



**ADDENDUM NO. 3**

**FOR THE**

**NEWBURGH RECREATION CENTER PROJECT**

**TOWN OF NEWBURGH  
ORANGE COUNTY, NEW YORK**

**CLIENT:**

**Town of Newburgh  
1496 Route 300  
Newburgh, NY 12550**

**PREPARED BY:**

**MHE Engineering, D.P.C.  
111 Wheatfield Drive, Suite 1  
Milford, PA 18337**

**NOTE: ANY UNAUTHORIZED ALTERATION OR  
ADDITION TO THIS DOCUMENT IS A  
VIOLATION OF SECTION 7209(2) OF THE  
NEW YORK STATE EDUCATION LAW.**

**DATE: March 21, 2024  
JOB#: 21-135**

**THIS ADDENDUM CONSISTS OF (11) PAGES, (6) ATTACHMENTS & (13) PLAN SHEETS/DETAILS**

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**Prospective Bidders are advised of the following revisions, additions and/or deletions to the contract documents.**

**Advertisement for Bids**

**THE BID OPENING DATE WILL BE CHANGED FROM MARCH 28, 2024 AT 2:00PM TO APRIL 4, 2024 AT 12:30PM.**

**REQUESTS FOR INFORMATION:**

1. Spec section 084113 aluminum framed entrances & storefronts, spec section 085113 aluminum windows & spec section 088000 glazing all mention windborne debris impact resistance as a performance requirement. However, the glass types listed in part 3.8 of spec section 088000, and indicated on the drawings, are not impact resistant glass types. Furthermore, based on the location of the project it does not appear that windborne debris impact resistance should be required. Please confirm that it is not required or revise the glass types in part 3.8 of spec section 088000 to include impact resistant glass types.

**RESPONSE:** The following Spec Sections 084113 and 085113 have been revised and are attached. Spec Section 088000 will be revised and included in Addendum 4.

2. Please confirm that a non thermal interior storefront product such as Kawneers Trifab 451 framing system is acceptable for interior window type 4.

**RESPONSE:** The interior windows are 2-1/2" x 4-1/2" aluminum windows based upon an EFCO series 402. Alternates are not being pre-qualified, but can be submitted during construction for or-equal approval.

3. E-702 depicts a diagram for work for a submersible pump lift station and cistern pump station. Please provide site Electrical plan(s).

**RESPONSE:** See the attached Plan Sheet C-106.

4. Table of Contents Division 9- Finishes should be updated with Cermaic Tile per "093013 SF - Ceramic Tiling" per issued spec section.

**RESPONSE:** A revised Table of Contents with Specification 093013 Ceramic Tiling is attached.

5. Drawings are showing curtain wall framing 8" deep; there is no curtain wall spec found, only storefront. Please advise which is to be utilized.

**RESPONSE:** Drawings are showing the framing of the correct depth, the intent is to have 2"x7 1/2" framing for storefront. For all items concerning this matter please see Storefront spec.

6. Spec 074213.13 has ATAS Opaline 8" OPF Panels as the basis of design. This material is not called out on the drawings - please advise if this has been removed from scope.

**RESPONSE:** Specification Section 074213.13 has been deleted and all metal wall panels and fascia shall be per section 133419, 2.5 of the Metal Building Systems specification.

7. Reference 15.1, B. What are the protocols and who is to pay for security?

**RESPONSE:** There are no security specified or required as part of this project. This section of the PLA reference the ability of the owner or the implement security requirements as needed. All bidders must also recognize that the project will be constructed at an active town park where both children and adults will have access throughout the construction period to the park. Bidders should understand this may affect coordination throughout the construction schedule as to deliveries and site logistics. It is not believed that this coordination should prolong or slow the construction of the project however it should be expected that planning and coordination in conjunction with the Clerk of the Works and the builder will be continuous. Lastly, the General Contractor is required to ensure that the construction site is safe and secure even when construction is not happening, their bid should include all necessary signage and fencing to ensure site safety.

8. At the pre-bid meeting MHE referenced and existing hydrant on site that was available for the contractor to use during construction. Sheet C-001, note #23 states that the contractor will be responsible to furnish all water necessary to flush, disinfect and pressure test the water main per AWWA standards. If there is a meter/backflow preventer installed on the hydrant, can water from the hydrant be used to fill, flush, and disinfect and pressure test the water main also?

**RESPONSE:** The contractor can use Town water via the onsite hydrant for filling, disinfection, pressure testing and flushing. A backflow preventer shall be furnished by the contractor and utilized on the hydrant during use of the hydrant.

9. Do we need any special permits for tapping the existing water main from the state or the town? This Water main is close to the highway boundary, will any other permits or restrictions apply?

**RESPONSE:** The contractor shall be responsible for obtaining and complying with the NYSDOT permit for the water connection. No Town permits are required.

10. Specification section 055000- Metal Fabrications; Please confirm the below items per 1.1 Summary A. Section Includes: item 5. Metal floor plate and supports, 6. Elevator pit sump covers, 7. Structural - steel door frames, 9. metal bollards & 10.) Pipe downspout guards are not applicable to the project. None can be located on the.

**RESPONSE:** Please refer to Specification 055000-Metal Fabrications provided in Addendum 1. See Detail 12 on Sheet C-507 for metal bollard locations.

11. Storage room 130 appears to have some millwork scope. Please provide additional details/sections to include type of millwork, countertops etc.

**RESPONSE:** Please see revised Plan Sheet A-602.

12. Drawing FP-101 depicts diesel lines coming in from South End of the building to Sprinkler Rm 116. Assuming these are fill port correct? There appears to be 61- Gal Tank within the Sprinkler Room. Please provide specification for the fuel tank.

**RESPONSE:** Specifications for fuel tank are as follows:

- a. Nominal Tank Volume: 61 gallons (usable volume 55 gallons) ; Sized per NFPA 20 & UL 142
- b. Tank Type : Double Wall
- c. Tank to include leak detector & 2" emergency vent.
- d. 2" NPT Lockable Fuel Cap
- e. 2" NPT Screened Tank Vent
- f. Fuel Gauge; 1.5" NPT
- g. Fuel Hoses for supply/return
- h. Notes:
  - i. Tanks are to be constructed and labeled in accordance with UL-142.
  - ii. Fittings per NFPA 30 and UL-142.
  - iii. Tank to be pitched toward drain @ ¼" per foot with outlet on the same elevation as engine fuel pump.

13. Please provide equipment matrix/schedule for Fire Suppression System.

**RESPONSE:** Equipment specifications are found within DIV-21 specifications.

14. Addendum#1, Drawing E-604 detail 4. Please advise as to who is responsible for providing the precast manhole vault for the Transformer [GC or Owner]?

**RESPONSE:** The General Contractor is responsible.

15. The metal building specification, 133419, 2.5 calls out 16" hidden fastener system. The formed metal wall panel specification, 074213.13 calls out "Flush-Profile, Concealed-Fastener Metal Wall Panels". The drawings call out: "N6 Vertical Corrugated Metal Siding - See Specs". Which specification is correct?

**RESPONSE:** All wall panels and fascia shall be as per the 133419, 2.5 Metal Building Systems Specification.

16. According to Woodard, the specified septic tank manufacture/supplier due to the weight of the tank, we may have to create an access road from the park entrance through the proposed absorption field #1, or will this not be an option because of over compaction of the sub soils in that area?

**RESPONSE:** See Septic Note 17 on Sheet C-002. The contractor shall sequence accordingly.

17. Windows elevations are showing glass with muntin/grid. Please confirm this is to be glass with applied muntin. If the curtain wall system is to be used for windows configuration, as per details in dwgs, it will not allow use of true muntin. Please clarify.

**RESPONSE:** Window muntins will be simulated divided lights with aluminum on the interior and exterior and with a space between the glass.

18. The updated civil drawings show a 10'x 10' transformer pad on the north side of the proposed building that states, "SEE STRUCTURAL PLANS." The structural plans show equipment pads at 14" thick, however, per addendum #1 electrical drawing E-604 - Detail #4, the transformer sits on top of a 6'x 6' precast concrete vault and has 12" wide crushed stone band around it for oil containment. Is the 10'x 10' pad supposed to be 2' wide concrete work pad around the perimeter of the vault, and if so, is the crushed stone oil containment still required? If the crushed stone oil containment is required, where is it supposed to go in relationship to the vault and the concrete pad?

**RESPONSE:** See revised Sheet C-106 and previously revised Sheet E-604.

19. Bid Form /3.02 Lump Sum Bid. Item B Contingency Items. Is the intent for items C-1 through C-5 to be included in the overall LS price in A? Or, will these Contingency items be treated below the line as essentially alternates with all markups to be included in unit pricing?

**RESPONSE:** The contingency items are to be included in 3.04 Total Base Bid. 3.04 Total Base Bid is a Lump Sum value to include the total of all contingency items from the last line of the contingency bid table.

20. Wall types C&D are both Pre Engineered Building end walls. Is the intent to infill frame between the girts with 25ga. studs 16" oc.

**RESPONSE:** The Pre-Engineering Metal Building Manufacturer will provide structural engineered shop drawings on the metal building. Since we do not know where the wall girts will start and stop, the intent is for those walls to be framed using wall types C and D in those walls, where the Pre-Engineered Metal Building Manufacturer does not need girts.

21. In the specification for the fire pump 213115 Pages 2 sec. 2.2 A. and 3 Sec 2.2 E it provides two different requirements for the fire pump: Can you clarify which one?

**RESPONSE:** The pump requirements stipulated within 213116.2.2.A for Pentaire #4-481-11A, 750 GPM at 50 PSI Boost are the correct values.

22. Alternate #2: It is called out on S105 for the overbuild of a gable - says to see architectural drawings, but the architectural drawings say to see structural drawings (1/A901). Please advise.

**RESPONSE:** Framing overbuild should be per the PEMB manufacturer. What is shown on the Structural and Architectural Sheets is the intent and general size of the overbuild.

23. There is reference to (2) types of ceiling tile in spec 095123: Armstrong #1757 and #972, however the finish schedule, sheet A702 doesn't state which area gets what. Please advise on what area gets what type of ceiling tile.

**RESPONSE:** Ceiling Tile #972 shall be installed in Room #106, #107, #108, #110 and #129.

24. Plan A-702 Floor transition details #5 and #15 show sufficient room for expansion and contraction between the wood athletic flooring and the adjacent athletic flooring. However, please provide a specification for the expansion plate required.

**RESPONSE:** Expansion plate floor cover shall be aluminum similar to series 806 by Inpro Architectural Products and shall have a mill finish.

25. What is the Building Use/Importance/Risk Category as: II (standard Occupancy Structure) or III - Hazardous / Special Occupancy? There may be more than 300 people in this structure.

**RESPONSE:** Please refer to Sheet S-001 under Structural Provisions, Risk Category is III due to total building occupancy of 694 persons.

26. Specification 2.2/B/4. is asking for "The lower 48" of all exterior walls shall be additional reinforcement to resist lateral snow loads." VP does not provide design for this as the building code does not address this. VP will not do any design of lateral snow load on the walls. Please specify what you want so VP can provide it.

**RESPONSE:** It is the design intent for the lower 48" of metal building exterior wall to be a delegated design. As a minimum wall girts shall be placed no greater than 16" on center vertically for the lower 48".

27. The specification 2.2/L calls for FM 1A-120 Fire/Windstorm Classification usually a coastal requirement. Do you really want FM 1-120 wind uplift on this project? This will require purlin spaces of 2'-6" in the body of the roof, 1'-3" in the Edge Zones of the roof and 0'-10" in the Corner Zones of the roof. Sag-N-Bag roof insulation on SkyNet will be negatively affected.

**RESPONSE:** This project is in a New York State Special High Wind Region, please bid as per design criteria on the bid plans and specs.

28. What is the Dead Load of the mezzanine floor joist framing and ¾" Structo-crete sub floor panel?

**RESPONSE:** The Dead Load of the mezzanine floor framing is 10 psf.

29. What is the Mezzanine Collateral Load? The main building is with 15 PSF. Do you want to use this on the Mezzanine?

**RESPONSE:** The Mezzanine Collateral Load shall be 5 psf.

- 30.** To elaborate on Question 25 from Addendum 2 - Section 4.2.C indicates that Schedule C list specialty work that would be exempt from the PLA. For example, there are vendors listed in the specifications that are not apart of any union because the work they perform is highly specialized. We ask that the sports flooring, gym equipment, & PEMB erection be exempt from the PLA as these are highly specialty trades. Please advise.

**RESPONSE:** No additional work scope will be broken out. See response to question #25 in Addendum 2.

- 31.** E-400 shows wiring from 'MPL1' running through exterior wall near column line 3 w/ note "To effluent pump lift station control panel. Coordinate w/ C-sheets". C-106 shows the same wiring exiting the building near column line 13. Please advise where this wire run goes from Col 3 to Col 13 (e.g. in-wall, underslab, underground). Please also advise control panel mounting location on exterior wall.

**RESPONSE:** Wiring from MPL1 is to be ran interior to the building at ceiling level, and then down to control panel location at wall. Control panel is to be located where DB-03 is running from the building on the exterior of the building.

- 32.** The specification 2.2/M/2. Calls for R=13ci (2" continuous insulation) + R27 (8" kraft-faced fiberglass insulation) 8" is R25 and plans call for R19 with R11cover SkyNet webbing. Please clarify. The facing seems inappropriate for a gym - GymGuard facing?

**RESPONSE:** Section 133419, 2.7 specifies that the insulation shall have a vapor retarder facing with a permeance rating not greater than 0.02 perm. The Sky-Web II insulation support system is in addition to the vapor

- 33.** The specification 2.3/D/3. calls for "Rafter: Uniform Depth." Plans show tapered rafters. Please clarify.

**RESPONSE:** See revised and reissued Specification 133419. Additional clarification; columns at column line 1, 2, 15 and 16 shall be uniform depth columns.

- 34.** Window type 4 per 7/A703 calls for GL3 (088000-3.6.C) self cleaning glass which needs direct exposure to sunlight in order to activate the process that breaks down dirt particles. As such, please confirm it is not required for interior Type 4 windows.

**RESPONSE:** The interior glass shall be ¼" clear tempered glass. Self cleaning is not required.

- 35.** Specification 096566 is calling for 3/8" Recycled Rubber Sheet flooring by Mannington Commercial HOWEVER drawing A-107 is calling for it as flecked outside the running track and solid inside. This is a conflict, all 3/8" Recycled rubber sheet flooring is flecked. Solid color is not available, some manufacturers may have an all black option but it is still flecked recycled rubber it will just be black on black instead of black on some other color. Please advise.

**RESPONSE:** The intent is to have the track area appear to be one color.

36. We are running the numbers for the rock removal on the project, and based on the sheets S-202 and S-203, it only shows rock within a portion of the foundation excavation, but only in one of the section views so there is no way to determine the true extent of the rock in the other plane, because no sections in the opposite direction are provided in this area. Is the unit price for rock including what is anticipated within the foundation excavation, or is the unit price for rock found within the site work area only? Currently, if we assume based on the original site grades, we are seeing an over run, but without additional sections provided in the southern portion of the building, we can not extrapolate on this.

**RESPONSE:** Bid per the quantities shown in the rock contingency.

37. The specifications appear to have both the owner and the contractor covering the testing requirements for the project. Who is responsible for the cost of the third party testing and inspections?

**RESPONSE:** The Owner is responsible only for Special Inspections identified on the Structural plan sheets, Contractor is responsible for all other testing and inspections.

38. Please confirm what size the water line to be abandoned (Sheet C-101) between the existing water valve and the restroom being demolished is, and also that is being abandoned in place, and not being removed.

**RESPONSE:** The water service for the existing bathroom is reputedly ¾" Type K copper. Contractor shall field verify prior to abandonment. The curb stop shall be turned off and the copper removed from the curb stop. The remainder of the service shall be abandoned in place.

39. Note 1 on sheet C-101 references a plan by MHE for the existing sanitary sewage disposal system at the site. Is this plan available so the contractor can see what we might encounter while we are installing the proposed absorption fields?

**RESPONSE:** The referenced plans are an attachment to this addendum. Please note this is a design plan and NOT an as-built.

40. Spec section 011000 Part C.9 states the GC is to provide and maintain project management software in accordance with 013000 Administrative Requirements. Although that spec section summary includes part 1.1A 4 Digital project management procedures, the specification does not provide details and/or which software. Please provide.

**RESPONSE:** The software to be provided is referenced in Spec Section 013000 Section 1.1/D.

41. Specification table of contents includes 312334 Structural Excavation backfill and compaction which is not included in the manual. Please provide.

**RESPONSE:** Specification 312334 Structural Excavation Backfill and Compaction is included in the Structural Specs folder.



**SPECIFICATION REVISIONS:**

Remove the below specification in its entirety:

- Specification 074213.13 Formed Metal Wall Panels

Replace the attached specifications in their entirety:

- 084113 Aluminum-Framed Entrances and Storefronts
- 085113 Aluminum Windows
- 092900 Gypsum Board
- 133419 Metal Building Systems

**CONSTRUCTION BID PLANS:**

Replace the attached drawing sheets in their entirety:

**Civil Plan Sheets**

Plan Sheet C-106

**Electrical Plan Sheets**

Plan Sheet E-100

Plan Sheet E-501

**Architectural Plan Sheets**

Plan Sheet A-602

**Mechanical Plan Sheets**

Plan Sheet M-100

Plan Sheet M-101

Plan Sheet M-500

Plan Sheet M-501

**Plumbing Plan Sheets**

Plan Sheet P-100

**CLARIFICATIONS:**

- The Cast Stone Veneer is approximately 1-1/2" in thickness and is installed over glass-mat gypsum sheathing.
- The existing toilet rooms will remain in operation throughout the duration of the Project. Contractor will pump and haul the waste based on a unit price, the bid form to be adjusted accordingly in the final addendum. The contractor shall demo the toilet rooms upon completion of the Recreation Facility.
- Change to Drawing FP-001: Eliminate all notes under the Submittals & Shop Drawings heading. Contractor is to refer to front-end bidding specifications for all project requirements relating to Submittals & Shop Drawings.
- The piping between C.B. #6 and C.B. #5 and between C.B. #4 and C.B. #5 shall be 30" HDPE Watertight ADS N-12 pipe. Pursuant to these revisions see the following revised details:
  - See revised Detail 2 on Sheet C-505.
  - See revised Detail 3 on Sheet C-505.
  - See revised Detail 6 on Sheet C-504.

### Addendum 3

- See additional bollard detail (Detail 12 on Sheet C-507) Contractor shall provide 6 bollards, locations to be selected by Owner in addition to the 2 bollards proposed adjacent to the pad mount transformer.
- Hollow Metal Frames at vestibule #124 and #126 to be structurally reinforced frames as required to support ceiling load.
- Specification Section 074213.13 shall be deleted. All Metal Wall Panels and Fascia shall be as per Specification 133419, 2.5 of the Metal Building Systems Specification.
- The Specifications Table of Contents has been revised to include the Ceramic Tiling Specification as per RFI #4 and to remove the 074213.13 Formed Metal Wall Panels.

**ALL BIDDERS MUST SUBMIT ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS WITH BID**

**ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS LISTED BELOW:**

**ADDENDUM 3 – 21 March 2024** \_\_\_\_\_

**SUBMIT THIS SHEET WITH YOUR BID**

**(End of Addendum No. 3)**

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## SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Aluminum-framed storefront systems.
  - 2. Aluminum-framed entrance door systems.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at a location to be determined.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
  - 1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
  - 2. Include point-to-point wiring diagrams.
- C. Samples: For each type of exposed finish required.
- D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
- E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.
- B. Product test reports.
- C. Source quality-control reports.
- D. Field quality-control reports.

- E. Sample warranties.

## 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E699 for testing indicated and accredited by the International Accreditation Service or the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement as complying with ISO/IEC 17025 and acceptable to Owner and Engineer/Architect.
- C. Product Options: 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.
  - 1. Do not change intended aesthetic effects, as judged solely by Engineer/Architect, except with Engineer/Architect's approval. If changes are proposed, submit comprehensive explanatory data to Engineer/Architect for review.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer or Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked-enamel, powder-coat, or organic finishes within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
  - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
  - 2. Failure also includes the following:
    - a. Thermal stresses transferring to building structure.
    - b. Glass breakage.
    - c. Noise or vibration created by wind and thermal and structural movements.
    - d. Loosening or weakening of fasteners, attachments, and other components.
    - e. Failure of operating units.
- C. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
  - 1. Minimum Performance Class: AW.
  - 2. Minimum Performance Grade: 40.
  - 3. Minimum Design Pressure: 40.
  - 4. Minimum Structural Test Pressure: 60 psf.
  - 5. Water Resistance Test Pressure: 8 psf.
  - 6. Wind Speed Equivalent: 125mph.
- D. Structural Loads:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.
- E. Deflection of Framing Members: At design wind pressure, as follows:
  - 1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
  - 2. Deflection Parallel to Glazing Plane: 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.
    - a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
    - a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch for spans greater than 11 feet 8-1/4 inches or 1/175 times span, for spans of less than 11 feet 8-1/4 inches.
- F. Structural: Test according to ASTM E330/E330M as follows:
1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
  2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- G. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- H. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:
1. Thermal Transmittance (U-factor):
    - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.45 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
    - b. Entrance Doors: U-factor of not more than 0.68 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
  2. Solar Heat-Gain Coefficient (SHGC):
    - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.35 as determined according to NFRC 200.
    - b. Entrance Doors: SHGC of not more than 0.35 as determined according to NFRC 200.
  3. Air Leakage:
    - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested according to ASTM E283.
    - b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
  4. Condensation Resistance Factor (CRF):
    - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 55 as determined according to AAMA 1503.
    - b. Entrance Doors: CRF of not less than 63 as determined according to AAMA 1503.

- I. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone basic protection.
  - 1. Large-Missile Test: For glazing located within 30 feet of grade.
  - 2. Small-Missile Test: For glazing located between 30 feet and above grade.
- J. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 STOREFRONT SYSTEMS

- 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. EFCO Corporation.
  - 2. Kawneer North America, an Arconic company.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
  - 1. Exterior Framing Construction: Thermally broken.
  - 2. Interior Vestibule Framing Construction: Nonthermal.
  - 3. Glazing System: Retained mechanically with gaskets on four sides.
  - 4. Finish: Baked-enamel or powder-coat finish.
  - 5. Fabrication Method: Field-fabricated stick system.
  - 6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 7. Steel Reinforcement: As required by manufacturer.
- C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

## 2.3 ENTRANCE DOOR SYSTEMS

- 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. EFCO Corporation.
  - 2. Kawneer North America, an Arconic company.
- B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
  - 1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with



reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

- a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
2. Door Design: Wide stile; 5-inch nominal width.
3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
  - a. Provide nonremovable glazing stops on outside of door.

## 2.4 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."
- B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door, to comply with requirements in this Section.
  1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
  2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
  3. Opening-Force Requirements:
    - a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
    - b. Accessible Interior Doors: Not more than 5 lbf to fully open door.
- C. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
  1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
  2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- D. Butt Hinges: BHMA A156.1, Grade 1, radius corner.
  1. Nonremovable Pins: Provide setscrew in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
  2. Exterior Hinges: Stainless steel, with stainless-steel pin.
  3. Quantities:
    - a. For doors up to 87 inches high, provide three hinges per leaf.

- b. For doors more than 87 and up to 120 inches high, provide four hinges per leaf.
- E. Continuous-Gear Hinges: BHMA A156.26.
- F. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.
- G. Manual Flush Bolts: BHMA A156.16, Grade 1.
- H. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.
- I. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- J. Cylinders:
  - 1. As specified in Section 087100 "Door Hardware."
  - 2. BHMA A156.5, Grade 1.
    - a. Keying: Master key system. Permanently inscribe each key with a visual key control number and include notation "DO NOT DUPLICATE" to be furnished by Owner.
- K. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- L. Operating Trim: BHMA A156.6.
- M. Removable Mullions: BHMA A156.3 extruded aluminum.
  - 1. When used with panic exit devices, provide keyed removable mullions listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305. Use only mullions that have been tested with exit devices to be used.
- N. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.
- O. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.
- P. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
- Q. Weather Stripping: Manufacturer's standard replaceable components.
  - 1. Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.
  - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

- R. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- S. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.
- T. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket anchored to frame hinge-jamb at center-pivoted doors.

## 2.5 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

## 2.6 MATERIALS

- A. Sheet and Plate: ASTM B209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
- C. Extruded Structural Pipe and Tubes: ASTM B429/B429M.
- D. Structural Profiles: ASTM B308/B308M.
- E. Steel Reinforcement:
  - 1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
  - 2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
  - 3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
- F. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

## 2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. 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 with ends coped or mitered.
  3. Physical and thermal isolation of glazing from framing members.
  4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  5. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
  6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.8 ALUMINUM FINISHES

- A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  2. Color and Gloss: As selected by Engineer/Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.

3.2 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 088000 "Glazing."

3.3 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

A. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 FIELD QUALITY CONTROL

A. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts mockups.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Engineer/Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
  - a. Perform a minimum of two tests in areas as directed by Engineer/Architect.
2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
  - a. Perform a minimum of two tests in areas as directed by Engineer/Architect.
3. Water Penetration: ASTM E1105 at a minimum uniform static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in

"Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.

- B. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 084113

## SECTION 085113 - ALUMINUM WINDOWS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes aluminum windows for exterior locations.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at a location to be determined.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.

#### 1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period:
    - a. Window: 10 years from date of Substantial Completion.
    - b. Glazing Units: 10 years from date of Substantial Completion.
    - c. Aluminum Finish: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
  - 1. Window Certification: AAMA certified with label attached to each window.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
  - 1. Minimum Performance Class: AW.
  - 2. Minimum Performance Grade: 40.
  - 3. Minimum Design Pressure: 40.
  - 4. Minimum Structural Test Pressure: 60 psf.
  - 5. Water Resistance Test Pressure: 8 psf.
  - 6. Wind Speed Equivalent: 125mph.
- C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.
- D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.
- E. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 62.
- F. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

### 2.2 ALUMINUM WINDOWS

- 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. EFCO Corporation.
  - 2. Kawneer North America, an Arconic company.
- B. Types: As indicated on Drawings.
- C. Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.
  - 1. Thermally Improved Construction: Fabricate frames, sashes, and muntins 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.

- D. Glass: Clear annealed glass, ASTM C1036, Type 1, Class 1, q3.
  - 1. Kind: Fully tempered where indicated on Drawings.
- E. Insulating-Glass Units: ASTM E2190.
  - 1. Glass: ASTM C1036, Type 1, Class 1, q3.
    - a. Tint: Clear.
    - b. Kind: Fully tempered where indicated on Drawings.
  - 2. Lites: Two.
  - 3. Filling: Fill space between glass lites with argon.
  - 4. Low-E Coating: Sputtered on second or third surface.
- F. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- G. Hardware, General: Provide manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.
  - 1. Exposed Hardware Color and Finish: As selected by Engineer/Architect from manufacturer's full range.
- H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- I. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
  - 1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

## 2.3 ACCESSORIES

- A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.
- B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
- C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
- D. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
- E. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

## 2.4 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.
- F. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

## 2.5 ALUMINUM FINISHES

- A. High-Performance Organic Finish (Two-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Engineer/Architect from full range of industry colors and color densities.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.
- B. Install windows 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 to produce weathertight construction.

- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- E. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085113

## SECTION 092900 - GYPSUM BOARD

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Tile backing panels.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Gypsum board, Type X.
  - 2. Mold-resistant gypsum board.
  - 3. Impact-resistant gypsum board.
  - 4. Glass mat gypsum sheathing board.
  - 5. Interior trim.
  - 6. Joint treatment materials.
  - 7. Laminating adhesive.
- B. Samples: For each texture finish indicated on same backing indicated for Work.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, 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.

#### 2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Gypsum Board, Type X: ASTM C1396/C1396M.

1. **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:
    - a. [National Gypsum Company.](#)
    - b. [USG Corporation.](#)
  2. Thickness: 5/8 inch.
  3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- C. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
1. **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:
    - a. [National Gypsum Company.](#)
    - b. [USG Corporation.](#)
  2. Core: 5/8 inch, Type X.
  3. Long Edges: Tapered.
  4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- D. Impact-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested in accordance with ASTM C1629/C1629M.
- a. [National Gypsum Company.](#)
  - b. [USG Corporation.](#)
  2. Core: 5/8 inch Type X.
  3. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds Level 2 requirements.
  4. Indentation: ASTM C1629/C1629M, meets or exceeds Level 2 requirements.
  5. Soft-Body Impact: ASTM C1629/C1629M, meets or exceeds Level 2 requirements.
  6. Hard-Body Impact: ASTM C1629/C1629M, meets or exceeds Level 2 requirements in accordance with test in Annex A1.
  7. Long Edges: Tapered.
  8. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.
- E. Glass-Mat Gypsum Sheathing Board: ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. **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:
    - a. [National Gypsum Company.](#)
    - b. [USG Corporation.](#)
  2. Core: 5/8 inch, Type X.

## 2.3 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C1178/C1178M, with manufacturer's standard edges.
1. 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:
    - a. National Gypsum Company.
    - b. USG Corporation.
  2. Core: 5/8 inch, Type X.
  3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- B. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.
1. 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:
    - a. National Gypsum Company.
    - b. USG Corporation.
  2. Thickness: 5/8 inch .
  3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

## 2.4 METAL SUSPENSION SYSTEM

- A. Manufacturers: Basis of Design: USG Drywall Suspension Systems. 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. Armstrong World Industries, Inc.
  2. National Gypsum Services Company
- A. Commercial quality, cold-rolled steel, hot dipped galvanized finish.
1. Main Tees: Fire-Rated Heavy Duty classification 1.617” high x 144” long, integral reversible splice with knurled face. (DGLW-26 1-1/2” Face and 1.617” high)
    - a. Cross Members: Fire-Rated members with knurled face. Cross Tees: DGLW-424 cross tee 1-1/2” high x 48” long with 1-1/2” wide face; DGLW-224 Fire-Rated: 1-1/2” high x 24” long with 1-1/2” face
  2. quick release cross tee ends for positive locking and removability without tools
  3. Accessory Cross Tees: Cross tees must have knurled faces and quick release cross tee ends for positive locking and removability without tools.
    - a. DGW-6026DM: 1.617” high x 5’ long with a 1-1/2” face
    - b. DGW-7226DM: 1.617” high x 6’ long with a 1-1/2” face
    - c. DGW-8426DM: 1.617” high x 7’ long with a 1-1/2” face
    - d. DGW-9626DM: 1.617” high x 8’ long with a 1-1/2” face

4. Wall Moldings: Single web with knurled face
    - a. DGWM-24: 1-1/2" x 1" x 144" long wall molding
    - b. DGCM-27: 144" x 1-5/8" x 1" x 1" channel molding
    - c. DGLC-12: 144" x 1-3/4" x 1" x 1" index channel molding
  5. Accessories
    - a. DGSC-180: Splice Clip
    - b. DGTC-90: Transition Clip
    - c. DGWC: Wall Attachment Clip
    - d. DGSP-180: Splice Plate
    - e. DGHUB: Dome Hub
    - f. CMAC-1: Close Mount Attachment Clip
  6. Wire: Hanger Wire 12 ga., galvanized or as noted on drawings
- B. USG Drywall Wall-to-Wall Suspension Systems – Commercial quality, cold-rolled steel, hot dipped galvanized finish for use in corridors and short span applications.
1. Main Tees: Fire-Rated Heavy Duty classification 1.617" high x [6'] [8'] [10'] [12'] [14'] [Custom] long, integral reversible splice with 1-1/2" knurled face.
  2. Wall Moldings: Single web with knurled face, 1-1/2" x 1" x 12' long, DGWM24
  3. Wall Channel: Single web with knurled face, 1-5/8" x 1" x 12' long, DGCM27
  4. Locking Wall Channel: Single web with knurled face, 1-3/4" x 1" x 12' long, DGLC-12

## 2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
  2. Shapes:
    - a. Cornerbead.
    - b. Bullnose bead.
    - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - d. L-Bead: L-shaped; exposed long flange receives joint compound.
    - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    - f. Expansion (control) joint.
    - g. Curved-Edge Cornerbead: With notched or flexible flanges.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
  - a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

## 2.7 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
  1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
  2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

## PART 3 - EXECUTION

### 3.1 INSTALLATION AND FINISHING OF PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.



- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
1. **Level 1:** Used in ceiling plenum areas, concealed areas, areas not open to public view. All joints and interior angles to have tape embedded in joint compound; tape and fastener heads don't need to be covered with joint compound. Surface to be free of excess joint compound.
  2. **Level 2:** Used with setting-type compound where water resistant gypsum backing board is used as substrate for tile. Garage areas, warehouse storage, or similar areas. All joints and interior angles to have tape embedded in joint compound and have a thin coat of compound. Fastener heads and accessories to be covered with a coat of joint compound. Surface to be free of excess joint compound.
  3. **Level 3:** Used in areas where heavy texture finish will be applied before painting, or where commercial grade wallcoverings are applied as final decoration. All joints and interior angles to have tape embedded in joint compound and have a 2 coats of compound. Fastener heads and accessories to be covered with 2 coats of joint compound. All joints to be smooth and free of tool marks and ridges. Prepared surface to be covered with primer prior to final decoration.
  4. **Level 4:** Used where residential grade wall coverings, flat paints, light textures will be applied. All joints and interior angles to have tape embedded in joint compound with a thin coat of compound; Additional coats of compound to be applied, 2 coats on all flat joints and 1 coat over interior angles. Fastener heads and accessories to be covered with 3 coats of joint compound. Joints to be smooth and free of tool marks and ridges. Prepared surface to be covered with primer prior to final decoration. Gloss, semi-gloss, and enamel paints are not recommended for this level.
  5. **Level 5:** Used in areas where gloss, semi-gloss, and enamel paints, or flat joints on untextured surface are specified. All joints and interior angles to have tape embedded in joint compound with a thin coat of compound; Additional coats of compound to be applied, 2 coats on all flat joints and 1 coat over interior angles. Fastener heads and accessories to be covered with 3 coats of joint compound. A thin skim coat of joint compound to be trowel applied to entire surface. Surface to be smooth and free of tool marks and ridges. Prepared surface to be covered with primer prior to final decoration.
- H. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- I. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
- J. Cementitious Backer Units: Finish according to manufacturer's written instructions.

### 3.2 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

### 3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

## SECTION 133419 - METAL BUILDING SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Metal soffit panels.
5. Thermal insulation.
6. Insulation Support System
7. Accessories.

#### 1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each type of metal building system component.
- ##### B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and attachments to other work.
- ##### C. Samples: For units with factory-applied finishes.
- ##### D. Delegated-Design Submittal: For metal building systems.
1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 INFORMATIONAL SUBMITTALS

- ##### A. Welding certificates.
- ##### B. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
1. Name and location of Project.
  2. Order number.
  3. Name of manufacturer.
  4. Name of Contractor.

5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, equipment loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors.

- C. Material test reports.
- D. Source quality-control reports.
- E. Field quality-control reports.
- F. Sample warranties.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
  1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
  2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  2. AWS D1.3, "Structural Welding Code - Sheet Steel."

## 1.7 WARRANTY

- A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: 20 years from date of Substantial Completion.
- B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- 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. American Buildings Company; a Nucor Company.
  - 2. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
  - 3. Metallic Building Company.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, licensed and registered in New York State, as defined in Section 014000 "Quality Requirements," to design metal building system.
- B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
  - 1. Design Loads: As indicated on Drawings.
  - 2. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."
  - 3. Deflection and Drift Limits: No greater than the following:
    - a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
    - b. Girts: Horizontal deflection of 1/180 of the span.
    - c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
    - d. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
    - e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

- f. Design primary secondary framing to maintain deflection criteria for all equipment that will be operational, i.e. gym separation nets, basketball backboards, etc.
- 4. Reinforced Lower Wall Panel:
  - a. The lower 48” of all exterior walls shall be additional reinforced to resist lateral snow loads. The load of concern is a result of snow sliding from the roof above and accumulating such that a lateral load is imparted on the lower 48” of the exterior wall.
- C. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- E. Fire-Resistance Ratings: Where assemblies are indicated to have a fire-resistance rating, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E119 or ASTM E108 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL's "Fire Resistance Directory," FM Global's "Approval Guide," or from the listings of another qualified testing agency.
- F. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
  - 1. Wind Loads: As indicated on Drawings and as calculated in accordance with ASCE 7.
- G. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E1680 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..
- H. Air Infiltration for Metal Wall Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..
- I. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E1646 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..
- J. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.].
- K. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
1. Uplift Rating: UL 90.
- L. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
1. Fire/Windstorm Classification: Class 1A-120.
  2. Hail Resistance: MH.
- M. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C1363 or ASTM C518:
1. Roof:
    - a. R-Value: R=25 fiberglass insulation w/ vinyl vapor retarder (interior side) + R=1 unfaced insulation on the exterior side.
  2. Walls:
    - a. R-Value: R=13 ci (2" continuous insulation) + R=25 (8" kraft-faced fiberglass insulation).

## 2.3 STRUCTURAL-STEEL FRAMING

- A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
- B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters and rake beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
    - a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.
  2. Exterior Column: Uniform depth or tapered depth.
  3. Rafter: Uniform depth or tapered depth.
- E. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other

miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the same requirements as primary steel. Supplemental steel shall be provided to support all material and equipment loads including but not limited to suspended ceilings, HVAC components (ductwork,etc) and gym equipment (basketball backboards, operational separation netting etc).

- F. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

## 2.4 METAL ROOF PANELS

- A. Comply with requirements in Section 074113.16 "Standing-Seam Metal Roof Panels" for roofing panel

## 2.5 METAL WALL PANELS

- A. Concealed-Fastener, Flush-Profile, Metal Wall Panels: Formed with vertical panel edges and a single wide recess, centered between panel edges flush surface; with flush joint between panels; with 1-inch-wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
  - a. Exterior Finish: Two-coat Fluoropolymer.
  - b. Color: As selected by Architect from manufacturer's full range.
2. Panel Coverage: 16 inches.
3. Panel Height: 1.5 inches.

## 2.6 METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
- B. Metal Soffit Panels: V-Groove-Profile Metal Soffit Panels to be a combination of perforated and solid formed panels to include intermediate stiffening ribs between panel edges.
  1. Finish: As selected by Architect from manufacturer's full range.



## 2.7 THERMAL INSULATION

- 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. Bay Insulation Systems; a division of Bay Industries.
- B. Faced Metal Building Insulation: ASTM C991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
- C. Unfaced Metal Building Insulation: ASTM C991, Type I, or NAIMA 202, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
- D. Retainer Strips: For securing insulation between supports, 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.
- E. Vapor-Retarder Facing: ASTM C1136, with permeance not greater than 0.02 perm when tested according to ASTM E96/E96M, Desiccant Method.
  - 1. 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:
    - a. Lamtec Corporation.

## 2.8 INSULATION SUPPORT SYSTEM

- A. Insulation Support System Basis of Design: “Sky-Web<sup>®</sup> II” insulation support system as manufactured by Dupont, Inc.
- B. Description:
  - 1. Compatible with roof system.
  - 2. Limit to “over-the-purlin” type insulation systems.
  - 3. Knotted Mesh:
    - a. Grid: Nominal 2-3/4 inches by 2-3/4 inches.
    - b. Material: Twisted twine of DuPont nylon Type 6-6 fiber.
    - c. Mesh Covering Interior Bays: 21-pound twine.
    - d. Five-Foot Strip Along Edge: #30 twine, with edge color coded for identification.
  - 4. Double selvage along the 2 edges in machine direction.
  - 5. Furnish up to 60 feet wide by building width.
    - a. Cover 1 or 2 bays of building length and extend eave-to-eave across building.
- C. Physical Properties:
  - 1. Minimum Tensile Strength: #30 Twine: 265 pounds.
  - 2. Runnage: #30 Twine: 605 feet per pound.
  - 3. Cord Used to Make Mesh-to-Mesh Edge Connections: #36 DuPont nylon Type 6-6 white braided twine.

4. Minimum Tensile Strength: 360 pounds.
  5. Runnage: 533 feet per pound.
  6. Mesh Weight: 0.012 pounds per sq ft.
- D. Fasteners and Attachment Hardware:
1. Connections to Eave and Gable Members:
    - a. 1/8-inch-diameter wire clips looped through 20-gauge steel V-straps.
    - b. Steel V-Straps: Fasten to framing with self-drilling screws.
  2. Mesh-to-Mesh Edge Connections:
    - a. Lace #36 nylon cord through edges of pieces of mesh being connected.
    - b. Edge Connections: Plastic cable ties.
- E. Fire-Hazard Classification:
1. UL Fire-Hazard Classification Ratings, UL 723:
    - a. Flame Spread: 3 or less.  
Smoke Developed: Less than 10.

## 2.8 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
- D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.
- E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Gutter Supports: Fabricated from same material and finish as gutters.
  2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

- F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot-long sections, complete with formed elbows and offsets.
  - 1. Mounting Straps: Fabricated from same material and finish as gutters.
- G. Roof Curbs: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.048-inch nominal uncoated steel thickness prepainted with coil coating; finished to match metal roof panels; with welded top box and bottom skirt, and integral full-length cricket; capable of withstanding loads of size and height indicated.
- H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

## 2.9 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
  - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
  - 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
  - 1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

## 2.10 SOURCE QUALITY CONTROL

- A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.
  - 1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.

- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written instructions and drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.
- F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
  - 1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
    - a. Joint Type: Snug tightened or pretensioned as required by manufacturer.
- G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
  - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.

2. Locate and space wall girts to suit openings such as doors and windows.
  3. Provide supplemental framing at entire perimeter of openings, including doors, windows, ventilators, and other penetrations of roof and walls.
- H. Steel Joists: Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.
1. Before installation, splice joists delivered to Project site in more than one piece.
  2. Space, adjust, and align joists accurately in location before permanently fastening.
  3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
  4. Joist Installation: Bolt joists to supporting steel framework using carbon-steel bolts unless otherwise indicated.
  5. Joist Installation: Bolt joists to supporting steel framework using high-strength structural bolts unless otherwise indicated. Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for high-strength structural bolt installation and tightening requirements.
  6. Joist Installation: Weld joist seats to supporting steel framework.
  7. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.
- I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
  2. Locate interior end-bay bracing only where indicated.
- J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

### 3.2 METAL PANEL INSTALLATION, GENERAL

- A. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
    - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
  2. Install metal panels perpendicular to structural supports unless otherwise indicated.
  3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.

4. Locate and space fastenings in uniform vertical and horizontal alignment.
  5. Locate metal panel splices over structural supports with end laps in alignment.
  6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- B. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
  2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

### 3.3 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
1. Install ridge and hip caps as metal roof panel work proceeds.
  2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
1. Install clips to supports with self-drilling or self-tapping fasteners.
  2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
  3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
  4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
  5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.

6. Provide metal closures at peaks, rake edges, rake walls and each side of ridge and hip caps.
- C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

### 3.4 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
  2. Shim or otherwise plumb substrates receiving metal wall panels.
  3. When two rows of metal panels are required, lap panels 4 inches minimum.
  4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
  5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
  6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
  7. Install screw fasteners in predrilled holes.
  8. Install flashing and trim as metal wall panel work proceeds.
  9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
  10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
  11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

### 3.5 METAL SOFFIT PANEL INSTALLATION

- A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.
- B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

### 3.6 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:

1. Over-Framing Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal roof panels fastened to secondary framing.
2. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.
3. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
  - a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
4. Two-Layers-between-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Install layer of filler insulation over first layer to fill space between purlins formed by thermal spacer blocks. Hold in place with bands and crossbands below insulation.
  - a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
5. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

### 3.7 DOOR AND FRAME INSTALLATION

- A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and



other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

- B. Personnel Doors and Frames: Install doors and frames according to NAAMM-HMMA 840.
  - 1. At fire-rated openings, install frames according to, and doors with clearances specified in, NFPA 80.
- C. Field Glazing: Comply with installation requirements in Section 088000 "Glazing."
- D. Door Hardware:
  - 1. Install surface-mounted items after finishes have been completed at heights indicated in DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
  - 4. Set thresholds for exterior doors in full bed of sealant complying with requirements for concealed mastics specified in Section 079200 "Joint Sealants."

### 3.8 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  - 2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
  - 3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
  - 1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
  - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints

of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

- C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
  - 1. Tie downspouts to underground drainage system indicated.
- E. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.
- F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

### 3.9 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.
- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 133419

BID SET

N/T  
 TOWN OF  
 NEWBURGH  
 L. 1644 P. 197  
 SBL: 4-2-21



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## TOWN OF NEWBURGH RECREATION CENTER

CHADWICK LAKE PARK  
 1702 ROUTE 300  
 NEWBURGH, N.Y. 12550

## PARTIAL STORM WATER AND GRADING PLAN

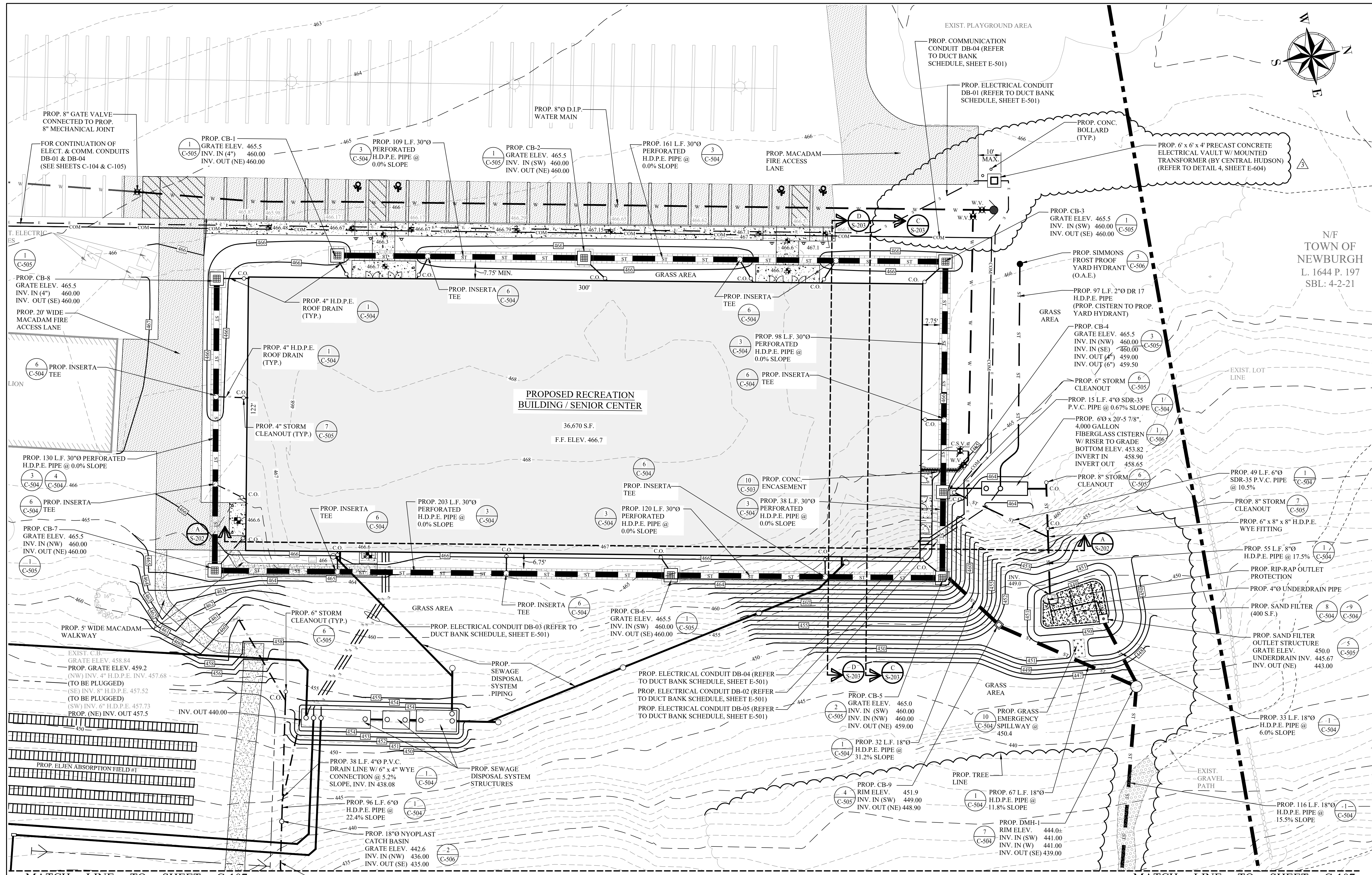
REVISIONS		
NO.	DESCRIPTION	DATE
1	ADDENDUM #1	3-6-2024
2	ADDENDUM #3	3-21-2024

ISSUED DATE:	28 February, 2024
DESIGN BY:	A.P.M.
DRAWN BY:	J.R.J.
CHECKED BY:	S.E.A.
REVIEWED BY:	M.W.W.

SHEET NO.

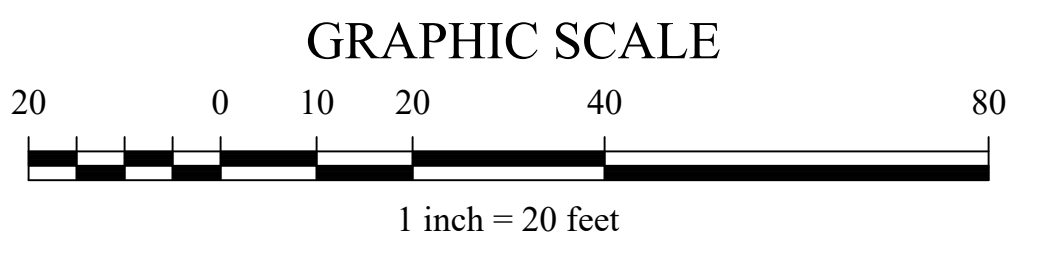
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PROJECT # 21-135 PHASE #



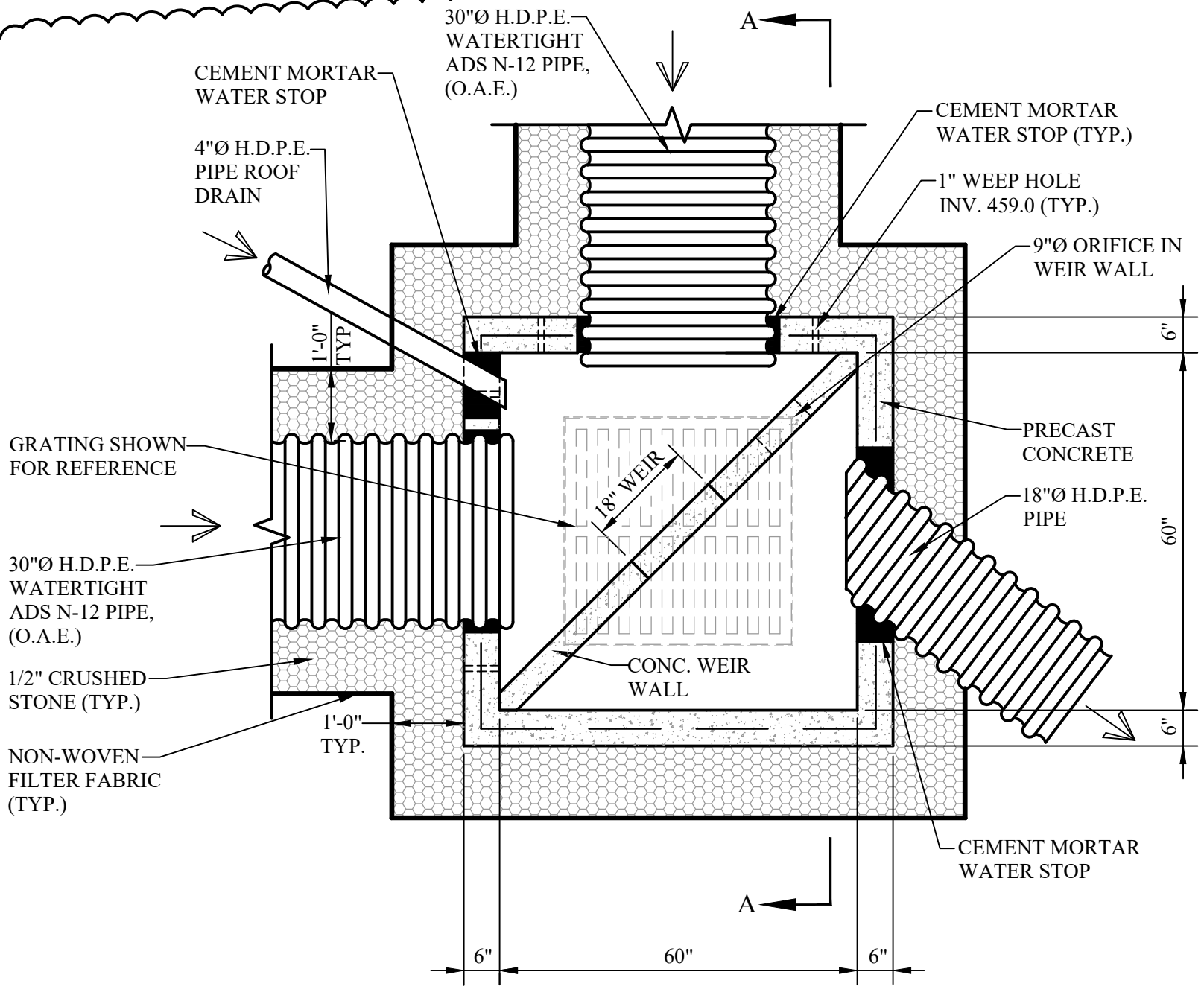
**1 PARTIAL STORM WATER AND GRADING PLAN**  
 SCALE: 1" = 20'

LEGEND	
---+467.7	EXIST. LOT LINE / R.O.W. LINE
---460	EXIST. SPOT ELEV.
---462	EXIST. 10' CONTOUR
---462	EXIST. 2' CONTOUR
U.P.	EXIST. UTILITY POLE
(Tree symbol)	EXIST. TREE
466.9	PROP. CONTOUR
W	PROPOSED SPOT ELEVATION
W	PROP. WATER LINE / WATER SERVICE
W.V.	PROP. WATER VALVE
C.S.V.	PROP. CURB STOP VALVE
Hydrant symbol	PROP. HYDRANT
CB	PROP. CATCH BASIN
D.M.H.	PROP. DRAINAGE MANHOLE
C.O.	PROP. CLEANOUT
E	PROP. STORM SEWER PIPE
COMM	PROP. ELECTRIC CONDUIT
---	PROP. COMMUNICATION CONDUIT

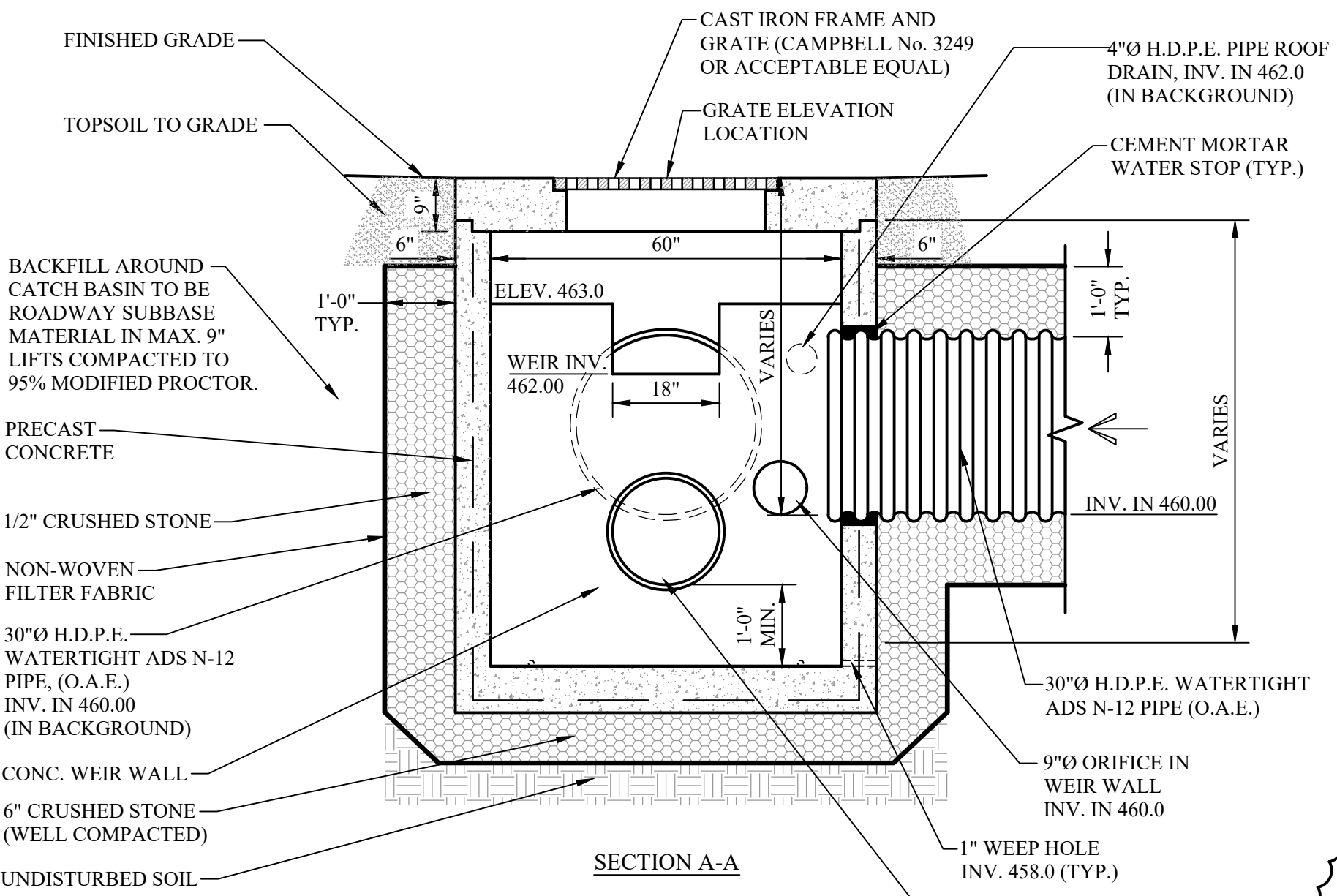


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2



PLAN VIEW



SECTION A-A

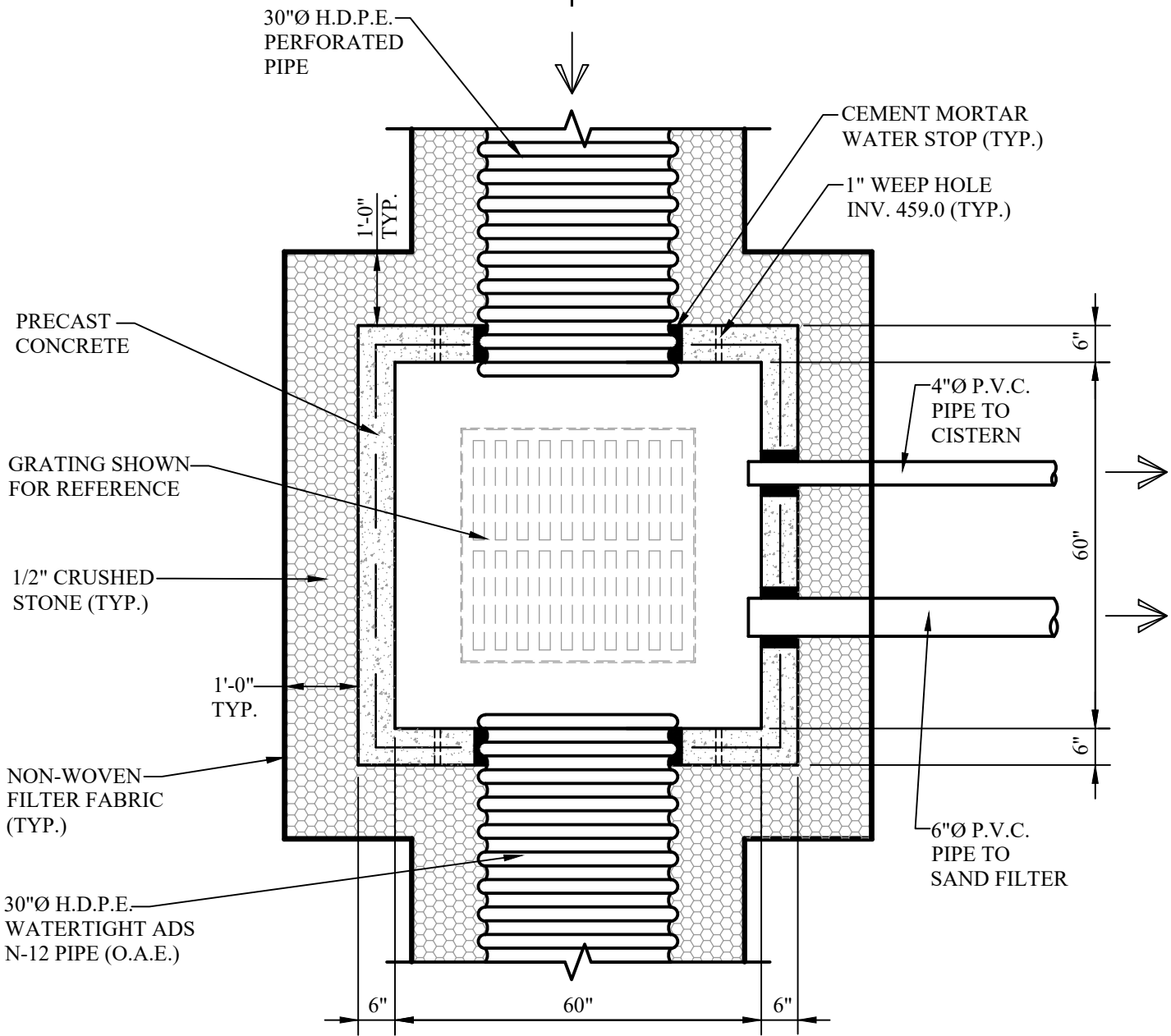
NOTE: SEE PLAN SHEETS FOR PIPING & OPENING REQUIREMENTS.

2  
C-505

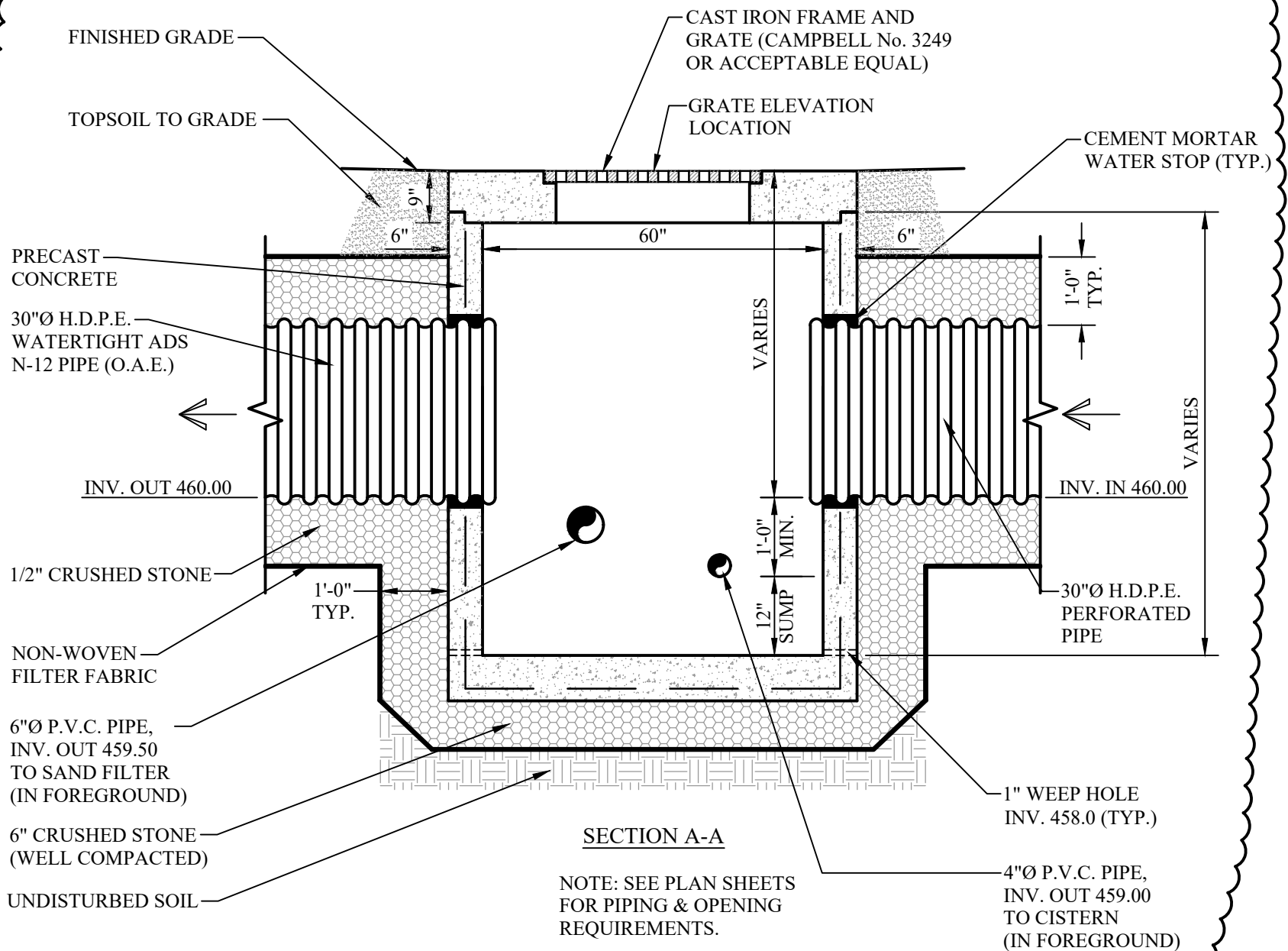
CATCH BASIN #5 DETAIL  
SCALE: N.T.S.

2

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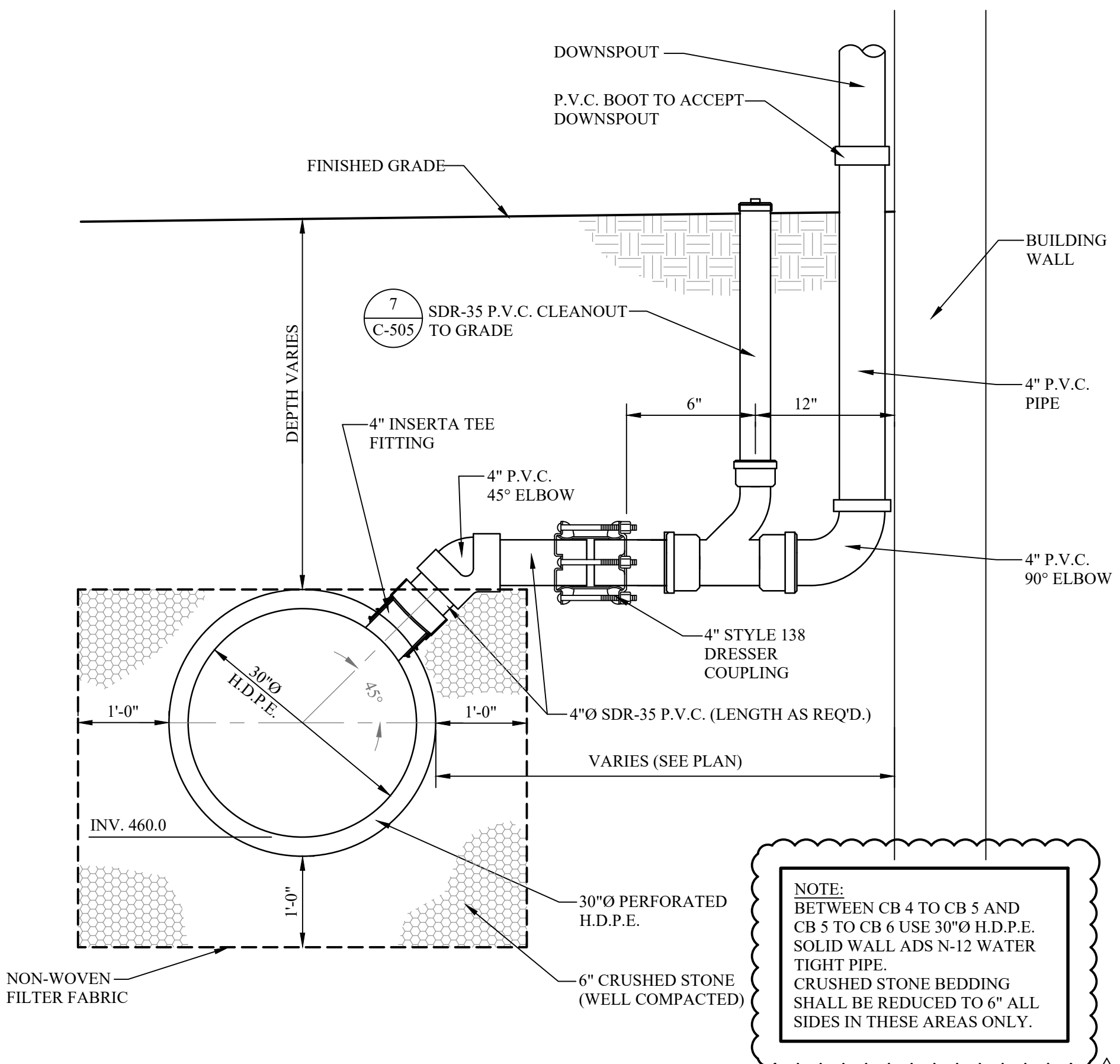
PLAN VIEW



SECTION A-A

NOTE: SEE PLAN SHEETS FOR PIPING & OPENING REQUIREMENTS.

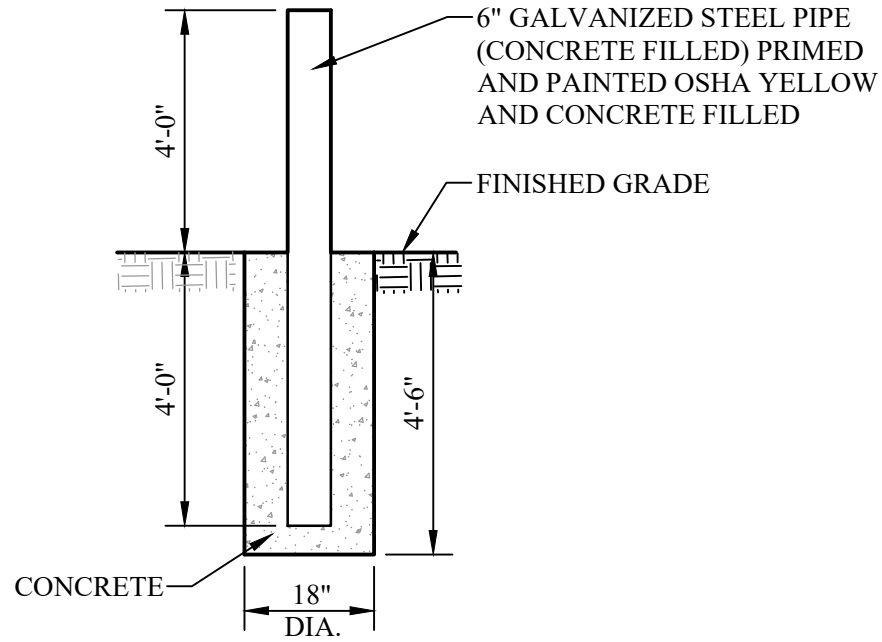
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**NOTE:**  
 BETWEEN CB 4 TO CB 5 AND  
 CB 5 TO CB 6 USE 30"Ø H.D.P.E.  
 SOLID WALL ADS N-12 WATER  
 TIGHT PIPE.  
 CRUSHED STONE BEDDING  
 SHALL BE REDUCED TO 6" ALL  
 SIDES IN THESE AREAS ONLY.

**6** ROOF DRAIN CONNECTION DETAIL  
 C-504 SCALE: N.T.S.

2



12  
C-507

**CONCRETE BOLLARD DETAIL**

SCALE: N.T.S.



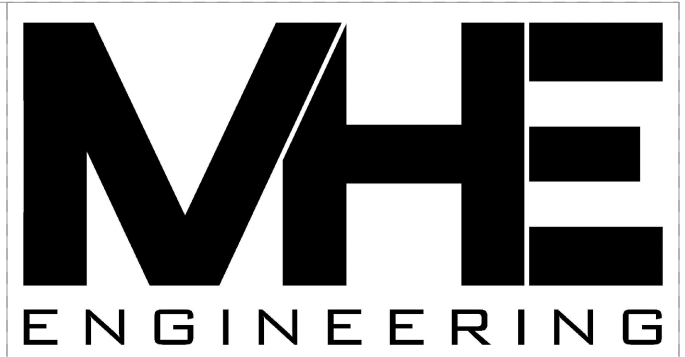


**GENERAL SHEET NOTES:**

1. REFER TO M001 FOR MECHANICAL LEGENDS, ABBREVIATIONS AND GENERAL PROJECT NOTES.

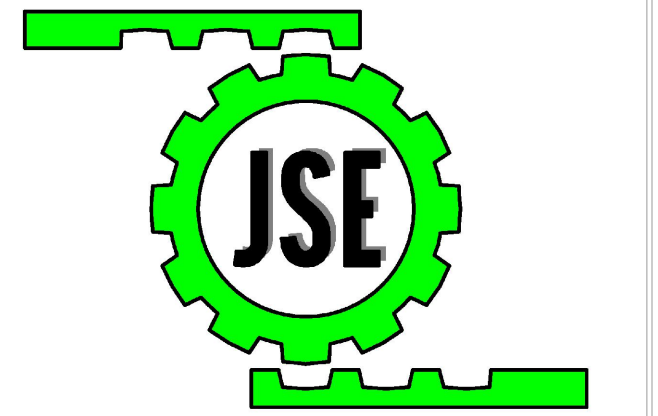
**SHEET KEY NOTES:**

- ① PROVIDE FLOOR MOUNTED ELECTRIC BASEBOARD AT LOCATION SHOWN. CONNECT TO ASSOCIATED VRY INDOOR UNIT FOR CONTROL. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ② PROVIDE ELECTRIC UNIT HEATER SUPPORTED FROM WALL/CEILING AT LOCATION SHOWN. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ③ PROVIDE DUCT MOUNTED ELECTRIC HEATING COIL WITHIN SA DUCTWORK AT LOCATION SHOWN AND CONNECT TO ASSOCIATED ERV FOR CONTROL. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ④ PROVIDE CEILING CASSETTE INDOOR VRY UNIT AT LOCATION SHOWN. PIPE UNIT AS INDICATED ON SHEET M200. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ⑤ PROVIDE CEILING RECESSED FAN COIL TYPE VRY INDOOR UNIT AT LOCATION SHOWN AND DUCT AS INDICATED. PIPE UNIT AS INDICATED ON SHEET M200. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ⑥ PROVIDE CEILING RECESSED ELECTRIC CABINET UNIT HEATER SUPPORTED FROM BUILDING STRUCTURE AT LOCATION SHOWN. COORDINATE CEILING LOCATION WITH THE GC. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ⑦ PROVIDE LOUVER AT LOCATION SHOWN. LOUVER MOUNTED AS HIGH AS POSSIBLE TO UNDERSIDE OF SPRINKLER/STORAGE ROOM CEILING. PROVIDE LOUVER WITH 120V AUTOMATIC AIR DAMPER, INTERLOCK W/ EF-2 OPERATION TO OPEN WHEN EF-2 IS ON AND CLOSE WHEN EF-2 IS OFF.
- ⑧ PROVIDE IN-LINE EXHAUST FAN AT LOCATION INDICATED WITH FACTORY INLET GRILLE AND DUCT TO EXTERIOR WALL LOUVER AS INDICATED. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ⑨ PROVIDE FLOOR MOUNTED ELECTRIC BASEBOARD AT LOCATION SHOWN. PROVIDE 7-DAY PROGRAMMABLE WALL MOUNTED THERMOSTAT FOR TEMPERATURE CONTROL. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.



33 Airport Center Drive, Suite 202 111 Wheatfield Drive, Suite 1  
New Windsor, NY 12553 Milford, PA 18337  
(845) 567-3100 (570) 296-2765

**BID SET**



**JADE STONE ENGINEERING**  
mechanical, electrical, plumbing



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**NEW RECREATION CENTER  
TOWN OF NEWBURGH**

CHADWICK LAKE PARK  
1702 NY-300, NEWBURGH, NY 12550

**MECHANICAL  
DUCTWORK  
PARTIAL PLANS**

**REVISIONS**

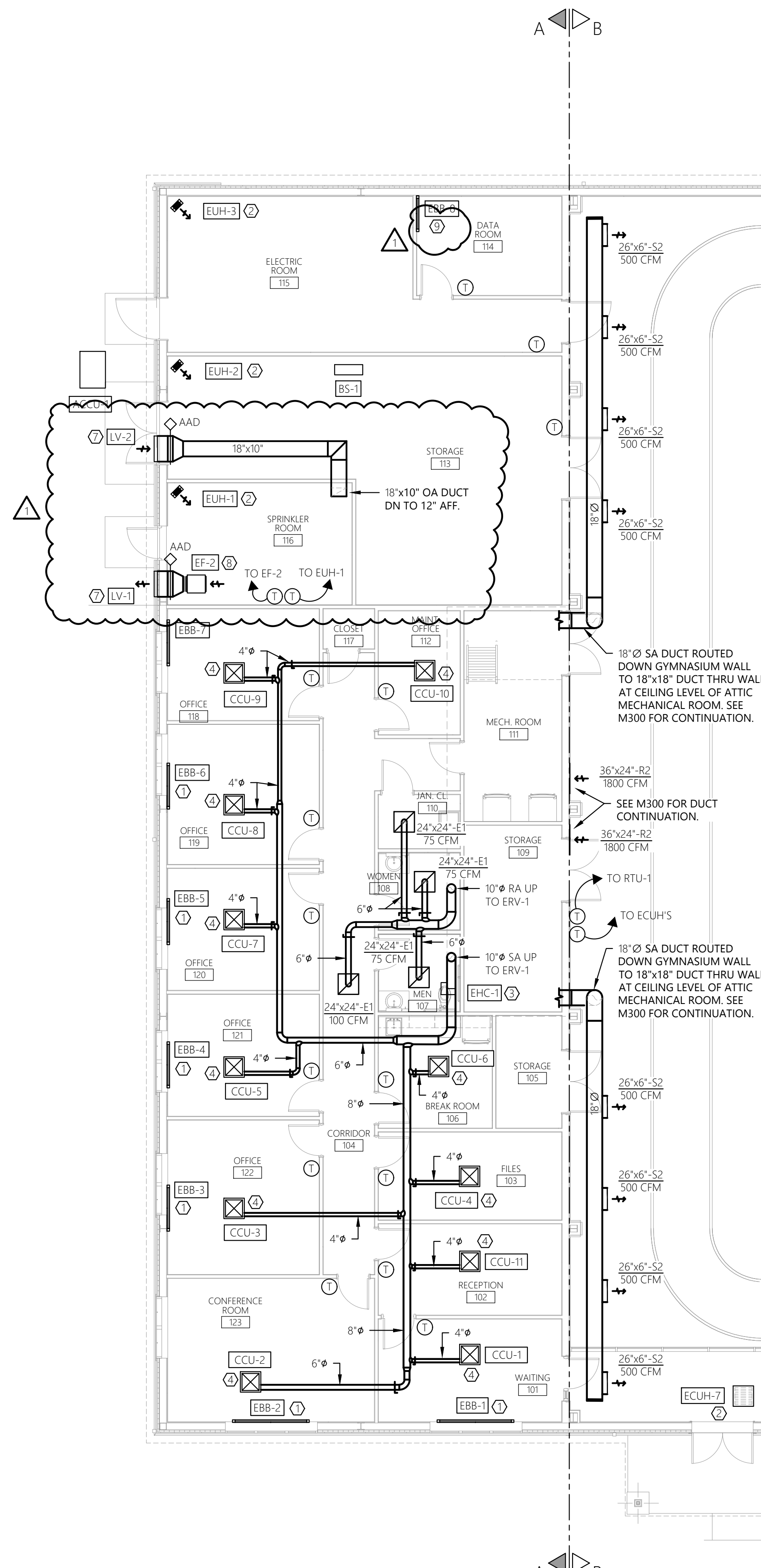
NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

ISSUED DATE: 28 FEBRUARY, 2024  
DESIGNED BY: JAE  
DRAWN BY: JAE  
CHECKED BY: JAE  
REVIEWED BY: JAE

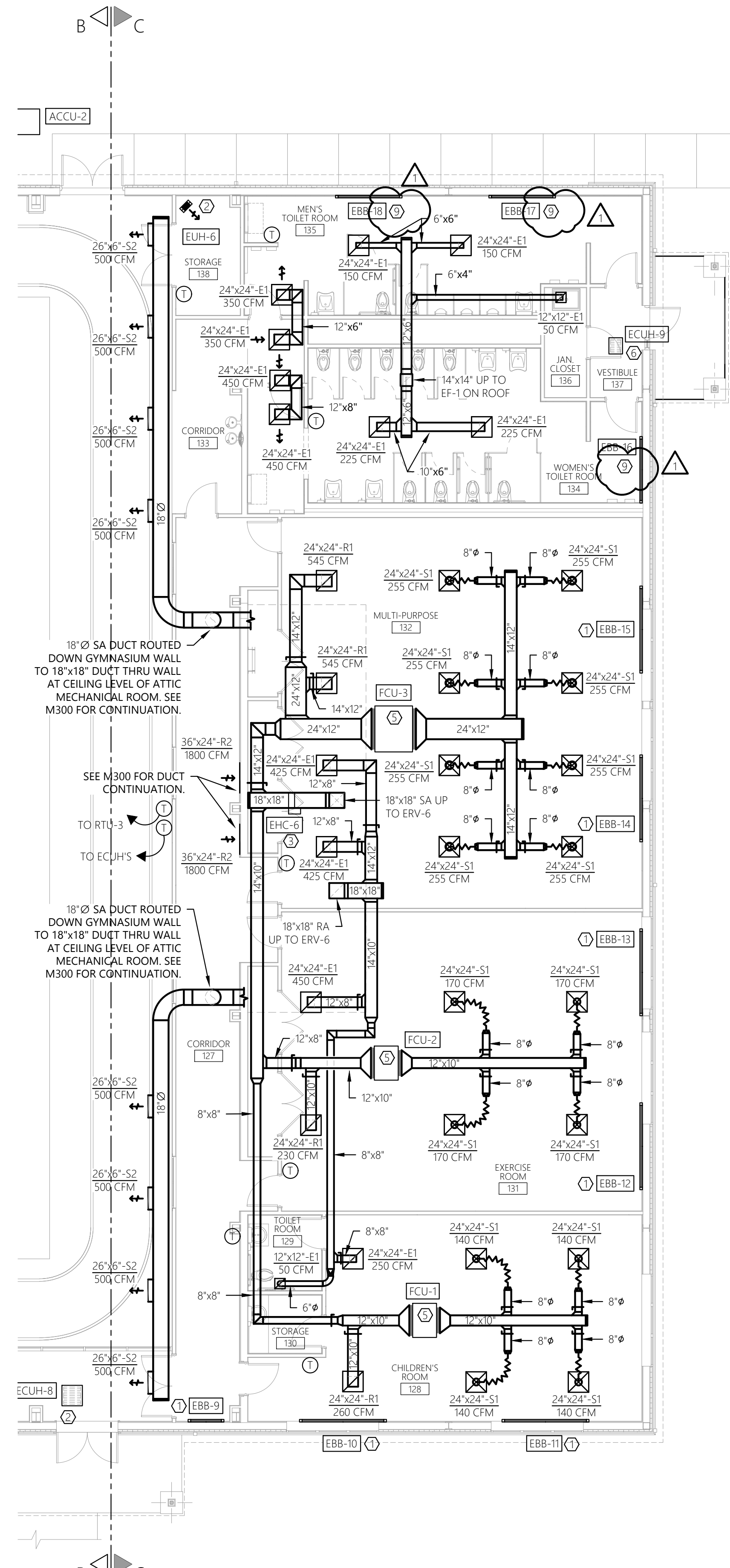
SHEET NO.

**M-100**

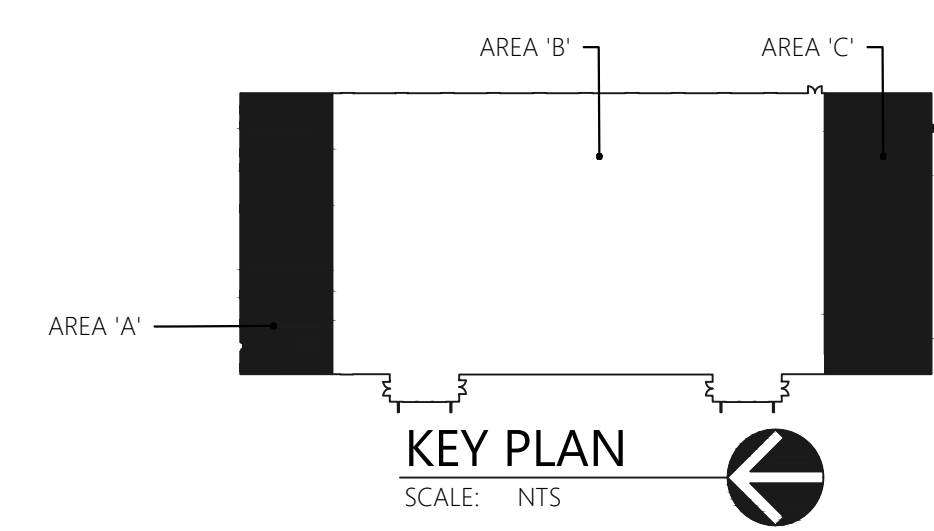
PROJECT # 21-135 PHASE #



**1 NORTH END DUCTWORK PLAN**  
SCALE: 1/8" = 1'-0"  
1ST FLOOR AREA 'A'



**2 SOUTH END DUCTWORK PLAN**  
SCALE: 1/8" = 1'-0"  
1ST FLOOR AREA 'C'



GENERAL SHEET NOTES:  
 1. REFER TO M001 FOR MECHANICAL LEGENDS, ABBREVIATIONS AND GENERAL PROJECT NOTES.

SHEET KEY NOTES:

- ① PROVIDE FLOOR MOUNTED ELECTRIC BASEBOARD AT LOCATION SHOWN. PROVIDE 7-DAY PROGRAMMABLE WALL MOUNTED THERMOSTAT FOR TEMPERATURE CONTROL. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ② BUILDING STRUCTURE AT LOCATION SHOWN. COORDINATE CEILING LOCATION WITH THE GC. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ③ PROVIDE WALL MOUNTED ELECTRIC CABINET UNIT HEATER AT LOCATION SHOWN INSTALLED AT 8'-0" ABOVE FINISHED FLOOR TO BOTTOM OF UNIT. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.
- ④ COOLING ONLY PACKAGED ROOFTOP UNIT (RTU) TO BE GROUND MOUNTED ON PAD PROVIDED BY THE GC. PROVIDE RTU WITH PAD MOUNT SIDE DISCHARGE CURB. PROVIDE SUPPLY AND RETURN DUCT CONNECTIONS AND ROUTE TO BUILDING INTERIOR AS INDICATED. COORDINATE FOR CONNECTION OF ELECTRICAL SERVICE BY THE EC.



BID SET



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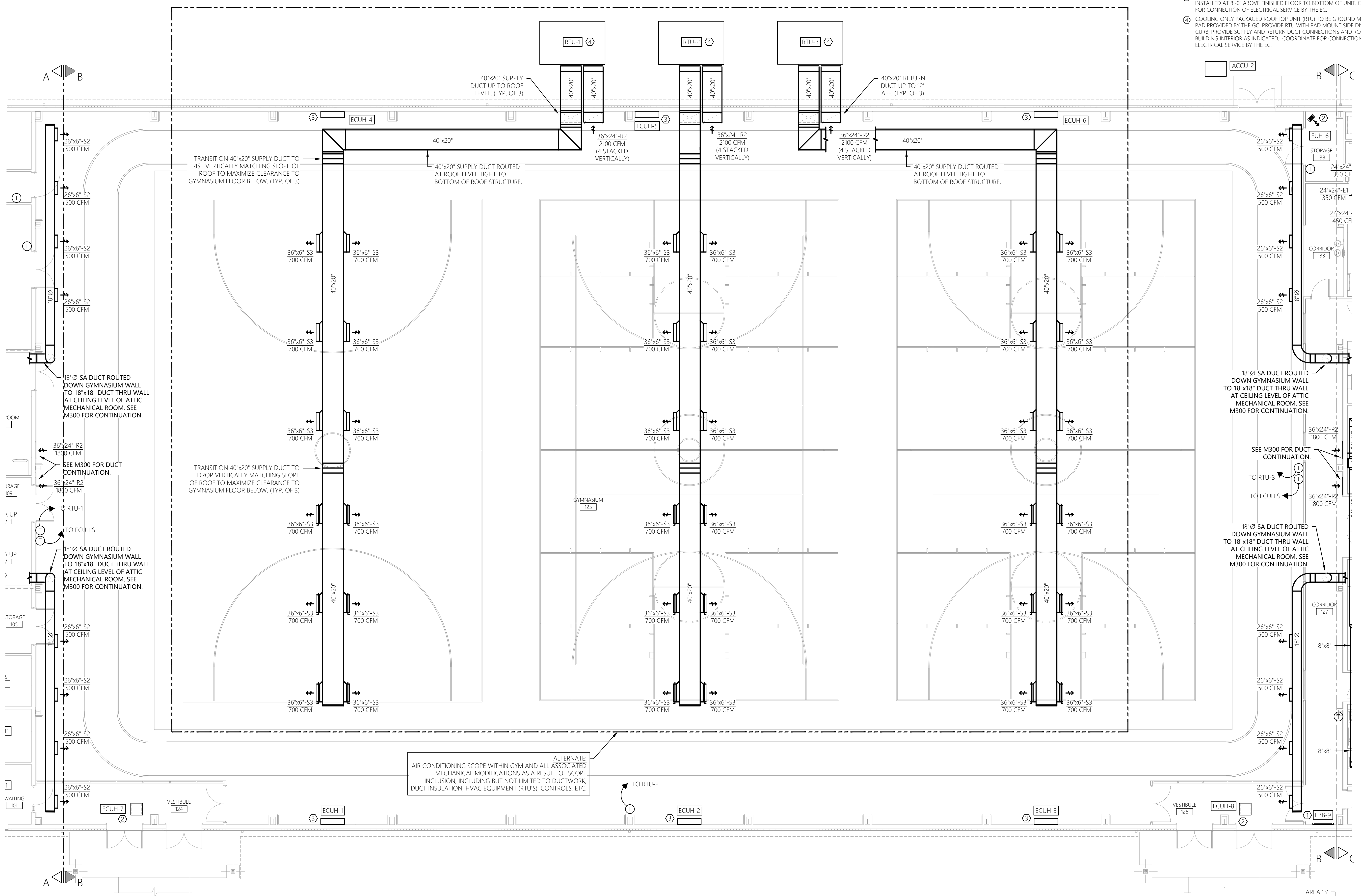
MECHANICAL  
 DUCTWORK  
 GYMNASIUM PLAN

REVISIONS

NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

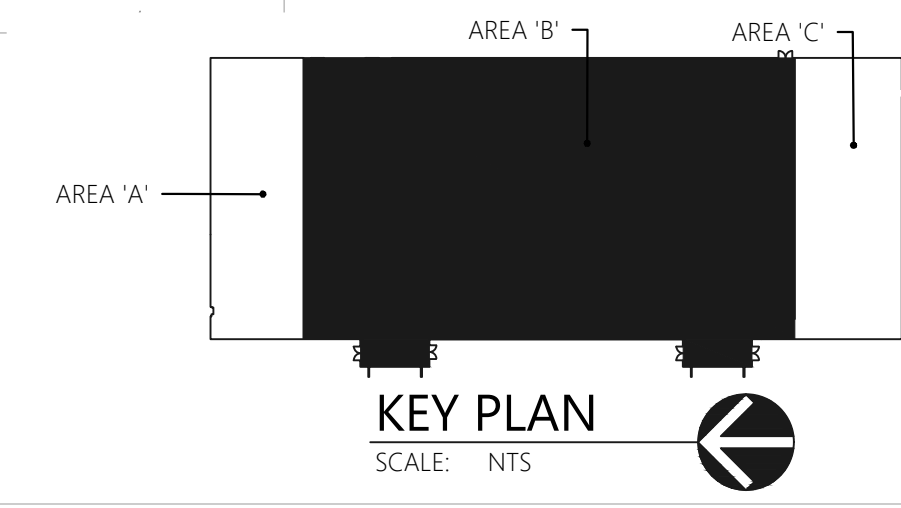
ISSUED DATE: 28 FEBRUARY, 2024  
 DESIGNED BY: JAE  
 DRAWN BY: JAE  
 CHECKED BY: JAE  
 REVIEWED BY: JAE

SHEET NO.  
**M-101**  
 PROJECT # 21-135 PHASE #

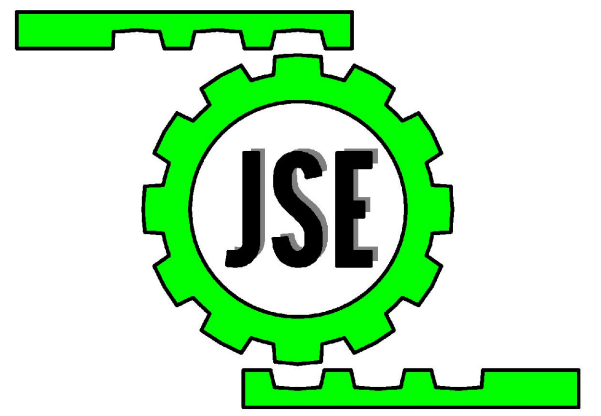


ALTERNATE AIR CONDITIONING SCOPE WITHIN GYM AND ALL ASSOCIATED MECHANICAL MODIFICATIONS AS A RESULT OF SCOPE INCLUSION, INCLUDING BUT NOT LIMITED TO DUCTWORK, DUCT INSULATION, HVAC EQUIPMENT (RTU'S), CONTROLS, ETC.

1 GYMNASIUM DUCTWORK PLAN  
 SCALE: 1/8" = 1'-0"  
 1ST FLOOR AREA 'B'



BID SET



**JADE STONE ENGINEERING**  
mechanical, electrical, plumbing



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**NEW RECREATION CENTER**  
**TOWN OF NEWBURGH**

CHADWICK LAKE PARK  
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**MECHANICAL SCHEDULES**

**REVISIONS**

NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

ISSUED DATE: 28 FEBRUARY, 2024  
DESIGNED BY: JAE  
DRAWN BY: JAE  
CHECKED BY: JAE  
REVIEWED BY: JAE

SHEET NO.

**M-500**

PROJECT # 21-135 PHASE #

VRV HEAT PUMP SCHEDULE																										
INDOOR UNIT											OUTDOOR UNIT															
UNIT TAG	LOCATION	AREA SERVED	ARRANGEMENT	SUPPLY CFM	OA CFM	COOLING COIL		HEATING COIL		ELECTRICAL			REMARKS	UNIT TAG	LOCATION	COOLING (BTU/H)	HEATING (BTU/H)	BASE REFRIGERANT CHARGE (L.B.)	ELECTRICAL				BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER INDOOR UNIT	BASIS OF DESIGN MODEL NUMBER OUTDOOR UNIT	REMARKS
						TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	HEATING CAPACITY (MBH)	EAT DB (°F)	LAT DB (°F)	VOLTS	PHASE							MCA	VOLTS	PHASE	MOP				
CCU-1	WAITING - 101	WAITING - 101	CEILING CASSETTE	420	55	6.17	6.03	9.28	65	98	208	1	0.3	ACCU-1	GROUND	74,067	65,012	25.8	460	3	25	21.1	DAIKIN	FXFQ07TVJU	REYQ96XAYDB	②
CCU-2	CONF RM - 123	CONF RM - 123	CEILING CASSETTE	512	90	12.3	10.0	18.0	65	103	208	1	0.4											FXFQ15TVJU		
CCU-3	OFFICE - 122	OFFICE - 122	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-4	FILES - 103	FILES - 103	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-5	OFFICE - 121	OFFICE - 121	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-6	BREAK RM - 106	BREAK RM - 106	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-7	OFFICE - 120	OFFICE - 120	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-8	OFFICE - 119	OFFICE - 119	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-9	OFFICE - 118	OFFICE - 118	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-10	MAINT. OFFICE - 112	MAINT. OFFICE - 112	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
CCU-11	RECEPTION - 102	RECEPTION - 102	CEILING CASSETTE	420	20	6.17	6.03	9.28	65	84	208	1	0.3											FXFQ07TVJU		
FCU-1	CHILDREN'S RM - 128	CHILDREN'S RM - 128	FAN COIL UNIT	560	300	12.36	10.87	17.40	65	84	208	1	1.5	ACCU-2	GROUND	101,167	70,156	25.8	460	3	25	21.1	DAIKIN	FXMQ15PBVIU	REYQ120XAYDB	②
FCU-2	EXERCISE RM - 131	EXERCISE RM - 131	FAN COIL UNIT	688	450	19.82	16.80	28.50	65	84	208	1	1.8											FXMQ25PBVIU		
FCU-3	MULTI-PURPOSE - 132	MULTI-PURPOSE - 132	FAN COIL UNIT	2,048	950	64.38	45.59	84.01	65	84	208	1	9.0											FXMQ72MVJU		

① PROVIDE WITH MANUFACTURER'S INTEGRAL CONDENSATE PUMP, KRP RELAY BOARD, AND 24V THERMOSTAT.  
② PROVIDE WITH LOW AMBIENT HEATING OPERATION DOWN TO 0°F AND MANUFACTURER'S RECOMMENDED REFINET BRANCH PIPING KITS AS REQUIRED. MOUNT AIR COOLED CONDENSING UNIT ON 18" EQUIPMENT BASE RAILS. DISCONNECT SWITCHES BY DIVISION 26.

BRANCH SELECTOR SCHEDULE									
UNIT TAG	LOCATION	NUMBER OF PORTS	RATED COOLING (MBH)	CAPACITY PER PORT (MBH)	ELECTRICAL			BASIS OF DESIGN MODEL NUMBER	REMARKS
					VOLTS	PH	MCA		
BS-1	STORAGE - 113	10	290	54	208	1	1.0	B510Q54TVJ	①
BS-2	STORAGE - 138	4	144	54	208	1	0.4	B54Q54TVJ	①

① SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.

ENERGY RECOVERY UNIT SCHEDULE														
UNIT TAG	LOCATION	SERVICE	MOTOR HP (EA)	NO. OF MOTORS	EXHAUST CFM	EXHAUST ESP	SUPPLY CFM	SUPPLY ESP	ELECTRICAL			BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
									MCA	VOLTS	PHASE			
ERV-1	MECH ATTIC - 201	VRV SYSTEM	0.5	1	375	0.88	1400	0.91	15	460	3	RENEWAIRE	EV450JIN	① ②
ERV-2	MECH ATTIC - 201	GYMNASIUM - 125	2.0	2	1800	1.0	2000	1.0	15	460	3	RENEWAIRE	HE-2XJINH	① ②
ERV-3	MECH ATTIC - 201	GYMNASIUM - 125	2.0	2	1800	1.0	2000	1.0	15	460	3	RENEWAIRE	HE-2XJINH	① ②
ERV-4	MECH ATTIC - 202	GYMNASIUM - 125	2.0	2	1800	1.0	2000	1.0	15	460	3	RENEWAIRE	HE-2XJINH	① ②
ERV-5	MECH ATTIC - 202	GYMNASIUM - 125	2.0	2	1800	1.0	2000	1.0	15	460	3	RENEWAIRE	HE-2XJINH	① ②
ERV-6	MECH ATTIC - 202	VRV SYSTEM	2.0	2	1700	1.0	1700	1.0	15	460	3	RENEWAIRE	HE-2XJINH	① ②

① PROVIDE WITH FACTORY CONTROLS.  
② PROVIDE WITH FACTORY MOUNTED VFD AND DISCONNECT SWITCH.  
③ PROVIDE WITH FACTORY MOUNTED MOTOR STARTER AND DISCONNECT SWITCH.

ELECTRIC DUCT HEATING COIL SCHEDULE													
UNIT TAG	LOCATION	SYSTEM	KW	CFM	ΔT (°F)	COIL INLET DIA.	ELECTRICAL			BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS	
							PHASE	VOLTS	MOP				
EHC-1	MEN - 107	ERV-1	2	375	16	SEE PLANS	3	460	15	RENEWAIRE	EK-0812002SCCHL	①	
EHC-2	MECH ATTIC - 201	ERV-2	28	2000	44	SEE PLANS	3	460	45	RENEWAIRE	EK-2414028SCCHR	①	
EHC-3	MECH ATTIC - 201	ERV-3	28	2000	44	SEE PLANS	3	460	45	RENEWAIRE	EK-2414028SCCHR	①	
EHC-4	MECH ATTIC - 202	ERV-4	28	2000	44	SEE PLANS	3	460	45	RENEWAIRE	EK-2414028SCCHR	①	
EHC-5	MECH ATTIC - 202	ERV-5	28	2000	44	SEE PLANS	3	460	45	RENEWAIRE	EK-2414028SCCHR	①	
EHC-6	MULTI-PURPOSE - 132	ERV-6	23	1700	42	SEE PLANS	3	460	35	RENEWAIRE	EK-2414023SCCHL	①	

① INTERLOCK CONTROL THROUGH ASSOCIATED ENERGY RECOVERY UNIT AND PROVIDE WITH FACTORY MOUNTED DISCONNECT SWITCH.

EXHAUST FAN SCHEDULE														
UNIT TAG	SERVICE	ARRANGEMENT	DRIVE	CFM	SP (IN WG)	FAN RPM	MAX SONES	ROOF OPENING SIZE	ELECTRICAL			BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
									HP (W)	VOLTS	PHASE			
EF-1	EXHAUST	ROOF DOWNCAST	BELT	890	0.5	1398	6	14 1/2" X 15"	1/4	115	1	GREENHECK	SQ-130	① ②
EF-2	EXHAUST	IN-LINE	DIRECT	925	0.5	1140	6	NA	1/4	115	1	GREENHECK	SQ-130	① ②

① PROVIDE WITH INSULATED SLOPED ROOF CURB AND INSECT SCREEN.  
② EXHAUST FAN OPERATION SHALL BE TIED INTO LIGHTING CIRCUIT OF TOILET ROOMS SERVED, COORDINATE WITH EC FOR CONNECTION.  
③ PROVIDE WITH FACTORY DISCONNECT SWITCH AND INLET GRILLE.

STATIONARY ROOF VENTILATOR SCHEDULE									
UNIT TAG	LOCATION	SERVICE	CFM	THROAT DIMENSIONS	HOOD DIMENSIONS	AIR PRESSURE DROP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
EH-1	ROOF	EXHAUST/ERV'S	3975	36X36	69X63	0.06	GREENHECK	FGR-36x36	① ②
IH-2	ROOF	INTAKE/ERV'S	5700	36X36	69X63	0.09	GREENHECK	FGI-36x36	① ②
EH-2	ROOF	EXHAUST/ERV'S	5300	36X36	69X63	0.09	GREENHECK	FGR-36x36	① ②

① PROVIDE WITH INSULATED SLOPED ROOF CURB AND INSECT SCREEN.  
② PROVIDE FACTORY PAINTED HOODS TO MATCH ROOF, SUBMIT COLOR SELECTION TO ARCHITECT FOR APPROVAL.

ELECTRIC BASEBOARD SCHEDULE										
UNIT TAG	VOLTS	PHASE	CAPACITY (WATTS/FT)	CAPACITY (WATTS)	ENCLOSURE HEIGHT	ENCLOSURE LENGTH	ENCLOSURE DEPTH	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
EBB-2	208	1	250	1750	6"	84"	3-1/2"	STERLING	LBT SERIES	①
EBB-3	208	1	250	1000	6"	48"	3-1/2"	STERLING	LBT SERIES	①
EBB-4	208	1	250	1000	6"	48"	3-1/2"	STERLING	LBT SERIES	①
EBB-5	208	1	250	1000	6"	48"	3-1/2"	STERLING	LBT SERIES	①
EBB-6	208	1	250	1000	6"	48"	3-1/2"	STERLING	LBT SERIES	①
EBB-7	208	1	250	1000	6"	48"	3-1/2"	STERLING	LBT SERIES	①
EBB-8	208	1	250	750	6"	36"	3-1/2"	STERLING	LBT SERIES	①
EBB-9	208	1	250	750	6"	36"	3-1/2"	STERLING	LBT SERIES	①
EBB-10	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-11	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-12	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-13	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-14	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-15	208	1	250	2000	6"	96"	3-1/2"	STERLING	LBT SERIES	①
EBB-16	208	1	250	1500	6"	72"	3-1/2"	STERLING	LBT SERIES	①
EBB-17	208	1	250	1500	6"	72"	3-1/2"	STERLING	LBT SERIES	①
EBB-18	208	1	250	1500	6"	72"	3-1/2"	STERLING	LBT SERIES	①

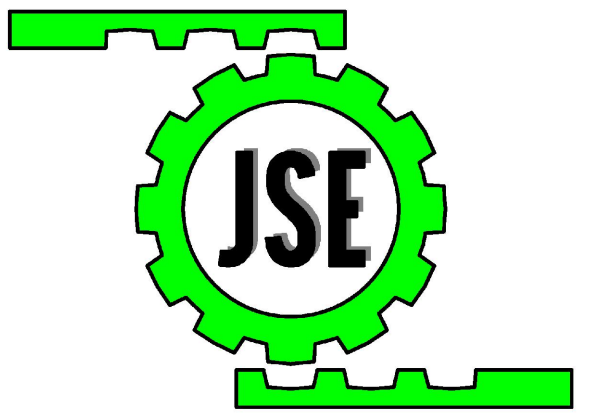
① PROVIDE WITH DOUBLE POLE DISCONNECT SWITCH AND POWER RELAY TO CONTROL BASEBOARD THRU ASSOCIATED VRV INDOOR UNIT.

ELECTRIC CABINET UNIT HEATER SCHEDULE										
UNIT TAG	LOCATION	MOUNTING ARRANGEMENT	KW	SUPPLY CFM	ELECTRICAL			BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
					VOLTS	PHASE	MCA			
ECUH-1	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-2	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-3	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-4	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-5	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-6	GYMNASIUM - 125	WALL MOUNT	10.0	500	460	3	13.0	REZTOR	EMC10-HG7	①
ECUH-7	VESTIBULE 124	RECESSED CEILING	4.0	300	208	1	19.2	QMARK	CFD-548	②
ECUH-8	VESTIBULE 126	RECESSED CEILING	4.0	300	208	1	19.2	QMARK	CFD-548	②
ECUH-9	VESTIBULE 137	RECESSED CEILING	1.5	150	120	1	12.5	QMARK	EFF1500	②

① PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, AND 24V WALL THERMOSTAT.  
② PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, BUILT-IN THERMOSTAT, AND T-BAR FRAME KIT.

ELECTRIC UNIT HEATER SCHEDULE										
UNIT TAG	LOCATION	MOUNTING ARRANGEMENT	KW	SUPPLY CFM	ELECTRICAL			BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
					VOLTS	PHASE	AMPS			
EUH-1	SPRINKLER RM - 116	WALL BRACKET	3.0	350	208	1	12.5	QMARK	MUH0321-PRO	①
EUH-2	STORAGE - 113	WALL BRACKET	3.0	350	208	1				

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 mechanical, electrical, plumbing



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**NEW RECREATION CENTER**  
 TOWN OF NEWBURGH

CHADWICK LAKE PARK  
 1702 NY-300, NEWBURGH, NY 12550

**MECHANICAL SCHEDULES**

REVISIONS		
NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

ISSUED DATE:	28 FEBRUARY, 2024
DESIGNED BY:	JAE
DRAWN BY:	JAE
CHECKED BY:	JAE
REVIEWED BY:	JAE

SHEET NO.

# M-501

ROOF TOP UNIT SCHEDULE																						
UNIT TAG	LOCATION	SERVICE	SA CFM	OA CFM (MIN)	ESP (IN WG)	TSP (IN WG)	MOTOR HP	ELECTRICAL				DX COOLING COIL					COMPRESSOR		BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS	
								MCA	VOLTS	PHASE	EER	TOTAL MBH	SENSIBLE MBH	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	# OF COMP.				COOLING STAGES
RTU-1	GROUND	GYM 125	8400	N/A	1.5	1.93	5	59.9	460	3	11	237.5	180.5	80	67	60.4	58.1	2	2	DAIKIN	DFC2404W000001C	①
RTU-2	GROUND	GYM 125	8400	N/A	1.5	1.93	5	59.9	460	3	11	237.5	180.5	80	67	60.4	58.1	2	2	DAIKIN	DFC2404W000001C	①
RTU-3	GROUND	GYM 125	8400	N/A	1.5	1.93	5	59.9	460	3	11	237.5	180.5	80	67	60.4	58.1	2	2	DAIKIN	DFC2404W000001C	①

① PROVIDE W/ LOW-LEAK INTERNAL HORIZONTAL ECONOMIZER WITH ENTHALPY SENSOR AND ECONOMIZER HOOD, BAROMETRIC RELIEF, MERV-8 FILTERS, PAD MOUNT SIDE DISCHARGE CURB, AND COMMERCIAL 7 DAY PROGRAMMABLE THERMOSTAT.

ALTERNATE:  
 AIR CONDITIONING SCOPE WITHIN GYM AND ALL ASSOCIATED MECHANICAL MODIFICATIONS AS A RESULT OF SCOPE INCLUSION, INCLUDING BUT NOT LIMITED TO DUCTWORK, DUCT INSULATION, HVAC EQUIPMENT (RTU'S), CONTROLS, ETC.

AIR INLET AND OUTLET SCHEDULE				
TYPE	DESCRIPTION	FACE SIZE (NECK SIZE)	MOUNTING TYPE	BASIS OF DESIGN MANUFACTURER AND MODEL
S1	SUPPLY	24"x24"	LAY-IN	PRICE SCD
S2	SUPPLY	26"x6"	DUCT MOUNT	PRICE SDG
S3	SUPPLY	36"x6"	DUCT MOUNT	PRICE HCD
E1	EXHAUST	24"x24"	LAY-IN	PRICE 81
R1	RETURN	24"x24"	LAY-IN	PRICE 81
R2	RETURN	36"x24"	WALL GRILLE	PRICE 90

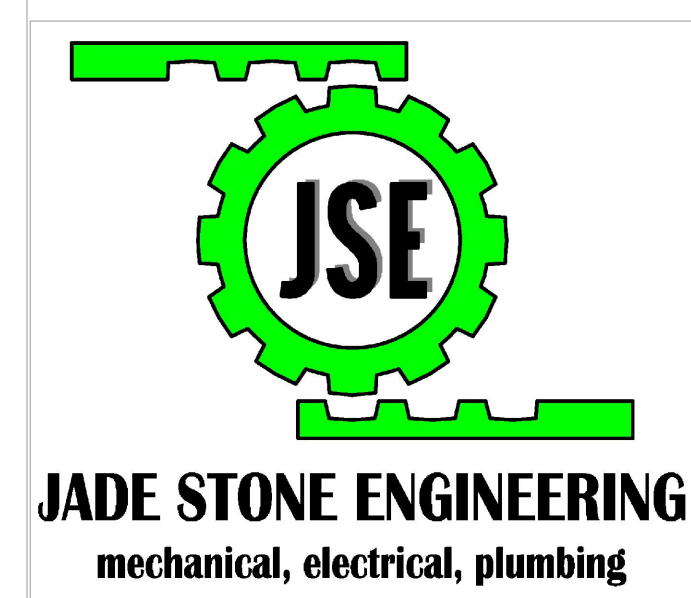
LOUVER SCHEDULE									
UNIT TAG	WIDTH	HEIGHT	CFM	FREE AREA (SQ. FT)	FACE VELOCITY (FPM)	BIRD SCREEN	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	REMARKS
LV-1	30"	24"	925	2.38	389	YES	GREENHECK	ESD-435	①
LV-2	30"	24"	925	2.38	389	YES	GREENHECK	ESD-435	①

① PROVIDE WITH MOTORIZED DAMPER.



GENERAL SHEET NOTES:  
 1. REFER TO P001 FOR PLUMBING LEGEND, ABBREVIATIONS, AND GENERAL PROJECT NOTES.

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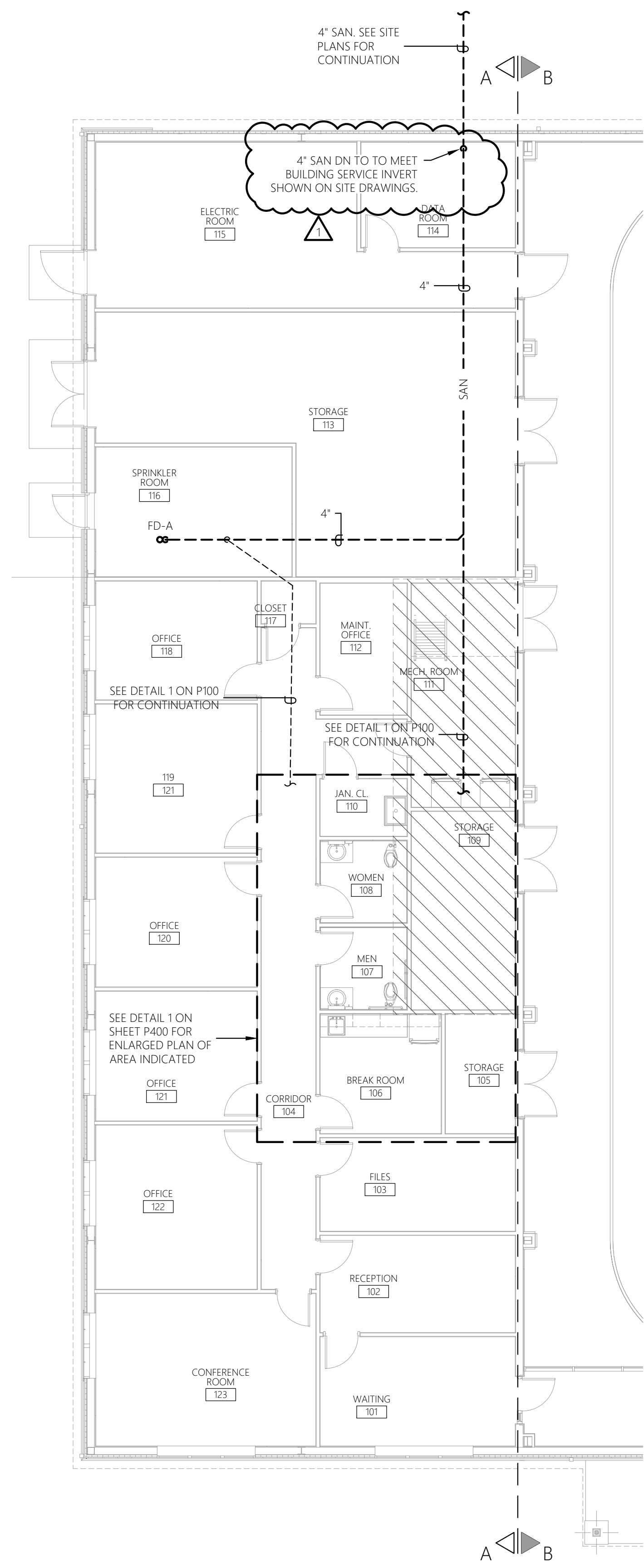
PLUMBING  
 SANITARY  
 PARTIAL PLANS

REVISIONS

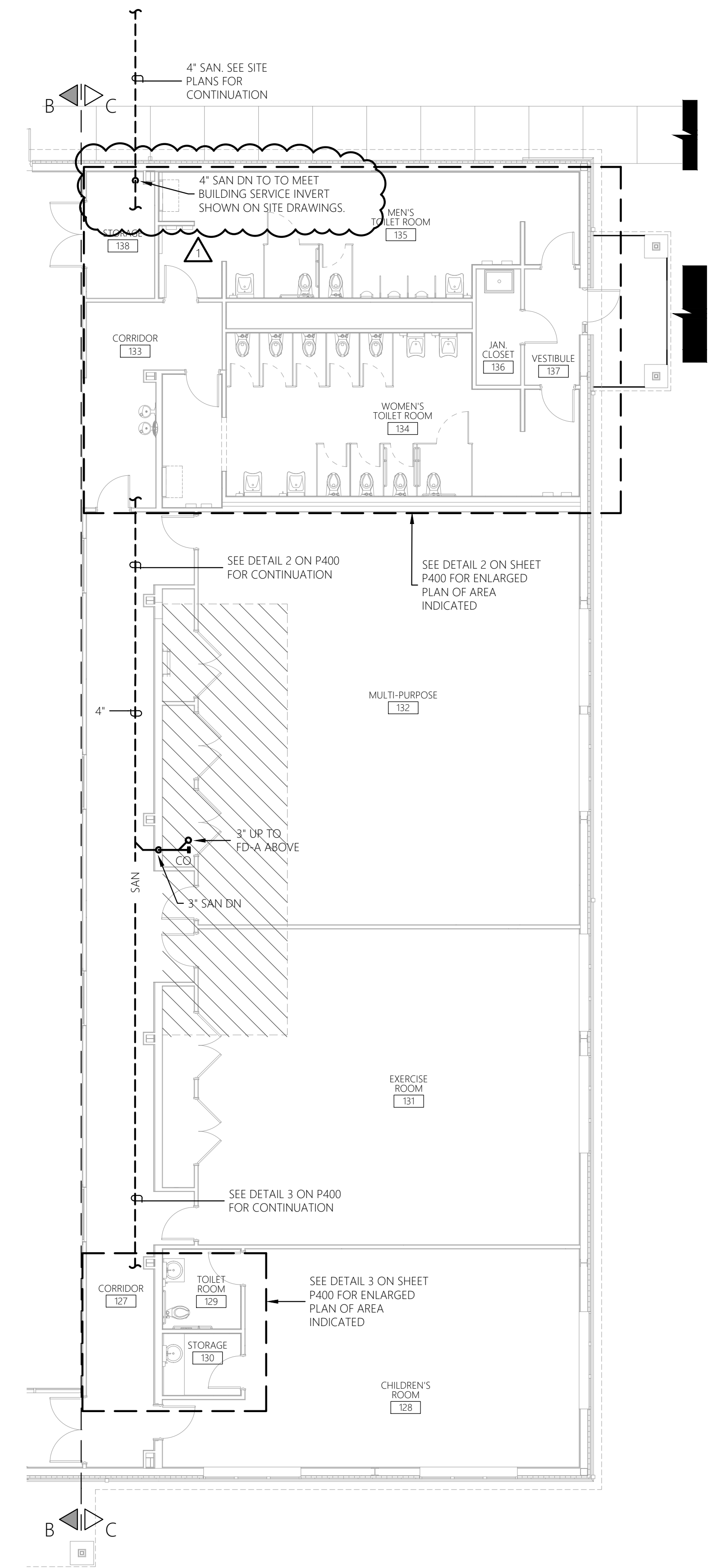
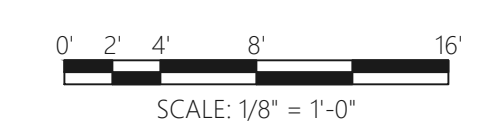
NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

ISSUED DATE: 28 FEBRUARY, 2024  
 DESIGNED BY: MAE  
 DRAWN BY: RDS  
 CHECKED BY: JAE  
 REVIEWED BY: JAE

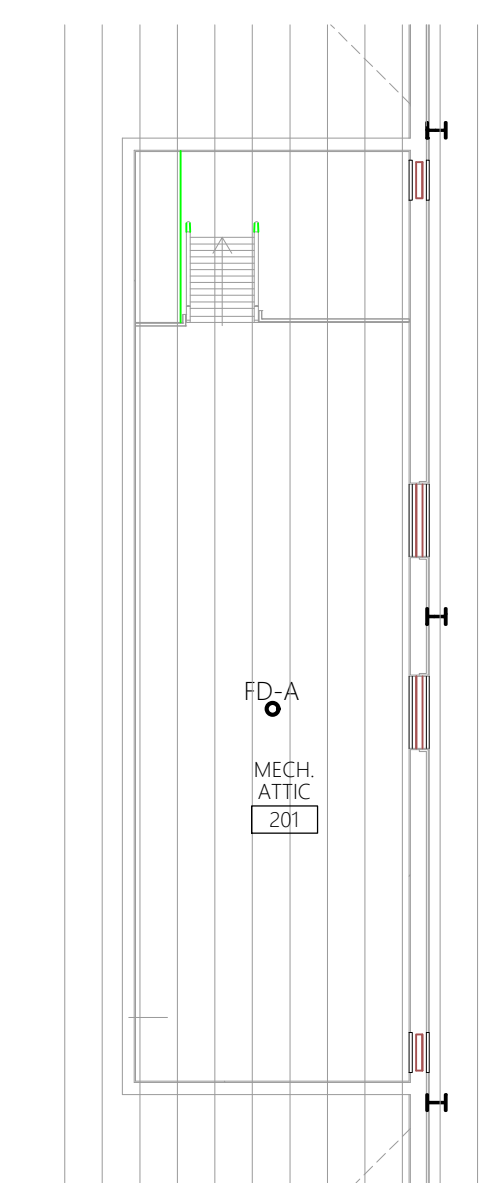
SHEET NO.  
**P-100**  
 PROJECT # 21-135 PHASE #



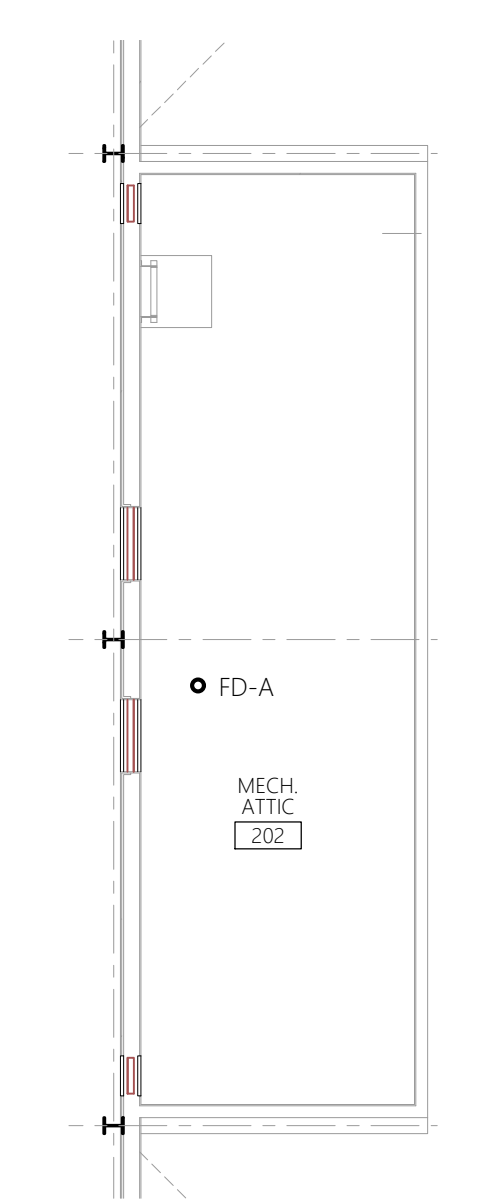
1 NORTH END SANITARY PLAN  
 SCALE: 1/8" = 1'-0" 1ST FLOOR AREA 'A'



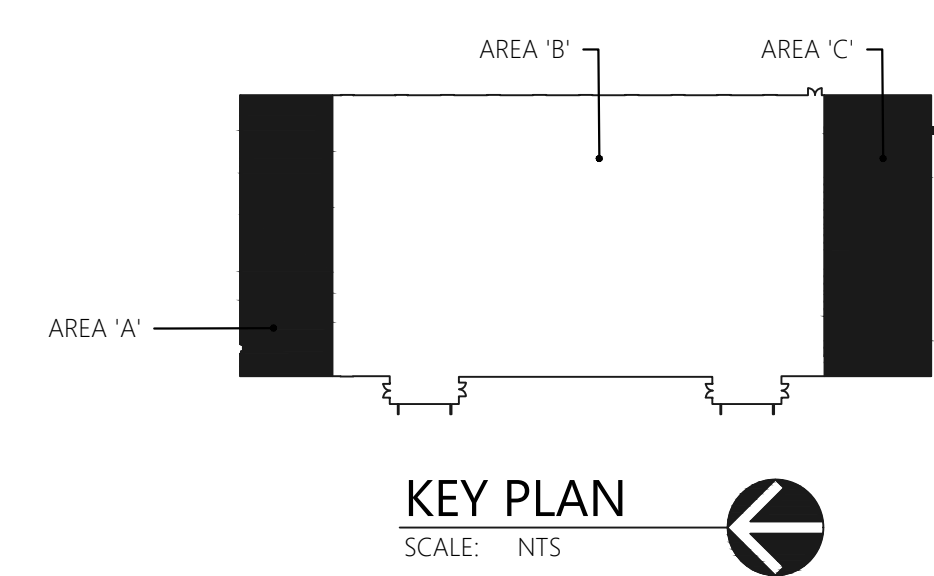
2 SOUTH END SANITARY PLAN  
 SCALE: 1/8" = 1'-0" 1ST FLOOR AREA 'C'



3 PARTIAL ATTIC SANITARY PLAN  
 SCALE: 1/8" = 1'-0" AREA 'A'



3 PARTIAL ATTIC SANITARY PLAN  
 SCALE: 1/8" = 1'-0" AREA 'C'



KEY PLAN  
 SCALE: NTS

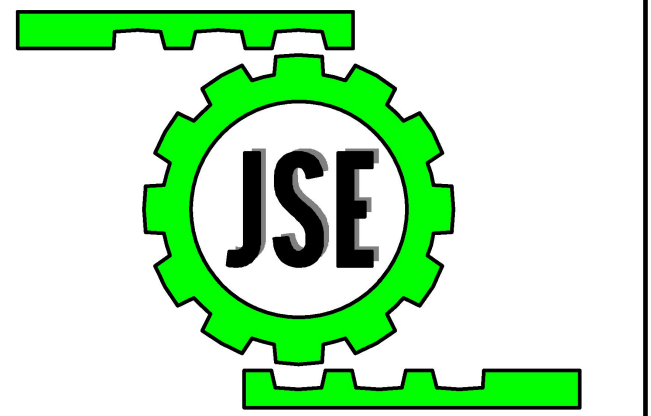
**GENERAL SHEET NOTES:**

- REFER TO E-001 FOR ELECTRICAL LEGENDS, ABBREVIATIONS AND GENERAL PROJECT NOTES.
- REFER TO E-500 FOR RACEWAY SCHEDULE FOR APPROVED RACEWAY USAGE.
- REFER TO E-503,E-504 FOR PANEL SCHEDULES FOR CIRCUIT CHARACTERISTICS.
- REFER TO E-500 FOR BRANCH CIRCUIT SCHEDULE (BCS) FOR CIRCUIT REQUIREMENTS.
- ALL CONDUCTORS SHALL BE THHN/THWN-2.
- INSTALLATION SHALL BE PER NEC1 GUIDELINES.
- PROVIDE HANGERS & SUPPORTS AS REQUIRED.
- PROVIDE GROUNDING PER NEC FOR ALL ELECTRICAL EQUIPMENT AND ASSOCIATED EQUIPMENT.
- PROVIDE SUBMITTAL DATA FOR ALL PROPOSED HARDWARE, DEVICES, CONDUIT, HANGERS, ETC. FOR ENGINEER REVIEW & APPROVAL PRIOR TO ORDERING.
- ALL CONDUCTORS AND EQUIPMENT NOT SHOWN FOR CLARITY. COORDINATE WITH ALL TRADES AND PROVIDE COMPLETE ELECTRICAL CIRCUITING FOR ALL INSTALLED EQUIPMENT. ALL REQUIREMENTS TO BE PER NEC.

**SHEET KEY NOTES:**

- PROVIDE DEDICATED 120V, 20A CIRCUIT FOR ELECTRIC HAND DRIERS. COORDINATE ROUGH-IN WITH G.C. AND MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE DEDICATED 120V, 20A CIRCUIT AND GFCI RECEPTACLE FOR WATER FOUNTAIN/BOTTLE FILLEERS. COORDINATE ROUGH-IN IN FIELD WITH P.C. AND MANUFACTURER'S RECOMMENDATIONS.

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mechanical, electrical, plumbing



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TOWN OF NEWBURGH

CHADWICK LAKE PARK  
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**ELECTRICAL**  
**POWER**  
**PARTIAL PLANS**

**REVISIONS**

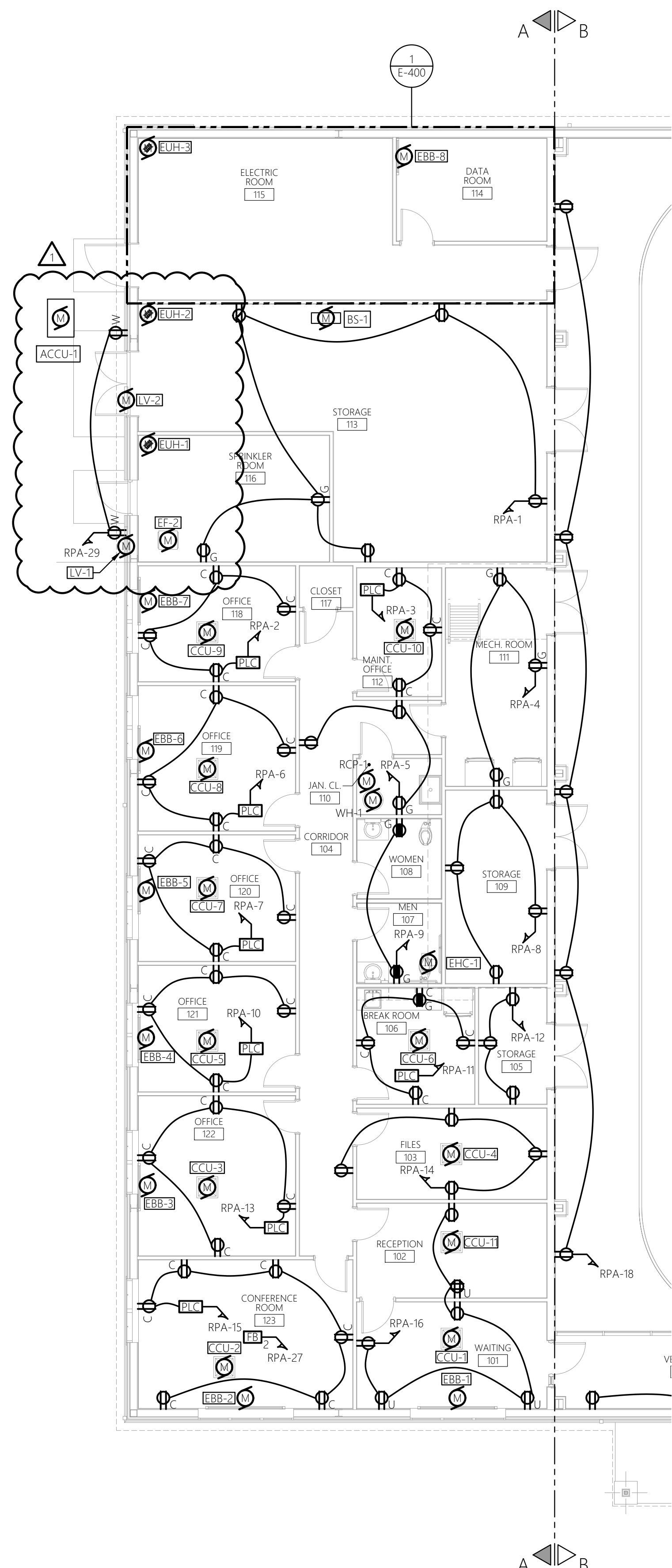
NO.	DESCRIPTION	DATE
1	Addendum 3	3/21/2024

ISSUED DATE:	28 FEBRUARY, 2024
DESIGNED BY:	BCW
DRAWN BY:	JTR
CHECKED BY:	BCW
REVIEWED BY:	BCW

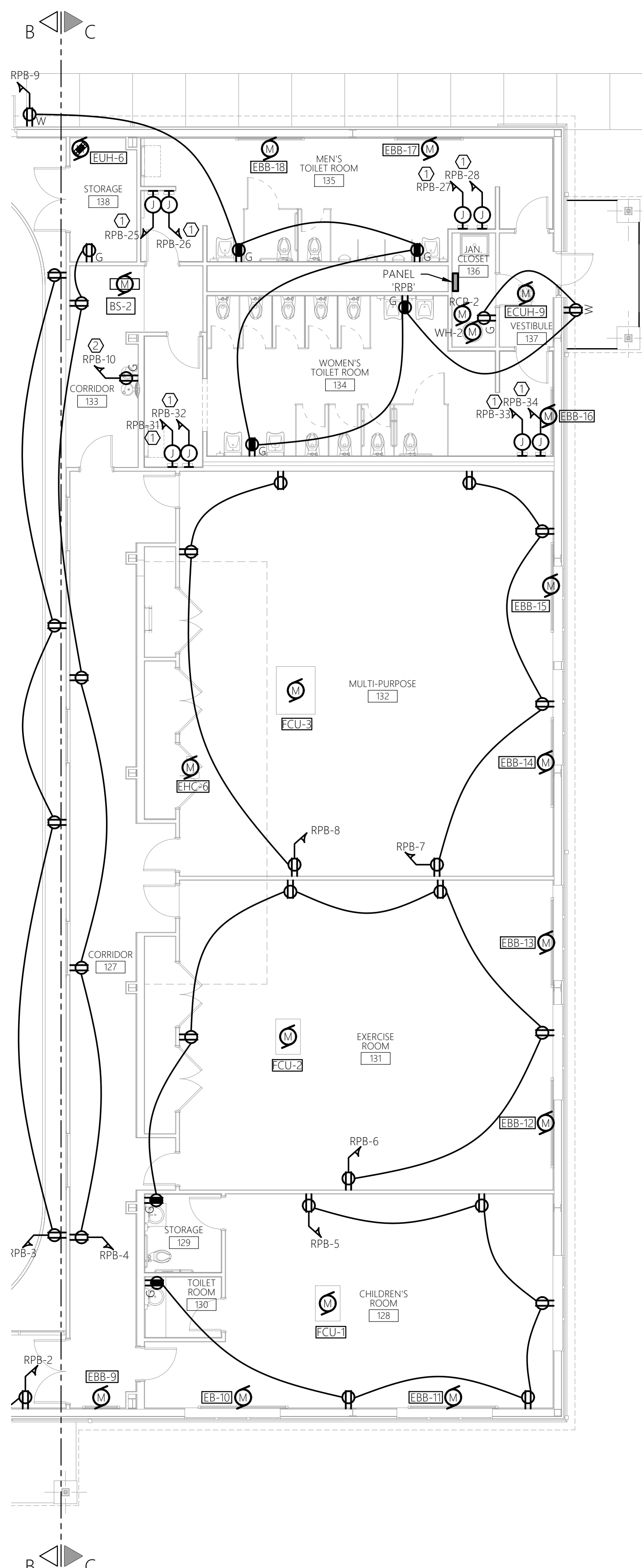
SHEET NO.

**E-100**

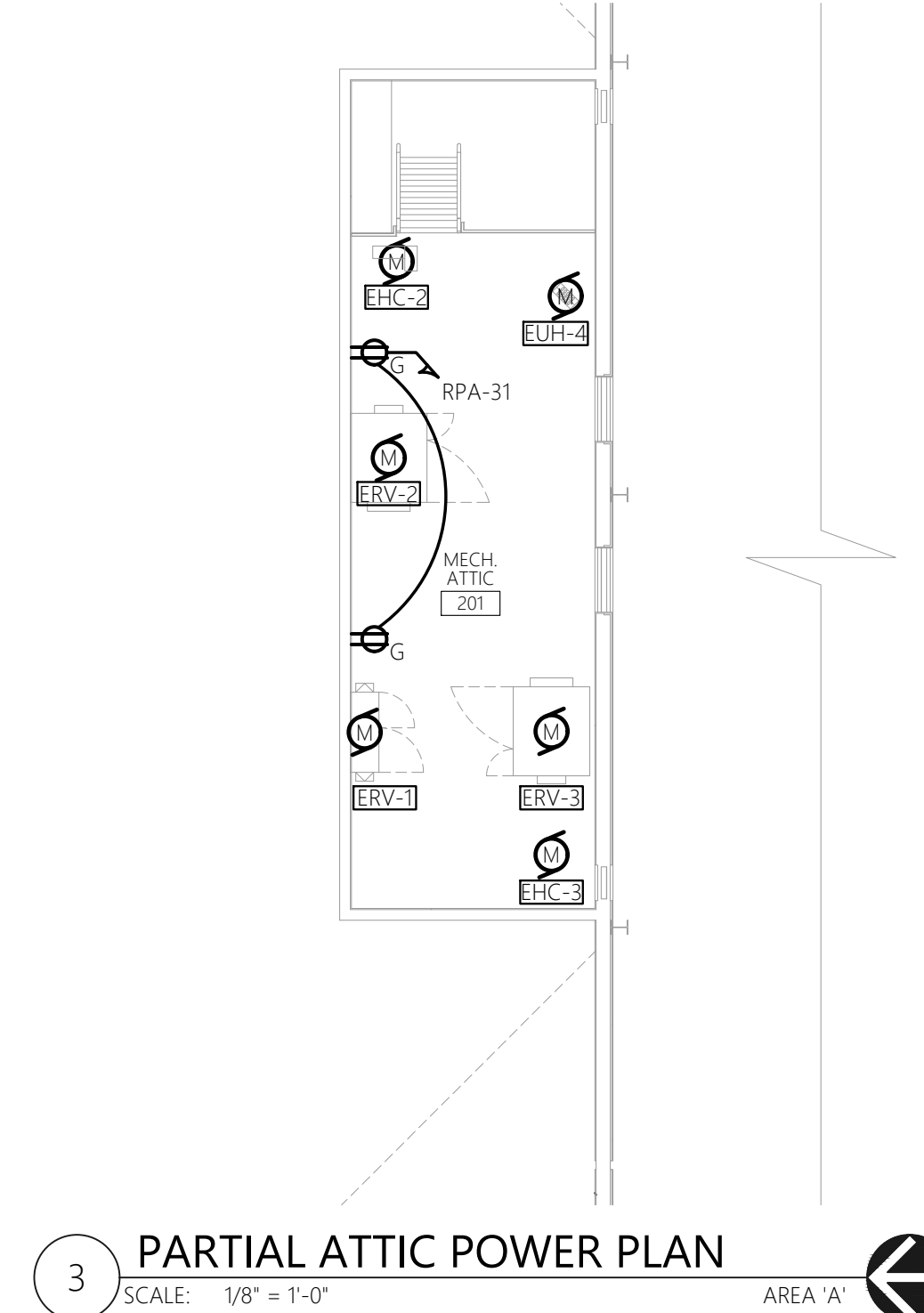
PROJECT # 21-135 PHASE #



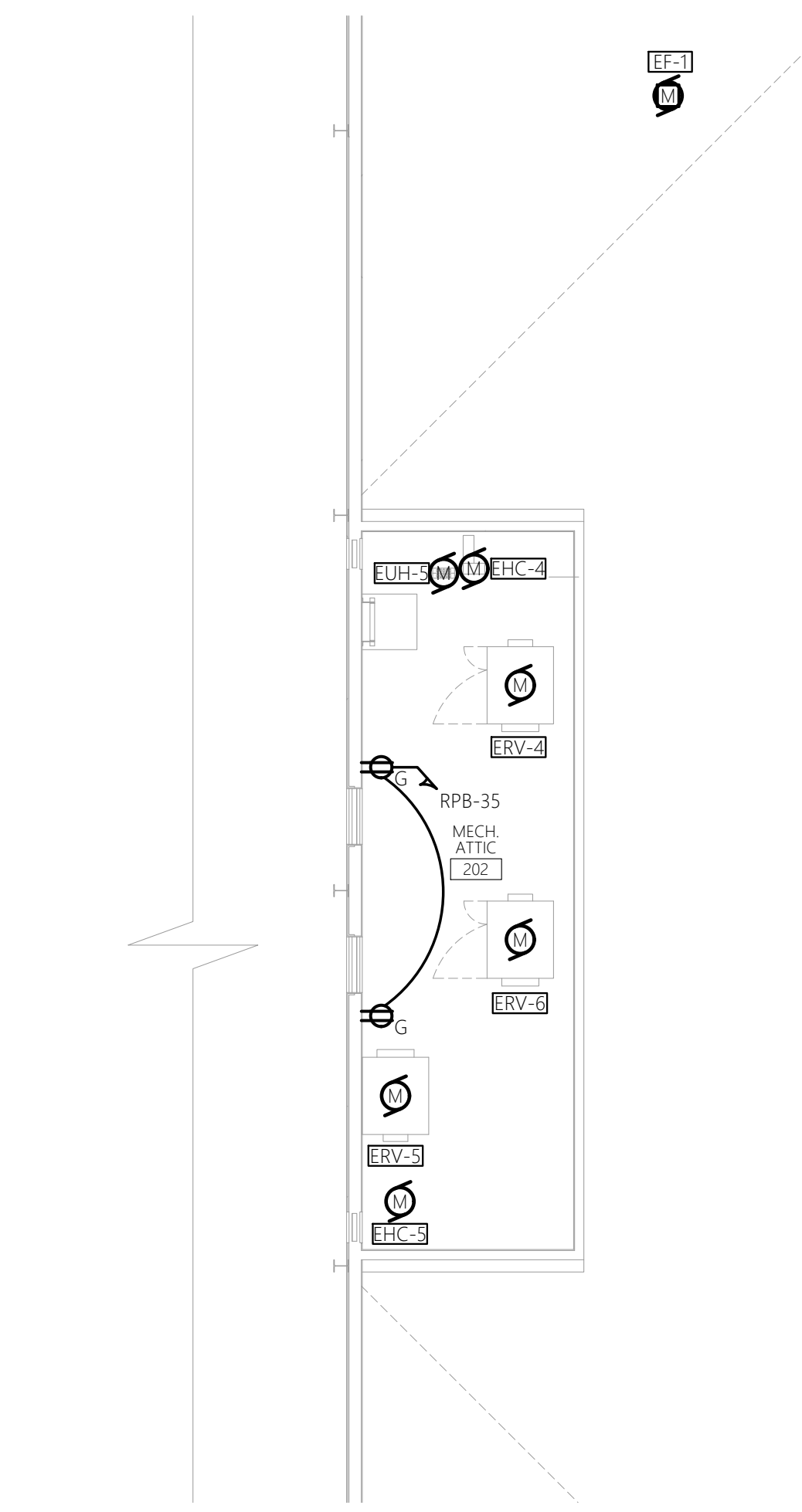
**1 NORTH END POWER PLAN**  
SCALE: 1/8" = 1'-0"  
1ST FLOOR AREA 'A'



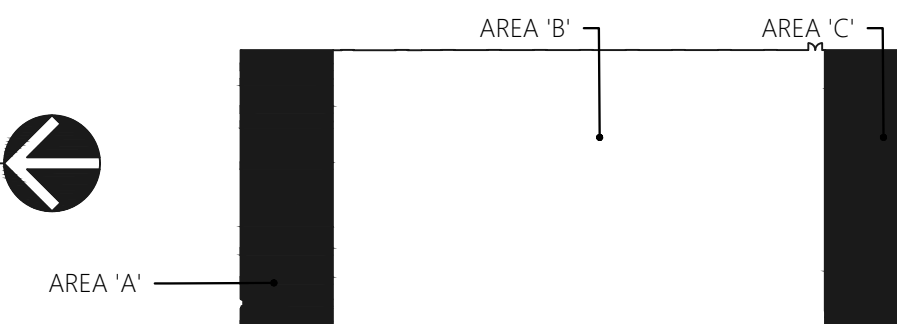
**2 SOUTH END POWER PLAN**  
SCALE: 1/8" = 1'-0"  
1ST FLOOR AREA 'C'



**3 PARTIAL ATTIC POWER PLAN**  
SCALE: 1/8" = 1'-0"  
AREA 'A'



**4 PARTIAL ATTIC POWER PLAN**  
SCALE: 1/8" = 1'-0"  
AREA 'C'



**KEY PLAN**  
SCALE: NTS

INDICATED BY		ON PLAN SHEETS		MECHANICAL EQUIPMENT CONNECTION SCHEDULE CONTINUED																		REMARKS
EQUIPMENT			ELECTRICAL LOAD				POWER CONNECTION				FIRE ALARM CONNECTIONS			DISCONNECT/SAFETY SWITCH				STARTER				REMARKS
SPECIFIC NOTES:											SPECIFIC NOTES:			TYPES:		SIZES:		TYPES:				
1. WHEN LOCATION IS NOT REFERENCED ON 'E' SHEETS, REFER TO 'M' SHEETS. 2. LOCATIONS SHOWN ARE GENERAL IN NATURE. COORDINATE WITH DIV. 23 PRIOR TO ROUGH-IN.											1. DETECTORS & REMOTE ANNUNCIATORS PROVIDED BY ELECTRICAL CONTRACTOR 2. COORDINATE INSTALLATION IN DUCTS WITH DIVISION 23. 3. ALL CABLING BY DIVISION 26/28			A: NON-FUSED B: FUSED M: MOTOR RATED SWITCH R: RECEPTACLE/CORD/PLUG N: NOT REQUIRED C: CKT BREAKER WITHIN SIGHT FM: FACTORY MOUNTED DISC.		AF: AMPERE FRAME AT: FUSE SIZE (RK5, UON)		VARIABLE FREQUENCY DRIVE W/ INTEGRAL DISC. AQUA: AQUA STAT 24T: 24V THERMOSTAT M: MOTOR RATED SWITCH - MANUAL STARTER ECM: ECM MOTOR N: NOT REQUIRED P: PACKAGED CONTROLLER BY MANUFACTURER LVT: LINE VOLT T-STAT (R: INDICATES REVERSE TYPE)				
EQUIPMENT TAG	EQUIPMENT TYPE	LOCATION ON PLAN	FLA	KVA	V	PH	HOMERUN TO	CKT BKR	CONDUCTORS & CONDUIT	CONNECTION BY DIVISION:	SUPPLY DUCT SMOKE	RETURN DUCT SMOKE	UNIT SHUTDOWN BY DUCT SMOKE	DISCONNECT TYPE/SIZE	NEMA ENCLOSURE TYPE	FURNISHED BY DIVISION:	INSTALLED BY DIVISION:	STARTER TYPE	NEMA ENCLOSURE TYPE	FURNISHED BY DIVISION:	FINAL CONNECTION BY DIVISION:	REMARKS
ECUH-1	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-2	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-3	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-4	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-5	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-6	CABINET UNIT HEATER	GYMNASIUM - 125	13 MCA	10.0	480	3	PANEL MP	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
ECUH-7	CABINET UNIT HEATER	VESTIBULE 124	19-2 MCA	4.0	208	1	PANEL MPL1	30/2	(2)#10 & #10G, 3/4" C	26	NO	NO	NO	FM	1	23	26	LVT	-	23	26	
ECUH-8	CABINET UNIT HEATER	VESTIBULE 126	19-2 MCA	4.0	208	1	PANEL MPL1	30/2	(2)#10 & #10G, 3/4" C	26	NO	NO	NO	FM	1	23	26	LVT	-	23	26	
ECUH-9	CABINET UNIT HEATER	VESTIBULE 137	12-5 MCA	1.5	120	1	PANEL MPL1	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	LVT	-	23	26	
EUH-1	UNIT HEATER	SPRINKLER RM - 116	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EUH-2	UNIT HEATER	STORAGE - 113	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EUH-3	UNIT HEATER	ELECTRIC RM - 115	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EUH-4	UNIT HEATER	MECH ATTIC - 201	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EUH-5	UNIT HEATER	MECH ATTIC - 202	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EUH-6	UNIT HEATER	STORAGE-138	12.5	3.0	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	24T	-	23	26	
EF-1	EXHAUST FAN	ROOF	-	1/4 HP	120	1	PANEL MPL2	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	3R	23	26	ECM	-	23	26	④
EF-2	EXHAUST FAN	SPRINKLER RM - 116	-	1/4 HP	120	1	PANEL MPL2	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	FM	1	23	26	P	-	23	26	
LV-1	LOUVER	STORAGE - 113	-	-	120	1	PANEL MPL1	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	23	26	P	-	23	26	⑤
LV-2	LOUVER	SPRINKLER RM - 116	-	-	120	1	PANEL MPL1	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	23	26	P	-	23	26	⑥
ACCU-1	AIR COOLED CONDENSING UNIT	OUTSIDE	21.1 MCA	-	480	3	PANEL MDP	30/3	(3)#10 & #10G, 3/4" C	26	NO	NO	YES	A	3R	26	26	P	-	23	26	
ACCU-2	AIR COOLED CONDENSING UNIT	OUTSIDE	21.1 MCA	-	480	3	PANEL MDP	30/3	(3)#10 & #10G, 3/4" C	26	NO	NO	YES	A	3R	26	26	P	-	23	26	
BS-1	BRANCH SELECTOR	STORAGE - 113	1.0 MCA	-	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	N	-	-	-	N	-	-	-	
BS-2	BRANCH SELECTOR	CORRIDOR - 133	0.4 MCA	-	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	N	-	-	-	N	-	-	-	
FCU-1	FAN COIL UNIT	CHILDREN'S RM - 128	1.5 MCA	-	208	1	PANEL MPL1	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	26	26	24T	-	23	26	
FCU-2	FAN COIL UNIT	EXERCISE - 131	1.8 MCA	-	208	1	PANEL MPL1	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	26	26	24T	-	23	26	
FCU-3	FAN COIL UNIT	MULTI-PURPOSE - 132	9.0 MCA	-	208	1	PANEL MPL2	20/2	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	A	1	26	26	24T	-	23	26	
RCP-1	RECIRC. PUMP	JAN. CLOSET - 110	1/6HP	-	120	1	PANEL MPL1	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	26	26	AQUA	-	22	26	
RCP-2	RECIRC. PUMP	JAN. CLOSET - 136	1/6HP	-	120	1	PANEL MPL1	20/1	(2)#12 & #12G, 3/4" C	26	NO	NO	NO	M	1	26	26	AQUA	-	22	26	
WH-1	WATER HEATER	JAN. CLOSET - 110	-	4.5	208	3	PANEL MPL1	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	A	1	26	26	P	-	22	26	
WH-2	WATER HEATER	JAN. CLOSET - 136	-	4.5	208	3	PANEL MPL1	20/3	(3)#12 & #12G, 3/4" C	26	NO	NO	NO	A	1	26	26	P	-	22	26	

**GENERAL SCHEDULE NOTES:**

- CONTRACTOR TO INSTALL STARTER/DISCONNECT ADJACENT TO UNIT. INSTALLATION TO COMPLY WITH NEC ARTICLE 110.26.
- EQUIPMENT FURNISHED BY OTHERS. COORDINATE WITH ASSOCIATED TRADE CONTRACTOR.
- CONFIRM HP, VOLTAGE AND PHASE CONNECTIONS PRIOR TO ROUGH-IN OF EQUIPMENT. COORDINATION REQUIRED BETWEEN TRADES.
- STARTERS SHALL BE NEMA STYLE AND SIZED BASED ON ELECTRICAL LOAD DATA LISTED ON SCHEDULE.
- MOTOR RATED SWITCHES SHALL BE EQUIPPED WITH HEATERS, WHICH SHALL BE SIZED BASED ON NAMEPLATE DATA (TO BE OBTAINED IN FIELD), NOT ON ELECTRICAL LOAD DATA ON SCHEDULE.
- CIRCUIT BREAKERS INDICATED ON SCHEDULE ABOVE SHALL BE PROVIDED BY THE CONTRACTOR IN THE PROPOSED PANEL (THEY ARE NOT EXISTING BREAKERS, UNLESS INDICATED ON THE PANELBOARD SCHEDULE).
- FOR THIS PROJECT, THE FOLLOWING HAS BEEN ASSUMED BY THE ENGINEER:  
DIVISION 26: ELECTRICAL SUB  
DIVISION 23: MECHANICAL SUB AND/OR CONTROLS SUB  
DIVISION 22: PLUMBING SUB

**REMARKS:**

④ EXHAUST FAN TO BE ENABLED BY TOILET ROOM LIGHTING OCCUPANCY/VACANCY SENSOR. PROVIDE ALL NECESSARY FIELD WIRING/CONNECTIONS. COORDINATE WITH M.C.

⑤ PROVIDE INTERLOCK CIRCUITRY BETWEEN EF-2 AND LV-1. COORDINATE ALL REQUIREMENTS WITH M.C.

⑥ PROVIDE INTERLOCK CIRCUITRY BETWEEN EF-2 AND LV-2. COORDINATE ALL REQUIREMENTS WITH M.C.

DUCT BANK SCHEDULE							
DESIGNATION	TYPE	ORIGIN	DESTINATION	CIRCUIT			REMARKS
				CONDUCTORS/CONDUIT	ORIGIN	DESTINATION	
DB-01	FLOWABLE FILL	UTILITY POLE	PROPOSED UTILITY PAD-MOUNTED TRANSFORMER	(4)#2, 4" C 15KV FEEDER	UTILITY	PROPOSED UTILITY PAD-MOUNTED TRANSFORMER	
DB-02	FLOWABLE FILL	PROPOSED UTILITY PAD-MOUNTED TRANSFORMER	BUILDING	SPARE 4" CONDUIT	EXISTING RISER POSE	MDP (ELECTRIC ROOM)	
DB-03	FLOWABLE FILL	EFFLUENT PUMP LIFT STATION CONTROL PANEL	EFFLUENT PUMP LIFT STATION	(3) SETS OF ((4)#300, EACH IN 3" C)	PROPOSED UTILITY PAD-MOUNTED TRANSFORMER	ELECTRIC ROOM	
DB-04	FLOWABLE FILL	BUILDING	DATA ROOM	REFER TO RISER DIAGRAM- SHEET E702	CONTROL PANEL	SUBMERSIBLE PUMPS	
DB-05	FLOWABLE FILL	BUILDING	CISTERN	4" CONDUIT, CABLING BY INTERNET SERVICE PROVIDER	UTILITY POLE	DATA RACK	
DB-05	FLOWABLE FILL	BUILDING	CISTERN	REFER TO RISER DIAGRAM- SHEET E702	HOA SWITCH CONTROL PANEL	CISTERN PUMP	

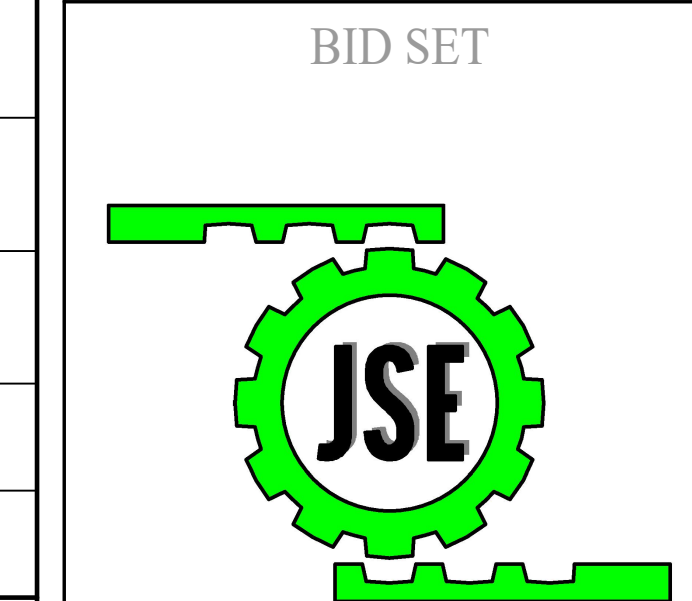
**GENERAL SCHEDULE NOTES:**

- VERIFY CIRCUIT REQUIREMENTS WITH APPLICABLE EQUIPMENT MANUFACTURERS. PROVIDE CONDUCTORS AND CONDUIT AS REQUIRED.
- DUCT BANK SWEEPS SHALL NOT HAVE LESS THAN 20'-0" RADIUS UNLESS OTHERWISE NOTED.
- COORDINATE DUCT BANK LOCATIONS AND INSTALLATIONS WITH EXISTING AND PROPOSED STRUCTURES, EQUIPMENT, AND PIPING SYSTEMS.

**REMARKS:**



33 Airport Center Drive, Suite 202 111 Wheatfield Drive, Suite 1  
New Windsor, NY 12553 Milford, PA 18337  
(845) 567-3100 (570) 296-2765



**JADE STONE ENGINEERING**  
mechanical, electrical, plumbing



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**NEW RECREATION CENTER**  
**TOWN OF NEWBURGH**

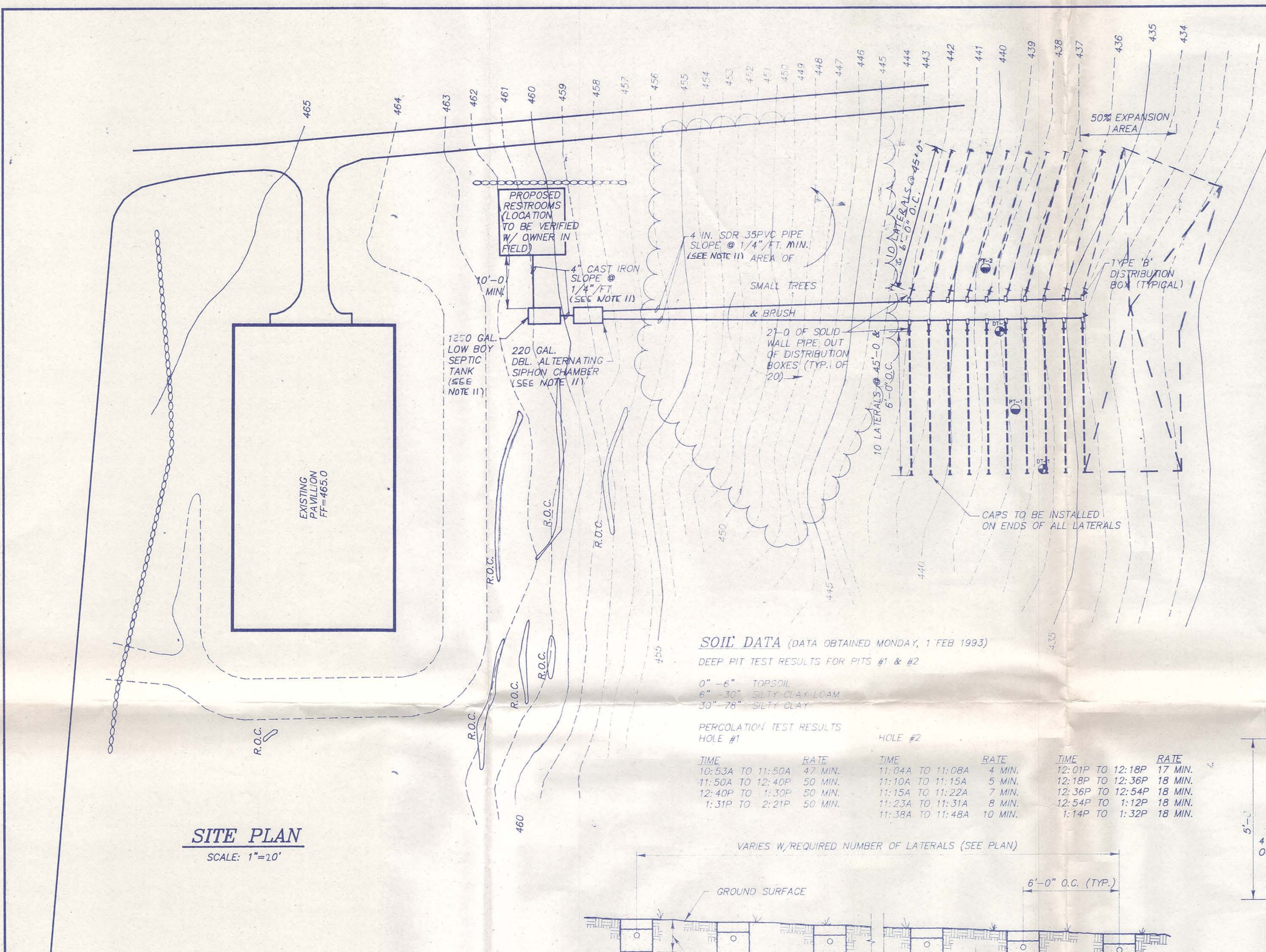
CHADWICK LAKE PARK  
1702 NY-300, NEWBURGH, NY 12550

**ELECTRICAL SCHEDULES**

NO.	DESCRIPTION	DATE
1	Addendum 1	3/6/2024
2	Addendum 3	3/21/2024

ISSUED DATE: 28 FEBRUARY, 2024  
DESIGNED BY: BCW  
DRAWN BY: JTR  
CHECKED BY: BCW  
REVIEWED BY: BCW

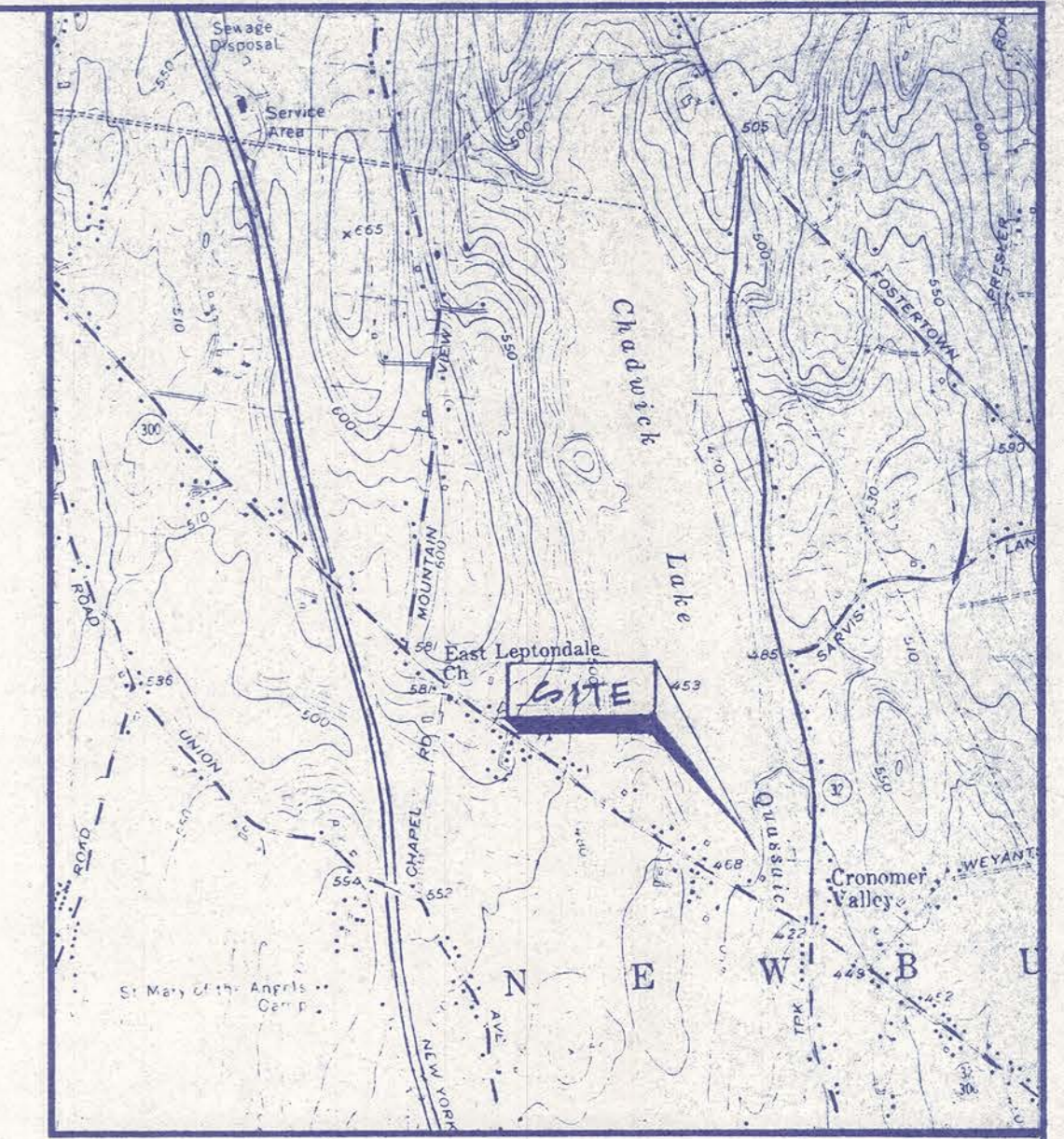
SHEET NO.  
**E-501**  
PROJECT # 21-135 PHASE #



**SITE PLAN**  
SCALE: 1"=10'

**NOTES:**

- ALL EQUIPMENT AND ITS INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AND SUBJECT TO THE INSPECTION AND APPROVAL OF ALL APPLICABLE LOCAL AND GOVERNMENTAL AGENCIES HAVING JURISDICTION INCLUDING THE FOLLOWING:  
TOWN OF NEWBURGH BLDG. DEPT.
  - PRECAST CONCRETE SEPTIC TANK CAPACITY SHOWN HEREON IS MINIMUM; 1,250 GALLON CAPACITY IS RECOMMENDED
  - LATERALS FROM DISTRIBUTION BOX AND DROP DISTRIBUTION BOX OUTLETS SHALL BE SOLID WALL PIPE FOR A MINIMUM DISTANCE OF TWO FEET.
  - MINIMUM SEPARATIONS REQUIRED FROM SEPTIC DISPOSAL SYSTEM:  
PROPERTY LINE ----- 10 FT.  
WELLS UPGRADE FROM SANITARY SYSTEM ----- 100 FT.  
WELLS DOWNGRADE FROM SANITARY SYSTEM ----- 200 FT.  
HOUSE TO ABSORPTION SYSTEM ----- 20 FT.  
HOUSE TO SEPTIC TANK ----- 10 FT.  
SURFACE WATER TO ABSORPTION SYSTEM ----- 100 FT.
  - SANITARY DISPOSAL SYSTEM DESIGN BASED ON:  
PERCOLATION TEST PERFORMED - 1 FEB. 1993  
STABILIZED PERCOLATION RATE - 50 MIN. PER IN.  
DESIGN FLOW RATE ----- 800 GPD  
ABSORPTIVE RATE ----- 0.45 GPD/SF  
ABSORPTIVE TRENCH ----- 888 LF REQUIRED  
900 LF PROVIDED
- DESIGN BASED ON 200 PICNICERS AT 5 GPD AS PER NYSDEC, DESIGN STANDARDS FOR WASTEWATER TREATMENT WORKS 1988. DESIGN FLOW INCLUDES A 20% REDUCTION FOR WATER SAVING FIXTURES.
- DOSING CHAMBER SIZING:  
DOSING VOLUME = 75% PIPE CAPACITY  
= 0.75 X 0.65 GAL/FT X 450 FT  
= 219.37 GAL. OR 220 GAL.
- PRECAST CONCRETE STRUCTURES AS MANUFACTURED BY ROTONDO & SONS, INC., REHOBOTH, MASS.; WOODARD CONCRETE PRODUCTS, INC., BULLVILLE, NEW YORK; OR ACCEPTABLE EQUAL.
  - CELLAR, ROOF AND FOOTING DRAINS TO BE DIVERTED FROM SANITARY SYSTEM AREAS.
  - SURFACE WATER TO BE DIVERTED FROM SANITARY SYSTEM AREAS AND WELLS.
  - OBSERVATION OF THE SYSTEM INSTALLATION WILL BE REQUIRED, THE OWNER AND/OR CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE OF THE START OF WORK.
  - ALL PIPES AT STRUCTURES AND CONTACT SURFACES ON SEPTIC TANK, DISTRIBUTION BOXES & MANHOLES TO HAVE AN ASPHALTIC SEAL OR ACCEPTABLE EQUAL.
  - THE INSTALLATION OF THE SEPTIC TANK AND DOSING CHAMBER AND ASSOCIATED PIPING WILL REQUIRE THE REMOVAL OF BEDROCK. THIS ROCK REMOVAL SHALL BE DEEMED INCLUDED IN THE BID PRICE
  - ALL DISTURBED AREAS SHALL BE RESTORED WITH A MIN. OF 4" TOPSOIL AND PERENNIAL RYE GRASS AND MULCHED.
  - UTILIZE PROPER EROSION CONTROL MEASURES CONTINUOUSLY TO PREVENT EROSION UNTIL GROUND COVER IS STABILIZED.
  - SIPHON CHAMBER OPERATION SHALL BE WITNESSED BY ENGINEER AND BUILDING INSPECTOR PRIOR TO BACKFILLING SYSTEM.



**LOCATION MAP**  
SCALE: 1"= 2000'

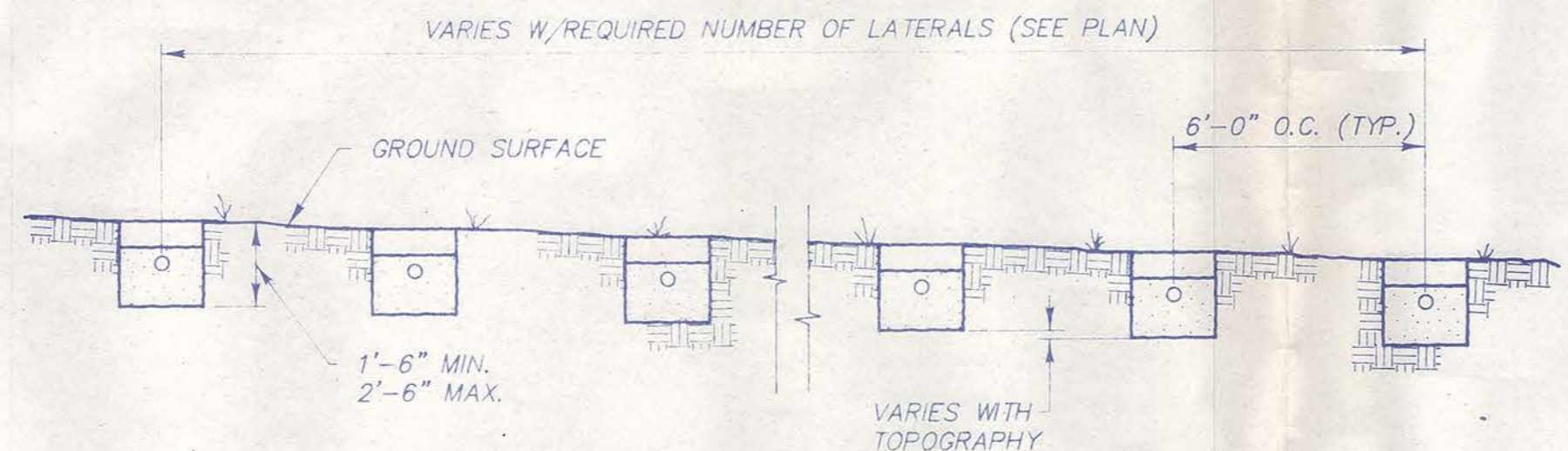
**SOIL DATA** (DATA OBTAINED MONDAY, 1 FEB 1993)

DEEP PIT TEST RESULTS FOR PITS #1 & #2

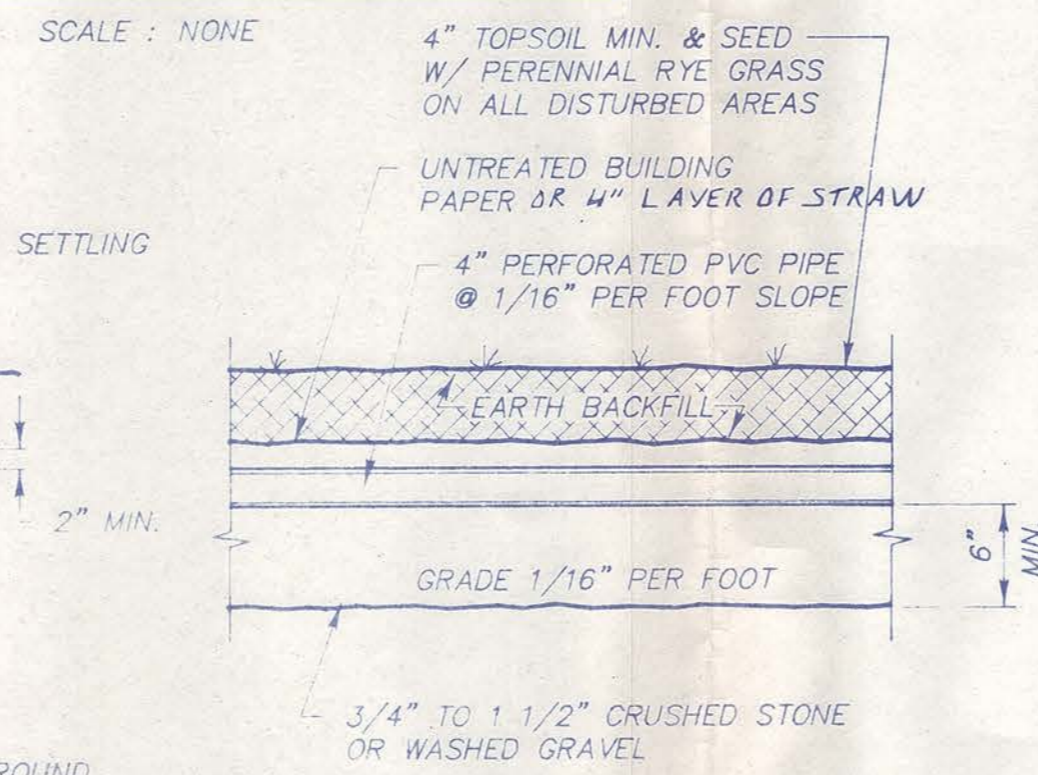
0" - 6" TOPSOIL  
6" - 32" SILTY CLAY LOAM  
30" - 78" SILTY CLAY

PERCOLATION TEST RESULTS

HOLE #1		HOLE #2	
TIME	RATE	TIME	RATE
10:53A TO 11:50A	47 MIN.	11:04A TO 11:08A	4 MIN.
11:50A TO 12:40P	50 MIN.	11:10A TO 11:15A	5 MIN.
12:40P TO 1:30P	50 MIN.	11:15A TO 11:22A	7 MIN.
1:31P TO 2:21P	50 MIN.	11:23A TO 11:31A	8 MIN.
		11:38A TO 11:48A	10 MIN.



**DISTRIBUTION FIELD SECTION**

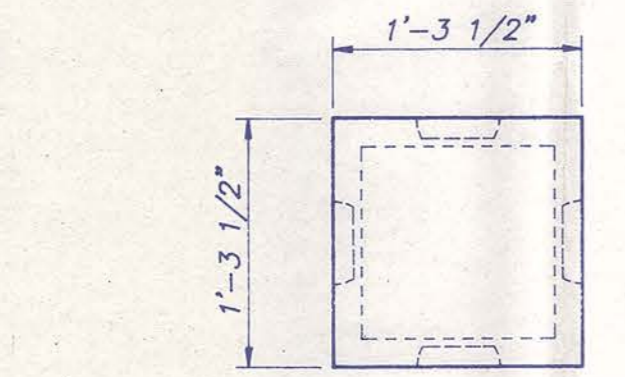


**ABSORPTION TRENCH DETAILS**

SCALE: NONE

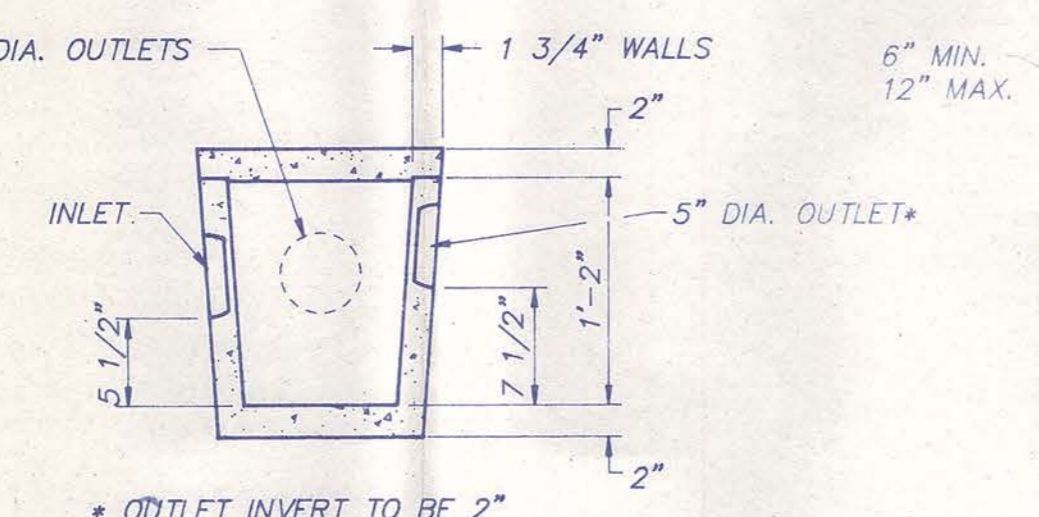
**LEGEND**

- DEEP TEST LOCATIONS
- PERCOLATION TEST LOCATIONS
- 1'-0" CONTOURS
- 5'-0" CONTOURS
- 4" PERFORATED PVC PIPE
- STONE WALLS
- R.O.C. ROCK OUTCROPS



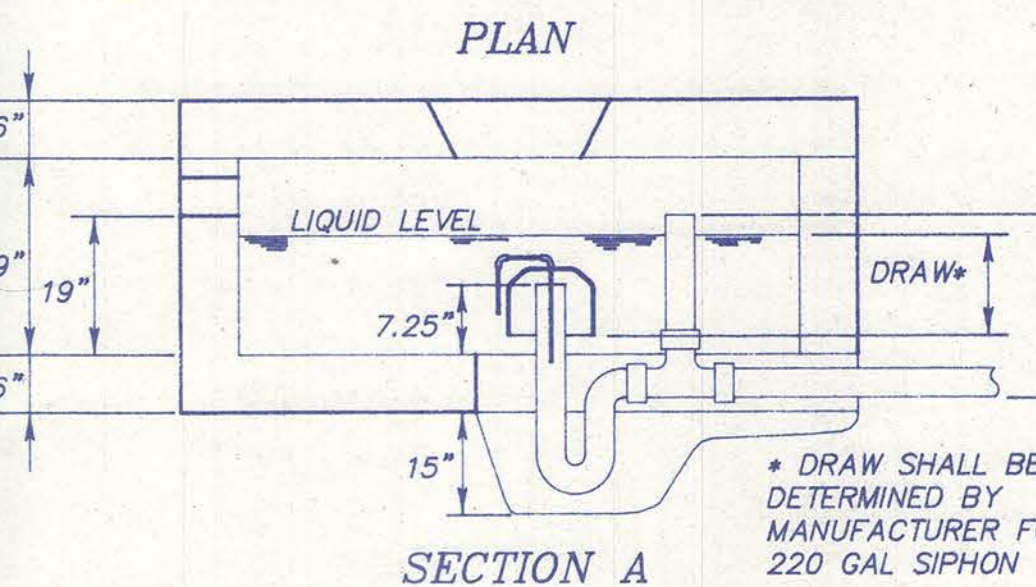
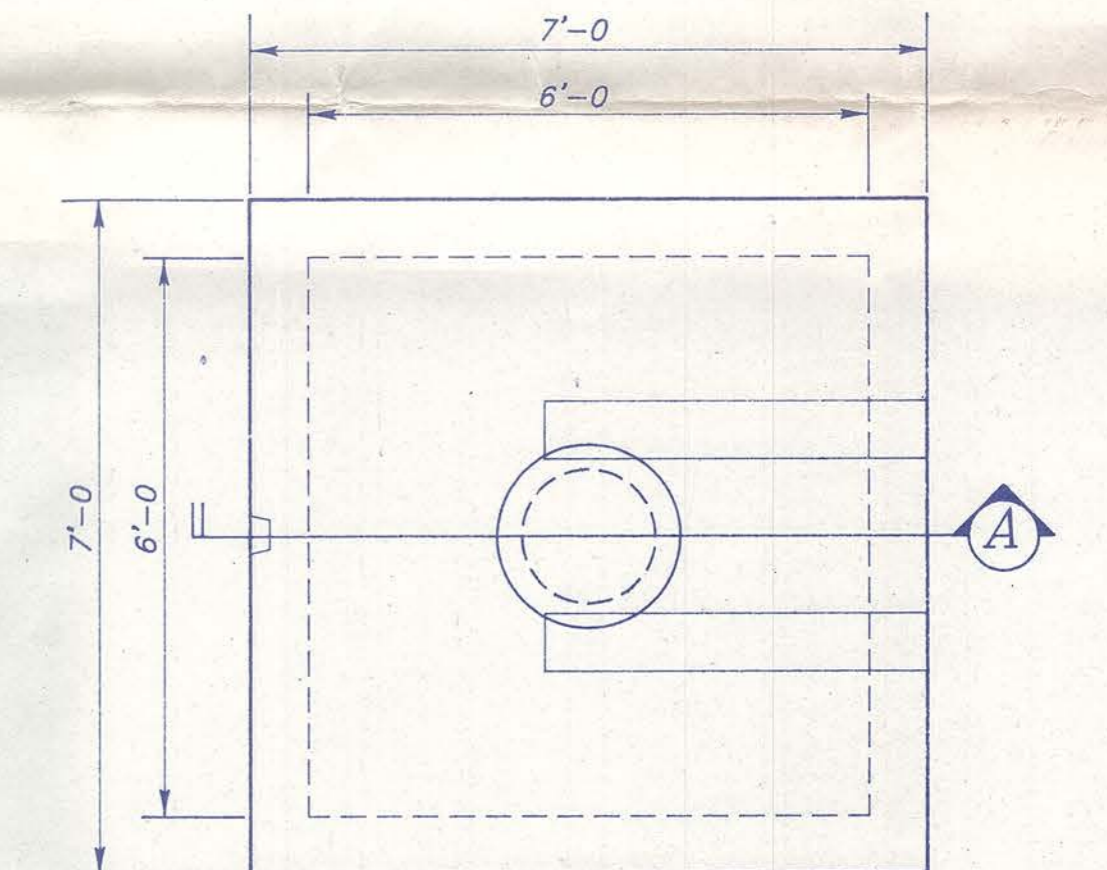
**TYPE "B" DISTRIBUTION BOX DETAIL**

SCALE: 1" = 1'-0"



**PRECAST 1250 GAL LOW BOY SEPTIC TANK**

SCALE: NOT TO SCALE



**PRECAST DBL ALTERNATING SIPHON CHAMBER**

SCALE: NOT TO SCALE

**MHE** McGOEY, HAUSER and EDSALL  
CONSULTING ENGINEERS, P.C.  
45 Quassaick Ave. (Rte. 9-W) New Windsor, New York  
8 East View Place Port Jervis, New York

Revision	Date	Description
A	4/23/94	GENERAL REVISIONS

PLAN FOR:  
SANITARY SEWAGE DISPOSAL SYSTEM FOR  
CHADWICK LAKE PAVILLION  
TOWN OF NEWBURGH ORANGE COUNTY, NEW YORK

Design: PJH	Sheet: 1
Drawn: MSO	
Checked: WJH	
Scale: AS NOTED	
Date: 8 FEB 93	
Job No: 92-114	

**SANITARY SYSTEM PLAN & DETAILS**

Unauthorized addition or alteration of this plan is a violation of Section 7209(2) of the New York State Education Law.



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*Site and Infrastructure Subgroup*

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