMING ACCESSORIES

A. Non-Loadbearing Framing Accessories:
   1. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.
   2. Drywall Corner Clips: Drywall clips help support drywall to reduce wood blocking on top plates, end walls, and corners.
   3. Steel Column and Beam Drywall Clip: UL-listed slip-on clips to connect gypsum board to steel beams and columns for fireproofing.

2.06 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
   3. USG Corporation: www.usg.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.

3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
4. Thickness:
   a. Vertical Surfaces: 5/8 inch.
   b. Ceilings: 1/2 inch.
   c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
5. Paper-Faced Products:
   a. USG Corporation; Sheetrock Brand EcoSmart Panels Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

C. Impact Resistant Wallboard:
1. Application: High-traffic areas indicated.
2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Hard Body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
8. Type: Fire-resistance-rated Type X, UL or WH listed.
9. Thickness: 5/8 inch.
10. Edges: Tapered.
11. Paper-Faced Products:
    a. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Hi-Impact Gypsum Board: www.goldbondbuilding.com/#sle.

D. Backing Board For Wet Areas:
1. Application: Surfaces behind tile in wet areas, including tub and shower surrounds and shower ceilings.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
   a. Thickness: 1/2 inch.
   b. Products:
      1) USG Corporation; Fiberock Brand Tile Backerboard 1/2 in. (12.7 mm): www.usg.com/#sle.
      2) Substitutions: See Section 016000 - Product Requirements.

E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: 1/2 inch.
3. Edges: Tapered.
4. Products:
   a. USG Corporation; Sheetrock Brand UltraLight Panels 1/2 in. (12.7 mm): www.usg.com/#sle.

F. Acoustical Sound Dampening Wall and Ceiling Board: Two layers of heavy paper-faced, high-density gypsum board separated by a viscoelastic polymer layer and capable of achieving STC rating of 50 or more in typical stud wall assemblies as calculated in accordance with ASTM E413 and when tested in accordance with ASTM E90.
   1. Thickness: 1/2 inch.
   2. Long Edges: Tapered.
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   4. Products:
      a. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond SoundBreak XP Wall Board: www.goldbondbuilding.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.07 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: See Section 072100.

B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   2. Joint Compound: Drying type, vinyl-based, ready-mixed.

C. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

D. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure in all locations.
   2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

F. Blocking: Install wood blocking for support of:

1. Framed openings.
2. Wall-mounted cabinets.
3. Plumbing fixtures.
4. Toilet partitions.
5. Toilet accessories.
6. Wall-mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Cementitious Backing Board: Install over steel framing members where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

E. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   3. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling, and sanding are not required at base layer of double-layer applications.

D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.08 CLEANING

A. See Section 017700 Closeout Procedures, for additional requirements.

3.09 PROTECTION

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION 092116

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SECTION 093000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Cementitious backer board as tile substrate.

D. Non-ceramic trim.

E. Setting Materials

F. Grout

G. Maintenance and Accessory Materials.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - Cast-In-Place Concrete. Cast concrete subfloors.

C. Section 079200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

D. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

E. Section 092116 - GYPSUM BOARD ASSEMBLIES: Tile backer board.

F. Section 224000 - Plumbing Fixtures:

1.03 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.

B. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.

E. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.

G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).

H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.

I. ANSI A108.10 - Installation of Grout in Tilework; 2026.

J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

K. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Modified Dry-Set Mortar; 2023.

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

M. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.

N. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

O. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.

P. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.

Q. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

R. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).

S. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.

T. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).

U. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2025-2026.

V. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Field Verified Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

D. Samples for verification: Provide full size samples for verification for products specified.

E. Installer's Qualification Statement:
   1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation; www.tile-assn.com/#sle

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than 1 box of each type.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.07 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a [5-year] period after Date of Substantial Completion.

C. Manufacturer's Warranty: Include coverage for degradation of color finish. Complete form in Owner's name and register with manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.

B. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule .
   1. American Olean Corporation: www.americanolean.com/#sle.
   2. Creative Materials: www.creativematerialscorp.com/#sle.
   3. Crossville: www.crossville.com/#sle.
   4. Dal-Tile Corporation: www.daltile.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

C. Glazed Wall Tile, Type TW-1 through TW-13: ANSI A137.1 standard grade.
   1. Moisture Absorption: as indicated on drawings as tested in accordance with ASTM C373.
   2. Size: As indicated on drawings.
   3. Surface Finish: As indicated on drawings.
   4. Color(s): As indicated on drawings.
   5. Pattern: As indicated on drawings.
   6. Products: Provide Basis-of-Design Product as listed on Interior Finish Schedule.
      a. American Olean Corporation: www.americanolean.com/#sle.
      b. Crossville: www.crossville.com/#sle.
      c. Dal-Tile Corporation: www.daltile.com/#sle.
      d. Substitutions: See Section 016000 - Product Requirements.

D. Floor Tile, Type TF-1: ANSI A137.1 standard grade.
   1. Moisture Absorption: as indicated on drawings as tested in accordance with ASTM C373.
   2. Size: As indicated on drawings.

3. Thickness: As indicated on drawings.
4. Edges: Square.
5. Color(s): As indicated on drawings.
6. Pattern: As indicated on drawings .
7. Products: Provide Basis-of-Design Product as listed on Interior Finish Schedule.
    a. Creative Materials: www.creativematerialscorp.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

2.02 TRIM AND ACCESSORIES

A. Ceramic Trim: Matching cove base and flat top ceramic shapes in sizes coordinated with field tile.
    1. Wall Base Tile, Type TB-1: ANSI A137.1 standard grade.
    2. Applications:
        a. Floor to Wall Joints: Cove base.
    3. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule .Same as for tile, in locations specified.
    4. Substitutions: See Section 016000 - Product Requirements.

B. Non-Ceramic Trim: Satin natural anodized extruded aluminum and brushed stainless steel, style and dimensions as indicated on drawings, set with tile mortar or adhesive.
    1. Applications:
        a. Open edges of wall tile.
        b. inside and outside wall corners.
        c. Transition between floor finishes of different heights.
        d. Thresholds at door openings.
        e. Floor and wall expansion and control joints.
        f. Floor-to-wall joints.
        g. Borders and other trim as indicated on drawings.
        h. Provide connectors and 90 degree corner trim pieces as required for complete instllation of non-ceramic trim system.
    2. Manufacturers: Provide Basis-of-Design Product as listed in Interior Finish Schedule or comparable product by one of the following:
        a. Schluter-Systems: www.schluter.com/#sle.
        b. Tarkett: tarkettcommercial.tarkett.com/#sle.
        c. Kuberit USA: www.kuberitusa.com/#sle.
        d. Substitutions: See Section 016000 - Product Requirements.

2.03 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
    1. Custom Building Products: www.custombuildingproducts.com/#sle.
    2. LATICRETE International, Inc: www.laticrete.com/#sle.
    3. Mapei Corporation: www.mapei.com/#sle.
    4. Substitutions: See Section 016000 - Product Requirements.

C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
    1. Products:
        a. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
        b. Substitutions: See Section 016000 - Product Requirements.

2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers: Provide Basis-of-Design Product as listed in Interior Finish Schedule or comparable product by one of the following:
   1. H.B. Fuller Construction Products, Inc: www.tecspecialty.com/#sle.
   2. LATICRETE International, Inc: www.laticrete.com.
   3. Mapei Corporation: www.mapei.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Color(s): As indicated on drawings.
   2. Products:
      a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Crack Resistance: No failure at 1/8 inch gap, minimum.
   2. Fluid or Trowel Applied Type:
      a. Material: Synthetic rubber.
      b. Thickness: 20 mils, maximum.
      c. Products:
         1) LATICRETE International, Inc; LATICRETE FRACTURE BAN SC: www.laticrete.com/#sle.
         2) Substitutions: See Section 016000 - Product Requirements.

B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 5/8 inch thick; 2 inch wide coated glass fiber tape for joints and corners.
   1. Products:
      a. USG Corporation; DUROCK Cement Board.
      b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 090561 - Common Work Results for Flooring Preparation.
   2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 090561.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Install thresholds where indicated.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep control and expansion joints free of mortar, grout, and adhesive.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints unless otherwise indicated. Use epoxy grout unless otherwise indicated .

M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with polymer modified grout, unless otherwise indicated.
   1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with epoxy grout.
      a. Any levels above ground level scheduled to receive tile.
   2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F131.

3.05 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244 with epoxy grout unless otherwise indicated, using membrane at toilet rooms.

B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, with thin set epoxy bond coat, unless otherwise indicated.

C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202 with thin set epoxy bond coat.

D. Over metal studs without backer install in accordance with TCNA (HB) Method W241, mortar bed, with membrane where indicated.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

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SECTION 095100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Placement of special anchors or inserts for suspension system.

C. Section 053100 - STEEL DECKING: Placement of special anchors or inserts for suspension system.

D. Section 072100 - Thermal Insulation: Acoustical insulation.

E. Division 21 - Fire Suppression Sections: Sprinkler heads in ceiling system.

F. Division 23 - Mechanical (HVAC) Sections: Air inlets and outlets, diffusers, grilles, etc. in ceiling system.

G. Division 26 - Electrical: Light fixtures and other electrical items in ceiling system.

H. Division 27 - Communications Sections: Speakers in ceiling system.

I. Division 28 - Electronic Safety and Security Sections: Fire alarm components and security devices in ceiling system.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

F. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.

G. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

H. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples: Submit two samples six by six inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, six inches long, of suspension system main runner, cross runner, and perimeter molding.

F. Evaluation Service Reports: Show compliance with specified requirements.

G. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

H. Manufacturer's qualification statement.

I. Specimen warranty for all ceiling system components.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: One box of each type of ceiling specified.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide Standard manufacturer warranty for defect in materials and workmanship. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL: ACOUSTIC CEILING TILE (ACT)

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule .

B. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
   2. Certainteed Architectural: www.certainteed.com/ceilings-and-walls/#sle.
   3. USG Corporation: www.usg.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

C. Suspension Systems:
   1. Same as for acoustical units.
   2. Substitutions: See Section 016000 - Product Requirements.

2.03 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Rating: In accordance with test procedures in ASTM E119 and complying with the following:
   1. UL (FRD) Assembly Design No.: As indicated on drawings.

B. Surface Burning Characteristics: Class A in accordance with ASTM E84.

2.04 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Panels, Type ACT-1 through ACT-9: Mineral fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type A.
      a. Form: A2.2, wet formed.
      b. Pattern: E - lightly textured.
   2. Size: 24 by 24 inches.
   3. Thickness: 7/8 inch.
   4. Light Reflectance: 87 percent, in accordance with ASTM E1264.
   5. Noise Reduction Coefficient (NRC) Range: 0.80, in accordance with ASTM E1264.
   6. Articulation Class (AC): 170, in accordance with ASTM E1264.
   7. Ceiling Attenuation Class (CAC): 35, in accordance with ASTM E1264.
   8. Panel Edge: Square.
   9. Tile Edge: Square.
   10. Color: As indicated on drawings.
   11. Suspension System: Exposed grid.
   12. Products:
      a. Armstrong World Industries, Inc; Ultima, High NRC #1940 and Health Zone #1445: www.armstrongceilings.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.05 SUSPENSION SYSTEMS

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
   1. Materials:
      a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System: Hot-dip galvanized steel grid and cap.
   1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
   2. Profile: Tee; 15/16 inch face width.
   3. Finish: Baked enamel.
   4. Products:
      a. Armstrong World Industries, Inc; Prelude XL: www.armstrongceilings.com/#sle.

2.06 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Perimeter Moldings: Same metal and finish as grid.
   1. Size: As required for installation conditions.
   2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
   3. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

E. Metal Edge Trim for Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
   1. Trim Height: As indicated on finish schedule.
   2. Finish: Baked enamel.
   3. Color: As indicated on finish schedule..
   4. Products:
      a. Armstrong World Industries, Inc; AXIOM Classic: www.armstrongceilings.com/#sle.

F. Acoustical Insulation: ASTM C665 friction fit type, unfaced batts.
   1. Thickness: 2 inch.
   2. Size: To fit acoustical suspension system.

G. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions, as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

F. Where obstructions occur, provide preformed closures to match perimeter molding.

G. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.

H. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.06 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures for additional requirements.

B. Clean surfaces.

C. Replace damaged or abraded components.

END OF SECTION

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SECTION 095423
LINEAR METAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Linear metal ceilings.

B. Suspended metal support system and perimeter trim.

1.02 RELATED REQUIREMENTS

A. Section 072100 - Thermal Insulation.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

E. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

F. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

H. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.

I. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required..

C. Shop Drawings: Indicate reflected ceiling plan.

D. Samples: Submit two samples 6 by 6 inch in size illustrating color and finish of components exposed to view.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Linear Panels: Five percent of amount installed, standard length.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section.
   1. Minimum five years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Accept factory-finished products on site in manufacturer's unopened factory packaging only; reject opened packages.

C. Protect factory-finished products from damage to appearance by storing products in manufacturer's unopened factory packaging in dry storage area.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 1-year manufacturer warranty; include coverage for corrosion resistance and discoloration of surface finish.

PART 2 PRODUCTS

2.01 GENERAL:

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Linear Metal Ceilings:
   1. **Basis of Design:** Armstrong World Industries, Inc; Metal Works: www.armstrongceilings.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.03 LINEAR METAL CEILINGS

A. Linear Metal Ceiling System: Panels, suspension members, trim, and accessories as required to provide a complete system.

B. Performance Requirements:
   1. Design to support imposed loads of indicated items without eccentric loading of supports.
   2. Design for maximum deflection of 1/360 of span.

2.04 COMPONENTS

A. Linear Metal Panels:
   1. Classification: ASTM E1264, Class A, Type XX, galvanized steel formed sheet.
      a. Pattern: C - perforated, small holes.
   2. Type: Linear panel with reveals; snap-in installation.
      a. Size and Configuration: As indicated on drawings.
      b. Panel Profile: Channel shaped with square edges.
      c. Perforations: Microperforated.
      d. Spacing: 1 inch reveal between panels.
   3. Material: Electrogalvanized Steel, ASTM A666/A666M, Type 304.
      a. Finish: Powder coat.
   4. Size: As inidcated on finish schedule.

5. Color: As indicated on finish schedule.

B. Linear Metal Baffles: Suspended vertically from suspension members.
   1. Profile: Blade shaped.
   2. Spacing: 6 inch reveal between baffles.
   3. Perforations: Microperforation.
   4. Material: Aluminum extrusions, ASTM B221 (ASTM B221M).
   5. Size: As indicated on finish schedule.
   6. Finish: Powder coat
   7. Color: As indicated on finish schedule.
   8. Suspension System: As indicated on Finish schedule.

C. Acoustical Backer: Manufacturer's standard non-woven fabric; as required to achieve specified acoustic performance.

D. Edge Molding, Expansion Joints, and Splices: Same material, thickness, and finish as linear panels.

E. End Caps: Formed metal; same color and finish as sight-exposed surfaces of linear panels.

F. Accessories: Stabilizer bars as required for suspended grid system; sight-exposed surfaces same color and finish as sight-exposed surfaces of linear panels.

G. Brackets: L-shaped, size recommended by ceiling manufacturer for specified application.

H. Suspension Members: Formed steel sections, with integral attachment points; galvanized finish; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

I. Insulation: See Section 072100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

C. Verify that required utilities are available, in proper location, and ready for use.

D. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Suspension Components:
   1. Install after above-ceiling work is complete in accordance with manufacturer's instructions, ASTM C636/C636M, and ASTM E580/E580M.
   2. Hang carrying members independent of walls, columns, ducts, light fixtures, pipe, and conduit; where carrying members are spliced, avoid visible displacement of face panels with adjacent panels.
   3. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest adjacent hangers to span the required distance.

B. Linear Metal Ceiling:
   1. Install linear panels, baffles, and other system components in accordance with manufacturer's instructions.
   2. Install prefabricated corner sections at changes in panel direction.

C. Insulation: Install above panel members; fit tight between grid members ; place insulation with facing side down.

3.03 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation From Dimensioned Position: 1/4 inch.

3.04 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean surfaces.

C. Replace damaged or abraded components.

END OF SECTION

SECTION 096400
WOOD AUDITORIUM (STAGE) FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sprung wood flooring system with vinyl finish.

B. Subflooring.

C. Sleepers.

D. Sheet vapor retarder.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete subfloor surface; recessed.

C. Section 061000 - ROUGH CARPENTRY: Subfloor blocking.

D. Section 087100 - Door Hardware: Thresholds.

E. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ANSI E1.26 - Entertainment Technology - Recommended Testing Methods and Values for Shock Absorption of Floors used in Live Performance Venues; Current Edition.

B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2026.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

E. ASTM F2772 - Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2024.

F. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers. Review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data for flooring, subflooring, floor finish materials, and resilient pads

C. Shop Drawings: Indicate floor joint pattern and termination details.
   1. Indicate provisions for expansion and contraction and wall base.
   2. Indicate size and type of fasteners and anchors.

D. Certificate: Certify products of this section meet or exceed specified requirements.

E. Test Reports: Submit test reports showing compliance with DIN EN 14904.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Instructions: Indicate standard and special installation procedures and perimeter conditions requiring special attention.

H. Sustainable Design Submittals: Submit VOC content documentation for field-applied adhesives and finish coatings.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

K. Maintenance Data: Include maintenance procedures, recommended maintenance materials, suggested schedule for cleaning, and stripping and re-finishing recommendations.

L. Maintenance Materials: Furnish the following for Owner's use in project maintenance:
   1. See Section 016000 - Product Requirements for additional provisions.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 10 years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 10 years of documented experience and approved by manufacturer.
   1. Flooring contractor shall submit a list of at least three completed projects of similar magnitude and complexity completed under current corporate identity.
   2. Flooring contractor shall be manufacturer trained.

C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions, shop drawings, and reference standard documents containing execution requirements.

D. Floor System Performance: Tested and in compliance with ANSI E1.26.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver all flooring system materials to project site in manufacturer's original packaging.

C. Store all flooring system materials off the floor in a well-ventilated, weather-tight space.

D. Materials shall not be delivered, stored or installed until all masonry, painting and plastering work is complete, and all overhead mechanical work, theatrical rigging and lighting are installed. **Room temperature of 65-80 degrees Fahrenheit and relative humidity of 35-50 % are to be maintained.** In- Slab Relative Humidity shall be 85% or less using ASTM F2170 In-Slab Relative Humidity test. Ideal installation/storage conditions are the same as those that will prevail when building is occupied

E. Materials shall not be stored at the installation location if the In-Slab relative humidity level for the concrete slab is above 85% using ASTM F2170 In-Slab Relative Humidity test.

F. Refer to manufacturer's instructions for further information regarding conditions and requirements of concrete prior to installation.

1.08 FIELD CONDITIONS

A. Do not install floor system until concrete has been cured 60 days and the requirements in "Delivery, Storage and Handling" are obtained.

B. Do not install wood flooring until wet construction work is complete and permanent heat and air conditioning is installed and operating.

C. General Contractor is responsible to ensure slab is clean and free of all dirt and debris prior to floor installation beginning.

D. Maintain room temperature at 65 to 80 degrees F for one week prior to delivery of materials, during installation, and after installation.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty against manufacturing defects. Complete forms in Owner's name and register with manufacturer.

C. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of interior finish. Include provision for replacing units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

B. Source Limitations: Obtain specified products from single source from single manufacturer.

C. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

D. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the drawings.

2.02 MANUFACTURERS

A. Wood Auditorium (Stage) Flooring:
   1. **Basis of Design:** Robbins; Wood Dance Flooring (Bio-Channel Classic Forever Marley) with vinyl finish floor: www.robbinsdancefloors.com/#sle.

B. Substitutions: See Section 016000 - Product Requirements.

2.03 MATERIALS

A. Vapor Barrier: 6-mil polyethylene.

B. Subfloor:
   1. Engineered wood sleepers with 7/16” (11mm) EPDM pads attached, factory encased in a steel channel. Sleeper must be free to move vertically within steel channel confines to assure proper uniformity of resiliency and function.
   2. 23/32” (18mm) structural rated sheathing, exposure 1 (CD-X).
   3. 23/32” (18mm) rated sheathing, exposure 1.

C. Finish Surface:
   1. Base mat.
   2. Structure layer.
   3. Structure Coating.
   4. Finish Coating: Pigmented water-dispersed polyurethane.
      a. Color: As selected by Architect from manufacturer's standard range.
   5. Wear coat.

2.04 ACCESSORIES

A. Fasteners:
   1. Subfloor Fasteners: 1-1/4” coated staples or equivalent.
   2. Adhesive: Elastomeric subfloor adhesive.

B. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, pre-molded outside corners; black color.

2.05 SOURCE QUALITY CONTROL

A. See Section 014000 - BSD Quality Requirements for additional requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting the work specified herein.

B. Inspect concrete slab for proper tolerance and dryness, and report any discrepancies to the General Contractor in writing. Slab will be level to within 1/8” (3mm) in a 10’ (3m). Moisture content of the concrete slab not exceed 85% in accordance with ASTM F2170.
   1. Test in accordance with Section 090561 - Common Work Results for Flooring Preparation.
   2. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   3. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
   4. Follow moisture and alkalinity remediation procedures in Section 090561.

C. All work required to get concrete subfloors in acceptable condition shall be the responsibility of the General Contractor.

D. Subfloor shall be broom cleaned by General Contractor.

E. Installer shall document all working conditions provided in General Specifications prior to commencement of installation.

3.02 PREPARATION

A. Prepare substrate to receive wood flooring in accordance with manufacturer's and MFMA instructions.

B. Vacuum clean substrate.

3.03 INSTALLATION

A. Vapor Barrier:
   1. Install polyethylene with joints lapped a minimum of 6” and turned up at walls to height of finish floor.

B. Subfloor:
   1. Install resilient and force attenuation pads on sleepers per manufacturer’s recommendations.
   2. Place channels 16-1/16” on center, end-to-end, staggering end joints in adjacent rows, perpendicular to the intended direction of the maple flooring. Gap the ends of the sleepers approximately 1/4". Provide 1-1/2” to 2" expansion void at the perimeter and all vertical obstructions.
   3. Anchor channels at predetermined locations.
      a. **NOTE:** Anchor sleepers in 3 of the pre-determined holes, at both ends and in center. When shimming for leveling is necessary, anchor in all 5 holes.
      b. **NOTE:** If extensive shimming is necessary, alternate anchoring ‘non-standard’ method may be necessary. Additional costs for this ‘non-standard’ method are to be borne by the purchaser.
   4. Install stop blocking per manufacturer’s recommendations.
   5. Install 23/32” plywood subfloor parallel to sleeper channels and securely fasten subfloor 6” on center along each channel sleeper.

6. Install the upper plywood subfloor perpendicular to the lower subfloor panels staggering joints and spacing 1/8” apart. Secure these panels using adhesive and staples per manufacturer’s instructions.
7. Fill and sand seams per manufacturer’s instructions for smooth surface for finish floor surfacing.

C. Finish Floor Surfacing:
1. Base mat.
   a. Unroll base mat wall to wall and allow to relax at least 1 hour. Weld seams by approved method. Allow to cure minimum 4 hours before proceeding.
2. Structure Layer:
   a. Mix three-component pigmented polyurethane resin and apply over base mat according to manufacturer's instructions. Allow to cure minimum 12 hours before proceeding.
3. Structure Coating:
   a. Mix three-component structure coating and apply using roller(s) according to manufacturer's instructions. Allow 24 hours curing time before proceeding.
4. Wear Coat:
   a. Mix three-component wear coating and apply according to manufacturer's instructions.

D. Wall Base:
1. Install vented cove base anchored to walls with base cement. Use pre-molded outside corners and neatly mitere inside corners.

E. Cure Time:
1. No traffic or other trades shall be allowed on the surface for a period of one week following completion to allow for complete and proper cure of the finish.

F. Other Trades:
1. It shall be the responsibility of the General Contractor to protect the surface from damage by other trades before acceptance by the Owner or Owner's Representative.

G. Safety:
1. No smoking, open flames or sparks from electrical equipment or any other source shall be permitted during the installation process, or in areas where materials are stored.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - BSD Quality Requirements for additional requirements.

3.05 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Clean floor surfaces in accordance with floor finish manufacturer's instructions.

C. Remove all unused materials from project site and dispose of properly.

3.06 CLOSEOUT ACTIVITIES

A. See Section 017700 - Closeout Procedures, for additional submittals.

B. See Section 017900 - Demonstration and Training for additional requirements.

3.07 PROTECTION

A. Protect installed flooring system from subsequent construction operations.

B. Do not permit traffic over unprotected floor surface.

3.08 MAINTENANCE

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

END OF SECTION

SECTION 096466
WOOD ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood athletic flooring.

B. Subflooring.

C. Sleepers.

D. Resilient cushioning.

E. Sheet vapor retarder.

F. Floor finishes.

G. Surface finishing and game markings.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete subfloor surface; recessed.

C. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Removal of existing floor coverings, cleaning, and preparation.

D. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2026.

B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

D. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.

E. MFMA (PUR) - Performance and Uniformity Rating Sport Specific Standards; current edition.

F. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers. Review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data for flooring, subflooring, floor finish materials, resilient cushion, and game insert or socket devices.

C. Shop Drawings: Indicate floor joint pattern and termination details.
   1. Indicate provisions for expansion and contraction, wall base, and game insert or socket devices.
   2. Indicate size and type fasteners and anchors.
   3. Indicate location, size, design, and color of game markings.

D. Test Reports: Submit test reports showing compliance with DIN EN 14904.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Manufacturer's Instructions: Indicate standard and special installation procedures and perimeter conditions requiring special attention.

G. Sustainable Design Submittals: Submit VOC content documentation for field-applied adhesives, stains, finish coatings, and sealers.

H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, a suggested schedule for cleaning, stripping and re-finishing recommendations, stain removal methods, and polishes and waxes.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

K. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with MFMA (SPEC).

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
   1. Minimum ten years of documented experience.
   2. Member mill of the Maple Flooring Manufacturers Association, Inc (MFMA).

C. Installer Qualifications: Company specializing in installing products specified in this section.
   1. Minimum ten years of documented experience.
   2. MFMA accredited and approved by flooring manufacturer.

1.07 MOCK-UPS

A. Construct mock-up of wood athletic flooring including wood flooring. Illustrate final finish and include example of painted game lines.

B. Size of mock-up to be not less than 36 inch long by 36 inch wide.

C. Locate where directed.

1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Materials shall not be delivered, stored or installed until all masonry, painting, plastering tilework, marble and terrazzo work is complete, and all overhead mechanical work, lighting, backstops, scoreboards are installed. **Room temperature of 55-80 degrees Fahrenheit (13 to 27 degrees Celsius) and relative humidity of 35-50 % are to be maintained.** In- Slab Relative Humidity shall be 85% or less using ASTM F2170 In-Slab Relative Humidity test. Ideal installation/storage conditions are the same as those that will prevail when building is occupied

C. Materials shall not be stored at the installation location if the In-Slab relative humidity level for the concrete slab is above 85% using ASTM F2170 In-Slab Relative Humidity test.

1.09 FIELD CONDITIONS

A. Do not install floor system until concrete has been cured 60 days and the requirements in "Delivery, Storage and Handling" are obtained.

B. Do not install wood flooring until wet construction work is complete and permanent heat and air conditioning is installed and operating.

C. General Contractor is responsible to ensure slab is clean and free of all dirt and debris prior to floor installation beginning.

D. Permanent heat, light and ventilation shall be installed and operating during and after installation. Maintain room temperature between 65 degrees F and 80 degrees F and relative humidity between 35 to 50 percent for a period of seven days prior to delivery of materials to installation space, during installation, and after installation. Consult MFMA guidelines for further information.

E. Acclimate wood flooring materials to installation space a minimum of 48 hours prior to installation.

F. After floors are finished, area to be kept locked by General Contractor to allow curing time for the finish. If after required curing time General Contractor or Owner requires use of auditorium, they shall protect the floor by covering with non-fibered kraft paper or red rosin paper with taped joints, until acceptance by Owner (or Owner's Agent) of complete stage floor.

1.10 WARRANTY

A. Provide manufacturer's standard 1 year warranty against manufacturing defects.

B. Complete forms in Owner's name and register with manufactuer.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Wood Athletic Flooring:
   1. **Basis of Design:** Robbins Sports Surfaces; Bio-Channel Star: www.robbinsfloor.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements

2.03 WOOD ATHLETIC FLOORING

A. General: Wood athletic flooring, MFMA (PUR) compliant for application indicated; system components provided by single manufacturer.

B. Application: Gymnasium.

C. System Description:
   1. Fixed, cushioned subfloor system, anchored with metal chanels and anchors, wood strip flooring.

2.04 COMPONENTS

A. Wood Strip Flooring:
   1. Provide MFMA grade-marked flooring, stamped as manufactured by MFMA member mill.
   2. Species: Northern hard maple, kiln dried; tongue and groove edges, end matched.
   3. Grade: Second and better.
   4. Moisture Content: 7 to 9 percent.
   5. Thickness: 25/32 inch.
   6. Width: 2-1/2 inches.
   7. Length: Random, minimum of 9 inches.

B. Subflooring: Manufacturer's standard pre-engineered subfloor suitable for system indicated.
   1. Nominal 3/4 inch x 24 inch x 96 inch sheathing with factory prepared anchor slots.

C. Channels: Galvanized steel, manufacturer's standard size and shape for system indicated.

D. Resilient Underlayment (shock pad): Polyethylene foam sheet.
   1. Thickness: 9/16 inch

E. Vapor Retarder: Polyethylene sheet, 6 mil thick; 2 inch wide tape for sealing sheet seams.

F. Fasteners and Anchors: Manufacturer's standard type and size to suit application.

2.05 FINISHES

A. Wood Floor Finish System:
   1. **(Basis of Design)** Canlak Coatings; Poloplaz sealers, paints and finishes: www.canlakcoatings.com/#sle.
      a. Cleaning Solvent: as recommended by floor finish manufacturer.
      b. Sealer: Poloplaz Low VOC Sealer.
      c. Tinted Sealer: Poloplaz Low VOC Tinted Sealer.
         1) Color as selected by Architect from manufacturer's full range of standard colors.
      d. Line Paint: Poloplaz "Fastbreak" paints.
         1) Color as selected by Architect from manufacturer's full range of standard and custom colors.
      e. Finish Coats: Poloplaz Low VOC "Magnum" finish.
   2. Substitutions: See Section 016000 - Product Requirements

2.06 ACCESSORIES

A. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, pre-molded outside corners; black color.

B. Game Socket Devices: Cast aluminum type, with anchors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/8 inch in 10 feet.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH). Moisture content of the concrete slab shall not exceed 85% using ASTM F2170, In-Slab Relative Humidity test.
   1. Test in accordance with Section 090561 - Common Work Results for Flooring Preparation.
   2. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   3. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
   4. Follow moisture and alkalinity remediation procedures in Section 090561.

D. Verify that required floor-mounted utilities are in correct location.

E. All work required to get concrete subfloors in acceptable condition shall be the responsibility of the General Contractor.

F. Subfloor shall be broom cleaned by General Contractor.

G. Installer shall document all working conditions provided in General Specifications prior to commencement of installation.

3.02 PREPARATION

A. Prepare substrate to receive wood flooring in accordance with manufacturer's and MFMA instructions.

B. Vacuum clean substrate.

3.03 INSTALLATION

A. Place vapor retarder over concrete surface, overlap seams a minimum of 6 inches and seal with tape. Turn up wall to height of finish floor

B. Resilient Underlayment with Plywood Subfloor: Install in accordance with manufacturer's instructions.
   1. Install resilient underlayment and anchor channels per manufacturers instructions.
   2. Place subfloor sheathing at 90 degree angle to direction of finished floor.

C. Install solid blocking at doorways, under stacked bleachers, under locations of heavy equipment, and as shown on drawings, in accordance with flooring manufacturer's recommendations.

D. Wood Flooring:
   1. Install in accordance with manufacturer's and MFMA instructions.
   2. Lay flooring parallel to length of main playing area. Blind nail to subfloor.
   3. Install edge strips at unprotected or exposed edges, and where flooring terminates.
   4. Provide 1-1/2 inch expansion space at walls and other interruptions.

E. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside corners.

F. Finishing and Painting:
   1. Mask off adjacent surfaces before beginning sanding.
   2. Sand flooring to smooth even finish with no evidence of sander marks. Remove dust by vacuum.
   3. Inspect entire area of floor to insure that surface is acceptable for finishing, completely free from sanding dust.
   4. Apply finishes in accordance with floor finish manufacturer's and MFMA instructions.
   5. Tack rag with approved solvent to remove all dust. Allow floor to thoroughly dry after final tack ragging.
      a. Do not use steel wool if applying a water-based product.
   6. Apply first coat of SEALER as soon as possible after final sanding and tack ragging is completed.
   7. After first coat of sealer is thoroughly dry, abrade, vacuum and tack rag. Apply second coat of SEALER to entire floor.
   8. After second coat of sealer is thoroughly dry, abrade, vacuum and tack rag. Lay out and PAINT game lines and scheduled painted areas.
      a. When using masking tape, pull it up as soon as the paint begins to dry or set.
      b. After the game markings have thoroughly dried, lightly abrade using steel wool or a pad recommended by the finish manufacturer.
      c. Vacuum and tack rag the entire floor surface.
   9. Apply first coat of FINISH.
   10. After first coat of finish is thoroughly dry, abrade, vacuum and tack rag. Apply final coat of FINISH.
   11. After final finish coat is thoroughly dry, take necessary precautions to protect floor from damage caused by traffic of any type or from any other source.

3.04 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Clean floor surfaces in accordance with floor finish manufacturer's instructions.

C. Remove all unused materials from project site and dispose of properly.

3.05 PROTECTION

A. Prohibit traffic on finished floor for 72 hours after installation.

B. Place protective coverings over finished floors; do not remove coverings until Date of Substantial Completion.

END OF SECTION

SECTION 096500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient sheet flooring.

B. Resilient tile flooring.

C. Static control resilient tile flooring.

D. Resilient base.

E. Resilient stair coverings and accessories.

F. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

C. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

D. Section 260526 - Grounding and Bonding for Electrical Systems: Grounding and bonding of static control flooring to building grounding system.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

B. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring; 2025.

C. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2022.

D. ASTM F1700 - Standard Specification for Solid Vinyl Floor in Modular Format such as Tile(s) or Plank(s); 2025.

E. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).

F. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2019 (Reapproved 2025).

G. ASTM F2169 - Standard Specification for Resilient Stair Treads; 2015 (Reapproved 2025).

H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Field Verfified Shop Drawings: Indicate seaming plans, floor patterns, and layout of grounding strips and connections to the building grounding system.

D. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: Quantity equivalent to 5 percent of each type and color.
   3. Extra Wall Base: Quantity equivalent to 5 percent of each type and color.
   4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum five years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum five years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Protect roll materials from damage by storing on end.

E. Do not double stack pallets.

1.08 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a 5-year period after Date of Substantial Completion.

C. Manufacturer's Warranty: Include coverage for degradation of color finish. Complete form in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 SHEET FLOORING

A. Vinyl Sheet Flooring: Homogeneous without backing, with color and pattern throughout full thickness.
   1. Manufacturers:
      a. **Basis of Design:** Tarkett Flooring; Homogeneous Sheet Vinyl: www.commercial.tarkett.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1913.
   3. Thickness: 0.080 inch nominal.
   4. Static Load Resistance: 250 psi minimum, when tested as specified in ASTM F970.
   5. Seams: Heat welded.
   6. Integral coved base with cap strip.
   7. Pattern: As indicated on finish drawings..
   8. Color: As indicated on drawings.
   9. Product:
      a. Tarkett Flooring; iQ Granit: www.commercial.tarkett.com/#sle.

B. Welding Rod: Solid bead in material compatible with flooring, produced by flooring manufacturer for heat welding seams, and in color matching field color.

2.03 TILE FLOORING

A. Vinyl Tile - Type SVT-1 through SVT-5: Solid vinyl with color and pattern throughout thickness.
   1. Manufacturers:
      a. **Basis of Design:** Patcraft, a Shaw Industries company; Admix 1508V: www.patcraft.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648.
   4. Plank Tile Size: 18 by 36 inch.
   5. Total Thickness: 3.2 mm.
   6. Pattern: Color as indicated on drawings.
   7. Color: As indicated on drawings.

B. Luxury Vinyl Tile - Type LVT-1 through LVT-7: Printed film type, with transparent or translucent wear layer; acoustic interlayer or backing.
   1. Manufacturers:
      a. Basis of Design: Patcraft, a Shaw Industries company; www.patcraft.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1700, Class III.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648.
   4. Plank Tile Size: As indicated on drawings.
   5. Wear Layer Thickness: 20 mil.
   6. Total Thickness: 5 mm.
   7. Tile Edge: Straight.
   8. Pattern: As indicated on drawings..
   9. Color: As indicated on drawings.

10. Products:
    a. Patcraft, a Shaw Industries company; True Species: www.patcraft.com/#sle.
    b. Patcraft, a Shaw Industries company; Mark Making: www.patcraft.com/#sle.
    c. Patcraft, a Shaw Industries company; Linocut: www.patcraft.com/#sle.

C. Static Control Tile - Type SDT-1: Homogeneous; color and pattern throughout thickness.
1. Manufacturers:
    a. Basis of Design: Tarkett Flooring; iQ Granit SD: www.tarkett.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.
2. Minimum Requirements: Solid vinyl tile complying with ASTM F1700, Class 1, Type A.
3. Electrical Resistance:
    a. Dissipative Tile: Electrical Resistance between 10^6 to 10^9 ohms as tested in accordance with ASTM F150.
4. Critical Radiant Flux (CRF): Class 1, minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648.
5. Tile Size: 24 by 24 inch.
6. Total Thickness: 0.08 inch.
7. Pattern: As indicated on drawings.
8. Color: As indicated on drawings.

2.04 STAIR COVERING

A. Resilient Stair Treads: - Type RST-1; full width and depth of stair tread in one piece; tapered thickness.
1. Manufacturers:
    a. Basis of Design: Tarkett, a Johnsonite Company; Angle Fit Rubber Stair Treads: www.johnsonite.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.
2. Minimum Requirements: Comply with ASTM F2169, Type TS, rubber, vulcanized thermoset.
3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
4. Nominal Thickness: 0.125 inch.
5. Nosing: Square.
6. Striping: 2 inch wide contrasting color abrasive strips.
7. Texture: Hammered.
8. Color: As indicated on drawings.

B. Stair Risers: - Type RSR-1 through RSR-4 Full height and width of tread in one piece, matching treads in material and color.
1. Manufacturers:
    a. Basis of Design: Tarkett, a Johnsonite Company; Rubber Stair Risers: www.johnsonite.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.
2. Thickness: 0.125 inch.
3. Color: As indicated on drawings.

2.05 RESILIENT BASE

A. Resilient Base - Type RB-1 : ASTM F1861, Type TS, rubber, vulcanized thermoset; Style B, Cove.
1. Manufacturers:
    a. Basis of Design: Tarkett, a Johnsonite Company; Baseworks: www.johnsonite.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
3. Height: 4 inches.
4. Finish: Satin.
5. Length: Roll.
6. Color: As indicated on drawings.
7. Accessories: Premolded external corners and internal corners.

B. Vented Resilient Base - Type RB-2: ASTM F1861, Type TS, rubber, vulcanized thermoset; style as scheduled.
1. Manufacturers:
   a. Basis of Design: Tarkett, a Johnsonite Company; Vent Cove Wall Base: www.johnsonite.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.
2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
3. Height: 4 inches with 3 inch toe.
4. Finish: Satin.
5. Length: 4 foot sections.
6. Color: As indicated on drawings.
7. Accessories: Premolded external corners and internal corners.

2.06 TRIM AND ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Trim, Moldings, Transition and Edge Strips: Satin natural anodized extruded aluminum and brushed stainless steel.
1. Applications:
   a. Inside and outside wall corners.
   b. Transition between floor finishes of different heights.
   c. Thresholds at door openings.
   d. Borders and other trim as indicated on drawings.
   e. Provide connectors and 90 degree corner trim pieces as required for complete instllation.
2. Manufacturers; Provide Basis-of-Design Product as listed in Interior Finish Schedule or comparable product by one of the following:
   a. Schluter-Systems: www.schluter.com/#sle.
   b. Tarkett: tarkettcommercial.tarkett.com/#sle.
   c. Profilitec: www.profilitec.com/#sle.
   d. Substitutions: See Section 016000 - Product Requirements.

D. Copper Grounding Strips: Type and size as recommended by static control flooring manufacturer.

E. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).

1. Test in accordance with Section 090561.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 090561.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 090561.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:
1. Spread only enough adhesive to permit installation of materials before initial set.
2. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 260526 for grounding and bonding to building grounding system.
3. Fit joints and butt seams tightly.
4. Set flooring in place, press with heavy roller to attain full adhesion.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

G. Install flooring in recessed floor access covers, maintaining floor pattern.

3.04 INSTALLATION - SHEET FLOORING

A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.

C. Cut sheet at seams in accordance with manufacturer's instructions.

D. Seal seams by heat welding where indicated.

E. Coved Base: Install as detailed on drawings, using coved base filler as backing at floor to wall junction. Extend sheet flooring vertically to height indicated, and cover top edge with metal cap strip.

3.05 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

C. Install square tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

D. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.06 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.07 INSTALLATION - STAIR COVERINGS

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.08 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.09 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

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SECTION 096566
RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rubber sheet flooring, adhesively installed.

B. Rubber tile, adhesively installed.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

C. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Removal of existing floor coverings, cleaning, and preparation.

D. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

E. Section 096500 - Resilient Flooring.

1.03 REFERENCE STANDARDS

A. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

B. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

A. See Section 013300 -Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, and layout, colors, and widths of game lines and equipment locations.

D. Verification Samples: Actual flooring material specified, not less than 12 inch square, mounted on solid backing.

E. Test Reports: Submit test reports showing compliance with DIN EN 14904.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Instructions: Indicate standard and special installation procedures and perimeter conditions requiring special attention.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 5% of material matching installed flooring.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for packaging waste requirements.

B. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

C. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.08 FIELD CONDITIONS

A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70 to 95 degrees F for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F or to go above 100 degrees F.

1.09 WARRANTY

A. Manufacturer's Limited 5 year Warranty against defects in manufacturing or workmanship.

B. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, “ I “ series, drawings.

2.02 PREFORMED ATHLETIC FLOORING

A. Manufacturers:
   1. Basis of Design :Tarkett: www.tarkett.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Rubber Sheet Flooring: Recycled SBR (styrene butadiene rubber) with urethane binder, lengths to avoid transverse seams.
   1. Thickness: Minimum 3/8 inch.
   2. Sheet Width: Minimum 48 inches.
   3. Durometer Hardness, Type A: Minimum of 65, when tested in accordance with ASTM D2240.
   4. Color: As indicated on drawings.
   5. Products:

a. Tarkett; Replay Commotion: www.tarkett.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.

C. Rubber Tile Flooring: Two-layer vulcanized rubber.
1. Thickness: Minimum 3/8 inch.
2. Tile Edge/Installation: Square edge, adhesive installation.
3. Size, Square Edge Tile: Nominal 24 inches by 24 inches.
4. Durometer Hardness, Type A: Minimum of 76, when tested in accordance with ASTM D2240.
5. Surface Texture: Hammered.
6. Color: As indicated on drawings.
7. Products:
a. Tarkett; Triumph Sport Rubber Tile: www.tarkett.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES

A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.

B. Flooring Adhesive: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
1. Test in accordance with Section 090561.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 090561.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 090561.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Resilient Sheet Flooring:
1. Unroll flooring and allow to relax before beginning installation.
2. Mix adhesive thoroughly and apply to substrate with notched trowel. Roll flooring into fresh adhesive, butting factory edges and compression fitting.
3. Roll entire flooring surface with steel roller to assure adhesion to substrate and eliminate air bubbles.
4. Immediately remove any adhesive from flooring surface, using chemical recommended by flooring manufacturer.
5. Weld seams using techniques and equipment recommended by manufacturer.

6. Lay out game lines using tape and taping machine approved by flooring manufacturer. Apply game line paint with roller, and allow to dry before removing tape.
7. Apply transparent top coat over flooring if recommended by manufacturer, to achieve a uniform finished appearance.

D. Rubber Tile Flooring:
1. Lay out center lines in spaces to receive tile flooring, based on location of principal walls. Start tile installation from center, and adjust as necessary to avoid tiles less than one-half width at perimeter.
2. Lay tiles square with room axis, matching for color and pattern by selecting from cartons and mixing as recommended by manufacturer.
3. Spread only enough adhesive to permit installation of materials before initial set.
4. Fit joints and butt seams tightly; press with heavy roller to attain full adhesion.

3.04 CLEANING

A. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION

A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

END OF SECTION

SECTION 096700
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 079200 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

C. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ANSI/ESD STM7.1 - The Protection of Electrostatic Discharge Susceptible Items Flooring Systems Resistive Characterization; 2021.

B. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Samples: Submit two samples, 6 by6 inch in size illustrating color and pattern for each floor material for each color specified.

D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Top Coat Materials: 2 gallons.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section.
   1. Minimum five years of documented experience.
   2. Approved by manufacturer.

C. Supervisor Qualifications: Trained by product manufacturer , under direct full time supervision of manufacturer's own foreman.

1.07 MOCK-UPS

A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
   1. Number of Mock-Ups to be Prepared: One.
   2. Use same materials and methods for use in the work.
   3. Locate where directed.
   4. Minimum Size: 48 inches by 48 inches.
      a. Include 48 inch length of integral cove base.

B. Obtain approval of mock-up by Architect before proceeding with work.

C. Approved mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.09 FIELD CONDITIONS

A. Maintain minimum temperature in storage area of 55 degrees F.

B. Store materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a 5-year period after Date of Substantial Completion.

C. Manufacturer's Warranty: Include coverage for degradation of color finish. Complete form in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.

2.02 MANUFACTURERS

A. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule .

B. Fluid-Applied Flooring:
   1. Dur-A-Flex: www.dur-a-flex.com/#sle.
   2. Key Resin Company: www.keyresin.com/#sle.
   3. **Basis of Design:** Stonhard : www.stonhard.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.03 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring Type ERF-1 and ERF-2: Epoxy base coat(s), with troweled aggregate.
   1. Aggregate: Quartz granules.
   2. Top Coat: Polyurethane.
   3. System Thickness: 1/4 inch, nominal, dry film thickness (DFT).

4. Texture: Slip resistant.
5. Sheen: Gloss.
6. Integral Cove Base: 4 inch high.
7. Color: As indicated on Drawings.
8. Products:
   a. Stonhard; Stonshield SLT: www.stonhard.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES

A. Base Caps: Extruded anodized aluminum with projecting base of 1/8 inch; color as selected.

B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.

C. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 090561.
   2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 090561.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Prepare concrete surfaces according to ICRI 310.2R.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

E. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - ACCESSORIES

A. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

D. Install flooring in recessed type floor access covers.

E. Cove at vertical surfaces.

3.05 FIELD QUALITY CONTROL

A. See Section 014500 - Quality Requirements, for additional requirements.

B. Test installed floor surface in accordance with ANSI/ESD STM7.1 .

3.06 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 096813
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

B. Walk-Off Carpet

1.02 RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL: Reclamation/Recycling of new carpet tile scrap and removed carpet tile.

C. Section 033000 - CAST-IN-PLACE CONCRETE: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

D. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Removal of existing floor coverings, cleaning, and preparation.

E. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2026.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

E. CRI 104 - Standard for Installation of Commercial Carpet; 2018.

F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Warranty: Provide manufacturer's written warranty for all products outlined in this section.

D. Samples: Submit two full sized carpet tiles illustrating color and pattern design for each carpet color selected.

E. Accessory Samples: Submit two 2 inch long samples of edge strip.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

K. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 016000 - Product Requirements, for additional provisions.
2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum five years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Tile Carpeting: **Refer to Interior Finish Schedule, Sheet I000 for Basis of Design**.
1. Substitutions: See Section016000-Product Requirements.

2.03 MATERIALS

A. Walk-Off Tile Carpeting [Type WOC-1]; High performance solution dyed multi-pattern loop entryway carpet system.
1. Product: **Refer to Interior Finish Schedule, Sheet I000 for Basis of Design.**
2. Tile Size: 24 by 24 inch.
3. Thickness: Refer to drawing I000 Finish Schedule
4. Color: Refer to drawing I000 Finish Schedule.
5. Pattern: Refer to drawing I000 Finish Schedule.
6. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
7. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
8. Pile Weight: 24 oz/sq ft..
9. Primary Backing Material: Synthetic
10. Secondary Backing Material: Ecoworx Tile.
11. Product:
a. Miliken; Obex/ Cutex: www.milliken.com/#sle.

B. Tile Carpeting [Type CPT-2]; High performance solution dyed textile composite.
1. Product: Refer to Interior Finish Schedule, Sheet I000 for Basis of Design.
2. Tile Size: 24 by 24 inch.
3. Thickness: Refer to drawing I000 Finish Schedule

4. Color: Refer to drawing I000 Finish Schedule.
5. Pattern: Refer to drawing I000 Finish Schedule.
6. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
7. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
8. Primary Backing Material: Refer to drawing I000 Finish Schedule
9. Product:
    a. Tarket Flooring; Angled in Enrichment: www.commercial.tarkett.com/#sle.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Transition Strips: Embossed aluminum, color as selected by Architect.

C. Stair Nosing: Rubber type, square nose, ribbed top surface, one piece per stair tread width, color as selected by Architect.

D. Carpet Tile Adhesive: Type recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
    1. Test in accordance with Section 090561.
    2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
    3. Follow moisture and alkalinity remediation procedures in Section 090561.

3.02 PREPARATION

A. Remove existing finish flooring, where applicable.

B. Prepare floor substrates for installation of flooring in accordance with Section 090561.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile as indicated on Interior

F. Fully adhere carpet tile to substrate.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.04 INSTALLATION ON STAIRS

A. Use one piece of carpet for each tread and the riser below. Apply seam adhesive to all cut edges.

B. Lay carpet with pile direction in the length of the stair.

C. Adhere carpet tight to stair treads and risers.

3.05 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Remove excess adhesive without damage, from floor, base, and wall surfaces.

C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 096816
SHEET CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet, stretched-in with cushion underlay and direct-glued.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL: Reclamation/Recycling of new carpet scrap and new cushion scrap.

C. Section 033000 - CAST-IN-PLACE CONCRETE: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied carpet.

D. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

E. Section 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

C. CRI (GL) - Green Label Testing Program - Certified Products; Current Edition.

D. CRI 104 - Standard for Installation of Commercial Carpet; 2018.

E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.

D. Samples: Submit two samples 12 inch by 12 inch in size illustrating color and pattern for each carpet and cushion material specified.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum five years documented experience.

B. Installer Qualifications: Company specializing in installing carpet with minimum five years documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Protect roll materials from damage by storing on end.

1.08 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

C. Ventilate installation area during installation and for 72 hours after installation.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule .

B. Carpet:
   1. Tarkett: www.commercial.tarkett.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.03 CARPET

A. Type CPT-1, CPT-3 through CPT-6 Carpet: Tufted, nylon.
   1. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648.
   2. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
   3. Color: As indicated on drawings.
   4. Pattern: As indicated on drawings.
   5. Roll Width: 6 feet.
   6. Maximum Electrostatic Charge: 3 Kv. at 20 percent relative humidity (RH).

7. Gauge: 5/64 inch.
8. Stitches: 10 per inch.
9. Pile Weight: 17 oz/sq yd.
10. Density Factor: 6.6 kilotex.
11. Products:
    a. Tarkett Flooring; Powerbond: www.tarkett.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES

A. Subfloor Filler: Type recommended by carpet manufacturer.

B. Tackless Strip: Carpet gripper, of type recommended by carpet manufacturer to suit application, with attachment devices.

C. Adhesives:
1. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GL) certified; in lieu of labeled product, independent test report showing compliance is acceptable.

D. Carpet Adhesive: Recommended by carpet manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesives to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
1. Test in accordance with Section 090561.
2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 090561.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Lay out carpet and locate seams in accordance with shop drawings.
1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
2. Do not locate seams perpendicular through door openings.

3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
4. Locate change of color or pattern between rooms under door centerline.
5. Provide monolithic color, pattern, and texture match within any one area.

E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

3.05 INSTALLATION ON STAIRS

A. Install tackless strips at back of treads, with pins facing riser, and at bottom of riser, with pins facing tread.

B. Install cushion on stair treads butt tight to applied nosing.

C. Install carpet on stairs with the run of the pile in opposite direction of anticipated traffic to avoid peaking of backing at nosings.

D. Stretch carpet over stair treads, full width in one piece. Fold carpet under 1-1/2 inches on each side.

3.06 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Remove excess adhesive from floor and wall surfaces without damage.

C. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 097200
WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall coverings.

B. Digitally Printed Vinyl Letter Signage.

C. Acoustic Wall Coverings.

D. Window Film.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

C. Section 099000 - Painting and Coating: Preparation and priming of substrate surfaces.

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on wall covering and adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Samples: Submit two samples of wall covering, six by six inch in size illustrating color, finish, and texture.

E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Wall Covering Materials: 25 linear feet of each color and pattern of wall covering; store where directed.
   3. Package and label each roll by manufacturer, color and pattern, and destination room number.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 MOCK-UP

A. Provide panel, 3 panel drops wide, full height, illustrating installed wall covering and joint seaming technique.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

1.09 WARRANTY

A. Provide manufacturer's standard warranty covering each wall covering product, adhesive and accessories specified in this section.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, “ I “ series, drawings.

2.02 WALL COVERINGS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Products: **Basis of Degin: Refer to I000 Finish Schedule.**

C. Wall Covering - Type VWC-1: 100% Vinyl on 100% Gypsum Cement Liner
   1. Comply with ASTM F793/F793M, Category V, Type II.
   2. Total Weight: 20 oz. per linear yard
   3. Roll Width: As indicated on drawings. Contractor to field very all dimensions prior to placing order.
   4. Backing: Non-Woven
   5. Color: Refer to Finish Schedule.
   6. Pattern: Refer to Finish Schedule.
   7. Surface Texture: Smooth.
   8. Overcoating: Surcoat; Stain and abrasion-resistant topcoat

9. Manufacturers:
    a. Basis of Design: Level Wallcovering; Eclipse: www.findyourlevel.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.
10. Adhesive: Type recommended by wall covering manufacturer to suit application to subtrate.
11. Termination Trim: Extruded aluminum, as required per field conditions.
12. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
13. Substrate Primer and Sealer: As recommended by wall covering manufacturer.

D. Digitally Printed Vinyl Letter Signage: Custom printed self-adhesive wall covering.(Type VLS-1 and VLS-3).
1. Comply with ASTM F793/F793M.
2. Material:
    a. Type ll vinyl with protective overlam included, coated on one side with removable and repositionable acrylic pressure sensitive adhesive.
3. Total Thickness: 4 mil.
4. Backing: Paper liner with pressure sensitive adhesive.
5. Color and Pattern: As indicated on drawings.
6. Pattern: As indicated on drawings.
7. Surface Texture: Smooth.
8. Overcoating: Manufacturer's standard protective over-laminate.
9. Manufacturers: **(Basis of Design)** As indicated on Interior Finish Schedule on Interiors, " I " series drawings.
    a. Takeform; Amplify: www.takeform.net/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

E. Type AWC-1 through AWC-3, Acoustic Wall Covering: 100% Needle Punched Polyester Fiber (PET) rolls with no less than 91% recycled material.
1. Thickness: As indicated on drawings.
2. Weight: As indicated on drawings.
3. Roll Width: 51 inch.
4. Roll Length: 36 feet.
5. Fire Rating: Class A Per ASTM E84
6. Antimicrobial: Per ASTM G21-15
7. Color Fastness: As indicated on drawings.
8. Color: As indicated on drawings.
9. Pattern: As indicated on drawings.
10. Repeat: Non-woven. No pattern repeat. Product has directional grain. Install per manufacturer's recommended direction.
11. Manufacturers: **(Basis of Design)** As indicated on Finish Schedule on Interiors, " I " series drawings.
    a. Autex Acoustics; Vertiface: www.autexacoustics.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

F. Type WF-1 and WF-2, Polyester Film:
1. Manufacturers:
    a. **(Basis of Design)** 3M; Fasara Glass finishes as indicated on finish schedule.
    b. Substitutions: See Section 016000 - Product Requirements.
2. Fire Resistance: Class A, in compliance with testing per ASTM E84.
    a. Flame Spread: 0 (zero).
    b. Smoke Developed: 10 (ten).
3. Film Thickness: 2.0 mil.

4. Roll Width: As indicated on drawings.
5. Pattern, Style and Color: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler to achieve a Level 5 surface; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.

E. Wall surfaces to be finished to Level 5, unless otherwise approved in writing by wall covering manufacturer.

F. Marks: Seal with shellac those that may bleed through surface finishes.

G. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

H. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply adhesive to wall surface immediately prior to application of wall covering.

C. Use wall covering in roll number sequence.

D. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

E. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

F. Butt edges tightly.

G. Overlap adjacent panels as recommended by manufacturer.

H. Horizontal seams are not acceptable.

I. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

J. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface, unless otherwise recommended by manufacturer.

K. Do not install wall covering more than 1/4 inch below top of resilient base.

L. Cover spaces above and below windows, above doors, in pattern sequence from roll.

M. Apply wall covering to electrical wall plates prior to replacing.

N. Wall covering is required behind fin tube cabinets and convector covers.

O. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.

P. Install termination trim.

Q. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

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SECTION 097220
VINYL WINDOW FILM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Window film.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM F793/F793M - Standard Classification of Wall Coverings and Ceiling Coverings by Use Characteristics; 2025.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures.

B. Product Data: Provide data on window film.

C. Shop Drawings: Provide an elevation of each installation, showing colors and dimensions.

D. Samples: Submit two samples of each color to be used in film, 8" x 8" in size illustrating color, finish, and texture.

E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum 5 years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

PART 2 PRODUCTS

2.01 WINDOW FILMS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 20/85, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Window Film: Vinyl Film.
   1. Total Thickness: 4 mil.
   2. Roll Width: 60 inch.
   3. Color: White.
   4. Pattern: As indicated on finish schedule.
   5. Surface Texture: Smooth.
   6. Products:
      a. Basis of Design: 3M Fasara Glass Finishes, Gradation: www.3m.com/#sle.
      b. Basis of Design: 3M Fasara Glass Finishes, Center Gradation: www.3m.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

C. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work, and comply with requirements of window film manufacturer.

B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

B. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall liner in accordance with manufacturer's instructions.

B. Use wall covering in roll number sequence.

C. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

D. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

E. Butt edges as recommended by manufacturer.

F. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

G. Cover spaces above and below windows, above doors, in pattern sequence from roll.

H. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

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SECTION 097800
INTERIOR WALL PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Decorative plastic wall paneling.

B. Laminated interior wall paneling.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2026.

B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.

C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.

D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.

E. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2025.

F. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

G. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

I. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 2019.

J. ISO 2812-1 - Paints and Varnishes -- Determination of Resistance to Liquids -- Part 1: Immersion in Liquids Other than Water; 2017.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit manufacturer's descriptive literature for each specified product. Include anchorage devices specific to project substrate types.

C. Shop Drawings: Submit elevations for each application and location. Indicate details of joints and attachments.
   1. Scale of Drawing Elevations: 1/4 inch to 1 foot, minimum.
   2. Scale of Drawing Details: 1-1/2 inches to 1 foot, minimum.

D. Samples: Submit two samples 12 by 12 inches in size, indicating finish, surface design, and color for each type of panel and trim.

E. Samples: Submit two 12-inch long frames; finish as specified.

F. Certificates: Certify that products of this section meet or exceed specified requirements.

G. Manufacturer's Instructions: Provide manufacturer's installation instructions.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Maintenance Data: Include recommended instructions, methods, and materials for cleaning FRP panels.

K. Specimen Warranty: Manufacturer warranty.

1.05 QUALITY ASSURANCE

A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with ASTM E84.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.

C. Installer Qualifications: Company specializing in installing work of the type specified in this section, and with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site, on strong pallets, in manufacturer's original packaging, marked with manufacturer's product identification.

B. Store panels and trim flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

1.07 FIELD CONDITIONS

A. Building shall be fully enclosed prior to installation with heat and ventilation consistent with good working conditions for finish work.

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.

C. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer's standard 1 year warranty against defects in material and workmanship.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, “ I “ series, drawings.

2.02 MANUFACTURERS

A. Decorative Plastic Wall Paneling: Refer to Interior Finish Schedule, Sheet I000 for Basis of Design.
   1. Marlite, Inc.: www.marlite.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Laminated Interior Wall Paneling:
   1. Panel Specialists, Inc.; Series 310 High Pressure Laminate: www.panelspec.com/#sle.

2. Panel Specialists, Inc.; Series 410 Magnetic Marker Board and Tack Board Surface: www.panelspec.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.03 REGULATORY REQUIREMENTS

A. Surface Burning Classification: Provide wall paneling assemblies meeting Class C when tested in accordance with ASTM E84.

2.04 DECORATIVE PLASTIC WALL PANELING

A. Type FRP-1 and FRP-2 Decorative Plastic Wall Paneling:
   1. Dimensions:
      a. Panel Size: As indicated on drawings.
      b. Panel Thickness: 0.090 inch.
   2. Tolerances:
      a. Length and Width: +/- 1/8 inch.
      b. Square: Not to exceed 1/8 inch for 4 foot and 8 foot panels or 5/32" for 10 foot panels.
   3. Surface Texture: Smooth.
   4. Material: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
      a. Resistant to rot, corrosion, denting, peeling, and splintering.
      b. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84.
      c. Flexural Strength: 0.9×10^4 psi per ASTM D790.
      d. Tensile Strength: 11.5×10^3 psi per ASTM D638.
      e. Hardness (scratch resistance): 28 per ASTM D2583.
      f. Impact Strength: Greater than 6 ft lbf/in, when tested in accordance with ASTM D256.
      g. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      h. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
      i. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.
      j. Water Absorption: 0.15 percent, maximum, when tested in accordance with ASTM D570.
      k. Panel Color and Groove Color:
         1) As indicated on drawings.
      l. Finish Gloss Level: Matte.
      m. Tile Pattern, Groove Direction and Tile Size: As indicated on drawings.
   5. Edges: Square.

B. Accessories:
   1. Trim:
      a. Material: As indicated on drawings.
      b. Color/Finish: Clear anodized.
      c. Inside Corner Trim: Standard angle.
      d. Outside Corner Trim: Standard angle.
      e. Edge Trim: Manufacturer's standard shape.
   2. Adhesive: Type recommended by panel manufacturer.
   3. Sealant: Type recommended by paneling manufacturer; clear.

2.05 LAMINATED INTERIOR WALL PANELING

A. Type WPS-1 through WPS-5 Laminated Wall Panels:
   1. Applications: As indicated on drawings.
   2. Panel Size: As indicated on drawings.

3. Thickness: As indicated on drawings.
4. Edges: Square.

B. Materials:
1. Substrate/Core: Fire rated particleboard.. Class A, when tested in accordance with ASTM E84.
2. Facing: High pressure laminate.
a. Color: As indicated on drawings.

C. Fabrication: Shop fabricate to greatest extent possible.

D. Accessories:
1. Trim:
a. Material: Extruded anodized aluminum.
b. Color/Finish: Clear anodized.
c. Profile: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate surfaces for adhered items are clean and smooth.
1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer.
2. Comply with adhesive manufacturer's recommendations for remedial measures at locations and application conditions where adhesion test results are unsatisfactory.

C. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill holes in panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to back side of panel using trowel recommended by adhesive manufacturer.

D. Apply panels to wall with vertical joints plumb and horizontal joints level and pattern aligned with adjoining panels.

E. Using a roller, apply pressure to panel face to ensure proper adhesion between surfaces.

F. Install panels with manufacturer's recommended gaps for panel field and corner joints.

G. Fill channels in trim with sealant before mounting to panel.

H. Install trim with adhesive.

I. Seal joints at wall base and between panels with approved sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

3.03 ADJUSTING

A. Replace paneling installed out of plumb and/or not aligned with adjacent panels or construction.

3.04 CLEANING

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements.

B. Clean panel faces using cleaning agents and methods recommended by manufacturer to remove soiling.

3.05 CLOSEOUT ACTIVITIES

A. See Section 017700 - Closeout Procedures, for closeout submittals.

3.06 PROTECTION

A. Protect installed interior wall paneling from subsequent construction operations.

END OF SECTION

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SECTION 098430
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound-absorbing panels.

B. Sound-absorbing ceiling baffles.

C. Mounting accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 095100 - ACOUSTICAL CEILINGS: Ceiling suspension system.

C. Section 099000 - PAINTING AND COATING.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.

D. Verification Samples: Fabricated samples of each type of panel specified; 6 by 6 inch, showing construction, edge details, and fabric covering.

E. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

F. Manufacturer's qualification statement.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Panels: Quantity equal to 5 percent of total installed, but not less than three of each type.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least five years of documented experience.

B. Installer Qualifications: Company specializing in installing products of the type specified in this section, with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, " I " series, drawings.

2.02 FABRIC-COVERED SOUND-ABSORBING UNITS

A. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule.
   1. Acoufelt: www.acoufelt.com/#sle
   2. Autex Acoustics: www.autexglobal.com/#sle.
   3. Kinetics Noise Control, Inc: www.kineticsnoise.com/#sle.
   4. Soundply: www.soundply.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

B. General:
   1. Prefinished, factory assembled fabric-covered panels.
   2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Fabric-Covered Acoustical Panels for Walls: (Type AWP-1 through AWP-6 and AWP-17)
   1. Manufacturers:
      a. Autex Acoustics; Cube base with Vertiface: www.autexglobal.com/#sle.
      b. Substitutions: See Section016000-Product Requirements.
   2. Panel Core: Manufacturer's standard 100% polyester fiber core.
      a. Facing: Manufacturrs 100 percent PET acoustic wallcovering.
   3. Fire Rating: Class A , in compliance with ASTM E84.
   4. Sound Absorption: Noise Reduction Coefficient (NRC) of 0.70 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
   5. Panel Size: As indicated on finish schedule.
   6. Panel Thickness: 1 inch.
   7. Corners: Square.
   8. Fabric: Woven polyester.
   9. Color: As indicated.
   10. Mounting Method: Direct applied with adhesive.

D. Fabric-Covered Acoustical Panels for Walls (Type AWP-12 and AWP-14 through AWP-16)
   1. Manufacturers:
      a. Kinetics, Hardside Acoustical Panels: www.kineticsnoise.com/#sle.
      b. Substitutions: See Section016000-Product Requirements.
   2. Panel Core: Manufacturer's standard rigid fiberglass core.
   3. Fire Rating: Class A , in compliance with ASTM E84.
   4. Sound Absorption: Noise Reduction Coefficient (NRC) of [1.00] when tested in accordance with ASTM C423 for Type B and D mounting, perASTM E795.
   5. Panel Size: As indicated in drawings.
   6. Panel Thickness: 2 inches
   7. Corners: Square

8. Edges: Beveled.
9. Fabric: As indicated in finish schedule.
10. Color: As indicated in finish schedules.
11. Type B Mounting: Use fixing clips ("Z" clips) to attach to metal hat channels anchored to wall substrate.
12. Type D Mounting: Use fixing clips ("Z" clips) and 16 guage hanging wire to anchor to panel and wall subsrate in music spaces as indicated.

2.03 POLYESTER (PET) FELT SOUND-ABSORBING UNITS

A. Manufacturers: Provide Basis-of-Design Product as listed on Interior Finish Schedule.
   1. Autex: www.autexglobal.com/#sle
   2. Acoufelt: www.acoufelt.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

B. General:
   1. Prefinished, factory assembled panels.
   2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Acoustical Panels for Walls: (Type: AWP-7)
   1. Acoustic Panels for Walls:
   2. Sound Absorption: Noise Reduction Coefficient (NRC) of [.45] when tested in accordance with ASTM C423 for Type A mounting, perASTM E795.
   3. Product: Basis of Design as indicated on finish schedule
      a. Autex; Digital Print on Cube Base: www.autexglobal.com/#sle.
      b. Substitutions: See Section016000-Product Requirements.
   4. Panel Size: As indicated on drawings.
   5. Panel Thickness: 1"
   6. Color: Custom digital print; as indicated on drawings.
   7. Mounting Method: Direct applied with adhesive.

D. Acoustical Panels for Walls: (Type: AWP-8, AWP-9, AWP-13)
   1. Acoustic Panels for Walls:Sound Absorption: Noise Reduction Coefficient (NRC) of .45 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
   2. Product: Basis of Design as indicated on finish schedule
      a. Acoufelt; Spine/Cleave: www.acoufelt.com/#sle.
      b. Substitutions: See Section016000-Product Requirements.
   3. Panel Size: As indicated on Drawings.
   4. Panel Thickness: 12mm
   5. Corners: Square.
   6. Color: As indicated.
   7. Mounting Method: Use fixing clips ("Z" clips) to attach to wall substrate, as recommended by manufacturer.

E. Acoustical Panels for Walls: (Type: AWP-11)
   1. Acoustic Panels for Walls:Sound Absorption: Noise Reduction Coefficient (NRC) of .54 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
   2. Product: Basis of Design as indicated on finish schedule
      a. Acoufelt; Beveled: www.acoufelt.com/#sle.
      b. Substitutions: See Section016000-Product Requirements.
   3. Panel Size: As indicated on Drawings.
   4. Panel Thickness: 12mm
   5. Corners: Square.
   6. Edges: Beveled.

7. Color: As indicated.
8. Mounting Method: Use fixing clips ("Z" clips) to attach to wall substrate, as recommended by manufacturer.

F. Acoustical Ceiling Clouds: (Type: ACS-3 and ACS-4)
1. Sound Absorption: Noise Reduction Coefficient (NRC) of [0.80]to[0.85] when tested in accordance with ASTM C423 for Type B mounting, perASTM E795.
2. Product: Basis of Design as indicated on finish schedule
   a. Acoufelt; Rooftop Gable: www.acoufelt.com/#sle.
   b. Acoufelt; Rooftop Butterfly: www.acoufelt.com/#sle.
   c. Substitutions: See Section016000-Product Requirements.
3. Cloud Size: As indicated on Drawings.
4. Thickness: 1/2 inch
5. Color: As indicated
6. Mounting: Vertically suspended from structure [as indicated on finish schedule].

G. Acoustical Ceiling Baffles: (Type: ACS-5 through ACS-7)
1. Acoustic Baffles for Ceilings:Sound Absorption: Noise Reduction Coefficient (NRC) of 1.0 to 1.65 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
2. Product: Basis of Design as indicated on finish schedule
   a. Acoufelt; Custom Trapezoid Shape: www.acoufelt.com/#sle.
   b. Substitutions: See Section016000-Product Requirements.
3. Baffle Size: As indicated on Drawings.
4. Baffle Thickness: 8 inch.
5. Corners: Square.
6. Color: As indicated.
7. Mounting: Vertically suspended from structure as indicated on finish schedule

H. Acoustical Ceiling Baffles: (Type: ACS-8 through ACS-12)
1. Acoustic Baffles for Ceilings:Sound Absorption: Noise Reduction Coefficient (NRC) of 1.0 to 1.65 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
2. Product: Basis of Design as indicated on finish schedule
   a. Acoufelt; Truss Ceiling Baffle: www.acoufelt.com/#sle.
   b. Acoufelt; Truss LED Ceiling Baffle: www.acoufelt.com/#sle.
   c. Substitutions: See Section016000-Product Requirements.
3. Baffle Size: As indicated on Drawings.
4. Baffle Thickness: 3 inch.
5. Corners: Square.
6. Color: As indicated.
7. Mounting: Vertically suspended from structure as indicated on finish schedule

I. Acoustical Ceiling Baffles: (Type: ACS-14 through ACS-16)
1. Acoustic Baffles for Ceilings:Sound Absorption: Noise Reduction Coefficient (NRC) of 1.0 to 1.65 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
2. Product: Basis of Design as indicated on finish schedule
   a. Acoufelt; Wing Ceiling Baffle: www.acoufelt.com/#sle.
   b. Substitutions: See Section016000-Product Requirements.
3. Baffle Size: As indicated on Drawings.
4. Baffle Thickness: 12 mm.
5. Corners: Square.

6. Color: As indicated.
7. Mounting: Vertically suspended from structure as indicated on finish schedule

2.04 WOOD VENEER SOUND-ABSORBING UNITS

A. Manufacturers:
   1. Soundply, Latus ; https://soundply.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Wood Veneer Acoustical Panels for Walls: Fiberglass reinforced polymer applied to an MDF skin. Class A mineral wool core panels with prime grade, finished face veneer and nonwoven acoustical fabric adhered to back of panel.
   1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   2. Sound Absorption: Noise Reduction Coefficient (NRC) of 0.95 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
   3. Panel Size: As indiated in drawings.
   4. Panel Thickness: 2 inch.
   5. Surface Veneer Species: As indicated in finish schedule..
      a. Grain Direction: Vertical.
      b. Factory Finish: As scheduled.
   6. Perforated Panel:
      a. Hole Diameter: 0.02 inch, nominal.
      b. Spacing: manufacturer's standard
   7. Mounting: Use fixing clips ("Z" clips) to attach to metal hat channels anchored to wall substrate.
      a. Edge Profile: Reveal.

2.05 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
   1. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
   2. For panels suspended from ceiling, provide fabric covering both sides, with seams only at panel edges.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

C. Factory-applied finishes on wood veneer panels to be uniform, smooth, and without blemishes.

2.06 ACCESSORIES

A. Spline-Mounting Accessories: Manufacturer's standard concealed connecting splines of extruded aluminum designed for screw attachment to walls, with coordinating moldings and trim for interior and exterior corners and miscellaneous conditions.
   1. Color of Exposed Trim: As selected from manufacturer's standards.

B. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.

C. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each acoustical unit, sized appropriately for weight of acoustical unit.
   1. Through-threaded eyelets bolted through concealed perimeter frame.

D. Tensioned Cable System: Manufacturer's standard accessories for mounting conditions and spans indicated.

E. Standoff Mounting System: Manufacturer's standard accessories for mounting conditions and spans indicated.

F. Trim Moldings: Manufacturer's standard metal trim moldings for concealing panel joints; color as selected from manufacturer's standards.

G. Fixing Clips: Manufacturers standard for application as indicated.

H. Furring Strips: Metal hat channel.

I. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Install mounting accessories and supports in accordance with shop drawings.

C. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

D. Furring Mounted Wood Veneer Panels:
   1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inch on center, maximum.
   2. Install acoustic back-up material between furring as required for application.
   3. Adhere first panel from edge to furring strip, and attach subsequent panels using fixing clips.

E. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints.

3.03 CLEANING

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 099000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Masonry: Concrete masonry units or concrete brick.
         2) Metal: Aluminum, galvanized.
         3) Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, and other ferrous metal.
      b. Interior:
         1) Concrete, Walls and Ceilings: Cast-in-place concrete, precast concrete, unglazed brick, fiber cement board, tilt-up, and plaster.
         2) Concrete Masonry Units: smooth .
         3) Metal: Galvanized and Primed steel.
         4) Metal, Galvanized: Ceilings and ductwork.
         5) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and other ferrous metal.
         6) Wood: Walls, ceilings, doors, and trim.
         7) Drywall: Walls, ceilings, gypsum board, and similar items.
         8) Concrete: Floors, non-vehicular.
         9) Gymnasium Ceilings

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055000 - METAL FABRICATIONS: Shop-primed items.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

D. SSPC-SP 2 - Hand Tool Cleaning; 2024.

E. SSPC-SP 3 - Power Tool Cleaning; 2024.

F. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

G. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Product characteristics.
2. Surface preparation instructions and recommendations.
3. Primer requirements and finish specification.
4. Storage and handling requirements and recommendations.
5. Application methods.
6. Clean-up information.

C. Samples: Submit three paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Division 01 for additional provisions.
2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
3. Label each container with color in addition to manufacturer's label.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

D. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

1.07 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: **Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.**

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, “ I “ series, drawings.

C. Comparable Products: Products of approved manufacturers will be considered in accordance with 016000 - Product Requirements, and the following:
1. Manufacturer approves products in writing for application specified.
2. Products that meet or exceed performance and physical characteristics of basis of design products.

3. Other Acceptable Manufacturers:
    a. Benjamin Moore & Co..
    b. PPG Paints.
    c. Behr Process Corporation.

2.02 PAINTINGS AND COATINGS

A. General:
1. Provide factory-mixed coatings unless otherwise indicated.
2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
    a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
    b. Architectural coatings VOC limits of State in which the project is located.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site, or other method acceptable to authorities having jurisdiction.

C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 PAINT SYSTEMS - EXTERIOR

A. Masonry: Concrete masonry units (CMU), cinder or concrete block.
1. Latex Systems:
    a. Semi-Gloss Finish:
        1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
            (a) 75 to 125 sq ft/gal.
        2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 series: www.sherwin-williams.com/#sle.
            (a) 6 to 12 mils wet, 2 to 4 mils dry per coat.

B. Metal: Aluminum, galvanized.
1. Latex Systems:
    a. Gloss Finish:
        1) 1st and 2nd Coats: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
            (a) 2 to 4 mils dry per coat.

C. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
1. Latex Systems:
    a. Gloss Finish:
        1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 to 10 mils wet, 1.8 to 3.6 mils dry per coat.
        2) 2nd and 3rd Coats: Sherwin-Williams Pro Industrial Acrylic Gloss, B66-600 Series: www.sherwin-williams.com/#sle.
            (a) 2 to 4 mils dry per coat.

2.04 PAINT SYSTEMS - INTERIOR

A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
   1. Latex Systems:
      a. Semi-Gloss Finish High Performance (HP):
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1950 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.6 mils dry per coat.

B. Gymnasium Ceilings: Including concrete, structural steel, galvanized metal ductwork.
   1. Dryfall Waterborne Topcoats:
      a. Eg-Shel finish
         1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-82 Series:www.sherwin-williams.com/#sle.
            (a) 6 mils wet, 1.9 mils dry per coat.

C. Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
   1. Latex Systems:
      a. Eg-Shel/Satin Finish High Performance (HP):
         1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
            (a) 75 to 125 sq ft/gal.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Eg-Shel, B20-1950 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.7 mils dry per coat.

D. Metal: Galvanized.
   1. Latex Systems:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.
            (a) 2 to 4 mils dry per coat.

E. Metal, Galvanized: Ceilings and ductwork.
   1. Multi-Surface Acrylic Coating System:
      a. Gloss Finish High Performance:
         1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Multi-Surface Acrylic, B66-1500 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.

F. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
   1. Latex Systems:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Acrylic Semi-Gloss, B66-650 Series: www.sherwin-williams.com/#sle.

(a) 2 to 4 mils dry per coat.

G. Wood: doors, and trim.
1. Latex Systems:
a. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.8 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Semi-Gloss, B31 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.3 mils dry per coat.

H. Drywall and Plaster: Walls, ceilings, gypsum board, and similar items.
1. Latex Systems:
a. Eg-Shel Finish High Performance (HP):
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 HP Zero VOC Eg-Shel, B20-1950 Series: www.sherwin-williams.com/#sle.
b. Flat Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.6 mils dry per coat.
2. Epoxy Systems, Water-Based:
a. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
b. Eg-Shel/Low Luster Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.5 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Catalyzed Epoxy, B73-360 Series: www.sherwin-williams.com/#sle.
(a) 5 mils wet, 2 mils dry per coat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.

D. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk.
   2. Fill bug holes, air pockets, and other voids with cement patching compound.
   3. Prepare concrete according to SSPC-SP 13.

E. Masonry: Remove efflorescence and chalk.

F. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.

G. Plaster: Fill hairline cracks, small holes, and imperfections with patching plaster. Make smooth and flush with adjacent surfaces. Treat textured, soft, porous, or powdery surfaces in accordance with manufacturer's instructions.

H. Concrete Floors and Traffic Surfaces: Prepare concrete according to SSPC-SP 13.

I. Aluminum: Remove surface contamination and oil; wash with solvent according to SSPC-SP 1.

J. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
   2. Prepare surface according to SSPC-SP 2.

K. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.

L. Wood: Remove dust, grit, and foreign matter. Scrape, sand, and spot prime knots and pitch streaks. Fill nail holes and imperfections with wood filler and sand smooth.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items factory primed or factory finished items if acceptable to top coat manufacturers.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 099000

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SECTION 101100
VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Porcelain enamel steel markerboards.

B. Tackboards.

C. Tackstrips.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking and supports.

C. Section 092116 - GYPSUM BOARD ASSEMBLIES: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

C. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2018.

D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

F. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide manufacturer's data on porcelain enamel steel markerboard, tackboard surface covering, trim, and accessories.

C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.

D. Samples: Two, 2 by 2 inches in size illustrating materials and finish, color and texture of porcelain enamel steel markerboard, trim, and tackable surfaces.

E. Samples:
   1. Visual Display Panels: Not less than 8-1/2 by 11 inches (215 by 280 mm), with facing, core, and backing indirect from final work. Include one panel for each type, color, and texture required.
   2. Trim: 6 inch (150 mm) long sections of each trim profile specified.
   3. Display Rail: 6 inch (150 mm) long section of each type specified.
   4. Accessories: Fill-sized sample of each type of accessory specified.

F. Test Reports: Show compliance to specified surface burning characteristics requirements.

G. Manufacturer's printed installation instructions.

H. Maintenance Data: Include data on regular cleaning, stain removal .

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Entity that employs installers and supervisors who are trained and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum unit size, or it unit size is impracticable to ship in one pieve, provide two or more pieces with joines in locations indicated on approced Shop Drawings.

1.07 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, HVAC system is operating and maintatining ambient temperature and humidty conditions at occupancy levels during the remainder of the construction period.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer's Standard Limited Lifetime Warranty: On porcelain writing surface, for life of building, under normal usage and maintenance and when installed in accordance with manufacturer's instructions and recommendations. Warranty covers replacement of defective material but does not include cost of removal and reinstallation.

C. Submit manufacturer's standard written warranty against failure in material or workmanship.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 VISUAL DISPLAY UNITS

A. Porcelain Enamel Steel Markerboards:
   1. Manufacturers:
      a. **(Basis of Design)** ASI Visual Display Products; (Type WS-1) 9300 Series and (Type WS-2) 9100 Series: www.asi-visualdisplayproducts.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Type WS-1, Porcelain Enamel Markerboard:
      a. Color: White.
      b. Steel Face Sheet Thickness: 24 gauge, 0.0239 inch .
      c. Face Sheet Gloss: High.
      d. Core: Hardboard, manufacturer's standard thickness, laminated to face sheet.
      e. Backing: Aluminum foil, laminated to core.
      f. Size: As indicated on drawings.
      g. Frame: 1-1/2" wide Extruded aluminum , with concealed fasteners.
      h. Frame Finish: Anodized, natural.
      i. Accessories: Provide marker tray, map rail, and (1) flag holder per classroom.
   3. Type WS-2, Porcelain Enamel Markerboard:

a. Color: White with black staff lines.
b. Steel Face Sheet Thickness: 24 gauge, 0.0239 inch .
c. Face Sheet Gloss: Low.
d. Core: Hardboard, manufacturer's standard thickness, laminated to face sheet.
e. Backing: Aluminum foil, laminated to core.
f. Size: As indicated on drawings.
g. Frame: 9/32" wide Extruded aluminum , with concealed fasteners.
h. Frame Finish: Anodized, natural.
i. Accessories: Provide accessories as indicated on drawings.

B. Tackboards: Uni-color resilient homogeneous tackable linoleum laminated to cork.
1. Manufacturers:
a. **(Basis of Design)** ASI Visual Display Products; (Type TAC-1) Series 9300: www.asi-visualdisplayproducts.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.
2. Cork Thickness: 1/4 inch.
3. Fabric: Uni-color resilient homogeneous tackable linoleum.
4. Color: As selected from manufacturer's full range.
5. Backing: Hardboard, laminated to tack surface.
6. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
7. Pattern Match: Straight Match, Reverse Hung
8. Surface Gloss: Matte
9. Size: As indicated on drawings.
10. Frame: 9/32" wide Extruded aluminum , with concealed fasteners.
11. Frame Finish: Anodized, natural.
12. Adhesives: As determined by manufacturer.
13. Caulk: Coordinate with color of cork surface.

C. Tackstrips: Fine-grained, homogeneous natural cork.
1. Manufacturers: **Refer to I000 Finish Schedule for Basis of Design. Accessory of WS-1.**
a. Substitutions: See Section 016000 - Product Requirements.
2. Cork Thickness: 1/4 inch.
3. Height: 2 inches.
4. Length: As indicated on drawings.
5. Frame and End Stops: Extruded aluminum, with concealed fasteners.
6. Frame Profile: As indicated on drawings.
7. Frame Finish: Anodized, natural.

2.03 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.

B. Burlap: Tightly woven, flame retardant treated.

C. Hardboard for Cores: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides).

D. Fiber Board: ASTM C208, cellulosic fiber board.
1. Foil Backing: Aluminum foil sheet, 0.005 inch thick.

E. Adhesives: Type used by manufacturer.

2.04 ACCESSORIES

A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 2 inch wide , full width of frame.

B. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.

C. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board.

D. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, anodized aluminum finish.

E. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Complete finishing operations, including painting, before beginning installation of tacakable cork surface wallcovering materail.

B. Wall surface to recieve wallcovering materials shall be dry and free from dirt, grease, loose paint, and scale.

C. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

D. Notify the contractor and architect in writing of any conditions detrminetal to the proper and timely completion of the installation.

E. Verify flat wall surface for frameless adhesive-applied boards.

3.02 PREPARATION

A. Acclimatize tackable wall panels by removing from packaging in installation area not less than 24 hours before application.

B. Remove switchplates, wall plates, and surface-mounted fixtures where tackable wall paneling is applied. Reinstall items on completion of installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install visual display surfaces in location and at mounting heights indicated on Drawings. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, back materials, addhesives, brackets, anchors, trims, and accessories necessary for complete installation.

B. Field-Assumbled Visusal Dispaly Board Assemblies: Coordinate field-assembled units with grounds, trim, and accessories indicated. Joint parts with a neat, precision fit.

1. Make joints only where total length exceeds maximum manufacturer length. Fabricate with minimum number of joints, balanced around center of board, as inidcated on shop drawings.
2. Where size of visual display board assemblies or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structrual support accessories to suit conditions indicated.

C. Factory-Fabricated Visual Display Board Accessories: Attach manufacturer's standard concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches (400 mm) on center. Secure tops and bottoms of boards to walls.

D. Visual Display Board Assmebly Mounting Heights: Install Visual Display units as mounting heights indicated on drawings.

E. Install tackable cork surfaces in accordance with manufacturer's instructions.

F. Install with top of marker tray at 30 inches above finished floor.

G. Secure units level and plumb.

3.04 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.

B. Cover with protective cover, taped to frame.

C. Remove temporary protective cover at Date of Substantial Completion.

END OF SECTION

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SECTION 101419
DIMENSIONAL LETTER SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dimensional letter signage.

1.02 PRICE AND PAYMENT PROCEDURES

A. Allowances:
   1. See Section 012100 - DO NOT USE BSD Allowances for cash allowances affecting this section.
   2. Include cash allowance for purchase and delivery but not installation.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.

D. Samples: Submit one sample of each type of dimensional letter sign of size similar to that required for project, indicating sign style, font, and method of attachment.

E. Verification Samples: Submit samples showing colors and finishes specified.

F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

G. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package dimensional letter signs as required to prevent damage before installation.

B. Store under cover and elevated above grade.

C. Store tape adhesive at a normal room temperature of 68 to 72 degrees F.

1.07 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List and Singage Schedule indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Dimensional Letter Signs:
   1. **Basis of Design**: Takeform; Acrylic Dimensional Letter: www.takeform.net/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.03 REGULATORY REQUIREMENTS

A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.04 DIMENSIONAL LETTERS

A. Applications: As indicated on finish schedule.
   1. Use individual Acrylic letters.
   2. Mounting Location: Interior as indicated on drawings.

B. Acrylic Letters:
   1. Material: Acrylic plastic sheet, flat.
   2. Thickness: Manufacturer's standard for letter size.
   3. Letter Height: As indicated on drawings.
   4. Text and Typeface:
      a. Character Font: Helvetica, Arial, or other sans serif font.
      b. Character Case: Upper case only.
   5. Finish: Matte.
   6. Color: As indicated on finish schedule.
   7. Mounting: Concealed screws.

2.05 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel.

B. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate dimensional letter signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until substantial completion; repair or replace damaged items.

END OF SECTION

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SECTION 101423
PANEL SIGNAGE

PART 1 GENERAL

SUMMARY

1.01 SECTION INCLUDES:

A. Panel signs.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.04 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: For each type of product.

C. Shop Drawings: For panel signs.
   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

D. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
   1. Include representative Samples of available typestyles and graphic symbols.

E. Product Schedule: For panel signs. Use same designations indicated on Drawings or specified.

F. Qualification Data: For manufacturer.

G. Sample Warranty: For special warranty.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by signage manufacturer.

B. Source Limitations: Obtain all sign types through one source from a single manufacturer.

C. Regulatory Requirements:
   1. Interior/Exterior Accessible Signs: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.
      a. Accessible Toilet Rooms (Element): ADA, ICC/ANSI A117.1-1998, Comply with The Building Code of New York State, 1110.1.4, 1110.1.6, E107.1. Not resident room toilets.

1.07 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of finishes beyond normal weathering.

b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List and Singage Schedule indicated on the Interior " I " series drawings.

2.02 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.03 PANEL SIGNS

A. General: Provide panel signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
1. Produce smooth panel sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch measured diagonally.

B. **(Basis of Design)** Takeform; Vivid: www.takeform.net/#sle.
1. Substitutions: See Section 012500 - Substitution Procedures.

C. Signage Series - ADA Alternative.
1. Color – Burgundy unless otherwise noted.

D. Graphic Content and Style:
1. Provide sign copy that complies with requirements indicated for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.
2. Color – Bright White, unless otherwise noted.

E. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.
1. Panel Material: Non-glare acrylic, not less than 1/8-inch (3 mm). (1/4-inch for slot signs)
2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).

2.04 ACCESSORIES

A. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

2.05 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.06 PANEL SIGN TYPES

A. Refer to drawings for signange schedule, signgage locations and types.
   1. Text to be provided in both English and Spanish, as indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
   1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Install signs so they do not protrude or obstruct according to the accessibility standard.
   3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Accessible Signage: Install in locations on walls on latch side of door and according to the accessibility standard.

C. Mounting Methods:
   1. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.03 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION

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SECTION 102113.17
PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Phenolic toilet compartments.

B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking and supports.

C. Section 102800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. See Section , 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, door swings.

D. Samples: Submit two samples of partition panels, 6 inch by 6 inch inch in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.06 WARRANTY

A. Manufacturer's standard warranty against system delamination, breakage or corrosion for 25 years from date of receipt by Owner.
   1. System materials that are found to be defective during the warranty period, for the reasons stated above, shall be replaced by the Manufacturer at no additional cost to the Owner.
   2. All labor costs, related to the replacement of defective materials, shall be the responsibility of the Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Phenolic Toilet Compartments:

1. **(Basis of Design)** Partition Systems International of South Carolina; Phenolic Toilet Partitions: www.psisc.com/#sle.
2. Substitutions: Section 016000 - Product Requirements.

2.02 PHENOLIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor-mounted unbraced.
   1. Color: As selected by Architect from manufacturer's full range..

B. Doors:
   1. Thickness: 3/4 inch.
   2. Width: 24 inch.
   3. Width for Handicapped Use: 36 inch, out-swinging.
   4. Height: 58 inch.

C. Panels:
   1. Thickness: 1/2 inch.
   2. Height: 58 inch.

D. Pilasters:
   1. Thickness: 3/4 inch.
   2. Width: As required to fit space; minimum 3 inch.

E. Screens: Without doors; to match compartments; mounted to wall with two panel brackets.

2.03 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.
   1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow stainless steel, 1 inch by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.

C. Wall and Pilaster Brackets: Polished stainless steel; manufacturer's standard type for conditions indicated on drawings.

D. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.

E. Hardware: Polished stainless steel:
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Door Latch: Slide type with exterior emergency access feature.
   3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   4. Coat hook with rubber bumper; one per compartment, mounted on door.
   5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/8 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION 102113.17

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SECTION 102123
CUBICLE CURTAINS AND TRACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface mounted overhead curtain track and guides.

B. Cubicle curtains.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 055000 - METAL FABRICATIONS: Track supports above ceiling.

C. Section 061000 - ROUGH CARPENTRY: Blocking and supports for track.

D. Section 095100 - ACOUSTICAL CEILINGS: Suspended ceiling system to support track.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 SUBMITTALS

A. See Section See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data for curtain fabric characteristics and track components.

C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.

D. Samples: Submit two fabric samples, 6 by 6 inch in size illustrating fabric color.

E. Samples: Submit 12 inch sample length of curtain track including typical splice, wall and ceiling hanger, and escutcheon.

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention .

G. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Curtains: One of each type and size.
   3. Extra Carriers: Ten.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept curtain materials on site and inspect for damage.

B. Store curtain materials on site and deliver to Owner for installation when requested.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.

1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, " I " series, drawings.

2.02 MANUFACTURERS

A. Cubicle Track and Curtains:
1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
2. **(Basis of Design)** Inpro; Clickeze: www.inprocorp.com/#sle.
3. Substitutions: See Section 016000 - Product Requirements.

2.03 TRACKS AND TRACK COMPONENTS

A. Tracks: Extruded aluminum sections; one piece per track run.
1. Profile: Channel.
2. Mounting: Surface.
3. Structural Performance: Capable of supporting vertical test load of 50 lbs without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
4. Track End Stop: To fit track section.
5. Track Bends: Minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers.
6. Finish on Exposed Surfaces: White enamel.
7. Products:
   a. Inpro Architectural Products; Optitrac Cubicle Track: www.inprocorp.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

B. Curtain Carriers: Nylon rollers, size and type compatible with track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.
1. Provide 2.2 plus 1 carriers per foot of track length

C. Wand: Aluminum 42 inches long, attached to lead carrier, for pull-to-close action.

D. Installation Accessories: Types required for specified mounting method and substrate conditions.

2.04 CURTAINS

A. Cubicle Curtains:
1. Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
2. Inherently flame resistant or flameproofed; capable of passing NFPA 701 test.
3. Material: Close weave polyester; anti-bacterial, anti-microbial, liquid and stain repellant, no PFAS, self deodorizing, sanitized, and preshrunk.
4. Color/Pattern: As indicated on finish schedule.
5. Open Mesh Cloth: Open weave to permit air circulation; flameproof material.
   a. Color: As indicated on finish schedule.
6. Attachment of Curtain Fabric to Open Mesh Cloth: Manufacturer's standard sewn seam
7. Products:
   a. Inpro Architectural Products; Clickeze curtain with Shield by Panaz fabric: www.inprocorp.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

B. Curtain Fabrication:

1. Width of curtain to be 10 percent wider than track length.
2. Height of curtain to end 12 inches above finished floor.
3. Railroad fabric without vertical seams.
4. Pattern match fabric with vertical seams.
5. Include open mesh cloth at top 20 inches of curtain for room air circulation, attached to curtain as specified above.
6. Curtain Heading: Fabric band matching curtain panel with metal grommet holes for carriers spaced 6 inches on center.
7. Seams and Hems: Manufacturer's standard fabrication method for securely sewn and finished seams and hems.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work of this Section.

B. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Install curtain track to be secure, rigid, and true to ceiling line.

B. See Section 055000 for track supports above ceiling.

C. Secure track to ceiling system.

D. Install end cap and stop device.

E. Install curtains on carriers ensuring smooth operation.

END OF SECTION

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SECTION 102600
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards.

B. Protective wall covering.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking for wall and corner guard anchors.

C. Section 092116 - GYPSUM BOARD ASSEMBLIES: Placement of supports in stud wall construction.

D. Section 092216 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

E. Section 097200 - Wall Coverings: Terminating wall covering at wall and door protection.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2026.

C. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.

F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 013300 Submittal Procedures, for submittal procedures.

B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.

C. Shop Drawings: Include plans, elevation, sections, and attachment details.

D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
   1. Submit one sections of corner guards, 6 inches long.
   2. Submit two samples of protective wall covering, 6 by 6 inches square.

E. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.

F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Stock Materials: One package(s) of minimum 24 inches long unit of each kind of covers for corner guards.
3. Extra Stock Materials: 50 square feet of each kind of protective wall covering.

H. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

B. Protect work from moisture damage.

C. Protect work from UV light damage.

D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.

E. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.06 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective work within a [5-year] period after Date of Substantial Completion.

C. Manufacturer's Warranty: Include coverage for degradation of color finish. Complete form in Owner's name and register with manufacturer.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least [five] years of documented experience.

B. Manufacturer approved installer.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, “ I “ series, drawings.

2.02 MANUFACTURERS

A. Corner Guards : Refer to Interior Finish Schedule, Sheet I000 for Basis of Design.
1. Inpro; High Impact Corner Guard: www.inprocorp.com/#sle.
2. Substitutions: See Section 012519 - Equivalent Procedures.

B. Protective Wall Covering:Refer to Interior Finish Schedule, Sheet I000 for Basis of Design.
1. Construction Specialties, Inc; Acrovyn Wall Panels: www.c-sgroup.com/#sle.
2. Inpro; Palladium: www.inprocorp.com/#sle.
3. Wolf Gordon, Rampart; www.wolfgordon.com/#sle.
4. Substitutions: See Section 016000 - Product Requirements.

2.03 PERFORMANCE CRITERIA

A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.

B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.

C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.04 PRODUCTS

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Interior Finish Schedule indicated on the Interiors, " I " series, drawings.

C. Corner Guards - Surface Mounted (CG-1 and CG-2):
   1. Material: High impact vinyl with full height extruded aluminum retainer.
   2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
   3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   4. Width of Wings: 2 inch.
   5. Corner: Square.
   6. Color: As indicated on finish schedule.
   7. Length: One piece.
   8. Product:
      a. Inpro; High Impact Corner Guard: www.inprocorp.com/#sle.

D. Protective Wall Covering (WP-1):
   1. Material: Olefin composite.
   2. Thickness: As indicated on drawings.
   3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   4. Color: As indicated on drawings.
   5. Backing: Dense Polyester/Cotton
   6. Pattern: As indicated on drawings.
   7. Accessories: Provide manufacturer's standard color-matched trim and moldings.
      a. Top Cap Trim.
   8. Mounting: Adhesive.
      a. Reverse hang, random match.
   9. Product:
      a. Wolf Gordon; Rampart: www.wolfgordon.com/#sle.

E. Rigid Sheet Wall Protection (WP-2, WP-3, and WP-5):
   1. Material: High-impact acrylic-modified vinyl.

2. Thickness: 1.6mm
3. Panel Size: As indicated on finish schedule.
4. Color and Pattern: As indicated on drawings.
5. Texture: As selected from manufacturer's standard textures.
6. Mounting: Adhesive. Caulk all seams to match.
7. Product:
    a. Construction Specialties, Inc; Acrovyn 4000 Series Wall Protection: www.c-sgroup.com/#sle.

F. Rigid Sheet Wall Protection (WP-4):
1. Material: High-impact, unplasticized polyvinyl chloride, rigid vinyl.
2. Thickness: 0.040 inches
3. Panel Size: As indicated on finish schedule.
4. Color and Pattern: As indicated on drawings.
5. Texture: As selected from manufacturer's standard textures.
6. Mounting: Adhesive. Caulk all seams to match.
7. Product:
    a. Inpro; Palladium Wall Protection: www.inprocorp.com/#sle.

G. Adhesives and Primers: As recommended by manufacturer.

H. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

I. See Section 061000 for wood blocking for wall and corner guard anchors.

2.05 FABRICATION

A. Fabricate components with tight joints, corners and seams.

B. Pre-drill holes for attachment.

C. Form end trim closure by capping and finishing smooth.

2.06 SOURCE QUALITY CONTROL

A. See Section 014000 - BSD Quality Requirements, for additional requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

C. Verify that substrate surfaces for adhered items are clean and smooth.
1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.

D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

B. Install wall protection at heights indicated on drawings.

C. Position corner guard 4 inches above finished floor to 48 inches high.

D. Position protective wall covering no less than 1 inch above finished floor to allow for floor level variation.

1. Wainscot Installation: Establish a level line at the specified height for entire length of run. Install by aligning top of edge of covering with this line.
2. Apply adhesive with 1/8 inch V-notch trowel to an area of wall surface that can be completed within cure time of the adhesive.
3. Use a roller to ensure maximum contact with adhesive.
4. At inside and outside corners cut covering sheets to facilitate installation of trim pieces or corner guards.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch.

B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.04 CLEANING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, for additional requirements.

B. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

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SECTION 102800
TOILET ACCESSORIES

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Public-use washroom accessories.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:
   1. Construction details and dimensions.
   2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Material and finish descriptions.
   4. Features that will be included for Project.
   5. Manufacturer's warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

D. Warranty: Sample of special warranty.

1.04 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.05 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.06 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MATERIALS

A. Stainless Steel: ASTM A666/A666M, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C1503, clear-glass mirrors, nominal 6.0 mm thick.

I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.03 PUBLIC-USE WASHROOM ACCESSORIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   1. A & J Washroom Accessories, Inc.
   2. American Specialties, Inc.
   3. **(Basis of Design)** Bobrick Washroom Equipment, Inc.: www.washroominc.com/#sle.
   4. Bradley Corporation.
   5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.

B. Toilet Paper Dispenser:
   1. Provided by Owner, installed by Contractor (OFCI).

C. Paper Towel Dispenser:
   1. Provided by Owner, installed by Contractor (OFCI).

D. Liquid-Soap Dispenser:
   1. Provided by Owner, installed by Contractor (OFCI).

E. Grab Bar:
   1. **(Basis of Design)** Bobrick Washroom Equipment, Inc., B-5806 Series: www.washroominc.com/#sle.
   2. Mounting: Flanges with concealed fasteners.
   3. Material: Stainless steel, 0.05 inch thick.
      a. Finish: Smooth, No. 4, satin finish.
   4. Outside Diameter: 1-1/4 inches.
   5. Configuration and Length: As indicated on Drawings.

F. Sanitary-Napkin Disposal Unit:
   1. Provided by Owner, installed by Contractor (OFCI).

G. Combination Sanitary Napkin/Tampon Dispenser:
   1. (**Basis of Design**) Bobrick No. B-47069C.
   2. Mounting: Surface Mounted.
   3. Material: Stainless steel.

H. Mirror Unit:
   1. (**Basis of Design**) Bobrick No. B-1658.
   2. Frame: Stainless-steel channel.
      a. Corners: Manufacturer's standard.

3. Hangers: Produce rigid, tamper and theft resistant installation, using methos indicated below.
   a. One-piece galvanized steel, wall-hanger device with spring-action locking mechanism to hold miorror unit in position with no exposed screws or bolts.
   b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
4. Glass: No. 1 quality, 1/4" (6mm) tempered select float glass: selected for silvering and electrolytically copper plated by the galvanic process.
5. Size: As indicated on drawings.

I. Coat Hook with Bumper:
1. (**Basis of Design)** Bobrick No. B-9541.
2. Mounting: Surface Mounted.
3. Material: Stainless Steel
   a. Satin Finish

J. Electric Hand Dryers:
1. (**Basis-of-Design**) Excel hand dryer model: Xlerator.
2. Mounting: Surface Mounted.
3. Material and Finish: To be selected by owner from manufacturer's full range of available materials colors.
4. Automatic Sensor Operated.
5. 208-277V Volt.
6. HEPA Filtration System.
7. ADA-Compliant.
8. Provide where indicated.

K. Surface-Mounted Horizontal Design (Baby) Changing Station:
1. (**Basis-of-Design**) Model KB310-SSWM with external stainless steel bag hook as manufactured by Koala Kare Products, a Division of Bobrick.
2. Handles: Station shall have two solid handles that allow operation with less than 5 lbs. of force. Handles rest below 27” for cane detection when unit is in the down position.
3. Front Panel shall be deep drawn, one-piece, seamless, 18-8, Type 304, 20 gauge (0.91mm) stainless steel with satin finish and laser etched logo with rounded corners.
4. Aesthetics: Unit shall have no plastic covering or visible plastic on the front of the unit and no adhesive labels applied to the front panel.
5. Flange: Deep drawn, one-piece seamless, 18-8, Type 304, 18 gauge (1.2 mm) stainless steel with satin finish. Flange edges and corners shall have radii that complements the arc on the top, bottom, and side edges of the front panel.
6. Frame and Hinge Mechanism: Concealed 11-gauge chassis, compromised of 1” diameter integral steel-tubing that supports the changing bed and interacts with 11-gauge steel wall mounting bracket to provide steel-on-steel hinge stop. The wall frame shall serve as wall-mounting bracket.
7. External Diaper Bag Hook: 18-8, Type 304, 3/4 inch (19mm) diameter, wall-mounted, solid stainless steel rod with satin-finish.
8. Skirt: Shall be constructed of Type 304, 20 gauge (0.91mm) stainless steel with satin finish. Skirt corners shall have radii that complements the arc on the top, bottom, and side edges of the front panel.
9. Bed Surface: injection molded polypropylene with Microban® antimicrobial additive, and ISO 22196 tested for efficacy.
10. Surface is contoured, concave and smooth. Bed surface shall be minimum 535 sq. in.

11. Performance: Unit has minimal deflection from 90 degrees with a 200 lbs. static load placed in the center of the changing surface. Unit exceeds ASTM Standard F2285 static load requirement of 100 lbs.
12. Complies with requirements applicable in the jurisdiction of the project, including but not limited to ADA, TAS, ICC A117.1, International Building Code (IBC), and state building code requirements as applicable. Also complies with ASTM Standard F2285, Standard Consumer Safety Performance Specification for Diaper Changing Stations for Commercial use and EN 12221 for changing units for domestic use.
13. Dual Cavity Dispenser: Includes integral spring tab to make dispensing bed liners and diaper disposal sacks easier. Total 50 liner capacity. Equipped with tumbler lock, keyed alike Bobrick restroom accessories.
14. Operation: Concealed pneumatic cylinder providing controlled opening and closing of the changing station bed.
15. Instruction Graphics: Universal instruction graphics and safety messages in multiple languages.
16. Safety Straps: Replaceable, restraining straps.

L. Surface-Mounted Adjustable Height (Adult) Changing Station:
1. (**Basis-of-Design**) Model KB3000-AHL as manufactured by Koala Kare Products, a Division of Bobrick.
2. Powered-Height Adjustability: Changing surface shall electronically adjust from 12” (300mm) to 41” (1,041mm) from floor.
3. Unit shall have two sets of built-in electronic controls for height adjustment. One located on face of wall cover and one on the front of changing surface.
4. Weight Capacity: Tested to support up to 500 lbs. (227 kg.) static load.
5. Changing Surface shall be polyethylene and meet IK10 standard for resistance to high impact and sharp objects.
6. Back-Up Battery: Unit shall have a built-in backup battery system that allows for continuous operation in the event of a power interruption.
7. Emergency Stop: Unit shall include a wall-mounted emergency stop to break power to actuator.
8. Changing Surface shall be a minimum 75 ¼” (1,911mm) long, and 31 ½” (800mm) wide, and can be opened and closed with one-hand.
9. Unit shall have a safety rail with a curved dip in the center for easier patient changing by caregiver. Safety rail rotates and locks under changing bed when in closed position.
10. Unit shall withstand significant exposure to water without damage to electrical components. It shall include a grounded power cord and have a splash-proof control system. Electrical components and wiring shall not come in contact with station users or caregivers.
11. Changing surface shall not have covered areas to help ensure cleanliness.
12. Unit shall have ISO 60601-1 and -2 whole product certification.
13. Durability: Cycle tested through range of motion 28,000 times at 500lbs. Stress tested to 100,000 cycles with 500lbs. bounce load test.
14. Frame shall be constructed of 2” powder coated steel tubing.

2.04 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F446.

3.02 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

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SECTION 104400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire protection cabinets.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - Unit Masonry: Installation requirements in masonry walls.

C. Section 061000 - ROUGH CARPENTRY: Wood blocking.

1.03 REFERENCE STANDARDS

A. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.

C. NAAMM AMP 500 - Metal Finishes Manual for Architectural and Metal Products; Current Edition.

D. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data; For fire protection cabinets: Provide door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed- or semi-recessed-mounting method and relationships of box and trim to surrounding construction.

C. Certificate: Certify products of this section meet or exceed specified requirements.

D. Shop Drawings; For fire protection cabinets: Include plans, elevations, sections, details, and attachments to other work.

E. Product Schedule; For fire protection cabinets: Indicate whether recessed, semirecessed or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function.

F. Manufacturer's Instructions: Indicate special criteria and wall opening coordination requirements.

G. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.05 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.06 SEQUENCING

A. Apply decals or vinyl lettering on field painted fire protection cabinets after painting is complete.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect prior to bidding.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Fire Protection Cabinets and Accessories:
   1. **(Basis of Design)** Activar Construction Products Group, Inc. - JL Industries; Ambassador Series: www.activarcpg.com/#sle.
   2. Larsen's Manufacturing Co: www.larsensmfg.com/#sle.
   3. Potter-Roemer: www.potterroemer.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Fire-Rated, Fire-Protection Cabinets: Listed and labeled to comply with requirements inASTM E814 for fire-resistance rating of walls where they are installed.

2.03 FIRE PROTECTION CABINETS

A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire-resistance rating of walls where cabinet installed.

B. Materials: Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.

C. Fire-Rated Cabinet Construction: {CH#480534}, complying with UL 1479.
   1. Formed primed cold-rolled steel sheet; 0.043 inch thick base metal; double wall with 5/8 inch thick fire barrier material.

D. Cabinet Configuration: Recessed type.
   1. Projected Trim: Returned to wall surface, with 3/8-inch projection, and 2-inch wide face.
   2. Provide cabinet enclosure with right-angle inside corners and seams and with formed perimeter trim and door stiles.

E. Door: 0.043 inch metal thickness, reinforced for flatness and rigidity with roller type catch. Hinge doors for 180 degree opening with continuous piano hinge, of same material and finish as trim. Provide recessed door pull and friction latch.

F. Door Glazing: Polycarbonate plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.

G. Cabinet Mounting Hardware: Appropriate to cabinet, with predrilled holes for placement of anchors.

H. Fabrication: Weld, fill, and grind components smooth.

I. General Finish Requirements: Comply with NAAMM AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

J. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected by Architect.

K. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Lettering complying with authorities having jurisdiction for letter style, size, spacing and location. Identify fire extinguisher in fire protection cabintet with the words "FIRE EXTINGUISHER".
   1. Location: Applied to cabinet door.
   2. Application Process: Pressure sensitive vinyl letters.
   3. Color: Red.
   4. Orientation: Vertical.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and interfaces with other work.

B. Verify substrate and site conditions for product installation are in accordance with manufacturer's written instructions.

C. Verify rough openings for cabinet are sized and located in accordance with manufacturer's written instructions.

D. Notify Architect in writing of conditions detrimental to completion of work. Do not proceed with installation until detrimental conditions are corrected.

E. Examine walls and partitions for suitable framing depth and blocking where recessed or semi-recessed cabinets will be installed.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare recesses for recessed and semi-recessed fire protection cabinets as required by type and size of cabinet and trim style.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings,15 inches minimum from finished floor to inside bottom of cabinet, at locations indicated on drawings.

C. Secure rigidly in place.
   1. See Section 061000 for in-wall blocking requirements.

D. Identification: Install decals at locations indicated.

3.04 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.05 MAINTENANCE

A. See Section 017700 - Closeout Procedures, for additional requirements relating to maintenance service.

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SECTION 105113
METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers.

B. Locker benches.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE: Concrete base construction.

C. Section 061000 - ROUGH CARPENTRY: Wood blocking and nailers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

C. ASTM F1267 - Standard Specification for Metal, Expanded, Steel; 2018 (Reapproved 2023).

D. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's published data on locker construction, sizes, and accessories.

C. Shop Drawings: Indicate locker plan layout and numbering plan.

D. Manufacturer's Installation Instructions: Indicate component installation assembly.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect locker finish and adjacent surfaces from damage.

1.06 WARRANTY

A. Manufacturer's standard One year Warranty.

B. Warranty applies to the original purchaser only and the purchaser’s sole remedy under this warranty is limited to the repair and replacement of the products and specifically excludes consequential, incidental or other damages directly or indirectly resulting from failure or loss of use of, or by, Lyon products. Damage from deliberate destruction and vandalism

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Metal Lockers:
   1. ASI Storage Solutions: www.asi-storage.com/#sle.

2. **(Basis of Design)** Lyon Workspace Products: www.lyonworkspace.com/#sle.
3. Substitutions: See Section 016000 - Product Requirements.

2.03 LOCKER APPLICATIONS

A. Type L3, Student (corridor): Metal lockers, free-standing for base indicated on drawings.
   1. Width: 12 inches.
   2. Depth: 12 inches.
   3. Height: 60 inches.
   4. Configuration: Single tier.
   5. Fittings: Size and configuration as indicated on drawings.
      a. Hat shelf.
      b. Hooks: Two single prong.
   6. Ventilation: Louvers at top and bottom of door panel.
   7. Handles: Stainless Steel Recessed Handle.
   8. Locking: Padlock hasps, for padlocks provided by Owner.
   9. Provide sloped top.
   10. Number Plates: 1" high numbers (black), etched on aluminum plates near top of locker.
   11. Locker Color: To be selected from manufacturer's full range by Architect.
   12. Products:
      a. Lyon Workspace Products; Heavy Duty Corridor Lockers: www.lyonworkspace.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

B. Type L1 Athletic Locker: Metal lockers, free-standing for base indicated on drawings.
   1. Width: 18 inches.
   2. Depth: 18 inches.
   3. Height: 60 inches.
   4. Configuration: Single tier.
   5. Fittings: Size and configuration as indicated on drawings.
      a. Upper shelf.
      b. Hooks: One single prong.
      c. Single shoe shelf.
   6. Ventilation: Perforated side panels and doors.
   7. Handles: Stainless Steel Recessed Handle.
   8. Locking: Padlock hasps, for padlocks provided by Owner.
   9. Provide sloped top.
   10. Number Plates: 1" high numbers (black), etched on aluminum plates near top of locker.
   11. Locker Color: To be selected from manufacturer's full range by Architect.
   12. Products:
      a. Lyon Workspace Products; Heavy Duty Ventilated Lockers: www.lyonworkspace.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

C. Type L2 Athletic Locker: Metal lockers, free-standing for base indicated on drawings.
   1. Width: 18 inches.
   2. Depth: 18 inches.
   3. Height: 60 inches.
   4. Configuration: Two tier.
   5. Fittings: Size and configuration as indicated on drawings.
      a. Hooks: One single prong.
   6. Ventilation: Perforated side panels and doors.
   7. Handles: Stainless Steel Recessed Handle.

8. Locking: Padlock hasps, for padlocks provided by Owner.
9. Provide sloped top.
10. Number Plates: 1" high numbers (black), etched on aluminum plates near top of locker.
11. Locker Color: To be selected from manufacturer's full range by Architect.
12. Products:
    a. Lyon Workspace Products; Heavy Duty Ventilated Lockers: www.lyonworkspace.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

2.04 METAL LOCKERS

A. Accessibility: Design units indicated on drawings as 'accessible' to comply with ICC A117.1 and ADA Standards.

B. Locker Case Construction:
1. Heavy-Duty, Welded Construction: Made of formed and welded together sheet steel; metal edges finished smooth without burrs; powder coat finished inside and out.
    a. Assembly: Do not use bolts, screws, or rivets to assemble locker bodies.
    b. Locker Body Components: Formed and flanged from steel sheet of the following type and minimum thicknesses:
        1) Unperforated Steel Sheet (Corridor Lockers): 24 gauge, Commercial Steel (CS), Type B, supplied for exposed applications and complying with ASTM A1008/A1008M and the following:
            (a) Rust inhibitive phosphate treatment with powder coat finish.
            (b) Body and Shelves: 24 gauge, 0.0239 inch.
            (c) Door Frame: 16 gauge, 0.0598 inch.
            (d) "Z" Base: 14 gauge, 0.0747 inch.
                (1) Height: 4 inches.
        2) Expanded Steel Sheet (locker room lockers): Made from 16 gauge, ASTM A1008/A1008M carbon steel sheet and complying with ASTM F1267, Type II, expanded and flattened, style 3/4 - 16, with a minimum 70 percent open area.
            (a) Rust inhibitive phosphate treatment with powder coat finish.
        3) Body and Shelves: 16 gauge, 0.0598 inch.
        4) Door Frame: 16 gauge, 0.0598 inch.
    c. Frames: Formed channel shape, welded and ground flush, welded to body.
    d. Where ends or sides are exposed, provide flush panel closures.
    e. Provide filler strips where indicated or required, securely attached to lockers.

C. Doors: Channel edge; welded construction, manufacturer's standard stiffeners, grind and finish edges smooth.
1. Door Thickness: 14 gauge, 0.0747 inch, minimum.
2. Form recess for operating handle and locking device.

D. Latches and Door Handles: Manufacturer's standard.
1. Latching: Manufacturer's standard for locking arrangement selected.
    a. Single-Point Lift Handle Gravity Latch: Pocket-mounted, provide for doors 18 inches or taller.
        1) Handle Pocket, Recess: Stainless steel flush-mounted cup recessed into face of door.
        2) Latching Mechanism: Spring activated nylon slide latch enclosed in steel latch channel allows closing of door while padlock or built-in lock is in position.

E. Hinges: Heavy-duty, 5-knuckle type; two for doors under 42 inches high; three for doors over 42 inches high.

F. Sloped Top: 20 gauge, 0.0359 inch, with closed ends.

G. Coat Hooks: Stainless steel or zinc-plated steel.

H. Locks: Padlocks as provided by Owner.

2.05 LOCKER BENCHES

A. Locker Benches: Stationary type; bench top of laminated maple; cast iron pedestals.
   1. Accessibility: Comply with ICC A117.1 and ADA Standards.
   2. Height and length as indicated on drawings.
   3. Pedestal Finish: To match lockers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Place and secure on prepared base.

C. Install lockers plumb and square.

D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 pounds.

E. Bolt adjoining locker units together to provide rigid installation.

F. Install end panels, filler panels, and sloped tops.

G. Install fittings if not factory installed.

H. Install locker bench pedestals and bench top.

I. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 105528
KEY CABINETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Narcotics Cabinet

1.02 RELATED REQUIREMENTS

A. Section 061000 - ROUGH CARPENTRY: Wood blocking and nailers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2026.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

D. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2022.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

F. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequencing: Install cabinet after completion of flooring, painting, and construction.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures.

B. Product Data: Manufacturer's published data on cabinet construction, size, and accessories.

C. Samples:
   1. Submit two samples 3 by 6 inches in size showing color and finish of metal locker material.

D. Manufacturer's qualification statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened, undamaged packaging.

B. Store materials at temperature and humidity conditions recommended by manufacturer and protect them from exposure to harmful weather conditions.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty to repair or replace components that fail in materials or workmanship. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Narcotics Cabinet:
   1. **Basis of Design**: Medicus Health: www.medicus-health.com/#sle
   2. Substitutions: See Section 016000 - Product Requirements.

2.03 DOUBLE LOCK KEY NARCOTICS CABINET

A. Double Lock Key Narcotics Cabinet:
   1. Double Door, Double Lock, High security pick resistant tubular locks.
   2. Product Number: 2976M1
   3. Cabinet: Heavy duty steel contruction, powder coated, 12" wide x 8" deep x 15" high.
      a. Two doors with two seperate locks
      b. Stainless steel pinned door hinges for prevention of pin removal.
      c. (2) Height adjustable shelves.
      d. Fully meets DEA guidelines for secure storage of Schedule I and Schedule II controlled susbtances.
   4. Clutch lock mechanism.
   5. Color: To be selected from manufacturer's full range.
   6. Mounting: Wall.
      a. Predrilled holes for mounting.
   7. Installation Location: Interior.
      a. Within wall mounted casework.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify correct location and that blocking is in place.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Align, plumb, level, and anchor in accordance with manufacturer's requirements.

C. Secure modules with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.

D. Install fittings if not factory installed.

E. Replace components that do not operate smoothly.

3.03 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean cabinet interior and exterior surfaces with cleaners recommended by manufacturer.

3.04 PROTECTION

A. Protect installed lcabinet from subsequent construction operations.

END OF SECTION

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SECTION 114000
FOOD SERVICE EQUIPMENT

PART 1- GENERAL

1.1 SECTION INCLUDES:

A. Foodservice Equipment as listed in the itemized specifications and listed in the contract drawings.

1.2 DEFINITIONS:

A. Furnish -- Supply and deliver to the project site, ready for unloading, unpacking, setup, assembly, and installation.

B. Install -- Will include the actual unloading, unpacking, assembly, erecting/setting in place, leveling, anchoring, protecting, cleaning, and related operations on the equipment to be made ready for utility connections by other trades as indicated.

C. Contractor -- All references for the Contractor in this Section 114000 shall refer to the Food Service Equipment Contractor (abbreviated as FSEC). Reference to any other contractor or subcontractor, shall be specific as such:
1. General Contractor (abbreviated as GC)
2. Plumbing Contractor (abbreviated as PC)
3. Electrical Contractor (abbreviated as EC)
4. Mechanical Contractor (abbreviated as MC)

1.3 RELATED SECTIONS:

A. Refer to General Conditions, Supplementary Conditions, and applicable provisions for additional instructions.

B. Refer to Mechanical Section for applicable provisions and sections regarding mechanical services, including, but not limited to, rough-ins, grease traps, steam traps, drain traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete final connections to individual items as specified in this Section.

C. Refer to Electrical Section for applicable provisions and sections regarding electrical services, including, but not limited to, rough-ins, wiring, disconnects, and other materials necessary to complete final connections to individual items as specified in this Section.

D. Work included in other Sections will include provision of any wall, floor, and/or ceiling/roof openings, penetrations, recesses, sleeves, conduits, and equipment pads as required for installation of items included in this section. Also sealing of these openings, penetrations, recesses, sleeves, etc., after installation of the equipment items as required. Such work is not included in this Section. Work included in other Sections -- Disconnection of existing equipment to be relocated and/or reused; and disconnection of existing equipment which will not be reused, shall be as determined, and designated by the Architect in other Sections. Mounting and installation of gas regulators, gas hoses, gate valves, water hammer arrestors, back flow preventers, water filters, faucets, lever drains, and drain lines, and pressure-reducing valves will

be performed by the plumbing contractor. Such work is not included in this section.

E. Work included: The FSEC is responsible for all equipment listed in the Itemized Specifications below and all food service equipment on the plans. FSEC is responsible for installation of the walk-in cooler/freezer and refrigeration systems, and installation of the new hoods. The FSEC is responsible for mounting any hand sinks or water filter systems sink on the wall. FSEC is to confirm ability and sizing of equipment to be installed and access into the room.

1.4 STANDARDS, LAWS, AND ORDINANCES:

A. Standards: Except and unless otherwise noted, comply with the following standards as applicable to the manufacture, fabrication, and installation of the work of this Section:

1. American with Disabilities Act (ADA): Comply with requirements, as applicable to this Project.

2. National Sanitation Foundation (NSF): Comply with the latest Standards and Revisions established by NSF for equipment and installation. Provide NSF seal of approval on each applicable manufactured item, and on items of custom fabricated work.

3. Underwriters Laboratories (UL): For electrical components and assemblies provide either UL labeled and registered products or, where no labeling service is available, recognized markings to indicate listing in the UL Recognized Component Index.

4. National Fire Protection Association (NFPA): Comply with the applicable sections of the current NFPA codes for exhaust hood, ventilators, duct and fan materials, hood wet chemical fire suppression systems, construction, and installation, as well as any local codes and standards.

5. Wet chemical fire suppression systems for exhaust hoods/ventilators shall comply with UL 300 Standard or most current standard.

6. National Electrical Manufacturers Association (NEMA): Comply with the most current codes or standards.

7. American Gas Association (AGA): Comply with AGA standards for gas heated equipment and provide equipment with the AGA seal. Automatic safety pilots are to be provided with all equipment whenever available.

8. American National Standards Institute (ANSI): Comply with current standards for gas-burning equipment and provide labels indicating name of testing agency. Comply with current codes and standards for L.P. gas cylinder connections, and with applicable standards of the Compressed Gas Association for compressed gas piping. Follow codes for water connection air gaps and vacuum breakers.

9. American Society of Mechanical Engineers (ASME): Comply with ASME Boiler Code requirements for steam generating and steam heated equipment. Provide ASME inspection stamp and registration with National Board.

10. American Society for Testing and Materials (ASTM): Comply with current requirements for flat glass. Comply with codes for heat-treated flat glass, Kind HS, Kind FT coated, and

uncoated glass.

11. National Electric Code (NEC): Comply with current NFPA codes for electrical wiring and devices included with foodservice equipment, and applicable NEMA and NECA standards.

12. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.

13. Air Conditioning and Refrigeration Institute (ARI): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.

14. Refrigeration Service Engineers Society (RSES): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.

15. No CFC refrigerants shall be allowed on this project under any circumstances. HFC refrigerants and components shall be used where available. R290 refrigerant should be used where possible.

16. All walk-in coolers and freezers shall meet the applicable sections of NYECC C403.10.

17. All refrigeration components installation, repairs, and/or associated work on any refrigeration system, self-contained or remote, shall be performed by a Certified Refrigeration Mechanic.

18. All applicable local codes, standards, and regulations and any special local or job site conditions shall be complied with.

1.5 SUBSTITUTIONS:

A. All substitutions for itemized equipment specified will require prior approval of the Foodservice Consultant and owner. Such requests must be made in writing no later than ten (10) business days prior to the bid due date. If approved, an addendum will be issued to all bidders at least five (5) business days prior to bid due date. All requests for substitutions shall comply with conditions and requirements as stated in Section 1.6 below.

B. If custom fabricated items are submitted, and accepted as a substitute for standard manufactured items, these items shall meet the specifications of the specified manufactured items, in general, the fabrication section of this document.

1.6 APPROVED SUBSTITUTIONS OR ALTERNATES:

A. Substitutions approved by addendum as noted in Section 1.5, and/or any alternate manufacturers listed in the Itemized Specifications, may be utilized, with the following conditions:

1. The contract documents are designed and engineered using the primary specified manufacturer and model. The Food Service Equipment Contractor shall assume total responsibility for any deviations required due to the utilization of a substitution/alternate manufacturer or model, including but not limited to, fitting alternates into the available

space, providing directions to the General Contractor for required changes, and assuming any associated cost for utility, building, architectural, or engineering changes.

2. The submittal of an alternate manufacturer or model shall indicate agreement to the above stated conditions. At the Owner's sole discretion, failure to comply with any of these conditions, or to supply complete and correct data information shall result in the Food Service Equipment Contractor being required to provide the originally specified manufacturer and model at no additional cost to the owner.

3. Inclusion of an alternate manufacturer in the Itemized Specifications is not intended to indicate that there is an equal alternate unit to match every primary specified unit. It shall be the responsibility of the Food Service Equipment Contractor to ensure that the alternate unit submitted matches the primary specified unit, including all listed options and accessories, and meets the other project conditions.

4. The Food Service Equipment Contractor shall be responsible for supplying the model, which is equal to the primary specified model regarding general function, features, options, sizes, accessories, utility requirements, finish, operation, and listing approvals. If it is determined by the owner, or their appointed representative, at any time during the construction and installation prior to the final acceptance of the project, that the substitution / alternate model submitted is not equal to the primary specified model, the Food Service Equipment Contractor shall assume all associated costs, and implications required to replace the model submitted with the originally specified brand and model.

5. The Food Service Equipment Contractor's bid will clearly list any substitutions or alternates to be used, including the manufacturer and model number. The proposal shall also include a manufacturer's specification/data sheet for each substitution / alternate, with any, and all deviations between the specified manufacturer and the alternate manufacturer itemized and listed. Submittal of a manufacturer's specification sheets shall not be acceptable as the data sheet. Complex alternates such as utility distribution systems, exhaust hoods, walk-in coolers/freezers, custom fabricated items, etc., will require shop drawings specific to this project.

6. Manufacturers not approved for substitutions, or listed as an approved alternate will not be permitted, unless submitted for prior approval as described above in Section 1.5, paragraph A.

1.7 SUBMITTALS:

A. Rough-In Drawings:

1. The Food Service Equipment Contractor shall be solely responsible for the accuracy of the information provided in the submittal packages.

2. In the event utility rough ins have been accomplished before a contract is awarded to the Food Service Equipment Contractor, the FSEC shall check the existing facility and adjust their equipment to suit job site conditions and utilities where possible. If this is not possible, immediately send a letter with reasons, practical solutions, and any costs associated with the proposed solutions to the owner and the Foodservice Consultant.

3. Submit required number of sets as directed by the architect for approval. After approval, reproduce, and supply the required number of distribution prints for the other trades for construction purposes.

4. If the architect utilizes an electronic submittal service or process, after approval, supply the required number of distribution prints for the other trades for construction purposes.

5. Submit minimum 3/8 inch per foot scale rough-in drawings for approval. These drawings shall be dimensioned, showing location of ducts, stubs, floor, and wall sleeves for ventilation, plumbing, steam, electrical, refrigeration lines, and concrete base/recess/curb dimensions as required for equipment. Drawings shall be submitted in a minimum of 24” x 36” format.

6. Verify mechanical, electrical, ventilating rough in, and sleeve penetration locations at project site as required.

B. Shop Drawings:

1. Submit shop drawing sets as directed by the architect for approval. After approval, reproduce, and supply the required number of distribution prints for the other trades for construction purposes.

2. Submit CAD shop drawings in PDF format for items of custom fabrication included in this contract. Shop drawings shall be submitted at minimum 3/4 inches per foot scale, and shall show dimensions, materials, construction details, installation, and relation to adjoining work or equipment requiring cutting or close fitting. Shop drawings shall also indicate all reinforcing, anchoring, and related work required for the complete installation of these items. Drawings shall be submitted in a minimum of 24” x 36” format.

3. Before proceeding with the fabrication of any item, the Food Service Equipment Contractor will verify all necessary dimensions and details with all job site dimensions and conditions considered.

C. Submittals:

1. Submit an Equipment Manual with a cover sheet, and detailed information on every item included in the Itemized Equipment List. This information shall include but not limited to items and model numbers, basic description, quantity required, all options and accessories to be provided, exact utility requirements, manufacturer specification sheets, reference to specific shop drawings, etc. Mark each data sheet with the applicable project equipment item number. Highlight model numbers and/or accessories on each sheet for a clear indication of what is included in the submittal. Each data sheet includes NEMA plug and receptacle configuration for applicable items. Every cover sheet and associated detailed submittal shall provide sufficient and complete information to verify that the Food Service Equipment Contractor is providing each item in compliance with the Contract documents.

2. Architect / Foodservice Consultant review of shop drawings, and equipment manuals is for general conformance and compliance with the design concept, and contract documents. Markings, and / or comments shall not be construed as relieving the Food Service Equipment Contractor from compliance with the contract documents. The Food Service

Equipment Contractor remains solely responsible for all details and accuracy and for performing their work in a safe, satisfactory, and professional manner.

1.8 OPERATION AND MAINTENANCE MANUALS:

A. Operation and Maintenance Manuals: The Food Service Equipment Contractor will supply a set of manuals for items of standard manufacture on, or before, the date of final acceptance of installation by the owner. Manuals are to be in alphabetical order according to the manufacturer. Each set should include a blank page for quick reference, clearly marked, separating each manual and / or section within the binder. Electronic versions are acceptable unless printed versions are required by the architect, owner, or construction manager.

B. Submit with the operation and maintenance manuals a list of local service agencies complete with telephone numbers, address, and e-mail information for the authorized agencies to perform the warranty work.

C. Provide a letter of warranty in the front of the manual complying with Section 1.14. This letter must include the actual date the warranty begins, and list all labor, service, workmanship, and factory warranty periods.

1.9 AS BUILT AND RECORD DOCUMENTS:

A. Maintain one record set of Foodservice Equipment Plans with any related corrections, revisions, additions, deletions, changes, future items, etc. noted during construction and installation.

B. Provide final sets of shop drawings and equipment manuals with any related corrections, revisions, additions, deletions, changes, future items, etc. noted during construction and installation as specifications record set.

C. These documents shall be provided to the owner before the date of final acceptance of installation.

1.10 DISCREPANCIES

A. If discrepancies are discovered between the drawings and the specifications, the FSEC will notify the Food Service Consultant in writing of any discrepancies discovered and await clarification prior to proceeding with the items or areas in question.

1.11 FOOD SERVICE EQUIPMENT CONTRACTOR QUALIFICATIONS:

A. Submit evidence of compliance with the following qualifications and conditions.

1. Manufacturers' authorized dealer, able to purchase, distribute, and install all items specified in this project.

2. Seven (7) years minimum continuous operation under the same company name and ownership.

3. Successfully completed at least eight (8) installations of similar scope and size during the last two (2) years. Provide references with contact information for verification.

4. Maintain installation staff or have access to qualified personnel with a minimum of seven (7) years' experience in the installation of comparable size and scope projects.

5. Maintain a staff or have access to personnel experienced in the preparation of professional shop drawings and submittals as outlined in related sections.

6. Maintain or have access to manufacturers authorized service personnel together with readily available stock of repair, and replacement parts.

7. Maintain or have access to a fabrication shop with NSF and UL standards and officially listed with labeling requirements. If the fabricator will be a subcontractor for the FSEC, they shall have ten (10) years minimum experience in the fabrication of comparable size, scope, and level of quality projects. The Food Service Equipment Contractor shall submit the fabrication shop company name and credentials to the Foodservice Consultant and owner, who shall have the right of approval or disapproval of this fabricator.

B. Any subcontractor employed by Food Service Equipment Contractor for this project shall comply with these same qualification requirements.

C. The Architect and/or Foodservice Consultant for the project shall approve the Food Service Equipment Contractor.

1.12 PRODUCT HANDLING:

A. Storage of Materials, Equipment, and Fixtures. The Food Service Equipment Contractor is responsible for receiving and warehousing equipment and fixtures and holding items until the job site is ready for delivery and installation.

B. Handling Materials and Equipment. Verify and coordinate conditions at the job site, particularly door, and/or wall opening sizes and clearances, to assure access for all equipment. Pieces too large for existing site conditions shall be hoisted, crane-lifted, or otherwise handled as required. All special handling equipment charges shall be arranged for and paid for by the Food Service Equipment Contractor and are to be included in the bid price, unless conditions change at the job site, after acceptance of bid through no fault of the FSEC.

1.13 PRODUCT PROTECTION:

A. The Food Service Equipment Contractor is responsible during the progress of the project to protect their equipment against theft or damage, until final acceptance by the owner. Items should not be delivered to the job site before the site is ready for installation, unless at the request of the owner or the construction manager. All scheduled deliveries should be signed for and the delivery condition noted by the owner or the construction manager.

B. Protect all items before, during, and after installation and protect the associated work and materials of the other trades.

1.14 WARRANTIES:

A. Unless otherwise noted, items furnished shall be fully guaranteed against defects in workmanship

and material(s) for two (2) full years from the date of the first event to occur of the following: Start-up for intended use by the owner/operator, Substantial completion of installation of kitchen equipment contract package as agreed to by the owner, or final acceptance of installation by the owner. Should a Temporary Certificate of Occupancy be issued for partial completion of work, the items furnished within that designated area shall be under warranty from the date of issue of the certificate. The Food Service Equipment Contractor or their service agent will make repairs and replacements without charge to the owner within a reasonable time.

1.15 SCHEDULE:

A. Contract acceptance constitutes a guarantee that the contractor can and will obtain materials, equipment, and labor upon notice to proceed to permit overall completion of the entire building project on schedule. The contractor shall coordinate their work with the progress schedule as prepared and updated periodically by the General Contractor, or the Construction Manager.

B. Anticipated delays, not through fault of the Food Service Equipment Contractor, shall be noted in a written notification to the Foodservice Consultant, and the Architect immediately upon the realization by FSEC that delays are possible, or probable.

C. Extra charges from rush orders, special handling, overnight UPS/FedEx, air shipments, etc., to meet the required schedule will be paid by the Food Service Equipment Contractor, if insufficient time was allowed in placing factory orders.

D. Failure of manufacturers to meet promised delivery dates will not grant relief to the Food Service Equipment Contractor for failure to meet schedules unless it can be proven in writing with supporting data (i.e., proof of dates orders were placed) that orders were received by the manufacturer with reasonable lead times.

PART 2 - EQUIPMENT

2.1 GENERAL:

Refer to schedule on Foodservice Drawings and Section 4, Itemized Specifications, included in this Section.

2.2 MATERIALS:

A. Quality Standards for Metals:

1. Stainless Steel: Type 302/304, #4 finish where exposed, 2B finished where not exposed.

2. Steel Sheet: Hot-rolled carbon steel.

3. Galvanized Steel Pipe: Welded or seamless, schedule 40, galvanized or heavier.

4. Steel Structural Members: Hot rolled or cold formed, carbon steel unless stainless steel is indicated.

B. Quality Standards for Plastic Laminates:

1. Comply with current NSF Standards.

2. Applied directly over 3/4" thick close-grained plywood, Grade A/B, or better of selected, smooth, sanded stock to ensure a smooth ripple-free laminated surface. OSB, MDF, or particleboard panels are not considered acceptable. If specified plywood substrate is unavailable, submit specifications and sample of alternate material for approval.

3. Adhere to substrate materials with manufacturer recommended waterproof and heatproof contact cements only.

4. Exposed faces and edges shall be faced with 1/8” thick material. Corresponding backs are to be covered with approved backing material. No unfinished exposed plywood surfaces will be acceptable.

5. All plastic laminate surfaces are to be finished without waves and unsightly joints.

6. Color and texture as selected by the Architect/Interior Designer.

C. Insulation:

1. For low temperature applications, such as ice bins, cold pans, or fabricated under counter freezers or refrigerators, use urethane, rigid board foam, or foamed-in-place; not less than two (2) inches thick, except that vertical surfaces of cold pans and ice bins may be one (1) inch thick. Insulation shall be bonded at joints with urethane or polyurethane expanding foam to fill all voids and prevent condensation on exterior. Polystyrene foam will not be acceptable.

2. For heated type applications, use mineral wool, a minimum of one (1) inch thick.

3. All insulation shall be fully encased, or enclosed.

D. Joint Materials:

1. Sealants: Silicone based, liquid elastomeric sealant, non-solvent release type. Sealants shall be NSF listed, and FDA approved for use in food zones. Installation shall comply with applicable requirements of NSF Standards.

2. Gaskets: Solid or hollow neoprene or PVC light grey, self-adhesive or prepared for either adhesive application or mechanical attachment.

E. Paints and Coatings:

1. Provide the types of painting and coating materials which, after drying or curing, are suitable for use in conjunction with foodservice and which are durable, non-toxic, non-dusting, non-flaking, mildew resistant, and comply with all governing regulations for foodservice.

2. Pretreatment. All metal surfaces to be painted are to be cleaned and/or chemically etched as per the recommendations of the manufacturer for the finish coating that is to be applied.

3. Raw metal surfaces are to be coated with suitable primer/filler paint before application of finish coat.

4. Sound Deadener: NSF listed sound deadening material, latex sound deadener, for internal surfaces of metal work, and underside of metal counters, dish tables, sink bowls, and drain boards. Install “tacky tape” between work top, and underbracing, or framing.

2.3 FABRICATED COUNTERS, TABLES, AND METAL PRODUCTS:

A. General Fabrication Requirements:

1. Remove burrs from sheared edges of all sheet metal to eliminate cutting hazard. Maintain flat, smooth surfaces without damage to finish.

2. Reinforce metal at locations of hardware and accessory attachments wherever metal is less than 14-gauge thickness or requires mortised or recessed installation. Weld in place on concealed side of work. Reinforcements will not show on finished, exposed surfaces.

3. Exposed screws or bolt heads, rivets, or butt joints filled with solder are not acceptable. Where fasteners are permitted, provide Phillip’s head or oval head machine screws. Cap threads with acorn nuts, unless fully concealed and inaccessible. Provide nuts and lock washers where necessary or indicated. Match fastener material and finish with finish of metal being fastened.

4. Where components of fabricated metal work are indicated to be galvanized or steel and involve welding of the metal, complete the fabrication, and clean all welding slag, then paint with a high-grade aluminum color, rust-preventative spray paint.

5. Welding and Soldering:

a. Welding: All welded parts shall be non-porous and free from imperfections, pits, cracks, or discolorations. Stainless steel joints and seams shall be heli-arc welded, ground smooth and polished to a No. 4 finish. Welds of galvanized steel shall be ground smooth.

b. Materials 18-gauge or heavier shall be welded. Seams and joints are to be shop welded or soldered as indicated. Welds must be ground smooth and polished to match the original finish.

c. Where galvanizing has been burned off, the weld shall be cleaned and then painted with a high-grade aluminum color, rust-preventative spray paint.

6. Provide removable panels for access to mechanical and electrical service connections and components concealed inside equipment, but only where other means of access is not possible and not indicated through other work.

7. Where ends of equipment, rear or end splashes, shelves, etc., are open after fabrication, they are to be enclosed by forming metal and welding, adding filler sections, if necessary, to close entire opening flush to walls, adjacent fixtures, or equipment.

8. Coved Corners: Stainless steel foodservice equipment shall have a minimum of 1/4" radius coves in horizontal and vertical corners, and intersections, and are to be constructed to NSF standards.

9. Set each item of non-mobile and non-portable equipment securely in place, level and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Where indicated or required for safety of equipment operator, anchor equipment to floor or wall. Where equipment is indicated to be anchored to floor, provide legs with adjustable flanged feet. Install two anchors on each foot.

10. Quality of Work: All work to be of the highest quality in the trade. Field verify all dimensions before fabricating, adjust where necessary to conform to building and job site conditions, neatly fit around pipes, offsets, and other obstructions. Fabricate only in accordance with approved shop drawings.

11. The approved manufacturers for this section are the following: **Titan Stainless** of Pageland, SC, **SML** of Quebec, Canada, and **Custom Metals** of Whitman, MA. All others will be rejected.

12. All items are to be UL listed and NSF certified. All items must have a visible NSF label on each piece of equipment. If equipment has an electrical component, these items must have a visible UL label in addition to the NSF label.

B. Metal and Gauges:

1. Unless otherwise indicated in Itemized Equipment Specifications, fabricate exposed metalwork of stainless steel, and fabricate the following components from the gauges of metal as indicated:

a. 14-gauge 304 stainless steel with #4 finish for all sinks; drain boards, table and counter tops, reinforcements, gusset plates, and hat channels.

b. 16-gauge 304 stainless steel with #4 finish for all wall shelves, under shelves, inserts, trays, single-pan drawers, or door fronts.

c. 18-gauge 304 stainless steel with #4 finish for all wall cabinets, table, counter base cabinets, skirting, enclosure panels, trim strips, and corners, double-pan drawer fronts or doors, hoods, ventilators, access panels, or covers.

d. Type 304 stainless steel is to be used as the standard construction.

C. Fabrication Methods:

1. Fabricate metal work surfaces by forming, and welding to provide seamless construction, using welding rods matching sheet metal, or welding on stainless steel using stainless steel filler rods, grinding, and polishing to match surrounding surfaces. Where necessary for disassembly, provide waterproof field joints with gasket and concealed bolting. If field-welded field joint is indicated, provide a straight, smooth, edge.

2. Reinforce work surfaces at a minimum 24 inches on center in both directions with galvanized or stainless steel structural members as indicated.

D. Top Construction:

1. All tops, unless otherwise indicated, shall be constructed of 14-gauge stainless steel. Exterior edges not adjacent to walls or other equipment shall be turned down 1 ½" with ½" 45-degree turn in. Tops adjacent to walls shall be turned up 6" with 45-degree angle to wall and down ¾". Tops adjacent to other equipment shall be flanged straight down 2". Sound deadening material shall be provided between frame members and stainless-steel tops.

2. The edges of dish table tops not adjacent to walls shall be turned up 3" and rolled down 1-1/2" with corners bull nosed. Dish table tops adjacent to walls shall be turned up 6" back 2" on a 45-degree angle and down ¾". All horizontal edges and internal corners of dish tabletops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished.

3. Edges of preparation counter tops, with sinks, not adjacent to walls shall have non-spill edge, unless specified otherwise. Preparation counter tops, with sinks, adjacent to walls shall be turned up to 6", back 2" on a 45-degree angle and straight down ¾". All horizontal edges and internal corners of preparation counter tops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished. Backsplashes of counter tops with sinks shall be pierced on 8" centers over sinks.

4. All tops shall be reinforced on the underside with enclosed channels running from front to back with center bracing where required to hold tops flat.

5. Metal tops shall be one-piece welded construction, including joints only where necessary.

6. Fasten tops to supporting frames, cabinet bases, or structural members with stainless steel welded stud bolts and stainless-steel cap nuts.

7. Professionally designed bolt together field joints, trim strip, or other commercial joint material to suit requirements shall be used only where it is specified.

8. Welded Field Joints, where specified, will be welded, ground, and polished to match surrounding surfaces. Excessive distortion from the welding will not be acceptable.

E. Structural Components:

1. Unless otherwise indicated, provide framing of minimum 1-1/4" O.D. round pipe or tubing, with mitered and welded joints and gusset plates, ground smooth. Provide 16-gauge stainless steel tube for exposed or concealed framing.

2. Where indicated, enclosed bracing channels of 1" x 4" x 1" are to be used, of material specified, 14-gauge, and attached to tops as outlined in other sections.

F. Field Joints:

1. For any field joint required because of size of a particular item, use a butt-joint, reinforced with formed angles of same material on underside, attached with stud bolts. If bolt together joint is required, provide with concealed stainless-steel bolts and nuts, with waterproof gasket between angles, and seal with food grade and NSF-listed silicone sealant. If specified as field-welded joint, weld and fill with stainless steel filler rod, grind, and polish to match surrounding material.

2. Field joints shall be located for practical construction of sizes convenient for shipping and entry into building spaces. All field joints shall be fully continuously welded with the same type of metal, ground smooth and polished to the original finish of the metal.

G. Open Pipe Bases:

1. All open bases shall be constructed of 1-5/8” OD 16-gauge stainless steel tubular uprights and cross braces fully welded together, ground smooth and polished. Top of cross braces shall 12” above floor.

2. Uprights shall be fitted on the floor with adjustable, stainless-steel feet as specified inserted into uprights with inside threads to eliminate any possibility of threading collecting dirt and other matter. The tops of legs shall be fitted into die-stamped fully enclosed stainless-steel gussets welded to the reinforcing channels on the underside of stainless-steel tops.

3. Use stainless steel adjustable bullet feet or stainless steel adjustable flanged feet with mounting holes as indicated. Legs are to be spaced sufficiently close enough together to support the weight of items on top of table or counter, and in no case more than 5’-0” on center.

4. Tables 6’-0” long and under shall have four (4) legs and tables 7’-0” long shall have six (6) legs. Legs on dish tables shall be spaced not more than 5’-0” apart unless specified otherwise.

H. Cabinet Bases and Bodies:

1. All cabinet bodies and bases shall be enclosed with 18-gauge stainless steel. Exterior vertical corners shall be square. Bodies and bases shall be mounted on high sanitary adjustable counter legs with toe kicks unless otherwise noted.

I. Legs & Cross rails:

1. Equipment legs and cross rails shall be 1-5/8" O.D., 16-gauge type 304 stainless steel tubing. Fit legs with stainless steel adjustable bullet feet or stainless steel adjustable flanged feet with mounting holes as indicated. Cross rails are to be notched at end and welded to legs as specified. All welds are to be continuous, ground smooth, and polished to match surrounding material. Tack welds are not acceptable. Where flanged feet are specified, anchor to floor with either expanding, driven in stainless steel pins or stainless-steel lag bolts with expanding anchors as indicated.

2. Stainless Steel Gussets to be 16-gauge stainless steel exterior, to accept 1-5/8"O.D. stainless steel tubing, with Allen set screw for fastening and adjustment. Reinforced with 12-gauge mild steel insert welded in interior. To be welded to framing members as indicated.

3. Legs shall be fastened to equipment with gussets, as follows:

   a. Sinks to have gussets welded to stainless steel channels, 14-gauge or heavier, anchored to either drain boards, or sink bowls as indicated, with stainless steel welded stud bolt.

   b. Metal Top Tables and Dish Tables to have gussets welded to stainless steel channels, unless otherwise indicated, 14-gauge or heavier, anchored to top with stainless steel welded stud bolts.

   c. Wood Top Tables to have gussets welded to stainless steel channels, 14-gauge or heavier, anchored to underside of top with stainless steel screws through slotted holes to allow for top expansion.

J. Casters:

1. Type and size as specified on drawings and specifications, NSF approved, not less than 5” diameter; heavy-duty ball-bearing, solid or disc wheel with non-marking grease proof rubber, neoprene or polyurethane wheel as specified. The minimum width of tread shall be 1-3/16”. Minimum weight capacity shall be 250 pounds per caster unless otherwise noted in itemized specifications.

2. Unless otherwise indicated, each equipment item on casters is to be supplied with two (2) swivel-type casters and two (2) swivel-type casters with foot brakes. Brakes are to be on front casters for equipment against walls and on opposing corners of equipment not normally against walls.

K. Shelves:

1. All under shelves and interior shelves shall be constructed of 18-gauge stainless steel.

2. Under shelves on open base tables shall be welded to the legs.

3. Construct solid shelves under pipe base tables of 16-gauge stainless steel, with 1-1/2" turn-down front and ends, bottom edges turned in additional 2" @ 45-degrees, and 1-1/2" turn-up at rear, unless indicated otherwise. Notch and fully welded to pipe legs as necessary, ground smooth and polished to match surrounding material. Tack welds are not acceptable. In fixtures with enclosed bases, turn up shelves at both rear and sides.

4. Interior shelves of cabinet bodies and bases shall be adjustable and removable unless specified otherwise. Sides and rear edges of shelves shall be turned up and front turned down. Shelves shall be braced on the underside. Where plumbing and other appurtenances pass through counter bases, open chases, shall be provided to accommodate piping.

5. Elevated Shelves: All elevated shelves shall be constructed of 16-gauge stainless steel and shall be turned down 1-1/2" with ½" 45-degree turn in on front and ends. Freestanding shelves, unless specified otherwise, shall be mounted on 1 5/8" OD stainless steel tubular uprights mounted to counter tops.

L. Sinks:

1. All sinks shall be constructed of 14-gauge stainless steel having back, bottom and front formed of one (1) continuous sheet of metal with ends and partitions welded in place. All vertical and horizontal corners of sink compartments shall be coved with metal on a 5/8" (minimum) radius. Bottom of sinks are to be creased and pitched toward drains.

2. Sink inserts shall be constructed the same as specified for sinks above with coved corners. Sink inserts shall be welded integral with stainless steel tops. Fully fabricated 14-gauge Stainless Steel construction. Deep Drawn or stamped bowls are not acceptable. Sink bottoms are to be creased and pitched toward drains.

3. Partitions to be double thick, 1" minimum space between walls. Multiple compartments shall be continuous on the exterior with stainless steel apron.

4. Cove interior vertical and horizontal corners of each tub not less than 5/8-inch radius, die formed. Outer ends of drain boards have roll rim risers not less than 3 inches high.

5. Punch rear splashes with holes for faucets as indicated 2-1/2" below top edge. Verify center-to-center spacing with faucet specified.

M. Plumbing Fixtures:

1. Where exposed or semi-exposed, provide piping in bright chrome plated brass or polished stainless steel and copper where not exposed. PVC is not acceptable for cold water drains (ice bins, soda fountains, condensate from refrigeration) unless they where allowed by local codes. PVC is not acceptable on any drains where hot water will flow or for pressured water lines.

2. Vacuum Breakers: Provide with foodservice equipment items where specified.

3. Unless otherwise indicated, furnish lever or twist waste drains as specified on all sinks, with removable flat strainers and 2" IPS outlet size. If basket drains are specified, there will be all stainless-steel construction.

4. Handle (lever or twist, as specified) to extend to front edge of sink. Handle to be supported and protected by stainless steel bracket where indicated. No riveting, screws, or soldering permitted to fit drains to sinks, with all parts of drains easily removable for servicing and replacement.

5. Water pans for hot food tables shall be fitted with 1" drains with chrome-plated brass standpipes or manifolded together to a single gate valve for draining as indicated.

6. All faucets furnished with equipment included in this Section shall comply with current NSF and Lead-Free Standards. No lead products are acceptable on this project and need to conform to lead testing per NYSOCCRR sub part 67-4. When the itemized specifications list a faucet by manufacturer and model, the Contractor shall verify that the listed faucet complies with this requirement. If the listed faucet does not comply, the Contractor shall notify Foodservice Consultant immediately and submit for approval a similar model, which does comply, from the same manufacturer where possible. Provide mounting kit for all splash mounted faucets to the plumber for installation. Mounting kits depend on faucet requirements.

N. Electrical Materials and Components:

1. Provide standard materials, devices and components as recommended by the manufacturer or fabricator, selected, and installed in accordance with NEMA standards and recommendations as required for safe, efficient use, and operation.

2. Components shall bear the UL label, or be UL recognized, with the whole item being UL listed.

3. Confirm all electrical requirements for project, including but not limited to, actual voltages available, single, or three-phase availability, etc.

4. Electrical work for custom fabricated equipment shall be completely pre-wired to a junction or pull box mounted on the equipment, all wires clearly marked and labeled for outlet or item served. Counters should be wired for a single connection point at the job site wherever possible and specified. Verify local requirements for UL Listing on complete assembly and provide if required.

5. Custom fabricated refrigeration units shall be provided with vapor proof light fixtures with shatterproof polycarbonate lamp shields and automatic switches. All wiring shall be concealed if possible.

6. Controls, Switches, and Receptacles: Provide recognized commercial grade signal lamps, switches, controls, and switches as indicated. All such units to be complete with pilot lights, permanent signs, and graphics to assist the user of each item. Provide stainless steel cover plates on all electrical boxes and switches; these are always to be located out of heat zones, easily accessible, and in locations that prevent accidental contact by staff.

7. Convenience Outlets and Power Receptacles:

   a. Make cutouts and install appropriate boxes or outlets in fabricated fixtures complete with wiring, conduit, outlet, and stainless-steel cover plate.

   b. GFCI outlets shall be furnished where adjacent to sink compartments as per the National Electrical Code.

8. Plugs and Cords: Where cords and plugs are provided, they shall comply with National Electrical Manufacturers Association (NEMA) requirements. Indicate NEMA configuration for each applicable item.

9. Heating Equipment:

    a. Electric heating equipment should be so installed as to be readily cleanable or removable for cleaning.

    b. Steam heated custom fabricated equipment shall be a steam coil/heat exchanger design, and will include all necessary control valves, components, and moisture traps located and shall be installed and located in an accessible position.

10. Motors are to be enclosed type, except drip-proof type where not exposed to dust or moisture condition. Ball bearings or sleeve bearings are acceptable on small-timer motors; moisture resistant windings, horsepower, and duty-cycle ratings as indicated.

11. Internal Wiring of Fixtures and Equipment:

    a. The FSEC shall be responsible for internal wiring of electrical devices built into fabricated equipment items. Wiring is to be enclosed in metal conduit or an electrical chase where indicated, to an accessible pull-box, with all wires clearly labeled. For any item shipped in sections, all wiring shall be properly connected internally to a single connection point and verified by the FSEC.

    b. Furnish dishwashers, and conveyors internally wired to junction boxes, or distribution panel as specified, including all required switches, motors, immersion heaters, solenoids, and other components required for proper operation.

    c. Where light fixtures are specified or detailed as part of counters, cases, or fixtures; light fixtures, lamps, and shields shall be furnished and installed. If fluorescent light fixtures are specified, warm white lamps are to be used unless otherwise specified and ballasts shall be included. Shatter shields shall be provided for all light fixtures.

    d. All wiring shall conform to the National Electrical Code and shall be UL listed.

    e. Exposed flexible steel conduit on kitchen equipment shall be neoprene jacketed Seal-Tite conduit equal to Anaconda type UA/UL approved, complete with approved liquid-tight connectors on each end and designed to provide electrical grounding continuity.

    f. Exposed electrical conduit used in kitchen wet area applications, except for flexible connections, shall be rigid galvanized steel. Thin wall conduit (EMT) shall not be permitted for wet areas. Exposed outlet boxes shall be liquid-tight type, with threaded hubs.

O. Enclosures:

1. Provide enclosures, including panels, housings, skirts, trim panels, operating components, mechanical, and electrical devices associated with the food service equipment unless specifically indicated otherwise.

P. Doors:

1. Metal doors shall be double-cased stainless steel, 18-gauge with corners welded, ground smooth and polished. The inner pan shall be fitted tightly into outer pan with a sound-deadening material such as Styrofoam used as a core. The two pans shall be tack welded together, and joints sealed. Door thickness to be 3/4".

2. Wood doors are to be constructed as detailed. If Formica or other plastic surfaces are used, sides and backs must be laminated as specified on plans or specifications.

3. Hinged Door Hardware: Hinged doors shall be mounted with heavy duty NSF approved hinges with pulls. Catches shall be heavy-duty magnetic type, unless otherwise indicated.

4. Sliding Door Hardware: Sliding doors shall be mounted on large, quiet ball bearing rollers with quiet nylon wheels in 14-gauge stainless steel overhead tracks. Rollers to be easily replaceable and doors to be removable without the use of tools (lift out).

5. All hardware used must be identified with the manufacturer's brand name, and part number on shop drawings so that broken or worn parts may be easily obtained and replaced.

Q. Drawer Assemblies:

1. Assemblies shall consist of removable drawer body mounted in a ball bearing slide assembly with fully enclosed housing. Slide assembly consists of one pair of 200-pound capacity, 300 series stainless steel, full extension, side-mounting, self-closing type, with stainless steel ball-bearings and positive stops. Drawers have side and back enclosure panels, front spacer angle, two drawer carrier angles, secured to slides and stainless-steel front. Drawer pulls shall be stainless steel full grip type with frame beveled edge.

2. Unless otherwise indicated, drawers for general storage are to have a removable 20"x 20" x 5" deep stainless-steel pan. Drawers intended to hold food products are to be designed to hold standard 12" x 20" stainless steel food pans up to 4" deep in a stainless-steel assembly.

3. Drawer fronts are double-pan construction, ¾" thick, and 18-gauge stainless steel, welded, ground, and polished. The back pan is tightly in-fitted, tack welded and sealed. Sound deaden with rigid insulation material.

4. Provide drawers with replaceable soft neoprene bumpers or, for refrigerated drawers, a full perimeter soft gasket.

R. Sound Deadening:

1. Sound deaden underside of metal tops, drain boards, under shelves, cabinet interior shelves, etc., above the underbracing, reinforcing, or framing only.

2. Sound Deadener: NSF listed sound deadening material, latex sound deadener for internal surfaces of metal work, and underside of metal counters, dish tables, sink bowls, and drain boards. Install "tacky tape" between work top, and underbracing, or framing.

S. Serving Counter Fabrication:

1. Tops are a minimum of 14-gauge 300 series stainless steel with not less than a #4 finish with 2” square turndown on all sides. Corners are fully welded and polished. The tops are attached to the cabinet body so that no spot weld marks appear.

2. Cabinet bodies are heavy gauge 300 series stainless steel panelized construction, 14-gauge stainless steel vertical channel supports at all tray slide bracket locations and additional galvanized channel supports as per detail shown below.

3. Starting at the base of the unit, the unit shall have a 2 " high x minimum 4” wide, 14-gauge galvanized supports running from front to rear at each leg location. Located left to right on back of the shelf nosing and across the rear of the unit are approx. ½ “x 2” galvanized supports. All the base bracing shall be closed off to prevent vermin from entering.

4. Inside the unit behind the end mullion, there are 20-gauge galvanized inserts to match the width of the mullion and close off any gaps. Should the unit have a work shelf on the operator side a 14-gauge backer should be installed, so that any screws to hold the shelf in place are penetrating the 14-gauge backer.

5. In the inside rear of the unit, there are to be minimum 4” wide “C” Shaped 14-gauge 300 series stainless steel vertical supports, installed at each end of the unit, and where any attachment is made for tray slide, additional supports shall be installed vertical so that the spacing from center to center does not exceed 16" inches. Across the top of the vertical support and around the perimeter of the top, unit shall have 1/2" x 2” 20 gauge “C” shaped supports. Unit top shall have top support where needed.

6. All open shelf areas shall be the full width and depth of the base area. No cavities shall be created in the construction of the body that is not accessible without the use of tools.

7. All supports and body panels shall be welded together in unitized or panelized body construction.

8. All units include a 300 series stainless steel built-in under shelf with utility access holes and grommeted black covers. Intermediate under shelves where required are welded in position. Under shelf shall run the full distance of the unit, less the material thickness of the end panels and shall be full depth, less the material thickness of the back panel.

9. Casters are secured to a 2” x 4”, minimum 14 gauge galvanized inverted channel that runs front to back.

10. The cabinets may have a choice of stainless steel or powder coated material as determined by the consultant or architect. If a powder coat is chosen, then galvanized will be used in lieu of stainless steel in the construction of the base.

11. Exterior finish can be a choice of plastic laminate veneered to body panels, removable laminated panels, powder coat paint finish, or a variety of millwork options as specified.

12. All powder coat painting must be conducted in-house at the approved manufacturer’s facility to ensure quality control.

13. Tray Slides: Before fabrication of counters with tray slides, verify size and shape of tray to be used. Edge of tray shall not overhang outer support/slider by more than 2". If the edge of tray exceeds this dimension, notify Architect, in writing, for evaluation and adjustment if necessary. Tray slide to be capable of supporting 300 pounds per linear foot, live load.

14. All equipment must bear labeling and be approved by the U.L. for safety and sanitation and must be built in an ISO 9001:2000 approved manufacturing facility. Compliance with the National Sanitation Foundation's (NSF) standards 2, 4 and 7 shall be confirmed by U.L. Sanitation or other nationally known and respected third-party testing facilities.

2.4 REFRIGERATION:

A. General:

1. All refrigerant and associated components shall comply with the latest code requirements and shall comply with the latest Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, power air curtains on doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. Refrigerants must comply with the latest type required by Federal Regulations and use R290 refrigerant where possible.

2. Wiring for walk-in refrigerator and freezer cabinets shall be UL approved type from exterior junction boxes to internal components, with insulation, unless local codes require metallic conduit (EMT or Greenfield). For freezer applications, Seal-Tite Flex or approved equal shall be used. Lighting receptacles, and door switches shall be mounted weatherproof boxes. All penetrations to be insulated with expanding foam and sealed to prevent condensation moisture buildup.

3. Furnish either single, or multiple condensing units, or a rack refrigeration system as specified and/or recommended by the manufacturer for the items on the equipment schedule. Furnish all components necessary for a complete installation of the system, including coils, receivers, compressors, motors, motor starters, mounting bases, vibration isolation units, fans, dryers, valves, piping, insulation, gauges, winter control equipment, etc.

4. All refrigerant and associated components shall comply with the latest code requirements. No CFC refrigerants or associated components shall be allowed on this Project. HFC refrigerants and components shall be used where available. HCFC refrigerants and components, with a minimum 2010 phase-out date and intermediate replacement refrigerants, are to be used only when HFC refrigerants are not available.

5. The minimum outdoor operating ambient temperature for design of units is -10 degrees Fahrenheit, unless otherwise specified. The maximum indoor design temperature for operation of compressor units is 95 degrees Fahrenheit. The maximum outdoor ambient design temperature shall not be less than 100 degrees Fahrenheit. Special attention is to be given to conditions at mounting locations of condensing units, such as sun exposure, restricted air flow and ventilation, fences, walls, roof color, and materials.

B. Components:

1. Expansion Valves: Remote refrigeration system shall be complete with thermostatic expansion valves at the evaporator coils.

2. Thermometers: Fabricated refrigerated compartments to be fitted with either flush dial or digital thermometers as specified on individual items. Thermometers shall be adjustable and calibrated after installation. Accuracy to be +/- 2 degrees Fahrenheit.

3. Hardware: Refrigerator hardware for fabricated refrigerator compartments shall be heavy-duty components, NSF Listed. Use self-closing, heavy duty edge mount style hinges, with Spring Kit. Latches to be magnetic edge mount type, with cylinder locks, unless specified or detailed otherwise. All doors and drawers for walk-in coolers/freezers and reach-in refrigerated compartments, both fabricated and standard shall be fitted with cylinder locks.

C. Cold Pans:

1. Ice pans, refrigerated pans, and cabinets shall be provided with breaker strips or other insulation where adjoining top or cabinet face materials to prevent transfer of cold and possible condensation problems.

2. All open top mechanically cooled custom fabricated, standard buy-out refrigerators, and / or cold pans shall comply with the latest NSF Standard #9 requirements.

D. Refrigerated Equipment Ventilation:

1. Adequate ventilation shall be provided for custom fabricated equipment with integral refrigeration condensing units, both built-in and drop-in. If flow through ventilation cannot be provided, provide flow direction partitions and an additional fan capable of cooling the condensing unit. If in the opinion of the Food Service Equipment Contractor or Refrigeration Subcontractor additional room ventilation is required to ensure correct operating temperatures of standard buy-out, custom fabricated, remote refrigeration condensing units, or compressor rack assemblies, they shall so state in a letter to the Architect for evaluation and decision.

2.5 MISCELLANEOUS:

A. Reasonable quietness of operation of equipment is expected, and the Foodservice Contractor will be required to replace or repair any equipment producing excessive noise at no expense to the owner. This includes but is not limited to bumpers and gaskets for doors and drawers, and sound deadening or insulation where specified and practical.

B. Manufactured Equipment Items: Furnish items as scheduled or herein specified. Verify dimensions, spaces, rough in, and service requirements, as well as electrical characteristics before ordering. Provide trim, accessories, and miscellaneous items for complete installation.

C. Nameplates: Whenever possible, locate nameplates and labels on manufactured items in an accessible position, but not within the normal view of customers.

D. All items must have a visible NSF label on each piece of equipment. If equipment has an electrical component, these items must have a visible UL label in addition to the NSF label.

PART 3- EXECUTION

3.1 SITE EXAMINATION:

A. Verify site conditions under the provisions of the General Conditions, Supplementary Conditions, and applicable provisions of other Sections. Notify the Architect, in writing, of unsatisfactory conditions for proper installation of foodservice equipment specified in this section.

B. Verify that all required service utilities are available, and of the correct characteristics in the required locations. Notify the Architect, in writing, of any problems or conflicts with food service equipment specified in this section.

C. Verify wall, column, door, window, and ceiling locations and dimensions. Fabrication and installation should not proceed until dimensions and conditions have been verified and coordinated with fabrication details.

D. Verify that necessary wall reinforcement or backing has been provided for wall-mounted equipment. Coordinate with General Contractor for placement of such backing during wall construction.

E. Verify that ventilation ducts are of the correct characteristics and in the required locations.

3.2 SUPERVISION:

A. A competent supervisor employed by the Food Service Equipment Contractor shall be always present during progress of the FSEC’s work.

B. A competent supervisor employed by the Food Service Equipment Contractor shall be always present during work by any of the FSEC’s subcontractors.

3.3 SITE CLEANUP:

A. Throughout the progress of their work, the Food Service Equipment Contractor shall keep their working area free from debris, and shall remove all trash, rubbish, etc., daily. At no time is the FSEC to allow any trash, debris, rubbish, crating, boxes, packaging, etc. to accumulate at the job site. At the completion of their work, the FSEC shall leave the premises in a clean and finished condition.

3.4 INSTALLATION:

A. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved. Install items as per each manufacturer’s installation manual.

B. Set each item of non-mobile and non-portable equipment securely in place, leveled, and adjusted to correct height. Anchor where indicated and where required for sustained operation and use without unnecessary movement. Conceal anchors wherever possible. Adjust counter tops and other work surfaces to a level tolerance of (+/-) 1/16” or better.

C. Complete field assembly joints in all by welding, bolting / gasketing or as otherwise indicated and specified. Grind all welds smooth and restore the finish to match surrounding materials as specified.

D. Provide anchors, supports, bracing, clips, attachments, etc., as required to comply with the local seismic restraint requirements.

E. Verify, and coordinate mounting heights of all wall shelves and equipment with equipment located below for proper clearances.

F. Insulate contact points between dissimilar metals to prevent electrolysis. Cut, punch, and drill components for outlets, fixtures, piping, conduit, and fittings as required. Coordinate with other trades and provide holes in food service equipment for plumbing and electrical service to and through the fixtures as required or indicated. This includes welded sleeves, collars, ferrules, or escutcheons. These services are to be located so that they do not interfere with intended use, and / or servicing of the fixture.

G. Provide sealants and gaskets around each unit to make joints airtight, waterproof, vermin-proof, and sanitary for cleaning purposes. At internal corner joints, apply sealant or gaskets to form a sanitary cove. The shape exposed surfaces of sealant slightly concave. Sealant filled or gasketed joints will be acceptable up to 3/8” joint width. Wider joints are to be provided with a matching metal closure or trim strip with sealant application to each side of strip.

3.5 ADJUSTING:

A. Repair or replace equipment that is found to be defective in its operation, including units that are operating with excessive noise or vibration.

B. Test and adjust equipment, controls, and safety devices to ensure proper working order and conditions.

3.6 CLEANING AND RESTORING FINISHES:

A. Restore damaged finishes, polish exposed metal surfaces, and touch-up painted surfaces. Replace work, which cannot be successfully restored.

B. After completion of installation, and completion of other major work in foodservice areas, remove all protective coverings, films, etc., and clean foodservice equipment.

C. Clean and polish glass, plastic, hardware, accessories, fixtures, and fittings and leave in a condition ready for the owner to sanitize and use.

3.7 EQUIPMENT START-UP, TESTING, AND DEMONSTRATION:

A. Prior to final connections by other trades, the Food Service Equipment Contractor is responsible for inspecting and verifying the readiness of all utilities. FSEC to coordinate a site meeting with all trades required to review and approve all rough-in and accessory items that meet the equipment requirements per the manufacturer’s recommendations. A written report shall be submitted by the FSEC to the architect and/or consultant.

B. The Food Service Equipment Contractor is to test and start up ***all*** equipment prior to the equipment demonstration. Any problems should be addressed prior to the training, and a written report should be submitted by the FSEC to the architect and/or consultant.

C. The Food Service Equipment Contractor is to plan for a demonstration of food service equipment operation and maintenance in advance with the owner / operator. This training session for all equipment should be provided on one day or a few consecutive days pending approval by the owner/operator. Demonstrate all equipment to familiarize the owner / operator with operation and maintenance procedures including periodic preventative maintenance measures required. Include an explanation of service requirements, and simple on-site service procedures as well as information concerning the name, address, and telephone number of a qualified local source of service. The individual performing the demonstration should be knowledgeable of the operating and service aspects of the equipment. The FSEC shall provide a written attendance sheet for all attendees including owner/operator, FSEC representative, and all equipment demonstrators. Failure to provide this submittal will hinder the closeout of the project.

PART 4 - ITEMIZED SPECIFICATIONS:

ITEM: 01

QUANTITY: 1

MANUFACTURER: STRUCTURAL CONCEPTS

MODEL: B37R

DESCRIPTION: COLD GRAB & GO STATION
Oasis Self-Service Refrigerated Merchandiser, 35 5/8” wide, high profile, open front, (4) non-lighted shelves, top LED light, Breeze-E with Energy Wise self-contained refrigeration system, E-coated evaporator coil, condensate pan, magnetic air filter, one piece formed ABS plastic tub, black interior, full end panels with mirrored ends, stainless-steel interior, non-locking casters with levelers, ETL and NSF listed.

- 120/60/1
- Refrigeration: Breeze-E self-contained refrigeration, lower front air intake/upper front air discharge.
  - Compressor air intake through the lower front and channeled up the rear and out the upper front.
- Clean Sweep, automatic condenser coil cleaner
- Interior Color: Powder coated Silversan Black
- Exterior Color: Powder coated Silversan Black or laminate color to be selected by the architect.
- Rear Exterior Color: Black
- Rear Doors: None
- Lower Front Panel Color: Powder coated Silversan Black or laminate color to be selected by the architect.
- End Panel Left: Full stainless steel with mirror interior
- End Panel Right: Full stainless steel with mirror interior
- Thermometer: Digital Fahrenheit thermometer
- (LED) lights for all shelves
- Roll-down security cover with lock.
- One-year parts and labor warranty

- Five-year compressor warranty

ITEM: 02

QUANTITY: 1

DESCRIPTION: SNACK DISPLAY (BY OWNER – NOT IN CONTRACT)

ITEM: 03

QUANTITY: 1

DESCRIPTION: SNACK DISPLAY (BY OWNER – NOT IN CONTRACT)

ITEM: 04

QUANTITY: 1

MANUFACTURER: HOSHIZAKI

MODEL: FM-23-HC-BLK

DESCRIPTION: ICE CREAM STATION
Freezer Merchandiser, single section, 20.71 cubic feet capacity, 30" wide x 29 ¾" deep x 78" tall, (1) self-closing multi pane hinged glass door, door with lock, (5) adjustable shelves, LED interior lighting, temperature range: -10° to -0°F, bottom mount self-contained refrigeration system, 2" leveling legs, black painted galvanized steel exterior, white steel interior and stainless-steel floor, polyurethane insulation with cyclopentane blowing agent, R290 Hydrocarbon refrigerant, UL and NSF listed.

- 120/60/1
- Right hinge door

ITEM: 05

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE

MODEL: CCSL-28-MOD

DESCRIPTION: MOBILE CASHIER STATION
CounterCraft Serving Counter, 34" high, engineered stone top with eased edge, stainless steel enclosed cabinet body, full length under shelf, with casters (all with brakes).

- Mobile modular style construction.
- Fully welded angle iron frame utilizing 1.5" x 1.5" x 1/8" galvanized angle. Welds smoothly ground and sprayed with silver enamel paint. Angle iron to run front-to-back and at each mullion. 1/2" sound deadening tape to be applied to top of angle iron frame prior to installation of countertop.
- Counter top consists of 3cm engineered stone with eased edges. Grommet hole for POS cords. Color to be Corian Quartz "Ethereal White."

- Single sided tray slide consists of 3cm engineered stone with 3 ½" turndown, two stainless steel half round tray runners. Color to be Corian Quartz "Ethereal White."
- Counter front to consist of stand-off plastic laminate clad millwork decor panels with 1" stainless steel body reveal between panels. Color to be Wilsonart "Fawn Cypress" #8208K-16.
- LED lighting is located beneath the tray slide, with wiring concealed to a remote switch.
- All internal stainless-steel fabrication to be fully welded.
- Unit on locking casters with access pane to caster in kickplate.
- Stainless steel removable kickplate, fastened with screws.
- Installed with Insignia Endura-Stone Technology. Insignia Endura-Stone is backed by a Five-year warranty on all solid surface and stone countertops against cracks or breakage due to thermal or installation related stress. Counter-top seaming of joints is to be provided by CounterCraft.
- All electrical to be interconnected to a single cord and plug. Electrical is to be installed in electrical conduit pipe, flex conduit to be kept to a minimum. Exposed flex conduit will not be accepted. All receptacles mounted in the counter to be recess mounted and labeled. All electrical to be UL certified and pre-run with in the counter with connecting j-box.
- Provide integral cashier station with a locking utility drawer mounted to the underside of the counter top. Cashier section to be open below with removable intermediate shelves. Provide grommet hole with cap for dedicated outlet below.
- CAT5e data box for the POS system shall be mounted in the cashier stand base along with outlet for POS system.
- Serving Counter to be certified using Underwriters Laboratory (UL) Assembly Listing E253182 and must comply with UL 197 and NSF/Ansi Standard.
- Factory delivery, final assembly, and installation to be included.
- See detail drawings for more information.

ITEM: 06

QUANTITY: 1

MANUFACTURER: STRUCTURAL CONCEPTS

MODEL: FSI660R

DESCRIPTION: REFRIGERATED DISPLAY CASE
Oasis Refrigerated Self-Service Island, 80 ¾" x 48" x 60" tall, open-air screen, (3) non-lit non-adjustable metal shelves, top light, black interior, includes price tag molding, laminated exterior, levelers, Breeze self-contained refrigeration system, air intake on one side and out the other side, R290 Hydrocarbon refrigerant, removable deck pans with access to refrigeration system, ETL and NSF listed.

- 208-240/60/1
- Breeze self-contained refrigeration
- Casters with levelers
- Interior Color: Powder coated Silversan Black
- Exterior Color: Laminate color selection by the architect
- Thermometer: Digital Fahrenheit thermometer
- Shelving: Non-adjustable metal shelves
- Shelving: All shelves with LED lights
- One-year parts and labor warranty
- Five-year compressor warranty

- Second year parts and labor warranty

ITEM: 07

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE

MODEL: CSL-42-MOD

DESCRIPTION: CASHIER STATION
CounterCraft Serving Counter, 34" high, engineered stone top with eased edge, stainless steel enclosed cabinet body, full length under shelf, with casters (all with brakes).

- Mobile modular style construction.
- Fully welded angle iron frame utilizing 1.5" x 1.5” x 1/8" galvanized angle. Welds smoothly ground and sprayed with silver enamel paint. Angle iron to run front-to-back and at each mullion. 1/2" sound deadening tape to be applied to top of angle iron frame prior to installation of countertop.
- Counter top consists of 3cm engineered stone with eased edges. Color to be Corian Quartz “Ethereal White.”
- Double tray slide consists of 3cm engineered stone with 3 ½” turndown, two stainless steel half round tray runners. Color to be Corian Quartz “Ethereal White.”
- Allowance for (8) Cut outs for silverware cylinders.
- (12) Steril-Sil Model #RP-25 Black plastic silverware cylinders.
- Counter front to consist of stand-off plastic laminate clad millwork decor panels with 1” stainless steel body reveal between panels. Color to be Wilsonart “Fawn Cypress” #8208K-16.
- LED lighting is located beneath the tray slide, with wiring concealed to a remote switch.
- All internal stainless-steel fabrication to be fully welded.
- Unit on locking casters with access pane to caster in kickplate.
- Stainless steel removable kickplate, fastened with screws.
- Installed with Insignia Endura-Stone Technology. Insignia Endura-Stone is backed by a Five-year warranty on all solid surface and stone countertops against cracks or breakage due to thermal or installation related stress. Counter-top seaming of joints is to be provided by CounterCraft.
- Allowance for the milk cooler to plug into the cashier unit.
- All electrical to be interconnected to a single cord and plug. Electrical is to be installed in electrical conduit pipe, flex conduit to be kept to a minimum. Exposed flex conduit will not be accepted. All receptacles mounted in the counter to be recess mounted and labeled. All electrical to be UL certified and pre-run with in the counter with connecting j-box.
- Provide integral cashier station with a locking utility drawer mounted to the underside of the counter top. Cashier section to be open below with removable intermediate shelves. Provide grommet hole with cap for dedicated outlet below.
- CAT5e data box for the POS system shall be mounted in the cashier stand base along with outlet for POS system.
- Serving Counter to be certified using Underwriters Laboratory (UL) Assembly Listing E253182 and must comply with UL 197 and NSF/Ansi Standard.
- Factory delivery, final assembly, and installation to be included.
- See detail drawings for more information.

ITEM: 08

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE

MODEL: CCSL-42-MOD

DESCRIPTION: CASHIER STATION
CounterCraft Serving Counter, 34" high, engineered stone top with eased edge, stainless steel enclosed cabinet body, full length under shelf, with casters (all with brakes).

- Mobile modular style construction.
- Fully welded angle iron frame utilizing 1.5" x 1.5” x 1/8" galvanized angle. Welds smoothly ground and sprayed with silver enamel paint. Angle iron to run front-to-back and at each mullion. 1/2" sound deadening tape to be applied to top of angle iron frame prior to installation of countertop.
- Counter top consists of 3cm engineered stone with eased edges. Color to be Corian Quartz “Ethereal White.”
- Double tray slide consists of 3cm engineered stone with 3 ½” turndown, two stainless steel half round tray runners. Color to be Corian Quartz “Ethereal White.”
- Allowance for (8) Cut outs for silverware cylinders.
- (12) Steril-Sil Model #RP-25 Black plastic silverware cylinders.
- Counter front to consist of stand-off plastic laminate clad millwork decor panels with 1” stainless steel body reveal between panels. Color to be Wilsonart “Fawn Cypress” #8208K-16.
- LED lighting is located beneath the tray slide, with wiring concealed to a remote switch.
- All internal stainless-steel fabrication to be fully welded.
- Unit on locking casters with access pane to caster in kickplate.
- Stainless steel removable kickplate, fastened with screws.
- Installed with Insignia Endura-Stone Technology. Insignia Endura-Stone is backed by a Five-year warranty on all solid surface and stone countertops against cracks or breakage due to thermal or installation related stress. Counter-top seaming of joints is to be provided by CounterCraft.
- Allowance for the milk cooler to plug into the cashier unit.
- All electrical to be interconnected to a single cord and plug. Electrical is to be installed in electrical conduit pipe, flex conduit to be kept to a minimum. Exposed flex conduit will not be accepted. All receptacles mounted in the counter to be recess mounted and labeled. All electrical to be UL certified and pre-run with in the counter with connecting j-box.
- Provide integral cashier station with a locking utility drawer mounted to the underside of the counter top. Cashier section to be open below with removable intermediate shelves. Provide grommet hole with cap for dedicated outlet below.
- CAT5e data box for the POS system shall be mounted in the cashier stand base along with outlet for POS system.
- Serving Counter to be certified using Underwriters Laboratory (UL) Assembly Listing E253182 and must comply with UL 197 and NSF/Ansi Standard.
- Factory delivery, final assembly, and installation to be included.
- See detail drawings for more information.

ITEM: 09

DESCRIPTION: SPARE NUMBER

ITEM: 10

QUANTITY: 2

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: MC3ND

DESCRIPTION: MILK COOLER
Milk Cooler, forced air, dual access, drop-down doors, flat top carton capacities hold (18) 13" x 13" x 11" or (4) 19" x 13" x 11” milk crates, self-latching doors/lids with safety bumpers, cylinder lock, heavy-duty epoxy coated wire floor racks, electronic control, exterior digital thermometer, auto defrost, stainless steel interior and exterior with reinforced stainless-steel floor, 2” polyurethane foam insulation throughout, R290 Hydrocarbon refrigerant, snap in door gaskets, floor drain, 1/4 HP, 5” casters, UL and NSF listed.

- 120/60/1
- Self-Contained refrigeration
- Low profile evaporator for dual access of crates.
- Wrap around bumper
- Floor lock
- Exterior digital thermometer
- Seven-years parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 11

DESCRIPTION: SPARE NUMBER

ITEM: 12

DESCRIPTION: SPARE NUMBER

ITEM: 13

DESCRIPTION: SPARE NUMBER

ITEM: 14

QUANTITY: 1

MANUFACTURER: FOOD WARMING EQUIPMENT

MODEL: UHS-4-L

DESCRIPTION: HEATED CABINET
Heated Cabinet, mobile, (4) universal tray slides, (4) 18" x 26" or (8) 12" x 20" pan capacity per compartment, 4 ½” OC, adjustable on 1 ½” increments, Humi-temp heat and humidity heating system, adjustable thermostat, individual controls, removable humidifier pan, fully insulated on top, back, bottom, sides, and doors, (1) flush mounted door, edge mount door latches, push bar handles, wraparound bumper, stainless steel all welded tubular frame construction, 4 3.5" casters two four (4) swivel with brakes, NSF and UL listed.

- 120/60/1
- Manual Control
- Left hand hinge door
- Two-year parts warranty
- One-year labor warranty
- Coordinate with counter opening and height
- Outlet in cabinet base wired to load center.

ITEM: 15

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: HF91-2-HFL-HFL

DESCRIPTION: HOT/ COLD SHELF
Hot / Frost Display Merchandiser, open front, two tiers with switchable full hot or cold function on each tier, individually controlled and operated tiers, stainless-steel body and shelves, lighted and slanted shelves, programmable color touch screen control, self-contained refrigeration, UL, and NSF listed.

- 120/208/60/1: Wired to load center
- Digital Connected Control System
- One-year parts and labor warranty

ITEM: 16

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: CP2-SL-DC-D

DESCRIPTION: CONDIMENT & DRESSING STATION
Cold food unit, ¾” top recess, accommodates (2) 12" x 20" x 6” pans stainless steel cold refrigerated pans, 300 series stainless steel top with overhang and locking tabs, fully insulated galvanized exterior housing, digital touch screen control panel, Wi-Fi enabled, air-cooled condensing unit, (2) individually controlled cold wells, 1” drain extended through cabinet base, 72" control wire, includes spacing rim, UL and NSF listed.

- 120/60/1: Wired to load center.
- Five-year compressor warranty
- (6) Vollrath Model #30062 Super Pan V Full Size Food Pan, 6" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #77250 Super Pan V Steam Table Pan Cover, Stainless, full size, NSF

ITEM: 17

DESCRIPTION: SPARE NUMBER

ITEM: 18

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: CP1-SL-DC-D

DESCRIPTION: BURGER TOPPING STATION
Cold food unit, ¾" top recess, accommodates (1) 12" x 20" x 6" pans stainless steel cold refrigerated pans, 300 series stainless steel top with overhang and locking tabs, fully insulated galvanized exterior housing, digital touch screen control panel, Wi-Fi enabled, air-cooled condensing unit, (2) individually controlled cold wells, 1" drain extended through cabinet base, 72" control wire, includes spacing rim, UL and NSF listed.
- 120/60/1: Wired to load center.
- Five-year compressor warranty

ITEM: 19

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT

MODEL: BGA-1

DESCRIPTION: BREATH GUARD
Counter Craft single tier, adjustable series food guards from full service to self-service with #8 highlight edges, 1-1/4" square steel post. Posts extend through the countertop and secure to the angle iron frame within counter body. 3/8" tempered top, front, side, and serving shelf glass panels. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected. Includes LED lights only with no heat. Adheres to current NSF standards.

ITEM: 20

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: HF48-2-HFL-HFL

DESCRIPTION: BURGER STATION
Hot / Frost Display Merchandiser, open front, two tiers with switchable full hot or cold function on each tier, individually controlled and operated tiers, stainless-steel body and shelves, lighted and slanted shelves, programmable color touch screen control, self-contained refrigeration, UL, and NSF listed.
- 120/208/60/1: Wired to load center
- Digital Connected Control System
- One-year parts and labor warranty

ITEM: 21

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: FCP3-SB

DESCRIPTION: SALAD STATION
Cold food drop-in Slimline unit, accommodates (3) 12" x 20" stainless steel cold refrigerated pans, stainless steel top with overhang and locking tabs, fully insulated galvanized exterior housing, digital touch screen control panel, Wi-Fi enabled, air-cooled condensing unit, (2) individually controlled cold wells, flush mounted wells, 1” drain extended through cabinet base, 72" control wire, includes spacing rim, R290 Refrigerant, NEMA 5-15P, UL and NSF listed.

- 120/60/1: Wired to load center.
- Flush mount wells
- Five-year compressor warranty
- (6) Vollrath Model #30042 Super Pan V Full Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #77250 Super Pan V Steam Table Pan Cover, Stainless, full size, NSF
- (6) Vollrath Model #30242 Super Pan V Half Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #75120 Super Pan V Steam Table Pan Cover, Stainless, 1/2 size, NSF

ITEM: 22

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT

MODEL:BGA-1

DESCRIPTION: BREATH GUARD
Counter Craft single tier, adjustable series food guards from full service to self-service with #8 highlight edges, 1-1/4" square steel post. Posts extend through the countertop and secure to the angle iron frame within counter body. 3/8” tempered top, front, side, and serving shelf glass panels. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected. Includes LED lights only with no heat. Adheres to current NSF standards.

ITEM: 23

DESCRIPTION: SPARE NUMBER

ITEM: 24

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: HCF-3

DESCRIPTION: HOT/ COLD FOOD STATION
Hot, Cold, Freeze Combination Pan, drop-in, heated and refrigerated, (3) 12" x 20" pan capacity, 300 series stainless steel interior liners, independent electronic controls, individual wired remote digital

controls for hot or cold operation, stainless steel top and well, steel exterior housing, fully insulated galvanized exterior housing air cooled self-contained refrigeration, 1” drain extended through cabinet base, and UL and NSF listed.

- 120/208/60/1: Wired to load center.
- Flush mounted pans
- Dry heat wells with silicone liners
- Digital Connected Control System
- Two- year parts and labor warranty
- Five-year compressor warranty
- (6) Vollrath Model #30042 Super Pan V Full Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #77250 Super Pan V Steam Table Pan Cover, Stainless, full size, NSF
- (12) Vollrath Model #30242 Super Pan V Half Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (12) Vollrath Model #75120 Super Pan V Steam Table Pan Cover, Stainless, 1/2 size, NSF.

ITEM: 25

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE MANUFACTURING

MODEL: BGA-1

DESCRIPTION: BREATH GUARD
Counter Craft single tier, adjustable series food guards from full service to self-service with #8 highlight edges, 1-1/4" square steel post. Posts extend through the countertop and secure to the angle iron frame within counter body. 3/8” tempered top, front, side, and serving shelf glass panels. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected. Includes LED lights only with no heat. Adheres to current NSF standards.

ITEM: 26

QUANTITY: 1

MANUFACTURER: DUKE MANUFACTURING

MODEL: WW-5

DESCRIPTION: HOT FOOD STATION
Waterless hot food unit, 5 well drop-in unit, electric, dry operation, (5) 12" x 20" stainless steel hot food wells individually controlled, removable FDA approved black silicone rubber liner, fully insulated galvanized exterior housing, lift-out style for service, touch screen control panel with (3) preset temperatures, Wi-Fi enabled, 72" control wire, includes spacing rim, UL and NSF listed.

- 208/60/1: Wired to load center.
- Dry well operation with silicone liners
- No drain or water connection is required.
- Digital Connected Control System
- Recess for sheet pans

- (6) Vollrath Model #30042 Super Pan V Full Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #30022 Super Pan V Full Size Food Pan, 2 ½" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (6) Vollrath Model #77250 Super Pan V Steam Table Pan Cover, Stainless, full size, NSF
- (12) Vollrath Model #30242 Super Pan V Half Size Food Pan, 4" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (12) Vollrath Model #30222 Super Pan V Half Size Food Pan, 2 ½" deep, 22-gauge 300 series stainless steel, reinforced pour corners, reverse formed flattened edges, anti-jamming design, NSF
- (12) Vollrath Model #75120 Super Pan V Steam Table Pan Cover, Stainless, 1/2 size, NSF

ITEM: 27

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE MANUFACTURING

MODEL: BGA-1

DESCRIPTION: BREATH GUARD
Counter Craft single tier, adjustable series food guards from full service to self-service with #8 highlight edges, 1-1/4" square steel post. Posts extend through the countertop and secure to the angle iron frame within counter body. 3/8" tempered top, front, side, and serving shelf glass panels. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected. Includes LED lights only with no heat. Adheres to current NSF standards.

ITEM: 28

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE MANUFACTURING

MODEL: SCOL-548.5/449

DESCRIPTION: SERVING COUNTER
CounterCraft Serving Counter, 34" high, engineered stone top with eased edge, stainless steel enclosed cabinet body, full length under shelf, and 6" stainless steel legs with adjustable feet.

- Continuous semi-enclosed base style construction with utility chase within counter.
- Fully welded angle iron frame utilizing 1.5" x 1.5" x 1/8" galvanized angle. Welds smoothly ground and sprayed with silver enamel paint. Angle Iron to be framed around each cutout for drop-in-equipment. Angle iron to run front-to-back and at each mullion. 1/2" sound deadening tape to be applied to top of angle iron frame prior to installation of countertop.
- Counter top consists of 3cm engineered stone with eased edges. Color to be Corian Quartz "Ethereal White."
- Tray slide consists of 3cm engineered stone with 3 ½" turndown, two stainless steel half round tray runners. Color to be Corian Quartz "Ethereal White."
- Counter front to consist of stand-off plastic laminate clad millwork decor panels with 1" stainless steel body reveal between panels. Color to be Wilsonart "Fawn Cypress" #8208K-16.

- LED lighting is located beneath the tray slide, with wiring concealed, and a remote switch on operators' side of the counter.
- Stainless steel internal shelving compartments, fully enclosed back, sides, and top. Removable rear access panels, removable top panel, coved corners All internal stainless-steel fabrication to be fully welded.
- All stainless-steel fabrication to be fully welded. Butt or knuckle joints will not be accepted.
- Provide compressor compartments with hinged louvered door panels and provide proper ventilation for compressors as required by the equipment.
- Open storage where possible.
- Reinforced cut out for drop-in and slide-in units. The drop-in and slide-in units are to be furnished by the F.S.E.C.
- Stainless steel legs and adjustable bullet feet
- Stainless steel removable kickplate, fastened with screws
- Installed with Insignia Endura-Stone Technology. Insignia Endura-Stone is backed by a Five-year warranty on all solid surface and stone countertops against cracks or breakage due to thermal or installation related stress. Counter-top seaming of joints is to be provided by CounterCraft.
- All electrical to be interconnected to load center. Electrical is to be installed in electrical conduit pipe, flex conduit to be kept to a minimum. Exposed flex conduit will not be accepted. All wiring to be numbered at all junctions per circuit. Wiring diagram to are provided at each load center door. All receptacles mounted in the counter to be recess mounted and labeled. All electrical to be UL certified and pre-run with in the counter with connecting j-box and 24-panel load centers. Onsite reconnection of electrical wiring is included, which may be required if the serving line has a field joint and to be interconnected by the F.S.E.C.
- Provide grommet holes as required for countertop equipment.
- Plumbing lines are to be 3/4" copper coated for corrosion lines. All hot food well drains are to be manifolded with unions for ease of maintenance. Manifolded drains lead to single 3/4" turn ball valve mounted in full stainless-steel housing. Drain valve to be located on operator side for ease of access. All plumbing will be located within the utility chase of the counter.
- Custom control panel containing remote mounted controls for drop-in equipment with labeling and switches.
- Provide custom Counter Craft single tier, adjustable series food guards with #8 highlight edges 1-1/4" square steel post. Posts to extend through the countertop and secure to the angle iron frame within counter body. 3/8" tempered top, front, sides or thicker as required by the span, and serving shelf glass panels. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected. Guards will be easily adjustable from NSF self-service position to a fully closed service position. Includes LED lights only with no heat. Adheres to current NSF standards. Frame of breath guards are to be stainless steel finish.
- Connected Control System is powered by Duke Sous Chef Technology. Touchscreen digital controls with secure Bluetooth Mesh connectivity. All compatible appliances are controllable from touchscreen control and/or the mobile application.
- Serving Counter to be certified using Underwriters Laboratory (UL) Assembly Listing E253182 and must comply with UL 197 and NSF/Ansi Standard.
- Factory delivery, final assembly, and installation to be included.
- See detail drawings for more information.

ITEM: 29

DESCRIPTION: SPARE NUMBER

ITEM: 30

QUANTITY: 1

MODEL: HF64-2-HFL-HFL

DESCRIPTION: PRE-MADE PANNI STATION
Hot / Frost Display Merchandiser, open front, two tiers with switchable full hot or cold function on each tier, individually controlled and operated tiers, stainless-steel body and shelves, lighted and slanted shelves, programmable color touch screen control, self-contained refrigeration, UL, and NSF listed.

- 120/208/60/1: Wired to load center
- Digital Connected Control System
- One-year parts and labor warranty

ITEM: 31

QUANTITY: 3

MANUFACTURER: GLOBE

MODEL: GPG14D

DESCRIPTION: PANINI STATION
Double Panini Sandwich Grills with Cast-Iron Plates, 14” wide x 14” deep x 28” tall, low profile sandwich press, Pivot-action top plate to accommodate food variety, Thermostatically controlled temperature range, stainless steel body with separate controls on each side, easy-clean drip tray, countertop, 2700-3600 watts, UL and NSF listed.

- 208/240/60/ with cord and plug
- Cleaning brush
- One-year parts and labor warranty

ITEM: 32

QUANTITY: 1

MANUFACTURER: COUNTERCRAFT BY DUKE

MODEL: BGW

DESCRIPTION: BREATH GUARD
Counter Craft glass wall with frosted glass or school mascot, 1-1/4" square steel post. Posts extend through the countertop and secure to the angle iron frame within counter body. 3/8” tempered front and sides. Glass is to have high polish profiled edges with rounded corners; sharp edges will be rejected.

ITEM: 33

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CBWT3060-US

DESCRIPTION: WORK TABLE
Cabinet Base Work Table shall be custom built as per General Specifications, approximately 5’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with square edge, 6" high backsplash with fully enclosed ends. Cabinet base to have locking cabinet doors, stainless-steel bottom, and removable and adjustable center shelf the length of the unit. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Coordinate backsplash height with wall receptacles.

ITEM: 34

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D2RNSS

DESCRIPTION: REACH-IN REFRIGERATOR
Designer Line Refrigerator, double section, self-contained expansion-valve refrigeration, stainless steel exterior, and interior with polyurethane foam insulation throughout, standard depth cabinet, full-height doors with locks and vertical handles, door hinges are self- closing with a hold open feature, LED lighting, electronic temperature control with exterior digital display, UL and NSF listed.

- 120/60/1
- (2) Additional shelves
- 5” Casters with brakes
- Seven-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 35

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CBWT3070-US

DESCRIPTION: WORK TABLE
Cabinet Base Work Table shall be custom built as per General Specifications, approximately 5’10” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with square edge, 6" high backsplash with fully enclosed ends. Cabinet base to have locking cabinet doors, stainless-steel bottom, and removable and adjustable center shelf the length of the unit. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Coordinate backsplash height with wall receptacles.

ITEM: 36

QUANTITY: 1

MANUFACTURER: GLOBE

MODEL: SG13A

DESCRIPTION: FOOD SLICER
Premium Heavy Duty Slicer, automatic, 13” steel knife with hardened edge, four speeds, three stroke lengths, LCD display, top-mounted removable sharpener, knife cover interlock, kickstand, tilting carriage accommodates up to 13 ¾” high, 8” diameter, 11” wide large products, advanced meat grip, seamless anodized aluminum base, 1/2 HP knife motor, auto off feature, UL and NSF listed, made in USA.

- 120/60/1
- 13” Globe knife blade
- Knife blade removal tool
- Fence
- Vegetable Hopper
- Large Slicer Cover
- Wall Chart
- Two-year parts and labor warranty.
- Lifetime sharpening stones warranty.

ITEM: 37

QUANTITY: 1

MANUFACTURER: ADVANCE TABCO

MODEL: 7-PS-91

DESCRIPTION: HAND SINK
Hand Sink, wall model with pedestal base, approximately 14” x 10” x 5” sink bowl with inverted “V” edge, 8” integral backsplash, 20-gauge, #304 stainless steel all welded construction, one (1) hole for splash-mounted faucet, 6" apron, includes hands free electronic faucet, basket drain, mounting bracket and clip with hardware, and NSF listed.

- Model #7-PS-10 P-Trap Assembly
- Electronic Faucet, splash type, gooseneck, with metering/check valve.
- Full length sink apron.
- Front Access Panel
- Mount and seal to the wall
- Coordinate with P.C. to make sure utilities and censored faucet components fit within the stainless-steel enclosure provided with the sink.

ITEM: 38

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: DL1WI-SS-RT

DESCRIPTION: ROLL- THROUGH HEATED CABINET
Designer Line Series Heated Cabinet, single section, roll-thru, stainless-steel exterior, and interior with 3" polyurethane foam insulation throughout, stainless steel reinforced floor, standard depth cabinet, accommodates 66" high racks, full height doors with lock and vertical workflow handle, door hinges are self- closing with a hold open feature, welded corners on all doors, snap in door gaskets and lock, LED lighting , and electronic controls with exterior digital thermometer, UL and NSF listed.

- 208/60/1
- Left hinge on kitchen side
- Right hinge on serving line side
- Six-years parts and labor warranty
- Two-year door gasket warranty
- (1) Channel Manufacturing, Model #AXD-UTR-14, Pan Rack, heavy-duty series, 21" wide x 26" deep x 64" high, all aluminum welded construction, end load, 4" Angle Spacing, fifteen (15) tiers to hold one (1) 18" x 26" or two (2) 12" x 20" steam table pans per shelf, 5" x 2" heavy-duty swivel plate casters with Zerk grease fitting style, NSF listed.
  - Made in USA
  - Corner Bumpers
  - (2) Heavy-duty casters with brakes
  - Lifetime warranty against rust and corrosion
- (12) Vollrath Model #5315, Full size sheet pan, 18"wide x 26" deep x 1" heigh, 12-gauge 3000 series aluminum, open bead, natural finish, NSF, Made in USA.

ITEM: 39

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT30120-US

DESCRIPTION: PREP TABLE
Work Table shall be custom built as per General Specifications, approximately 10'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 16"x 20" x 14" deep sink bowl with removable bowl cover, with a cover holder mounted under the countertop next to the sink bowl, lever waste, and slotted bracket. Provide two (2) 20"x 20" x 5" stainless steel drawers with lock on anti-slam slides with ½" Poly cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Seal the table to the wall.
- Coordinate wall receptacles with backsplash height.
- (1) T&S Brass Model #B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.

  - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
  - (2) Model #017420-45 24" flex supply hoses
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 ½" sink opening, 2" drain outlet with 1 ½" adapter and overflow assembly.

ITEM: 40

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS- PT30144-US-OS

DESCRIPTION: PREP TABLE
Work Table shall be custom built as per General Specifications, approximately 12'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 16"x 20" x 14" deep sink bowl with removable bowl cover, with a cover holder mounted under the countertop next to the sink bowl, lever waste, and bracket. Provide two (2) 20"x 20" x 5" stainless steel drawers with lock on anti-slam slides with ½" Richlite cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Provide two (2) wall mounted, 12" deep solid over shelf with a 2" rear upturn tight to the wall.
  - Verify mounting height with owner.
  - Coordinate wall backing with General Contractor
- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Coordinate wall receptacles with backsplash and over shelf height.
- Seal the table to the wall.
- (1) T&S Brass Model #B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
  - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
  - (2) Model #017420-45 24" flex supply hoses
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 ½" sink opening, 2" drain outlet with 1 ½" adapter and overflow assembly.

ITEM: 41

QUANTITY: 1

MANUFACTURER: ROBOT COUPE

MODEL: CL52E

DESCRIPTION: FOOD PROCESSOR

Commercial Food Processor, includes vegetable prep attachment with full moon shaped and one round hopper, magnetic safety system, motor brake and lever activated auto restart, stainless steel motor base and shaft, chute, and continuous feed, reversible discharge plate, (1) #28058 3mm grating disc, (1) #28064 3mm slicing disc, stainless steel base, single speed 425 RPM, 2 HP, ETL and NSF listed.

- 120/60/1
- One-year parts and labor warranty
- Model #28063W Slicing Disc, 2mm (5/64")
- Model #28004W Slicing Disc, 4mm (5/32")
- Model #28067W Slicing Disc, 10mm (3/8")
- Model #28065W Slicing Disc, 5mm (3/16")
- Model #28059W Grating Disc, 5mm (3/16")
- Model #28112W Dicing Kit, 10 x 10mm (3/8"), includes: slicing disc (28130) and dicing grid (#28119)
- Model #107810 “S” Blade and Disc Holder, wall mount, holds (1) “S” blade and (8) discs.

ITEM: 42

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D1RIN-SS-RT

DESCRIPTION: PASS-THROUGH REFRIGERATOR
Refrigerator, roll-thru, single section, self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic electric condensate evaporator, stainless steel exterior and interior, 3” polyurethane foam insulation throughout, standard depth cabinet, full-height solid doors with locks and vertical workflow handles, door hinges are self- closing with a hold open feature, welded corners on all doors, snap in door gaskets, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, stainless steel ramps, accommodates 66” high racks, UL and NSF listed.

- 120/60/1
- Right hinge on kitchen side
- Right hinge on serving line side
- Six-years parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty
- (1) Channel Manufacturing, Model #AXD-UTR-14, Pan Rack, heavy-duty series, 21" wide x 26" deep x 64" high, all aluminum welded construction, end load, 4" Angle Spacing, fifteen (15) tiers to hold one (1) 18" x 26" or two (2) 12" x 20" steam table pans per shelf, 5" x 2" heavy-duty swivel plate casters with Zerk grease fitting style, NSF listed.
  - Made in USA
  - Corner Bumpers
  - (2) Heavy-duty casters with brakes
  - Lifetime warranty against rust and corrosion
- (12) Vollrath Model #5315, Full size sheet pan, 18"wide x 26" deep x 1" heigh, 12-gauge 3000 series aluminum, open bead, natural finish, NSF, Made in USA.

ITEM: 43

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: DL1WI-SS-RT

DESCRIPTION: ROLL- THROUGH HEATED CABINET
Designer Line Series Heated Cabinet, single section, roll-thru, stainless-steel exterior, and interior with 3" polyurethane foam insulation throughout, stainless steel reinforced floor, standard depth cabinet, accommodates 66" high racks, full height doors with lock and vertical workflow handle, door hinges are self- closing with a hold open feature, welded corners on all doors, snap in door gaskets and lock, LED lighting , and electronic controls with exterior digital thermometer, UL and NSF listed.

- 208/60/1
- Left hinge on kitchen side
- Right hinge on serving line side
- Six-years parts and labor warranty
- Two-year door gasket warranty
- (1) Channel Manufacturing, Model #AXD-UTR-14, Pan Rack, heavy-duty series, 21" wide x 26" deep x 64" high, all aluminum welded construction, end load, 4" Angle Spacing, fifteen (15) tiers to hold one (1) 18" x 26" or two (2) 12" x 20" steam table pans per shelf, 5" x 2" heavy-duty swivel plate casters with Zerk grease fitting style, NSF listed.
  - Made in USA
  - Corner Bumpers
  - (2) Heavy-duty casters with brakes
  - Lifetime warranty against rust and corrosion
- (12) Vollrath Model #5315, Full size sheet pan, 18"wide x 26" deep x 1" heigh, 12-gauge 3000 series aluminum, open bead, natural finish, NSF, Made in USA.

ITEM: 44

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT30108-US

DESCRIPTION: PREP TABLE
Work Table shall be custom built as per General Specifications, approximately 9'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 16"x 20" x 14" deep sink bowl with removable bowl cover, with a cover holder mounted under the countertop next to the sink bowl, lever waste, and slotted bracket. Provide two (2) 20"x 20" x 5" stainless steel drawers with lock on anti-slam slides with ½" Poly cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Coordinate wall receptacles with backsplash.
- Coordinate window opening with backsplash
- Seal the table to the wall.

- (1) T&S Brass Model #B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
  - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
  - (2) Model #017420-45 24" flex supply hoses
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 ½" sink opening, 2" drain outlet with 1 ½" adapter and overflow assembly.

ITEM: 45

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D2RNSS

DESCRIPTION: REACH-IN REFRIGERATOR
Designer Line Refrigerator, double section, self-contained expansion-valve refrigeration, stainless steel exterior, and interior with polyurethane foam insulation throughout, standard depth cabinet, full-height doors with locks and vertical handles, door hinges are self- closing with a hold open feature, LED lighting, electronic temperature control with exterior digital display, UL and NSF listed.

- 120/60/1
- (2) Additional shelves
- 5" Casters with brakes
- Seven-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 46

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS- PT30126-US-WS

DESCRIPTION: PREP TABLE
Work Table shall be custom built as per General Specifications, approximately 10'6" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 16" x 20" x 14" deep sink bowl with removable bowl cover, with a cover holder mounted under the countertop next to the sink bowl, lever waste, and slotted bracket. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Provide two (2) wall mounted, 12" deep solid over shelf with a 2" rear upturn tight to the wall.
  - Verify mounting height with owner.
  - Coordinate wall backing with General Contractor
- Flanged feet on front corner legs only.

- Secure flanged feet to the floor with stainless steel fasteners.
- Coordinate wall receptacles with backsplash and wall shelves.
- Seal the table to the wall.
- (1) T&S Brass Model #B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
  - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
  - (2) Model #017420-45 24" flex supply hoses
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 ½" sink opening, 2" drain outlet with 1 ½" adapter and overflow assembly.

ITEM: 47

QUANTITY: 1

MANUFACTURER: CHANNEL MANUFACTURING

MODEL: AXD- UTR-14

DESCRIPTION:SHEET PAN RACK
- (1) Channel Manufacturing, Model #AXD-UTR-14, Pan Rack, heavy-duty series, 21" wide x 26" deep x 64" high, all aluminum welded construction, end load, 4" Angle Spacing, fifteen (15) tiers to hold one (1) 18" x 26" or two (2) 12" x 20" steam table pans per shelf, 5" x 2" heavy-duty swivel plate casters with Zerk grease fitting style, NSF listed.
  - Made in USA
  - Corner Bumpers
  - (2) Heavy-duty casters with brakes
  - Lifetime warranty against rust and corrosion
- (12) Vollrath Model #5315, Full size sheet pan, 18"wide x 26" deep x 1" heigh, 12-gauge 3000 series aluminum, open bead, natural finish, NSF, Made in USA.

ITEM: 48

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-MWT3048-US

DESCRIPTION: MOBILE WORK TABLE
Mobile Work Table shall be custom built as per General Specifications, approximately 4'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge and bull-nosed corners, turn-down on all four sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.
- Built-in Sheet Pan rack under the counter top with universal pan slides at 3" spacing.

ITEM: 49

QUANTITY: 1

MANUFACTURER: HALTON

MODEL: KVE-CJ-77

DESCRIPTION: EXHAUST HOOD
Provide Halton exhaust hood per drawing #FS104 as shown on plans and in accordance with the following specifications:

The dry filter type hood is a Type I, commercial kitchen, U.L. 710 listed ventilator canopy, approved for use over 400° F and 600° F. Ventilator canopy shall be size, and shape as shown on drawing and shall be complete with grease filters, grease trough, removable grease cup, and without a fire damper in exhaust duct. This non compensating exhaust only ventilator canopy is intended for use over light to heavy-duty types of cooking appliances. The hood shall have the size, shape, and performance specified in the contract documents. The hood section is approximately 7’ 5” x 5' 4" x 24” high with (1) 12” x 10” rear top exhaust collar. The total exhaust is a total of 1,455 CFM. Exhaust duct collar to be fully welded with 4" high and a 1" flange. Ventilator canopy is to include temperature sensors in the duct to sense heat from cooking equipment and automatically energize the exhaust and makeup air systems per IMC-2006 507.2.1.1. Unit shall have a fire cabinet mounted on the side of the hood complete with an electrical control system.

Furnish and install a complete kitchen exhaust canopy. The hood shall be an Exhaust canopy. Halton Model KVE Wall Mounted style as manufactured by the HALTON Company of Scottsville, Kentucky. The canopy shall bear either the ETL or Underwriters Laboratories U.L. label, for listed range hood without exhaust fire damper per standard 710 and be fabricated in compliance with NFPA-96-2001 and shall bear the National Sanitation Foundation seal of approval.

All exposed surfaces shall be 18-gauge stainless steel with a #4 brushed finish, double shell end walls, and face construction. Single wall construction will not be permitted. Hood shall be UL Listed and labeled for “zero clearance” at the end(s) of the hood as shown on drawings when mounted against a wall. Unexposed surfaces are 18-gauge stainless steel. The installation shall be in accordance with the manufacturer’s recommendations and conform to NFPA-96 guidelines and all applicable local codes. The hood height shall not exceed 24” tall. The overall lengths of the hoods shall be as indicated on drawings and/or equipment schedule. Use of Capture Walls to create a seal between cooking equipment and wall shall not be used as they require cooking equipment to be located further from wall reducing isle space. Bottom edge of hood front panels to be square, chamfered front shall not be allowed as they reduce front overhang and jeopardize capture and containment over tall cooking equipment. The use of stainless-steel end panels shall not be permitted.

The exhaust duct connection shall be made at the rear and top of the hood extraction chamber as shown on contract drawings. Seams and joints shall be welded liquid tight in accordance with National Fire Protection Association (NFPA) bulletin #96. Exposed external welds shall be ground and polished to match the original material finish. The hood shall be Underwriters Laboratories (UL) Listed 710. Construction shall conform to the requirements of National Sanitation Foundation (NSF) standard 2 and the NSF seal shall be displayed on the front face of the hood. Hanger brackets shall be threaded ½-13 and located on approximately five-foot centers.

The hood will include an active internal “Capture-Jet” System on all open sides of the hood that will allow for Capture and Containment of thermal plume at specified air volumes. The Capture Jet air shall be pulled

into a 1" air plenum with the Capture-Jet fan and discharged through Capture-Jet ports that are located along the inside front, side, and bottom edge of the hood at discharge velocity of 1800 FPM. Slot type, passive devices or "Short-Cycle" discharge is not acceptable.

Each canopy shall have a filter housing of the same material as the canopy liner. The filter housing shall be equipped with a concealed drip tray the full length of the canopy and with a grease cup for easy removal and daily cleaning. The hood shall be equipped with Halton KSA (High Efficiency) multi-cyclone Stainless Steel grease extractors. The KSA filters shall be NSF and UL classified. The particulate extraction efficiency is 93% on particulates of 5 microns and 98% on particles with a diameter of 10 microns or larger per ASTM F2519 method of test. The pressure loss over the extractor shall not exceed 0.50 inches W.C. at flow rates approved by UL for heavy load cooking. Sound levels shall not exceed an NC rating of 55. Baffle, adjustable or slot type extractors shall not be acceptable. The airflows through the KSA extractors and the Capture Jet air chamber are to be determined through the integral T.A.B. (Testing and Balancing) ports located on the outside end of the exhaust plenum inside each hood section. It is the responsibility of the air balancer to adjust the exhaust volumes after installation with a Magnahelic Gauge or Shortridge Digital Anemometer and the hood TAB ports to match the Pressure vs Air Flow Curves card provided in each hood section. The exhaust airflow will be calculated based on the convective heat generated by the appliances underneath each canopy. Submittal shall include convective heat calculations based on the input power of the appliance served and efficiency of hood system consistent with results of independent test based on ASTM Standards F-1704-05 Capture & Containment and F-2474-05 Heat Gain to Space. Final air volume calculations shall comply with the hood listing. The use of end panels or rear seals to achieve required airflows are not acceptable.

An illuminated hood light button and exhaust fan on/off button to be provided by hood manufacturer and installed flush mounted under the front lip of the hood as shown on contract drawings for ease of access. Each hood shall be equipped with Halton Culinary LED Lights (HCL). Constructed from stainless steel frame and Aluminum hosing, the light fitting comprises flush mounted broad beam spots with a diffusion angle of at least 80°. Each light is comprised of a patented mixing chamber and a specific reflector. Both should provide a good balance between direct and diffuse light components without dazzling the staff to mitigate eye fatigue. The shielding angle shall exceed DIN 12464-1 requirement and be at least 30°. The illuminance on the working surfaces shall be 50-foot candles with a CRI Color Rendering Index greater than 80. The wattage per fixture will be 14W, and provide code required 50-foot candles at the cooking surface. The LED's lifetime shall be 50,000 hours. The internal power supplies shall have at least the same lifetime. They shall enable switching on/off or dimming the light (0-100%) with one or several switches. The lights shall be supplied with vapor proof, grease proof, and heat proof UL-listed designed specifically for commercial kitchen hood application. The HCL light fixture has white and red emitters for Safe Guard Alarm function. All light fixtures shall be wired in a concealed manner to a junction box on top of the hood for connection to the light switch. All wiring is in accordance with the National Electric Code (NFPA 70).

The wall backsplash panels are to be aesthetically pleasing and span between hood and floor and the length of the unit including the fire cabinet. Wall panels to be constructed with the same material, finish, and grain as the hood. Panels should go behind the hood at a minimum of two (2) inches, and the hood should be sealed to the wall. F.S.E.C. is responsible for providing cut-outs in the stainless panels to accommodate any utilities coming out of the wall under the hood. Include divider bars and end trim for securing wall paneling to wall.

Provide closure panels constructed with the same material as the hood to close off space between the top of hood and ceiling as required for field installation.

Exhaust fans are to be coordinated with the CFM requirements of the hood.

Note: Exhaust and supply fans are to be provided and installed by a separate contractor and are to be coordinated with the CFM and power requirements of the unit.

The hood shall be both UL and NSF rated per the most current codes and regulations.

F.S.E.C. is responsible for verifying and coordinating the exhaust duct riser location with the ceiling joists and all other site conditions.

ITEM: 50

QUANTITY: 1

MANUFACTURER: ANSUL OR EQUAL

MODEL: R-102

DESCRIPTION: FIRE SUPPRESSION SYSTEM
The Fire suppression system is to be mounted in cabinet at the end of the hood. Manual activation, along with means for simultaneous automatic shutting down of protected cooking equipment upon activation of said system to be included. System should be designed to provide plenum and duct collar protection. All exposed piping to be stainless steel plated. The manufacturer shall build a fusible link detection system into ventilator sections. All exposed fusible links are to be recessed into the top of the hoods with no visible conduit. Provision shall be made for manual actuation by readily accessible and plainly marked remote manual release station in each cooking area, located no less than 54" and no more than 78" above floor. Pull station will be surface mounted and conduit for system shall be concealed in the ceiling as much as possible. The system is to be sized in accordance with most current UL Standards. The system shall be furnished and installed by an authorized distributor in the field in accordance with manufacturer's instructions and in accordance with UL listings and shall conform to current NFPA and local and/or state codes and standards. This shall include mounting of system units, remote manual releases, nozzles, actuating devices, and running of all pipe and control tubing appurtenant to systems. The system should shut down the make-up air system, if applicable, in case of activation but allow the exhaust fan to keep operating.

Unit shall be stored pressure type, of sufficient capacity as determined by published standards to provide high concentration of liquid agent in plenum areas and duct collars. Liquid agent to be stored in containers equipped with pressure gauge to verify operational readiness. Nozzles located in plenum and ductwork shall be capable of functioning with heavy accumulation of grease.

The gas shut-off valve shall be furnished by the F.S.E.C. and the size verified by the plumbing engineer. The F.S.E.C. is responsible for coordinating installation with all trades.

Micro-switches for electrical equipment shut off and/or actuation of fire alarm system shall be furnished as part of the fire protection system by the manufacturer and connected to the shunt trip provided and installed by the Electrical Contractor. The Electrical Contractor is to furnish and install a control relay to detect the operation of the system by connection to the Micro switches supplied by the Fire Protection System Contractor. The Electrical Contractor is to interface with the building alarm system and/or the fire command station, and the micro switches as specified.

All access openings, holes, sleeves, chases, etc. in the building structure necessary to permit piping and control tubing to be run between system unit, ventilator, and ductwork are to be provided by the General Contractor.

Provision shall be made to shut off the gas and electric supply to all cooking equipment upon actuation of the system.

ITEM: 51

QUANTITY: 1

MANUFACTURER: MARSAL

MODEL: SD-1048 STACKED

DESCRIPTION: PIZZA BAKE OVEN
Pizza Oven, Deck Type, gas, stacked (2) 10"tall baking chambers, (4) 18" pie capacity per deck , 2" thick brick decks, 300 - 650° thermostats, spring balanced doors, 18-gauge stainless steel top, front, sides and doors, aluminized steel interior, zero clearance on both sides to a combustible surface, adjustable legs wended to the base frame, 190,000 BTU, UL listed.

- Natural gas
- Three-piece tool kit includes brush, 7" peel, and 12" peel
- Standard flue
- One-year labor warranty
- Eighteen-month parts warranty

ITEM: 52

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: PA43N-D

DESCRIPTION: PREP REFRIGERATOR
Pizza Prep Table, 43" wide, one-section, 12.0 cubic feet capacity, forced air, 300 series stainless steel work top with 19" poly cutting board, (2) drawers hold (2) 12 x 20 x 6 pans per drawer, hot gas condensate evaporator, 2” polyurethane foam insulation throughout, stainless steel front and end panels, aluminum interior, electronic control, off cycle defrost, side-mounted refrigeration, reversing condenser fan, R290 Hydrocarbon refrigerant, 1/4 HP, ETL and NSF listed.

- 120/60/1
- Condensing unit on the left
- Refrigerated drawer compartment over the condensing unit compartment
- 6” Casters with brakes
- 15 11/16" Cutting Board that has no overhang and is flush with front of the unit
- Seven-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 53

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D1FEN

DESCRIPTION: REACH-IN FREEZER
Designer Reach-In Freezer, extra wide, single section, self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic electric condensate evaporator, unit can be operated as low as -10°F, stainless steel front, aluminum interior and ends, 3” polyurethane foam insulation throughout, standard depth cabinet, full-height solid doors with locks and vertical workflow handles, door hinges are self- closing with a hold open feature, welded corners on all doors, snap in door gaskets, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- 5” Casters with brakes
- Right door hinge
- Seven-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 54

QUANTITY: 2

MANUFACTURER: TITAN STAINLESS

MODEL: FS- MWT3048-US

DESCRIPTION: MOBILE WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 4’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel flat top and bull-nosed corners, turn-down on all four sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 55

DESCRIPTION: SPARE NUMBER

ITEM: 56

DESCRIPTION: SPARE NUMBER

ITEM: 57

QUANTITY: 1

MANUFACTURER: ADVANCE TABCO

MODEL: 7-PS-91

DESCRIPTION: HAND SINK
Hand Sink, wall model with pedestal base, approximately 14” x 10” x 5” sink bowl with inverted “V” edge, 8” integral backsplash, 20-gauge, #304 stainless steel all welded construction, one (1) hole for splash-mounted faucet, 6" apron, includes hands free electronic faucet, basket drain, mounting bracket and clip with hardware, and NSF listed.

- Model #7-PS-10 P-Trap Assembly
- Electronic Faucet, splash type, gooseneck, with metering/check valve.
- Full length sink apron.
- Front Access Panel
- Mount and seal to the wall
- Coordinate with P.C. to make sure utilities and censored faucet components fit within the stainless-steel enclosure provided with the sink.

ITEM: 58

QUANTITY: 3

MANUFACTURER: METRO

MODEL: MX-G SERIES

DESCRIPTION: POT & PAN RACK
Unit consists of four (4) posts, four (4) shelves, and four (4) locking casters.

- (12) Model #MX2448G Metro-Max I Shelf, 48" wide x 24" deep, removable open grid polymer mats with Microban antimicrobial protection, reinforced type 304 stainless steel corners, wedge connectors with quick adjust corner releases, NSF.
- (12) Model #MX70UP Metro-Max I Post, 70" high, open pole for use with stem casters, polymer construction with built in Microban antimicrobial product protection, NSF.
- (12) Model #5PCBX Stem Caster, brake, 5” diameter, polyurethane wheel tread with donut bumpers.
- (6) Model #XTR2448XE Cutting Board and Tray Drying Rack System thirty-four (34) tray capacity, 6" up-rights with 1 1/8” spacing, mounts on 48" wide x 24" deep frame, taupe epoxy, NSF.
- (3) Model #XTR2448XEa Cutting Board and Tray Drying Rack System fourteen (14) tray capacity, 6" up-rights with 3” spacing, mounts on 48" wide x 24" deep frame, taupe epoxy, NSF.
- (3) Model #XDRIP Adjustable drip tray. Provide removable drip pan as part of this item.
- (3) Vollrath Model #8002410, Super Pan 1/1 Food Pan, 2 ½” deep, low-temp polycarbonate clear plastic, top flange corners with concave indentation, anti-jamming, ramped sides, reverse form flattened edge, framing shoulder, interchanges with SPV stainless steel pan line, NSF, made in USA.
- The bottom three shelves hold the drying rack. (1) with the 3” spacing and (2) with the 1 1/8” spacing.
- Verify shelf spacing with owner.

ITEM: 59

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS- MWT3072-US

DESCRIPTION: MOBILE WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 6’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with marine edge and bull-nosed corners, turn-down on all four sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 59.1

QUANTITY: 1

MODEL: FS-SLDRS62

DESCRIPTION: SLANTED DISH RACK SHELF
Slanted dish rack wall shelf shall be custom built as per General Specifications, approximately 5’2",16-gauge 304 stainless steel with drip trough and drip tube on left front corner, and 2” up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 60

QUANTITY: 1

MANUFACTURER: MEIKO

MODEL: FV 40.2

DESCRIPTION: UNDERCOUNTER DISHWASHER
Point 2 Series Ventless Dishwasher, with waste air heat recovery, door type, high temperature with built-in booster, approximately 37 racks per hour capacity, 0.66 gallons per rack, stainless steel non-clogging wash and rinse arms, front-mounted controller with digital display and service diagnostics, fully automatic operation, automatic push-handle cycle start, variable programmed timed cycles, Auto-Safe temperature control for guaranteed sanitization, Soft Start protection system, double wall stainless steel construction, pumped drain and rinse, 1 HP wash pump, NSF and ETL listed.

- 208/230/60/3
- Internal detergent and rinse additive dispensing system
- Stainless steel stand
- External vent fan control with adjustable delay timer
- Drain water tempering kit
- Start-up with performance and installation inspection
- One-year parts and labor warranty

ITEM: 61

QUANTITY: 1

MANUFACTURER: POWER SOAK

MODEL: POWER SOAK M

DESCRIPTION: POWER WASH
Powerwash Sink shall be custom built as per General Specifications, (154”x34”), 14-gauge 304 stainless steel top with raised rolled edge and rounded corners, provide an 10” rear backsplash with enclosed ends, (3) sink bowls, continuous front with lever waste handle bracket for lever waste and overflow, stainless steel under shelf with 2” up-turn at rear and ends mounted under the left and right drain board, cross rails on the sides and rear, stainless steel gussets, legs, and flanged feet on front ends with bullet feet on rear and centers.

- 54” Powersoak wash tank compartment with Low Profile Wash jets spaced every 6” flush along the back wall of wash tank and above the wash pump intake, stainless steel Wash Pump Intake to run full length of the rear of the tank below wash jets, stainless steel Wash Pump Housing fully self-draining with no use of drain line or valve, (1) Utensil Basket powered by one dedicated wash jet, Dual liquid high and low water level sensors, Bottom of wash tank to be creased to facilitate draining, 2 HP Wash Pump Motor with stainless steel impeller, pump housing and wash manifold, 7000 watt wash tank heater to maintain wash tank temperature at 115˚ +/- ½ ˚ F, and chemical injection point pre-drilled at factory. Wash Tank to have ¼” Plate stainless steel hooks welded to the rear of the tank with dimples on front channel enabling Sheet Pan Racking System to be installed where sheet pans are loaded and stand vertically from the front to the back of the wash tank.
- 20” Rinse tank compartment
- 20” Sanitize tank compartment with Chemical sanitizer injection point pre-drilled at factory and Dual liquid high and low water level sensors.
- All welded unit, shipped as one unit, so no field joints are required.
- Full undershelves under left and right ends
- Power control panel with automatic wash tank heat with four-hour wash timer, low voltage power is supplied to all operator controls and sensors, Operator controls - Green (ON) / Red (OFF) buttons, automatically monitors and regulates the wash water temperature, monitors high and low liquid levels in both the wash tank and sanitizer tank and Meets UL 50, category 4X specifications.
- Gen 3 Sheet Pan rack system
- Gen 3 Utensil Basket
- Pack of Detergent Packets
- Pre-Rinse faucet and (2) fill faucets are included with the unit.
- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall
- Three-year parts and labor warranty
- Refer to detail drawings for more information.

ITEM: 62

DESCRIPTION: SPARE NUMBER

ITEM: 63

QUANTITY: 3

MANUFACTURER: METRO

MODEL: MX-G SERIES

DESCRIPTION: POT & PAN RACK
Unit consists of four (4) posts, four (4) shelves, and four (4) locking casters.

- (12) Model #MX2448G Metro-Max I Shelf, 48" wide x 24" deep, removable open grid polymer mats with Microban antimicrobial protection, reinforced type 304 stainless steel corners, wedge connectors with quick adjust corner releases, NSF.
- (12) Model #MX70UP Metro-Max I Post, 70" high, open pole for use with stem casters, polymer construction with built in Microban antimicrobial product protection, NSF.
- (12) Model #5PCBX Stem Caster, brake, 5” diameter, polyurethane wheel tread with donut bumpers.
- (6) Model #XTR2448XE Cutting Board and Tray Drying Rack System thirty-four (34) tray capacity, 6" up-rights with 1 1/8” spacing, mounts on 48" wide x 24" deep frame, taupe epoxy, NSF.
- (3) Model #XTR2448XEa Cutting Board and Tray Drying Rack System fourteen (14) tray capacity, 6" up-rights with 3” spacing, mounts on 48" wide x 24" deep frame, taupe epoxy, NSF.
- (3) Model #XDRIP Adjustable drip tray. Provide removable drip pan as part of this item.
- (3) Vollrath Model #8002410, Super Pan 1/1 Food Pan, 2 ½” deep, low-temp polycarbonate clear plastic, top flange corners with concave indentation, anti-jamming, ramped sides, reverse form flattened edge, framing shoulder, interchanges with SPV stainless steel pan line, NSF, made in USA.
- The bottom three shelves hold the drying rack. (1) with the 3” spacing and (2) with the 1 1/8” spacing.
- Verify shelf spacing with owner.

ITEM: 64

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-WT3072-US-OS

DESCRIPTION: WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 6’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with square edge, 6" high backsplash with fully enclosed ends. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, full-length stainless steel under shelf with a 2” rear up-turn.

- Provide wall mounted, 12” deep solid over shelf with a 2” rear upturn tight to the wall.
  - Verify mounting height with owner.
  - Coordinate wall backing with General Contractor
- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Coordinate wall receptacles with backsplash and over shelf height.
- Seal the table to the wall.

ITEM: 65

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT30108-US-OS

DESCRIPTION: PREP TABLE
Work Table shall be custom built as per General Specifications, approximately 9’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide (1) 24”x 24” x 14” deep sink bowl with removable bowl cover, with a cover holder mounted under the countertop between the legs and the sink bowl, lever waste, and slotted bracket. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2” rear up-turn and drain access.

- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Coordinate window opening with backsplash
- Seal the table to the wall.
- (1) T&S Brass Model #B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
  - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
  - (2) Model #017420-45 24" flex supply hoses
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 ½” sink opening, 2" drain outlet with 1 ½” adapter and overflow assembly.

ITEM: 66

QUANTITY: 1

MANUFACTURER: ADVANCE TABCO

MODEL: 7-PS-91

DESCRIPTION: HAND SINK
Hand Sink, wall model with pedestal base, approximately 14” x 10” x 5” sink bowl with inverted “V” edge, 8” integral backsplash, 20-gauge, #304 stainless steel all welded construction, one (1) hole for splash-mounted faucet, 6" apron, includes hands free electronic faucet, basket drain, mounting bracket and clip with hardware, and NSF listed.

- Model #7-PS-10 P-Trap Assembly
- Electronic Faucet, splash type, gooseneck, with metering/check valve.
- Full length sink apron.
- Front Access Panel
- Mount and seal to the wall
- Coordinate with P.C. to make sure utilities and censored faucet components fit within the stainless-steel enclosure provided with the sink.

ITEM: 67

QUANTITY: 1

MANUFACTURER: FOOD WARMING EQUIPMENT

MODEL: UHS-5-5

DESCRIPTION: MOBILE HEATED CABINET
Heated Cabinet, mobile, split cavity, five (5) universal tray slides per cavity, five (5) 18" x 26" or ten (10) 12" x 20" pan capacity per compartment, 4 ½" OC, adjustable on 1 ½" increments, Humi-temp heat and humidity system, adjustable thermostat, separate controls, insulated, removable humidifier pan, ten (2) flush mounted doors, edge mount door latches, push bar handles, wraparound bumper, stainless steel interior and exterior, 5" casters two (2) rigid and two (2) swivel with brakes, NSF and UL listed.

- 120/60/1
- Manual Control
- Magnetic Door Latch
- Right Hand Door Hinging
- Floor Lock (includes 6" casters)
- Full Perimeter Bumper
- Two-year parts warranty
- One-year labor warranty

ITEM: 68

QUANTITY: 1

MANUFACTURER: RATIONAL

MODEL: ICP 6-FULL ON 6-FULL E

DESCRIPTION: DOUBLE COMBINATION OVEN
Two iCombi Pro 6-full size combination ovens, double stack, Rational intelligent connectable cooking system with four assistants: iDensity Control, iCooking Suite, iProduction Manager, and iCare System, full-size, electric, cooking controls with (6) operating modes, (5) cooking methods, (3) manual operation modes: combi-Steamer, Convection Oven, or Combination. Each oven has a capacity of (6) 18"x26" or (12) 12"x20" pan capacity, core temp probe with 6-point measurement, 85° to 572°F temperature range, hand shower with automatic retracting system, comes with (3) grid shelves, quick clean, care control, eco mode, ethernet interface and Wi-Fi interface, NSF and UL listed.
Provide the following:

- 208/60/3
- Energy Star
- Requires ethernet connection.
- The door is to be hinged on the right.
- Rational Certified Installation with Pre-Installation Site Survey, including stacking kit and installation of stacking kit, water filter system, and commissioning.
- F.S.E.C. is responsible in coordination with Rational, for providing water samples or test results from a recent water sample.
- Water Filtration Double Cartridge System with (2) additional cartridges
- Certified installation of water filter system.
- Certified Chef training
- Mobile oven stand on adjustable height casters, with stacking kit and safety set
- Installation Kits
- (6) Stainless steel grid shelves with K-12 promotion
- (6) Fry Baskets with K-12 promotion
- Fully automatic cleaning system including deliming of the steam generator.

- AutoDose System for integrated autonomous cleaning which includes (2) Cleaner Cartridges and (2) Care Cartridges
- (2) Box of 6 Cleaner Cartridges
- (2) Box of 6 Care Cartridges
- Condensation breaker
- USB data memory stick
- Positioning aid for core temperature probe
- Two-year parts and labor warranty
- Five-year steam generator warranty
- (12) Vollrath Model #9002P, Wear-Ever Sheet Pan, full size, 18"wide x 26"deep x 1"high, 18-gauge aluminum alloy, natural finish, perforated, Made in USA.
- (12) Vollrath Model #30023, Super Pan V Food Pan, perforated, full size, 2-1/2" deep, 22-gauge, 300 series stainless steel, anti-jamming design with reinforced pour corners, NSF, Made in USA.

ITEM: 69

QUANTITY: 1

MANUFACTURER: IMPERIAL

MODEL: IHR-4

DESCRIPTION: RANGE
Spec Series Heavy Duty Range, gas, 36", (4) 40,000 BTU anti-clogging open burners, cast iron “S” grates, stainless steel tubing and solid brass components, (1) 40,000 BTU standard oven with safety pilot and manual shut off valve, burner baffle and heat deflector, porcelain sides, rear, deck, and door lining, and heavy duty door hinge, (1) chrome rack, manual controls, removable crumb tray, stainless steel front, sides, landing ledge, back guard and kick plate, 5” landing ledge, 6" legs with adjustable feet, NSF listed.

- Natural gas with rear gas connection and pressure regulator
- Stainless Steel back-guard with shelf
- Additional oven rack
- One-year parts and labor warranty
- (1) T&S Brass Model #HG-4D-36SKSafe-T-Link Gas Connector Kit, ¾” connection, 36" hose length, stainless steel braiding with extruded coating, one (1) Quick-Disconnect, two (2) Swivelink fittings, one (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 220,000 BTU per hour minimum flow capacity.

ITEM: 70

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-MWT3236

DESCRIPTION: MOBILE WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 3’0” x 2’8” x 34” high to work surface, 14-gauge 304 stainless steel top with square edge and bull-nosed corners, turn-down on all four

sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 71

QUANTITY: 1

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D36GN

DESCRIPTION: REFRIGERATED EQUIPMENT STAND
Griddle Stand, refrigerated, one-section, two drawers with polished chrome drawer handles which accommodate (1) 12”x20”x6” pan and (1) 6” x 20”x 6” pan each, easy glide fully extendable drawers designed to accommodate 6” deep hotel pans side-by-side, drawers designed to hold 205 pounds, marine edge top, front breathing self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel exterior and interior, high density polyurethane foam insulation, single piece snap in drawer gaskets, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, ETL and NSF listed.

- 120/60/1
- 5” Casters with brakes
- Condensing unit on the right
- Seven-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 72

QUANTITY: 1

MANUFACTURER: IMPERIAL

MODEL: ITG-36

DESCRIPTION: GRIDDLE
Griddle, countertop, gas, 36" wide x 24" deep cooking surface, 1" thick polished steel griddle plate, (3) thermostatic controls with heat protection grip, continuous pilot, aeration baffles, 4” wide grease gutter, removable 1 gallon grease can with weep hole, full width rear flue, stainless steel front, sides, splash guard, and ledge, 90,000 BTU, and NSF listed.

- Natural gas
- 4" stainless steel adjustable legs
- One-year limited parts and labor warranty
- (1) T&S Brass Model #HG-4D-36SKSafe-T-Link Gas Connector Kit, ¾” connection, 36" hose length, stainless steel braiding with extruded coating, one (1) Quick-Disconnect, two (2) Swivelink fittings, one (1) 90° elbow, ball valve, restraining cable adjustable for 3' to 5', 220,000 BTU per hour minimum flow capacity.

ITEM: 73

QUANTITY: 1

MANUFACTURER: IMPERIAL

MODEL: PCVE-2

DESCRIPTION: CONVECTION OVEN
Double Convection Oven, electric, (2) decks, standard depth, manual controls, (2) speed fan motor, (2) speed cool-down feature, (2) interior oven lights, 10 rack positions with (5) racks per deck, dual open 50/50 doors with windows, 60-minute manual timer, stainless steel top, front, sides, doors, and legs, all welded and finished seams, porcelainized oven interior with coved corners, ETL and NSF listed.

- 208//60/3
- Extra Oven rack per compartment
- 6” Legs
- One-year parts and labor warranty

ITEM: 74

QUANTITY: 1

MANUFACTURER: HALTON

MODEL: KVE 245-CJ

DESCRIPTION: EXHAUST HOOD
Provide Halton exhaust hood per drawing #FS104 as shown on plans and in accordance with the following specifications:

The dry filter type hood is a Type I, commercial kitchen, U.L. 710 listed ventilator canopy, approved for use over 400° F and 600° F. Ventilator canopy shall be size, and shape as shown on drawing and shall be complete with grease filters, grease trough, removable grease cup, and without a fire damper in exhaust duct. This non compensating exhaust only ventilator canopy is intended for use over light to heavy-duty types of cooking appliances. The hood shall have the size, shape, and performance specified in the contract documents. The hood sections are approximately 9’ 9” x 5' 3" x 24” high with (1) 12” x 12” rear top exhaust collar, and second the section approximately 9’ 8” x 5' 3" x 24” high with (1) 12” x 10” rear top exhaust collar . The total exhaust is a total of 3,049 CFM. Exhaust duct collar to be fully welded with 4" high and a 1" flange. Ventilator canopy is to include temperature sensors in the duct to sense heat from cooking equipment and automatically energize the exhaust and makeup air systems per IMC-2006 507.2.1.1. Unit shall have a fire cabinet mounted at the end of the hood complete with an electrical control system. This system will also have a Make-Up Air plenum across the full length of the front of the hoods as shown on the plans.

Furnish and install a complete kitchen exhaust canopy. The hood shall be an Exhaust canopy. Halton Model KVE Wall Mounted style as manufactured by the HALTON Company of Scottsville, Kentucky. The canopy shall bear either the ETL or Underwriters Laboratories U.L. label, for listed range hood without exhaust fire damper per standard 710 and be fabricated in compliance with NFPA-96-2001 and shall bear the National Sanitation Foundation seal of approval.

All exposed surfaces shall be 18-gauge stainless steel with a #4 brushed finish, double shell end walls, and face construction. Single wall construction will not be permitted. Hood shall be UL Listed and labeled for

"zero clearance" at the end(s) of the hood as shown on drawings when mounted against a wall. Unexposed surfaces are 18-gauge stainless steel. The installation shall be in accordance with the manufacturer's recommendations and conform to NFPA-96 guidelines and all applicable local codes. The hood height shall not exceed 24" tall. The overall lengths of the hoods shall be as indicated on drawings and/or equipment schedule. Use of Capture Walls to create a seal between cooking equipment and wall shall not be used as they require cooking equipment to be located further from wall reducing isle space. Bottom edge of hood front panels to be square, chamfered front shall not be allowed as they reduce front overhang and jeopardize capture and containment over tall cooking equipment. The use of stainless-steel end panels shall not be permitted.

The exhaust duct connection shall be made at the rear and top of the hood extraction chamber as shown on contract drawings. Seams and joints shall be welded liquid tight in accordance with National Fire Protection Association (NFPA) bulletin #96. Exposed external welds shall be ground and polished to match the original material finish. The hood shall be Underwriters Laboratories (UL) Listed 710. Construction shall conform to the requirements of National Sanitation Foundation (NSF) standard 2 and the NSF seal shall be displayed on the front face of the hood. Hanger brackets shall be threaded ½-13 and located on approximately five-foot centers.

The hood will include an active internal "Capture-Jet" and "Comfort Jet" System on all open sides of the hood that will allow for Capture and Containment of thermal plume at specified air volumes. The Capture Jet air shall be pulled into a 1" air plenum with the Capture-Jet fan and discharged through Capture-Jet ports that are located along the inside front, side, and bottom edge of the hood at discharge velocity of 1800 FPM. Slot type, passive devices or "Short-Cycle" discharge is not acceptable.

Each canopy shall have a filter housing of the same material as the canopy liner. The filter housing shall be equipped with a concealed drip tray the full length of the canopy and with a grease cup for easy removal and daily cleaning. The hood shall be equipped with Halton KSA (High Efficiency) multi-cyclone Stainless Steel grease extractors. The KSA filters shall be NSF and UL classified. The particulate extraction efficiency is 93% on particulates of 5 microns and 98% on particles with a diameter of 10 microns or larger per ASTM F2519 method of test. The pressure loss over the extractor shall not exceed 0.50 inches W.C. at flow rates approved by UL for heavy load cooking. Sound levels shall not exceed an NC rating of 55. Baffle, adjustable or slot type extractors shall not be acceptable. The airflows through the KSA extractors and the Capture Jet air chamber are to be determined through the integral T.A.B. (Testing and Balancing) ports located on the outside end of the exhaust plenum inside each hood section. It is the responsibility of the air balancer to adjust the exhaust volumes after installation with a Magnahelic Gauge or Shortridge Digital Anemometer and the hood TAB ports to match the Pressure vs Air Flow Curves card provided in each hood section. The exhaust airflow will be calculated based on the convective heat generated by the appliances underneath each canopy. Submittal shall include convective heat calculations based on the input power of the appliance served and efficiency of hood system consistent with results of independent test based on ASTM Standards F-1704-05 Capture & Containment and F-2474-05 Heat Gain to Space. Final air volume calculations shall comply with the hood listing. The use of end panels or rear seals to achieve required airflows are not acceptable.

An illuminated hood light button and exhaust fan on/off button to be provided by hood manufacturer and installed flush mounted under the front lip of the hood as shown on contract drawings for ease of access. Each hood shall be equipped with Halton Culinary LED Lights (HCL). Constructed from stainless steel frame and Aluminum hosing, the light fitting comprises flush mounted broad beam spots with a diffusion angle of at least 80°. Each light is comprised of a patented mixing chamber and a specific reflector. Both should provide a good balance between direct and diffuse light components without dazzling the staff to mitigate eye fatigue. The shielding angle shall exceed DIN 12464-1 requirement and be at least 30°. The

illuminance on the working surfaces shall be 50-foot candles with a CRI Color Rendering Index greater than 80. The wattage per fixture will be 14W, and provide code required 50-foot candles at the cooking surface. The LED's lifetime shall be 50,000 hours. The internal power supplies shall have at least the same lifetime. They shall enable switching on/off or dimming the light (0-100%) with one or several switches. The lights shall be supplied with vapor proof, grease proof, and heat proof UL-listed designed specifically for commercial kitchen hood application. The HCL light fixture has white and red emitters for Safe Guard Alarm function. All light fixtures shall be wired in a concealed manner to a junction box on top of the hood for connection to the light switch. All wiring is in accordance with the National Electric Code (NFPA 70).

The wall backsplash panels are to be aesthetically pleasing and span between hood and floor and the length of the unit including the fire cabinet. Wall panels to be constructed with the same material, finish, and grain as the hood. Panels should go behind the hood at a minimum of two (2) inches, and the hood should be sealed to the wall. F.S.E.C. is responsible for providing cut-outs in the stainless panels to accommodate any utilities coming out of the wall under the hood. Include divider bars and end trim for securing wall paneling to wall.

Provide closure panels constructed with the same material as the hood to close off space between the top of hood and ceiling as required for field installation.

Exhaust fans are to be coordinated with the CFM requirements of the hood.

Note: Exhaust and supply fans are to be provided and installed by a separate contractor and are to be coordinated with the CFM and power requirements of the unit.

The hood shall be both UL and NSF rated per the most current codes and regulations.

F.S.E.C. is responsible for verifying and coordinating the exhaust duct riser location with the ceiling joists and all other site conditions.

QUANTITY: 1

MANUFACTURER: HALTON

MODEL: M.A.R.V.E.L.

DESCRIPTION: EXHAUST HOOD DEMAND CONTROL SYSTEM
Furnish and install a Halton Safe-Guard Solution including M.A.R.V.E.L. DCV system includes FireWatch and AirWatch and connected IoT platform, complete with the following functionality and features:
Halton Safe-Guard Sustainability package, including exhaust canopy(s), sensors, mechanical components, automation devices and private 4G cellular network in quantities as identified on construction drawings and documentation. All system devices can report status in real time to Halton IoT platform for data analysis. System to operate fully independently of B.A.S. while providing transfer of status to the same. Operator is to be provided with secure access via web portal on any connected device to allow remote system monitoring and status reporting. Support to be provided by Halton staffed Network Operating Center.

Halton includes the following functionality and diagnostic capabilities:
- Remote Start Up Capability
    - Automatic connectivity upon system powered on
    - Automatic balancing of hoods and make up air to design airflow

    - Remote operational functionality test of fan and system operation
    - Remote verification of temperature, pressure, and thermal imaging readings
    - Remote simulation of Fire response logic
        - Make up air shut down
        - Exhaust fan on to 100% speed
        - Simulated release of the fire system
- Automated Reporting of system status
    - Ambient temperature
    - Duct temperature
    - Automated Balancing Damper status
        - Damper position in real time
        - Damper actuator status
        - Exhaust temperature
- Variable volume control, independent operation of each hood
    - Thermal imaging sensor for instantaneous response to changes in cooking activity
- Visualization of Halton system operation 24/7
    - Automatic system fault notification
    - Faults automatically passed by email/SMS
    - Automated monthly analytic report of health
- Ability to optimize system set points and alarms remotely to improve operational efficiency
    - Data collection for system predictive maintenance and advanced scheduling

Install included Halton Safe-Guard AirWatch IEQ sensors with the following functionality and diagnostic capabilities to help manage and improve the IEQ in the kitchen space to enhance the wellbeing of kitchen staff. Additionally, it can monitor adjacent spaces, such as dining rooms, to ensure that their IEQ levels follow the requirements set in the Well Standard.

The IEQ sensor to monitor standard physical parameters such as ambient temperature, relativity humidity, and pressure in space. The sensor also measures gases including carbon dioxide (CO2). Lastly, the sensor will monitor particulate matter (PM) at three different concentration levels: PM10, PM2.5 and PM1.

- Continuous measurement of Indoor Air Quality
    - Sensors include monitoring of
        - CO2, PM1, PM2.5, PM10 and VOC
        - Temperature, Relative Humidity, Atmospheric Pressure
- System algorithm adjusts airflow based on sensor reading independent of hood operation
    - PM 2.5 verifies full capture of generated load and effluent.

Install provided Halton Fire-Watch with the following functionality and diagnostic capabilities:
Monitoring system for cooking appliances installed in a kitchen hood consisting of thermal imaging sensor, hood exhaust air temperature sensors, controller, alarm display, and optional devices to interrupt power source for cooking appliances being monitored. Controller network is connected to Halton EDGE device. Install provided electric gas valve (up to 2”) required to shut off utility services to the appliances during Stage 2 of Fire-Watch.

- Early Fire Warning System
- Exhaust temperature is within 5°F of the fire suppression system activation. Setpoints are originally programmed based on project documentation and cooking equipment layout and to be verified and adjusted, if needed, after the fire suppression system is installed and tested.
    - Exhaust airflow will increase to maximum.

- Optional feature: If Exhaust temperature is still escalating, thermal imaging detecting potential fire, countdown to disconnect power to cooking appliance initiated. Default timer is set to 10 seconds. If user takes no action, power to cooking appliance is disconnected.

All alarms are recorded on the cloud server, designated person on a job site is notified automatically by email or text message.

- Install provided Grease duct monitoring sensors:
  - Measured accumulation of grease in affected ductwork
  - Alert for maintenance when the measured depth of grease exceeds NFPA96 guidelines
  - System auto resets when the duct is cleaned

Refer to contract drawings for additional information on what is required and included for field connections and interconnections.

Provide M.A.R.V.E.L. II which is an independent custom programmed demand control system that provides for the complete and independent hood section modulation of exhaust and make-up-air volumes when multiple hood sections share a common exhaust duct and fan. Additionally, this system allows for the modulation and introduction of make-up-air when single MUA units are specified to support multiple hoods. The system is to be integrated with kitchen hoods and control panel as specified in Division 23. The Demand Control System may be utilized as a single autonomous device, or as a part of a network. The Demand Control System, when controlling 4 hoods or more, shall be capable of monitoring and controlling up to 3 typical roof top units.

Hoods specified shall be provided with Safe-Guard and M.A.R.V.E.L. II components including proactive Thermal Imaging Infrared Radiation Index Sensors (IRIS Sensors), duct temperature thermostat, pressure transducer, PLC controller, and Automated Balancing Damper (ABD Damper) and a remote mounted AirWatch IEQ (Indoor Environmental Quality) space temperature sensor per zone. There shall also be an illuminated “Override” button and light button mounted to the face of each hood section as indicated on bid documents. The Safe-Guard with M.A.R.V.E.L. II control panel’s remote IEQ space temperature sensor is shipped separately and installed in the field by the F.S.E.C. Refer to contract drawings for additional installation information and locations.

As part of the M.A.R.V.E.L. II system, the hood system shall include a 6”H, ABD automated kitchen exhaust balancing damper pre-welded to each exhaust duct collar at the factory. The automated balancing damper(s) shall bear the ETL label per, ETL listed to Standard an accessory for Exhaust hoods for Commercial Cooking Equipment UL 710, Standard for Exhaust Hood, and Related Controls for Commercial and Institutional Kitchen ULC-S646-06 and be fabricated in compliance with NFPA-96. The installation shall be in accordance with the manufacturer’s recommendations and conform to NFPA-96 guidelines and all applicable local codes. The damper shall automatically adjust to allow for balancing airflow based on pressure differential readings from integral T.A.B. test and balance port in the Capture Jet hood. The damper outer casing shall be constructed of continuously welded 16ga. galvanized steel including the balancing blades. The size and location are indicated on the drawings and/or equipment schedule and match the exhaust collar size for the hood system.

The integrated PLC controller mounted in each hood section will analyze signals from the IEQ space temperature sensor as well as the cooking activity Thermal Imaging sensors, duct temperature sensor and pressure transducers mounted in the hood. Signals are compared to algorithm so that the ABD damper(s) and VFD will proactively adjust the exhaust fan speed to satisfy current cooking load conditions. A proportional signal of exhaust rate will be sent to the building BMS system to adjust the MUA fan speed.

Individual hood section design exhaust volumes are programmed into the PLC and based on manufacturers heat load-based design software and ASTM-1704-05 design criteria for optimal capture & containment.

Sequence of operation begins when proactive rapid responding Thermal Imaging infrared cooking activity sensors identify idle or cooking conditions by average measurement of appliance surface temperatures and or rapid fluctuation of change in either direction. Temperature data is compared to inputs from the other system components to identify actual cooking activity and both exhaust and corresponding make-up-air volumes are adjusted/ maintained to ensure complete appliance thermal plume capture & containment.

For ease of field balancing of hoods, the M.A.R.V.E.L. panel shall include a “One Push” button on the touch screen for air balancing purposes. Pushing the button will bring all hoods to design air flow with CFM measured and verified. It is also to confirm Automated Balancing Damper operation, Make up air signal output and all sensor reporting.

System to also come equipped with VFD(s) (pre-programmed and provided by hood manufacturer) to control fan speeds. The Safe-Guard with M.A.R.V.E.L. II system shall automatically control the speed of the exhaust fan(s). The system will output a 0-10v proportional signal to the BMS through BACnet connection to control make up air fan. The signal is proportional of exhaust 0-100% of design flow. The Safe-Guard with M.A.R.V.E.L. II main control panel includes a customized HMI color with a graphical display touch screen of the kitchen hood(s) and cooking equipment viewable in real time and can be remotely monitored and/or controlled thru a cellular modem connection. It can monitor parameters including but not limited, hood status (off, idle, cooking), real time airflow monitoring, ABD damper positioning, exhaust duct temperature, grease sensor, and VFD status. It will also monitor the AirWatch IEQ space sensor, which includes CO2 levels, relative humidity levels, and actual energy savings. HMI will indicate any current faults that need operator attention. The touch screen shall allow operator to change operating set points of the system. Some features are password protected for security purposes. HMI touch screen to be located on the face of the M.A.R.V.E.L. II. Location and size of the panel(s) as indicated on bid documents. Operator generated performance and efficiency reports are exportable in either a graphical, excel or basic spreadsheet format. The system will be continuously connected via the internet to a Network Operations Center (NOC) for real-time supervision, management, trending, reports and alarms notifications via email and SMS.

The Safe-Guard M.A.R.V.E.L. II master control panel native language is Modbus and interfaces with BMS BACnet (IP is standard or MSTP if required) communication protocol for building automation and control network compatibility all to comply with standard ASHRAE, ANSI and ISO protocol. Interconnection of Safe-Guard M.A.R.V.E.L. II control panel to hood sections, individual system components and BMS shall be completed by the appropriate trades as identified/ indicated on bid set drawings.

M.A.R.V.E.L. II Demand Control System shall also include the Halton KGS duct safety and monitoring system. Required hood duct and plenum sensors will be installed/provided as part of the hoods at the factory. This signalling device monitors the grease deposition levels in connected ductwork. Sensors shall be mounted in the plenum of the exhaust hood with the highest grease producing appliances and along the ductwork. Number and location of sensors as indicated on the bid set drawings. Sensors will need to be field installed in the monitored duct work by HVAC contractor. Connected data cable supplied by Halton. Labor to install manufacturer provided data cable by mechanical or controls contractor per bid set specifications.

Once the acceptable grease deposition levels consistent with NFPA-96 guidelines for cleaning are exceeded, a visual alarm is displayed on the M.A.R.V.E.L. II touch screen alerting the operator that the ductwork requires cleaning. Optionally a signal can be sent to the Building Management System (BMS) via a dry contact closure. The system also gives an indication whether the cleaning was done satisfactorily. System is ETL Listed and tested to UL 2017 standards and CSA C22.2 #205.

System includes Standard Year One Complimentary Monitoring Service during the warranty period when required internet connection is provided as per bid set specifications and drawings. System will also be accessible by the owner through the Web for this one-year term which includes automated alarm signaling to the owner or BMS. Ongoing monitoring service is optional for a nominal fee after the first year.

Division 23 contractors will be responsible for wiring all interconnections and primary circuits as described in the bid set document drawings. Manufacturer to provide cables between the hoods and associated control panels and room temperature sensor(s). Electrician or Controls Contractor are responsible for providing the labor to run low voltage and 120/1 wiring cables and required and control power per submittal drawings.

Halton to provide a pre-site coordination visit that includes a Halton factory representative on site. The factory representative will meet with the various contractors on site to coordinate the installation and wiring necessary to ensure the required connections are made to and from Halton equipment as designed. This pre-site visit meeting should be scheduled after the Halton equipment has arrived on site, but before the wiring to the Halton equipment is to begin.

Proposed alternative systems that primarily depend on reactive temperature sensors or smoke detection and do not have the ability to measure both individual hood exhaust volumes and make-up-air volumes for each zone shall not be permitted. A duct mounted temperature sensor only system will not be permitted. A duct mounted temperature sensor in conjunction with a smoke detector will not be permitted.

Field Start-Up to be performed by the manufacturers ASA (Authorized Service Agency). Balancing exhaust volumes through the Halton hoods is performed by the Halton ASA at time of start-up. Contracted air balancer must confirm through air balance and report that the mechanical system is providing for total design and make-up-air volumes per the mechanical schedule.

This system should control the main cooking hood and the pizza hood.

ITEM: 75

QUANTITY: 1

MANUFACTURER: ANSUL OR EQUAL

MODEL: ANSUL R-102

DESCRIPTION: FIRE SUPPRESSION SYSTEM
The Fire suppression system is to be mounted in cabinet at the end of the hood. Manual activation, along with means for simultaneous automatic shutting down of protected cooking equipment upon activation of said system to be included. System should be designed to provide plenum and duct collar protection. All exposed piping to be stainless steel plated. The manufacturer shall build a fusible link detection system into ventilator sections. All exposed fusible links are to be recessed into the top of the hoods with no visible

conduit. Provision shall be made for manual actuation by readily accessible and plainly marked remote manual release station in each cooking area, located no less than 54" and no more than 78" above floor. Pull station will be surface mounted and conduit for system shall be concealed in the ceiling as much as possible. The system is to be sized in accordance with most current UL Standards. The system shall be furnished and installed by an authorized distributor in the field in accordance with manufacturer's instructions and in accordance with UL listings and shall conform to current NFPA and local and/or state codes and standards. This shall include mounting of system units, remote manual releases, nozzles, actuating devices, and running of all pipe and control tubing appurtenant to systems. The system should shut down the make-up air system, if applicable, in case of activation but allow the exhaust fan to keep operating.

Unit shall be stored pressure type, of sufficient capacity as determined by published standards to provide high concentration of liquid agent in plenum areas and duct collars. Liquid agent to be stored in containers equipped with pressure gauge to verify operational readiness. Nozzles located in plenum and ductwork shall be capable of functioning with heavy accumulation of grease.

The gas shut-off valve shall be furnished by the F.S.E.C. and the size verified by the plumbing engineer. The F.S.E.C. is responsible for coordinating installation with all trades.

Micro-switches for electrical equipment shut off and/or actuation of fire alarm system shall be furnished as part of the fire protection system by the manufacturer and connected to the shunt trip provided and installed by the Electrical Contractor. The Electrical Contractor is to furnish and install a control relay to detect the operation of the system by connection to the Micro switches supplied by the Fire Protection System Contractor. The Electrical Contractor is to interface with the building alarm system and/or the fire command station, and the micro switches as specified.

All access openings, holes, sleeves, chases, etc. in the building structure necessary to permit piping and control tubing to be run between system unit, ventilator, and ductwork are to be provided by the General Contractor.

Provision shall be made to shut off the gas and electric supply to all cooking equipment upon actuation of the system.

ITEM: 76

DESCRIPTION: SPARE NUMBER

ITEM: 77

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-WT3060-US-OS

DESCRIPTION: MOBILE WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 5'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge, 6" high backsplash with fully enclosed ends. Provide one (1) 20"x 20" x 5" stainless steel drawer with lock on anti-slam slides with ½" Poly cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the

boards from under the drawer. Provide stainless steel gussets and legs with bullet feet, full-length stainless steel under shelf with a 2” rear up-turn.

- Provide wall mounted, 12” deep solid over shelf with a 2” rear upturn tight to the wall.
  - Verify mounting height with owner.
  - Coordinate wall backing with General Contractor
- Coordinate wall receptacles with backsplash and wall shelf.

ITEM: 78

QUANTITY: 1

MANUFACTURER: TITAN STAINLESS

MODEL: FS- WT30108-US

DESCRIPTION: WORK TABLE
Work Table shall be custom built as per General Specifications, approximately 9’0” x 2’6” x 34” high to work surface, 14-gauge 304 stainless steel top with square edge. Provide two (2) 20”x 20” x 5” stainless steel drawers with locks on anti-slam slides with ½” Poly cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide stainless steel gussets and legs with bullet feet, full-length stainless steel under shelf with a 2” rear up-turn.

ITEM: 79

DESCRIPTION: SPARE NUMBER

ITEM: 80

QUANTITY: 1

MANUFACTURER: ARCTIC INDUSTRIES,AMERICAN PANEL, THERMO-KOOL

MODEL: 222101

DESCRIPTION: WALK-IN COOLER/ FREEZER
General –The overall size of the walk-in box shall be approximately 21’0” x 15’ 10” x 8’6 ¼” Tall. The cooler and freezer compartment interior dimensions are as shown in the drawings. Verify size and shape as shown on the plan. Walk-ins shall be constructed of prefabricated modular panels manufactured by Arctic Industries, Miami, Florida. All insulated panel structures to be set up at factory prior to shipment, checked for structural and quality accuracy, photo-graphed prior to shipment. They shall be designed for easy and accurate field assembly, future enlargement by the addition of panels, or dismantling should relocation to an alternate site be desired. Construction shall be in strict compliance with NSF Standard 7 and UL. This unit shall be installed in a floor recess to create a smooth transition between the walk-in floor and the building floor.

Panel Construction - All panels shall consist of interior and exterior metal surfaces precision roll formed to exact dimensions with double 90° edges to enhance overall panel rigidity. The finished metal surfaces shall be fitted with a teardrop profile gasket and placed in precision-tooled fixtures where they are injected with Foamed-in-Place urethane insulation. Curing of the insulating core shall take place at a controlled

temperature within the foaming fixture to provide permanent adhesion to the metal surfaces, to allow uniform foam expansion and to maximize finished panel strength. Panel edges shall have a molded urethane tongue and groove profile of insulation factor equal to core material to accurately align panels during installation and to assure an airtight seal. No structural wood, steel, straps, or other non-insulating materials shall be used in panel construction. Finished panels must be UL classified building units and each should bear the Underwriters Laboratory label.

Finished panels will be 4" thick and will be provided in 11 ½", 23", 34 ½" and 46" widths to conform to project drawings. Corner panels shall be one piece 90° angled construction and shall measure 12" x 12" or 12" x 6 ½" where required. For units with multiple compartments, specially designed "Tee" panels shall be provided to form partition wall to outside wall junctures. "Tee" panels shall measure 23" x 12" or 23" x 6 ½" where required. All panels shall be interchangeable with like panels or standard doorframe sections for fast and easy assembly.

Floor Construction – Where prefabricated floor panels are required, they shall be of similar design to other panels and shall incorporate a fully die formed ¼" NSF coved radius at all interior floor to wall junctures. Floor panels shall be reinforced with ¾" exterior grade plywood and shall be capable of supporting evenly distributed loads up to 1300 pounds per square foot or more. Floor to be: 16-gauge Stainless Steel with non-skid strips in the aisle ways.

Door Construction - Entrance doors are constructed like other panels and shall be flush mount, magnetic in-fitting type. Door sections shall be constructed to conform to Underwriters Laboratories Standards for electrical safety and shall bear all appropriate UL listing labels. The perimeter of the door and frame shall be built of a fiberglass reinforced plastic (FRP) pultrusion weighing not less than 8.4#/lineal foot. All pultrusion's shall be non-conductive, non-corrosive, rust proof and listed by the National Sanitation Foundation. Doorjamb shall house a doorframe heater circuit, and a magnet attracting stainless steel trim strip. The doorframe shall be equipped with flexible bellows type vinyl door gasket with magnetic core, and flexible EPDM (ethylene propylene diene monomer) door sweep. Standard door frame sections 46", 57 ½" or 69" wide shall be equipped with a LED vapor proof light fixture and globe pre-wired to a rocker type light switch with pilot light. An aluminum braided heater wire with integral circuit closure providing activation while the refrigerated room is within operating temperature and a 14-gauge stainless steel threshold plate shall also be included in all door frames.

The door hardware shall be die cast zinc with brushed satin finish. Doors shall be mounted with three (3) heavy-duty cam lift hinges. The pull handle assembly shall incorporate a keyed cylinder lock and an inside safety release handle to prevent personnel entrapment. A hydraulic closer device shall assist positive door closing and sealing.

Walk-In Monitoring System Modularm 75LC: System to have an easy-to-read LCD display with high and low alarm set points with audible and visual alerts for alarm conditions. The system shall include Auto set Technology for automatic set point control. The system should have an integrated, push-button light switch with on/off indicator light. The system shall comply with the latest federal energy requirements by incorporating an automatic lighting shut-off. The system shall be supplied with dry contacts for connection to equipment that requires dry contacts such as building monitoring systems, dialers, etc. A magnetic contact, MC-1, shall be installed on the door for auto light feature and door "open" monitoring. The system to be supplied to interior press button light switch and panic alarm with constant burning backlight, IP-1. The system should include a Motion detector, MD-1, to reset the light timer when motion is present. Both digital displays should be in the exterior entrance door panel frame when one or more doors are on a partition wall.

Doors to be:
Exterior entrance doors, 36” x 78” (swing as shown on drawing) to include:

- Stainless steel interior and exterior
- Door Closer
- Door Kick plate, 1/10” aluminum tread plate, 36” High on interior and exterior of each door
- Cam lift hinges (3)
- Deadbolt key/padlock handle with inside safety release
- Magnetic gasket
- Single Sweep gasket
- Switch with pilot light
- Monitoring System
- 14”x 24” Vision Window, heated

Finishes - The interior and exterior finish on all panel surfaces may be manufactured from any combination of the following premium grade aluminum or steel materials. The gauge or thickness of the metal material listed is rated prior to embossing.

- Exposed Exterior walls: 22-gauge stainless steel diamond embossed
- Interior walls: 26-gauge embossed white stucco coating
- Interior ceilings: 26-gauge embossed white stucco coating
- Un-exposed exterior to be 26-gauge stucco embossed galvanized steel

Insulation - Insulation shall be 4” thick high-pressure impingement mixed (HPIM) foamed-in-place urethane, minimum density of 2.4 pound per cubic foot, fully heat cured, and bonded to metal finishes. The insulation shall be manufactured using HCFC-141b expanding agent, which has an ozone depletion rating of 0.1 and a global warming rating of 0.05. The thermal conductivity (“K” factor) shall not exceed 0.133 BTU/Hour/Square Foot/Degree Fahrenheit/Inch of Thickness across the entire width of the panel. Overall coefficient of heat transfer (“U” factor) shall not exceed .033 and the resistance to heat penetration (“R” factor) shall not be less than 30. The insulation shall have a 97% closed cell structure to prevent absorption of liquids. The finished aluminum panel (not just the core material) shall be listed by Underwriters Laboratories as a Class 1 (UL-723) building material and demonstrate a flame spread rating of 20 or less and smoke developed of 350 or less in accordance with ASTM-E84 Standards. This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions. Foam used shall be Factory Mutual listed.

Panel Assembly - Assembly of Walk-In shall be accomplished using cam-action locking mechanisms precisely positioned along the outside tongue or groove edges of each panel to exactly correspond with a matching mechanism in the adjacent panel. Cam lock spacing on vertical joints shall not exceed 46” and at junction of vertical and horizontal joints by 23”. Cam locks shall be foamed-in-place and anchored securely in the panel by steel “wings” integral to the lock housing. Cam locks shall be operated through access ports using a hex wrench, thereby pulling the panels together and establishing an airtight seal. All access ports shall be located on the walk-in interior to facilitate assembly when close to building structures and shall be covered by vinyl snap-in caps after final assembly. Complete step-by-step assembly instructions, and erection drawings shall be supplied by the manufacturer.

Walk-In Accessories for each compartment:

- (2) LED 48” Light fixtures per compartment, high output, for low temperature applications in cooler and freezer
- LED Vapor-proof light in each door frame

- (2) Power air curtain with backing on exterior of cooler: Berner Model #SLC-07-1036A-SS complete with cord and plug for receptacle built into the door panel.
- Non-skid strips (in aisles only)
- Exposed exterior with 1/10" aluminum tread plate, 32" high, with bumper-rail mounted at top of kick. plate.
- Exterior corners of building walls to be sealed with full-height stainless steel closure strips.
- Provide stainless steel closure panels between walk-in and ceiling.
- Provide a vapor barrier between the concrete slab and the walk-in-floor panels. (Typically, a 15-pound asphalt paper with a 4" overlap at all seams). Verify with manufacturers installation instructions. Provide documentation and photos as proof of installation.
- Heated pressure relief port on freezer sections

Warranty - Insulated panel products are to be warranted for a period of ten (10) years after the date of installation for the original user should the panels be installed properly and be used under normal service conditions. After an inspection authorized by the manufacturer, should any part of the product prove to be defective in material or workmanship, it will be repaired or replaced free of charge, F.O.B. factory. This warranty does not apply to accessories or components supplied but manufactured by other companies who furnish their own warranties.

F.S.E.C. shall provide an installation workmanship warranty for three (3) years from the date of installation.

All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, strip curtains on hinged doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors.

Prior to turning on refrigeration systems, F.S.E.C. to "test" the walk-in boxes to verify they are air tight. A smoke test, flood light test, or other means of similar testing is required. If an air-tight test is not performed, the F.S.E.C. will provide a letter of workmanship warranty for a period of five (5) years covering any defects or air leaks in the walk-in unit.

ITEM: 81 & 82

QUANTITY: 1

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: YS11KAE / KLP212MA

DESCRIPTION: WALK-IN COOLER REFRIGERATION
Walk-In cooler will be provided with a condensing unit and evaporator for refrigerated equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit suspended on a structural steel base with cover and winter controls. This system is designed to be a 100% redundant package.

Condensing units shall be accessible with preassembled remote, scroll type, air-cooled units for outdoor installation with matching evaporator. Condensing units shall be equipped with PSC fan motors and

evaporator fans shall utilize the ECM type fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency.

Single rack system is to be manufactured to hold the cooler and freezer compressor units in one (1) housing. The curb and wind restraints are to be provided by others and coordinated by the F.S.E.C. Refrigeration systems are to be mounted on the roof of the building. Coordinate exact location with Architect and General Contractor.

Medium temperature unit shall utilize R-454a refrigerant. Manufacturer is to calculate heat loads and provide systems with a minimum of 105% of needed capacity to maintain holding temperature 35° F in coolers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an Eco-Smart controller will consist of the following factory-mounted parts:

- Electronic controller board with three- digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor
- Electric expansion valve
- 24V transformer
- Ethernet connection for refrigeration monitoring

The Eco-Smart board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A), and alarm (5A). Board will include connection point for alarm system provided by others.

Medium temperature systems come with one (1) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are caused by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

COOLER CONDENSER:
Compressors shall be scroll type and shall operate on R-454A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. Provide one (2) YS11KAE Medium temperature, 35° F, pre-assembled remote, scroll outdoor remote refrigeration condenser with voltage to be 208/3. Provide and install a weatherproof stainless-steel housing, low ambient controls, and a mounting stand. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20° F.

COOLER EVAPORATOR:

Evaporator Coils - Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the Eco-Smart Controller System. Evaporators shall be off cycle; electric or reverse cycle defrost. Provide two (2) KLP212MA evaporator unit and voltage of 120/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. All cooler systems are equipped with an "off cycle" timer to maximize heat transfer and maintain optimum energy efficiency. Evaporators shall be U.L. listed.

MONITORING:
The system shall be provided with means to monitor the refrigeration systems via the SmartVap controller, which is an on-demand or adaptive control board.

- The system goes into defrost only when needed.
- Saves energy by adapting to the load and cooling required.
- Includes remote monitoring and communication capabilities.
    - Ability to view and control system operation remotely.
    - Remotely download temperature and alarm report history.
    - Remotely view and change system parameters and alarm settings.
    - Advanced alarm notification via text and/or e-mail for up to five recipients.

Multiple refrigeration systems are being monitored, therefore the F.S.E.C. is to provide Cate5e or Cat6 cable from the evaporators to a network switch (which requires 120v receptacle), and then to the Edge Manager (which requires 120v receptacle) for monitoring of multiple systems with a single IP address. Network coordination and owner IT department will be required for final operation and installation. F.S.E.C. is responsible for running the cable to the designated termination and sealing all walk-in penetrations. Network coordination and owner IT department will be required for final operation and installation.

Piping Specifications:

- All refrigeration piping will be performed by the Food Service Equipment Contractor. This Contractor will install all components and piping per the manufacturer's recommendations. The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations. Traps, piping hangers and supports, and all associated hardware shall be provided by this contractor.
- The refrigeration installation must be done by a licensed and certified technician. Proof of license is to be submitted prior to the start of any work.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized to one nominal size.
- FSEC will make all final refrigeration connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the P.C.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, air curtain, and lights. Coordinate location with the General Contractor.
- Provide Cat5 or Cat 6 cable from the evaporator to the building internet network or Food Service director's office for monitoring of the refrigeration system, to be installed by the E.C.

Wiring:
- All interior wiring shall be “liquidtite” fittings and sealed to prevent water migration.
- The use of Romex, BX, and MC Cable is prohibited and should be deemed to not meet specifications.
- All control wiring and inter-wiring is to be done by the Food Service Equipment Contractor.
  - Control wiring from evaporator to safety valve is by the F.S.E.C.

Warranty:
The successful bidder shall provide written warranties required to be provided by the manufacturer:
- Five-Year compressor Warranty by RDT
- Two-Year parts warranty by RDT
- Two-Year labor warranty by RDT
- Three-Year Service / Workmanship Warranty on refrigeration installation provided by the F.S.E.C.

ITEM: 83

QUANTITY: 8

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: WALK-IN COOLER SHELVING
Each unit consists of four (4) posts and four (4) shelves.
- (16) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (16) Model #MQ2442G Metro-Max Q Shelf, 42" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (32) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and shelf spacing with owner.

ITEM: 84

QUANTITY: 1

MANUFACTURER: METRO

MODEL: HP-PDMB SERIES

DESCRIPTION: WALK-IN COOLER DUNNAGE RACKS
- (1) Model #HP2260PDMB Metro Bow-Tie Dunnage Rack, 22" x 60" x 12" high, slotted, holds up to 3,000 pounds, with separate polymer tie for joining racks, Microban antimicrobial product protection, rust and corrosion proof polymer construction, NSF.
- Verify sizes with site conditions.

ITEM: 85 & 86

QUANTITY: 1

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: YF10KAE / KLP314LE

DESCRIPTION: WALK-IN FREEZER REFRIGERATION
Walk-In Freezer will be provided with a condensing unit and evaporator for refrigerated equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new compressor unit mounted on a structural stainless-steel base with cover and winter controls. This system is designed to be a 100% redundant package.

Condensing units shall be accessible with preassembled remote, scroll type, air-cooled units for outdoor installation with matching evaporator. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency.

Single rack system is to be manufactured to hold the cooler and freezer compressor units in one (1) housing. The curb and wind restraints are to be provided by others and coordinated by the F.S.E.C. Refrigeration systems are to be mounted on the roof of the building. Coordinate exact location with Architect and General Contractor.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom-designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an on-demand controller will consist of the following factory-mounted parts:
- Electronic controller board with three- digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor
- Electric expansion valve
- 24V transformer
- Ethernet connection for refrigeration monitoring

The Eco-Smart Controller board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A), and alarm (5A). Board will include connection point for alarm system provided by others.

Low temperature systems come with two (2) preprogramed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are caused by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil. The Eco-Smart Controller system will: Float the head pressure, reduce system refrigerant charge by a minimum of one third, and reduce the defrost time when hot gas is used to defrost the coil. Any proposed alternatives must perform the energy saving functions of all three features.

FREEZER CONDENSER:

Compressors shall be hermetic/scroll type and shall operate on R-454A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. Two (2) YF10KAE Low temperature, -10° F, pre-assembled remote, hermetic/scroll type outdoor remote refrigeration condenser, and voltage to be 208/3. Provide and install stainless-steel housing, low ambient controls, and a roof mounting curb. Low temperature units also are to include evaporator drain line heaters. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20 F.

FREEZER EVAPORATOR:
Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the On-Demand Defrost Control System. Evaporators shall be off cycle; electric or reverse cycle defrost. Provide two (2) KLP314LE evaporator unit with voltage of 208/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Freezer evaporators shall utilize electric defrost and heated drain pan. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. Evaporators shall be U.L. listed.

Multiple refrigeration systems are being monitored, therefore the F.S.E.C. is to provide Cate5e or Cat6 cable from the evaporators to a network switch (which requires 120v receptacle), and then to the Edge Manager (which requires 120v receptacle) for monitoring of multiple systems with a single IP address. Network coordination and owner IT department will be required for final operation and installation. F.S.E.C. is responsible for running the cable to the designated termination and sealing all walk-in penetrations. Network coordination and owner IT department will be required for final operation and installation.

Piping Specifications:

- All refrigeration piping will be performed by the Food Service Equipment Contractor. This Contractor will install all components and piping per the manufacturer's recommendations. The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations. Traps, piping hangers and supports, and all associated hardware shall be provided by this contractor.
- The refrigeration installation must be done by a licensed and certified technician. Proof of license is to be submitted prior to the start of any work.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized to one nominal size.
- FSEC will make all final refrigeration connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the P.C.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, air curtain, and lights. Coordinate location with the General Contractor.
- Provide Cat5 or Cat 6 cable from the evaporator to the building internet network or Food Service director's office for monitoring of the refrigeration system, to be installed by the E.C.

Wiring:
- All interior wiring shall be “liquidtite” fittings and sealed to prevent water migration.
- The use of Romex, BX, and MC Cable is prohibited and should be deemed to not meet specifications.
- All control wiring and inter-wiring is to be done by the Food Service Equipment Contractor.
  - Control wiring from evaporator to safety valve is by the F.S.E.C.

Warranty:
The successful bidder shall provide written warranties required to be provided by the manufacturer:
- Five-Year compressor Warranty by RDT
- Two-Year parts warranty by RDT
- Two-Year labor warranty by RDT
- Three-Year Service / Workmanship Warranty on refrigeration installation provided by the F.S.E.C.

ITEM: 87

QUANTITY: 5

MANUFACTURER: METRO

MODEL: HP-PDMB SERIES

DESCRIPTION: WALK-IN FREEZER DUNNAGE RACK
- (2) Metro Model #HP2236PDMB Metro Bow-Tie Dunnage Rack, 22" x 36" x 12" tall, slotted, holds up to 1,500 pounds, with separate polymer tie for joining racks, Microban antimicrobial product protection, rust and corrosion proof polymer construction, NSF listed.
- (3) Model #HP2260PDMB Metro Bow-Tie Dunnage Rack, 22" x 60" x 12" high, slotted, holds up to 3,000 pounds, with separate polymer tie for joining racks, Microban antimicrobial product protection, rust and corrosion proof polymer construction, NSF.
- Verify sizes with site conditions.

ITEM: 88

QUANTITY: 4

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: WALK-IN FREEZER SHELVING
- (8) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (8) Model #MQ2442G Metro-Max Q Shelf, 42" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (16) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 89

QUANTITY: 1

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ROAM02016L02015T3F

DESCRIPTION: REFRIGERATION RACK
A single rack system is to be manufactured to hold the cooler and freezer compressor units in one housing. The refrigeration system is to be mounted on the roof of the building.

The refrigeration package shall be pre-engineered, and factory assembled air-cooled unit. The system shall be housed in a weather-protected compact powder coated steel frame. The entire housing shall be brushed stainless steel. The unit shall include an air-cooled aluminum fin copper tube condenser. The exterior housing shall feature stainless-steel one-piece louvers. Lifting points shall be integrated into the frame component. Condenser fan motors shall be mounted withing the enclosure. The condenser intake surface shall be protected with stainless steel expanded metal guard to protect against vandalism and hail damage. Each unit shall be equipped with a ball-bearing fan motor, suction filter, sight glass, liquid filter, liquid line inlet and outlet valve, defrost cycle and high-pressure super-hose connections. Each unit shall be equipped with fan motor cycling controls and / or head pressure regulator where required for low ambient conditions. All refrigerant lines shall be extended to outside the housing in a neat and orderly manner. All tubing shall be securely supported and anchored with non-corrosive coated clamps. The package shall have a factory-mounted and pre-wired control panel, with main disconnect where required, circuit breakers, and contactors wired for single-point connection.

- 208/3
- Provide side access for the refrigeration lines and provide a 12” stand as part of the rack system, to be fastened to the roof rails.
- Warranty: The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:
  - Five-Year Compressor Warranty by RDT.
  - Two-Year parts warranty by RDT
  - Two-Year labor warranty by RDT
  - One Year Manufacturer’s Warranty on all other components by RDT.
  - Three-Year Service / Workmanship Warranty on refrigeration installation provided by the F.S.E.C.

ITEM: 90

DESCRIPTION: SPARE NUMBER

ITEM: 91

DESCRIPTION: SPARE NUMBER

ITEM: 92

QUANTITY: 15

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: DRY STORAGE SHELVING
Each unit consists of four (4) posts, five (5) shelves, and (4) casters with brakes.

- (60) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (10) Model #MQ2454G Metro-Max Q Shelf, 54" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (5) Model #MQ2436G Metro-Max Q Shelf, 36" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (60) Model #MQ74UPE Metro-Max Q Post, 74" high, caster-ready with no, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- (60) Model #5MBX Stem caster, 5” with brake, resilient wheel tread, 200-pound capacity, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 93

QUANTITY: 1

MANUFACTURER: ADVANCE TABCO

MODEL: 9-OP-21

DESCRIPTION: MOP SINK
Mop Sink, floor mount, 21" wide x 21” deep x 10” high overall, 26" wide x 26" front-to-back x 14" deep bowl with coved corners, 16-gauge construction with notched out front, fully welded 304 stainless steel, full skirt, 2" NPS drain with stainless steel removable strainer plate, NSF.

- Mop Holder, holds three (3) mops
- Service Faucet Hose, 36" length
- Service Faucet, heavy duty with 8” centers
- Provide stainless steel wall panels, 36” tall on rear and side wall
- Seal sink unit to the walls

ITEM: 94

QUANTITY: 1

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: CHEMICAL SHELVING
Each unit consists of four (4) posts and four (4) shelves.

- (4) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.

- (48) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

END OF SECTION

SECTION 115313
LABORATORY FUME HOODS AND RELATED PRODUCTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bench-top High-Performance Laboratory Fume Hoods.

B. Service fixtures (ie. water, gas, etc.) and electrical service fittings in fume hoods.

C. Piping and wiring within service fittings, light fixtures, switches, and other electrical devices.

D. Fume hood base support.

E. Work Surfaces within fume hoods.

F. Filler panels and ceiling enclosures for fume hoods.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 220500: Furnish and installation of plumbing utilities and final connections to fume hoods.

C. Section 230000 : Furnishing and installation of exhaust duct work and equipment, and final connection of hoods.

D. Section 260010: Furnishing and installation of electrical utilities and final connections to hoods.

1.03 REFERENCE STANDARDS

A. ANSI - American National Standards Institute; 2020.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

C. ASTM C1036 - Standard Specification for Flat Glass; 2025.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ISO 9001 - Quality Management Systems — Requirements; 2026.

F. NFPA 30 - Flammable and Combustible Liquids Code; 2024, with Errata (2025).

G. NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals; 2024.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. SEFA 1 - Laboratory Fume Hoods and Ventilated Enclosures for Laboratories; 2026.

J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

K. UL 1805 - Standard for Safety Laboratory Fume Hoods and Cabinets; Current Edition, Including All Revisions.

L. UL 61010-1 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements; Current Edition, Including All Revisions.

1.04 SCOPE AND CLASSIFICATION

A. This specification covers the requirements for the purchase of bench mounted laboratory fume hoods for use with remote exhaust blower systems.

B. Bench-mounted laboratory fume hoods in 4 foot, internal depth of 23.3” and external depth of 31.7" is required.

C. This specification sets the intent for quality, performance and appearance.

1.05 REFERENCE STANDARDS

A. The laboratory hoods must conform to the following regulations and standards.
   1. SEFA 1, Scientific Equipment and Furniture Association, Recommended Practices for Laboratory Fume Hoods
   2. SEFA 8, Recommended Practices for Laboratory Grade Metal Casework, 8.0 Cabinet Surface Finish Tests
   3. NFPA 45, National Fire Protection Association, Fire Protection for Laboratories Using Chemicals
   4. ASTM E84-09C, ANSI 2.5, NFPA 255, UL 723, UBC 8-1 (42-1), Standard Test method for Surface Burning Characteristics of Building Materials
   5. ASHRAE 110, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Method of Testing Performance of Laboratory Fume Hoods
   6. ANSI/AIHA Z9.5, American Industrial Hygiene Association, Laboratory Ventilation
   7. OSHA, Federal Register 29 CFR Part 1910, Occupational Safety & Health Administration, U.S. Department of Labor, Occupational exposures to hazardous chemicals in laboratories.

B. The laboratory fume hoods must carry the ETL listed mark for the following.
   1. UL 61010-1 (formerly 3101-1), Underwriters Laboratories Inc., Electrical Equipment for Laboratory Use
   2. CAN/CSA C22.2 No. 61010-1, Canadian Standards Association, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
   3. UL 1805, Underwriters Laboratories Inc., Standard for Laboratory Hoods and Cabinets

C. 230 volt model fume hoods must carry the CE conformity marking as required by the Council of European Communities.

1.06 PERFORMANCE REQUIREMENTS

A. General Design Requirements (See Part 2 for details)
   1. Fume hoods shall function as ventilated, enclosed workspaces, designed to capture, contain and exhaust fumes, vapors and particulate matter produced or generated within the enclosure.
   2. Fume hood shall be factory designed to function as a by-pass fume hood.
   3. Structure and Materials of construction
      a. Hoods are of double-wall construction
      b. Powder-coated, cold rolled steel exterior
      c. Galvanized steel support members
      d. One-piece, monolithic, molded polyester resin liner
   4. Baffles
      a. One-piece, monolithic, molded polyester resin
      b. Moving or adjustable baffles are not acceptable
   5. Sash
      a. Maximum opening is 28".
      b. Unobstructed viewing height is 37.5".
      c. Hood incorporates a perforated sash handle to bleed air into the hood chamber directing fume concentrations away from the user's breathing zone.
   6. Airfoil:
      a. Hoods are provided with an airfoil across the bottom of the sash area that allows airflow into the hood regardless of user's position.

7. Besides the exhaust blower, no additional blowers are required for specified containment.
8. Access for maintenance is from both the front and exterior sides of the hood.
9. Services:
    a. Hood manufacturer shall furnish and deliver all service outlets, accessory fittings, electrical receptacles and switches, as listed in these specifications, equipment schedules or as shown on drawings.
    b. Plumbing fittings mounted on the fume hood superstructures shall be pre-plumbed per section 2.03.
    c. Final plumbing and electrical connections are the responsibility of those contractors fulfilling requirements of Divisions 22 and 26.
    d. All electrical services are pre-wired to a single point internal junction box at the top right of the hood.
10. Hoods without service fixtures must pass through a 33” opening without disassembly.

B. Containment
1. The purpose of this section is to set a standard of performance for the bidder’s laboratory fume hood before award of contract, and may not necessarily represent the operating conditions of the hoods after installation. Before or after award of contract, owner may require representative witness to said testing at their option, with failure to meet passing criteria as grounds for rejection of the bidder. Test data shall be provided at no cost to the owner.
2. Evaluation of manufacturer’s standard product shall take place in manufacturer’s test facility meeting the following criteria.
    a. Lab to be located at manufacturer’s place of business for the testing of bench-mounted laboratory hoods in accordance with ASHRAE Standard 110.
    b. Room shall accommodate hoods up to 16’ wide, while maintaining sufficient area so that a minimum of 15 feet of clear space is available in front of and 5’ on both sides of hoods for viewing tests.
    c. The facility's ventilation system shall have adequate heating and air conditioning so that room air temperatures can be maintained within the desired ranges.
    d. One hundred percent non-recirculated air to be both carbon and HEPA filtered to ensure removal of contaminants that could interfere with containment testing before entering the lab.
    e. Make-up air to the test room shall be ceiling-supplied through any combination of multiple diffusers to either minimize adverse airflow, or increase it depending on test objectives.
    f. Exhaust volumes shall be computer controlled and measured via AMCA calibrated orifices and flow station at each exhaust trunk.
    g. Room pressurization must be digitally monitored, and variable depending on test objectives.
    h. All equipment must be properly calibrated.
    i. Qualified personnel familiar with the laboratory and its operation shall be available to perform the test.
    j. Include the following instrumentation and test equipment:
        1) Properly calibrated hot wire thermal anemometer capable of measuring air velocities from 10 to 600 ft/minute; correlate with computer data acquisition format to provide simultaneous readings at all points.
        2) Theatrical smoke generator or other source of high volume smoke.
        3) Smoke tubes or other source of localized smoke.
        4) Leakmeter with traceable calibration, calibrated just before test, to indicated concentration of sulfur hexafluoride.

5) Tracer gas: Sulfur hexafluoride supplied from a cylinder with two stage regulator.
6) Adjustable mannequin, 5' 0' to 5'8" in height, with reasonable human proportions, clothed in a smock
7) Inclined manometer with graduations no greater than 0.2 inch of water.
8) Ejector system: Tracer gas ejector built to specific ASHRAE-110 requirements.
9) Critical orifice: Sized to provide tracer gas at four or eight liters per minute at an upstream pressure sufficient to maintain release rate.
10) Data acquisition software to include HoodPro™ and LabMeasurePro™ from Exposure Control Technologies, Inc. or equal.

3. Hood shall be tested to ASHRAE 110 modified test method as detailed below.
4. Some fume hoods may use face velocity controls, motorized baffles, integral auxiliary make up, or supply fans. Because all of these devices are subject to failure, containment testing shall show both operational containment and product containment with these systems off.
5. Fume hood sashes shall be placed in their full open position, at least 28” from the work surface, unless noted otherwise.
6. Ambient Temperature: 68 to 74 degrees Fahrenheit
7. Average Face Velocity: Face velocity average shall be 60 fpm, as noted below in subsection 8.d, parts 1 and 2, plus or minus 5%.
   a. An imaginary grid is formed comprised of equal 12” by 12” squares, or smaller, across the face opening of the laboratory hood. Airflow velocity readings are taken at the intersections of these grids with calibrated hot wire anemometer over a twenty second period of time. Probes shall communicate readings to a computer data acquisition package, which will provide an average of each reading over the one-minute period and also an overall average upon completion of data acquisition. Face velocity shall be determined by averaging readings at the hood face.
   b. Average face velocity must be achieved without exceeding the CFM noted in part C.
8. Tracer Gas Detection: Hood shall achieve a rating of 4.0AM0.00 maximum average and 4.0AM0.01 maximum spike (unless specifically otherwise noted), wherein:
   a. 4.0 = tracer gas release in liters/minute, AM = as manufactured, 0.01 = tracer gas in parts per million (PPM)
   b. With the ejector body 6" from the rear of the sash plane, the test shall be conducted for each ejector position noted.
      1) Left position with ejector 12" from the left interior wall.
      2) Center position with ejector equidistant from the sidewalls.
      3) Right position with ejector 12" from the right interior wall.
   c. Install mannequin positioned in front of the hood, centered on the ejector.
   d. Detector probes shall be placed 3” in front of the sash plane. The test shall be conducted for each detector probe position and corresponding face velocity.
      1) Detector probe in the region of the nose and mouth of the mannequin. Test with average face velocity of 60 fpm.
      2) With the mannequin height reduced 4”, place detector probe in the chest of the mannequin, and even with the height of the ejector. Test with average face velocity of 60 fpm.
   e. Open tracer gas valve, and collect readings with a computer data acquisition package, which is capable of monitoring and visually recording a minimum of one reading per second for a minimal five minute time period for each position.
   f. The single control rating of the fume hood shall be the results of the test position yielding the highest average levels of tracer gas in any of the six mannequin/ejector configurations.

g. With the ejector and mannequin in the center position, detector probe in the region of the nose and mouth of the mannequin, average face velocity of 60 fpm, tracer gas released, and concentration recorded, open and close the sash in a smooth motion. Test to be repeated three times, with peak values of 0.01 PPM or less.
h. With the mannequin removed, the periphery of the hood is traversed by the probe at 1" in front of the hood opening at a rate of 3 inches per second. The hood shall have a maximum perimeter reading of 0.03 PPM or less.

9. Flow Visualization:
a. Test the operation of the lower air bypass airflow opening and hood periphery by introducing light smoke under the airfoil, and around the perimeter of the sash opening. If any smoke that enters the hood reverses directions and escapes from any of these locations, the hood fails this portion of the test and receives no rating.
b. Introduce smoke along both walls and the hood floor in a line parallel to the hood face and 6 inches back into the hood. Define air movement toward the face of the hood as reverse airflow and define lack of movement as dead air space. All smoke should be carried to the back of the hood and out.
c. Introduce a large volume of smoke at the work surface in the center of the hood, and 6" inside the plane of the sash. Define air movement toward the face of the hood as reverse airflow and define lack of movement as dead air space. All smoke should be carried to the back of the hood and out.
d. All data on the above, including instrumentation and equipment, and test conditions shall be provided on a report, including the average face velocities, and a separate graph-type performance curve on all tracer gas tests for all required fume hood widths. Performance test data for a 6' representative hood shall be conducted by an independent testing agency and by a specific individual certified to perform such tests by the National Environmental Balancing Bureau (NEBB).

C. Efficiencies
1. The fume hood shall maintain constant volumetric rate (+/- 5 CFM) and static pressure losses (+/- 0.01" H2O) across all sash positions, unless the hood has a restricted by-pass for use with a variable air volume (VAV) system.
2. The fume hood shall demonstrate a minimization of the volumetric rate of air (CFM) requirement at any given face velocity. Required CFM to achieve desired face velocity shall not exceed that which is noted in the chart below.
3. The fume hood shall demonstrate a minimization of static pressure loss (inches of H2O) at any given CFM. Static pressure loss at desired face velocity, and corresponding CFM, shall not exceed that which is noted in the chart below.
a. *There is not a written standard that would suggest a design face velocity below 60 fpm. This data is for informational purposes only.

D. Noise Criterion: The hood shall have a Noise Criterion (NC) rating of less than 50; measured 36" in front of the hood with full open sash, at 100 fpm face velocity. NC is a factor of sound pressure level (dB) and frequency.

E. Illumination: Shall be a minimum average of 80 foot-candles inside the work area. Work area is defined as the area inside the lined portion of the fume hood, from the face of baffle to sash plane, from interior left to interior right, and from the work surface to a height of 28 inches.

F. Materials of Construction: Interior and Exterior materials of construction and finishes shall meet the requirements in Part 2 of this specification.

1.07 QUALITY ASSURANCE

A. Fume hoods shall be designed, including comprehensive engineering analysis, by a qualified, licensed Professional Engineer.

B. Manufacturer's Qualifications

1. ISO 9001 Certified manufacturing plant and processes.
2. Ten installations of equal or larger size and requirements. Provide contact at each.
3. Only hood manufacturers who have had fume hoods as a principal product for 30 years are considered.

C. Fume hoods shall be Made in America
1. 95% or more of raw material and component suppliers shall be United States based.
2. Stainless and cold rolled steel used in manufacturing shall be sourced from United States steel mills.
3. Final product must be fabricated and assembled within the United States of America.
4. Owner reserves the right to evaluate Made in America claims for compliance with the Bureau of Consumer Protection.

D. Supply all equipment in accordance with this specification. Offering a product differing in materials, construction, or performance from this specification requires written approval obtained seven days or more before the proposal deadline.

E. The owner/architect reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.

F. Manufacturer's warranty against defects in material or workmanship on its fume hoods will be for 1 year from date of installation or 2 years from date of purchase, whichever is sooner, and includes replacement of parts (except lamps) and labor.

1.08 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Laboratory hood specification sheets and product manuals shall be submitted by the hood manufacturer upon request, and include safe and proper operation and maintenance information.

C. Shop Drawings: Include plans, elevations, sections, and details.
1. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports.
2. Indicate locations and types of service fittings together with associated service supply connection required.
3. Indicate duct connections, electrical connections, and locations of access panels.
4. Include roughing-in information for mechanical, plumbing, and electrical connections.
5. Provide face opening, volumetric rates, and static pressure drop data.

D. Submit a document detailing the information supplied on the Hood Safety Practices Label to verify compliance to specifications.

E. Product Test Reports: Showing compliance with specified performance requirements, including NEBB representative test report as defined previously.

F. Independent validation:
1. Written verification that the laboratory fume hoods carry the ETL listed mark for the following.
a. UL 61010-1 (formerly 3101-1), Underwriters Laboratories Inc., Electrical Equipment for Laboratory Use
b. CAN/CSA C22.2 No. 61010-1, Canadian Standards Association, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
c. UL 1805, Underwriters Laboratories Inc., Standard for Laboratory Hoods and Cabinets
2. Written verification that 230 volt model fume hoods carry the CE conformity marking as required by the Council of European Communities.

3. Written verification from an outside testing agency confirming coating compliance to SEFA 8-2010, Recommended Practices for Laboratory Grade Metal Casework, 8.0 Cabinet Surface Finish Tests

G. Documentation of ISO 9001 Certified manufacturing plant and processes.

H. List of five installations (of equal or larger size and requirements) is available upon request. Provide contact at each.

I. Declaration of Made in America. Owner reserves the right to evaluate Made in America claims for compliance with the Bureau of Consumer Protection.

J. Material Submittals
1. Samples for Verification: of the hood exterior wall material, interior liner and baffle material, epoxy work surface material, and color selection chips are available from the hood manufacturer upon request.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

B. Schedule delivery of equipment so that spaces are sufficiently complete that equipment can be installed immediately following delivery.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install fume hoods until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. **(Basis of Design)** Labconco Corporation; Protector Premier Series: www.labconco.com/#sle.

B. Substitutions: See Section 016000 - Product Requirements.

2.03 MATERIALS

A. Hood Interior Liner and Baffle
1. Liner material must comply with UL 1805, and be listed within NRTL test report as proof of compliance.
2. General Material Properties
a. Nonflammable, corrosion and chemical-resistant
b. Fiberglass reinforced polyester resin
c. Minimum thickness is 3/16"
d. Smooth, white finish
3. Method of Construction
a. Liner shall be one continuous molded component, and of monolithic construction, including the left and right side walls, rear, ceiling, and duct collar. Liners that are

bonded together, do not include the duct collar within the continuous structure, or are of panelized construction are not acceptable.

4. Flame and Smoke Characteristics
   a. Flame retardant, self-extinguishing, with a flame spread rating of 25 or less in accordance with ASTM E84
5. Chemical Resistance
   a. Splash and Spill Resistance:
      1) Suspend sample panel in a vertical plane
      2) Apply five drops of each reagent listed with an eyedropper
      3) Apply liquid reagents at top of panel and allow to flow down full panel height
   b. Fume Resistance:
      1) Place 25 milliliters of reagent into 100 milliliters beakers and position panel over beaker tops in the proper sequence. Ensure beaker pouring lip permits air to enter the interior atmosphere.
      2) After 24 hours remove panel, flush with water, clean with detergent, rinse, wipe dry and evaluate
   c. Evaluation ratings: Change in surface finish and function shall be described by the following ratings
      1) E: Excellent for intended service with expected long and economic life.
      2) G: Some staining may result with prolonged usage. Satisfactory for limited service. Tests under actual conditions suggested.
      3) F: Surface deterioration may be experienced with prolonged usage. Test under actual conditions.
      4) NR: Not Recommended
   d. Required minimum results for each reagent (Reagent, Rating)

1) Acetic Acid G	2) Acetone G
3) Acrylic Acid G	4) Aluminum Fluoride E
5) Aluminum Sulfate E	6) Ammonia E
7) Ammonium Bicarbonate E	8) Ammonium Carbonate G
9) Ammonium Chloride E	10) Ammonium Fluoride F
11) Ammonium Hydroxide G	12) Ammonium Nitrate E
13) Ammonium Persulfate E	14) Ammonium Sulfate E
15) Ammonium Thiocyanate E	16) Amyl Acetate E
17) Amyl Alcohol E	18) Aniline F
19) Aniline Sulfate E	20) Antimony Pentachloride E
21) Antimony Trichloride E	22) Aqua Regia (HNO3-HCl) Aromatic Hydrocarbon E
23) Arsenious Acid E	24) Barium Carbonate E
25) Barium Chloride E	26) Barium Hydroxide F
27) Benzaldehyde F	28) Benzene G
29) Benzene Sulfonic Acid E	30) Benzoic Acid E
31) Bleach - Hypochlorite E	32) Bromine, liquid F
33) Butyl Acetate E	34) Butyl Alcohol E
35) Butyric Acid E	36) Calcium Chlorate E
37) Calcium Chloride E	38) Calcium Hydroxide E
39) Calcium Hypochlorite E	40) Calcium Sulfate E

41) Caprylic Acid(n-Octanoic Acid) E	42) Carbon Dioxide E
43) Carbon Disulfide Vapor F	44) Hydrocyanic Acid E
45) Hydrofluoric Acid G	46) Hydrofluorosilic Acid F
47) Hydrogen E	48) Hydrogen Chloride, Anhydrous E
49) Hydrogen Fluoride, Wet F	50) Hydrogen Peroxide E
51) Hydrogen Sulfide E	52) Hypochlorous Acid E
53) Kerosene E	54) Lactic Acid E
55) Lead Acetate E	56) Lime Slurry E
57) Linseed 0il E	58) Lithium Chloride E
59) Magnesium Carbonate E	60) Magnesium Chloride E
61) Magnesium Sulfate E	62) Malic Acid E
63) Mercaptan, 0rganic, H2S, H20, Butanol E	64) Mercuric Chloride E
65) Mercurous Chloride E	66) Mercury E
67) Alcohol E	68) Methyl Chloride F
69) Methyl Ethyl Ketone G	70) Methyl Isobutyl Ketone E
71) Moisture E	72) Naptha E
73) Napthalene E	74) Nickel Chloride E
75) Nickel Nitrate E	76) Nickel Sulfate E
77) Nitric Acid E	78) Nitrobenzene G
79) Nitrogen E	80) Nitrous Acid E
81) 0leic Acid E	82) 0xalic Acid E
83) Perchloric Acid NR	84) Phenol F
85) Phosphate Salts E	86) Phosphonitrilic Chloride, Cl2, HCl, benzene, H20 Vapors E
87) Phosphoric Acid E	88) Phosphoric Vapor & Condensate E
89) Phosphoric: Nitric Vapor E	90) Phosphoric: HCl, Saturated with phosphorous E
91) Phosphoric: HCl, Sat. with Cl2 E	92) Phosphorous 0xychloride, CHl, Cl2, H20 Vapors E
93) Phosphorous Trichloride, HCl, Cl2, H20 Vapors E	94) Phosphorous Sesquisulfide E
95) Phthalic Anhydride E	96) Picric Acid in Alcohol E
97) Potassium Bicarbonate E	98) Potassium Carbonate E
99) Potassium Chloride E	100) Potassium Dichromate E
101) Potassium Ferrocyanide E	102) Potassium Hydroxide F
103) Potassium Nitrate E	104) Potassium Permanganate G
105) Potassium Persulfate E	106) Potassium Sulfate E
107) Propylene Glycol E	108) PVA Emulsion E
109) Pyridine F	110) Silver Nitrate E
111) Sodium Acetate G	112) Benzoate E

113) Sodium Bicarbonate E	114) Sodium Bisulfate E
115) Sodium Borate E	116) Sodium Bromide E
117) Sodium Carbonate E	118) Sodium Chloride E
119) Sodium Cyanide F	120) Sodium Ferricyanide E
121) Sodium Hydroxide G	122) Sodium Hypochlorite E
123) Sodium Nitrate E	124) Sodium Sulfate E
125) Sodium Sulfide E	126) Sodium Sulfite E
127) Sodium Tetraborate E	128) Sodium Xylene Sulfonate E
129) Stannic Chloride E	130) Stannous Chloride E
131) Stearic Acid E	132) Styrene G
133) Sulfite Liquors E	134) Sulfur, molten, vapors E
135) Sulfur Chloride E	136) Sulfur Dioxide E
137) Sulfonated Aliphatics, HCl, H2S, Butanol vapors E	138) Sulfur Dioxide Saturated H20; trace HF, H2S04, H2S, F2 E
139) Sulfur Dioxide: S03 wet vapor F	140) Sulfur Trioxide E
141) Sulfuric Acid G	142) Sulfuric Acid + Dichromate G
143) Sulfuric + Chromic G	144) Sulfuric Acid vapor G
145) Sulfuric-Nitric Acids G	146) Sulfuric - HCl G
147) Sulfurous Acid G	148) Tannic Acid E
149) Tartaric Acid E	150) Tetropotassium Pyrophosphate E
151) Toluene G	152) Toluene Diisocyanate E
153) Trichloroacetic Acid E	154) Trichloroethylene G
155) Trichloroethylene, HCl, Cl2, H20 vapors G	156) Trichlorophenol F
157) Trisodium Phosphate F	158) Waste, 0rganic, H20, HCl, Cl2, vapors E
159) Water E	160) Zinc Chloride E
161) Zinc Sulfate E	162)

B. Sheet Steel
   1. Side panels and access panels 20-gauge (or heavier) sheet steel.
   2. Hood corner posts are 18-gauge sheet steel.
   3. Ceiling enclosure panels are 18 gauge sheet steel.
   4. Cold-rolled, commercial steel (CS) sheet, complying with ASTM A1008/A1008M.

C. Chemical Resistant Finish
   1. General: Prepare, treat, and finish welded assemblies after welding. Prepare, treat, and finish components that are to be assembled with mechanical fasteners before assembling.
   2. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8. Third party validation required.
   3. Powder-coat process required. Paint processes that release Volatile Organic Compounds (VOC) are not acceptable
   4. Color for Fume Hood Finish:

a. As selected by architect from Manufacturer's full range

D. Safety Glass
1. Tempered
a. Clarity and temper test to be as specified in latest edition of Glass Tempering Association, Engineering Standards Manual, Section 8.1.
b. Surface and interior visible quality to be as specified per ASTM C1036, Standard Specification for Flat Glass, Table 4, Quality level Q3.

2.04 CONSTRUCTION

A. Superstructure:
1. Self-supporting, rigid structural assembly, to support inner wall consisting of fume hood liner and outer wall of sheet metal exterior.
2. Fabricated from galvanized steel.
3. Space shall accommodate fume hood wiring and plumbing components for service fixtures.
4. Access to fixture valves concealed in wall provided by exterior removable access panels or through removable access panels on the front posts.

B. Exterior
1. Fabricate from steel sheet with component parts screwed together.
2. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.
3. Interchangeable side panels shall lift off without the use of tools to allow access to plumbing lines, service fittings, electrical wiring, counterbalance sash weights, and light fixtures. Exposed fasteners or hardware, and Velcro type fasteners, are not acceptable.
4. Corner posts
a. Pre-punched and plugged to accommodate up to 4 service fixtures per side
b. All services are accessible from the front of the hood.
c. Aerodynamic shape
d. Accommodate two electrical duplexes per side.
e. Right hand corner post includes electrical switches and pre-cut for Airflow monitor installation.
f. Un-used penetrations shall be plugged.
5. Top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.
6. Panel above header shall be removable without the use of tools to allow access to mechanical connection, electrical wiring, counterbalance sash weights, and light fixtures. Exposed fasteners or hardware, and "hook-and-loop" type fasteners, are not acceptable.

C. Dimensions
1. Overall exterior dimensions are as follows:
a. 4 foot nominal width: 48" w x 59" h x 31.7"d
2. Overall interior dimensions are as follows:
a. 4 foot nominal width: 38.1" w x 48" h x 23.3"d

D. Hood Liner
1. Adhere interior liner components to superstructure.
2. Stainless steel fasteners shall be used on the interior ceiling for structural integrity.
3. Fasteners exposed to chemical environment are not acceptable.
4. Punch fume hood lining side panels to receive four service fittings, for use with remote controls, per side. Provide removable plug buttons for holes not used for indicated fittings.

E. Hood Baffle

1. Baffle system shall be designed to capture a wide range of gaseous densities without adjustment or moving components.
2. Shall provide a continuous horizontal slot at the work surface, vertical openings running the interior height of the hood on the left and right sides, and an opening at the ceiling running left to right.
3. The baffle system shall be constructed with the same material as the fume hood liner.
4. The baffles shall be removable for cleaning.
5. Exposed components to be non-metallic. Metal components exposed to chemical environment are not acceptable.
6. Moving parts or adjustment of any kind is not acceptable.

F. Exhaust Connection
1. Fiberglass reinforced polyester resin, and a continuous component of the fume hood liner. Duct collars attached with fasteners, adhesive, or varying in material of construction from the liner are not acceptable.
2. 12.81" ID to accommodate any 12” nominal duct without the need for a transition adapter. 4, 5, and 6-foot hoods have one exhaust connection, 8-foot hoods have two exhaust connections. Additional components required to accommodate 12” nominal mechanical system are not acceptable.
3. Ducting shall go inside the duct collar to ensure condensate travels into the hood and evaporates. Duct collars that allow duct connection over the collar are not acceptable.

G. Airfoil
1. 316 Stainless Steel with Chemical-Resistant Finish.
2. Airfoil shall have an aerodynamic radius to sweep the air into the hood with minimal turbulence. Airfoil directs airflow across work top to remove heavier-than-air gases.
3. Must have 5 rows of perforations to allow the air to bypass underneath and through the foil and sweep across the work surface to prevent any back flow of fumes escaping from the front of the hood opening. This airflow continues even if blocked by the presence of the operator.
4. Foil must extend back under the sash to prevent closure of the lower by-pass opening when the sash is in the fully closed position, directly on top of the airfoil.

H. Sash Assembly
1. Glass: Fully tempered safety glass with unobstructed, side-to-side view of fume hood interior and service fixture connections.
2. Dimensions: The full sash opening height is 28", the total unobstructed viewing height is 37.5" measured from the work surface.
3. Sash Tracks: Steel with Chemical Resistant Finish. Shall include bump stops for opening and closing.
4. Sash Handle: extruded aluminum with Chemical Resistant Finish. Sash handle includes a perforated air passage directly atop the handle to bleed air into the hood chamber and direct chemical fumes away from the user's breathing zone. The handle is ergonomic in design and is easy to grasp when operating
5. Sash guides: Corrosion resistant extruded poly-vinyl chloride.
6. Sash System
   a. Vertical Sash (Chain and Sprocket)
      1) Hoods have a single vertical sash counterbalanced by a single weight.
      2) Sash and weight to be connected via #35 chains.
      3) Rear sprockets shall be connected via timing shaft to prevent sash tilting and permit one finger operation at any point along full width sash handle. Maximum 7 pounds pull required to raise or lower sash throughout its full length of travel.
      4) Design system to hold sash at any position without creep and to prevent sash drop in the event of chain failure.

5) Include a defeatable, and automatically resetting sash stop positioned for an 18" sash height.

I. Electrical Components
   1. Lighting
      a. Provide UL Listed, high-efficiency, quick-start, T8 LED lighting systems, including bulbs.
         1) 4 Foot Hoods - 2 each, 12-watt LED lamps
      b. Vapor-Proof: all electrical components shall be outside of the contaminated air space. Lighting shall be located behind a laminated safety glass shield, sealed to the top of the hood liner.
      c. The LED light assemblies shall be serviceable from outside the fume hood cavity, without the use of tools.
      d. Light switch to be included on the lower right corner post, at heights compliant with the Americans with Disabilities Act (ADA).
   2. Blower Switch Pick one
      a. Hoods shall be provided with blower switch, on the lower right corner post, at heights compliant with the Americans with Disabilities Act (ADA).
   3. Electrical Receptacles
      a. The hoods shall accommodate up to four (two per corner post) electrical receptacles as indicated in schedule or drawings. Options to include:
         1) 115 volt, 60 Hz, three-wire polarized and grounded electrical duplex
         2) 115 volt, 60 Hz, three-wire polarized and grounded electrical duplex, with Ground Fault Circuit Interruption (GFCI)
         3) 230volt, 60 Hz, three-wire polarized and grounded electrical duplex
      b. Receptacles shall be individually wired to field wiring box, and each rated at 20 Amperes.
      c. Cover plates shall be acid resistant thermoplastic.
   4. Wiring
      a. Every electrical component shall be individually wired to a single point internal field wiring box (including individual duplexes/receptacles).
      b. Field wiring box to be 7" x 4" x 2.5", grounded, and have (12) 7/8" diameter knock out penetrations.
      c. Final wiring and circuit dedication is to be by others.
      d. Each receptacle circuit shall accommodate being wired to a dedicated building circuit rated at 20A, or the receptacles wired to a single circuit with the total load not exceeding 20 Amperes.
   5. Fume hood to have third party validation of compliance to UL 1805 and UL 61010-1 by a Nationally Recognized Testing Laboratory (NRTL)

J. By-Pass Opening
   1. The size of the by-pass opening is controlled by sash position for use with a constant volume mechanical system. The hood shall not have a change in static pressure or exhaust volume across all sash positions.

K. Hood Safety Practices Label: Corrosion resistant plate attached to the corner post of the fume hood with the following Hood Safety Practices:
   1. For use with substances that produce hazardous levels of airborne chemicals: gas, fumes, vapors, dust
   2. Do not put your head in the hood.
   3. Minimize drafts and sudden movements in front of the hood.
   4. Work a minimum of six inches inside the hood.
   5. Elevate equipment above the work surface.

6. Keep sill and baffle unobstructed.
7. Do not use the hood for storage.
8. Adjust the sash to smallest opening possible when in use.
9. Close sash when unattended.
10. Do not remove any of the hood components.
11. Do not place flammable solvents near heat, flame or sparks.
12. Do not evaporate large amounts of flammable liquids.
13. Wipe up spills immediately.
14. Routinely validate airflow.
15. If the ventilation system malfunctions, or airflow alarm indicates unsafe condition, close sash and discontinue hood operation immediately-call for help.
16. Do not use with Biohazards or Perchloric Acid

L. Fume Hood Accessories
1. Service Fixtures: Color-coded hose nozzle outlets and valves mounted inside the fume hood and controlled from the exterior with color-coded index handles
   a. The hoods are equipped without service fixtures or will be provided with a total of up to 8 service fixtures as indicated in schedule.
   b. Hose connectors located inside the fume hood cavity are chemically-resistant, glass-filled polypropylene with 6 serrations.
   c. Service lines shall be factory installed from valve to outlet
      1) Copper tubing unless otherwise noted
      2) Brass service lines for gas
      3) Connections shall be made with quick-connect compression fittings on the inlet and outlet of the valve body, soldered and brazed connections not easily disassembled are not acceptable.
      4) Inlet tubing not included or services include a coil of tubing to be routed below the hood at time of installation
   d. Valves
      1) Extruded brass valve and rotating seat, TFE-coated silicone bronze stem and TFE packing.
      2) Fixture handles are plastic and color coded as well as labeled for the designated type of service.
      3) Fixtures are rated at maximum pressure of 200 psi.
      4) Coefficient of flow for the valve, Cv=0.43.
2. Tissue Screen: Provide epoxy-coated, stainless-steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.
3. Rear Finish Panel: Shall be the same materials and coating as the hood exterior.
4. Ceiling Enclosure Panels:
   a. Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling.
   b. Exposed fasteners are not acceptable.
   c. Height adjustment to be within the following ranges as specified in the schedule.
      1) 11.0 - 14.0”
      2) 14.0 – 18.6”
      3) 18.6 – 24.4”
5. Distillation Grid: Include stainless steel rods and connectors for field installation, and factory drilled liner.
6. Face Velocity Monitor/Alarm
   a. Audio/Visual Airflow Monitor
      1) Provide audible and visual alarm in the event of an unsafe face velocity.

2) Alarm must sit flush with the fume hood corner post.
3) Based on a thermally compensated thermistor in the alarm module, and air passing through a separate airstream into the hood interior.
4) LED lights display red for alarm and green for normal operation.
5) Must include external alarm and night setback functions.
6) Alarm mute shall be accessible from the front of the monitor; visual alarm must remain activated until alarm condition is corrected.
7) UL Listed electrical components
8) Calibration shall be through a front located potentiometer.
9) Calibration is the responsibility of the owner, following a complete balancing of the mechanical system, and concurrently with As-Installed testing.

M. Work Surface
1. 1.25” thick, molded from solid modified epoxy resin, with smooth, non-specular, black finish.
2. One inch radius front edge for optimal fume hood performance.
3. 3/8” dished area to match the fume hood interior work space and form a water tight pan for spill containment.
4. Include a 2.5” diameter hole on each side for service pass-through and piping. Hole to be covered by hood superstructure upon installation.
5. Include two 1.5” diameter penetrations to accommodate base cabinet venting. Holes to be located outside of dished area and under the fume hood baffles. Include plugs.
6. Physical Properties:
   a. Flexural Strength: Not less than 10,000 psi.
   b. Modulus of Elasticity: Not less than 2,000,000 psi.
   c. Hardness (Rockwell M): Not less than 100.
   d. Water Absorption (24 Hours): Not more than 0.02 percent.
   e. Heat Distortion Point: Not less than 260 deg F (127 deg C).
   f. Flame-Spread Index: 25 or less per ASTM E84.

N. Supporting Base Cabinets
1. Base cabinets shall be in depths of 22", widths, quantities, and types called out in the equipment schedule or drawings, and meet the requirements of this specification.
2. Construction requirements for all cabinets
   a. Exterior construction is 18 gauge (or heavier) cold rolled sheet steel with Chemical Resistant Finish.
   b. Hinges are 10 gauge (or heavier) plate with self-clinching pilot pin. Knuckle, bullet, or piano type hinges are not accepted.
   c. The rear panel will feature a 12" x 8" removable plumbing access panel.
   d. Units 24" wide or less have only one door.
   e. Each cabinet includes four leveling feet.
   f. Capable of supporting up to 800 pounds.
   g. An 8" filler panel is required to increases the cabinet depth to 30".
3. Standard Storage
   a. Overall exterior dimensions:
      1) 48" 48" w x 22" d x 35.5"-36.75"
   b. Flush pull handles are ABS, low gloss black.
4. Acid Storage
   a. Overall exterior dimensions:
      1) 48" 48" w x 22" d x 35.5"-36.75"

b. Completely lined with a polyethylene corrosion resistant liner. The liner is 3/16" thick, with a vacuum formed PVC liner pan at the bottom to contain spills. Each door has a 3/16" sheet polyethylene liner.
c. The cabinet is labeled: "ACID".
d. Flush pull handles are ABS, low gloss black.
e. Each cabinet is vented into the fume hood with a 1-1/2" vent pipe. It should provide a positive airflow directly into the fume hood exhaust system.
f. Supply an epoxy coated steel shelf with PVC liner pan if indicated in the schedule.
g. Acid cabinets with louvers are not acceptable

5. Solvent Storage
   a. Overall exterior dimensions:
      1) 48" 48" w x 22" d x 35.5"-36.75"
   b. Solvent storage cabinets are specifically designed for the storage of flammable and combustible liquids.
   c. Solvent Storage Cabinet must be compliant with NFPA 30 “Flammability and Combustible Liquids Code.”
   d. Cabinets 30" wide and greater shall be tested and approved by Factory Mutual to meet Factory Mutual Approval Standard 6050.
   e. The bottoms, top, sides, and doors are fabricated of 18 gauge steel and are all double panel construction with a 1-1/2" air space between panels.
   f. All joints are welded or screwed to provide a rigid enclosure. A 2" deep liquid tight pan that covers the entire bottom of the cabinet is furnished to contain liquid leaks and spills.
   g. A full-depth, 18 gauge steel, adjustable shelf is also provided. Shelves are sealed leak tight.
   h. Two diametrically opposed flame arrestor vents with spark screens are provided in the back of the cabinet, as well as a grounding screw.
   i. The cabinet has an interior finish same as the exterior.
   j. The cabinet is labeled: "FLAMMABLE - KEEP FIRE AWAY".
   k. The right hand door shall have a three point latching device.
   l. Door handles include a key lock. Solvent storage handles are locking lever handles with bright chrome finish.
   m. If noted on the schedule, self-closing/self-latching models shall be provided with a fusible-link feature to ensure the doors will close if the temperature outside the cabinet exceeds 165 degrees Fahrenheit. The doors are synchronized so that both doors will fully close.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fume hoods.

B. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in and for rough opening dimensions required for the installation of the hood.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install fume hoods according to shop drawings and manufacturer's written instructions.

B. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework.

C. Securely attach access panels, but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

D. Neighboring splash blocks shall not be attached directly to the hood.

E. Install according to standards required by authority having jurisdiction.

F. Sequence installations to ensure utility connections are achieved in an orderly and expeditious manner.

G. Touch up minor damaged surfaces caused by installation. Replace damaged components as directed by Architect.

3.03 FIELD QUALITY CONTROL

A. NFPA 45 requires that fume hoods be field tested when installed.

B. Field test installed fume hoods according to ASHRAE 110 to verify compliance with performance requirements.
   1. Adjust fume hoods, hood exhaust fans, building's HVAC system, and make other corrections until tested hoods perform as specified in fume hood schedule.
   2. After making corrections, retest fume hoods that failed to perform as specified.

3.04 ADJUSTING AND CLEANING

A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.

B. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

C. Clean adjacent construction and surfaces that may have been soiled in the course of installation of work in this section.

D. Provide all necessary protective measures to prevent exposure of equipment and surfaces from exposure to other construction activity.

E. Advise contractor of procedures and precautions for protection of material and installed equipment and casework from damage by work of other trades.

END OF SECTION 115313

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SECTION 116133

PRODUCTION RIGGING, CURTAINS AND TRACKS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SCOPE

A. All materials, components, and services necessary to provide a complete system indicated in this Section, as specified herein and shown on related Drawings, including:
   1. Verification of dimensions and conditions at the job site.
   2. Preparation and submission of complete shop drawings and samples for approval prior to fabrication.
   3. Shipment of equipment to job site and the secured storage of all non-fixed equipment.
   4. Installation and completion, in accordance with these Specifications, related Drawings, the Equipment Manufacturer's recommendations, established trade criteria, and all applicable code requirements.
   5. The inspection, demonstration, and necessary adjustment of the completed installation by the Contractor's engineering personnel.
   6. Preparation and submission of complete record drawings and operational and maintenance data and certificates.

1.03 WORK INCLUDED

A. Deadhung linesets.
B. Motorized winches and winch controls.
C. Curtains and tracks.
D. Rigging accessories.
E. The above is for reference only and is not intended to define the limits of the work for a complete installation.

1.04 WORK NOT INCLUDED

A. Principal structural steel work, except as herein indicated.
B. Electrical wiring, conduit, and connections.
C. The above is for reference only and is not intended to define the limits of the work for a complete installation.

1.05 RELATED WORK IN OTHER SECTIONS

A. Structural steel.
B. Concrete and masonry.
C. Smoke vents and roof hatches.
D. HVAC.
E. Plumbing and sprinklers.
F. General electrical work.
G. Section 26 09 61 – Production Lighting Control and Equipment
H. Section 27 41 00 – Performance Audio / Video System

1.06 QUALIFICATIONS

A. All equipment and installation shall be the responsibility of a single contractor who shall own and operate his own full-time, staffed shop and sewing room for the fabrication and

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assembly of stage equipment. This contractor shall assume complete responsibility for the engineering, fabrication, transportation, and installation of the work in this Section, and shall hold the Owner, Architect, Schuler Shook, and all their Employees and Consultants harmless for any costs for errors or omissions associated with the work of this Section and any action arising therefrom.

B. Approved contractors may, at their option, arrange for sub-contract field and special shop work to be done by others. Bid submissions must identify such subcontractors and indicate the work they are to do.

C. The contractor shall have at least ten (10) years' experience in the installation of similar equipment and systems. If requested, the contractor shall submit a representative list of installations during the above period.

D. The Project Manager assigned to this project shall work from this office and there shall be full-time staff available by telephone at this office location during normal business hours.

E. Subject to the above requirements, work performed under this Section may be by one of the following listed contractors:

1. I. Weiss Theatrical Solutions Fairview, NJ, 201.402.6500.
2. Northeast Stage, Freehold, NJ, 732.431.2201.
3. Wenger, Syracuse, NY, 315.451.3440.

F. Contractors not having a qualified and experienced sewing room as an integral part of their operation shall employ the services of a qualified and experienced sewing sub-contractor for the fabrication of stage curtains. The sewing sub-contractor shall have at least ten (10) years' experience in the fabrication of curtains for similar projects. If requested, the Contractor shall submit a representative list of projects performed by the sewing sub-contractor during the above period. Subject to the above requirements, work performed under this Section may be by one of the following listed sewing sub-contractors:

1. Beck Studios, Milford, OH.
2. I. Weiss Theatrical Solutions, Fairview, NJ.
3. Rose Brand, New York, NY.
4. Stage Decoration & Supplies, Greensboro, NC.

G. Other contractors or sewing sub-contractors may be considered with the prior review of Schuler Shook. Contractors seeking approval to bid must contact Schuler Shook and provide the following information not less than ten (10) days prior to the bid date:

1. List of projects of similar scale and complexity completed in the last five (5) years. Provide project name, location, completion date, and description of equipment installed. Provide contact name, title and phone number for references familiar with contractor’s work on each project listed.
2. Samples of shop drawing submittals for projects of similar scale and complexity completed in the last five (5) years.
3. Technical data sheets for any product proposed for use on this project.
4. Samples of any products requested by Schuler Shook.
5. Name, resume and number of years of employment for contractor’s Project Manager assigned to this project.

1.07 SUBMITTALS

A. With bid.

1. Proof of qualifications as listed above.

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2. A list of any and all proposed deviations or exceptions from the contract Drawings and Specifications, whether or not these variations have been formally or informally accepted by Schuler Shook. Any deviations or exceptions from the Drawings or Specifications proposed after bid shall not be accepted.
3. A schedule for the anticipated completion of the following:
    a. Shop drawings.
    b. Delivery of all equipment.
    c. Installation of all systems.

B. Shop drawings.
1. Shop drawings shall be produced by the primary rigging equipment manufacturer. Where multiple manufacturers are providing equipment, the Contractor shall assemble all shop drawing submittals into a single, complete package with internal coordination. Shop drawings produced by an equipment dealer / vendor shall not be accepted. Partial shop drawing submittals shall not be accepted.
2. Prepare all shop drawings under the supervision of professional electrical and structural engineers so licensed by the State of New York. All shop drawings shall be stamped and certified by those engineers. Structural Engineer's review shall include, but not be limited to, all elements related to overhead lifting, all elements suspended overhead, and structural support of all elements provided by the Contractor.
3. Within forty-five (45) days of contract award, the Contractor shall submit one (1) complete set of computer-generated drawings in PDF format to the Architect for approval prior to fabrication:
    a. Floor plan and section of stage in scale equal to 1/4" = 1'-0".
    b. Elevation of each rigging set type showing stage floor, stage ceiling, all blocks, batten travel, arbor travel, low and high trims, and cable management.
    c. Curtain schedule indicating fabric, finished size, fullness, and top finish.
    d. Complete, fully dimensioned shop drawings of all major components.
    e. Requisite plans, sections, schematics, and details indicating assembly and installation of components.
    f. Quantities of each component and sub-assembly.
    g. Load ratings of all bearings, blocks, trim chains, lift lines, and purchase lines within the system.
    h. Certification that all steel cable and rope is certified to meet Federal Standard RR-W-410E or ASTM 1023/A 1023M and to meet the required breaking strength.
    i. Indication of all supplementary structural support to be supplied and installed as part of the work of this Section.
    j. Complete descriptions, including manufacturer and model number, of all bearings, motors, and transmissions.
    k. Complete descriptions, including manufacturer and model number, of all electrical components. All control panel switches and pilot lights shall be described by the manufacturer's catalog sheet.

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l. Power requirements and installation wiring diagrams for all electrical components.

m. Indication by boxed caption of any and all deviations or exceptions from the contract Drawings and Specifications, whether or not these variations have been formally or informally accepted by Schuler Shook.

C. Samples.

1. Within forty-five (45) days of contract award, the Contractor shall submit to the Architect and Schuler Shook for approval prior to fabrication:

a. Standard color lines and / or color samples as required for all curtain fabrics for selection by Architect.

b. Custom curtain colors, fabrics or assemblies shall be submitted at a scale sufficient to review all pattern repeats, trim, decorative elements, hems and finishing. Custom samples shall be minimum 24-inches square, identical in weight and pile to the finished curtain fabric. Contractor shall obtain written approval of all custom colors, fabrics or assemblies prior to fabrication.

c. Samples of any equipment component requested by Schuler Shook.

2. Samples shall not be considered part of specified quantities but shall be returned to Contractor upon request.

D. Final submittal.

1. Within thirty (30) days of final tests, and as a condition for final approval, the Contractor shall submit three (3) bound sets to the Architect and one (1) bound set to Schuler Shook:

a. Receipts for delivery of all non-installed items, i.e., all items designated, "deliver to Owner."

b. "As built and approved" drawings and wiring diagrams showing all systems and components as installed, including all field modifications.

c. Operation and service manuals, schematics, and parts lists for each unit of equipment installed or provided.

d. Flameproofing certificates.

e. Certificates of warranty, as set forth below.

1.08 TESTING AND INSTRUCTION

A. The primary rigging equipment manufacturer shall conduct a preliminary site inspection and notify Schuler Shook in writing that the installation is complete and ready for punch list inspection. The manufacturer site inspection may be waived in writing by Schuler Shook prior to bid.

B. Upon completion of all installation work and manufacturer inspection, the Contractor shall certify in writing to the Architect that the work is complete and ready for final inspection. Final inspection shall be scheduled by the Owner, the Architect, and Schuler Shook within fourteen (14) days following the Contractor's notice of completion.

C. Final inspection shall be conducted by a knowledgeable representative of the Contractor, in the presence of the Owner, the Architect, and Schuler Shook, and shall include the following:

1. Visual examination of all components.

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2. Operation of all components.
3. Sightline check of masking curtains.

D. Necessary adjustments or modifications shall be made as required.

E. Contractor's representative shall instruct Owner's designated staff or representatives in the safe operation and maintenance of all equipment, including the storage and cleaning of all fabrics. This instruction session shall be scheduled to last a minimum of four (4) hours.

F. The contractor shall provide to the Owner video-recorded instructions on the operation and maintenance of the system. Information contained in the video shall include all points of operation and maintenance covered in the instruction session with the Owner's staff. A recording of the actual instruction session is acceptable. Provide two (2) DVDs each containing full copies of the video instruction.

G. The contractor shall return to the job site 11 months after the date of final acceptance to provide a complete rigging system inspection. This inspection shall be scheduled at the convenience of the venue, respecting production and staff schedules. The inspection shall include:
1. Visual examination and operation of all components.
2. Necessary adjustments or modifications shall be made as required. Any defects in materials or workmanship shall be remedied as specified in the warranty.
3. Instruction session with facility staff to review safe operation and maintenance of all equipment. This instruction session shall be scheduled to last a minimum of one (1) hour.
4. Written proposal to Owner to provide rigging inspection every 12 months or on schedule defined by the Owner.
5. Written notification to Schuler Shook including date of rigging inspection, list of necessary adjustments or warranty repairs, and names of facility staff that attended instruction session.

GENERAL REQUIREMENTS

H. General Conditions of the project contract, work schedules, and site regulations apply to this work.

I. This work shall comply with all local codes and applicable NEC and UL standards, and all components shall carry pertinent UL labels.

J. Equipment shall comply with applicable UL standards including:
1. UL 508A Industrial control panels.
2. UL 924 Emergency lighting and power equipment.
3. UL 1640 Portable power distribution equipment.

K. All equipment shall be fully insured against loss or damage during shipment, job site storage, installation, and testing. The Contractor shall have and assume full responsibility for the safety of every unit of equipment, components, wiring, and plans during delivery, installation, and testing. Certification of such coverage shall be furnished to the Architect within 30 days of award of contract.

L. Warranty.
1. The Contractor shall unconditionally warrant all equipment and systems provided under this Section to be free from defects in materials and workmanship for a period of at least twelve (12) months from the date of final acceptance of all work of this Section.
2. All repairs and service during the warranty period shall be performed at the job site.

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Labor, materials, and transportation of replacement materials, parts and service personnel to and from the job site shall be included hereunder at the Contractor's expense.

3. Appropriate additional equipment or draperies to replace equipment, devices, or draperies removed for repair, service, or cleaning shall be provided at the job site at no expense to the Owner.
4. Warranty service shall be performed by personnel in the employ of the Contractor and shall not be sub-contracted or assigned to another company, service, or individual unless the Owner has approved such assignment in writing, in which event the Contractor shall nevertheless be responsible to the Owner for such work.

PART 2 - PRODUCTS

2.09 GENERAL

A. All components shall be new and of first quality.

B. Machinery and component parts shall comply with all applicable tests, ratings, specifications, and code requirements and bear appropriate labels of conformity and acceptability.

C. All components shall bear pertinent flameproofing certificates and UL labels. All components shall bear labels identifying the manufacturer, model number, and serial number. All such labels and certificates shall be permanently attached in a conspicuous location.

D. Operating parts of all equipment shall be machine finished, and tolerances, finishes, fit, etc., where not specified, shall conform to good trade practices.

E. All items necessary for a complete, operational system shall be provided, including bolts, nuts, washers, fittings, anchors, supports, hinges, and all other items required for completeness and operational safety. Where not specified elsewhere in this Section, all bolts shall be Grade 5 or better.

F. Where not specified elsewhere in this Section, all rope and wire rope shall be selected using a minimum safety factor of 8 to 1. All chain, shackles, and all other hardware shall be selected using a minimum safety factor of 3 to 1. These safety factors apply to dynamic loading conditions.

G. Where not specified elsewhere in this Section, sheaves and drums shall have a tread diameter of at least 30 times the diameter of the wire rope employed.

H. All lineset locations shall be numbered sequentially from the front of the stage to the rear of the stage, with no lineset numbers being out of order.

I. Unless specifically shown otherwise in the drawings, the contractor shall run all lift lines directly from the headblock to the loftblocks without muling. Contractors wishing to add muling may do so only with the approval of Schuler Shook, such proposals to be made at least ten (10) days prior to bid date. Muling to accommodate unforeseen site conditions must be approved by Schuler Shook prior to installation.

J. All control panel faceplates shall be black anodized aluminum or black painted steel, and all labels and legends shall be permanently engraved directly into the faceplate. Engravings shall be filled with white enamel. Lamicoid labels may be used if mechanically fastened. Dry transfer, decals, plastic "dymo," or other types of adhesive labels shall not be used. Silk-screened legends shall not be used. All control panel faceplates shall have beveled edges and rounded corners.

K. Where specification allows for “approved equal,” substitutions shall be proposed to Schuler

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Shook at least ten (10) days prior to bid date.

L. Equipment and hardware are specified on the basis of performance and minimum acceptable quality. Materials manufactured by any of the following companies that equals or surpasses the performance and quality specified will be acceptable:
   1. Automatic Devices Company, Allentown, Pennsylvania.
   2. J. R. Clancy, Syracuse, New York.
   3. H & H Specialties, South El Monte, California.
   4. I. Weiss Theatrical Solutions, Fairview, NJ.
   5. Thern, Winona, Minnesota.

M. Imported steel cable and rope shall be tested and certified as specified herein. Cable or rope provided by any of the following vendors that equals or surpasses the performance and quality specified will be acceptable. Other vendors seeking approval to provide imported cable or rope must contact Schuler Shook not later than ten (10) days prior to bid date.
   1. J. R. Clancy, Syracuse, New York.
   2. H & H Specialties, South El Monte, California.
   3. I. Weiss Theatrical Solutions, Fairview, NJ.
   4. Thern, Winona, Minnesota.

2.10 8-INCH UNDERHUNG LOFT BLOCKS WITH IDLER PULLEYS

A. Sheaves shall have an outside diameter of at least 8 inches, made of Class 30 gray iron conforming to ASTM specification A-48 OR Nylatron GS. Sheaves shall be grooved for 1/4" wire rope, with a groove diameter clearance of .015 inch.

B. Hubs shall be min. 2" diameter, machine faced, bored for and press-fitted with double sealed precision ball bearing assemblies. Each bearing shall be designed for a dynamic radial loading of at least 1,000 pounds at 500 rpm.

C. Shafts shall be min. 1/2 inch diameter cold finished steel shafting. One end shall be locked to the side plate by a keeper pin; the other end shall be threaded and drilled for a castellated lock nut and cotter pin.

D. Side plates shall be min. 12 gauge cold rolled steel plate, flame cut to latch over one-half of structural member bottom flange. Side plates shall be attached by at least five (5) min. 5/16" bolts through ungrooved pipe spacers sized to space side plates for proper sheave clearance. Locate spacers where appropriate to retain cables in sheave grooves.

E. Locking adjustment shall be high-tensile cast iron angle clip on min. 3/4" threaded rod with two (2) nuts to lock in place OR notched side plates and ¾” draw bolt with steel clip.

F. Provide 3" diameter UHMW or Nylatron idler pulleys grooved for 1/4" wire rope. Side plate of idler assembly shall be min. 10 gauge steel attached by 3/8" bolt with lock nut through idler pulleys. Ungrooved pipe spacers shall be used as necessary to fasten the loft block side plate and idler side plate together. Locate spacers where appropriate to retain cables in pulley grooves.

G. Locate idler pulleys at <u>every</u> loft block location in order to provide proper lift line cable alignment.

H. Blocks shall be Clancy 2xC-10819I OR Clancy 2xC-10859I or equal.

I. Attachment, location and quantity as shown in the Drawings and Schedules.

2.11 12-INCH UNDERHUNG LOFT BLOCKS WITH IDLER PULLEYS

A. Sheaves shall have an outside diameter of at least 12 inches, made of Class 30 gray iron conforming to ASTM specification A-48. Sheaves shall be grooved for 1/4” or 3/8" wire

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rope as required.

B. Hubs shall be min. 3-7/8" diameter, machine faced, bored for and fitted with tapered roller bearings. Each bearing shall be designed for a dynamic radial loading of at least 1,500 pounds at 500 rpm.

C. Shafts shall be min. 3/4 inch diameter cold finished steel shafting. One end shall be locked to the side plate by a keeper pin; the other end shall be threaded and drilled for a castellated lock nut and cotter pin. Shaft nut shall be factory adjusted to bearing manufacturer's specifications.

D. Side plates shall be min. 10 gauge cold rolled steel plate. Side plates shall be attached by at least five (5) min. 3/8" bolts through ungrooved pipe spacers sized to space side plates for proper sheave clearance. Locate spacers where appropriate to retain cables in sheave grooves.

E. Locking adjustment shall be high-tensile cast iron angle clip on min. 3/4" threaded rod with two (2) nuts to lock in place OR notched side plates and ¾" draw bolt with steel clip.

F. Provide 3" diameter UHMW or Nylatron idler pulleys grooved for 1/4" or 3/8" wire rope. Side plate of idler assembly shall be min. 10 gauge steel attached by 3/8" bolt with lock nut through idler pulleys. Ungrooved pipe spacers shall be used as necessary to fasten the loft block side plate and idler side plate together. Locate spacers where appropriate to retain cables in pulley grooves.

G. Locate idler pulleys at every loft block location in order to provide proper lift line cable alignment.

H. Blocks shall be Clancy 3CC-11219I OR Clancy 3CC-11259I or equal.

I. Attachment, location and quantity as shown in the Drawings and Schedules.

2.12 STEEL CABLE

A. All steel cable shall be certified to meet Federal Standard RR-W-410E or ASTM 1023/A 1023M and to meet the required breaking strength. Imported steel cable will only be accepted if provided by a vendor pre-approved in article 2.01.M above.

B. Counterweight set lift lines. 7 x 19 pre-formed galvanized aircraft cable of right regular lay. Cables larger than 3/8" diameter are permitted to be of 6x37 XIPS construction. Minimum breaking strength shall be not less than indicated below:

1.

2. Cable Diameter	3. Minimum Breaking Strength
4. 3/16”	5. 4,200 lbs.
6. 1/4”	7. 7,000 lbs.
8. 5/16”	9. 9,800 lbs.
10. 3/8”	11. 14,400 lbs.
12. 7/16”	13. 17,600 lbs.
14. 1/2”	15. 22,800 lbs.

16.

C. All wire rope connections shall employ thimbles of the proper size and compressed oval sleeve fittings as manufactured by National Telephone ("Nicopress"). All fittings shall be malleable copper. Aluminum fittings shall not be acceptable. All connections shall be

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selected and installed to develop the full tensile strength of the cable. Contractor shall maintain and inspect all swaging equipment on a daily basis to ensure the integrity of swaged fittings.

D. Drop-forged steel cable clips may be used only in specific locations as directed by this Specification, or in locations approved in advance in writing by Schuler Shook or the Owner. Clips shall meet or exceed Federal Specification FF-C-450 and shall produce a termination equal to at least 80% of the breaking strength of the wire rope. The saddles of the clips shall be in contact with the load end of the rope. One clip shall be tight against the thimble to retain the cable in the thimble. Quantity of the clips shall be according to the following:

17.

18. Cable Diameter	19. Quantity of Clips
20. 3/16”	21. 2
22. 1/4”	23. 2
24. 5/16”	25. 2
26. 3/8”	27. 2
28. 7/16”	29. 2
30. 1/2”	31. 3

32.

E. Sizes and connections per Drawings and Schedules.

2.13 BATTEN TRIM DEVICE

A. Batten Trim Clamp

1. Batten trim clamps shall consist of two pipe clamps to encompass and clamp the pipe batten to prevent its rotation. The top of one clamp half shall allow the attachment of cable terminations, as specified in this section. The second clamp shall be fitted with a Nylon or aluminum grooved spacer with a minimum 2" diameter.
2. Line adjustment shall be made by loosening the end clamp and relocating the clamp along the batten or by adjusting the turnbuckle if provided.
3. Batten trim clamps shall have a recommended working load limit of a minimum 700 lbs.
4. Batten trim clamp shall be J. R. Clancy 026-23X1.5 or approved equal.

B. Quantities and attachment per Drawings.

2.14 SUSPENSION CHAINS – DEAD HUNG PIPES AND CURTAINS

A. Suspension chains shall be welded passing link steel chain, rated at not less than 1,000 lbs. breaking strength.

B. One end of each chain shall be attached to the beam clamp; the other end shall be attached to a screw-pin type drop forged shackle rated at not less than 1,000 lbs. breaking strength. Double wrap chain around pipe batten. Shackle pins shall be wired shut or secured with plastic cable ties after adjustment.

C. Quantities and attachment per Drawings.

2.15 PIPE BATTENS

A. Pipe battens shall be nominal 1-1/2" I.D. Schedule 40 black steel pipe, ASTM A-120,

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stripped and painted with at least one coat of flat black paint.

B. Splices shall be close-fitting internal steel sleeves with a wall thickness of not less than 0.1875 inch. Splices shall be min. 24 inches long, bolted through the pipe with two 5/16" bolts and lock nuts on each side of the joint. Bolts shall be placed at right angles to ensure a rigid splice. Expanding or pressure-type splices shall not be acceptable.

C. Provide six (6) inch yellow vinyl end caps on both ends of every batten as well as a 1-inch wide painted yellow strip at the center of every batten. Yellow end caps or center marks should be omitted on auditorium battens that are always in public view.

D. Paint the lineset number in white 12 inches from both ends of every batten, using stenciled numerals not less than 1" high. Lineset numbers are not required on dead-hung or fixed battens.

E. Provide flat bar pipe hangers as required to support the offstage ends of stage electric double battens when the plug strip hanger brackets (provided by others) do not extend the full length of the battens.

F. Lengths and quantities as per Drawings and Schedules.

2.16 BEAM CLAMPS – DEAD HUNG PIPES AND CURTAINS

A. Provide adjustable beam clamps for attachment of suspension chains to building structure. Field verify all beam sizes.

B. Beam clamps shall be Clancy #015-798 or equal.

C. Install as indicated in the drawings.

2.17 MOTORIZED PACKAGED HOIST

A. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by Schuler Shook at least ten (10) days prior to the bid date:
   1. Electronic Theatre Controls “Prodigy” or “Vortek” with full backbone.
   2. J.R. Clancy “PowerLift” with full backbone.
   3. J.R. Clancy “Summit Hoist” with full backbone.
   4. Approved equal.

B. The winch assembly shall be designed to lift and hold the following:
   1. Variable speed: General purpose battens, valance and border curtains.
   2. Fixed speed: Stage electrics and orchestra shell ceiling panels.

C. The winches shall provide hoisting speeds as follows:
   1. Fixed speed: approximately 20 feet per minute.

D. All winches shall be “soft start” and “soft stop.”

E. The winch capacities shall be as listed on the Drawings and Schedules.

F. The winch travel shall be as shown on the Drawings.

G. Cable management:
   1. Pantograph cable management shall be provided for all lighting “electric” battens and all acoustic shell ceiling panels. The pantograph shall be provided and installed by the Contractor. Coordinate all power and data cable quantities and sizes with the theatrical lighting contractor.
   2. Alternate cable management assemblies, including “Prodigy Cable Management,” may be accepted with prior approval from Schuler Shook.
   3. Power or data plug boxes or plug strips shall be provided by the theatrical lighting contractor unless otherwise noted on the Drawings.

H. All lift lines shall run continuously from the batten to the drum(s) without clewing. Each

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winch drive unit assembly shall consist of a motor, brake, gear reducer, limit switch assembly, and individual drum for each lift line. All drives shall be direct.

I. Limit Switches.
   1. Provide four mechanical, adjustable limit switches for each winch assembly, as follows:
      a. Upper limit over-travel backup.
      b. Upper limit of travel.
      c. Lower limit of travel.
      d. Lower limit over-travel backup.
   2. Normal travel limit switches, when struck, shall not permit operation of the unit, except in the direction away from the limit switch. Over-travel limit switches, when struck, shall de-energize the motor, and shall not permit travel in any direction until specifically reset at the limit switch enclosure or with an ultimate by-pass key switch.
   3. Unless otherwise noted, the lower limit of travel (low trim) shall be +3'-0" above the stage floor and upper limit of travel (high trim) shall be the maximum attainable.

J. Load Monitoring
   1. Each winch system shall include an integral load cell for monitoring of overload and underload conditions.
   2. A pre-programmed weight increase or decrease shall stop the winch and display the fault condition to the rigging system operator. The operator shall have the option of accepting the load change and continuing the winch movement or cue.
   3. The load monitoring software shall consider lift line cable weight and not create a fault condition due to cable weight changes.
   4. The rigging system operator shall have the ability to temporarily override load monitoring when a batten is being loaded or unloaded during work sessions. When loading or unloading is complete, the load monitoring system shall automatically update the weight of that batten for future load monitor calculations.
   5. The load monitoring system shall stop the winch if the rated capacity is exceeded. In this condition, it shall only be possible to lower the batten to the low trim. The batten shall not be raised or operated at faster speeds until the excess weight is removed and the system load is within the rated capacity.

K. Provide and install all necessary supplemental structure and mounting hardware. Identify all supplemental structure and attachment methods in the shop drawings.

L. Provide and install all necessary enclosures and safety barriers to prevent injury to performers or technicians. All enclosures or safety barriers shall be easily removed and replaced as necessary for equipment service.

M. Provide and install all necessary controllers, connection boxes, and device interfaces as required for a complete and operable system.

N. Devices provided and installed by the Contractor.

O. All required power disconnects, feeds, wire and conduit provided and installed by Division 26. All power and control connections by Division 26.

P. Install as shown in the Drawings.

2.18 PACKAGED HOIST CONTROL SYSTEM

A. The system described below is based upon general performance criteria common to the

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products listed below. No other system shall be considered unless specifically approved by Schuler Shook at least ten (10) days prior to the bid date:

1. Electronic Theater Controls “QuickTouch Preset Handheld.”
2. J.R. Clancy “Vantis Pendant Controller.”
3. Approved equal.

B. The control system shall be designed for the safe and reliable control of for a minimum of eight (8) automated rigging hoists or linesets.

C. Physical requirements:

1. The control system shall have an emergency stop “E-STOP” circuit that shall place the system into a “safe-state” condition and remove power to all hoists / axes controlled by the system. E-STOP buttons shall be located at the control console and in remote locations as indicated in the drawings. E-STOP buttons shall be configured as follows:
   a. Buttons shall be red mushroom style, minimum 1.6 inch diameter.
   b. Buttons shall be internally illuminated when in E-STOP condition.
   c. Buttons shall employ turn release mechanism.
   d. All remote or portable buttons shall include switch guard, minimum 2 inch diameter, to prevent nuisance activation of E-STOP buttons. Switch guard is not required at control console.
   e. Label: Rigging Control Emergency Stop.
2. The control system shall have “ON/OFF” key switch to prevent unauthorized use. Key switch position shall never disable E-STOP operation. Deliver six (6) keys to Owner.
3. Dead man operation.
   a. The control console shall have an integrated “dead man switch” that requires the presence of an operator to physically hold a momentary switch for the duration of any automated rigging movements.
   b. Release of the “dead man switch” shall immediately stop all movements and cue sequences.
   c. Systems that allow hoists / axes to operate without an operator actively present shall not be acceptable.
   d. Touchscreen “Hold-to-Run” operation shall not be accepted for “dead man” operation.
4. The control console shall include one (1) integrated touch screen for display and selection of cue lists and hoists / axes.
5. The control console shall include integrated “Up”, “Down”, and “Go” buttons or macro buttons that may be assigned these functions.
6. For variable speed systems only, the control console shall include joystick control for dynamic up / down or rate control of selected hoists / axes.
7. The control system shall run on industrial computer components and shall be embedded in non-volatile memory.
8. All programming or cueing shall be recordable to backup media.
9. The control system shall include a UPS power supply for operation of the control

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console for a period of ten (10) minutes in the event of power loss.

10. The control console shall be wall mounted.

D. Provide all necessary control racks and mounting hardware.

E. Devices provided and installed by the Contractor.

F. All required power disconnects, feeds, wire and conduit provided and installed by Division 26. All power and control connections by Division 26.

G. Install as shown on the Drawings.

2.19 TRACKS

A. Tracks shall be of the heavy-duty channel type, approximately 3" x 3", 14 gauge galvanized steel [OR 12 gauge aluminum], entirely enclosed except for slot in bottom. Automatic Devices Company 2800-BL series, or approved equal.

B. Each half of every track shall be one continuous piece, except where splicing clamps are required. Splicing clamps shall provide a flush, positive alignment of track sections. ADC 2824-BL, or approved equal.

C. Tracks shall be supported at both ends, at the center of the overlap, and no more than 6'-0" O.C. in between, using hanging clamp ADC 2808-BL, or approved equal. Attach to pipe battens using clamp for 1-1/2" I.D. pipe, ADC 2815, or approved equal.

D. Carriers shall be constructed of steel bodies with a "hollow center" design to contain operating line, with nylon tired ball bearing wheels and 6" trim chains on plated swivels. ADC 2851-BL (single) and 2852-BL (master), or approved equal.

E. All tracks shall be provided with rear fold devices to stack curtain only at offstage track ends. Rubber washers shall be placed on both sides of each rear fold tab. ADC 2833-A-BL, or approved equal.

F. Operating line shall be 1/2" braided cotton with a fiberglass center, ADC 2830, or approved equal.

G. Live end pulleys shall contain two (2) 8” diameter Nylatron sheaves on ball bearings. Dead end pulleys shall contain a single 8” diameter Nylatron sheave on ball bearings. ADC 2863-A (live) and 2864-A-45 (dead), or approved equal. Pulleys shall be located to minimize interference with neighboring linesets. Dead end pulleys shall be installed at a 45-degree angle from horizontal.

H. Floor pulleys shall contain an 8-inch diameter Nylatron sheave on ball bearings. The floor pulleys shall be securely anchored to the stage floor, ADC 2866-A, or approved equal.

I. All pulleys shall provide for positive retention of the operating line.

J. All tracks and associated hardware shall be flat black.

K. Quantities, sizes, and locations as indicated on the Drawings and Schedules.

2.20 CURTAINS

A. Fabrics.

1. All fabrics not inherently flameproof shall be fully mill flameproofed by the immersion process to meet or exceed the minimum requirements set forth by the State of California "Small Scale 701." The Contractor shall submit certificates so stating.
2. All fabrics shall be produced from one dye lot per color. Color quality shall be consistent throughout, with no visible streaking, striping, or spotting.
3. Velour. 100% polyester velour, 54 inches wide. Inherently flame retardant (IFR). Colors and weights as indicated in the Schedule of Curtains and Tracks.
   a. 32 ounce: KM Fabrics “Royale” or approved equal.

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b. 25 ounce: KM Fabrics “Charisma” or approved equal.

c. 22 ounce: Rosebrand “Encore” or approved equal.

d. 20 ounce: KM Fabrics “Crescent” or approved equal.

e. 13 ounce: KM Fabrics “Plateau” or approved equal.

B. Fabrication.

1. General.

a. All pile fabrics shall have pile running up unless otherwise indicated. The main drape and main valence curtains shall have pile running down.

b. All fabric widths shall run full height, with no vertical piecing.

c. Thread colors shall match face fabric.

d. The center of every curtain shall be indicated by a 1/2"-wide fabric strip sewn to the back of the webbing.

e. Every curtain shall include a permanent label sewn to the back of the off-stage end at the top of the curtain. This label shall indicate fabric, color, finished size, and inherently flame retardant characteristics.

f. Every curtain shall include a minimum 4-inch wide by 12-inch long “test strip” of the curtain material sewn adjacent to the permanent label. The test strip shall be used for periodic confirmation of the flame retardant status.

g. Sizes and quantities as shown on the Drawings and Schedules.

2. Traveler curtains.

a. Top hem shall be double turned and reinforced with continuous 3-1/2" heavy jute webbing. Fullness shall be sewn into the curtain by means of box pleats 12 inches O.C. Two No. 2 brass grommets shall be provided at each top corner of each finished panel and one grommet shall be provided at the center of each box pleat along the top hem.

b. Bottom hem shall be 6 inch double turned and contain a continuous No. 6 plated jack chain held in a separate muslin pocket 4 inches above bottom of curtain and tacked at each vertical seam to prevent bunching. A dust ruffle of the face fabric shall be sewn at the back of the bottom hem and shall be exposed 2 inches below the bottom hem.

c. Vertical hems shall be faced back with one-half width of face fabric and hand tacked full height.

d. One heavy duty 1-1/2" S-hook shall be provided for each grommet for attachment to track.

3. Walk-along curtain panels.

a. Top hem shall be double turned and reinforced with continuous 3-1/2" heavy jute webbing. One No. 2 brass grommet shall be provided at each top corner of each finished panel and 12 inches O.C. along the top hem.

b. Bottom hem shall be 6 inch double turned and contain a continuous No. 6 plated jack chain held in a separate muslin pocket 4 inches above bottom of curtain and tacked at each vertical seam to prevent bunching.

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c. Vertical hems shall be 4 inch double turned.

d. One heavy duty 1-1/2" S-hook shall be provided for each grommet for attachment to track.

e. Provide manual draw line with wooden ball at each end of every panel where the walk-along track is higher than +12'-0" AFF. Draw lines shall be securely fastened to master carriers. Wooden ball shall be located between +4'-0" and +5'-0" AFF.

4. Leg curtains.

a. Top hem shall be double turned and reinforced with continuous 3-1/2" heavy jute webbing. One No. 2 brass grommet shall be provided at each top corner of each finished panel and 12 inches O.C. along the top hem.

b. Bottom hem shall be 6 inch double turned and contain a continuous No. 6 plated jack chain held in a separate muslin pocket 4 inches above bottom of curtain and tacked at each vertical seam to prevent bunching.

c. Vertical hems shall be 4 inch double turned.

d. One tie line shall be provided for each grommet. Tie lines shall be braided cotton, black in color, and 36 inches long.

5. Border curtains.

a. Top hem shall be double turned and reinforced with continuous 3-1/2" heavy jute webbing. One No. 2 brass grommet shall be provided at each top corner of each finished panel and 12 inches O.C. along the top hem.

b. Bottom hem shall be 6 inch double turned.

c. Vertical hems shall be 4 inch double turned.

d. One tie line shall be provided for each grommet. Tie lines shall be braided cotton, black in color, and 36 inches long.

C. Fabricate and install as shown on the Drawings and Schedules.

2.21 MULTI-CONDUCTOR CABLE

A. Cables shall be type S or SO, rated at 600 volts, with two (2) #12 AWG conductors for each circuit required plus a minimum of two (2) grounding conductors per cable.

B. The manufacturer shall size the multi-conductor cables as required. There shall be no more than one (1) multi-conductor cable for each front of house truss.

C. Cable lengths as indicated in the Drawings and Schedules.

D. Cable clamps shall hold multi-conductor cables at the batten, before they enter the plug strip. Color: Black.

E. Cables and clamps provided by the Contractor.

F. All required power disconnects, feeds, wire and conduit provided and installed by the Contractor. All power and control connections by the Contractor.

G. Install as shown on the Drawings.

PART 3 – EXECUTION

3.22 FABRICATION

A. This Contractor is responsible for becoming familiar with and verifying all pertinent dimensions and conditions, both in the Drawings and in the field, before proceeding with

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any work.

B. Coordinate the design, planning, and scheduling of the work of this Section with the work of all other trades. Notify the Architect of any difficulties in coordinating work with other contractors. Failure to do so shall constitute acceptance of construction as suitable in all ways to receive the work of this Section.

C. All electrical components shall be fully assembled and internally wired, with terminals of the proper rating and clearly labeled, provided for external feeder and control wiring.

D. All metal fabricated items shall be given at least one coat of primer and one coat of finish paint. Color: black.

E. Where specifically called out in the Drawings and Specifications, tracks and fittings shall be painted or anodized black.

F. All equipment shall be fabricated and installed to facilitate maintenance and future replacement.

G. Machinery and equipment supplied under this Section shall be designed, constructed, and installed so that sound pressure levels measured at a distance of 5'-0" shall not exceed 50 decibels at any load or any speed.

3.23 INSTALLATION

A. Contractor shall employ only experienced stage riggers for the installation of work of this Section. A competent supervisor shall be maintained on this Project during the entire installation. A change of supervisor shall not be acceptable unless by written authorization of the Architect.

B. Coordinate installation with all other trades doing adjoining work.

C. Examine all existing conditions at the job site prior to beginning installation.

D. Provide protection for all stage flooring, regardless of whether flooring has been stained or sealed. Flooring shall be protected from both structural damage and cosmetic damage.

E. Provide and install all supplementary structural support as required for the installation and safe operation of equipment and materials supplied under this Section.

F. Do all required cutting, drilling, tapping, and welding necessary for proper installation. Cut no structural members unless specifically shown in the Drawings or indicated in the Contractor's shop drawings, or unless written approval is obtained from the Architect.

G. Install all items in conformity with standard trade practices and manufacturers' recommendations. Position all items accurately and true to plumb line and level. Maintain maximum headroom and clearances at all locations.

H. Ropes and cables shall enter rigging blocks and drums at a fleet angle not exceeding $\pm$2 degrees.

I. Steel cables shall be cut just above cable clips or swaged fittings. All cable ends shall be sealed with a bead of heavy-duty silicone adhesive.

J. All turnbuckles shall be wired shut after adjustment. All and screw-pin shackles shall be wired shut or secured with plastic cable ties after adjustment.

K. Install index strip lights, with the exception of electrical connections. All index strip light conduit, wire, and wall-box dimmers shall be provided and installed by the Division 26 Contractor.

L. Install all electrical plug strips associated with any motorized rigging lineset, with the exception of multi-conductor cable physical and electrical connections. All multi-conductor cable and electrical connections shall be provided and installed by the Division 26 Contractor. Installation of plug strips, plug boxes, or other theatrical lighting devices at the

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catwalks, pipe grid, or at other fixed locations within the building is not included in the theatre rigging scope.

M. Install all winches, winch motor starter panels, and winch control panels with the exception of the electrical power and control connections between devices. All winch power feeds, disconnects, conduit and wire shall be provided and installed by the Division 26 Contractor.

N. Advise the Division 26 Contractor as required on the installation of electrical equipment related to the work of this Section.

O. After the first rigging lineset has been fully installed contractor shall report to Schuler Shook, recording the top and bottom batten trim heights, before proceeding with the remainder of the linesets.

3.24 PROTECTION AND CLEANING

A. Provide protection for any theatre rigging equipment, panels and faceplates installed prior to the completion of construction and painting. Remove any debris or paint from equipment that was not adequately protected. Panels and faceplates not appearing “like new” shall be replaced.

B. No curtains or rigging accessories shall be installed until construction and painting are complete and the building has been cleaned. Any curtains or accessories delivered to the job site prior to their installation shall be stored in a clean area in dustproof bags.

C. Upon the completion of the work of this Section, dispose of all packing materials, debris and remnants which result from the work of this Section.

END OF SECTION

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SECTION 122413
ROLLER WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

B. Interior motorized roller shades.

C. Motor controls.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - Unit Masonry: Installation requirements for unit masonry walls.

C. Section 061000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

D. Section 079200 - Joint Sealants: Sealing the perimeter of installation accessories for light-blocking shades.

E. Section 092116 - Gypsum Board Assemblies: Installation requirements for metal stud and gypsum board walls.

F. Section 095100 - Acoustical Ceilings.

G. Section 262726 - Wiring Devices: Finish requirements for wall controls specified in this section.

1.03 REFERENCE STANDARDS

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

D. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

E. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to provide rough-in of electrical wiring as required for installation of hardwired motorized shades.

B. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.

C. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
   2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
   1. Motorized Shades: Include power requirements and standard wiring diagrams for specified products.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
   1. Motorized Shades: Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.

D. Certificates: Manufacturer's documentation that line voltage components are UL listed or UL recognized.

E. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.

F. Selection Samples: Include fabric samples in full range of available colors and patterns.
   1. Motorized Shades: Include finish selections for controls.

G. Verification Samples: Minimum size 10 inches square, representing actual materials, color and pattern.

H. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

I. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.

J. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

K. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience with shading systems of similar size and type.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: five years.
   2. Electric Motors: One year.

3. Electronic Control Equipment: One year.
4. Fabric: five years.
5. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 MANUFACTURERS

A. Interior Manually Operated Roller Shades:
   1. **(Basis of Design)** Draper, Inc; Clutch Operated FlexShade: (Single and Dual Roller Shade, as noted on finish drawings). www.draperinc.com/#sle.
   2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   3. MechoShade Systems LLC: www.mechoshade.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Interior Motorized Roller Shades, Motors and Motor Controls:
   1. **(Basis of Design)** Draper, Inc; Motorized FlexShade: www.draperinc.com/#sle.
   2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   3. MechoShade Systems LLC: www.mechoshade.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.03 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.
   3. Motorized Shades: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed or recognized to UL 325.
      a. Comply with NFPA 70.
      b. Electrical Components: Listed, classified, and labeled as suitable for the purpose intended. Where applicable, system components to be FCC compliant.
      c. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view; fully compatible with controls to be installed.

B. Interior Roller Shades Type WT-1 (single roller) and Type WT-3 (dual roller) - Basis of Design: Draper, Inc; Clutch Operated FlexShade: www.draperinc.com/#sle.
   1. Description: Single and dual roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
      a. Drop Position: Regular roll.
      b. Mounting: Window jamb mounted - inside, between jambs.
      c. Size: As indicated on drawings.
      d. Fabric: As indicated under Shade Fabric article.

2. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
    a. Hardware Type: Headbox.
    b. Double Roller Mounting: Configured for light-filtering and room-darkening shades in one opening.
        1) Light-Filtering Fabric: Room-side of opening.
        2) Room-Darkening Fabric: Glass-side of opening.
3. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
    a. Material: Extruded aluminum, clear anodized finish, with wall thickness and material selected by manufacturer.
    b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
    c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
    d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
    a. Style: Closed pocket; aluminum elliptical slat inside pocket with heat-sealed ends.
5. Manual Operation:
    a. Clutch Operator Location: Right side.
    b. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
    c. Drive Chain: Continuous loop stainless steel beaded ball chain, 95 pounds minimum breaking strength. Provide upper and lower limit stops.
    d. Shade Lift Assistance: Manufacturer's standard spring device contained in the idler end of roller tube to reduce force required to lift shades; as required based on shade weight.
    e. Chain Retainer:
        1) Chain tensioning device complying with WCMA A100.1.
        2) Manufacturer's standard clip.
    f. Idler Assembly: Molded nylon with adjustable length idler pin or spring-loaded idler to facilitate easy installation and removal of shade for service.
6. Accessories:
    a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to mounting end caps, without exposed fasteners; clear anodized finish.
        1) Profile: L shaped.
        2) Color: Black.
    b. Exposed Headbox: Extruded aluminum, size as required to conceal shade mounting; clear anodized finish.
    c. End Cap Covers: Manufacturer's standard end caps to cover exposed ends of brackets. Match fascia finish.
    d. Side Channels: With light seals designed to eliminate light gaps at sides of shades as they are drawn down. Provide side channels and shadeband guides or other means of aligning side bands with channels at top.
    e. Interior Side Channels: As required for light sealing / room darkening shades.
    f. Fasteners: Noncorrosive, and as recommended by shade manufacturer.

C. Interior Roller Shades Type WT-2 - Basis of Design: Draper, Inc; Motorized FlexShade: www.draperinc.com/#sle.

1. Description: Single roller, motor-operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
    a. Drop Position: Regular roll.
    b. Mounting: Window jamb mounted - inside, between jambs.
    c. Size: As indicated on drawings.
    d. Fabric: As indicated under Shade Fabric article.
2. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
    a. Hardware Type: Headbox.
3. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
    a. Material: Extruded aluminum or steel, with wall thickness and material selected by manufacturer.
    b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
    c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
    d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
4. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
    a. Style: Closed pocket; aluminum elliptical slat inside pocket with heat-sealed ends.
5. Shade Motor: Quiet 120V AC motor (sound level of 38 dBA or less), located on right side facing window from inside (standard).
6. Accessories:
    a. Light Gap Reduction Channels: Provide extruded aluminum channels to reduce light leakage at sides of shades.
    b. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to mounting end caps, without exposed fasteners; clear anodized finish.
        1) Color: Black.
    c. Exposed Headbox: Extruded aluminum, size as required to conceal shade mounting; clear anodized finish.
    d. Fasteners: Noncorrosive, and as recommended by shade manufacturer.

2.04 SHADE FABRIC

A. Fabric for Light-Filtering Shades: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
    1. Manufacturers:
        a. **Basis of Design:** Mermet Corporation; E-Screen - 3%: www.mermetusa.com/#sle.
        b. Substitutions: See Section 016000 - Product Requirements.
    2. Material Certificates and Product Disclosures:
        a. Health Product Declaration (HPD): Complete, published declaration with full disclosure of known hazards.
    3. Performance Requirements:
        a. Flammability: Pass NFPA 701 large and small tests.
        b. Fungal Resistance: No growth when tested according to ASTM G21.
        c. Solar Transmittance (Ts): Between 4 and 16; color dependent.
        d. Visible Light Transmittance (Tv): Between 3 and 13; color dependent.
        e. Solar Absorption (As): Between 11 and 91; color dependent.
        f. Solar Reflectance (Rs): Between 5 and 70; color dependent.

4. Openness Factor: 3 percent.
5. Color: As indicated on drawings.

B. Fabric for Room-Darkening Shades: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
1. Manufacturers:
a. **Basis of Design:** Mermet Corporation; Flocke Blackout: www.mermetusa.com/#sle.
2. Material: Polyester with acrylic backing.
3. Material Certificates and Product Disclosures:
a. Health Product Declaration (HPD): Complete, published declaration with full disclosure of known hazards.
4. Performance Requirements:
a. Flammability: Pass NFPA 701 large and small tests.
b. Fungal Resistance: No growth when tested according to ASTM G21.
c. Solar Transmittance (Ts): Between 4 and 16; color dependent.
d. Visible Light Transmittance (Tv): Between 3 and 13; color dependent.
e. Solar Absorption (As): Between 11 and 91; color dependent.
f. Solar Reflectance (Rs): Between 5 and 70; color dependent.
5. Openness Factor: 0 (zero) percent.
6. Color: As indicated on drawings.

2.05 MOTOR CONTROLS

A. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.

B. Provide all components and connections necessary to interface with other systems as indicated.

C. Manual Controls:
1. Control Functions:
a. Open: Automatically open controlled shade(s) to fully open position when button is pressed.
b. Close: Automatically close controlled shade(s) to fully closed position when button is pressed.
c. Raise: Raise controlled shade(s) only while button is pressed.
d. Lower: Lower controlled shade(s) only while button is pressed.
2. Wall Controls: Provided by shade manufacturer.
a. Finish: To be selected by Architect.
b. Button Engraving: Manufacturer's standard engraving, unless otherwise indicated.
c. Basis of Design: Lutron Electronics, Inc; seeTouch QS Wallstation: www.lutron.com/#sle.
1) Programming: Support control of any individual shade or shade group/sub-group in system; customizable button actions.
2) Power: Low-voltage; NFPA 70, Class 2.
3) Wired Communications: Low-voltage; RS485.
4) Style: Architectural Insert Style.
5) Backlighting: Illuminate buttons and associated engraving; programmable light intensity.
6) Field-Changeable Replacement Kits: Support field-customization of button color, configuration, and engraving.
7) Contact Closure Interface: Two contact closure inputs with function independent of buttons.

2.06 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
   2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 SYSTEM STARTUP

A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.05 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.06 CLOSEOUT ACTIVITIES

A. See Section 017700 - Closeout Procedures, for closeout submittals.

B. See Section 017900 - Demonstration and Training, for additional requirements.

C. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.07 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.08 MAINTENANCE

A. See Section 017300 - Execution and 017700 - Closeout Procedures, for additional requirements relating to maintenance service.

END OF SECTION

SECTION 123100
MANUFACTURED METAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured standard casework, with cabinet hardware and required filler pieces.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking and nailers for anchoring casework.

C. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

D. Section 092116 - GYPSUM BOARD ASSEMBLIES: Reinforcements in metal-framed partitions for anchoring casework.

E. Section 096500 - Resilient Flooring: Resilient wall base.

F. Section 123600 - Countertops.

G. Division 22 Sections: Plumbing piping and fixtures installed in cabinets.

H. Division 23 Sections: Mechanical (HVAC) equipment, ductwork, piping, etc., installed in cabinets.

I. Division 26 Sections: Electrical components, wiring, etc., installed in cabinets.

1.03 REFERENCE STANDARDS

A. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

B. BHMA A156.9 - Cabinet Hardware; 2020.

1.04 DESIGN REQUIREMENTS

A. Reinforce frame counters, to safely support a load of 200 lbs concentrated on one square foot in any area with no indentation showing on surface and with permanent set not exceeding 0.005 inch.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Component dimensions, configurations, construction details, joint details, and attachments; manufacturer's catalog literature on hardware, accessories, and service fittings, if any.

C. Shop Drawings: Indicate casework types, sizes, locations, using large scale plans, elevations, cross sections. Include rough-in and anchors, reinforcements, and blocking, placement dimensions and tolerances, clearances required, and keying information.

D. Samples for Finish Selection: Fully finished, for color selection by Architect from manufacturer's full color range. Minimum sample size: 2 inches by 3 inches.

E. Manufacturer's Installation Instructions: Indicate special installation requirements .

F. Manufacturer's qualification statement.
   1. Manufacturer's certification that materials furnished conform to specification requirements.
   2. Test Reports: When requested by Architect, submit independent laboratory certified test reports verifying conformance to test performance specified

G. Installer's qualification statement.

H. Maintenance Data: Manufacturer's recommendations for care and cleaning.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Finish touch-up kit for each type and color of materials provided.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
   2. Producers of equipment shall comply with all governing codes, rules and regulations.

B. Installer Qualifications:
   1. Company specializing in performing work of the type specified in this section, with not less than five years of documented experience and approved by manufacturer.
   2. Familiar with installation and all governing codes, rules and regulations.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of casework and equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.

B. Protect items provided by this section during handling and installation, including finished surfaces and hardware items. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
   1. Protect all work surfaces throughout construction period with 1/4" corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering "NO STANDING".

C. Accept casework on site. Construction Manager shall inspect on arrival for damage. Replace damaged casework as required.

D. Coordinate size of access and route to place of installation.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 3-year warranty against defects. Complete forms in Owner's name and register with manufacturer. Covered defects include, but are not limited to:
   1. Ruptured, cracked, or stained finish coating.
   2. Discoloration or lack of finish integrity.
   3. Cracking or peeling of finish.
   4. Failure of hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.

1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Metal Casework:
1. **(Basis of Design)** Institutional Casework Inc; Cornerstone Series: www.iciscientific.com/#sle.
2. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements: Casework components have been tested in conformance with the most current edition of SEFA 8M, Recommended Practice and shall withstand the following maximum static load capacity, without damage to the component or to the casework operation, when properly leveled, supported and the load evenly distributed:
1. Steel base unit load capacity: 500 lbs. per lineal foot. When leveled on four leveling feet.
2. Suspended units: 300 lbs. Per lineal foot when sitting on uprights, performance of supporting structure is not inferred.
3. Drawers in a cabinet: 150 lbs.
4. Hanging wall cases: 300 lbs. Per lineal foot when sitting on uprights, performance of supporting structure is not inferred.
5. Load capacity for shelves of base units, wall cases and tall cases: 40 lbs./sq.ft., up to 200 lbs. evenly distributed, when leveled and sitting on four shelf clips.

B. Metal Finish Performance Requirements: Coatings on Casework components have been tested in conformance with the full requirements of SEFA 8M, Recommended Practice. See Section 2.07 for test procedures, acceptance levels and results for each criteria listed below from SEFA 8M, Section 8:
1. Chemical Spot Test – Section 8.1
2. Finish Impact Test – Section 8.3
3. Paint Adhesion on Steel – Section 8.4
4. Paint Hardness on Steel – Section 8.5

C. Hot Water Test – Section 8.2

2.03 FABRICATION

A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.

B. Casework: Die-formed metal sheet; each unit self-contained and not dependent on adjacent units or building structure for rigidity; factory-fabricated, factory-assembled, and factory-finished.
1. Style: Flush overlay - square edge.
2. Primary Cabinet Material: Cold-rolled steel.
3. Color: As selected from manufacturer's full range.
4. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with the following front-to-back dimensions:
   a. Base Cabinets: 22 inches.
   b. Tall Cabinets: 22 inches.
   c. Wall Cabinets: 16 inches.
5. Steel Sheet Metal:
   a. Gables, Front and Back Panels, Gusset Plates, Aprons, and Rails: 18 gauge, 0.0478 inch minimum thickness.
   b. Drawers, Cabinet Floors, Shelves, Filler Panels and Drawer Dividers: 20 gauge, 0.0359 inch minimum thickness.

c. Backing Sheet to Door and Door Fronts: 22 gauge, 0.0299 inch minimum thickness.

6. Structural Performance: Provide components that safely support the following minimum loads, without deformation or damage:
   a. Base Units: 500 pounds per linear foot across the cabinet ends.
   b. Drawers: 125 pounds.
   c. Hanging Upper Cases: 300 pounds.
   d. Shelves: 100 pounds.
7. Corners and Joints: Without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
8. Edges and Seams: Smooth. Form counter tops, shelves, and drain boards from continuous sheets.
9. Shelf Edges: Turned down 3/4 inch on each side and returned 3/4 inch front and back.
10. Ends: Close open ends with matching construction.
11. Welding: Electric spot welded; joints ground smooth and flush.
12. Drawers and Doors: Fabricate drawer and door fronts of sandwiched sheets of sheet steel welded together and reinforced for hardware.
    a. Fill with sound-deadening core.
13. Fittings and Fixture Locations: Cut and drill countertops, backs, and other casework components for service outlets and fixtures.
14. Access Panels: Where indicated, for maintenance of utility service fixtures and fittings and mechanical and electrical components.
15. Filler Panels: Flanged on both sides, of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.
16. Sloped Tops for Upper and Floor Cabinets: 20 gauge, 0.0359 inch minimum, with closed ends, flanged to allow attachment to cabinet(s) below.
17. Separation: Use bituminous paint or non-conductive tape to coat metal surfaces in contact with cementitious materials, and to separate dissimilar metals.

2.04 CABINET HARDWARE

A. Manufacturer's standard types, styles and finishes.

B. Comply with BHMA A156.9 requirements.
   1. Acceptable base materials for plated finishes include brass, bronze, and steel.

C. Locks: Provide locks on casework drawers and doors where indicated. Lock with 5 pin cylinder and 2 keys per lock.
   1. Hinged Doors: Cam type lock, satin chromium plated over nickel on base material.
   2. Keying: Key locks alike within a space; key each room separately.
   3. Master Key System: All locks operable by master key.

D. Shelves in Cabinets:
   1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.

E. Swinging Doors: Hinges, pulls, and catches.
   1. Hinges: Semi-concealed, number as required by referenced standards for width, height, and weight of door.
      a. Visible Hinges: Installed on framed cabinet face, and on door face, satin chromium plated over nickel on base material.
      b. Semi-Concealed Hinges: Installed as required by hinge design, satin chromium plated over nickel on base material.
   2. Pulls: Chrome wire pulls, 4 inches wide.
   3. Catches: Mechanical catch.

F. Drawers: Pulls and slides.

1. Pulls: Chrome wire pulls, 4 inches wide.
2. Slides: Steel, full extension arms, ball bearings; self-closing; capacity as recommended by manufacturer for drawer height and width.

2.05 MATERIALS

A. General: Manufacturer's standard materials for units specified, unless otherwise indicated.

B. Sheet Steel: High-strength low-alloy, cold rolled and leveled unfinished steel sheet, ASTM A1008/A1008M, Class 1 (matte) finish.

C. Sound Deadening Material: Inorganic, for sandwich panel fabrication.

D. Sealant For Use in Casework Construction: Manufacturer's recommended type.

2.06 FINISHES

A. Metal (Except Stainless Steel): Degrease and phosphate etch followed by primer; minimum two coats baked epoxy; Color as selected by Architect from manufacturer's full range.

B. Shop finish all components.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of support framing and anchors.

B. Verify that service connections are correctly located and of proper characteristics.

3.02 INSTALLATION

A. Install casework, components and accessories in accordance with manufacturer's instructions.

B. Large Components: Ensure that large components can be moved into final position without damage to other construction.

C. Use anchoring devices to suit conditions and substrate materials encountered.

D. Set casework items plumb and square, securely anchored to building structure, with no distortion.
   1. Base Cabinets: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions require more than 3/4 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
   2. Wall Cabinets: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
      a. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 feet and 1/2 inch in 20 feet or more, and/or maximum variation from plumb exceeds 1/4 inch per story.
      b. Maximum variation of finished gypsum board surface from true flatness exceeds 1/8 inch in 10 feet in any direction.

E. Align cabinets to adjoining components.

F. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
   1. Variation of tops of Base Cabinets from Level: 1/16 inch in 10 feet.
   2. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
   3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
   4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

G. Secure upper and floor cabinets to concealed reinforcement at gypsum board assemblies.

H. Separate dissimilar metals to prevent galvanic action.

I. Field touch-up blemishes to original finish.

3.03 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, fixtures to function smoothly.

3.04 CLEANING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, for additional requirements.

B. Clean casework, counters, shelves, legs, hardware, fittings and fixtures.

3.05 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Protect casework and countertops from ongoing construction activities. Prevent installers from standing on or storing tools and materials on casework or countertops.

C. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

SECTION 123200
MANUFACTURED WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured standard and custom casework, with cabinet hardware.

B. Plastic-Laminate-Clad Casework.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: VOC limitations for adhesives and sealants.

C. Section 061000 - ROUGH CARPENTRY: Blocking and nailers for anchoring casework.

D. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

E. Section 092116 - GYPSUM BOARD ASSEMBLIES: Reinforcements in metal-framed partitions for anchoring casework.

F. Section 096500 - Resilient Flooring: Resilient wall base.

G. Section 123600 - Countertops: Additional requirements for countertops.

H. Division 22 Plumbing Sections: Sinks and fittings installed in casework.

I. Division 26 Electrical Sections: Wiring, Conduit and connections to switches, receptacles, etc. installed in casework.

1.03 DEFINITIONS

A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.

B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.

C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.04 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program; Current Edition.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

D. BHMA A156.9 - Cabinet Hardware; 2020.

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. SEFA 8M - Laboratory Grade Metal Casework Standard; 2026.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

1.06 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Test reports certifying that the casework finish complies with SEFA-8 standards for chemical and physical resistance performance requirements.
   2. Performance test reports from an independent testing lab on each specified top material.
   3. Preparation instructions and recommendations.
   4. Storage and handling requirements and recommendations.
   5. Installation methods.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Location, size, type and arrangement of components in unit.
   2. Types of materials used for fabrication.
   3. Size and thickness of materials.
   4. Hardware types, function and finish.
   5. Types of finish for various components.
   6. Anchors, fasteners, and similar items.
   7. Mechanical and/or electrical services required.
   8. Indicate locations of blocking and reinforcements required for installing laboratory casework.
   9. Indicate locations and types of service fittings, together with associated service supply connection required.
   10. Include details of utility spaces.
   11. Include indicators of exposed conduits, if required, for service fittings.
   12. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
   13. Include coordinated dimensions for laboratory equipment specified in other Sections.

D. Samples for Finish Selection: Fully finished, for color and species selection. Minimum sample size: 2 inches by 3 inches.
   1. Plastic laminate samples, for color, texture, and finish selection.

E. Manufacturer's Installation Instructions.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

H. Maintenance Data: Manufacturer's recommendations for care and cleaning.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 016000 - Product Requirements for additional provisions.

J. Finish touch-up kit for each type and color of materials provided.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Quality Certification: Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section.

1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.
2. Provide designated labels on shop drawings as required by certification program.
3. Provide designated labels on installed products as required by certification program.
4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
5. Replace, repair, or rework all work for which certification is refused.

C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience and approved by manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.

B. Acceptance at Site:
1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.

C. Storage:
1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Examination" Article of this section.

1.09 FIELD CONDITIONS

A. For delivery and installation of laboratory casework and equipment, building conditions shall comply with AWI Standard 1700-G-3 and 1700-G-4 and be as follows:
1. Flooring required to be placed under casework and equipment installed.
2. Wood or metal blocking (wall grounds) installed within partitions to allow for immediate installation upon delivery.
3. Heating and air conditioning systems providing consistent temperature and humidity conditions to comply with by AWI Standard 1700-G-4 and 1700-G-5.
4. Relative humidity not less than 40 percent, nor more than 60 percent.
5. Temperatures not less than 65 degrees F (18 degrees C) and not greater than 80 degrees F (27 degrees C) in areas of casework and equipment installation.
6. Overhead mechanical, electrical and plumbing rough-in work is complete.
7. Wet operations complete prior to delivery.
8. Ceiling grids (with or without ceiling tiles), overhead soffits, ductwork and lighting installed.
9. Painting complete.
10. Coordination: Coordinate installation requirements with work of other trades.

1.10 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to the following:
1. Defects in materials and workmanship.
2. Deterioration of material and surface performance below minimum SEFA-8 standards as certified by independent third party testing laboratory.
3. Ruptured, cracked, or stained finish coating.
4. Discoloration or lack of finish integrity.
5. Cracking or peeling of finish.

6. Delamination of components.
7. Failure of adhesives.
8. Failure of hardware.

C. Within the warranty period, manufacturer shall, at their option, repair, replace, or refund the purchase price of defective casework.

D. Casework manufacturer shall be notified immediately of defective products and be given a reasonable opportunity to inspect the goods prior to return. Casework manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor. Casework manufacturer makes no other warranty, expressed or implied, to the merchantability, fitness for a particular purpose, design, sale, installation, or use, of casework; and, shall not be liable for incidental or consequential damages, losses of or expenses, resulting from the use of their products.
1. The warranty with respect to products from another company sold by the casework manufacturer is limited to the warranty extended by that other company.

E. Casework manufacturer shall provide, with close-out documents, a Certificate of Warranty for products provided.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Plastic-Laminate-Clad Casework:
1. Case Systems: www.casesystems.com/#sle.
2. **(Basis of Design)** Institutional Casework Inc; Spectrum Decor Series: www.iciscientific.com/#sle.
3. TMI Systems: www.tmisystems.com/
4. Substitutions: See Section 016000 - Product Requirements.

2.02 CASEWORK, GENERAL

A. Quality Standard: AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Types: More than one type is required. See drawings for location of each type of casework.

C. Plastic Laminate Faced Cabinets: Custom Grade.

2.03 FABRICATION - GENERAL

A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.

B. Construction: As required for selected grade.

C. Structural Performance: Safely support the following minimum loads:
1. Base Units: 500 pounds per linear foot across the cabinet ends.
2. Suspended Units: 300 pounds static load.
3. Drawers: 125 pounds, minimum.
4. Hanging Wall Cases: 300 pounds.
5. Shelves: 100 pounds, minimum.

D. Fittings and Fixture Locations: Cut and drill components for fittings and fixtures.

E. Hardware Application: Factory-machine casework members for hardware that is not surface applied.

F. Access Panels: Where indicated, for maintenance of utility service and mechanical and electrical components.

G. Removable back panels on indicated base cabinets. Provide partial height back panels at sink cabinets.

H. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

I. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.

J. Sloped tops for wall and floor cabinets: With closed ends, of matching construction and finish. Concealed anchorages for attachment to cabinet(s) below.

K. Mobile Cabinets: Same construction as fixed base cabinets, with modifications.
   1. Toe kick space eliminated.
   2. Cabinet underside reinforced as is standard with the manufacturer to provide caster mounting points.
   3. Four casters, each with a load rating of 165 pounds.

L. Apron Frames: Construction similar to other cabinets, with modifications.
   1. Frames fabricated from panels standard with the manufacturer. Include front and back panels, with drawer suspension framing mechanically fastened to support channels spanning between them.

M. Countertop Panel-Type Supports: Materials similar to adjacent casework, 1-1/2 inch in width, with front-to-back and toe space dimensions matching base cabinet. Designed to be secured in a concealed fashion to countertop material. Include two leveling devices per support panel.

2.04 PLASTIC-LAMINATE-CLAD CASEWORK

A. Plastic-Laminate-Clad Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base and tall cabinets.

B. Materials:
   1. Hardboard used in drawer bottoms and unexposed backs, consists of super-refined wood fibers and chips, highly compressed into a hard, dense, 1/4 inch (6 mm) thick, homogeneous sheet, faced with wood grain pattern melamine on the exposed face. Physical properties: Average MOR is 5,000 lbs/sq inches (3.5 kgf/sq mm); density is 48 lbs/cu ft (0.6 kg/cu m); and MOE of 500,000 psi (350 kgf/sq mm). All hardboard shall be CARB Phase 2 compliant.
   2. Particleboard is industrial grade, with the following physical properties: Density, 48 lb/cu. ft. (0.6 kg/cu m); minimum modulus of rupture 2,200 psi (1.5 kgf/sq mm); minimum modulus of elasticity 450,000 psi (315 kgf/sq mm). All particleboard shall be CARB Phase 2 compliant.
   3. High-pressure plastic laminate, regular grade, is melamine impregnated decorative surface papers, superimposed over kraft phenolic core sheets, vertical grade, high pressure, plastic laminate has a nominal thickness of 0.030 inch (0.76 mm) complying with NEMA LD 3.
      a. Exposed interior and exposed exterior surfaces.
   4. Low-pressure plastic laminate are panels of melamine resin impregnated decorative paper, thermally fused to industrial grade particleboard or to service tempered hardboard. Thermal fusion under heat and pressure, permanently bonds the resin-impregnated paper to the substrate, and produces a permanent bond between the melamine surface and the

substrate. Low-pressure plastic laminate is frosty white in color. Low-pressure plastic laminated to hardboard is used as drawer bottoms and unexposed interior backs.
   a. Unexposed and concealed interior and unexposed exterior.

C. Style: Flush overlay. Ease doors and drawer fronts slightly at edges.
   1. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
      a. Base Cabinets: 22 inches.
      b. Tall Cabinets: 22 inches.
      c. Wall Cabinets: 16 inches.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline.
   1. Finish: Matte or suede, gloss rating of 5 to 20.
   2. Surface Color and Pattern: As indicated on drawings.
   3. Exposed Interior Surfaces: Thermally fused laminate.
      a. Color: White.
   4. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Fabrication:
   1. Units and configurations designated for accessibility by users shall comply with ATBCB ADAAG (ADA standards).
   2. Design, material and construction of casework, shelving and tables shall comply with SEFA 8 performance and resistance standards.
   3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for its intended use.
   4. Décor Cabinets have a 1 inch (25 mm) by 4 inches (102 mm), low-pressure plastic laminate on particleboard core horizontal front and back top frame member, with black PVC edge-band on front member. Front intermediate rail is 10-5/8 inches (270 mm) by 3/4 inch (19 mm), low- pressure plastic laminate on particleboard core. Exposed exterior backs are high-pressure plastic laminated 3/4 inch (19 mm) particleboard. Cabinets with exposed interiors but unexposed exteriors have 3/4 inch (19 mm) particleboard, and the unexposed surface is laminated with low-pressure plastic laminate. Cabinets with unexposed interiors and exteriors have faces of low-pressure plastic laminated 1/4 inch (6 mm) hardboard. Exposed interior or exterior end panels are high-pressure plastic laminated 3/4 inch (19 mm) particleboard. Unexposed interior or exterior end panels are low-pressure plastic laminated 3/4 inch (19 mm) particleboard. Bottom, shelves, and dividers in cabinets with exposed interiors are high-pressure plastic laminated 3/4 inch (19 mm) particleboard; with unexposed interiors is low-pressure plastic laminated 3/4 inch (19 mm) particleboard. Exposed edges of end panels, bottom, shelves and dividers are edged with black PVC, applied after lamination. Color coordinated PVC must be specified, Drawer separators, furnished only when specified, are full depth, 3/4 inch (19 mm), and low-pressure plastic laminate on particleboard core.
   5. Cabinet construction is bored, doweled, dadoed, glued and screwed construction. Cabinets are enclosed without the use of common partitions. A full horizontal, mortise, tenon and glued, top frame is bored, doweled, glued, and reinforced with six (6) screws into the cabinet. Intermediate front rails and bottom rear horizontal parting rails are provided as required. Separators, where specified, are let into routed intermediate rails. Backs are recessed and encapsulated into dadoed end panels then screwed into the top and bottom case members. A standard enclosed toe space, 2-1/4 inches (57 mm) by 4 inches (102 mm) high, is provided, with toe rail bored, doweled and glued to end panels; however, casework cabinets, when in a library assembly such as a circulation desk, will have an enclosed toe space 2-1/4 inches (57 mm) deep by 6 inches (152 mm) high.

Shelves are supported on heavy-duty, laboratory grade, twin pin plastic shelf clips, which fit into two double rows of holes drilled 1-1/4 inches (32 mm) on centers, in the case end panels for maximum shelf adjustability.

6. Construction - Wall and Upper Cases: Wall and upper cases have components that are laminate on particleboard core. Adjustable shelves are 1 inch (25 mm) thick particleboard with laminate faces and appropriate edging. Backs, in cases with exposed interiors and exposed exteriors are 1/4 inch (6mm) thick hardboard with melamine face. Backs in cases with unexposed interiors and unexposed exteriors are 1/4 inch (6 mm) hardboard with melamine face. Exterior back cross rails: 4 inches (102 mm) by 3/4 inch (19 mm) hardwood plywood.
7. Construction - Tall Cases: Top panels in tall cases with exposed interiors are 1 inch (25 mm) hardwood plywood; tall cases with unexposed interiors have top panels of 1 inch (25 mm) plywood. Bottom panels in tall cases with exposed interiors are 3/4 inch (19 mm) hardwood plywood; and unexposed interiors have 3/4 inch (19 mm) plywood. Interiors, whether exposed or unexposed, are stain color matched to the exterior finish. Adjustable shelves are 1 inch (25 mm) thick hardwood plywood if exposed; 1 inch (25 mm) plywood if unexposed. Shelves are edged with 1/8 inch (3 mm) solid hardwood edging. Backs in tall cases with exposed interiors and exposed exteriors, are 1/4 inch (6 mm) hardwood plywood. Tall cases with unexposed interior or exterior backs have 1/4 inch (6 mm) hardboard melamine color stain matched to the interior. End panels in tall cases with exposed end panels have 3/4 inch (19 mm) hardwood plywood. End panels in cases with unexposed end panels have 3/4 inch (19 mm) plywood. All exposed edges of hardwood plywood components and plywood components are edged with 1/8 inch (3mm) solid hardwood edging. Tall cases have two exterior hardwood plywood cross rails, 4 inches by 3/4 inch (102 mm x 19 mm). Tall cases are rigidly constructed, integral units with the strongest, most advanced joinery methods utilized of bored, doweled, dadoed, glued and screwed construction. Each case is completely enclosed without the use of common partitions and has flush construction with overlapping doors to provide a dust resistant interior. The top panel is bored, doweled and glued into end panels; and the bottom panel is bored, doweled and glued into end panels and glued and screwed to the back. Additional back cross rails are provided as required. Backs are recessed and encapsulated into dadoed end panels and screwed to the top and bottom tall case members. An enclosed toe space 2-1/4 inch by 4 inches (57 mm by 102 mm) is provided with toe rail securely bored, doweled and glued to end panels and bottom panel. Adjustable shelves are supported on heavy-duty laboratory grade, twin pin plastic shelf clips, which fit into two rows of holes drilled 1-1/4 inches (32 mm) on centers in the end panels, for maximum shelf adjustability.
8. Construction - Tables: Open Frame Table exterior rails are 4-13/16 inches (122 mm) by 13/16 inch (21 mm), solid hardwood lumber. Interior rails are a minimum of 3/4 inch (19 mm) hardwood plywood. Compartment bottoms are 1/4 inch (6 mm) plywood. Legs are 2 1/4 inches (57 mm) square solid hardwood; legs are not laid up. Leg stretchers, when specified, are 2-1/8 inches (54 mm) by 1 inch (25 mm) thick, solid hardwood Openings are routed in the one-piece rail when drawers or compartments are required. A minimum of two interior cross rails are doweled and glued into exterior rails. Compartment bottoms are let into dadoed grooves in cross rails and the front and back rails, then glued on all four edges. Exterior rails are grooved to receive 3/8 inch (9 mm) flanges on the 13 gauge steel corner stabilizing bracket. Legs are secured to the stabilizing bracket with a 5/16 inch (8 mm) threaded hanger bolt, machine screwed into the solid leg a depth of at least two inches. The stabilizing bracket is attached to the leg bolt by a 5/16”locking nut with serrated flange. Tightening the locking nut on the bolt, draws the stabilizing bracket flanges against the solid hardwood rail, and clamps them against the solid hardwood leg. The stabilizing bracket is further secured to the solid hardwood rails by four (4) Euro

screws. Legs have molded black polyethylene, closed bottom, leg shoes. Exterior rails are also grooved to accept Z- clips for attaching the top.

2.05 COUNTERTOPS

A. Countertops: See Section 123600.

2.06 CABINET HARDWARE

A. Manufacturer's standard types, styles and finishes, and as indicated below.

B. Comply with BHMA A156.9 requirements.
   1. Acceptable base materials for plated finishes include brass, bronze, and steel.

C. Locks: Provide locks on all casework drawers and doors. Lock with 5 pin cylinder and 2 keys per lock.
   1. Hinged Doors: Cam type lock, satin chromium plated over nickel on base material.
   2. Tall Hinged Doors: Three-point latching system.
   3. Keying: Key locks alike within a space; key each room separately.
   4. Master Key System: All locks operable by master key.

D. Shelves in Cabinets:
   1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.

E. Swinging Doors: Hinges, pulls, and catches.
   1. Hinges: Concealed, number as required by referenced standards for width, height, and weight of door.
      a. Visible Hinges: Installed on framed cabinet face, and on door face, satin chromium plated over nickel on base material.
   2. Pulls: Chrome wire pulls, 4 inches wide.
   3. Catches: Mechanical catch.

F. Drawers: Pulls and slides.
   1. Pulls: Chrome wire pulls, 4 inches wide.
      a. Pull design to comply with project's referenced accessibility requirements.
   2. Slides: Steel, full extension arms, ball bearings; self-closing; capacity as recommended by manufacturer for drawer height and width.

2.07 MATERIALS

A. Adhesives Used for Assembly: Comply with VOC requirements for adhesives and sealants; see Section 016116.

B. Wood-Based Materials:
   1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.

C. Hardwood Plywood: Veneer core; HPVA HP-1 Grade as indicated; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.

D. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.

E. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications. complying with Grade requirements, and standard with the manufacturer.

2.08 ACCESSORIES

A. Plastic Edge Banding: Extruded PVC, flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   1. Color: As selected by Architect from manufacturer's full range.

2. Use at exposed edges.
3. Use at exposed shelf edges.

B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized finish in concealed locations and stainless steel finish in exposed locations.

C. Concealed Joint Fasteners: Corrosion-resistant, standard with manufacturer.

D. Grommets: Standard painted metal grommets for cut-outs, in color as selected by Architect from manufacturer's full range.

E. Sealant for Use in Casework Installation:
1. Manufacturer's recommended type.

PART 3 EXECUTION

3.01 PREPARATION

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

B. Clean surfaces thoroughly prior to installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.02 EXAMINATION

A. Site Verification of Environmental Conditions:
1. Do not deliver casework until the following conditions have been met:
   a. Building has been enclosed (windows and doors sealed and weather-tight).
   b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
   c. Ceiling, overhead ductwork, piping, and lighting have been installed.
   d. Installation areas do not require further “wet work” construction.

B. For Base Cabinets Installation: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions require more than 1/8 inch leveling adjustment within a ten foot run. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.

C. For Wall Cabinets Installation: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
1. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft and 1/2 inch in 20 ft or more, and/or maximum variation from plumb exceeds 1/4 inch per story.
2. Maximum Variation of finished gypsum board surface from true flatness: 1/8 inch in 10 feet in any direction.

D. Verify adequacy of support framing and anchors.

E. Verify that service connections are correctly located and of proper characteristics.

F. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.03 COORDINATION

A. Coordination with mechanical contractor who shall furnish, install and connect drain lines, service piping, vents, re-vents, in-line vacuum breakers, special plumbing fixtures, traps and tailpieces. Work to be completed through, under or along backs of working surfaces as required and complete final connection of services. Assemble, install and make final connections of service fixtures furnished by casework contractor, including service fixtures in

fume hoods. Furnish, install and connect fume hood blowers, motors and all related ductwork. Furnish, install and connect service piping within fume hoods, including final connection.

B. Coordination with electrical contractor who shall furnish, install and connect electrical service lines, wire and conduit within the equipment, including reagent racks and fume hoods. Work to be completed through, under or along backs of working surfaces as required. Complete final connection of services. Install and make final connections of electrical fixtures provided by casework installer, including elec. fixtures in fume hoods.

3.04 INSTALLATION

A. Perform installation in accordance with manufacturer's instructions.

B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.

C. Set casework items plumb and square, securely anchored to building structure.

D. Use concealed shims as required.

E. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.

F. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
   1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
   2. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
   3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
   4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

G. Secure wall and floor cabinets to concealed reinforcement and blocking at gypsum board assemblies.

H. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
   1. Where base cabinets are installed away from walls or service space framing, anchor to floor at toe space at not more than 24 inches on center, and at sides of cabinets with not less than two fasteners per side.

I. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches on center.

J. Install hardware uniformly and precisely.

K. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.

L. Replace units that are damaged, including those that have damaged finishes.

3.05 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.06 CLEANING

A. See Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for additional requirements.

B. Clean casework and other installed surfaces thoroughly.

3.07 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.

C. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

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SECTION 123500.00
MUSICAL INSTRUMENT STORAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Musical Instrument Storage Casework.

B. Music Library System.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 061000 - ROUGH CARPENTRY: Blocking and nailers for anchoring casework.

C. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

D. Section 092116 - GYPSUM BOARD ASSEMBLIES: Reinforcements in metal-framed partitions for anchoring casework.

E. Section 096500 - Resilient Flooring: Resilient wall base.

F. Section 123600 - Countertops: Additional requirements for countertops.

G. Division 22 Plumbing Sections: Sinks and fittings installed in casework.

H. Division 26 Electrical Sections: Wiring, Conduit and connections to switches, receptacles, etc. installed in casework.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Performance test reports from an independent testing lab on each specified top material.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Submit component and project-specific installation Drawings, cut sheets, and schedules showing all information necessary to fully explain design features, appearance, function, fabrication, installation, and use of system components in all phases of operation.
   2. Show components, assemblies, connections, attachments, and anchorage.
   3. Show fabrication and installation details. Distinguish between factory and field work.
   4. Include clearances, spacing, and relation to adjacent construction in plan.
   5. Include plans, elevations, sections, attachments, and work by other trades.
   6. Show system layouts, room locations, clearances, spacing, and relationship to adjacent construction.
   7. Show hardware, trim and accessories.
   8. Indicate seismic bracing and fastening requirements.

D. Samples for Finish Selection: Fully finished, for color and species selection. Minimum sample size: 2 inches by 3 inches.
   1. Plastic laminate samples, for color, texture, and finish selection.

E. Manufacturer's Qualification Statement.

F. Manufacturer's Installation Instructions.

G. Installer's Qualification Statement.

H. Maintenance Data: Manufacturer's recommendations for care and cleaning.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Finish touch-up kit for each type and color of materials provided.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in Manufacturer's original unopened containers with Manufacturer's labels attached.

B. Do not deliver components until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after rough-in, painting, and other finishing work have been completed, and installation areas are ready to accept work.

C. Handle and install materials to avoid damage.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide ten year manufacturer warranty for fail in materials or craftsmanship during warranty period..

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain specified products from single source from single manufacturer.
   1. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   2. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Wenger Corporation: www.wengercorp.com/#sle.

C. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

A. Materials to Meet Sustainable Design Requirements:
   1. No Added Urea Formaldehyde Products: Provide products made with composite products and adhesives with no urea formaldehyde added.
   2. FSC Certified Wood Products: Provide music education storage casework made with wood from certified sources.

3. GREENGUARD Indoor Air Quality Certified and GREENGUARD Children & Schools Certified.

B. Particleboard: To ANSI A208.1, minimum 43 pounds per cubic foot (689 kg/m3) density.

C. Fire Rated Particle Board: ANSI A208.1, minimum 45 pounds per cubic foot (720 kg/m3) density ASTM E-84 class 1.

D. Plywood: APA standards PS1-98 Section 5.7.4 or 5.7.1, or ANSI /HPVA HP-1-2004 panel provided with HDF skins to prevent grain telegraphing.

E. Particleboard Thermoset Panels: Particleboard panel with no formaldehyde added, 3/4-inch (19 mm) thick, finished with thermally-fused polyester surfacing on both sides, meeting performance requirements of laminate finish and edge banding described herein.

F. Laminate Finish: Composite, of thickness indicated, finished with thermally fused anti-microbial polyester surfacing on both sides, meeting performance properties of NEMA LD3 for VGS grade, with heat-bonded, radiused, 3 mm thick extruded PVC edge banding.
   1. Surface Abrasion Resistance: Taber Wheel, 400 cycles, for solid colors.

G. PVC Edge Banding: LMA EDG-1, radiused PVC extrusions, 3 mm thick, heat-bonded.

H. Polyethylene Shelves: High-density, 1-piece, blow-molded or polyethylene, with radiused front edge. Provide material with integrated color throughout so as not to show scratches.

I. Anchors and Fasteners:
   1. Factory Provided: Material, type, and size recommended by Manufacturer for secure anchorage to substrate.
   2. Field Installed: Manufacturer-recommended fasteners furnished by Contractor as required for substrate and project requirements.

2.03 MUSICAL INSTRUMENT STORAGE CASEWORK

A. Provide a modular instrument and accessories storage cabinet system.
   1. System shall include integral bases, adjustable levelers, and through-bolting fastening in the sizes and configurations shown on the Drawings.
   2. System shall include interior lining of sound-absorbent material to provide sound absorption and noise reduction properties and integrate a door design to minimize cubic volume loss and reduce vibration.

B. Product:
   1. Wenger Corporation; AcoustiCabinets: www.wengercorp.com/#sle.

C. General Requirements:
   1. All cabinets shall be designed to store a variety of instruments in fixed-size compartments.
   2. Cabinet Configurations: Provide cabinets in the size and configurations shown on the Drawings from manufacturer’s standard cabinet configurations.

D. Storage Casework Component Load Capacities:
   1. Storage Casework Wire-Grille Door Hinge: Each weld capable of resisting 400-pound-foot (1779 N) pull test without visible damage or permanent deformation.
   2. Storage Casework Full Grille Door Hinge: Full-length door capable of supporting 315 pounds (143 kg) through open and close cycle without permanent damage.

E. Panel Edge Banding: Provide 3 mm thick, heat-bonded, with radiused and profiled edges and corners.

F. Carcass joinery includes lag screws powder coated to match substrate.

G. Back panel: 7/32-inch (5.6 mm) reinforced with 3/4-inch (19 mm) stretcher panels held in a dado groove and lag screwed in place.

H. Seismic Performance: Comply with ASCE 7, Minimum Design Loads for Buildings and Other Structures: Section 9, Earthquake Loads based upon seismic design criteria indicated.

I. Acoustic Requirements:
   1. Acoustically enhanced instrument storage casework finished with interior lining of sound-absorbent material providing sound absorption and noise reduction properties.
   2. Sound Absorption Average: Minimum SAA of 0.80, based upon sound absorption coefficient for twelve one-third octave bands from 200 to 2500 Hz, inclusive, with a minimum Noise Reduction Coefficient (NRC) of 0.75, per ASTM C 423 and ASTM E 795 for fully assembled cabinet (system) and waterfall grille door.
   3. Acoustical Performance: Comply with Manufacturer's published sound absorption data.
   4. Door requirements: Provide doors with an open grille design constructed as specified below.

J. Fabrication:
   1. Fabricate components square and rigid. Make exposed metal safe to touch and free of sharp ends or burrs.
   2. Form frames, panels, doors, and accessories from one-piece, or one rigid assembly, unless specifically shown on Shop Drawings.
   3. Factory preassemble metal components by welding all joints, and connections; with no bolts, nuts, screws, or rivets used in assembly, except as required for knock-down shipping and attachment to mounting surfaces.

K. Components:
   1. Side Panels and Divider Panels:
   2. Particleboard thermoset panel with no urea formaldehyde added, 3/4-inch (19 mm) thick.
   3. Side panels machined to accept unit-to-unit through-bolting.

L. Shelving:
   1. Size shelves with an adequate gap between shelving and casework side panels to allow air movement inside the casework.
   2. Over 19 Inches (483 mm) wide: Provide tubular steel supports.
   3. Up to 27 Inches (686 mm) wide: Removable molded polyethylene shelf, with impact-resistant, radiused front edge, mounted to cabinet wall with self-locking clip.
   4. Over 27 Inches (686 mm) wide: Removable formed polyethylene shelf, ribbed, with high-impact-resistant, radiused front edge, supported by steel tube frame.

M. Cabinet Doors:
   1. Where multiple cabinet door types are specified, provide doors in the type and height indicated in the Drawings.

N. Waterfall Grille Doors - Acoustic:
   1. 5/16 and 1/4-inch (7.9 and 6.3 mm) diameter with full 360-degree welds at T-joints.
   2. Vertical grille rods shall be shaped in a non-linear pattern.
   3. Provide compartment height and full-height doors as indicated in the Drawings.

O. Hardware
   1. Butt Hinges:
      a. 2-3/4 inches (70 mm), 5-knuckle steel hinges made from 0.09-inch (2.29 mm) thick metal, ANSI/BHMA A156.9, Grade 1, with powder-coated finish, through-bolting to door and side panels, and welded to grille door frames.
      b. Provide 2 hinges on compartment doors, and 4 hinges on full-height doors.
   2. Slide Latch:
      a. 0.105-inch (2.67 mm) min. thickness steel, with padlock eye, powder-coat finish, through-bolted to panel door and side panel, and welded to grille door frames.
      b. Provide latches that secure without padlock. Padlocks furnished by Owner.

c. Provide clear plastic label holder for use with standard-size labels; number system available for user to print.

P. Panel Connectors: 1/4-20 x 1.77-inch (45 mm) panel connectors, with steel thread inserts, powder coated to match panels.

Q. Cabinet Levelers: Leveling glides with 3/8-inch (9.5 mm) diameter threaded steel rod in steel corner brackets, minimum two each per cabinet side, accessible from within unit, and concealed in completed installation.

R. Fasteners: Manufacturer-recommended fasteners as required for casework substrate and project performance requirements, consisting of one or more of the following:
1. Sheet Metal Screws: SAE J78, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
2. Wood Screws: ASME B18.6.1.
3. Expansion Anchors in Concrete and Concrete Masonry Units: Carbon-steel, zinc-plated.
4. Provide hardware to anchor the cabinets to the wall and to adjacent casework.

S. Cabinet Assemblies:
1. Accessories:
a. Filler Panels and Closure: 3/4-inch (19 mm) thick particleboard thermoset panels with no urea formaldehyde, with finish that matches cabinet. Provide the following, cut to fit field conditions, where indicated:
b. Wall filler between cabinet side and wall.
c. Top filler between cabinet top and wall.
d. Top of cabinet closure panel between cabinet and finished ceiling or soffits.
e. Finished back panel for exposed cabinet backs.

T. Finishes:
1. Casework Panel Color: As selected by Architect from Manufacturer's full line.
2. Steel Sheet, Steel Wire, and Exposed Fasteners Finish: Urethane-based electrostatic powder coating, as selected by Architect from Manufacturer's standard colors.

2.04 MUSIC LIBRARY SYSTEM

A. Provide a high-density pull-out storage system designed to store sheet music.

B. Product:
1. Wenger Corporation; Music Library System: www.wengercorp.com/#sle.

C. General Requirements:
1. Pull-out design, equally spaced shelves provide 10-1/2 inches (267 mm) of available height per shelf.
2. Frame: 16-gauge, 1-inch (25 mm) square tubular steel, painted black.
3. Construct units from 3/4-inch (19 mm) thick industrial-grade composite wood with no added formaldehyde and with polyester laminate finish.

D. Shelves:
1. Reinforce with an aluminum extrusion that includes a slot with vinyl material for labeling with dry-erase markers.
2. Shelf Rating: 100 pounds (45 kg).
3. Provide back panel designed to fit on either side of unit for left or right hand use.

E. Casters: 4 8-inch (203 mm) diameter fixed casters.

F. Provide bumpers for control of side and outward movement.

G. Fabrication:
1. Fabricate components square and rigid. Make exposed metal safe to touch and free of sharp ends or burrs.

2. Form frames, panels, doors, and accessories from one-piece, or one rigid assembly, unless specifically shown on Shop Drawings.
3. Factor- preassemble metal components by welding all joints and connections, with no bolts, nuts, screws, or rivets used in assembly, except as required for knock-down shipping and attachment to mounting surfaces.

H. Assemblies:
1. Provide unit assemblies in the size and configuration shown in the Drawings.
2. Standard Width 7-Shelf Unit:
a. 16 inches (406 mm) wide.
b. 12 inches x 34-1/2 inches x 10-1/2 inches (305 x 876 x 267 mm) of shelf space.
c. 4 adjustable shelves.
d. 3 fixed shelves.

I. Accessories:
1. Top Closure:
a. Provide top closure constructed particleboard that matches the end covers.
b. Capacity: supports up to 50 pounds per linear foot (74 kg/m) loading.
2. Provide lock hasp option (padlocks not included).

J. Finishes:
1. Casework Panel Color: As selected by Architect from Manufacturer's full line.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine installation areas and mounting surfaces with the Installer present for compliance with the Manufacturer's installation tolerances, including required clearances, floor level, location of blocking and anchoring reinforcements, and other existing conditions that may affect installation or performance.

3.02 PREPARATION

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Casework Installation:
1. Install plumb, level, and true. Install in accordance with Manufacturer's recommendations and approved submittals.
2. Install seismic bracing and fastening in accordance with approved shop Drawings.
3. Install hardware uniformly and precisely. Set hinges snug and flat. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
4. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind and close with uniform reveals.

C. Music Lubrary System installation:
1. Substrate:
a. Verify substrate is concrete or epoxy-coated concrete. Notify Manufacturer immediately if unit is designed to install on padded carpet or vinyl flooring.
2. Install plumb, level, and true, using integral levelers. Install in accordance with Manufacturer's recommendations and approved submittals.
3. Install seismic bracing and fastening in accordance with approved Shop Drawings.
4. Install hardware uniformly and precisely. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

5. Adjust installation so units operate smoothly without warp or bind and close with uniform reveals.

3.04 TOLERANCES

3.05 CLEANING

A. Repair or replace defective work as directed by Architect upon inspection.

B. Clean surfaces. Touch up marred finishes or replace damaged components that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by Manufacturer.

3.06 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.
   3. Turn over keys, tools, and any operating/maintenance instructions.

3.07 PROTECTION

A. Protect installed casework and music storage from subsequent construction operations.

END OF SECTION

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SECTION 123553.19
WOOD LABORATORY CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Standard and custom cabinets and cabinet hardware.

B. Plastic-Laminate-Clad Casework.

C. Tables.

D. Service enclosures.

E. Laboratory sinks.

F. Laboratory emergency equipment plumbing fixtures.

G. Service fittings and outlets.

1.02 RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: VOC limitations for adhesives and sealants.

B. Section 061000 - ROUGH CARPENTRY: Blocking and nailers for anchoring casework.

C. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

D. Section 092116 - GYPSUM BOARD ASSEMBLIES: Reinforcements in metal-framed partitions for anchoring casework.

E. Section 096500 - Resilient Flooring: Resilient wall base.

F. Section 123600 - Countertops: Additional requirements for countertops.

G. Division 22 Plumbing Sections: Sinks and fittings installed in casework.

H. Division 26 Electrical Sections: Wiring, Conduit and connections to switches, receptacles, etc. installed in casework.

I. Section 224000 - Plumbing Fixtures for non-laboratory sinks.

J. Section 224300 - Healthcare Plumbing Fixtures: Additional emergency equipment.

1.03 DEFINITIONS

A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.

B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.

C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.04 REFERENCE STANDARDS

A. ANSI Z358.1 - American National Standard for Emergency Eyewash and Shower Equipment; 2014, with Editorial Revision (2020).

B. AWI (QCP) - Quality Certification Program; Current Edition.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

E. BHMA A156.9 - Cabinet Hardware; 2020.

F. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. SEFA 3 - Laboratory Work Surfaces; 2020.

J. SEFA 7 - Laboratory Fixtures; 2021.

K. SEFA 8W - Laboratory Grade Wood Casework Standard; 2026.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of casework with related items.
   1. Service Fixtures: Coordinate location and characteristics of service connections.
   2. Equipment and Instruments: Coordinate installation of casework with equipment, scientific instruments, fume hoods, and biological safety cabinets.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Test reports certifying that the casework finish complies with SEFA-8 standards for chemical and physical resistance performance requirements.
   2. Performance test reports from an independent testing lab on each specified top material.
   3. Preparation instructions and recommendations.
   4. Storage and handling requirements and recommendations.
   5. Installation methods.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Location, size, type and arrangement of components in unit.
   2. Types of materials used for fabrication.
   3. Size and thickness of materials.
   4. Hardware types, function and finish.
   5. Types of finish for various components.
   6. Anchors, fasteners, and similar items.
   7. Mechanical and/or electrical services required.
   8. Indicate locations of blocking and reinforcements required for installing laboratory casework.
   9. Indicate locations and types of service fittings, together with associated service supply connection required.
   10. Include details of utility spaces.
   11. Include indicators of exposed conduits, if required, for service fittings.
   12. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
   13. Include coordinated dimensions for laboratory equipment specified in other Sections.

D. Samples For Color Selection: Wood samples, fully finished, for color and species selection. Minimum Sample Size: 2 inches by 3 inches.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

F. Test Reports: From independent laboratory indicating compliance with referenced chemical-resistance standards for cabinet finish and liner materials.

G. Manufacturer's installation instructions.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Maintenance Data: Manufacturer's recommendations for care and cleaning.

K. Finish touch-up kit for each type and color of materials provided.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience and approved by manufacturer.

C. Quality Certification:
1. Provide labels or certificates indicating that installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
2. Provide designated labels on shop drawings as required by certification program.
3. Provide designated labels on installed products as required by certification program.
4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.

B. Acceptance at Site:
1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.

C. Storage:
1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" paragraph of this section.

1.09 FIELD CONDITIONS

A. For delivery and installation of laboratory casework and equipment, building conditions shall comply with AWI Standard 1700-G-3 and 1700-G-4 and be as follows:
1. Flooring required to be placed under casework and equipment installed.
2. Wood or metal blocking (wall grounds) installed within partitions to allow for immediate installation upon delivery.
3. Heating and air conditioning systems providing consistent temperature and humidity conditions to comply with by AWI Standard 1700-G-4 and 1700-G-5.
4. Relative humidity not less than 40 percent, nor more than 60 percent.
5. Temperatures not less than 65 degrees F (18 degrees C) and not greater than 80 degrees F (27 degrees C) in areas of casework and equipment installation.
6. Overhead mechanical, electrical and plumbing rough-in work is complete.
7. Wet operations complete prior to delivery.
8. Ceiling grids (with or without ceiling tiles), overhead soffits, ductwork and lighting installed.
9. Painting complete.

10. Coordination: Coordinate installation requirements with work of other trades.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to:
   1. Defects in materials and workmanship.
   2. Deterioration of material and surface performance below minimum SEFA-8 standards as certified by independent third party testing laboratory.
   3. Delamination of components.
   4. Failure of adhesives.
   5. Ruptured, cracked, or stained finish coating.
   6. Discoloration, or lack of finish integrity.
   7. Cracking or peeling of finish.
   8. Failure of hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Plastic Laminate Clad Laboratory Casework:
   1. **(Basis of Design)** Institutional Casework Inc; Spectrum Decor Series: www.iciscientific.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 PLASTIC LAMINATE CLAD LABORATORY CASEWORK

A. Plastic Laminate Clad Laboratory Casework: Each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base and tall cabinets.
   1. Style: Flush overlay. Ease doors and drawer fronts slightly at edges.
   2. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
      a. Base Cabinets: 22 inches.
      b. Tall Cabinets: 22 inches.
      c. Upper Cabinets: 16 inches.
   3. Construction: Joints doweled, glued and screwed, except drawers may be lock-shoulder jointed; with interior of units smooth and flush; cabinet bottom flush with top of face frame; without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
   4. Structural Performance: In addition to the requirements of SEFA 3, SEFA 7, and SEFA 8W, components safely support the following minimum loads:
   5. Fittings and Fixture Locations: Cut and drill counter tops, backs, and other components for service outlets and fixtures.
   6. Access Panels: Where indicated, for maintenance of utility service and mechanical and electrical components.
   7. Removable back panels on indicated base cabinets. Provide partial height back panels at sink cabinets.
   8. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.

9. Sloped Tops for Upper and Floor Cabinets: With closed ends, of matching construction and finish. Concealed anchorages for attachment to cabinet(s) below.
10. Factory-finish all exposed and semi-exposed surfaces with the same finish.
    a. Finish Performance: Provide finish on all surfaces having chemical resistance of Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8W and no visible effect when surface is exposed to:
        1) Hot water at temperature between 190 degrees F and 205 degrees F trickled down the test surface at 45 degree angle for 5 minutes.
        2) Constant moisture in the form of 2 by 3 by 1 inch thick cellulose sponge kept continually saturated with water and in contact with test surface for 100 hours.

B. Tables: With standard aprons manufactured of not less than 3/4 by 3 1/2 inch solid lumber, machined to receive corner blocks, and bolted to 2 1/8 by 2 1/8 inch solid hardwood legs. 3/8 inch leveling devices, and slip-on type black PVC shoes.
    1. Table Drawers: Where indicated, manufacturer's standard drawers. Single drawer for tables up to 48 inches wide, two drawers for wider tables.

C. Apron Frames: Construction similar to other cabinets, with modifications.
    1. Frames fabricated from panels standard with the manufacturer. Include front and back panels, with drawer suspension framing mechanically fastened to support channels spanning between them.

D. Countertop Panel-Type Supports: Materials similar to adjacent casework, 1-1/2 inch in width, with front-to-back and toe space dimensions matching base cabinet. Designed to be secured in a concealed fashion to countertop material. Include two leveling devices per support panel.

E. Vertical Service Drop Enclosures: Where indicated on drawings, for service drops to platic laminate clad casework.
    1. Frames: Unless otherwise standard with the manufacturer, channel strut frames, with members at all corners, bottom, mid-height, and top of enclosure. Designed for anchorages at the bottom to countertop, and at top to miscellaneous metal support framing.
    2. Enclosures: Consisting of fixed and removable (access) panels, in configuration standard with the manufacturer.
        a. Extent: Up to underside of ceiling.
        b. Rear Panel: Fixed panel, constructed like other casework closure panels,
        c. Side Panels: Fixed panels,
        d. Front Panels:
            1) Fixed Panel: Decorative panel specified below.
            2) Removable (Access) Panel: Decorative panel specified below.
            3) Decorative Panel: Plastic-laminate-clad wood panel.
        e. Attachment: Use corrosion-resistant metal mounting hardware and fasteners.

2.03 CABINET HARDWARE

A. Manufacturer's standard types, styles, and finishes.

B. Finish of exposed stainless steel components: No.4 finish.

C. Locks: Provide locks on casework drawers and doors where indicated. Lock with 5 pin cylinder and 2 keys per lock.
    1. Hinged Doors: Cam type lock, bright chromium plated over nickel on base material.
    2. Tall Hinged Doors: Three-point latching system.
    3. Keying: Key locks alike within a space; key each room separately.
    4. Master Key System: All locks operable by master key.

D. Shelves in Cabinets:

1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.

E. Swinging Doors:
1. Hinges: Offset pin, number as required by referenced standards for width, height, and weight of door.
2. Catches: Magnetic.
3. Pulls: Chrome wire pulls, 4 inches wide.
4. Drawers:
a. Pulls: Chrome wire pulls, 4 inches wide.
b. Slides: Steel, full extension arms, ball bearings; self-closing; capacity as recommended by manufacturer for drawer height and width.

2.04 COUNTERTOPS

A. Countertops: See Section 123600.

2.05 SINKS

A. Laboratory sinks.
1. General: Manufacturer's adjustable support system for undermount sink installation.
2. Sink : Single-bowl.
a. Material: Epoxy
b. Mounting: Drop-in.

B. Non-laboratory sinks are identified on drawings and are specified in Section 224000.

2.06 LABORATORY EMERGENCY EQUIPMENT PLUMBING FIXTURES

A. See Section 224300 for emergency equipment plumbing fixtures not intended for installation in laboratory casework or for recessing into partitions.

B. General: Provide emergency equipment products complying with requirements of ANSI Z358.1.

C. Eyewash/Safety Shower Combination Units:
1. Cover/Eyewash Drain Pan: Combination fixture, with projecting activation handle requiring grasping and pulling down into operating position for activation.
a. Twin eyewash heads mounted on supply arms, with internal flow control, and filter.
2. Shower Head: 10 inch diameter stainless steel, with 20 gallons per minute flow control.
a. Mounting: Below finished ceiling in casework. Include vertical supply pipe and ceiling escutcheon.
b. Offset Dimension from Wall to Centerline of Head: 24 inches, standard.

2.07 SERVICE FITTINGS

A. General: Comply with requirements of SEFA 7.

B. Gas Service Fittings and Fixtures:
1. Laboratory Gas Fitting :
a. Valve: Forged or cast brass body, 90 degree inlet - outlet configuration, with polished chrome with clear epoxy coating finish.
b. Control: Ball valve.
c. Mounting: Deck (horizontal surface) turret base.
d. Supply Gas: Natural Gas.
e. Inlet: 3/8 inch NPS NPT.
f. Outlet: Manufacturer's standard, with removable seven-serration hose end.
1) Number: Two - 180 degrees apart.
g. Handle: Manufacturer's standard color-coded molded nylon hooded Handle with color-coded index disc.

C. Water Service Fittings and Fixtures:
   1. Water Fitting :
      a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, with polished chrome finish.
      b. Mounting: Deck (horizontal surface) turret base, with escutcheon.
      c. Inlet: 3/8 inch NPS NPT.
      d. Outlet: Manufacturer's standard, with anti-splash serrated hose end.
         1) Number: Two.
      e. Handle: Manufacturer's standard four-arm handle with color-coded index disc.
   2. Water, Single Faucet :
      a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, with polished chrome finish.
      b. Mounting: Deck (horizontal surface) turret base.
      c. Inlet: 3/8 inch NPS NPT.
      d. Gooseneck: Rigid gooseneck, with 6 inch spread, aerator.
         1) Number: Two.
      e. Handle: Manufacturer's standard wrist-blade handle with color-coded index disc.

D. Electrical Fittings and Fixtures:
   1. Electrical Fittings, General: Types indicated, for mounting on laboratory casework, including, as appropriate, grounding screws, and mounting accessories and fasteners.
   2. Electrical Power Fitting :
      a. General: 3-wire polarized receptacles meeting requirements of NFPA 70.
      b. Mounting: Flush, recessed.
      c. Receptacles: Duplex, 5-20R, GFCI.
      d. Orientation: Single face.
      e. Voltage: 120 V.
      f. Service: Normal power.
      g. Receptacle Color: Stainless Steel.
      h. See electrical drawings for circuiting.

2.08 MATERIALS

A. Wood-Based Materials:
   1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.

B. Hardwood Plywood: Veneer core; HPVA HP-1 Grade AA, Type I; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.

C. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.

D. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications. complying with Grade requirements, and standard with the manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Environmental Conditions:
   1. Do not deliver casework until the following conditions have been met:
      a. Building has been enclosed (windows and doors sealed and weather-tight).
      b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
      c. Ceiling, overhead ductwork, piping, and lighting have been installed.
      d. Installation areas do not require further “wet work” construction.

B. Verify adequacy of support framing and anchors.

C. Verify that service connections are correctly located and of proper characteristics.

3.02 INSTALLATION

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.

C. Set casework items plumb and square, securely anchored to building structure.
   1. Base Cabinets: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 3/4 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
   2. Wall Cabinets: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
      a. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft and 1/2 inch in 20 ft or more, and/or maximum variation from plumb exceeds 1/4 inch per story.
      b. Maximum Variation of finished gypsum board surface from true flatness exceeds 1/8 inch in 10 feet in any direction.

D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.

E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
   1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
   2. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
   3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
   4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

F. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.

G. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches on center.

H. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

I. Coordinate installation of work of this section with installation of fume hoods and laboratory equipment.

J. Countertops: Install countertops in one true plane, with ends abutting at hairline joints, and no raised edges.

K. Deliver sinks and service fittings in properly marked boxes, accompanied with written instructions, for supervised installation by appropriate trade contractor(s).

L. Replace units that are damaged, including those that have damaged finishes.

3.03 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.04 CLEANING

A. Clean casework and other installed surfaces thoroughly.

3.05 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Protect casework and countertops from ongoing construction activities. Prevent installers from standing on or storing tools and materials on casework or countertops.

C. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

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SECTION 123600
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Countertops for manufactured casework.

C. Wall-hung counters and vanity tops.

D. Solid Surface Sills

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 064100 - Architectural Wood Casework.

C. Section 123200 - Manufactured Wood Casework.

D. Section 224000 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

A. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2023.

B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. AWI (QCP) - Quality Certification Program; Current Edition.

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2026.

G. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

H. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

I. PS 1 - Structural Plywood; 2022.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

G. Installation Instructions: Manufacturer's installation instructions and recommendations.

H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience.

B. Quality Certification:
1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
3. Provide designated labels on shop drawings as required by certification program.
4. Provide designated labels on installed products as required by certification program.
5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source and from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. Basis-Of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the products indicated by the Finishes List indicated on the Interior " I " series drawings.

2.02 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
1. Laminate Sheet: NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.
a. Manufacturers: **Basis of Desgin: Refer to I000 Finish Schedule.**
1) **Basis of Design** - Panolam Industries International, Inc; Standard HPL: www.panolam.com/#sle.
2) Substitutions: See Section 016000 - Product Requirements.
b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.

c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
d. Finish: Matte or suede, gloss rating of 5 to 20.
e. Surface Color and Pattern: As indicated on drawings.

2. Exposed Edge Treatment: Molded PVC edge with T-spline, sized to completely cover edge of panel.
a. Color: As selected by Architect from the manufacturer's full line.
3. Back and End Splashes: Same material, same construction.
4. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade.

C. Wood Countertops: One-piece, glued-laminated under pressure.
1. Thickness: 1-1/2 inch, minimum.
2. Construction (Butcher Block): Maximum 1/2 inch thick strips glued perpendicular to surface.
3. Species: Maple; clear grade.
4. Exposed Edges: Rounded to approximately 3/8 inch radius.
5. Back and End Splashes: Same material, same construction; 3/4 inch thick, square edges.
6. Finish: Sanded smooth; two coat boiled linseed oil rubbed in with 48 hours between coats.
7. Fabricate in accordance with manufacturer's standard requirements.

D. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
1. Manufacturers:
a. Durcon, Inc: www.durcon.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.
2. Flat Surface Thickness: 1 inch, nominal.
3. Chemical-Resistance: Provide products that resist the following chemicals with not more than Moderate Effect when tested in accordance with NEMA LD 3:
4. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
5. Surface Finish: Smooth, non-glare.
6. Color: Black.
7. Exposed Edge Shape: 3/16 inch radius corner.
8. Back and End Splashes: Same material, same thickness; separate for field attachment.

E. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
1. Flat Sheet Thickness: 1/2 inch, minimum.
2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
a. Manufacturers: **Basis of Design: Refer to I000 Finish Schedule.**
1) Formica Corporation: www.formica.com/#sle.
2) Wilsonart: www.wilsonart.com/#sle.
3) Substitutions: See Section 016000 - Product Requirements.
b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
d. Color and Pattern: As indicated on drawings.
3. Other Components Thickness: 1/2 inch, minimum.

4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
6. Fabricate in accordance with manufacturer's standard requirements.

2.03 SILLS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherise.

B. Solid Surface Sills: Solid surfacing sheet or plastic resin casting over continous substrate.
1. Flat Sheet Thickness: 1/2 inch, minimum.
2. Solid Surface Sheet and Plastic Resin Casting: Comply with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard tools; not surface coating; color and pattern consistant throughout thickness.
3. Manufacturers: **Basis of Design: Refer to I000 Finish Schedule.**
a. Formica Corporation: www.formica.com/#sle.
4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
5. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
6. Color and Pattern: As indicated on drawings.
7. Other Component Thickness: 1/2 inch, minimum.
8. Exposed Edge Treatment: Built up to minimuim 1-1/4 thick; square edge.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B211/B211M, 6463 alloy, T5 temper.

B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Joint Sealant: Mildew-resistant silicone sealant, color matched to counter surface.

2.05 HARDWARE

A. Countertop Support Brackets: Fixed, L-shaped, face-of-stud mounting.
1. Materials: Steel; L-shaped cross-section.
a. Finish: Manufacturer's standard, factory-applied, powder coat.
b. Color: As selected from manufacturers full range..
2. Products:
a. **Basis of Design:** Rakks/Rangine Corporation; EH Series Brackets: www.rakks.com/#sle.
b. Substitutions: See Section 016000 - Product Requirements.

B. Countertop Brackets: Fixed, concealed vertical leg, side-of-stud mounting.
1. Materials: Steel L-shapes.
a. Finish: Manufacturer's standard, factory-applied, powder coat.
b. Color: Black.
2. Products:
a. **Basis of Design:** Rakks/Rangine Corporation; Concealed EH Countertop Support: www.rakks.com/#sle.

2.06 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.

2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   a. Rout a 1/8 inch drip groove at underside of exposed overlapping edges, set back 1/2 inch from face of edge.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

D. Wall-Mounted Counters: Provide aprons, brackets, and braces as indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Attach wood countertops using screws with minimum penetration into substrate board of 5/8 inch.

D. Attach epoxy resin countertops using compatible adhesive.

E. Apply sealer products in accordance with manufacturer's written instructions.

F. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 126100
FIXED AUDIENCE SEATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fixed, upholstered audience seating.

B. Seating accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - Cast-In-Place Concrete: Anchorage of seating components to concrete subfloor.

C. Section 126613 - TELESCOPING BLEACHERS.

1.03 REFERENCE STANDARDS

A. 16 CFR 1610 - Standard for the Flammability of Clothing Textiles; Current Edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

F. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2022.

G. ASTM D3597 - Standard Performance Specification for Woven Upholstery Fabrics—Plain, Tufted, or Flocked; 2002 (Reapproved 2024).

H. ASTM E1352 - Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies; 2016.

I. ASTM E1537 - Standard Test Method for Fire Testing of Upholstered Furniture; 2022.

J. BIFMA X5.4 - Public and Lounge Seating; 2020 (Reaffirmed 2025).

K. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

L. NFPA 261 - Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes; 2023.

M. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for each type of product specified.

C. Shop Drawings:
   1. Field Measurements: Verify seating layout by field measurements and record field dimensions on shop drawings.
   2. Seating Layout: Show seating layout, aisle widths, row-lettering and chair-numbering scheme, chair widths, and chair spacing in each row.

D. Selection Samples: Manufacturer's color charts and swatches for fabric upholstery, plastic laminate, baked enamel finish, hardwood and finishes, plywood and finishes, and molded plastic, indicating full range of materials, colors, and patterns available.

E. Product Certificates: For each type of flame-retardant treatment of fabric, from manufacturer.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Warranty: Submit installer warranty and ensure that forms have been completed in Owner's name and registered with installer.

I. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

J. Maintenance Data: For fixed audience seating to include in maintenance manuals. Include the following:
   1. Methods for maintaining upholstery fabric.
   2. Precautions for cleaning materials and methods that could be detrimental to seating finishes and performance.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of seating required, including accessories and mounting components, from single source, from single manufacturer.
   1. Upholstery Fabric: Obtain fabric of a single dye lot for each color and pattern of fabric required.

B. Installer Qualifications: An experienced installer certified in writing by the seating manufacturer to be qualified for installation of specified seating.

C. Fire-Test-Response Characteristics of Upholstered Chairs: Comply with NFPA 701 and the following:
   1. Fabric: Class 1 according to DOC CS 191 and 16 CFR 1610, tested according to California Technical Bulletin 117.
   2. Padding: Comply with California Technical Bulletin 117.
   3. Full-Scale Fire Test: Comply with California Technical Bulletin 133.

D. Preinstallation Conference: Conduct conference at Project site.

1.06 MOCK-UPS

A. See Section 014000 - Quality Requirements, for additional mock-up requirements.

B. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Size: Construct mock-up with at least 2 seats in each of 2 rows at location indicated.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver seats to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

B. Store seating units in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.08 FIELD CONDITIONS

A. Ambient Conditions: Do not install seating until space is enclosed and weatherproof, wet-work in space is complete and nominally dry, installation of finishes including painting is complete, and ceilings are complete.

B. Ambient Conditions: Continuously maintain ambient temperature and humidity conditions at values near those indicated for final occupancy for minimum of one week before, during, and after installation of seating.

C. Field Measurements: Verify actual dimensions of seating layout and construction contiguous with seating by field measurements before fabrication.

1.09 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for interior fixed audience seating. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 5-year warranty for installation of interior fixed audience seating commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with installer.

D. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fixed audience seating that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Faulty operation of self-rising seat mechanism.
      b. Wear and deterioration of fabric and stitching beyond normal use.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
   2. Warranty Periods: As follows, from date of Substantial Completion.
      a. Operating Mechanisms: Five years.
      b. Plastic, Wood, and Painted Components: Five years.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

C. The manufacturer and model number(s) or series listed below are Basis-of-Design.

2.02 MANUFACTURERS

A. Fixed Audience Seating:
   1. **(Basis of Design)** Hussey Seating Company; Quattro Traditional: www.husseyseating.com/#sle.
   2. Irwin Seating Company: www.irwinseating.com/#sle.
   3. SERIES Seating, LLC: www.seriesseating.com/#sle.

B. Substitutions: See Section 016000 - Product Requirements.

C. Provide all fixed audience seating by one manufacturer.

2.03 UPHOLSTERED SEATING

A. Description: Fixed seating system designed to permit radial installation using common middle support standards in each row and aisle standards aligned as indicated on drawings. Width of seats not less than 22 inches, except exit seat locations may be reduced to 20 inches to complete specific row dimensions.

B. Performance Criteria:

1. Fire Retardance of Upholstered Seating: Self-extinguishing when mock-up is exposed to smoldering cigarettes in accordance with ASTM E1352 or NFPA 261.
2. Fire Retardance of Fixed Audience Seating: Maximum instantaneous net peak rate of heat release of 250 kW or less, and total energy released during first 5 minutes of 40 mJ or less, when tested in accordance with ASTM E1537.
3. Strength and Durability: Comply with BIFMA X5.4 standards for seats, backs, armrests, and standards.

C. Support Standards: One-piece cast steel, with integral mounting points for backs, seats, and arm rests, and integral floor anchoring points.

D. Backs: Fixed type; two-panel construction with fabric covering over padding and protective back panel, with installed height not less than 35 inches above finished floor.
1. Padding: Polyurethane foam not less than 2 inches thick bonded to structural support.
2. Covering: Fabric bonded to padding and fastened by upholstery technique that facilitates replacement.
3. Outer Back: One-piece injection molded high-impact plastic, with scuff-resistant textured surface.

E. Seats: Hinged type, constructed to permit reupholstering without removing seat from chair.

F. Hinges: Self-lubricating, noiseless steel hinges with brass alloy bearings or nylon bushings, equipped with spring mechanism that causes unoccupied seat to rise automatically to uniform 3/4 fold, with 100 percent fold when additional pressure is applied.

G. Arm Rests: Locate at aisles and between chairs; mount to support standard with concealed fasteners; exposed surfaces of solid hardwood lumber with smoothed edges.

H. End Panels: One piece panels fastened securely to aisle standards with concealed fasteners, configured as follows:
1. Shape: Rectangular with curved bottom edge.
2. Finish: Plastic laminate.

2.04 MATERIALS

A. Cast Iron: ASTM A48/A48M, Class 25A minimum, free of air holes and casting imperfections, all edges ground smooth.

B. Sheet Steel: ASTM A879/A879M, Commercial Steel (CS) or Drawing Steel (DS) electrogalvanized sheet, 04Z (12G) coating class on both surfaces; chemically treated for baked enamel finish.

C. Steel Plates and Bars: ASTM A36/A36M; minimum 1/4 inch thick.

D. Steel Tubes: AISI/SAE1008/1010/1015, ASTM A500/A500M, Grade B cold-formed structural tubing; minimum wall thickness of 0.083 inch.

E. Concealed Plywood; Manufacturer's standard: HPVA HP-1 hardwood plywood, made with adhesive containing no urea formaldehyde or DOC PS 1 softwood plywood.

F. Exposed Hardwood: Solid lumber selected for absence of visible defects; birch, couma, northern hard maple, white oak, species standard with manufacturer, or _____.

G. Plastic Laminate: NEMA LD 3, Type 1, Grade GP 50, nominal thickness 0.050 inch; colors and patterns as selected from manufacturer's standards.

H. Polypropylene Sheet: Molded high density plastic with minimum tensile strength of 3300 psi, integral color pigments, and textured, scuff-resistant surface finish.

I. Polyurethane Foam: Density not less than 1.8 lb/cu ft, fire retardant, non-hardening and non-oxidizing, with high resistance to alkalis, oils, moisture, and mildew.

J. Upholstery Fabric: ASTM D3597 heavy-duty plain woven nylon fabric, treated to resist cigarette ignition and staining; color and pattern as selected from manufacturer's standards.
   1. Weight: 16 oz. / linear yard.
   2. Color and Pattern: As selected by Architect from manufacturer's full range.

2.05 FINISHES

A. Ferrous Metals: Manufacturer's standard two-coat baked enamel finish, applied over conversion coating appropriate to base metal.
   1. Color and Gloss: As selected from manufacturer's standard options.

B. Hardwood: Manufacturer's standard clear low-gloss finish.

C. Hardwood Plywood: Manufacturer's standard clear low-gloss finish.

2.06 ACCESSORIES

A. Aisle Lights: Manufacturer's standard UL-approved surface-mounted LED lamp assemblies, with louvers to conceal lamp and direct light toward floor, mounted on end panel near bottom edge; low mount, wiring route concealed to floor connection.

B. Seat and Aisle Numbers: Manufacturer's standard seat numbers securely fastened to front edge of folding seats and row numbers securely fastened to aisle arm rests; anodized aluminum finish, with letters and numbers countersunk and filled with black paint; recessed mounting.

C. ADA Plates: Manufacturer's standard seat plates securely fastened to end aisle panels; anodized aluminum finish, with letters and numbers countersunk and filled with black paint.
   1. Each designated aisle seat shall be identified by a sign or marker as per ANSI A117.1.

D. Audio Response System: Locate control box below arm rest panel at locations indicated; route wiring through concealed casing to floor connection box.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine floors, risers, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine substrates for conditions detrimental to installation of fixed audience seating. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Comply with manufacturer's installation instructions and approved shop drawings.

B. Anchor support standards securely to substrate with at least two anchoring devices recommended by manufacturer.
   1. Place standards in each row laterally so the standards at the aisle will be in alignment.
   2. Vary width of seats and backs as required to optimize sightlines, and comply with the ADA Standards for row and aisle widths.
   3. In curved rows, install standards to form smooth radius, without breaks or angled chords
   4. Attach components to standards with sufficient flexibility to compensate for convergence of seats toward the center.

C. Install seating so moving components operate smoothly and quietly.

3.03 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Prepare test and inspection reports.

3.04 ADJUSTING

A. Adjust seat mechanisms to ensure that seats in each row are aligned when unoccupied.

B. Adjust self-rising seat mechanisms so seats in each row are aligned when in upright position.

C. Verify that all components and devices are operating properly.

D. Verify that seating returns to correct at-rest position.

E. Repair minor abrasions and imperfections in painted finishes with a coating that matches factory-applied finish; replace units that cannot be repaired to unblemished appearance.

F. Replace upholstery fabric damaged or soiled during installation.

END OF SECTION 126100

SECTION 126613
TELESCOPING BLEACHERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Telescopic Gym Seating includes multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.

B. Electric motor operators, controls, and internal wiring.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 042000 - Unit Masonry: Connection of bleacher system to masonry walls.

C. Division 26 Electrical sections for electrical wiring and connections for electrically operated telescoping stands.

D. Section 260583 - Wiring Connections: Connection of electric motors and controls.

E. Section 096466 - Wood Athletic Flooring: Flooring support and levelness.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

D. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2025.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

H. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.

I. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.

J. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2025.

L. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2014 (Amended 2015).

M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

N. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.

O. FSC-STD-01-001 - FSC Principles and Criteria for Forest Stewardship; Current Edition.

P. ICC 300 - Bleachers, Folding and Telescopic Seating and Grandstands; Current Edition.

Q. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

R. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

S. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2026.

T. PS 1 - Structural Plywood; 2022.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage handling and requirements.
   3. Installation methods.

C. Delegated-Design Submittal: For telescoping stands indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by a qualified professional engineer responsible for their preparation and licensed in the State in which the Project is located.

D. Shop Drawings: Complete layout, in both stacked and extended positions, with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
   1. Provide drawings customized to this project.
   2. Include Professional Engineer certification.
   3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.

E. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.

F. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
   1. Operation and maintenance data to be included in operations and maintenance manuals.
   2. Include precautions for cleaning materials and methods that could be detrimental to telescoping stand finishes and performance.

G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

H. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

I. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Product to be supplied shall have a current evaluation report issued by ICC Evaluation Services (ICC-ES) certifying that it meets all structural design requirements of the current ICC 300, including all specified load combinations.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

C. Installer Qualifications: Company specializing in installing products specified in this section, with not less than five years of documented experience and approved by manufacturer.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M, AWS D1.3/D1.3M, and no more than 12 months before the start of scheduled welding work.

E. Forest Certification: Fabricate products with wood components produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC-STD-01-001.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Standard: Provide telescoping stands to comply with NFPA 102.

H. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

I. Preinstallation Conference: Conduct conference at Project site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver telescoping stands in manufacturers original packaging, clearly labeled with manufacturer name and content.

B. Handle bleacher equipment in a manner to prevent damage.

C. Deliver the telescoping stands at a scheduled time for installation that will not interfere with other trades operating in the building when at all possible.

D. Store, in original packaging, under cover and elevated above grade.

1.07 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings and construction contiguous with telescoping stands by field measurements before fabrication. Verify locations of walls, columns, and other construction that will interface with operating telescoping stands.
   1. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.

1.08 WARRANTY

A. See Section 017700 - Closeout Procedures, for additional warranty requirements.

B. Manufacturer's standard warranty shall include, labor, materials and freight for replacement or repairs.

C. Warranty for structural component parts of understructure: ten years from date of Owner acceptance.

D. Warranty for decking, seating, electrical components, end closure components, and surface material finishes: five years from date of Owner acceptance.

E. Correct defective Work within a five year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

PART 2 PRODUCTS

2.01 GENERAL

A. Source Limitations: Obtain specified products from single source from single manufacturer.

B. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

2.02 MANUFACTURERS

A. Telescoping Bleachers:
   1. Interkal LLC: www.interkal.com/#sle.
   2. **(Basis of Design)** Irwin Telescopic Seating Company; Versatract with Infinity Seating: www.irwintelescopicseating.com/#sle.
   3. Hussey Seating Company: www.husseyseating.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.03 TELESCOPING BLEACHERS

A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
   1. Provide a design certified by a licensed Professional Engineer licensed in the State in which the Project is located.
   2. Design to comply with applicable requirements of NFPA 102 and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.
   3. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
   4. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
   5. Configurations: As indicated on drawings.
   6. Wheelchair Spaces: Allow portions of first row, as indicated, to be manually retracted without affecting other rows; provide removable railings at row two behind wheelchair spaces in compliance with ADA Standards.
   7. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, roof drain leaders, and other obstructions; take field measurements prior to fabrication.
   8. Operation: Motor operated.

B. Design Loads: Design to withstand the following loading conditions:
   1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
   2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
   3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
   4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.

C. Dimensions:
   1. See drawings for overall dimensions.
   2. Bank Length: As indicated on drawings.
   3. Aisle Width: As indicated on drawings.
   4. Number of Rows: As indicated on drawings.
   5. Rise Per Row: 10 inches.
   6. Row Depth: 22 inches.
   7. Seat Height Above Tread: 6 inches.
   8. Open Depth: As indicated on drawings.
   9. Closed Depth: As indicated on drawings.
   10. Unit Height: As indicated on drawings.

D. Structural Supports: Steel; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
   1. Design each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.

2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
3. Bolting: Use lock-washers or locknuts.
4. Wheels: Minimum 5 inch diameter by 1-3/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
5. Finish: Manufacturer's standard enamel or powder coating.
6. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
7. Unlocking: Provide single manual release mechanism to allow retraction of all carriages, concealed behind skirt board of first row.
8. Unlocking: Automatically unlock all rows before engaging retraction mechanism.

E. Motor Operation: Manufacturer's standard drive mechanism, using motor adequately sized for the purpose.
1. Provide UL listed electrical components and wiring.
2. Controls: Start, Stop, Forward, and Reverse in a single control unit.
3. Control Station: Removable plug-in low-voltage pendant station, with first-row plug-in location for each motor.
4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
5. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
6. Electrical Characteristics: 120V, single phase, 60 Hz.
7. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches wide is acceptable.

2.04 SEAT AND PLATFORM COMPONENTS

A. Seat/Fascia Assembly: Continuous, molded UV-stabilized high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout, color as selected from manufacturer's standard selection; approximately 18 inch long sections independently removable with tongue-and-groove or rabbeted interlock at end joints.
1. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.
2. Fire Retardance: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929; smoke developed index of 450 or less, when tested in accordance with ASTM E84, or 75 or less when tested in thickness intended for use in accordance with ASTM D2843; and burning extent of 1 inch or less when tested in thickness intended for use in accordance with ASTM D635.
3. Provide end caps of same material and finish on each exposed end.
4. Supports: Internal steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
5. Seat/Fascia Color: As selected by Architect from manufacturer's standard range.

B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints tongue-and-grooved.
1. Plywood: PS 1, 5-ply southern pine or polyethylene-overlaid douglas fir or southern pine, Grade A-C.
2. Plywood Thickness: 5/8 inch, minimum.
3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
4. Provide end caps of same material and finish on each exposed end.
5. Finish: High gloss clear urethane, both sides, unless polyethylene finished.
6. Nosings: Formed steel, minimum, G60/Z275 hot-dipped galvanized.

7. At aisles provide permanently attached intermediate steps of same construction and finish.
8. At bottom of aisles provide step in front of first riser, hinged to first platform to fold for storage.

2.05 HANDRAILS AND RAILINGS

A. Provide the following railings:
   1. Aisle Handrails: Single post rotating railing segment mounted in center of aisle at every other row beginning at row 2.
   2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
   3. Height: 42 inches above adjacent platform or tread.
   4. All guardrails designed with four inch sphere passage requirements.

B. Design handrails and railings to withstand the following loads:
   1. Concentrated Load on Handrails: 200 pounds in any direction.
   2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
   3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
   4. Live Load on Guardrails:
      a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
      b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.

C. Railing Construction: Round steel pipe or tube, with formed elbows at corners and caps at ends of straight runs.
   1. Steel: 1-1/2 inch minimum outside diameter, with 11 gauge, 0.12 inch minimum wall thickness; textured powder coat epoxy finish.
   2. Guardrail Infill: 1 inch square tubing complying with all national building codes. Flexible uprights that can be expanded beyond the 4 inch sphere requirement are not acceptable.
   3. Powder Coat Finish Color: Black.

2.06 MATERIALS

A. Wood:
   1. Lumber: NIST PS 20, kiln dried, southern pine complying with SPIB's "Standard Grading Rules for Southern Pine Lumber" for B&B Finish (B and better) grade-of-finish requirements.
   2. Plywood: NIST PS 1, APA-grade trademarked, A-C grade.

B. Steel:
   1. Structural-Steel Shapes, Plates, and Bars: ASTM A36/A36M.
   2. Galvanized-Steel Sheet: ASTM A653/A653M, Grade 40 (276 MPa) G60 coating designation.
   3. Uncoated Steel Strip; Non-Structural Components: ASTM A1011/A1011M, Commercial Quality, Type B, Hot-Rolled Strip.
   4. Uncoated Steel Strip; Structural Components: ASTM A1011/A1011M Grade 33 (228 MPa), Grade 36 (249 MPa), Grade 40 (276 MPa), Grade 45 (311 MPa), or Grade 50 (345 MPa), Structural Quality, Hot-Rolled.
   5. Galvanized Steel Strip: ASTM A653/A653M Grade 40 (276 MPa) or Grade 64 (441 MPa), structural quality, coating designation G60.
   6. Tubing: ASTM A500/A500M, cold formed; Grade B, or ASTM A513/A513M, 46 ksi min yield.

C. Polyethylene Plastic: High-density polyethylene; injection molded, color-pigmented, textured, impact-resistant, dimensionally stable structural formulation.

2.07 ACCESSORIES

A. Fillers and Closures:

1. Ends of Retracted Units: Plywood panels, finished to match platforms.
2. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
3. Sides of Extended Units: Vinyl curtains.
4. Vinyl Curtains: 18 ounce vinyl with grommets; color as selected from manufacturer's standard palette.

B. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations.

C. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

2.08 FABRICATION

A. Fabricate understructure from structural-steel members in size, spacing, and form required to support design loads specified in referenced safety standard.

B. Weld understructure to comply with applicable AWS standards.

C. Round corners and edges of components and exposed fasteners to reduce snagging and pinching hazards.

D. Form exposed sheet metal with flat, flush surfaces, level and true in line, and without cracking and grain separation.

E. Seating Supports: Fabricate supports to withstand, without damage to components, the forces imposed by use of stands without failure or other conditions that might impair the usefulness of seating units.
1. Cantilever bench seat supports to produce toe space uninterrupted by vertical bracing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas where telescoping stands are to be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that field measurements are consistent with those on the shop drawings.

C. Verify that electrical rough-ins have been installed and are accessible.

D. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

F. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in order to comply with referenced safety standards and in accordance with manufacturer's written instructions.

B. Do not field cut or alter seats, fascia, or structural members without approval.

C. Provide manufacturer's field representative to inspect completed installation.

3.04 ADJUSTING

A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.05 CLEANING

A. Clean exposed and semi-exposed assembly surfaces.

B. Touch up finishes on damaged or soiled areas.

3.06 MAINTENANCE SERVICE

A. Service Capability: Show proof of full-time service capability by factory certified technicians directly employed by the installer.
   1. A four to eight-hour maximum on-site repair response is required during normal working hours, 8 a.m. to 5 p.m. weekdays (excluding holidays).
   2. All Full Time Service Personnel shall be Factory Authorized and Trained.
   3. Provide proof of Service Capability and a list of service parts regularly maintained in inventory.

3.07 CLOSEOUT ACTIVITIES

A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to, and train, Owner's operating personnel in proper operation and maintenance of equipment.
   1. Location: On site using installed equipment.
   2. Time: As agreed between Owner and Contractor.

3.08 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION 126613

SECTION 142100
ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electric traction elevator systems.

B. Products Supplied but Not Installed Under this Section:
   1. Hoist Beam
   2. Pit Ladder
   3. Inserts mounted in block walls for rail attachments

C. Work Supplied Under Other Sections:
   1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
   2. Main line disconnects for each elevator.
      a. One fused three phase permanent power in building electrical distribution room
   3. Hoistway ventilation shall be in accordance with local and national building code requirements.
   4. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.
   5. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
   6. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
   7. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.

D. Maintenance contract.

1.02 RELATED REQUIREMENTS

A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 033000 - CAST-IN-PLACE CONCRETE.

C. Section 042000 - UNIT MASONRY.

D. Section 055000 - Metal Fabrications.

E. Section 096500 - Resilient Flooring.

F. Section 211300 - Fire-Suppression Sprinkler Systems.

G. Section 220513 - Common Motor Requirements for Plumbing Equipment.

H. Section 260533.13 - Conduit for Electrical Systems: Electrical conduit requirements.

I. Section 260583 - Wiring Connections: Wiring connection requirements.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. 29 CFR 1926.502 - Fall protection systems criteria and practices; Current Edition.

C. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

D. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2025).

E. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

F. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2025.

G. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, Dumbwaiters, and Material Lifts; 2023.

H. ASME QEI-1 - Standard for the Qualification of Elevator Inspectors; 2024.

I. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

J. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

L. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

M. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2026.

N. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

O. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

P. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

Q. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

R. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

S. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

T. ITS (DIR) - Directory of Listed Products; Current Edition.

U. NEMA MG 00001 - Motors and Generators; 2024.

V. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

W. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

X. PS 1 - Structural Plywood; 2022.

Y. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other installers to provide necessary conduits for proper installation of wiring, including but not limited to the following:
      a. Elevator equipment devices remote from elevator machine room or hoistway.
      b. Elevator pit for lighting, sump pump, and pit ladder.
      c. Automatic transfer switch from controller cabinet.
      d. Fire alarm panel from controller cabinet.

2. Coordinate work with other installers for equipment provisions necessary for proper elevator operation, including but not limited to the following:
   a. Automatic transfer switches with auxiliary contacts for emergency power transfer status indication.
   b. Shunt trip devices for automatic disconnection of elevator power prior to fire suppression system activation; include provisions for shunt trip power monitoring.
   c. Overcurrent protection devices selected to achieve required selective coordination.

B. Preinstallation Meeting: Convene meeting at least one week prior to start of this work.
   1. Review schedule of installation, proper procedures and conditions, and coordination with related work.

C. Construction Use of Elevator: Not permitted.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit data on following items:
   1. Signal and operating fixtures, operating panels, and indicators.
   2. Car design, dimensions, layout, and components.
   3. Car and hoistway door and frame details.
   4. Electrical characteristics and connection requirements.

C. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
   1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
   2. Hoistway Components: Size and location of car machine beams, guide rails, buffers, ropes, and other components.
   3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
   4. Individual weight of principal components; load reaction at points of support.
   5. Loads on hoisting beams.
   6. Clearances and over-travel of car and counterweight.
   7. Locations in hoistway and machine room of traveling cables and connections for car lighting and telephone.
   8. Location and sizes of hoistway and car doors and frames.
   9. Electrical characteristics and connection requirements
   10. Electrical characteristics and connection requirements.
   11. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.

D. Samples: Submit samples illustrating car floor material, car interior finishes, car and hoistway door and frame finishes, and handrail material and finish in the form of cut sheets or finish color selection brochures.

E. Designer's qualification statement.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Welders’ Qualification Statement: Welders’ certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

I. Initial maintenance contract.

J. Maintenance Contract: Submit proposal to Owner for standard one year continuing maintenance contract agreement in accordance with ASME A17.1 and requirements as indicated, starting on date initial maintenance contract is scheduled to expire.
   1. Indicate in proposal the services, obligations, conditions, and terms for agreement period and for renewal options.

K. Operation and Maintenance Data:
   1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   2. Operation and maintenance manual.
   3. Schematic drawings of equipment and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.

L. Specimen warranty.

M. Executed warranty.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design guide rails under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

F. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

G. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction as suitable for the purpose indicated in construction documents.

H. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions, erection drawings, and shop drawings.

1.07 WARRANTY

A. See Section 017700 - Closeout Prodecures, for additional warranty requirements.

B. Manufacturer Warranty: Provide 1-year manufacturer warranty for elevator operating equipment and devices. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The manufacturer and model number(s) or series listed below are Basis-of-Design.
   1. Subject to compliance with requirements of product identified as basis-of-design, other manufacturers shall be considered for bidding as an equivalent when the bidder provides a written request for equivalency to the Architect.
   2. Follow all instructions as indicated in Section 012519 - Equivalent Procedures.

B. Electric Traction Elevators:
   1. **(Basis of Design)** KONE; KONE MonoSpace 300 DX: www.kone.us/#sle.

2. Otis Elevator Company: www.otis.com/#sle.
3. Schindler Elevator Corporation: www.us.schindler.com/#sle.

C. Substitutions: See Section 016000 - Product Requirements.

D. Source Limitations: Provide elevator and associated equipment and components produced by a single manufacturer and obtained from a single supplier.

2.02 ELECTRIC TRACTION ELEVATORS

A. Electric Traction Passenger Elevator:
1. Electric Traction Elevator Equipment:
a. Provide AC gearless, machine-room-less elevator system subject to compliance with the design and performance requiremetns of this specification.
2. Drive System:
a. Variable voltage, variable frequencey, alternating current (AC) drive system to develop high starting torque with low starting current.
3. Operation Control Type:
a. Selective Collective Automatic Operation Control.
4. Service Control Type:
a. Standard service control only.
5. Interior Car Height: 90 inch.
6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
7. Rated Net Capacity: 3500 pounds.
8. Rated Speed: 150 feet per minute.
9. Hoistway Size: As indicated on drawings.
10. Interior Car Platform Size: 77-5/8 inch wide by 66-5/8 inch deep.
11. Elevator Pit Depth: 60 inch.
12. Overhead Clearance at Top Floor: 140 inch.
13. Travel Distance: As indicated on drawings.
14. Number of Stops: 3.
15. Number of Openings: 3 Front; 0 Rear.
16. Traction Machine Location: As indicated on drawings.

2.03 COMPONENTS

A. Elevator Equipment:
1. Motors, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70 requirements.
a. See Section 260583 for additional information.
2. Guide Rails, Cables, Counterweights, Sheaves, Buffers, Attachment Brackets, and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
3. Controller: Provide microcomputer-based control system to perform all functions.
a. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
b. Controller shall be separated into two distinct halves, Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
c. Provide a serial cardrack and main CPU board containing a non- erasable EPROM and operating system firmware.
d. Variable field parameters and adjustments shall be contained in a non- volatile memory module.
4. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.

5. Controller Location: Locate controller{s} in the front wall integrated with the top landing entrance frame, machine side of the elevator. One non-fused three phase permanent power in hoist way at top landing. A separate control space should not be required.

B. Hoistway Components:
   1. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway
   2. Hoisting: Elevator must utilize traditional steel hoist cables that do not require a monitoring device.
   3. Governor: Friction type over-speed governor rated for the duty of the elevator specified.
   4. Buffers, Car and Counterweight: Polyurethane buffer.
   5. Hoistway Operating Devices:
      a. Emergency stop switch in the pit
      b. Terminal stopping switches.
      c. Emergency stop switch on the machine
   6. Positioning System: System consisting of magnets and proximity switches.
   7. Guide Rails and Attachments: Steel rails with brackets and fasteners.

C. Lubrication Equipment:
   1. Provide grease fittings for periodic lubrication of bearings.
   2. Grease Cups: Automatic feed type.
   3. Lubrication Points: Visible and easily accessible.

D. Car Components:
   1. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.
   2. Car Safeties: Device will be provided and mounted under the car platform, securely bolted to the Car Frame. The safety will be actuated by a centrifugal governor mounted at the top of the hoistway. The Safety is designed to operate in case the car attains excessive descending speed.
   3. Platform: Platform shall be all steel construction.
   4. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.
   5. Emergency Car Signals
   6. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
   7. Emergency Car Lighting: Provide emergency power unit employing a 12- volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
   8. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
   9. Ventilation: Fan

E. Signal Devices and Fixtures
   1. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be Brushed Stainless Steel
   2. Main Flush mounted car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have Amber Dot Matrix illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be Amber Dot

Matrix. All texts, when illuminated, shall be Amber Dot Matrix. The car operating panel shall have a Brushed Stainless Steel finish.

3. Additional features of car operating panel shall include:
   a. Car Position Indicator within operating panel Brushed Stainless Steel
   b. Elevator Data Plate marked with elevator capacity and car number on car top.
   c. Help buttons with raised markings.
   d. In car stop switch per local code.
   e. Call Cancel Button.
4. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a Brushed Stainless Steel finish.
   a. Hall fixtures shall feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available from that landing. Buttons shall be in a vertically mounted fixture.
5. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound. The chime will sound once for up and twice for down. The car riding lantern face plate shall have a Brushed Stainless Steel finish.
6. Combination Hall Position Indicator and Hall Lantern located at Lobby. Hall lanterns and hall indicators shall feature Amber illumination, all numbers will be Dot Matrix display.

F. Electrical Equipment:
   1. Motors: NEMA MG 1.
   2. Boxes, Conduit, Wiring, and Devices: Comply with NFPA 70 requirements.
      a. See Sections 260533.13 and 260583 for additional information.
   3. Sump Pump in Pit: See Section 220513 for additional information.
   4. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
   5. Include wiring and connections to elevator devices remote from hoistway. Provide additional components and wiring to suit machine room layout. See Section 260583.

2.04 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

B. Accessibility Requirements: Comply with ADA Standards.

C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.

D. Perform welding of steel in accordance with AWS D1.1/D1.1M.

E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and complying with requirements of authorities having jurisdiction (AHJ).

F. Perform electrical work in accordance with NFPA 70.

2.05 OPERATION CONTROLS

A. Elevator Controls: Provide landing operating panels and landing indicator panels.
   1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
   2. Landing Indicator Panels: Illuminating.
   3. Comply with ADA Standards for elevator controls.

B. Interconnect elevator control system with building security, fire alarm, card access, smoke alarm, and building management control systems.

C. Door Operation Controls:

1. Program door control to open doors automatically when car arrives at floor landing.
2. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.
3. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.
4. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.
5. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.
6. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.
7. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
8. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.

D. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).
   1. Designated Landing: At first (ground) floor.

2.06 OPERATION CONTROL TYPE

A. Selective Collective Automatic Operation Control: Applies to car in single elevator shaft.
   1. Refer to description provided in ASME A17.1.
   2. Automatic operation by means of one button in the car for each landing served and by "UP" and "DOWN" buttons at the landings.
   3. Stops are registered by momentary actuation of landing car buttons without consideration of the number of buttons actuated or the sequence buttons actuated, but the stops are made in the order that landings are reached in each direction of travel.
   4. All "UP" landing calls are made when car is traveling in the up direction.
   5. All "DOWN" landing calls are made when car is traveling in the down direction.
   6. Uppermost and lowermost calls are answered as soon as they are reached without consideration of the car travel direction.

2.07 MATERIALS

A. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.

B. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.

C. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

D. Stainless Steel Sheet: ASTM A666/A666M, Type 304; No. 4 Brushed finish unless otherwise indicated.

E. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

F. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.

G. Aluminum Sheet: ASTM B209/B209M, 3105 alloy, O temper.

H. Plywood: PS 1, Structural I, Grade C-D or better, sanded.

I. Tempered Glass: 3/8 inch minimum thickness, fully tempered in compliance with ASME A17.1, 16 CFR 1201, ANSI Z97.1, and ASTM C1048 tempered glass requirements.

J. Resilient Flooring: Vinyl tile flooring and Resilient base, see Section 096500.

2.08 CAR AND HOISTWAY ENTRANCES

A. Elevator:
   1. Car and Hoistway Entrances, Each Elevator Floor Lobby:
      a. Hoistway Fire Rating: 1 Hour.
      b. Elevator Door Fire Rating: 1 Hour.
      c. Framed Opening Finish and Material: Brushed stainless steel.
      d. Car Door Material: Brushed Stainless steel, with rigid sandwich panel construction.
      e. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.
      f. Door Type: Single leaf.
      g. Door Operation: Side opening, two speed.
      h. Door Width: 42 inch.
      i. Door Height: 84 inch.
      j. Sills: Extruded aluminum.

2.09 CAR EQUIPMENT AND MATERIALS

A. Elevator Car:
   1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open" button, "Door Close" button, and alarm button.
      a. Panel Material: Integral with front return; one per car.
      b. Car Floor Position Indicator: Above door with illuminating position indicators.
      c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
      d. Provide matching service cabinet integral with front return panel, with hinged door and keyed lock in each car.
   2. Flooring: By others.
   3. Wall Base: By others, 4 inch high.
   4. Front Return Panel: Match material of car door.
   5. Door Wall: 304 brushed stainless steel (4SS).
   6. Side Walls: 304 brushed stainless steel (4SS).
   7. Rear Wall: 441 brushed stainless steel (4SS).
   8. Hand Rail: Stainless steel, at three side walls. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
      a. Flat Bar Stock, Solid: 1/4 inch thick by 3 inch high.
      b. Stainless Steel Finish: No. 4 Brushed.
   9. Ceiling:
      a. Lay-in Panel: Aluminum sheet.
      b. Lighting: Round LED spotlights.

B. Car Accessories:

1. Certificate Frame: Stainless steel frame glazed with clear tempered glass, and attached with tamper-proof screws.

2.10 FINISHES

A. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that hoistway and pit are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of correct characteristics.

3.02 PREPARATION

A. Arrange for temporary electrical power for installation work and testing of elevator components. See Section 015000 - Temporary Facilities and Controls for additional requirements.

B. Maintain elevator pit excavation free of water.

3.03 INSTALLATION

A. Coordinate this work with installation of hoistway wall construction.

B. Install system components, and connect equipment to building utilities.

C. Provide conduit, electrical boxes, wiring, and accessories; see Sections 260533.13 and 260583.

D. Mount machines and motors on vibration and acoustic isolators.
   1. Place on structural supports and bearing plates.
   2. Securely fasten to building supports.
   3. Prevent lateral displacement.

E. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.

F. Install guide rails to allow for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.

H. Bolt brackets to inserts placed in concrete form work.

I. Field Welds: Chip and clean away oxidation and residue with wire brush; spot prime with two coats.

J. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.

K. Structural Metal Surfaces: Clean surfaces of rust, oil, or grease; wipe clean with solvent; prime with two coats.

L. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

A. See Section 014500 - Quality Requirements for additional requirements.

B. Testing and inspection performed at discretion of regulatory agencies certified in accordance with ASME QEI 1.
   1. Schedule tests with agencies and notify Owner and Architect.
   2. Obtain permits as required to perform tests.
   3. Document regulatory agency tests and inspections in accordance with requirements.
   4. Perform tests required by regulatory agencies.
   5. Furnish test and approval certificates issued by authorities having jurisdiction (AHJ).

C. Perform testing and inspection in accordance with requirements.
   1. Inspectors shall be certified in accordance with ASME QEI-1.
   2. Perform tests in accordance with ASME A17.2.
   3. Provide at least two weeks written notice of date and time of tests and inspections.
   4. Supply instruments and execute specific tests.

D. Operational Tests:
   1. Perform operational tests in the presence of Owner and Architect.
   2. Test single elevator system by transporting at least three persons up from main floor to top floor landings during a five minute period.
   3. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
      a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.

3.06 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.

B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.07 CLEANING

A. See Section 017700 - Closeout Procedures, for additional requirements.

B. Remove protective coverings from finished surfaces.

C. Clean surfaces and components in accordance with manufacturers written instructions.

3.08 CLOSEOUT ACTIVITIES

A. See Section 017700 - Closeout Procedures, for additional submittals.

B. See Section 017900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

D. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Conduct walking tour of project.
   3. Briefly describe function, operation, cleaning, and maintenance of each component.

E. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Manufacturer's training personnel.
   4. Location: At project site, unless otherwise indicated.

3.09 PROTECTION

A. Do not permit construction traffic within car after cleaning.

B. Protect installed products until Date of Substantial Completion.

C. Touch up, repair, or replace damaged products and materials before Date of Substantial Completion.

3.10 MAINTENANCE

A. See Section 017700 - Closeout Procedures, for additional requirements.

B. Provide Initial Maintenance Contract of elevator system and components in accordance with ASME A17.1 and requirements as indicated for twelve months from Date of Substantial Completion.

C. Submit proposal for continuation of Maintenance Contract in accordance with ASME A17.1 and requirements as indicated for installed elevator equipment.

D. Include systematic examination, adjustment, and lubrication of elevator equipment.

E. Maintain and repair or replace parts whenever required using parts produced by original equipment manufacturer.

F. Perform work without removing cars from use during peak traffic periods.

G. Provide emergency call back service during regular working hours throughout period of this maintenance contract.

END OF SECTION 142100