

**PROPOSED
MAIN FIREHOUSE FACILITY
ELLENVILLE FIRE DISTRICT
203 S. MAIN STREET, NYS RT. 209
ELLENVILLE, NY 12428**

PREPARED FOR:

**ELLENVILLE FIRE DISTRICT
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**GENERAL CONSTRUCTION
CONTRACT 2501.GC**

**ISSUED FOR BIDDING
September 17, 2026**

**ELLENVILLE FIRE DISTRICT
NEW FIREHOUSE FACILITY
SPECIFICATION NO. 2501
GENERAL CONSTRUCTION SPECIFICATION INDEX**

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DIVISION 2 - SITEWORK

SECTION 02100 – SITEWORK SCOPE OF WORK

02100.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", the "Contract Forms", and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

02100.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the execution of sitework and related improvements, complete, in strict accordance with the Contract Drawings and as herein specified and required by conditions at the site including but not necessarily limited to the following:
 - a. Any and all sitework and related improvements as required for the complete development of the site in accordance with the site plan including any work not specifically called out to be completed but required to achieve the full development of the site and affected areas including public roadway and sidewalk improvements.
 - b. Installation of permanent fence around sides and rear of property including clearing any and all vegetation, trees, rocks, trash, stumps, etc. as required for said installation.
 - c. Installation and maintenance of temporary fence along property frontage with two (2) access gates with tire cleaning gravel tracks.
 - d. Installation and maintenance of hay bales and silt fence around entire site, stockpiled areas, etc.
 - e. Compliance and maintenance of any and all storm water pollution prevention plan requirements (SWPPP) for the duration of construction.
 - f. Clearing and grubbing of entire site where indicated and/or as required for development of site including removal and legal disposal of trash, underbrush, trees, roots, stumps, etc.
 - g. Establish phase 1 on site parking area at start of construction. Refer to site staging plan and materials removal plan for complete scope of work.
 - h. Establishing temporary drainage measures including relocation of facilities as required for the duration of construction for work carried out in different staged locations.
 - i. Removing and or providing any and all fill that is either excess or required to establish grades and subgrades indicated on the drawings.
 - j. Excavation and backfilling of site as required for new building construction, drainage, utilities, etc,
 - k. Installation of all drainage and structures and related components.
 - l. Layout, forming and installation of any and all site concrete including curbs,

- walks, aprons, HC ramps, etc.
- m. Installation of all on site paving including fabric, base, binder and top course.
- n. Installation of flagpole.
- o. Installation of topsoil, plantings, mulch and lawn areas.
- p. Installation of masonry electronic sign base.
- q. Installation of dumpster pad and fencing.
- r. Any and all improvements along NYS Rt 209 including temporary barriers, flagmen, saw cutting, removal of existing shoulder and curbs as required. Provide all insurances and information as required for NYSDOT permit that will be obtained by owner.
- s. Signage and striping.
- t. Coordination with all trades to facilitate their trenching and utility installations.
- u. Spare conduits to be installed 18” min. below grade under apron and driveways and between building where indicated.

02150.0300 RELATED WORK SPECIFIED ELSEWHERE

Division 2 Remaining Sections.
Division 3 Concrete

02100.0600 COOPERATION

1. Properly coordinate the work of this Section with work of contiguous trades and/or Contracts.

DIVISION 2 - SITEWORK

SECTION 02150 - EXCAVATION & GRADING FOR BUILDING CONSTRUCTION

02150.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", the "Contract Forms", and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

02150.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the execution of excavation and grading for building construction and improvements, complete, in strict accordance with the Contract Drawings and as herein specified and required by conditions at the site.
 - a. General site excavation and grading for site development and building construction. Excavation, backfilling and grading shall include removal and replacement of objectional soils in accordance with the contours and elevations and grading contract limits shown on the Drawings. Refer to test borings, site plans, staging plan and foundation plan for full scope of work.
 - b. Clearing and grubbing and removal of any and all unwanted material.
 - c. Removal of all trees (except where noted to remain) including stumps and roots.
 - d. Porous fill.
 - e. Temporary shoring, bracing, sheet piling, etc. without exception including shoring for OSHA and jobsite safety requirements.
 - f. Disposal of rubbish and objectionable excavated materials. Excavation and demolition and removal of existing material of every name and nature which may be required for the installation of work under this contract unless otherwise noted on drawings and specifications.
 - g. Temporary protection barricades, enclosure, etc., required by Local Authorities including complete fence enclosure of site as directed by Architect.
 - h. Subgrade preparation.
 - i. Finish grading.

- j. Storm drainage systems including curb inlets, trench drains, piping, etc.
- k. Trench excavation for all General Construction site work, trenching for underground utilities. Coordinate scope of utility trenching with general contractor.
- l. Bituminous (asphalt) paving for driveways and parking and roads including striping.
- m. Topsoil and lawns.
- n. Spare conduits to be installed 18" min. below grade under apron and driveways and between building where indicated.

02150.0300 RELATED WORK SPECIFIED ELSEWHERE

Division 3 Concrete

02150.0400 INSPECTION OF SITE

- 1. Before submitting bid, visit the site and check all existing conditions. If, in the opinion of the Bidder and conditions exist which might affect the completion of the work as planned, he shall report them in writing to the Architect before submitting his bid. No consideration will be given to claims made because of possible existing adverse conditions not mentioned in these specifications.

02150.0500 SUBSURFACE CONDITIONS

- 1. Subsurface conditions have been investigated and information is shown on site plan. Borings were performed by Soil Mechanics.
- 2. Data and information thereby obtained and conveyed is not guaranteed to be accurate for entire site by the Owner, Architect or any of its agents or Contractors.
- 3. Contractor further acknowledges that he assumes all risks contingent upon nature of subsurface conditions to be actually encountered by him in performing work covered by his contract even though such actual conditions may result in his performing more or less work than originally anticipated. The Contractor shall report any unsatisfactory conditions when encountered prior to proceeding with work.

02150.0600 COOPERATION

- 1. Properly coordinate the work of this Section with work of contiguous trades via the general contractor.

1. Execute the work in such manner that no damage or injury shall occur to persons, existing curbs, roads and walks, and any and all other property. Any damage or injury resulting from work under this Division shall be the responsibility of the Contractor, who shall make good such damage and assume all responsibility for such injury, without additional cost to the Owner. Notify all individuals, municipal agencies and service utility companies having jurisdiction over any affected above surface or subsurface utilities and protect or remove and/or relocate these services as required in accordance with their requirements.
2. Trees:
 - a. All trees in building construction area (except for those selected to remain, if any) are to be removed. Existing trees to remain shall be protected by using boxing, guys, burlap around trees.
 - b. The Architect shall be notified of any situation in which trees or shrubs will hinder the construction operation. The Architect will decide the necessary action to be taken in such a situation.
3. Temporarily support and maintain the sides of excavations until permanent support is provided. Shore and brace all work, wherever required to prevent injurious caving or sliding, and to protect existing work. Provide sheet piling, adequately braced, where other means are insufficient to maintain excavations in stable conditions. Install work so as not to interfere with the proper placing and compacting of backfill. Remove all temporary work as the work progresses and necessity for same ceases to exist.

02150.0800 CLEARING AND GRUBBING

1. General: Under this item, the Contractor shall clear and grub the entire area within the limits of the work of this contract and remove all structures to the extent shown or as determined by the Architect.
2. Clearing and grubbing shall consist of the removal or destruction of trees, roots, stumps, bushes, and decayed or growing organic matter above and below the surface of the ground.
3. The Contractor shall use every precaution to prevent injury to roads, curbs, walks, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the area under contract, and shall repair or replace at his own expense any material or work damaged or destroyed by his forces, while clearing the site.
4. The Contractor shall see that stock piles of materials and storage of equipment are in cleared spaces and shall provide tarp protection of any and all stockpiles to prevent

erosion. He shall prevent his employees from tramping through existing plantings except when it is necessary in carrying out the work. He shall prevent equipment from being taken through existing planting.

5. No burning at the site will be permitted. Contractor shall assume that it will be necessary to remove all cleared material to public disposal areas and that on site burning will not be permitted.
6. Material removed under this item, unless otherwise specified or noted on the drawings, shall become the property of the Contractor and shall be legally disposed of.
7. All materials removed for roadwork and public improvements outside of the boundary of the site which require disposal shall be legally disposed of by the Contractor at his own expense.

02150.0900 LINES AND GRADES

1. Establish and maintain all lines and grades for the work with required batter boards and elevation points.
2. A competent Surveyor/Engineer shall be employed by the Contractor to establish all lines and grades and paid for by the Contractor.
3. Prior to any construction, notify the Architect of any discrepancy between the elevations and grades on the site in relation to the elevations and grades indicated on the drawings.
4. Removal of Existing Topsoil:
 - a. All topsoil in areas of operations shall be carefully scraped off and piled independent of the other excavated. This topsoil shall be reused for grading at the completion of the work. if it is not needed, it shall remain the property of the contractor and shall be removed from the site.
 - b. Stock piles shall be such shape and size as will keep loss of topsoil by wind and erosion to a minimum and shall be trimmed in a workmanlike manner to fairly uniform surfaces and slopes. They shall be placed on clear and well drained lands, in areas and covered with tarps to prevent erosion. Silt fences shall be installed around all stockpiles. The equipment, methods and workmanship shall be such as to avoid lifting of subsoil, or other unsuitable material. Topsoil operations shall not be carried on during unsuitable weather or when the topsoil is wet or frozen.
5. Drainage: Conduct operations so as to prevent the accumulation of surface water in the vicinity of excavated and graded areas and provide all necessary ditches as

required. Any water which accumulates in excavations shall be promptly remedied by pumping or other effective means. Provide temporary drainage structures with silt fence protection and recharge pools during construction.

02150.1000 GENERAL EXCAVATION

1. Include the satisfactory removal of all materials of every nature and description which are encountered in obtaining the lines, grades and elevations shown on the drawings. Suitable materials from the excavation shall be utilized for filling. Excavated materials which are not suitable for fill or embankment and excess materials (excluding topsoil) not needed for filling shall be removed and legally disposed of outside the site.

02150.1100 TRENCH EXCAVATION

1. Trenches shall be open cuts of the necessary width, to the correct alignment, for the proper installation of underground lines, with banks as nearly vertical as possible. Provide sheeting and/or shoring as may be necessary to protect life and the excavation it. Width of excavation at the bottom shall not exceed 20" plus the external diameter of the pipe, equally divided on each side of the pipe.
2. Bottom of trench shall be accurately graded and shaped to provide uniform bearing and support for the bottom quadrant of the pipe barrel on undisturbed soil at every point along its entire length. Excavation shall not be completely plowed, scraped or dug by machinery to finished grade. The last several inches shall be trimmed by hand to exact line and grade and shaped to support the pipe just prior to placing the pipe. In the event excavation is carried too deep in error, refill trench with suitable material compacted properly in accordance with other portions of this Section and excavate to proper elevation by hand. Ample provision shall be allowed for making up joints.
3. Trenches shall not be opened farther in advance of the pipe laying than is necessary. No pipe laying in wet trench will be permitted. Excavation must be kept free from water. In accordance with other portions of this Division, backfill and compact.

02150.1200 BUILDING EXCAVATION, FILLING AND BACKFILLING

1. Excavation:
 - a. Excavation shall be carried to elevations, depths and dimensions indicated. The footing elevations noted are intended to carry all bearings to the same strata of earth. No extra compensation will be allowed for any additional excavation required to insure uniform quality of bearing. All bearings shall be on undisturbed earth. If excavations for walls or footings are carried too deep by error, they shall be backfilled, but shall be brought to proper elevation with concrete mixed and placed as specified under Division 3 - CONCRETE, at no

additional cost to the Owner. Minimum bearing soil shall be one and one half (1 1/2) tons per sq. ft. Remove materials of every nature and description encountered in obtaining indicated lines and grades.

- b. Excavate outside of building walls and foundations, etc., as necessary to allow for inspection work if required.
- c. Bottom of all excavations shall be leveled or otherwise properly trimmed to lines and grades as required.
- d. Slabs on grade shall be placed upon approved (by independent testing company) compact granular fill, except as otherwise specified or shown on the drawings.
 - 1. Where natural subsoil directly under slabs on grade is of clay or silt, excavate to 6" below bottom of slab and backfill with compacted gravel. This does not exclude the placing of compacted gravel to a greater depth where shown on the drawings and/or herein specified.
- e. As the basis of the Contract, it shall be assumed that the material to be excavated is earth.
- f. Provide and operate all pumps, hose and drainage lines required to keep excavations free from water at all times, until after concrete has been placed for all footings and foundation walls. In the event that overtime labor is necessary to preform this work, it shall be done without additional cost to the Owner.

2. Filling and Backfilling:

- a. Promptly backfill excavations as work permits, but not before concrete walls and footings have attained adequate strength (min. 60% design) and piping and other items below backfill have been tested and approved.
- b. For backfilling, use earth free from waste, objectionable matter, loan, wood rubbish, debris or stones other 1/2 cubic foot. Do not use frozen material. Objectionable backfilling material shall be legally disposed of away from the site.
 - 1. All excess excavation not required as backfill for work under this Contract shall be removed and legally disposed of outside the site.
- c. Backfill and fill to new surface grades as required. If sufficient sound and approved fill materials are not on hand to complete filling operations to required grades, provide same at no extra cost to the Owner.
- d. Backfill around building walls, and under any slabs on grade, shall be with compacted clean sand and gravel.

- e. All filling and backfilling shall be deposited in layers: Each layer to be compacted to not less than 95% of the maximum density obtained at optimum moisture contents as determined by AASHTO T-180, Method "D". Final compaction tests must indicate a minimum of 95% compaction for the total fill.
- f. All rough grading shall be brought up to grades, required as shown on Site Plan. Unless otherwise indicated, the following depths shall be allowed for finished grading:
 - 1. Concrete Walls 5 Inches
 - 2. Bituminous Paving as Required by Drawings
 - 3. Grass Areas 6 Inches
 - 4. Other Areas As Required by Drawings
- g. Compaction shall be by Contractor using mechanical tampers.

02150.1300 SUBGRADE PREPARATION

- 1. Subgrades shall be shaped to the required line, grade, and cross-section, and shall be rolled with approved equipment until thoroughly compacted. In paved areas, the full depth of subgrade in fill areas and the top 6" of the subgrade in cut areas shall be compacted to not less than 95% of the maximum density obtained at optimum moisture content as determined by AASHTO-T-180, Method "D". In other areas, compact to not less than 90%. All soft or otherwise unsuitable subgrade material shall be removed and replaced with suitable materials as directed by the Architect. Low areas, holes, and depressions shall be brought to the required grade with approved material thoroughly compacted as herein provided. All roadway and parking area paving shall be installed on a subbase of a mixture of sand, gravel or other acceptable material compacted as described above for paved areas.

02150.1400 POROUS FILL

- 1. Stone or gravel: Pass through a 2" ring and be retained by a 1" mesh.
- 2. The subgrade below fill shall be brought to a true and even plane and compacted to a solid bearing. Porous fill shall be installed to a minimum compacted depth of 6" and leveled to a reasonably true and even surface. All piping, etc., installed below porous fill shall have been tested and approved before installation of fill. After placing porous fill, stones larger than 3" in any dimension shall be hand removed or broken up.

02150.1500 FINISHED GRADING

- 1. All areas shall be uniformly graded. The finished surface shall be reasonably smooth,

compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section. Ditches shall be finished so as to permit adequate drainage. The surface of areas to be turfed shall be finished to smoothness suitable for the application of turfing materials. The surface of the pavement subgrade shall not vary more than 0.50 foot from the established grade and approved cross-section.

02150.1600 PROTECTION

1. Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades re-established to the required elevations and slopes, at no additional cost to the Owner. The finished subgrade shall be protected and maintained in a satisfactory condition until the stone base course is placed.

1. General: Take special precautions when installing bituminous pavements to prevent the bituminous materials from staining the exposed parts of building, curbs, or structures above finished grade. Any stains or markings caused by paving work shall be removed by the Contractor, at his own expense.
2. Heavy Duty Bituminous pavements shall consist of a 2" New York State type 1A Asphaltic Concrete Surface Course placed on a 4" Penetration Macadam Base Course, over a fully compacted 6" Loam/RCA mix base and fabric mesh in accordance with the plans and sections on the drawings and as herein specified.
3. Penetration Macadam Base Course for Heavy Duty Pavements (minimum 4" compacted thickness):
 - A. The base course shall conform in all respects to the requirements of the State of New York, Dept. of Public Works, Division of Construction, "Public Works Specifications for "Item 45SN - Base Course - Bituminous - Macadam Penetration Method Asphalt", with the following modifications:

Use Size 3 Stone.
Bituminous material shall be asphalt cement.
Penetration grade 85 - 100%.
4. Asphaltic Concrete Surface Course: (minimum 2" thickness after compaction)
 - a. The asphaltic concrete surface shall conform to the requirements of State of New York, Dept. of Public Works, Division of Construction, and "Public Works Specifications as amended. References herein to "Standard Specifications" shall be to that document.
 - b. Thickness shall be compacted depth as indicated on the drawings.
 - c. The surface course shall conform to the requirements of the "Standard Specifications" for Item 51 - Asphalt Concrete - Type 1A (Mixing Method - Hot Mix - Two Course)"
5. All paving at roads shall comply with all NYSDOT permit requirements.

SECTION 02180 - TOPSOIL & LAWNS

A. MATERIALS

1. Grass Seed:

Pearl's Premium sun/shade fescue/Kentucky bluegrass mix or equal.

B. Seeded Lawns:

1. Prepare and seed all areas at locations indicated on the site plan.
2. Provide topsoil as required to maintain depth of 6" for all lawn areas. Topsoil shall be free of roots, debris and rock. Prior to spreading topsoil disc or scarify ground to a minimum depth of 3". Ground limestone shall be evenly distributed over topsoil at a rate of 100 pounds per 1,000 square feet. Commercial starter fertilizer (10-30-15) applied at the rate of 25 pounds per 1,000 square feet and worked into top 3" of the topsoil.
3. Immediately before any seed is sown, ground shall be scarified as necessary and raked until surface is smooth, friable and of a uniform texture. Minimum seeding rate 5 pounds to 1,000 square feet. Seed shall be raked into ground and rolled or tamped and thoroughly watered.

C. ORNAMENTAL PLANTINGS:

1. Contractor shall install any and all landscaping, shrubs, trees, etc. as indicated on the drawings.
2. Contractor shall water all landscaped areas for thirty (30) days upon completion of installation.

* * * * *

1. Scope

- A. Provide complete trench drainage systems where indicated on the drawings. System shall include but is not necessarily limited to precast trench drains, cast iron heavy duty lock down grate covers, anchors, fittings, hardware, end caps and outlet end with 4" nipple and piping tied into site drainage system.

2. Quality Assurance

- A. System shall be Slope trench drain system with "D" load class ductile iron slotted grate as detailed on the drawings or approved equal.

3. Submittals

- A. Manufacturers product literature and detailed shop drawings indicating the entire installation including all components and details referenced by catalog number and piping to storm drain location.

4. Installation

- A. All materials, systems, components, etc. shall be installed in strict compliance with the manufacturers printed product system specifications and installation instructions including drain systems manual and drain technical installation.
- B. The Drain System requires a bedding of concrete on both sides and under the channels. An area must be provided for channel placement wide enough and deep enough to accommodate the channel and bedding concrete. Follow installation techniques exist for proper placement of trench.

* * * * *

DIVISION 3 - CONCRETE

SECTION 03300 - CONCRETE & CEMENT WORK

03300.0100 GENERAL

1. Include all labor, materials, equipment and appliances and perform all operations in connection with the installation of concrete and cement work as shown on the drawings and specified herein, and generally include the following:
 - a. Concrete work for all foundations, footings, piers, walls, floor slabs, and all other items of concrete as required to make the work of this section complete, and as detailed on the drawings hereinafter specified.
 - b. All required formwork.
 - c. Reinforcing steel and wire mesh, including chairs, spacers and tie wires.
 - d. Installing and/or building in of all items embedded in the concrete such as anchor bolts, inserts, sleeves, blocking, etc., as required by this and other trades under this and other contracts.
 - e. Cement mortar protection for pipes and conduits in slabs.
 - f. Vapor barrier under slabs on grade.
 - g. Pre-molded joint fillers and water stops.
 - h. Finishes of all concrete and concrete slabs.
 - i. Concrete walks, platforms, terraces and curbs.
 - j. Testing and inspecting concrete work.
 - k. Concrete housekeeping pads for all motors, pumps, tanks and other items of equipment provided under Mechanical and Electrical Contracts.
 - l. Construction and expansion joints.
 - m. Perimeter insulation.
 - n. All other items of concrete and cement and related work to be inferred as needed to make the work of this contract complete.
 - o. Damp proofing all basement walls below grade.

- p. Water stops at basement footings and at all pier details.
- q. Set anchor bolts provided by structural steel contractor for all columns and other bearing plate locations as required.

03000.0300 RELATED WORK SPECIFIED ELSEWHERE

- 1. Waterproofing - Division 7.
- 2. Miscellaneous bolts, anchors, reglets, inserts, etc., required by other trades and installed under this Section.

03300.0400 CODE REQUIREMENTS AND APPLICABLE STANDARDS

- 1. Local building codes, laws and regulations govern all work. Adhere to where mandatory, specifications and drawings to the contrary notwithstanding.
- 2. ACI 318-95.
- 3. ACI 301-96 (paragraph reference).
 - a. Except as modified herein.
 - b. Contractor to maintain current copies of ACI-301 manual on site.

03300.0500 SHOP DRAWINGS

- 1. Submit shop drawings for approval in accordance with the requirements of the Supplementary General Conditions showing locations, size, length and bending of all bars, and also such additional details as may be required to completely cover the furnishing and installing of all reinforcement, chairs and spacers and execution of all concrete work. Allow sufficient time for checking and approval prior to fabrication. Show the location, sizes and forms of all required openings, miscellaneous steel items, inserts, anchor bolts, recesses, etc., as required for work under this and other Contracts.
- 2. All details shall be in accordance with the current rules and practices of the American Concrete Institute and jurisdictional codes, except where otherwise indicated.
- 3. Shop drawings shall indicate all slab depressions.

03300.0600 COORDINATION

- 1. Properly coordinate the work of this Section with work of contiguous trades.

03300.0700 MATERIALS

1. Cement: ASTM-C150 Type I, Type II, or Type III may be used only with written permission of the Architect. Air-entrained concrete where specified shall be obtained by use of approved air-entraining agents, the use of air-entraining, or other type cements is expressly prohibited without prior approval of the Architect. Cement used throughout the project shall not vary in color so as to prejudice appearance of exposed concrete. Only one brand of any type of cement shall be used for exposed concrete surfaces.

2. Aggregate: ASTM C33 except as modified herein.

a. Fine Aggregate shall conform to the following requirements:

Not more than 3% shall pass the No. 200 sieve.

Rational analysis shall conform to Table A as follows:

<u>Table A</u>	<u>By Weight</u>
Kaolin	Max. % 6
Quartz & Feldspar	Min. % 75
10 Cycle Sodium Sulphate	Max. % loss 6
5 Cycle Magnesium Sulphate	Max. % loss 15

It shall not show darker than light amber when tested by colorimetric method.

The graduation of the sand shall be constant and the fineness modulus shall not vary by more than 0.2.

b. Coarse Aggregate: Shall consist of hard crystalline stone or gravel free from clay, silt, shale, or decomposed or thin laminated pieces. The pieces shall be clear and uncoated, and conforming to Table B below:

<u>TABLE B</u>	<u>GRAVEL OR STONE</u>
<u>Abrasion Test</u> with Los Angeles Machine (ASTM Designation C-131) Max. Permissible percent by weight	40
<u>Soundness Test</u> (ASTM Designation C-88) Max. permissible percent by weight for 10 cycles, magnesium sulphate for 5 cycles, sodium sulphate	7.5

Chemical Test (ASTM Designation C-289)
and/or Petrographic Analysis (ASTM
Designation C-295) max. permissible
percent of following reactive minerals.

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Opal or Opaline chart	0.25%
Chalcedony	5%
Glassy or cryptocrystal lime acidic to intermediate volcanic rocks or tuffs	3%

Test with all aggregate for potential reactivity in accordance with ASTM C295, C289, and C227. Supply certified test reports by an agency satisfactory to the Architect for compliance of the aggregate to the contract documents.

Coarse aggregate where specified for lightweight structural concrete shall conform with the requirements of ASTM C330 - graded to size 3/4" to #4 of Table 1 therein.

3. Admixtures.

- a. Air-entraining admixtures shall be Darex AEA, neutralized Vinsol-Resin, or equivalent as approved by the Architect.
- b. Plasticizer shall be "Pozzolith" as manufactured by Master Builders.
- c. No other admixtures will be permitted without the express approval of the Architect.

4. Reinforcing bars shall be new billet stock unless otherwise specified and shall conform to ASTM 615, Grade 60. The Contractor shall furnish, when requested by the Architect, a certificate from the manufacturer guaranteeing that the present product meets the specification requirements.
5. Wire Mesh for concrete reinforcement shall consist of welded wire fabric conforming to ASTM Designation A185.
6. Mixing water shall be clean and potable. If there is any question as to its suitability, it shall be tested in accordance with AASHTO Standard Method of Test T-26.
7. Premolded Joint Material: Celotex Corp. "Flexell" or approved equal. Expansion joint sealer shall be Sonneborne Building Products, Inc. Sonolastic, one component Paving Joint Sealer or approved equal.

8. Surface Hardener: "Lapidolith" by Sonneborne Building Products, Inc., "Hornlith" by A.C. Horn Co., Inc. or "Saniseal" by the Master Builders Co.
 - a. Shall be installed in accordance with the Manufacturer's recommendations.
 - b. Provide five (5) year written guarantee by Manufacturer.
9. Vapor Barrier: "Vis Queen" as manufactured by Visking Division of Union Carbide, Polyethylene sheets, .066" thick, or other approved equal.
10. Perimeter Insulation: Shall be "Styrofoam SB" as manufactured by Dow Chemical Company or approved equal. Insulation shall be 2" thick unless otherwise noted on the drawings.
11. Grout under base plates: Fosroc "Conbextra" or approved equal.
12. Other materials as herein specified.

03300.0800 STORAGE OF MATERIALS

1. General: Storage facilities are subject to the approval of the Architect. Afford easy access for inspection and identification of shipments.
2. Cement: Store cement well off the ground in a dry, weather-tight adequately ventilated structure with provision to prevent the absorption of moisture.
3. Aggregates: Store aggregates in a manner to assure good drainage to preclude the inclusion of foreign matter, and to preserve the gradation. Keep each size group separate by means of bulkheads between the piles.
4. Reinforcing Steel: Store reinforcing steel off the ground under cover and protected from rusting, oil, grease and distortion.

03300.0900 FORM WORK

1. Chapter 2 of ACI 301 is included in its entirety except as modified hereinafter.
2. Design form work to be strong, rigid, accurately formed to within 1/4 inch of the lines and dimensions shown on the drawings and strong enough to support the dead weight of the concrete without deflection or leakage.
3. Design form ties so that they may be cut off no less than 1 inch from any concrete surface. Patch all holes left by form ties in a manner satisfactory to the Architect.

4. Coat all wall forms with a form oil. Keep reinforcement clean of form oil.
5. Provide temporary openings in forms to permit inspection, cleaning, and placing concrete.
6. Remove forms so as not to damage concrete. Remove forms in accordance with paragraph 2.3.4.

03300.1000 REINFORCING

1. Accurately fabricate reinforcing steel to the details and dimensions shown on the drawings, maintain bars free from dust, mud, rust, scale, oil, distortion, and structural defects.
2. Bend all bars cold and in a manner which will not injure the bars. Do not use bars with bends or kinks not indicated on the drawings. Fabricate in accordance with ACI315-80 standards.
3. Support all reinforcement rigidly in its design location prior to placing concrete, support reinforcing off the ground on precast concrete blocks.
4. Place all reinforcement within the limits of a days' operation, firmly supported and firmly connected before start of concrete placement. Provide concrete cover as indicated in paragraph 5.5 except as otherwise noted. Correct bent or displaced bars before placing concrete.
5. Prepare bending and placing drawings at a scale deemed suitable by the Architect for the work shown. Submit copies of shop drawings in accordance with the general conditions for review; correct and resubmit as required until approval is obtained. Maintain on the job site, an approved up-to-date set of shop drawings bearing the approved stamp by the Architect. All work shall conform to these drawings.

03300.1100 CONCRETE

1. Proportion all concrete to attain the properties and strength indicated in Table E.

Table E

<u>Description</u>	<u>28 Day Strength</u>
Piers and Footings	4000 psi
Slabs on grade	5000 psi
Foundation Walls	4000 psi
Floor Slabs (on Decking)	3500 psi

2. Submit a mix design, to the Architect, no less than 35 days prior to placement of concrete; for each class of concrete. The mix design consists of:
 - a. Mix proportions including admixtures.
 - b. Gradation and specific gravities of aggregates.
 - c. Test reports of the components quality as outlined in Paragraph 7.
 - d. Strength tests of designed mix indicating strength at least 20% higher than job requirements.
 - e. Slump, weight, and air content of designed mix.
3. The Architect, may at his discretion, require additional cement or other changes to the mix if the designed mix fails to meet the specification.
4. Produce concrete with a slump not exceeding 4 inches.
5. General Contractor shall arrange for making and testing samples of the concrete as placed. Tests will be in accordance with ASTM Standards. Failure of the concrete to comply with the contract documents as evidenced by these tests is sufficient cause for rejection of the concrete placed. Cost of all tests shall borne by the Owner.

03300.1200 MIXING

1. Equipment: Machine mix all concrete in a mechanical batch-type mixing plant conforming to acceptable standards. Provide mixers with adequate facilities for the accurate measurements and control of each of the materials entering the mixer. Prepare all batches by weight in automatically controlled batch plants.
2. Mixing: Do not charge mixers in excess of the manufacturers rated capacity for mixing, or operate in excess of the rated speed. Excessive mixing requiring the addition of water to preserve the required consistency will not be permitted. Discharge the entire batch before recharging. Discharge all wash water before recharging. Once initial sets has taken place, do not attempt to temper the concrete by addition of water.
3. Ready-Mixed Concrete: May be used provided that the central plant producing the concrete and the mixing and transporting equipment is suitable for the production, transportation and placing of the specified concrete. Ready-mixed concrete shall conform to the requirements of ASTM Designation C94 except as modified herein. Mixing in transit shall be prohibited.

03300.1300 PREPARATION FOR PLACING CONCRETE

1. Remove water from all areas where concrete is to be placed. Do not permit water to flow over freshly placed concrete. Clean forms and concrete handling equipment thoroughly. All form work, reinforcement, etc., will be inspected and approved prior to placing concrete. Clean earth foundations of mud, water, loose material and debris.

03300.1400 PLACING CONCRETE

1. Place concrete only when the weather conditions are suitable for proper placing, finishing and curing.
2. Mix, transport, and place concrete to maintain proper consistency and avoid segregation. Maintain concrete in a plastic state at all times from mixing to placing in final position.
3. Convey concrete from mixer to final location in a manner which will prohibit segregation. Do not exceed 3 foot fall from mixer conveyance. Do not exceed 6 foot free fall when placing in final position.
4. Vibrate all concrete in place with approved internal vibrators. Do not vibrate after initial set has taken place.

03300.1500 CONSTRUCTION JOINTS & EMBEDDED ITEMS

1. ACI 301, Chapter 5 is included in its entirety except as modified hereinafter.
2. Where not shown, locate construction joints to provide the least impairment to the structure: Location and detail of all construction joints must be approved by the Architect.
3. Location construction joints to produce the following maximum length of concrete placement:

Beams and slabs cast on ground	30 feet each way
Walls	50 feet each way

4. Accurately locate all inserts, sleeves, anchor bolts, etc. Mislocation or embedded items is solely the responsibility of the Contractor.

03300.1600 BONDING AND GROUTING

1. Clean all laitance and loose material from surfaces of set concrete, slush face of joint with neat cement grout. Place new concrete before grout has set.
2. Grout all base plates with a mix of one part cement to two parts sand.

03300.1700 PATCHING

1. Patch all slight honeycomb and other surface defects by chipping out defective material and patching with a 1 part cement to 3 parts sand mortar.
2. Where in the Architect's opinion the defects will impair the structural adequacy of the member, make repairs as directed by the Architect. All costs relating to such repairs will be borne by the Contractor.
3. Where in the Architect's opinion, the defects will impair the finished appearance of the area, make repairs as directed by the Architect. All costs relating to such repairs will be borne by the Contractor.

03300.1800 PROTECTION AND CURING

1. Protect concrete from injury, from any cause for no less than five (5) days after placing. Begin curing immediately after the concrete has attained its initial set. Cure by water spray, saturated burlap or curing compound. Cure in accordance with ACI 301, Chapter 12.

03300.1900 INCLEMENT WEATHER

1. Place concrete only when the ambient temperature is between 40 degrees F and 85 degrees F.

In order to place concrete at temperatures outside of the above range, special instructions may be issued by the Architect. All costs involved in implementing these special instructions will be borne by the Contractor.

2. In general, the special instructions will be in accordance with the recommendations of ACI 305-82 and ACI 306-88, except that Chapter 6 of ACI 306 will not be utilized.

03300.2000 FINISHING CONCRETE

1. Formed surfaces ACI 301 Chapter 5.3.3 is included in its entirety.
2. Flatwork: ACI 301 Chapter 5.3.4 is included in its entirety except as modified herein.
 - a. Finish all flat floors except as noted below with a steel trowel finish suitable for receiving floor finishes. Class A tolerance verify requirements with Architect.
 - b. Finish exterior slabs with non-skid broom finish. Class B tolerance.
 - c. Do not float or trowel concrete surfaces while the material is wet or sloppy.

Delay finishing operations until all surface water has disappeared. Do not dust cement over wet areas to accelerate drying.

3. Surface Hardener: Unless otherwise specified, all exposed interior concrete slab surfaces shall be treated with the specified surface hardener, applied in strict accordance with the manufacturer's printed instructions.
4. Wood Float Finish: Concrete platforms shall be finished by tamping with special tools to force the aggregate away from the surface, then screening with straight edge to bring surface to the required lines. While the concrete is still green, it shall be wood-floated to a true and uniform plane with no coarse aggregate visible.
5. Screeds for All Finished Work: Provide metal screeds as approved by the Architect. Screeds shall be set with instruments to proper elevations.

03300.2100 CONCRETE SIDEWALKS, TERRACES, RAMPS AND CURBS

1. Concrete and the equipment, workmanship, testing, etc., and materials therefore, shall conform to the applicable requirements of Division 3, CONCRETE, of these specifications except as otherwise specified herein. Concrete shall be air-entrained 4000 psi minimum compressive strength at 28 days. Concrete shall have a slump of not more than 4". Air entrained shall range between 5 and 8%.
2. Subgrade Course:
 - a. The subgrade shall be constructed true to grade and cross-section as shown on the drawings and shall be constructed in accordance with the applicable requirements of PARAGRAPH, SUBGRADE PREPARATION. The subgrade for curbs shall extend in all cases at least 1 foot in width beyond the back face of the curb.
3. Forms: Wood or metal, straight, free from warp, of sufficient strength to resist springing during construction, and of a height equal to the full depth of the finished work. Wood forms shall be 2" surfaced plank. Metal forms shall be of approved section with a flat top surface. Benders or thin plank forms may be used for curb returns. Forms shall be set with the upper edge true to line and grade and shall be held rigidly in place by stakes placed on the outside of forms and set flush with the top edge of the form. Clamps, spreaders and braces shall be used where required to insure rigidity in the curb forms.
4. Concrete Placement and Finishing:
 - a. Sidewalks & Ramps: Place in forms in a layer of such thickness than when compacted and finished the walk will be of the thickness shown on the drawings. After the concrete has been placed between side forms, a strike-off guided by the side forms shall be used to bring the surface to the proper section to be

- compacted. The concrete shall then be tamped with a heavy tamper and given a final tamping with a light tamper. The surface shall be finished to grade and cross section with a wooden float at least 10 feet in length, 6 to 8 inches in width, and at least 1 inch in thickness with handles at each end for longitudinally floating along the surface. After float, the surface shall be troweled smooth and then finished with a fine hair push broom drawn over the surface traverse to the line of traffic. If necessary water may be added to the surface immediately in advance of brooming. Before final finish, the surface shall be checked with a 10 foot straight edge, and any irregularities of more than 1/8" in 10 feet shall be eliminated. Divide into rectangles at intervals of approximately five feet by means of contraction joints. The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least 1" by means of a jointer having a radius of 1/8" or a cutting blade not more than 1/8" thick. The completed surface shall be uniform in color and completely free of blemishes and tool marks.
- b. Curbs: Place in the forms to the specified depth in 6" layers and thoroughly consolidate by tamping and spading so that there are no rock pockets at forms, and mortar entirely covers the top surfaces. Concrete may be compacted by means of mechanical vibrators approved by the Architect. The surface of the top of the curb shall be edged with the proper edging tool and floated and finished with a smooth wood float or a concrete rubbing block until it is true to grade and section and uniform in texture. These surfaces shall then be brushed with a fine hair brush with strokes parallel to the line of the curb. Ample water shall be used during the finishing operations. Immediately after removing the front curb forms, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until all blemishes, form marks, and tool marks have been removed. The surface of the face shall, while still wet, be brushed in the same manner as the curb top. The face of the finished curb shall be true and straight and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge, 10' long is laid on the top of the curb, or on the surface of gutters, the surface shall not vary more than 1/8" from the edge of the straight edge, except at grade changes or curves. All visible surfaces and edges of the finished curb, shall be free of all blemishes and form and tool marks, and shall be uniform in color, shape and appearance.

5. Expansion Joints:

- a. Provide expansion joints in sidewalks, terraces and platforms at all walk intersections and returns, at buildings, steps, structures, and other features against which the slabs abut. In addition, provide expansion joints for sidewalks at intervals of 20 feet. Form joints with expansion joint filler strips, 1/4" thick. The filler strips shall be Phillip Carey "Elastite", Serviceized Products Co. "KorkPak" or approve equivalent joint filler. Joint filler shall be held in place by means of steel pins or other devices to prevent warping of the filler during floating and

finishing. After finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/4".

- b. Expansion joints for curbs: Form expansion joints for curbs with joint filler cut and shaped to the cross section of the curb. Provide expansion joints at the ends of all returns and directly opposite the expansion joints of abutting concrete walks and unless otherwise indicated shall be of the same type and thickness as the joints in the sidewalk. Where curbs do not abut concrete walks, expansion joints at least 1/2 inch in width shall be provided at intervals not exceeding 20 feet.
 - c. After the concrete has cured and is thoroughly dry, the upper part of all expansion joints shall be cleaned and shall be sealed with joint sealer. Sealer shall be a cold-applied 2 component, polysulfide type sealant conforming as a minimum to ASA Standard 116.1-60. The compound shall be capable of being mixed on-the-job to a consistency appropriate for pressure extrusion. When mixed and applied in accordance with the manufacturer's instructions, the mixture shall completely fill the joints without the formation of air holes and voids.
6. Curing: Immediately after the completion of the finishing operations, the exposed surfaces of concrete shall be cured by one of the following methods, as the Contractor may elect.
- a. The entire exposed surface shall be covered with quilted covers conforming to AASHTO Specification M-73. Immediately after placing, they shall be thoroughly wet with water and kept in a saturated condition for not less than 7 days.
 - b. The entire exposed surface shall be wetted with a fine spray of water and then covered with waterproof paper conforming to ASTM Standard C-171. Sheets shall be laid directly on the concrete surface and overlapped 12" when a continuous sheet is not used. The curing medium shall be not less than 18" wider than the concrete surface to be cured, and shall be securely weighted down by placing a bank of moist earth on the edges just outside the forms and over the transverse laps to form closed joints. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.
7. Protection: After the concrete has been cured, all debris shall be removed, and the areas adjacent to the work shall be backfilled, graded, and compacted in a satisfactory manner in accordance with the lines and grades shown on the drawings. The completed work shall be protected from damage until accepted. The Contractor shall repair and clean, at no additional cost to the Owner, all concrete damaged or discolored during construction. Repair of sidewalks, if required, shall be made by removing and replacing defective portion between the nearest cleavage or expansion joints.

1. Provide complete trench drainage systems where indicated on the drawings at bays and apron. System shall include but is not necessarily limited to precast trench drains, cast iron heavy duty lock down grate covers, anchors, fittings, hardware, end caps and outlet end with 4" nipple. Coordinate with plumber who will provide and install piping tied into site drainage pools.

03300.2300 PERIMETER INSULATION

1. Manufacture: Perimeter insulation shall be "Styrofoam SB" rigid type, as manufactured by Dow Chemical Co., or approved equal. Thickness as shown on Drawings.
2. Preparation: The surfaces to which insulation is to be applied shall be smooth, flat and trim.
3. Foundation Walls: Install on the inside surface of the foundation wall to a minimum depth of 24" below bottom of slab with a thin layer of asphalt emulsion. Apply a layer of roofers felt, cut in strips the thickness of the floor slab, to the insulation to prevent the concrete from bonding to the insulation; cement with asphalt emulsion. Conform with details shown on the drawings.

03300.2400 INSPECTION AND TESTS

1. All concrete operations are subject to inspection and test as ordered by the Architect. All tests will be made in accordance with the appropriate ASTM Standards. The Contractor will provide all required assistance in performing these inspections and tests. The cost of inspection and tests will not be borne by the Contractor. The test performed constitute sufficient cause for rejection should these tests indicate failure to comply with the Contract documents.

03300.2500 TESTING

1. Testing and Inspection which may be performed by the Owner:
 - a. The General Contractor shall schedule for the following services:
 - b. Test cylinders shall be made and stored in accordance with ASTM C-31. The method of sampling fresh concrete shall be in accordance with ASTM C-172. The Contractor shall provide a safe storage box for storage of test cylinders in an undisturbed manner.
 - c. Two (2) of the specimens shall be tested after seven (7) days and two (2) after

- twenty-eight (28) days. Two (2) cylinders will be saved for testing at 45 days. 45 Day tests will not be required if the 28 Day tests are satisfactory. The 7 day strength will be assumed to have 70% of the 28 days strength. For Type III cement, the 7 day test shall indicate 90% of 28 day strength.
- d. Compression tests shall be conducted in accordance with ASTM C-39.
 - e. Slump tests shall be made for each truck load of concrete placed, in accordance with ASTM C-143.

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DIVISION 4 - MASONRY

SECTION 04200 - UNIT MASONRY

04200.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

0400.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all masonry and related work, complete, in strict accordance with the Contract Drawings and Schedule of Finishes, as specified herein or reasonably implied, in general as follows:
 - a. Concrete Masonry Units: For interior and exterior reinforced bearing walls and cavity as shown and detailed on the drawings.
 - b. Brick masonry unit veneer including all ties, etc.
 - c. All truss type reinforcing and steel rebar reinforcing, bearing plates, anchor bolts, eye and pintle masonry ties, etc. as noted on the drawings.
 - d. Expansion joints as shown on the drawings.
 - e. Furnishing and building in of anchors, ties, clamps, clips, etc., as required for work of this Section.
 - f. Mortar beds and grouting for saddles, windows, doors, louver frames, and similar items as noted on the drawings.
 - g. Scaffolding, hoists, centers, shoring, bracing, etc., as required for work under this Section.
 - h. Cleaning and pointing.
 - i. Clean-up and removal of rubbish, etc.
 - j. Do all cutting and patching, etc.
 - k. The masonry contractor shall install all necessary items that are required in the work and supplied by others, including: bolts, nailing blocks, inserts, anchors, flashing, lintels, expansion joints, conduits, etc.

0400.0300 QUALITY ASSURANCE

1. Tests:

Manufacturer or supplier of masonry units shall submit to Architect prior to delivery, certification of compliance of units with specified standards, as determined by an acceptable testing agency conforming to the applicable requirements of ASTM E329. Brick shall be tested in accordance with ASTM C67, and concrete masonry units in accordance with ASTM C140. If tests made after delivery indicate that units do not conform to specified requirements, costs of such tests shall be borne by the supplier.

2. Masonry cements:

Proprietary masonry cement mixes used in engineered masonry construction shall be subject to laboratory testing to assure compliance with minimum requirements for strength and bond.

3. Sample panels:

Erect sample panels for each type of masonry required, approximately 4 ft. long by 4 ft. high, showing the proposed color range, texture, bond, mortar, and quality of work. The sample panel, when accepted, shall become the project standard for bond, mortar, quality of work, and appearance. Do not begin work until panel is accepted by Architect.

0400.0400 SUBMITTALS

1. Samples:

Submit samples of each type of masonry unit and each accessory item required. Provide certification of pull-out strength of all masonry ties and anchors. Submit certification of compliance with required standards for all masonry units.

2. Shop Drawings:

Provide shop drawings of custom sized and shaped precast Brick as detailed on the drawings.

0400.0500 PRODUCT DELIVERY, STORAGE AND HANDLING

1. Delivery:

Deliver masonry units to job site in undamaged condition. Deliver and handle units to prevent chipping, breaking, or other damage.

2. Storage:

Store masonry units off ground and protected from wetting by capillary action, rain, or snow, and protected from mud, dust, or other materials and contaminants likely to cause staining or defects.

0400.0600 JOB CONDITIONS

1. Cold weather construction:

Masonry construction performed when ambient temperature falls below 40 degrees F. shall conform to the Recommended Practices and Guide Specifications for Cold Weather Masonry Construction published by the International Masonry Industry All-Weather Council.

2. Coverings:

The Contractor shall construct and maintain temporary protection as required to permit continuous progress of the work. During construction, partially completed walls which are not enclosed or sheltered shall be kept dry by covering at the end of each day and when work is not in progress with strong, weather-resistant material extended a minimum of 2 ft. down each side, and held securely in place.

3. Protections:

Do not apply uniform floor or roof loads for at least 12 hours or concentrated loads for at least 3 days after building masonry walls or columns.

4. Staining:

Prevent grout or mortar from staining the face of masonry to be left exposed or to be painted. Remove immediately any grout or mortar in contact with face of such masonry. Protect all sills, ledges, and projections from droppings of mortar. Protect door jambs and corners from damage during construction.

1. Materials

a. Portland cement:

ASTM C150, Type II

b. Lime:

Hydrated lime, ASTM C207, Type S.

c. Sand:

ASTM C144.

d. Aggregates:

ASTM C404.

e. Water:

Mixing water must be clean and free of harmful amounts of acids, alkalis, organic materials, or other substances that would adversely affect the quality or appearance of the mortar or the masonry units.

f. Brick and Stone:

1. Veneer Brick shall be ASTM C216, Grade SW, Type 1; as manufactured by Belden Brick Co. Bellcrest 550 or equal. Submit sample of Brick and Stone. Provide brick similar in color, texture, and physical properties to those available for inspection at the Architect's office. Do not exceed variations in color and texture of samples accepted by the Architect.
2. Stone accents and rockface shall be Continental Cast Stone Manufacturing Inc. or equal color 1100E Whitestone. Provide all samples, sizes and finishes for all interior and exterior stone as indicated and noted in the drawings.

g. Hollow loadbearing CMU:

ASTM C90, Grade N, Type 1, Normal weight.

h. Hollow non-loadbearing CMU:

ASTM C129, Type II, Light weight.

i. Provide bond beams with two (2) #5 3,000 psi concrete where indicated.

j. Reinforcement:

Steel reinforcing shall conform to the following ASTM Specifications:

1. Cold-drawn steel wire, ASTM A82.
2. Welded steel wire fabric, ASTM A185.
3. Billet steel deformed bars, ASTM A615, Grade 60.

k. Material for anchors and ties:

All anchors and ties shall be coated or corrosion-resistant metal meeting or exceeding the following ASTM Specifications:

1. Zinc coating of flat metal, ASTM A153.
2. Zinc coating of wire, ASTM A116, Class 3.
3. Copper-coated wire, ASTM B227, grade 30HS.
4. Stainless steel, ASTM A167, Type 304.

l. Types of anchors and ties:

Provide the following types of anchors and ties for masonry construction:

1. Wire mesh: Minimum 20 gauge, 1/2 in. mesh, galvanized wire, and 1 in. less in width than width of masonry.
2. Corrugated veneer anchors: Minimum 22 gauge, minimum 7/8 in. wide x 6 in. long.
3. Cavity wall ties: Shall be eye & pintle type minimum 3/16 in. wire diameter with drip, rectangular, at least 2 in. wide, or Z-shaped with 2 in. legs, length sufficient to allow 1 in. minimum mortar coverage of ends or legs. At all veneer space 16" vertical & horizontal staggered.
4. Joint reinforcement: Prefabricated welded joint reinforcement, longitudinal

cross tie wire minimum 9-gauge spaced 16 in. on center; ladder or truss-type design.

5. Dovetail flat bar anchors: Minimum 16 gauge, 7/8 in. minimum width, corrugated, turned up 1/4 in. at end, or with 1/2 in. hole within 1/2 in. of end of bar.
6. Wire anchors: Wire anchors shall be minimum 3/16 in. diameter.
7. Rigid anchors for intersecting bearing walls: 1 1/2 in. wide x 1/4 in. thick x 24 in. minimum length; turn up ends minimum 2 in. or provide cross pins.
8. Wire ties for grouted reinforced masonry: Minimum 9-gauge wire bent into rectangular stirrups 4 in. wide and 2 in. shorter than overall wall thickness; form so that tie ends meet in center of one embedded end of stirrup.

2. Mixes

a. Mortar mixes:

Mortar shall comply with the minimum requirements of ASTM C270, Type M for Arriscraft units use a Portland cement-lime based mortar mix, proportioned to a 1:1:6 ratio, where 1 part Portland cement is mixed with 1 part Type S hydrated mason's lime and 6 parts masonry sand. This mixture shall be properly mixed with the appropriate quantity of water to result in a Type N mortar as specified in CSA A179-94; Mortar and Grout for Unit Masonry, and ASTM C270-95a; Standard Specifications for Mortar for Unit Masonry.

b. Admixtures:

No air-entraining admixtures or materials containing air-entraining admixtures shall be used. No antifreeze compounds or other substances shall be added to mortar or grout. No calcium chloride shall be included in mortar or grout in which metal reinforcing or accessories will be embedded. Mortar colors shall consist of inorganic compounds not to exceed 15% of the weight of the cement except that carbon black shall not exceed 3% of the weight on the cement. If mortar colors are used in reinforced masonry, the ultimate compressive strength of the masonry shall be determined by prism tests.

0400.0800 EXECUTION

1. Preparation

a. Inspection:

Inspect surfaces that are to support masonry work to assure completion to proper lines and grades free of all dirt and other deleterious material. Do not begin work until surfaces not properly prepared have been satisfactorily corrected.

2. Field Quality Control

a. Mortar and grout:

Mix mortar and grout in accordance with the proportion requirements of ASTM C270, and ASTM C476 as applicable. Control batching procedure to ensure proper proportions by measuring materials by volume. Amount of mixing water and mortar consistency shall be controlled by mason. Retempering will be permitted only within the first 2 1/2 hours of initial mix. Any mortar or grout that has partially set shall be discarded.

b. Allowable tolerances:

1. Maximum variation from plumb in lines and surfaces of columns, walls, and arises shall not exceed 1/4 in. 10 ft.; 3/8 in. in any story or 20 ft. maximum; or 1/2 in. in 40 ft.
2. Maximum variation from plumb for external corners, expansion joints, and other conspicuous lines shall not exceed 1/4 in. in any story or 20 ft. maximum; or 1/2 in. in 40 ft.
3. Maximum variation from level or grades for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines shall not exceed 1/4 in. in any bay or 20 ft. maximum; or 1/2 in. in 40 ft.
4. Maximum variation of linear building line from an established position in plan and related portions of columns, walls, and partitions shall not exceed 1/2 in. in any bay or 20 ft. maximum; or 3/4 in. in 40 ft.
5. Maximum variation of linear building line from an established position in plan and related portions of columns, walls, and partitions shall not exceed 1/2 in. in any bay or 20 ft. maximum; or 3/4 in. in 40 ft.

c. Anchors and ties:

Remove all dirt, ice, loose rust, and scale prior to installation.

d. Protection of work:

Protect sills, ledges, and offsets from mortar droppings or other damage during construction. Remove misplaced mortar or grout immediately. Protect face

materials against staining. Protect door jambs and corners from damage during construction.

2. Installing Masonry

a. Preparation:

Verify that initial absorption rate of clay brick is less than 0.025 oz. /sq. in. per minute. Brick with absorption rates in excess of this amount shall be wetted with clean water 24 hours prior to placement until unit is nearly saturated, and shall be surface dry when laid. During freezing weather, units that require wetting shall be sprinkled with warm or hot water just before laying. No wetting of concrete unit masonry is permitted.

b. Installation:

Do not install cracked, broken, or chipped masonry units exceeding ASTM allowances. Use masonry saws to cut and fit exposed units. Lay brick plumb, true to line, and with level courses accurately spaced within allowable tolerances. Unless otherwise shown on the drawings, install masonry work using 1/2 running bond. Stop horizontal runs at end of workday by racking back in each course; toothing will not be permitted. Adjust units to final position while mortar is soft and plastic. If units are displaced after mortar has stiffened, remove, clean joints and units of mortar, and re-lay with fresh mortar. Adjust shelf angles to keep work level and at proper elevation. When joining fresh masonry to set or partially set masonry, remove loose unit and mortar, and clean and lightly wet exposed surface of set masonry prior to laying fresh masonry. The mason shall place all accessories and reinforcement in the masonry as the job progresses. Place horizontal joint reinforcement in first bed joint and each successive third joint of concrete masonry walls to prevent cracking. Cooperate with other trades to assure proper location of anchors, inserts, penetrations, etc.

c. Built-in items:

Install bolts, anchors, nailing blocks, inserts, frames, vent flashing, conduit, and other built-in items as masonry work progresses. Avoid cutting and patching. Solidly grout spaces around built-in items. Provide joints around exterior framed openings 1/4 to 3/8 in. wide, raked and tooled smooth to a uniform depth of 3/4 in., ready for caulking by others. Build chases in, do not cut. Install chases minimum of one masonry unit length from jambs.

d. Joints:

Provide nominal joint thickness of 3/8 in. for concrete unit masonry, 3/8 in. for brick masonry. Do not furrow bed joints for solid masonry units. Provide face-

shell bedding for concrete unit masonry except at grouted cells and base course, where full mortar bedding is required. Construct uniform joints. Provide full head and bed joints, shoved tight to prevent penetration of moisture. Provide weather-proof, concave, tooled joints in exposed surfaces when mortar is thumbprint hard, using round jointing tool. Strike joints flush in surfaces to be plastered, stucco, or covered with other material or surface-applied finish other than paint. Concave tool exterior joints below grade. Remove mortar protruding into cells or cavities to be grouted. Do not permit mortar droppings to fall into cavities of multi-wythe walls or to block weep holes. Fill with mortar all horizontal joints between top of masonry partitions and underside of concrete beams. Keep movement joints clean of all mortar and debris. For tuckpointing, rake mortar joints to a depth of 1/2 to 3/4 in., saturate with clean water, fill solidly with pointing mortar, and tool to match existing joints. Cut first course of CMU at each level with wet saw as required for bed joints to align with veneer joints.

e. Flashing & Damp Proofing:

Provide through-wall flashing at base of all cavity walls; at shelf angles; at lintels, heads, and sills of openings in exterior walls; at all locations shown on the drawings; and at any other locations as required to complete the integrity of waterproofed or dampproofed surfaces. Form dams at horizontal termination of all flashing.

Clean surface of masonry smooth and free from projections that might puncture or otherwise damage flashing membrane. Carefully fit flashing around projections and where dampproof membrane abuts columns, walls, etc. Neatly fold and bed in mastic or mortar so as to direct moisture to the outside. Form membrane to required profiles and install in such a manner as to force any moisture entering the wall to the outside. Hold outer edge of membrane to surface with mastic or mortar. Lap joints 4 in. and seal with mastic or embed in mortar. Form membrane to correct profile without wrinkles or buckles, and protect from punctures and tears during installation. Field cut units at 8/12 ratio at straight wall flashing where roofs intersect with masonry veneer.

Prior to installation of veneer brick and thin brick systems, the entire exterior face of CMU shall be damp proofed with Tamms Dehydrate 75 Emulsified Asphalt Damp Proofing Compound or equal, one (1) coat application.

f. Weep holes:

Provide weep holes in head joints in first course immediately above all flashing. Leave head joint free and clean of mortar or install weep hole tube in head joint. Space weep holes 24 in. on center maximum for brick masonry, and 24 in. on center maximum for Arriscraft. Keep weep holes and area above flashing free of mortar droppings. For backfill material behind retaining walls, and for loose fill

insulation in walls, screen cavity side of weep hole against clogging before fill material is placed.

g. Masonry bonding:

Bond facing and backing of multi-wythe walls as shown on the drawings with masonry headers extended a minimum of 3 in. into backing. If single header does not extend through wall, overlap headers from opposite sides of wall at least 3 in. Provide minimum number of wall headers equal to 4% of wall surface, spaced maximum distance of 24 in. on center either vertically or horizontally.

For multi-wythe walls of hollow concrete masonry units, bond inner and outer wythes by transverse lapping of stretcher unit at least 3 in. over units below, spaced maximum 32 in. on center vertically; or lap with stretcher units at least 50% wider than unit below, spaced maximum 16 in. on center vertically. Bond abutting or intersecting walls and partitions with at least 50% of units at the intersection laid in masonry bond. Provide a minimum of 3 in. of bearing of alternate units on unit below. Masonry bonding is not permitted for grouted or reinforced construction.

h. Metal-tie bonding:

Provide metal ties for bonding of multi-wythe walls as shown on the drawings. Stagger ties in alternate courses, and provide minimum of one tie for each 4.5 sq. ft. of wall surface. Maximum distance between adjacent ties not to exceed 18 in. vertically or 24 in. horizontally. Embed ties in horizontal joints of facing and backing. Provide additional ties within 12 in. of openings, spaced maximum 36 in. around perimeter.

In lieu of metal ties, contractor may use continuous prefabricated metal joint reinforcement as specified, spaced not more than 16 in. on center vertically.

For corner intersections of walls carried up separately, provide rigid steel anchors at maximum vertical spacing of 32 in. When intersecting bearing or shear walls are carried up separately, provide rigid steel anchors at a maximum vertical spacing of 2 ft.

Anchor nonbearing partitions abutting or intersecting other walls or partitions with cavity wall ties at vertical spacing not to exceed 4 ft.

i. Anchoring brick veneer:

Attach brick veneer to backing with metal veneer ties spaced maximum 16 in. on center vertically and horizontally with a minimum of one tie for each 2 sq. ft. of wall area. Embed ties at least 2 in. in horizontal joint of facing. Provide additional ties within 12 in. of openings, spaced maximum 36 in. around perimeter.

j. Expansion and contraction:

Provide vertical movement joints where called for on the drawings at intervals of not more than 20 ft. on centers, and at all offsets, returns, openings, and intersections with dissimilar materials. Provide continuous bond break at steel columns and members. Provide pressure-relieving joints by placing a continuous 1/8 in. neoprene pad below shelf angles.

3. Reinforced Masonry

a. Masonry strength:

Provide minimum ultimate compressive strength of 1,500 psi.

b. Reinforcement:

Hold vertical reinforcement firmly in place by means of frames or other suitable devices. Place horizontal reinforcement as masonry work progresses. Provide minimum clear distance between longitudinal bars equal to nominal diameter of bar. Provide minimum clear distance between bars in columns equal to 1 1/2 times bar diameter. Minimum thickness of mortar or grout between masonry and reinforcement shall be 1/4 in., except that 1/4 in. bars may be laid in 1/2 in. horizontal mortar joints, and 6-gauge or smaller wires may be laid in 3/8 in. mortar joints. Collar joints containing both horizontal and vertical reinforcement shall have a minimum width 1/2 in. larger than the sum of the diameters of the horizontal and vertical reinforcement.

c. Low-lift grouting:

For grout spaces less than 2 in. width, place grout at maximum 24-in. intervals in lifts of 6 to 8 in. as the wall is built. Assure that grout core is clean of mortar, mortar droppings, and debris. Agitate grout during and after placement to assure complete filling and coverage of reinforcement. If work is to be stopped for 1 hour or more, hold grout 1 1/2 in. below top of masonry. Continue grouting to top of finished wall.

d. High-lift grouting:

For grout spaces 2 in. or more in width, grout may be placed in lifts not to exceed 4 ft. For running bond, provide one metal tie for each 3 sq. ft. of wall with maximum spacing of 16 in. vertically and 24 or 32 in. horizontally for brick and concrete block respectively. For stack bond, provide one metal tie for each 2 sq. ft. of wall with maximum spacing 12 in. vertically and 24 in. horizontally for brick, or 16 in.

vertically and horizontally for concrete block.

Keep grout core clean. Provide cleanout holes in bottom course as required for inspection and cleaning. Replace cleanout plugs only after area to be grouted has been accepted. Do not place grout until the entire wall has been in place a minimum of 3 days. Place horizontal grout barriers at convenient intervals. If work is to be stopped for 1 hour or more, hold grout 1 1/2 in. below top of masonry. Continue grouting to top of finished wall.

e. Forms and shoring:

Provide substantial and tight forms to prevent leakage of mortar or grout. Brace or shore forms to maintain position and shape. Do not remove forms or shoring until masonry has hardened sufficiently to carry its own weight and any other temporary loads that may be placed on it during construction (10 days for girders and beams, 7 days for masonry slabs).

4. Cold-Weather Masonry Construction

a. Surface conditions:

Ice or snow that has formed on the masonry bed shall be thawed by application of heat. Apply heat carefully until top surface is dry to the touch. Any section of completed masonry work that is deemed frozen and damaged shall be removed before continuing construction of that section.

b. Condition of masonry units:

Use only dry masonry units, except as permitted below. Wet or frozen masonry units shall not be laid. No wetting of concrete masonry units will be permitted.

For brick masonry units used in cold-weather construction, initial rates of absorption may range to a maximum of 1 1/2 oz. When sprinkling is required to achieve proper rates, heated water shall be used. Water shall be above 70 degrees F. when temperature of units is above freezing and above 130 degrees F. when temperature of units is below freezing.

c. Construction requirements:

1. Air temperature 32 to 40 degrees F: Sand or mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F.
2. Air temperature 25 to 32 degrees F: Sand and mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F. Maintain temperature of mortar on boards above freezing.

3. Air temperature 20 to 25 degrees F: Sand and mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F. Maintain mortar temperatures on boards above freezing. Provide sources of heat on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.
4. Air temperature 20 degrees F. and below: Sand and mixing water shall be heated to provide mortar temperatures ranging from 40 to 120 degrees F. Enclosures and auxiliary heat shall be provided to maintain air temperature above freezing. Temperature of units when laid shall be not less than 20 degrees F.

d. Protection of completed work:

1. Mean ambient temperature 32 to 40 degrees F: Masonry completed or not being worked on shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.
2. Mean ambient temperature 25 to 32 degrees F: Masonry shall be completely covered with weather-resistive membrane for 24 hours.
3. Mean ambient temperature 20 to 25 degrees F: Masonry shall be completely covered with insulating blankets, or equally protected for 24 hours.
4. Mean ambient temperature 20 degrees F and below: Masonry temperature shall be maintained above freezing for 24 hours by enclosure and supplementary heat such as electric heating blankets, infrared heat lamps, or other approved methods.

5. Pointing and Cleaning

a. Pointing:

At final completion of masonry work, cut out any defective joints or holes in exposed masonry and repaint with mortar, tooling to match adjacent joints.

b. Cleaning:

Dry brush masonry surface after mortar has set at end of each workday and after final pointing. Clean exposed, unglazed masonry with stiff brush and clean water. Cleaning agents may be used only with written approval of Architect. Cleaning agents must be tested on sample wall area of 20 sq. ft. Protect adjacent materials from damage due to cleaning operations. Remove efflorescence in accordance with brick manufacturer's recommendations.

Leave work area and surrounding surfaces clean and free of mortar spots, droppings, and broken masonry.

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DIVISION 4 – MASONRY

SECTION 042516 – THIN BRICK/STONE VENEER MASONRY

PART 1: GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 general requirements apply to this section.

1.2 SUMMARY

A. Section Includes:

1. Thin Tech® Thin Masonry Support System comprised of:
 - a. Thin Tech® Thin Masonry Support Panel
 - b. Glen-Gery Construction Adhesive
 - c. Silicone Adhesive and Primer
 - d. Thin Tech® Air Vent
 - e. Thin Tech® Starter Angle
 - f. Thin Tech® Shim
 - g. Thin Tech® Universal Corner Support
 - i. Thin Tech® Fasteners
 - j. Thin Tech® spacers
 - k. Transition Tape
 - l. Glen-Gery Mortar
 1. Color Mortar Blend (Portland cement lime mortar)
 2. Type N or Type S Preblended Mortar
2. Related Materials and Procedures:
 - a. Thin Brick
 - b. Glazed Thin Brick
 - c. Cast Stone/Natural Stone
 - d. Cleaning
 - e. Embedded Flashing
 - f. Weepholes/Vents
 - g. Movement Joints
 - h. Fasteners
 - i. Silicone Sealant
 - j. Silicone Sealant Primer

B. Related Sections:

1. Division 03 Section – “Concrete” (Cast-in-Place, Precast)
2. Division 04 Section – “Masonry” (Unit Masonry)
3. Division 05 Section – “Metals” (Structural Framing, Cold-Formed Framing, Metal Fabrications)
4. Division 06 Section – “Wood, Plastics and Composites” (Rough Carpentry, Sheathing)
5. Division 07 Section – “Thermal and Moisture Protection” (Dampproofing and Waterproofing, Flashing and Sheet Metal, Joint Protection)
6. Division 08 Section – “Openings” (Wall Vents)
7. Division 09 Section – “Finishes” (Plaster and Gypsum Board, Tile)
8. Division 13 Section – “Special Construction” (Pre-Engineered Structures)

1.3 REFERENCES

- A. ANSI A118.4 - American National Standards Institute Specifications for Modified Dry-Set Cement Mortar
- B. ANSI A118.15 – American National Standards Institute Specifications for Improved Modified Dry-Set Cement Mortar
- C. ASTM A 240 – Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- D. ASTM A 510 – Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel
- E. ASTM A 653 – Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process
- F. ASTM A 925 – Standard Specification for Zinc 5% Aluminum Mischmetal Alloy Coated Steel Overhead Ground Wire Strand
- G. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus
- H. ASTM C 67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
- I. ASTM C 126 – Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
- J. ASTM C 270 – Standard Specification for Mortar for Unit Masonry
- K. ASTM C 954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

- L. ASTM C 1088 – Standard Specification for Thin Veneer Brick Units Made From Clay or Shale
- M. ASTM C 1364 - Standard Specification for Architectural Cast Stone
- N. ASTM C 1405 – Standard Specification for Glazed Brick (Single Fired, Brick Units)
- O. ASTM E 2925 - Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function
- P. ASTM D 4716 – Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- Q. ASTM E 2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights
- R. TMS 602 (ACI 530.1/ASCE 6) – Specifications for Masonry Structures.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product description, indicating material types, colors and thicknesses and storage and handling requirements prior to purchase. Field review with manufacturers representative [Kyle Evans (631) 786-4513] & Architect as part of submittal process to verify entire system to be utilized.
- B. Samples: Submit samples of each product type proposed for use.
- C. Material Certificates: Prior to delivery, submit to Architect/Engineer certificates indicating compliance with the applicable codes, specifications and criteria herein for [Thin Brick, including Grade and Type], [Architectural Cast Stone] [and] [Architectural Accent Cast Stone] as listed in this Section.
- D. Thin Brick Test Reports: Submit test reports substantiating compliance with requirements of [ASTM C1088] [ASTM C216 for thin brick cut from facing brick]. Sample and test in accordance with ASTM C 67.

1. Testing and reports shall be completed by an independent laboratory.

- a. Test reports for each type of brick shall be submitted to the Architect/Engineer for review.
- b. Thin Brick Test reports shall indicate:
 - i.) 5-hour boiling water absorption
 - ii.) Saturation coefficient
 - iii.) Initial rate of absorption

iv.) Efflorescence Rating

- E. Glazed Thin Brick Test Reports: Submit test reports substantiating compliance with requirements of [ASTM C1405 for thin brick cut from glazed brick] [ASTM C126 for glazed surfaces applied to thin brick complying with ASTM C1088]. Sample and test in accordance with ASTM C67 and C126.
1. Test reports for each type of glazed thin brick shall be submitted to the Architect/Engineer for review.
 - a. Glazed Thin Brick Test reports for the body shall indicate:
 - i.) 24-hour cold water absorption
 - ii.) Saturation coefficient
 - iii.) Initial rate of absorption
 - iv.) Efflorescence Rating
 - b. When specified, Glazed Thin Brick Test reports for the glazed surface shall indicate:
 - ii.) Resistance to fading
 - iii.) Resistance to crazing
 - iv.) [Imperviousness]
 - i.) [Opacity]
- F. Cast & Accent Stone Test Reports: Submit test reports substantiating compliance with requirements of ASTM C1364. Sample and test in accordance with ASTM C1364.
1. Test reports for each type of cast stone shall be submitted to the Architect/Engineer for review.
- G. Costs of Tests: Cost of tests shall be borne by the purchaser, unless tests indicate that units do not conform to the requirements of the specifications, in which case cost shall be borne by the seller.
- H. Installation Instructions: Submit copy of manufacturer's product installation instructions
- I. Manufacturer's Details: Submit individual drawings to be approved by Architect for special shaped thin veneer units.

1.5 CLOSEOUT SUBMITTALS

A. Warranty Documentation:

1. Product warranty documentation specified under Section 3.12 shall be supplied to contractor (for subsequent provision to building owner) upon completion of building construction.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Maintenance:

1. Installer shall supply to contractor (for subsequent provision to building owner) copy of manufacturer's pertinent documentation relating to typical repair of thin veneer system once occupancy commences.

1.7 QUALITY ASSURANCE

A. Masonry Standard: Comply with TMS 602 (ACI 530.1/ASCE 6) unless modified by requirements in the Contract Documents.

B. Comply with all applicable codes, regulations, and standards. Where provisions of applicable codes, regulations and standards conflict with requirements of this section, the more demanding shall govern.

C. Manufacturer Qualifications:

1. Obtain materials from one manufacturer to ensure compatibility.
2. Thin Masonry Support Panel:
 - a. Documented qualifications and capabilities that fully describe the ability to provide the required metal panel system and technical support to the Owner.
 - b. At least five (5) completed projects over the last two years, illustrating system performance equal to or exceeding the criteria listed in this specification.
 1. Include the project location, award date, the completion date, the contract value, and the name and telephone number of a person employed by the Owner who has personal knowledge of the manufacturer's contractual and technical performance.

D. Installer Qualifications:

1. All products listed in this Section shall be installed by a Glen-Gery trained Thin Tech[®] installer or installer providing proof of a minimum of five years' experience with a related thin masonry support system.
2. At least one supervisory journeyman, who has completed Glen-Gery Thin Tech[®] training, shall be present at all times during execution of work, who shall be thoroughly familiar with design requirements, types of materials being installed, reference standards and other requirements, and who shall direct all Thin Tech[®] related work performed at jobsite.
3. Upon request, installer shall furnish proof of training/experience documentation that may

include the following to Contractor prior to commencement of work under this Section:

- a. Glen-Gery training certificate.
 - b. Lists of completed projects with project names, addresses, and contact information of architects and owners.
 - c. Specialty certification held by [company] [installer] that are relevant to this project, including the name of the certification, certifying body, and date certified.
- E. Sample/ Mock-Up Panels: Sample/mock-up panels shall be used to review installation process as well as [thin brick,] [cast stone] [natural stone] and mortar color selections and serves as the standard of workmanship for the Project.
1. Build Mock-up panels [with adjoining walls at a 90 degree angle for Thin Tech® System in sizes approximately 48 in. (1,219 mm) long by 48 in. (1,219 mm) high by full wall thickness.
 2. Build mock-up panel for walls to receive Glen-Gery Thin Tech® System as shown on designated project drawings.
 - a. All thin brick shipped for the mock-up shall be included in the panel.
 - b. Use mock-up panel as standard of comparison for all masonry work built of same material.
 - c. Where masonry is to match existing, erect panel adjacent and parallel to existing surface.
 - d. Clean [one-half of] exposed faces of panel with masonry cleaner as indicated and approved by manufacturer.
 - e. Approval of panel is for color, texture, and blending of masonry units; relationship of mortar to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - f. Protect approved panel from the elements.
 - g. Do not start work until Architect/Engineer/Owner has accepted mock-up panel.
 - h. Do not destroy or move sample or mock-up panels until work is completed and accepted by Architect/Engineer/Owner.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's unopened packaging.
- B. Inspect all materials upon arrival and notify supplier if any damage is observed. Store products in manufacturer's packaging or according to manufacturer's recommendations until ready for installation.

- C. Store Glen-Gery Thin Tech® Panels, masonry units, mortar, and accessories off the ground to prevent contamination by mud, dust or other materials likely to cause staining or other defects.
- D. Protect materials from contamination, moisture, freezing, overheating or other damage in accordance with manufacturer's instructions. Cover all materials with a non-staining waterproof membrane material when necessary to protect from elements.
- E. Store different types of materials separately.
- F. Store adhesive and mortar additive above 32° Fahrenheit and below 86° Fahrenheit temperatures.
- G. Store and dispose of solvent-based materials and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- H. Panels must be stored to prevent permanent distortion and kept dry before installation. Panels and accessories should be covered at all times prior to installation.
- I. Dry panels exposed to water or condensation prior to installation or application of thin brick. The presence of moisture on the brick or metal panels may adversely affect adhesive performance.

1.9 PROJECT CONDITIONS

- A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during and after installation.
- B. Protection of Work:
 - 1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's limits.
 - 2. Stain Prevention:
 - a. Prevent adhesive and mortar from staining the face of masonry.
 - b. To avoid smearing of adhesive or mortar on the face of masonry, allow adhesive and mortar on face of installed masonry to become firm before trying to remove.
 - c. Protect all sills, ledges and projections from droppings of adhesive or mortar.
 - d. Protect the wall from rain-splashed mud and mortar splatter.
- C. Cold Weather Requirements:
 - 1. Do not use frozen masonry materials or materials mixed or coated with ice or frost.

2. Do not build on frozen substrates.
3. Comply with cold-weather construction requirements contained in TMS 602 (ACI 530.1/ASCE 6).

D. Hot Weather Requirements:

1. Comply with hot-weather construction requirements contained in TMS 602 (ACI 530.1/ASCE 6).
2. Protect mortar from uneven and excessive evaporation.
 - a. The face of the installed thin brick may be dampened with water prior to mortar installation to reduce the absorption of moisture from the mortar joint and increase bond.
 - b. Veneer may be fogged with water to prevent drying prior to proper hydration of mortar. Apply only enough moisture to consistently dampen the wall without allowing water to run down the face of the masonry.

PART 2: PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: Glen-Gery Corporation located at 1166 Spring Street, P.O. Box 7001, Wyomissing,
Contact: Kyle Evans (Kings Materials) E: kyle@kingsny.com P: (631)786-4513
- B. Substitutions: Not permitted.

2.2 THIN MASONRY VENEER SUPPORT SYSTEM

- A. Thin Masonry Veneer Support Panel: Metal support panel consisting of 26 gauge (16 mil) , stucco embossed, textured steel with angled ties providing structural mechanical support for interior or exterior thin masonry veneer, installed by fastening to concrete, masonry, metal or wood frame construction.
1. All Metal Panels for thin brick support specified and shown on drawings shall be Elite Thin Tech® Panels as manufactured by the Glen-Gery Corporation.
 2. Exterior Finish: [G90 Galvanized with thermal set coating] [Stainless steel]
 3. Support ties: [3/8 in. (10 mm)], [5/8 in. (16 mm)]
 4. Support Panels: 4 ft. x 4 ft. nominal (16 sq. ft, 1.44 m² - actual dimensions except as noted: 48 in. [W] 47-7/8 in. x [H] 48 in. x [T] 3/8 in. {1,216 mm x 1,219 mm x 10 mm}) masonry support panels for flat wall areas, shall be for unit heights as follows:
 - a. 2-5/8 in. (2.667 in., 68 mm) spacing for Modular, Standard, Norman, and other 2-1/4 in. (57 mm) high units. Three (3) courses equal 8 in. (203 mm).
 - b. 3.2 in. (3-1/8 in., 81 mm) spacing for Engineer, Handmade Oversize, and other 2-3/4 in. (70 mm) high units. Five (5) courses equal 16 in. (406 mm).

- c. 4 in. (102 mm) spacing for Econo, Utility and other 3-5/8 in. (92 mm) high units.
- d. 8 in. (203 mm) spacing for 8-Square and other 7-5/8 in. (194 mm) high units. 5/8 in. (16 mm) support ties.
- e. 12 in. (305 mm) for 11-5/8 in. (295 mm) high units. 5/8 in. (16 mm) support ties.

B. Fasteners (For Masonry Support Panel)

1. Screw fasteners as supplied by Glen-Gery: Pan head fasteners with a minimum #10, (0.190 in., 4.8 mm) thread diameter and corrosion resistance provided by tri-layered ceramic surface coating with a minimum

protection of 1000 hrs. when tested according to ASTM B117.

- a. Fasteners for attachment to wood studs, concrete and masonry: Self-tapping, point type 17.
- b. Fasteners for attachment to light gauge steel studs: Self-drilling, with a drilling capacity of 0.035 to 0.176 in. and minimum torsional strength of 75 lb/in.

2. Fastener Length:

- a. Wood stud fasteners: [1-½ in. (38 mm)] [2-¼ in. (57 mm)] [3 in. (76 mm)] [4 in. (102 mm)] [5-1/4 in. (133 mm)] Screw fasteners shall penetrate the studs a minimum of 1-1/4 in. (32 mm).
- b. Metal framing/support member fasteners: [1-½ in. (38 mm)] [3-½ in. (89 mm)] [4-1/2 in (114 mm)] [5-¾ in. (146 mm)]. Fasteners shall penetrate not less than member thickness plus three threads (3/16 in., 5 mm).
- c. [Masonry] [or] [Concrete] fasteners: [1-½ in. (38 mm)] [2-¼ in. (57 mm)] [3 in. (76 mm)] [4 in. (102 mm)] [5-1/4 in. (133 mm)]. Screw fasteners shall penetrate the substrate a minimum of 1 in. (25 mm).

C. Starter Angle Flashing:

1. Glen-Gery Thin Tech® Starter Angle:

- a. Stainless steel conforming to ASTM A240/A240M, Type 304, 0.018 in. (0.45 mm) (26 gauge) pre-bent in 10 ft. (3.05 m) lengths.
- b. Depth: [1-1/4 in. (32 mm)] [2-1/4 in. (57 mm)] [3-1/4 in. (83 mm)] [4-1/4 in. (108 mm)]
- c. Profile: [45 degree drip] [straight hemmed]

D. Resistive Barrier

1. Provide water resistive barriers as designated in Division 07.
2. Water resistive barrier shall be [Laticrete MVIS Air & Water Barrier] [Water-resistive barrier complying with ASTM E2556, Type II] [Two layers of water-resistive barrier equal to or complying with ASTM E2556, Type I].

E. Drainage Mat/Rainscreen shall be:

a. Glen-Gery Drainage Mat

1. Filter fabric laminated to spun and heat welded entangled geomatrix, 0.25 in. (6 mm) two-ply polypropylene core mesh with cornrow configuration
2. Permits moisture drainage and creates airspace
3. Hydraulic Transmissivity, Machine Direction, ASTM D 4716:
 - a. Flow Rate: 3.70 GPM/ft. width.
 - b. Transmissivity: $7.65\text{E-}03 \text{ m}^2/\text{s}$.
4. Air Transmissivity, ASTM D 4716, Modified:
 - a. Estimated Flow Rate: 15.8 cu ft./min/ft. width.
 - b. Incremental Transmissivity: $6.97\text{E-}04 \text{ m}^2/\text{s}$

F. Shims: [1-¼ in. (32 mm) wide] [2-5/8 in. (67 mm) wide] by [H] 48 in. (1,219 mm) by [T] 3/8 in. (10 mm), manufactured from G90 hot dipped galvanized, 26 gauge (16 mil) steel with thermal set coating, stucco embossed texture and centered channel.

G. Adhesives and Primer

1. Glen-Gery Heavy Duty Construction Adhesive for thin brick (maximum 1 in. [25 mm] thick) as supplied by Glen-Gery:
 - a. High-strength mastic exceeding ASTM D3498 and ASTM C557 specifications with less than 70 grams of VOC per liter with a shear value between the thin veneer and the panel greater than 50 PSI (10.5 kg/cm^2).
2. Adhesive for [cast stone] [natural stone] [and] [thin brick units more than ¾ in. (19 mm) thick] [and] [thin brick units 3-5/8 in. (92 mm)] or greater in height] when not otherwise mechanically attached (e.g. with Glen-Gery Thin Tech[®] support channels or clips) as supplied by Glen-Gery:
 - a. Silicone meeting or exceeding the following: TT-S-00230C, Class A, ASTM C-920,

Class 50, Type S, Grade NS, Use G,A,M,O; Type I & II, ASTM C1184-05, AAMA 805.2, AAMA 802.3 & 808.3, ASTM C1248.

3. Primer for cast/natural stone as supplied by Glen-Gery:

- a. One-component, colorless, non-yellowing polyisocyanate compatible with silicone sealants, porous and non-porous substrates.

H. Installation Hardware

1. Support Channels: 8 ft. (2.44 m) long, manufactured from 26 gauge (18 mil) [stainless steel] with ½ in. (13 mm) support leg, ¾ in. (19 mm) wide by ½ in. (13 mm) high clip

- a. 3-¾ in. (95 mm) Type 1 Classic Channel for 3-⅝ in. (92 mm) high units
- b. 7-¾ in. (197 mm) Type 2 Classic Channel for 7-⅝ in. (194 mm) high units
- c. 11-¾ in. (298 mm) Type 3 Classic Channel for 11-⅝ in. (295 mm) high units
- d. 2-⅜ in. (60 mm) Type 5 Classic Channel for 2-¼ in. (57 mm) high units

2. Cast/Natural Stone Sill Clips: Manufactured from Type 304 stainless steel

- a. SE1 Side Clip: 14 ga. (75 mil), Type 304 stainless steel split-end bent plate, 2 in. (51 mm) high x ¾ in. (19 mm) wide with ½ in. (13 mm) split bend
- b. WC1 Sill Clip: 22 ga. (30 mil) channel, 3-¾ in. (95 mm) high x 3 in. (76 mm) long with ½ in. (13 mm) support leg and ½ in. (13 mm) clip
- c. WC2 Sill Clip: 22 ga. (30 mil) channel 5 in. (127 mm) high x 3 in. (76 mm) long x ¾ in. (19 mm) wide with ½ in. (13 mm) support leg and ½ in. (13 mm) clip
- d. Z1 Z Clip: 14 ga. (75 mil) Type 304 stainless steel bent plate, 2 in. (51 mm) wide x 2 in. (51 mm) high x ¾ in. (19 mm) wide bent plate with ½ in. (13 mm) clip

I. Universal Corner Support: 6 in. (152 mm) x 6 in. (152 mm) x 4 ft. (1.22 m) long, pre-bent 90 degrees, manufactured from 26 gauge (16 mil) , stucco embossed, textured steel

- 1. Exterior Finish: [G90 Galvanized with thermal set coating] [Stainless steel]

J. Thin Tech® Spacer: 1-1/4" in. (31 mm) [H] x 1 in. (25 mm) [W] x 3/4 in. (19 mm) [T] injection molded plastic with height-setting panel clip, reusable.

K. Weepholes/Vents:

- 1. Glen-Gery Thin Tech® Air Vent: Impact resistant polypropylene copolymer. Density 2,000 grams/sq. meter. Size: ⅜ in. (10 mm) x ½ in. (13 mm) x 48 in. (1.22 m).

2.3 MASONRY UNITS, GENERAL

- A. Masonry unit weight may not exceed 15 psf.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other imperfections exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed work.

2.4 UNIT MASONRY

- A. Manufacturer: Glen-Gery Corporation located at 1166 Spring Street, P.O. Box 7001, Wyomissing, PA 19610; Tel: 610-562-3076; e-mail: info@glengery.com; Web: www.glengery.com
- B. Substitutions: Not permitted.
- C. General: Provide shapes indicated and as follows:
 - 1. Provide special shapes for applications where flats (stretcher units) cannot accommodate special conditions, including those at corners and openings.
 - 2. Provide special shapes for applications requiring thin brick of size, form, color and texture on exposed surfaces that cannot be produced by sawing.
 - 3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- D. Provide brick similar in texture, color and physical properties to those available for inspection at the Architect/Engineer's office and/or as supplied on the approved sample panel.
- E. All thin brick veneer specified and shown on drawings shall be 4"x1"x12" utility wire-cut (ASTM C216, Grade SW, Type 1); as manufactured by Kings Materials, or equal. Color shall be "Flashed Red as manufactured by the Glen-Gery Corporation."
 - 1. Thin Brick: Comply with ASTM C 1088, Grade Exterior.
 - a. Type [TBS]
 - b. Size:
 - i.) Utility: 3-5/8 in. (92 mm) high, 11-5/8 in. (295 mm) long
 - ii.) Thickness: [1 in. (25 mm)]
- F. All Glazed Thin Brick specified and shown on drawings shall be utility wire-cut (ASTM C216, Grade SW, Type 1); as manufactured by Kings Materials, or equal. Color shall be "Flashed Red as manufactured by the Glen-Gery Corporation."
 - 1. Glazed Thin Brick: Comply with [ASTM C 1088, Grade Exterior, Type TBX for the body

and ASTM C 126 Grade S, Type 1 for glazed surface requirements][ASTM C 1405].

- a. Size (height, length – actual dimensions listed)
 - i.) Utility: 3-5/8 in. (92 mm) high, 11-5/8 in. (295 mm) long
 - ii.) Thickness [1 in. (25 mm)]

2.5 CAST STONE MASONRY

A. Comply with requirements of ASTM C 1364.

- 1. Compressive Strength: as tested in accordance with ASTM C 1194.
- 2. Absorption, Cold Water: as tested in accordance with ASTM C 1195.
- 3. Linear Shrinkage: as tested in accordance with ASTM C 426.

B. Size: [1] inches wide/thick, [12] inches high, [24] inches long.

C. Color, Texture and Finish: Stone veneer shall be Rock Cast 12"x1"x24" "Rock Face" finish; as manufactured by Kings Materials, or equal. Color shall be "Smokehouse"

2.6 ACCENT STONE MASONRY

A. Comply with requirements of ASTM C 1364.

- 1. Compressive Strength: as tested in accordance with ASTM C 1194.
- 2. Absorption, Cold Water: as tested in accordance with ASTM C 1195.
- 3. Linear Shrinkage: as tested in accordance with ASTM C 426.

B. Size: [1] inches wide/thick, [8] inches high, [Maximum allowed] inches long.

C. Color, Texture and Finish: Rock Cast 8"x1"x Maximum length "Smooth Finish" with chamfered edges; as manufactured by Kings Materials, or equal. Color shall be "Buffstone".

2.7 MORTAR

A. Cold Weather Additives (including accelerators) shall not be used in mortar.

B. Mortar for thin brick:

- 1. Mortar shall conform to ASTM C 270, Standard Specification for Mortar for Unit Masonry.
 - a. Glen-Gery Color Mortar Blend: Color – (Verify - TBD by Owner) Type [S]
- 2. Mortar modified with polymer additives and conforming to ANSI A118.4 or ANSI A118.15 specifications for modified or improved modified dry-set cement mortar.

C. Mortar for cast & accent stone units:

1. Comply with masonry unit manufacturer's mortar requirements. Mortar shall conform to ASTM C 270, Standard Specification for Mortar for Unit Masonry.
 - a. Glen-Gery Color Mortar Blend: Color – (Verify - TBD by Owner) Type [S]
2. Mortar modified with polymer additives and conforming to ANSI A118.4 or ANSI A118.15 specifications for modified or improved modified dry-set cement mortar.

2.8 ANCILLARY MATERIALS

A. Flashing

NOTE TO SPECIFIER: These are flexible and/or self-adhering flashings designed for used at jambs and sills where applicable. Delete flashing options not required for project or referenced in specification Division 07.

1. [Self-Adhering] Stainless Steel Fabric Flashing: Composite flashing product consisting of a 0.003 in. (0.08 mm) single sheet of Type 304 stainless steel [bonded to a 0.004 in. (0.10 mm) layer of polymeric fabric][with a butyl block co-polymer adhesive].
2. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymers alloy as follows:
 - a. Monolithic Sheet: Elastomeric thermoplastic flashing, 0.040 in. (1.0 mm) thick.
 - b. Self-Adhesive Sheet: Elastomeric thermoplastic flashing, 0.025 in. (0.6 mm) thick, with a 0.015 in. (0.4 mm) thick non-asphaltic adhesive.
3. Butyl Flashing: Self-adhering flashing membrane, minimum 0.016 in. in thickness (0.15 mm) consisting of a polyolefin film and butyl adhesive
4. Adhesives, Primers, and Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for joints or connections to or between water-resistive barrier or air barrier system components.
 - a. Transition Tape:
 1. Asphalt free self-adhering membrane, 3 in. (76 mm) wide, consisting of woven polyethylene/polypropylene film bonded to heavy duty synthetic rubber adhesive.
 2. Self-adhering tape, 3 in. (76 mm) wide, consisting of a polyolefin film with an acrylic adhesive.
 - b. Primer: As recommended by the manufacturer of the specified product

B. Control and Expansion Joints

1. Bond Breaker Tape: Polyethylene tape, width to match width of movement joint.
2. Backer Rod: Non-gassing polyethylene or flexible polyurethane foam rod 25% wider than width of joint to be filled and depth exceeds requirements in as indicated in Division 07 Section "Joint Sealants".
3. Sealant: As specified in Division 07 Section "Joint Sealants" and complying with ASTM C920.

2.9 RIGID INSULATION

- A. Provide rigid insulation as designated in Division 07 (Armorwall exterior insulation board system).
- B. Closed-cell insulating rigid foam shall have a minimum compressive strength of 15 pounds per square inch and comply with the requirements of [ASTM C578] [or] [ASTM C1289].
- C. Maximum flame spread and smoke development when tested in accordance with ASTM E 84 shall not exceed 25 and 450 respectively.
- D. Thickness shall not exceed 3 in. (76 mm).

2.10 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 1. Diedrich Technologies, Inc.
 - a. 202 New Masonry Detergent
 - b. 202V Vana-Stop[®]
 - c. Green Clean 250 Manufactured Stone Cleaner
 2. [other cleaning agent as recommended by masonry unit and mortar manufacturer.]

PART 3: EXECUTION

3.1 EXAMINATION

- A. Do not begin Thin Tech[®] installation until substrates, water-resistive barrier, drainage mat, foundations, rough-ins and built-in construction have been installed according to project specifications and building code requirements.

1. Walls must be structurally sound and the substrate system designed with a wall deflection not greater than $L/360$.
 - a. Maximum wall frame spacing for stud walls = 24 in. (610 mm) O.C.
 - b. Maximum wall frame spacing for girts = 24 in. (610 mm) O.C.
 - c. Minimum 0.043 in. (18 gauge; 1.09 mm) metal framing for exterior walls.
2. Substrate shall provide continuous support and be flat, with surface variation not exceeding 1/8 in. (3 mm) within any 4 ft. (1.2 m) square area and have no planar irregularities greater than 1/4 in. (6 mm) in 10 ft. (3.05 m).
3. Substrate shall be concrete, masonry or one of the following as deemed suitable for specific project conditions:
 - a. [Exterior grade gypsum sheathing] [glass fiber mat-faced sheathing] [or] [cement board] not less than 1/2 in. (13 mm) in thickness.
 - b. Closed-cell insulating rigid foam not less than 1/2 in. (13 mm) thick conforming to ASTM C578 (min. 15 psi compressive strength and minimum 1.30 lb./cu. ft. [21 kg/cu. m] density) or ASTM C1289.
 - c. Oriented strand board (OSB) not less than 7/16 in. (11 mm) in thickness.
 - d. Exterior grade plywood not less than 3/8 in. (10 mm) in thickness.
- C. Verify walls are plumb and corners are braced to specifications.
- D. If substrate (including insulation), water-resistive barrier, drainage mat, foundations or flashings (including roof and kickout flashing when applicable) are the responsibility of another installer, notify Architect and General Contractor of unsatisfactory preparation before proceeding.
- E. Do not begin installation of Thin Tech panels until unacceptable conditions have been corrected. Installation constitutes acceptance of existing conditions.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation. All surfaces including, but not limited to metal panel and back face of thin brick must be free of water, snow, dirt, mud, oil and other foreign materials prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Trim or flash in place per manufacturer's details and/or BIA *Technical Note 28C* on Thin Brick Veneer.
- D. Protect the tops of all uncompleted walls to prevent water entry.

3.3 INSTALLATION, GENERAL

- A. Install materials in accordance with manufacturer's instructions.
- B. Select and arrange exposed masonry units to produce a uniform blend of color and texture.
 - 1. Install masonry units from several pallets or cubes as they are placed.
- C. Comply with tolerance requirements in TMS 602 (ACI 530.1/ASCE 6).

3.4 FLASHING

- A. Prior to metal panel installation, install starter angle and flashing in accordance with Glen-Gery Thin Tech® installation instructions or ASTM E2112. Prime substrate prior to installation when required by flashing manufacturer.
- B. Seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
- C. Extend horizontal through wall flashing vertically up the backing a minimum of 3 in. (76 mm).
- D. Lap flashing ends a minimum of 3 in. (76 mm).
- E. Seal vertical and horizontal legs of all flashing laps with compatible lap [cement] [sealant].
- F. Lap water-resistive barrier over top of flashing.

[or]

[Mechanically attach flashing] [Seal top edge of flashing][Tape top edge of flashing]
according to manufacturer's instructions to surface of [water-resistive barrier] [backing]
in such a manner as to [prevent moisture from entering the wall] [or] [redirect it to the
exterior].

- G. Turn up the ends of discontinuous (e.g., head, sill and stepped) flashings to form end dams or extend not less than 4" (102 mm) beyond edges of openings.
- H. Extend flashing through wall with at least 1/4 in. (6 mm) exposed to form a drip.

3.5 THIN MASONRY SUPPORT PANEL

- A. Install in accordance with manufacturer's written instructions as applicable to each type of substrate required.
- B. Trim, starter angle and flashing shall be installed prior to panel installation.
- C. Panels shall be clean, dry and free of dirt, oil or any other foreign contaminant.
- D. Attach panels flat to the substrate in true and level rows with support ties aligned and level to each other, including at corners.
- E. Stagger vertical support panel joints over sheathing joints and at least 16 in. (406 mm) horizontally from panels in rows above or below.
- F. Install full-size uncut panels when possible. Cut panels using a method resulting in clean, unbent edges when necessary to provide vertical staggered panel joints, to ensure panels are fastened to studs, or to fit specific conditions.
- G. Install panels with 1/16 in. to 1/8 in. (2 to 3 mm) space between the vertical edges of panels.
- H. Do not allow panels to bridge vertical or horizontal movement joints in substrate. The space between metal panels at substrate movement joint locations shall be equal to the thickness of the substrate movement joint.
- I. Stop panel at least 3/8 in. (10 mm) from inside corners, openings and other materials to allow for movement.
- K. Start panels at least [4 in. (102 mm) above earth] [2 in. (51 mm) above paved areas]. Maintain a minimum clearance of 2 in. (51 mm) above roof surfaces. Do not install Thin Tech[®] panels below grade.

3.6 FASTENERS (For Thin Masonry Support Panel)

NOTE TO SPECIFIER: Revise subparagraphs below to suit Project.

- A. Attach fasteners to framing/support members for framed applications. Do not attach Thin Tech[®] panel to the sheathing alone.
- B. Fasteners for wood studs shall penetrate the studs a minimum of 1-1/4 in. (32 mm).
- C. Fasteners for steel studs or other steel supports shall penetrate a minimum of three threads beyond steel member thickness.
- D. Fasteners for [masonry] [or] [concrete] shall penetrate the substrate a minimum of 1 in. (25 mm).

- E. Fastener Installation: Mechanically attach metal panels with a minimum of one fastener per sq. ft. (929 cm²), reducing fastener spacing along the top and bottom of the wall and around openings, as indicated below.
1. Spacing of pre-punched fastener holes results in the typical recommended fastener spacing of 8 in. (203 mm) vertically and 16 in. (406 mm) horizontally.
 2. Horizontal fastener spacing shall not exceed 24 in. (610 mm); vertical fastener spacing shall not exceed 16 in. (406 mm).
 3. Fasteners should not be installed behind masonry units, except where they are placed within the channels of Elite Panels.
 4. Provide additional fasteners around the perimeter of walls and around openings larger than 24 in. (610 mm) in either dimension, as well as building corners not utilizing corner panels as follows:
 - a. Fasteners shall be placed within 8 in. (203 mm) of the top and bottom of the building walls, at a maximum spacing of 12 in. (305 mm) horizontally.
 - b. At vertical ends of walls and openings, fasteners shall be spaced a maximum of 8 in. (203 mm) vertically within 4 in. (102 mm) of the vertical edge of the panel.
 - c. Where the vertical edge of Thin Tech[®] Elite Panel is more than 2 in. (51 mm) from a channel, install Thin Tech[®] Shim and fasten for additional support.

3.7 MASONRY UNITS

- A. Back face of [thin brick] [and] [cast stone] [natural stone] and surface of metal panel must be dry and clean; free of dirt, oil or and other contaminants.
- B. Prime cast stone and natural stone masonry units, if recommended, according to manufacturer's instructions.
1. Apply primer with a brush or roller at least 1 in. (25 mm) wide in vertical lines no more than 6 in. (152 mm) apart prior to adhering to panel.
 2. Do not prime within ½" to 1" (13 to 25 mm) of any stone edges.
 3. Allow primer to dry completely (at least one hour) before applying adhesive. Reapply primer if structural silicone adhesive is not applied within 8 hours.
- C. Prior to installing veneer units with adhesive, establish unit layout to ensure bond patterns with uniform joint thicknesses and to reduce cutting at openings, movement joints, returns, and offsets.
1. Avoid using less-than-half-size units, particularly at corners and jambs.
 2. Avoid using cut units at heads and sills of opening.

3. Ensure unfinished or cut faces are not exposed to view upon completion.
- D. Lay masonry in bond pattern as indicated on drawings or general notes.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of color and texture.
- F. Leave a uniform 3/8 in. to 1/2 in. (10 to 13 mm) space around the perimeter of openings to allow for movement joint installation.
- G. Apply [1 in. (25 mm) diameter dabs of specified adhesive, not more than 6 in. (152 mm) apart to the back of thin brick] [and] [3/8 in. (10 mm) wide vertical beads of specified adhesive not more than 6 in. (152 mm) apart to the back of cast/natural stone units.] and adhere units to panel. No less than two dabs/beads shall be applied to each full length unit. Corner units shall have at least one dab/bead of adhesive applied to the head/return.
 1. Do not apply adhesive in horizontal streams.
 2. Do not use excessive adhesive as this may cause veneer units to tilt away from wall prior to adhesive set.
 3. Do not apply silicone adhesive within 1/2 in. to 1 in. (13 to 25 mm) of any stone edges.
- H. Masonry units shall be adhered to dry panel within 5 to 10 minutes after adhesive has been applied and before film begins to form on the adhesive.
- I. When adjustment is necessary to be made after adhesive begins to harden, remove hardened adhesive and replace with fresh adhesive.
- J. Keep areas intended to receive sealant clear of thin brick, adhesive and other materials during construction.
- K. Do not allow masonry units to bridge movement joints in substrate

3.8 MORTAR INSTALLATION AND JOINTING

- A. After adhesive has set a minimum of 6 hours, completely fill head and bed joints intended to receive mortar.
- B. Discard mortar after two hours or when too stiff to work. Retempering within two hours is permitted, but may contribute to mortar color variation.
- C. Do not fill movement joints to receive sealant.
- D. Do not fill joints to receive Glen-Gery Thin Tech[®] Air vent.

- E. Form weep holes (head joints free of mortar) as required in Section 3.9, immediately above starter angles and flashings.
- F. Tool exposed joints when thumbprint hard to joint [concave] [V-shaped] [grapevine] profile.
- G. For glazed thin brick, use nonmetallic jointer
- H. Flush cut all joints not tooled.
- I. When repointing, completely remove mortar, and refill solidly with mortar and tool joints.

3.9 WEEPHOLES/VENTS

- A. Vents for Elite Panels: Omit mortar from head joints and install vents cut to [2-1/4 in. (57 mm)] [add desired height] vertically in head joints.
 - 1. Spacing of weep vents shall not exceed a maximum of 24 in. (610 mm) on center horizontally for units 12 in. (304.8 mm) or less in length and a maximum of 32 in. (813 mm) on center for larger units, in the joint between the flashing and masonry units above or in the lower third of the head joints immediately above the starter angles and flashings, including the base of the wall, at horizontal expansion joints and above all openings.
 - 2. Keep vents free of mortar or other obstructions.

3.10 MOVEMENT JOINTS

- A. Locate movement joints where indicated on drawings.
- B. Provide vertical and horizontal movement joints where indicated by leaving a continuous space no less than 3/8 in. (10 mm) wide between Thin Tech[®] panels, installing bond breaker tape or backer rod as specified and installing sealant as specified in Division 07 Section "Joint Sealants."
 - 1. Provide and install bond breaker tape at movement joints prior to installing masonry units 1 in. (25 mm) or less in thickness. Install backer rod where thickness of masonry unit exceeds 1 in. (25 mm).
- C. Keep entire length of movement joint clear of mortar, Thin Tech[®] adhesive and debris.
- D. Install movement joints between Thin Tech[®] wall assemblies and other materials, including around windows and doors.
- E. Install movement joints at changes in substrate and where movement joints occur in substrate or foundation.
- F. Install movement joints at changes in wall height or thickness.

- G. Spacing of vertical movement joints must not exceed 24 ft. (7.3 m) on center in walls without openings.
- H. Install movement joints at inside corners and within 2 to 4 ft. (0.6 to 1.2 m) of outside corners where intersecting walls (with Thin Tech[®] applied to each) are longer than 4 ft. (1.2 m).
- I. Install no less than one horizontal movement joint per story, with height between horizontal movement joints not exceeding 20 ft. (6.1 m).
- J. Install horizontal movement joints below all starter angles above the base of the wall.

3.11 CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses with a dry, non-metallic brush to remove adhesive as well as mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is set and cured, clean exposed masonry as follows:
 - 1. Cut out all defective mortar joints and holes in exposed masonry and fill with new mortar.
 - 2. Clean preselected sample wall area with specified cleaning product as per brick manufacturer's recommendations. Do not use muriatic or hydrofluoric acid. Do not proceed with cleaning until approved by Architect/Owner.
 - 3. Clean thin brick in accordance with cleaning product manufacturer's written instructions.
 - 4. Protect adjacent stone and non-masonry surfaces from contact with cleaner.

3.12 WARRANTY

- A. Provide manufacturer's 50 year warranty against material defects in Thin Tech[®] Elite panels and accessories.
- C. Warranty provides for the original purchaser. See warranty for detailed information on terms, conditions and limitations.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05120 - STRUCTURAL STEEL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Structural steel framing members, structural steel support members, struts, and with required bracing, welds, and fasteners.
- B. Baseplates, shear stud connectors and expansion joint plates.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

- A. Section 3300.1500: Anchorages cast in concrete.
- B. Section 0400.1200: Anchorages embedded in masonry.

1.03 RELATED WORK

- A. Section 05210 - Steel Joists.
- B. Section 05311 - Steel Roof Deck: Support framing for small openings in metal deck.
- C. Section 05313 - Steel Floor Deck: Support framing for small openings in metal deck.

1.04 REFERENCES

- A. ASTM A36 - Structural Steel.
- B. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- C. ASTM - A325 - High Strength Bolts for Structural Steel Joints.
- D. ASTM A490 - Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.

- E. ASTM - A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- F. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- G. ASTM A572 - High Strength Low Alloy Columbium-Vanadium Steel of Structural Quality.
- H. ASTM A502 - Steel Structural Rivets.
- I. AWS D1.1 - Structural Welding Code.
- J. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- K. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

1.05 SHOP DRAWINGS

- A. Submit shop drawings under provisions of the General Conditions.
- B. Indicate profiles, sizes, spacing, and locations of structural members, connections, attachments and fasteners.
- C. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- D. Prepare shop drawings under seal of a Professional Structural Engineer registered in State of New York.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Structural Steel Members: ASTM A36.
- B. Structural Tubing: ASTM A500, Grade B.
- C. Bolts, Nuts and Washers: ASTM A325.
- D. Welding Materials: AWS D1.1; type required for materials being welded.

- E. Primer: FS TT-P-31, brown.

2.02 FABRICATION

- A. Fabricate structural steel members in accordance with AISC Specification.

2.03 FINISH

- A. Clean, prepare, and shop prime structural steel members.

PART 3 EXECUTION

3.01 ERECTION

- A. Erect structural steel in accordance with AISC Specification.
- B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Do not field cut or alter structural members without approval of Architect/Engineer.
- D. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete. Use a primer consistent with shop coat.
- E. All structural steel installations shall be A-36 steel and shall conform to ASTM Specifications. Affidavit to be filed with Building Department upon request.
- F. All structural steel fabrication, erection, and connections shall conform to latest AISC standards and specifications Type 2 construction except as noted.
- G. All field connections to be 3/4" diameter machine bolts unless indicated otherwise. Shop connections to be either machine bolted or welded. All bolts to be A-325 friction type. Connections shall be per Type 1 construction per AISC for portal frames and shall be detailed to develop at least full allowable movement and shear capacity. All remaining steel to have Type 2 connections. A-307 bolts may be used for minor connections when acceptable to engineer.

- H. Steel encased in concrete shall not be painted. All steel surfaces not in contact with concrete shall receive one shop coat of approved paint, and after erection, one field coat. Omit primer paint at welds and high strength bolts.
- I. The structure shall be properly guyed and braced.
- J. Grout under column and beam bearing plates shall be non-shrink, propak or equal.
- K. Provide loose lintels as required for openings in masonry walls and partitions.
- L. Provide holes in shop for bolted blocking, pipe penetrations, etc. Details shall be shown on shop drawings for review by Engineer.

SECTION 05311 - STEEL FLOOR AND ROOF DECKING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Steel roof deck and accessories.
- B. Framed openings up to 18 inches (450 mm).
- C. Bearing plates and angles.

1.02 RELATED WORK

- A. Section 05120 - Structural Steel: 05210 - Steel Joists.

1.03 REFERENCES

- A. AISI - Specification for the Design of Cold-Formed Steel Structural Members.
- B. ASTM A36 - Structural Steel.
- C. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot- Dip Process, Structural (Physical) Quality.
- D. ASTM A525 - Steel Sheet, Zinc-Coated, Galvanized by the Hot- Dip Process.
- E. ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.
- F. AWS D1.1 - Structural Welding Code.
- G. SDI - Design Manual for Composite Decks, Form Decks, Roof Decks.

1.04 SHOP DRAWINGS

- A. Submit shop drawings under provisions of General Requirements.
- B. Indicate decking plan, deck profile dimensions, supports, projections, openings, and reinforcement, finishes, pertinent details, and accessories.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store decking on wood sleepers with slope for positive drainage.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sheet Steel: ASTM A446, Grade B structural quality; with G60 coating; unfinished.
- B. Bearing Plates: Angles: ASTM A36 steel.
- C. Welding Materials: AWS D1.1.
- D. Cell Closures: Closed cell foam rubber, profiled to decking.
- E. Metal Closure Strips, Wet Concrete Stops, Cover Plates, and Related Accessories: 22 gage sheet steel; of required profiles and size.
- F. Primer: Red oxide type.
- G. Touch-up Primer: Red oxide.

2.02 FABRICATION

- A. Metal Decking: Minimum gage as noted on plans, sheet steel, high fluted profile to SDI 24 inch sheets; multiple span; lapped joints.
- B. Fluted Floor Decking: Minimum gage as noted on plans, sheet steel, 1-1/2 inch fluted profile; 24 inch wide sheets, multiple span, lock seam joints, to SDI.
- C. Fabricate metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks to accommodate maximum working stress of 20,000 psi and maximum span deflection of 1/240.
- D. Fabricate roof sump pan of 14 gage sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, watertight.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Erect metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, and Roof Decks. Provide welding in accordance with AWS D1.1.
- B. On steel support members provide 3 inch minimum bearing. Align and level on supports.
- C. Weld male/female side lap at 18 inches oc maximum.
- D. Fasten deck to steel support members at ends and intermediate supports with 3/4 inch fusing welds at 12 inches oc maximum.
- E. Reinforce deck openings from 6 to 18 inches (150 to 450 mm) in size with 2 x 2 x 1/4 inch (50 x 50 x 6 mm) steel angles. Place angles perpendicular to flutes; extend minimum two flutes each side of opening and weld to deck.
- F. Install 6 inch (150 mm) wide sheet steel cover plates where deck changes direction. Spot weld in place 12 inches oc maximum.
- G. Install sheet steel strip closures at roof edge and floor edge upturned to thickness of slab, to contain wet concrete. Provide closures of sufficient strength to remain in place without distortion.
- H. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
- I. Install foam cell closures in locations above walls and partitions.
- J. Position roof sump pans with flange bearing on top surface of deck. Weld at each deck flute.
- K. Immediately after welding deck in place, touch-up welds, burned areas, and surface coating damage with prime paint.
 - 1. Metal floor deck shall be 1-1/2 inches deep, galvanized, Composite Type, equal to United State Steel Deck 1-1/2 inch "B-Lok" or Bowman 1-1/2 inch "Vgrip".
 - 2. Metal roof deck shall be 1-1/2 inches deep, galvanized, wide rib, equal to United Steel Roof Deck "Type B" or Bowman Roof Deck "Type B".

3. Weld to supports and screw side laps, per manufacturer's recommendations and specifications.
4. Deck units shall be in lengths to span over three or more supports where possible.
5. Stone concrete topping shall have 28 day, 3000 psi. Closures shall be provided at edges, at perimeter and at openings to serve as concrete stop.
6. Conform to steel deck institute recommendations.

ELLENVILLE FIRE DISTRICT
NEW FIREHOUSE FACILITY
NYS RT. 209, ELLENVILLE, NY

STEEL FLOOR AND ROOF DECKING
DIVISION 5 – METALS
SECTION 05311

SECTION 05400 - COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Non-load bearing formed steel stud interior wall framing including soffits, etc. as shown on the drawings and refer to the following details (pages 5-15).
- B. Supply and install pre-engineered and prefabricated roof truss system. Refer to page 16 specification.

1.02 RELATED WORK

- A. Section 07213 - Batt and Blanket Insulation: Insulation within framing members.
- B. Section 09260 - Gypsum Board Systems.

1.03 REFERENCES

- A. ASTM A90 - Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- B. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process, Physical (Structural) Quality.
- C. ASTM A570 - Hot-Rolled Carbon Steel Sheet and Strip. Structural Quality.
- D. ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.
- E. AWC (Association of Wall and Ceiling Industries) - Specifications Guide for Cold Formed Steel Structural Members.
- F. AWS D1.1 - Structural Welding Code.
- G. FS TT-P-645 - Primer, Paint, Zinc-Chromate, Alkyd Type.

1.04 SYSTEM DESCRIPTION

- A. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in structural framing components with three years minimum experience.

1.06 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Provide product data on standard framing members. Describe materials and finish, product criteria and limitations.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2 PRODUCTS

2.01 FRAMING MATERIALS

- A. Studs: ASTM A446 sheet steel.
- B. Track: Formed steel; channel shaped; same width as studs, tight fit.

2.02 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.

2.03 FASTENERS

- A. Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: ASTM A90, hot dip galvanized.
- B. Anchorage Devices: Power driven.
- C. Welding: In conformance with AWS D1.1.

2.04 FABRICATION

- A. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
- B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

2.05 FINISHES

- A. Galvanizing: G90 coating class.
- B. Primer: FS TT-P-645, touch-up for galvanized surfaces.

PART 3 EXECUTION

3.01 INSPECTION

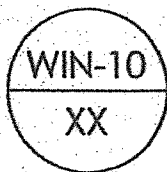
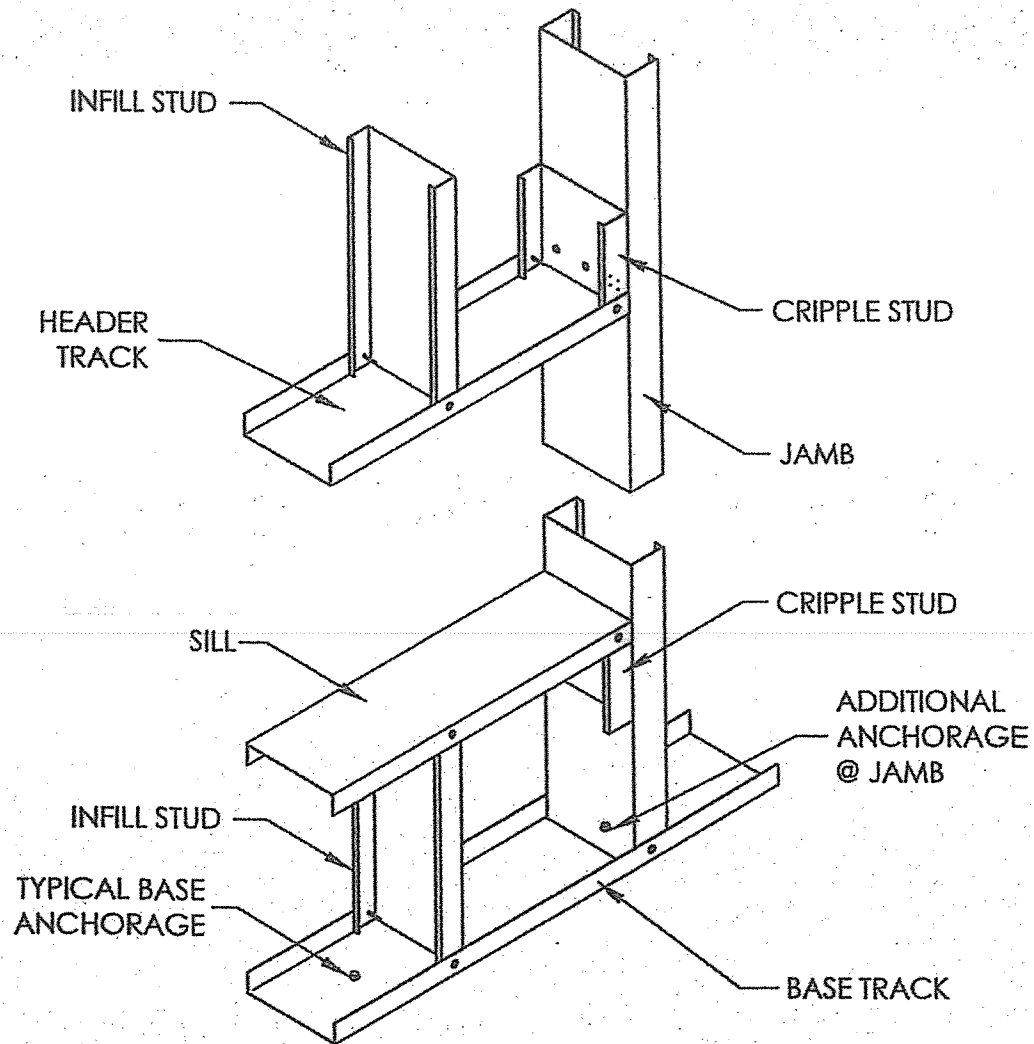
- A. Verify that substrate surfaces and building framing components are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions.

3.02 ERECTION OF STUDDING

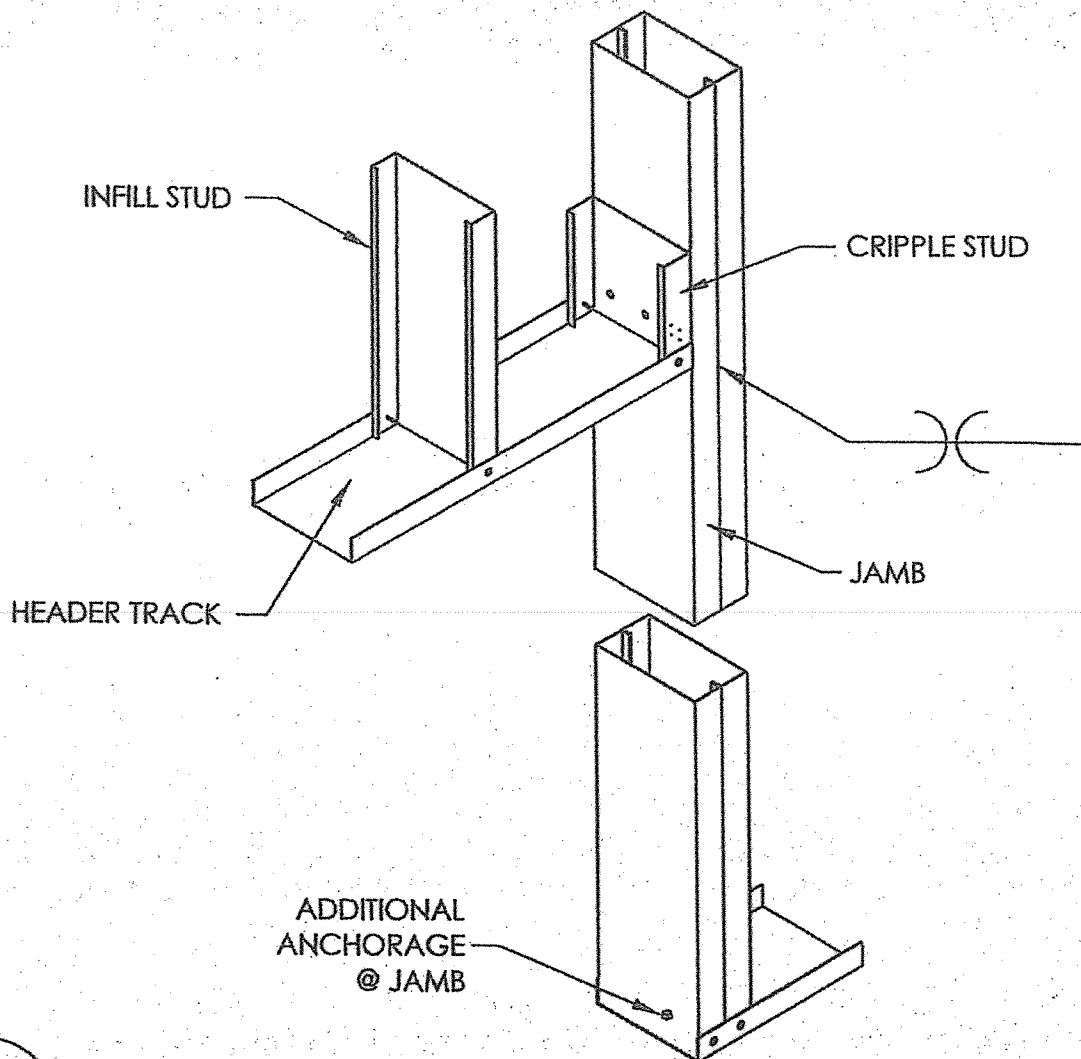
- A. Install components in accordance with manufacturer's instructions.
- B. Align floor and ceiling tracks; locate to partition layout. Secure in place with fasteners or welding at maximum 24 inches o.c.
- C. Place studs at 16 inches o.c.; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
- D. Construct corners using minimum three studs. Double stud at wall opening, door, and window jambs.
- E. Erect load bearing studs one piece full length. Splicing of studs is not permitted.
- F. Erect load bearing studs, brace, and reinforce to develop full strength to meet design requirements.
- G. Extend stud framing through ceiling to underside of floor or roof structure above.

- H. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- I. Install intermediate studs above and below openings to match wall stud spacing.
- J. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.
- K. Attach cross studs to studs for attachment of fixtures anchored to walls.
- L. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- M. Touch-up field welds and damaged galvanized surfaces with primer.
- N. Complete framing ready to receive gypsum wall board.

* * * * *

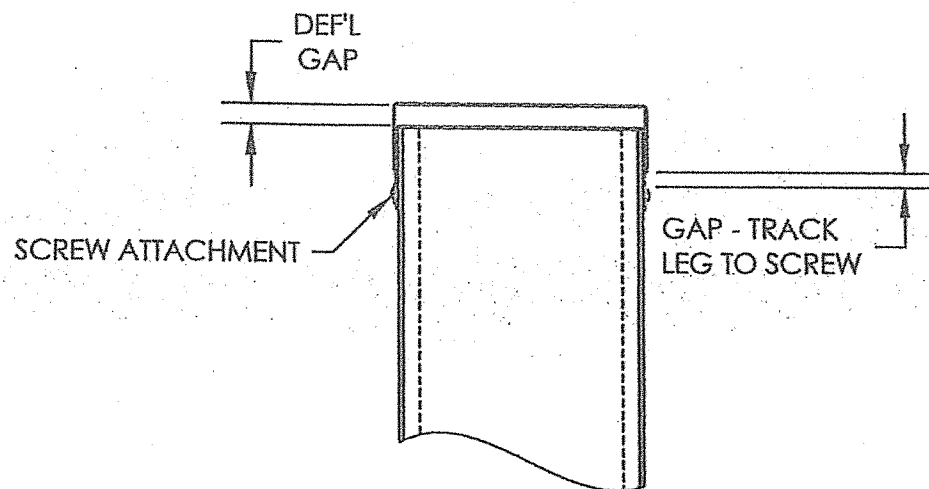


Window Non-Load Bearing Single Track Header Single Jamb
NTS

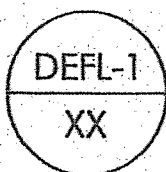
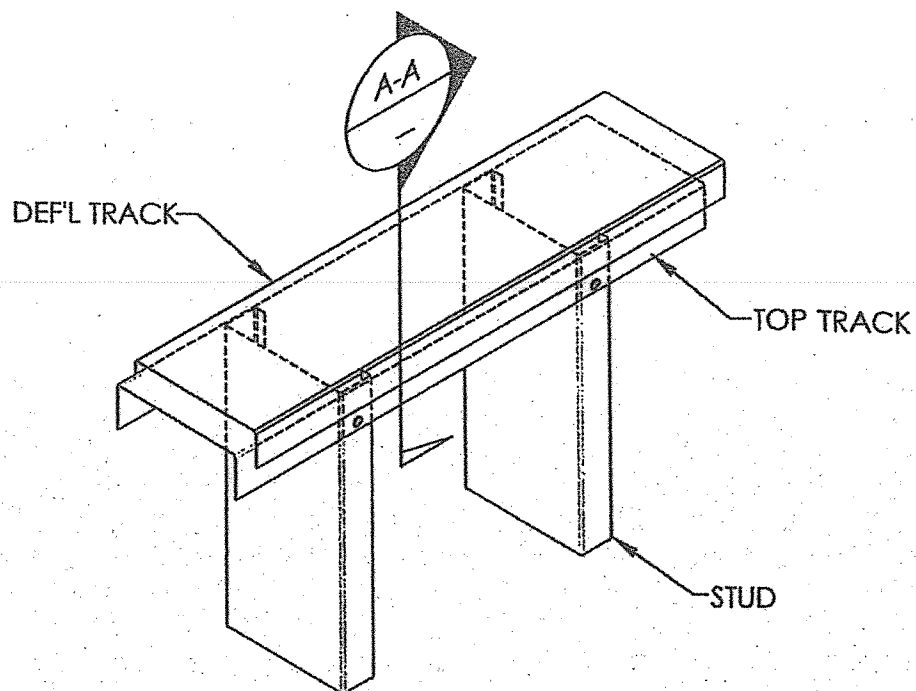


DR-11
XX

Door Non-Load Bearing Single Track Header Boxed Jamb
NTS

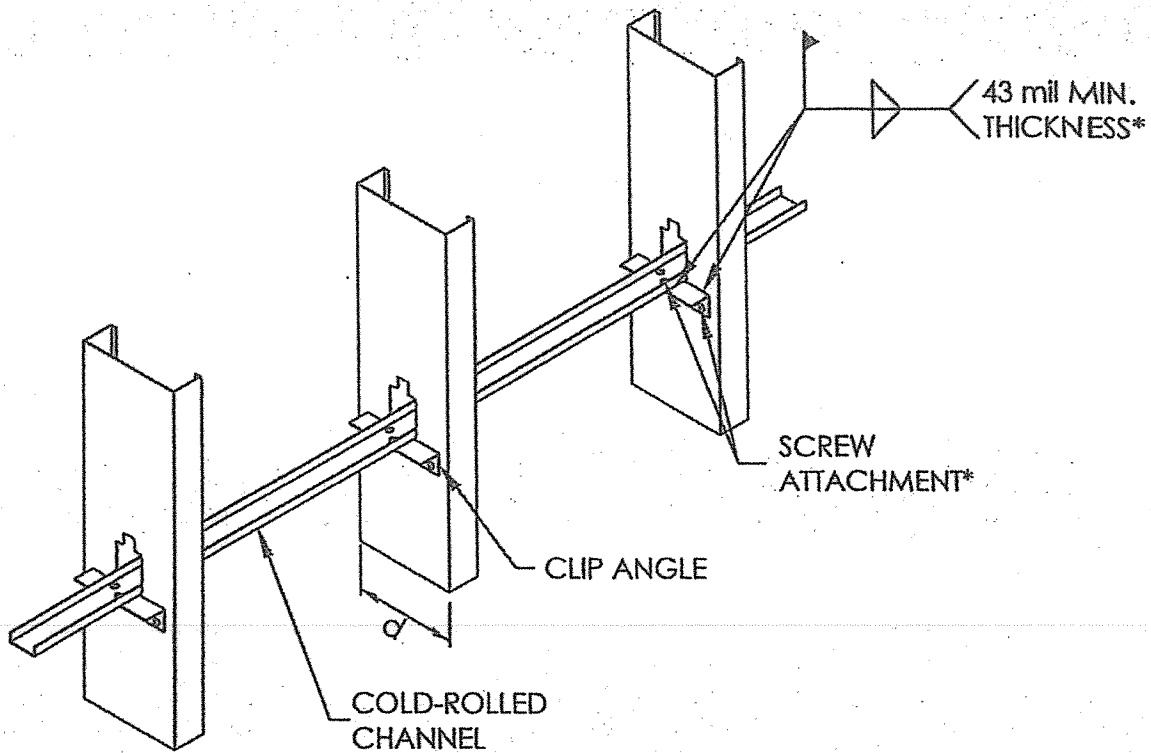


SECTION A-A



Deflection Track-In-Track Assembly

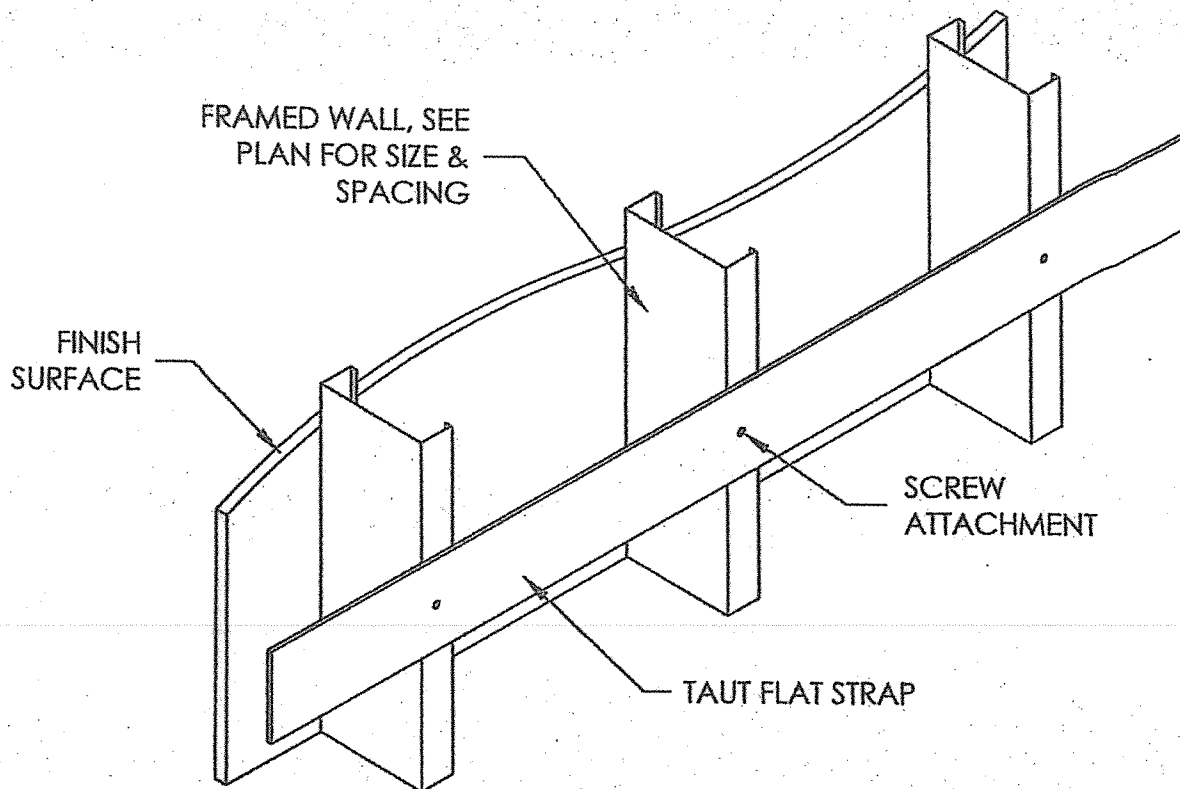
NTS



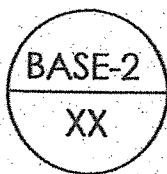
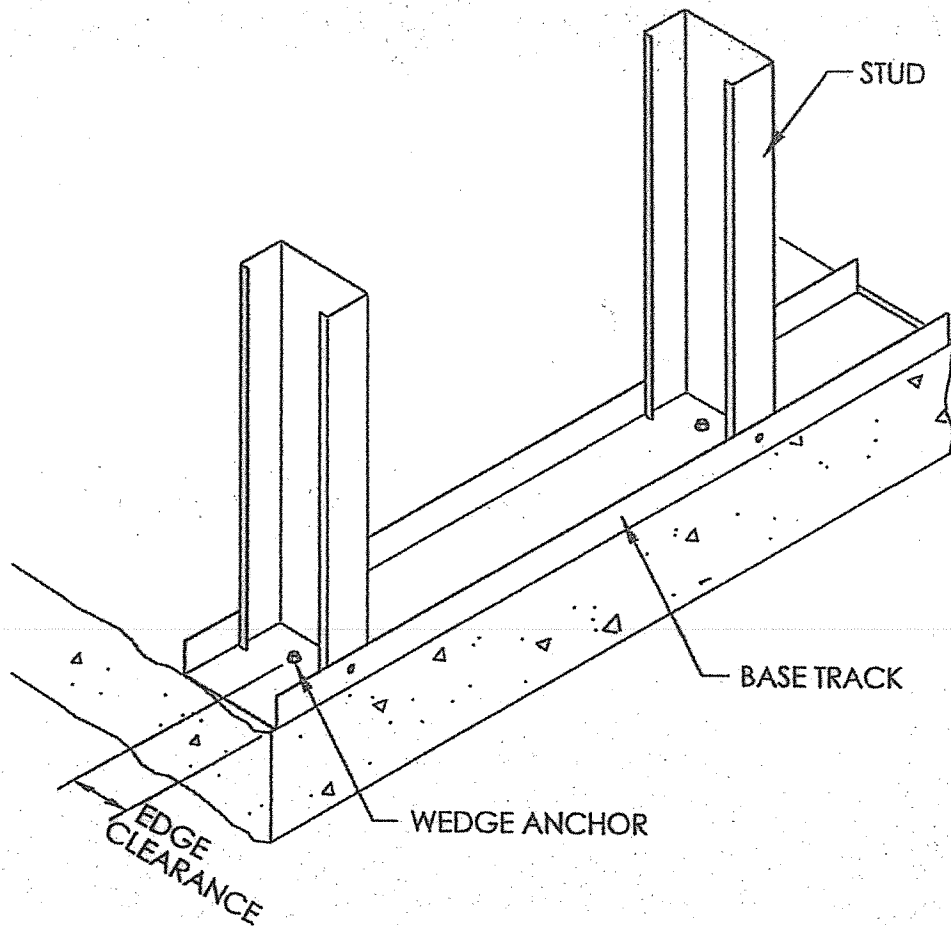
* EITHER SCREW OR WELD ATTACHMENT REQUIRED

BRG-1
XX

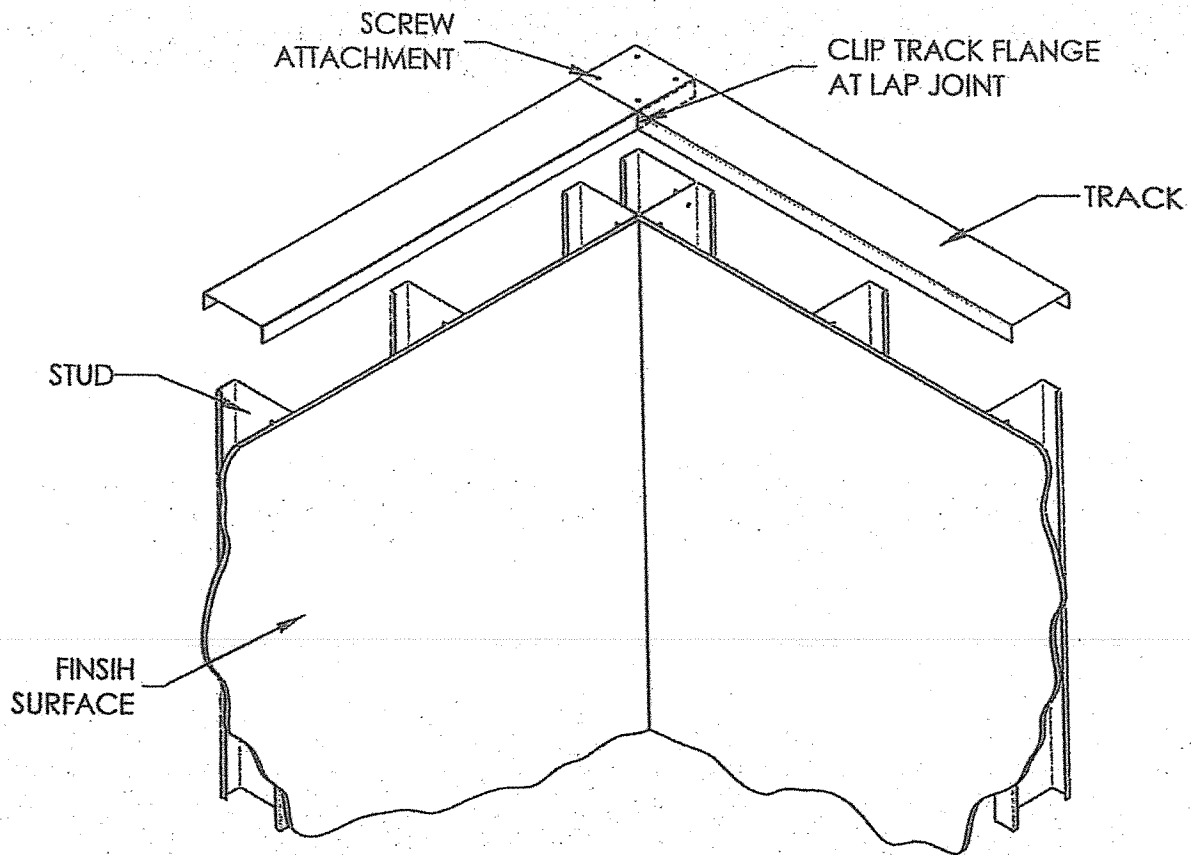
Bridging Cold-Rolled Channel With Clip Angle
NTS



BACK-1 Backing Flat Strap Lightly Loaded
XX NTS

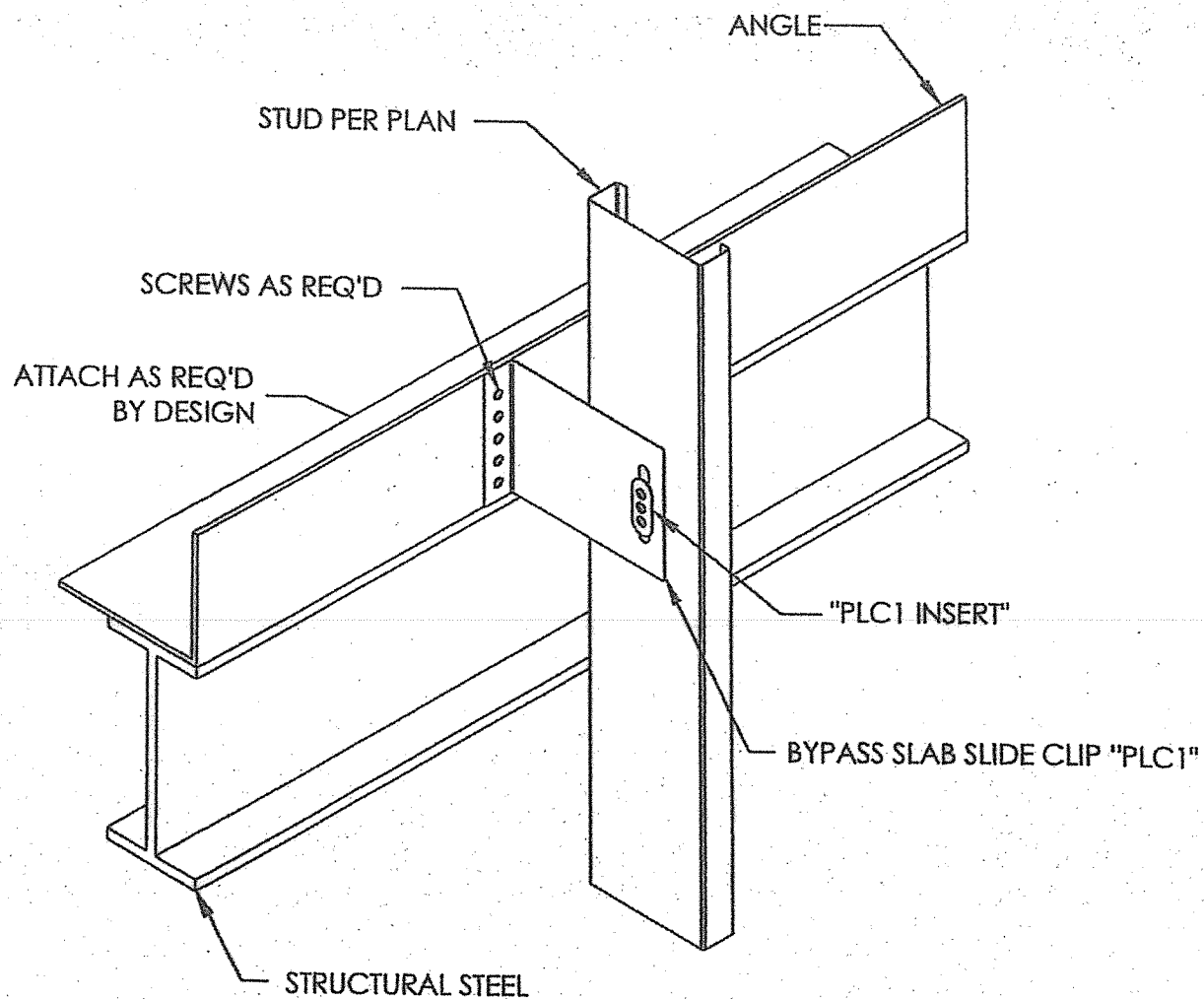


Bottom Track Anchorage Wedge Anchor
NTS

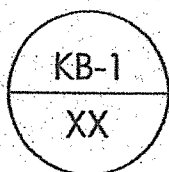
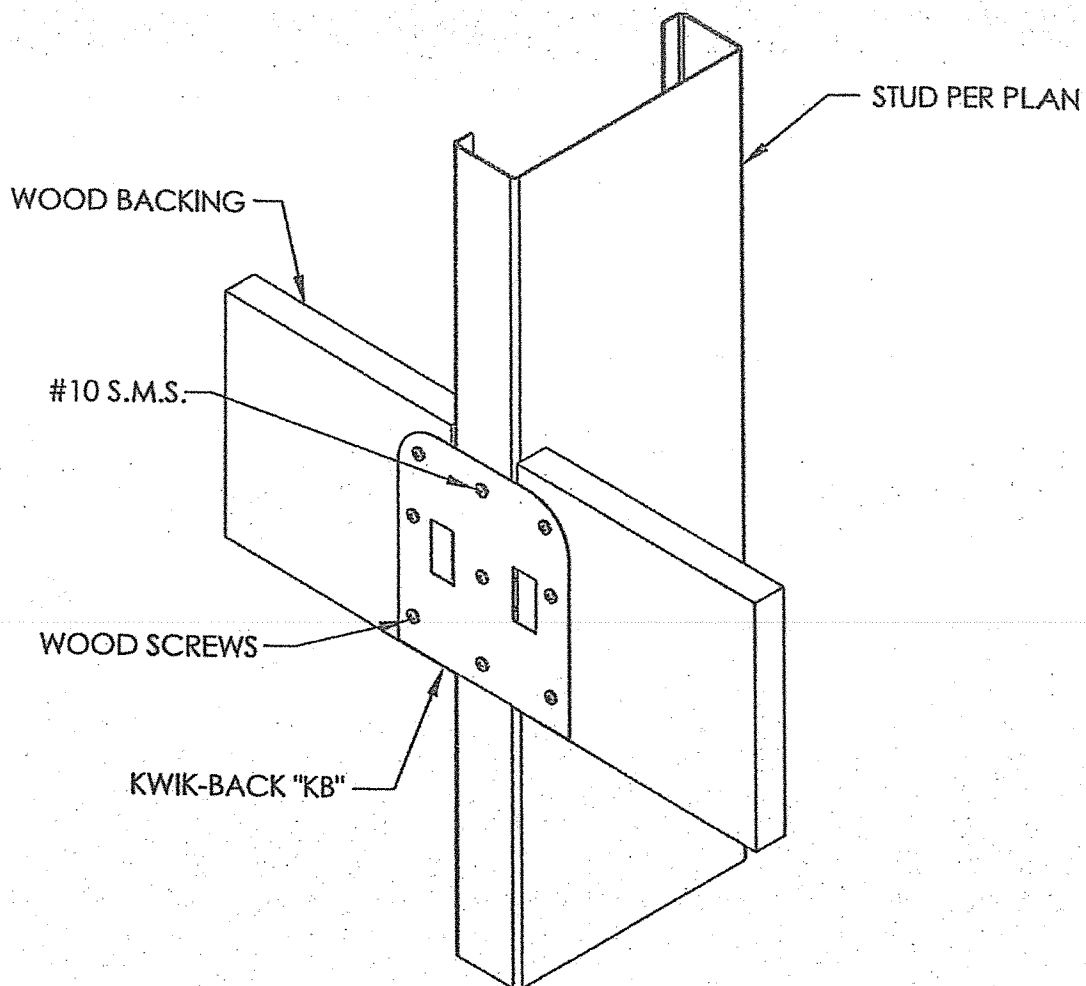


CRNR
 XX
 NTS

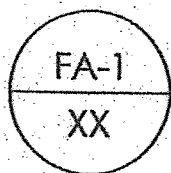
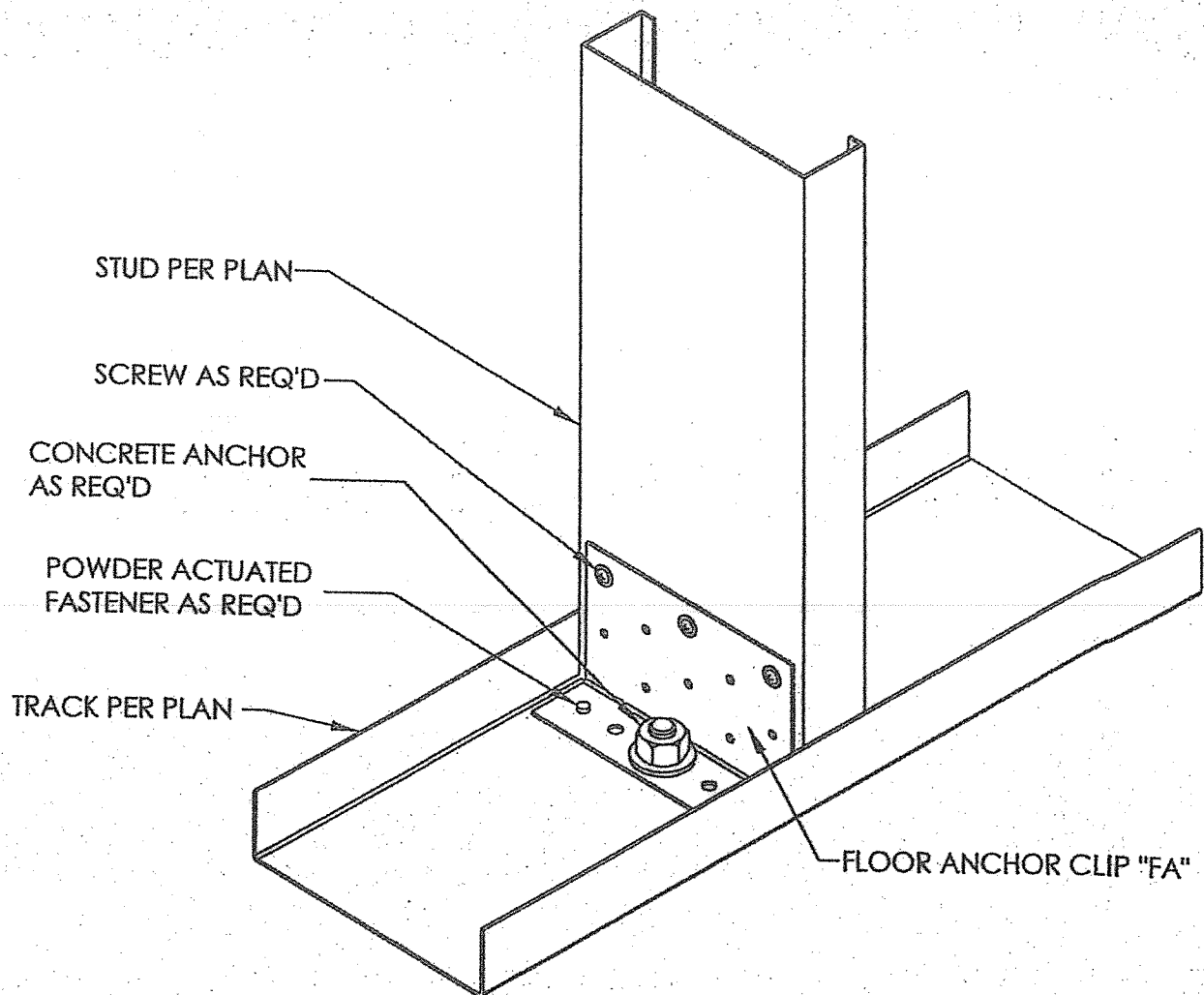
Wall Framing at Corner Track Lap Connection



PLC1-1 Bypass Slab Slide Clip Detail
XX NTS



Kwik-Back Detail
NTS



Stud to Floor Anchoring Detail
NTS

SECTION 05 44 00

(formerly 05425)

Pre-Engineered, Pre-Fabricated Light Gauge Steel Roof & Floor Trusses

PART 1 GENERAL

1.01 SUMMARY

A. Section includes pre-engineered, pre-fabricated light gauge cold formed steel framing elements. Work includes:

1. Light Gauge Cold-formed steel open web floor trusses.
2. Light Gauge Cold-formed steel roof trusses.
3. Anchorage, bracing and bridging.

B. Related work

1. Drywall attachment
2. Roofing, fascia, soffit

1.02 REFERENCES

Reference standards:

A. ASTM:

1. ASTM A653/A653M-94 "Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process."
2. ASTM A780-93a "Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings."

B. American Welding Society (AWS)

1. AWS D1.1 "Structural Welding Code - Steel."
2. AWS D1.3 "Structural Welding Code - Sheet Steel."

1.03 PERFORMANCE REQUIREMENTS

A. AISI "Specifications": Calculate structural characteristics of cold-formed steel truss members according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members, 1996 (1990)."

B. Structural Performance: Design, engineer, fabricate, and erect cold-formed steel trusses to withstand specified design loads within limits and under conditions required.

1. Design Loads: As specified.
2. Deflections: Live load deflection meeting the following (unless otherwise specified):
 - a. Floor Trusses: Vertical deflection less than or equal to 1/360 of the span.
 - b. Roof Trusses: Vertical deflection less than or equal to 1/240 of the span.
3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 120 degrees F (67 degrees C).

1.04 SUBMITTALS

1. Submit manufacturer's product data and installation instructions for each type of cold-formed steel framing and accessory required.
2. Submit shop drawings showing member, type, location, spacing, size and gauge of members, method of attachment to supporting members and all necessary erection details. Indicate supplemental bracing, strapping, splices, bridging, accessories and details required for proper installation.
3. Submit detailed floor truss and roof truss layouts.
4. Submit truss drawings, sealed and signed by a qualified registered Professional Engineer, verifying truss' ability to meet local code and design requirements. Include:
 1. Description of design criteria.
 2. Engineering analysis depicting member stresses and truss deflection.
 3. Truss member sizes and gauges and connections at truss joints.
 4. Truss support reactions.
 5. Top chord, Bottom chord and Web bracing requirements.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Fabrication shall be performed by a cold-formed steel truss fabricator with experience designing and fabricating cold-formed steel truss systems equal in material, design, and extent to the systems required for this Project.

1. Cold-Formed steel truss system installation shall be performed by an experienced installer approved by the steel truss system fabricator.

B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code—Steel" and AWS D1.3 "Structural Welding Code—Sheet Steel."

1. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's unopened containers or bundles, fully identified by name, brand, type and grade. Exercise care to avoid damage during unloading, storing and erection.

B. Store trusses on blocking, pallets, platforms or other supports off the ground and in an upright position sufficiently braced to avoid damage from excessive bending.

C. Protect trusses and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep trusses free of dirt and other foreign matter.

1.07 PROJECT CONDITIONS

A. During construction, adequately distribute all loads applied to trusses so as not to exceed the carrying capacity of any one joist, truss or other component.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Ultra-Span® Truss Manufacturer

2.02 COMPONENTS

A. System components: Aegis Metal Framing, LLC ULTRA-SPAN® and POSI-STRUT® light gauge steel floor truss and roof truss components.

B. Provide manufacturer's standard steel truss members, bracing, bridging, blocking, reinforcements, fasteners and accessories with each type of steel framing required, as recommended by the manufacturer for the applications indicated and as needed to provide a complete light gauge cold formed steel truss system.

2.03 MATERIALS

A. Materials:

1. All component gauges: Fabricate components of structural quality steel sheet per ASTM A653 with a minimum yield strength of 50,000 psi.
2. Bracing, bridging and blocking members: Fabricate components of commercial quality steel sheet per ASTM A653 with a minimum yield strength of 33,000 psi.

B. Ultra-Span steel truss components: Provide sizes, shapes and gauges indicated.

1. Design Uncoated-Steel Thickness: 20 gauge, 0.0350 inch (0.91 mm).
2. Design Uncoated-Steel Thickness: 18 gauge, 0.0460 inch (1.20 mm).
3. Design Uncoated-Steel Thickness: 16 gauge 0.0570 inch (1.52 mm).
4. Design Uncoated-Steel Thickness: 14 gauge, 0.0730 inch (1.90 mm).

C. Finish: Provide components with protective zinc coating complying with ASTM A653, minimum G60 coating.

D. Fasteners:

1. Manufacturer recommended self-drilling, self-tapping screws with corrosion-resistant plated finish. Fasteners shall be of sufficient size and number to ensure the strength of the connection.
2. Welding: Comply with AWS D1.1 when applicable and AWS D1.3 for welding base metals less than 1/8" thick.
3. Other fasteners as accepted by truss engineer.

2.04 FABRICATION

A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.

1. Fabricate truss assemblies in jig templates.
2. Cut truss members by sawing or shearing or plasma cutting.
3. Fasten cold-formed steel truss members by welding or screw fastening, or other methods as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correct welding work.

b. Locate mechanical fasteners and install according to cold-formed steel truss component manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.

B. Care shall be taken during handling, delivery and erection. Brace, block, or reinforce truss as necessary to minimize member and connection stresses.

C. Fabrication Tolerances: Fabricate trusses to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual trusses no more than plus or minus 1/8 inch (3mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel truss to a maximum out-of-square tolerance of 1/8 inch (3mm).

PART 3 EXECUTION

3.01 EXAMINATION

1. Examine structure, substrates and installation conditions. Do not proceed with cold-formed steel truss installation until unsatisfactory conditions have been corrected.
2. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION, GENERAL

A. General:

1. Erection of trusses, including proper handling, safety precautions, temporary bracing and other safeguards or procedures are the responsibility of the Contractor and Contractor's installer.
2. Exercise care and provide erection bracing required to prevent toppling of trusses during erection.
3. Erect trusses with plane of truss webs vertical and parallel to each other, accurately located at design spacing indicated.
4. Provide proper lifting equipment suited to sizes and types of trusses required, applied at lift points recommended by truss fabricator. Exercise care to avoid damage to truss members during erection and to keep horizontal bending of the trusses to a minimum.
5. Provide framing anchors as indicated or accepted on the engineering design drawing or erection drawings. Anchor trusses securely at bearing points.
6. Install roof framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations.
 1. DO NOT cut truss members without prior approval of truss engineer.
 2. Fasten cold-formed steel roof framing by welding or screw fastening, as standard with fabricator. Wire tying of roof framing is not permitted.
- a. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correct welding work.
- b. Locate mechanical fasteners and install according to cold-formed roof framing manufacturer's instructions with screw penetrating joined members by not less than 3 exposed screw threads.

SECTION 05510 - METAL STAIRS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Steel stair frame of structural sections, with open and closed risers as called out on plans.
- B. Pan to receive concrete fill stair treads and landings.
- D. Balusters and handrailing.
- E. Steel ladder and service platform for access to roof kitchen exhaust fan for service..

1.02 REFERENCES

- A. ANSI A202.1 - Metal Bar Grating Manual for Steel and Aluminum Gratings and Stair Treads.
- B. ASTM A36 - Structural Steel.
- C. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- D. ASTM A307 - Low-Carbon Steel Externally and Internally Threaded Fasteners.
- E. ASTM A352 - High Strength Bolts for Structural Steel Joints.
- F. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
- G. ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot- Dip Process, Physical (Structural) Quality.
- H. ASTM A500 - Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- I. ASTM A501 - Hot-formed Welded and Seamless Carbon Steel Structural Tubing.
- J. AWS D1.1 - Structural Welding Code.
- K. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

- L. FS TT-P-641 - Primer Coating, Zinc Dust - Zinc Oxide (for Galvanized Surfaces).
- M. FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type.

1.03 STRUCTURAL REQUIREMENTS

- A. Fabricate stair assembly to support live load of 100 lb/sq. ft. with deflection of stringer not to exceed 1/240 of span.
- B. Railing assembly, wall rails, and attachments to resist lateral force of 50 lbs. at any point without damage or permanent set.

1.04 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01300.
- B. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, openings, size and type of fasteners, and accessories.
- C. Include erection drawings, elevations, and details where applicable.
- D. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- E. Prepare shop drawings under seal of a Professional Structural Engineer registered in the State of New York.
- F. Submit samples under provisions of Section 01300.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Section: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Sheet Steel: ASTM A446, Grade B, structural quality with galvanized coating.
- D. Bolts, Nuts, and Washers: ASTM A307.

- E. Welding Materials: AWS D1.1; type required for materials being welded.
- F. Primer: FS TT-P-31, brown; for shop application and field touch-up.
- G. Touch-up Primer for Galvanized Surfaces: FS TT-P-641.
- H. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of structure.

2.02 FABRICATION - GENERAL

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fit and shop assemble sections in largest practical sizes, for handling through building openings.
- D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius. At exposed to view locations, place plastic filler between welds; sand flush.
- E. Make exposed joints butt tight, flush, and hairline.
- F. Accurately form components required for anchorage of stairs, landings and railings to each other and to building structure.

2.03 FABRICATION - PAN STAIRS AND LANDINGS

- A. Fabricate stairs with risers and treads of pan construction to receive concrete.
- B. Form treads and risers from minimum 16 gage sheet stock.
- C. Secure tread pans to stringers' clip angles, welded in place.
- D. Form stringers of rolled steel channels, 12 inches deep. Weld fascia plates to channels using 14 gage steel sheet stock across channel toes.
- E. Form landings from minimum 20 gage metal decking. Reinforce underside with angles to attain design load requirements.

- F. Prime paint components.

2.04 FINISH

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact bond with concrete or where field welding is required.
- C. Prime paint items specified with one coat.

PART 3 EXECUTION

3.01 ERECTION

- A. Erect stairs level and plumb, free from distortion or defects detrimental to appearance or performance.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Verify alignment with adjacent construction. Coordinate related work.
- D. Do not field cut or alter members.
- E. Field bolt and weld to match standard of shop bolting and welding. Hide bolts and screws whenever possible. Where not hidden, use flush countersunk fastenings.
- F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

SECTION 05521 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Steel pipe and tube handrails, balusters, and fittings.

1.02 RELATED WORK

- A. Section 05510 - Metal Stairs: Handrailing at stairs.

1.03 REFERENCES

- A. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
- B. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

1.04 STRUCTURAL REQUIREMENTS

- A. Railing assembly, wall rails, and attachments to resist lateral force of 50 lbs. at any point without damage or permanent set.

1.05 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01300.
- B. Indicate component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.
- D. Submit samples under provisions of Section 01300.

PART 2 PRODUCTS

2.01 STEEL RAILING SYSTEM

- A. Rails and Posts 1-1/2 inches diameter steel pipe welded jointing.
- B. Posts: 12 inches diameter steel pipe welded jointing.

- C. Fittings: Elbows, Tee-shapes, wall brackets, escutcheons; cast steel.
- D. Mounting: Adjustable brackets and flanges, with steel inserts for casting in concrete where required.
- E. Splice Connectors: Steel concealed spigots.
- F. Primer: FS TT-P-31, brown; one coat.

2.02 FABRICATION

- A. Verify dimensions on site prior to shop fabrication.
- B. Fit and shop assemble sections in largest practical sizes, for delivery to site and installation.
- C. Supply components required for secure anchorage of handrails and railings.
- D. Grind exposed welds smooth and flush with adjacent surfaces.
- E. Make exposed joint butt tight, flush, and hairline.
- F. Accurately form components required for anchorage of railings to each other and to building structure.

PART 3 EXECUTION

3.01 PREPARATION

- A. Supply items to be cast into concrete embedded in masonry or placed in partitions with setting templates and erection drawings to appropriate Sections.

3.02 INSTALLATION

- A. Install in accordance with shop drawings and manufacturer's instructions.
- B. Erect work square and level, free from distortion or defects detrimental to appearance or performance.
- C. Anchor handrailings to structure.
- D. Weld field connections and grind smooth to complete assembly. Touch-up welds with primer.

DIVISION 6 - WOOD AND PLASTICS

SECTION 06100 - ROUGH CARPENTRY

06100.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

06100.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all carpentry related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.
 - a. Blocking, grounds, nailing strips, wedges, centerings, wood curbs for roof openings, wood closures and members to receive flashing, etc., for the work of this Contract.
 - b. Roof sheathing.
 - c. Fascias & trim
 - b. All other items of carpentry work indicated on the drawings.
 - c. All required miscellaneous rough hardware and fasteners.

06100.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Concrete Work - Division 3.
2. Masonry - Division 4.
3. Doors and Windows - Division 8.
4. Specialties - Division 10.
5. Thermal & Moisture Protection - Division 7.

06100.0400 MATERIALS

1. General: Lumber shall conform to the requirements of the latest edition of the American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Association having jurisdiction, and shall bear the official grade and trademark of the Inspection Bureau of the Association and a mark of

mill identification. Moisture content of lumber shall not exceed 19 percent (19%).

2. Preservative Treatment: Pressure treat all lumber for exterior work, and for all wood furring, screeds and grounds, and all lumber embedded in or in contact with masonry or concrete, against decay with zinc chloride or other approved preservatives, in accordance with the standard specifications of the American Wood Preservers Association; shall be kiln dried after treatment.
3. Lumber:
 - a. Defects or blemishes shall not appear in the material used. Lumber shall be D4S, sound, thoroughly seasoned and well manufactured, and free from warp that cannot be corrected in the process of nailing or bolting.
 - b. Furring Screeds and Grounds: Western or Northern White Pine, Fir or Spruce which has been prepared and bundled by the manufacturer for those purposes.

06100.0500 VERIFICATION OF DIMENSIONS AND CONDITIONS

1. All dimensions and conditions at the building which affect the size, construction and installation of items or features provided under this Section shall be carefully checked, verified and compared with the drawings. All discrepancies and conflicts including those between different materials or installations shall be reported to the Architect in writing for correction and adjustment.
2. Consult and agree with other trades on details of construction of adjoining installations which have not yet been completed.

06100.0600 STORAGE OF LUMBER AND WOODWORK

1. Lumber for rough usage when delivered at the site shall be immediately piled in stacks to insure drainage and free circulation. Stacks shall be supported on skids, placed to give slope of not less than 1/2" per foot, the stacks with a minimum clearance of 6" above grade. Stacks shall be covered with tarpaulins or other watertight covering. Grounds and similar small sized lumber shall be stored inside the building as soon as possible after delivery.

06100.0700 TEMPORARY PROTECTION, ENCLOSURES AND PARTITIONS

1. Provide and maintain protection during the life of the Contract for all materials and work installed under this Section and for other work requiring protection.
2. Provide and maintain all temporary partitions and enclosures for doors, windows, temporary openings, and for openings to exclude rain and snow and to permit maintenance of suitable conditions and temperatures within the building for the work to be actively executed at all times.

3. Provide batten doors, complete with hinges and padlocks at all exterior door openings, and as directed and approved by the Architect.
4. Remove and dispose of, off the site, all temporary protection enclosures.

06100.0800 ROUGH HARDWARE

1. Provide all items of rough hardware of every description including nails, spikes, screws, bolts, anchors, ties, expansion shields and bolts, strap irons and other items which are required to assemble or secure the work shown or specified herein.
2. All nails, driven into the face of exposed exterior woodwork, shall be non-corrosive and such nails shall be set and putty stopped.

06100.0900 FRAMING AND BLOCKING

1. Provide blocking, etc., as shown or as obviously necessary for the various systems and items herein specified, with all bolts or nails and all gusset plates, metal attachments, and miscellaneous steel items or devices shown or necessary for rigid substantial construction and support of work indicated.
2. Conform to details shown on the drawings. Framing shall be accurately done and abutting members shall fit closely and be securely fastened together as approved.
 - a. Attaching to Masonry: Except where built-in anchors are shown or specified, members required to be attached to masonry shall be secured to same with expansion bolts extending into masonry not less than 4" or by special bolts or anchors where so shown or specified.
3. Set all members in designated positions, build plumb and true, and brace in position. Frame as shown or directed for the proper assembly of work, both concealed and within enclosed areas.

06100.1000 NAILING STRIPS FOR ROOFING AND SHEETMETAL WORK

1. Materials in general shall be dimension fir lumber or other approved species dressed to required sizes. All material where indicated as bolted, shall be secured with bolts of sizes and spacing as included therein. Furring for soffit finish shall be arranged for solid nailing at all edges and joints.
2. Include required recessing of nuts and washers, as required.
3. Provide all other required bolts and fastenings.

06100.1100 GROUND, FURRING AND SCREEDS

1. Provide all wood grounds and/or furring required for the securing in place of all finished carpentry work, interior wood finish and other items furnished by this or other contractors including trim, mouldings, finished carpentry, shelving, frames, covers, stools, aprons, etc.
2. Grounds shall be minimum 3/4" thick and as wide as may be necessary for the required purpose; securely attached with hardened nails, screws, toggle bolts or other fasteners. Grounds shall be carefully plumb, leveled and straightened by means of wood or steel wedges or blocks and where necessary shall be aligned with continuous partitions and wall surfaces.
3. Grounds and screeds shall be of dressed lumber free from wave or knots which would impair its usefulness.
4. The attention of the contractor is called to the fact that the plans do not show all the blocking nor some of the subordinate framing which will be required. This blocking and subordinate framing will be required. This blocking and subordinate framing is nevertheless to be furnished and installed under this Section.

* * * * *

SECTION 06200
FINISH CARPENTRY

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Finish carpentry items, other than shop fabricated work, with hardware and attachment accessories.
- B. Any and all wood chair rails, window trim, wainscot, bar ,trophy cases, wood wall finishes etc.

1.02 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

- A. Section 08700 - Hardware: Supply of cabinet hardware to this Section.

1.03 RELATED WORK

- A. Section 06100 - Rough Carpentry.
- B. Section 06410 - Custom Casework: Shop fabricated cabinetwork.
- C. Section 08210 - Wood Doors.
- D. Section 08610 - Wood Windows.
- E. Section 08700 - Hardware: Supply of finish carpentry hardware.
- F. Section 09900 - Painting: Painting and finishing of finish carpentry items.

1.04 REFERENCES

- A. AWI - Quality Standards.
- B. FS L-P-508 - Plastic Sheet, Laminated, Decorative and Non- Decorative.
- C. FS MM-L-736 - Lumber - Hardwood.
- D. FS TT-W-550 - Wood Preservative, Chromated Copper Arsenate Mixture.
- E. FS TT-W-568 - Wood Preservative, Creosote-Petroleum Solution.
- F. FS TT-W-570 - Wood Preservative, Pentachlorophenol.
- G. FS TT-W-571 - Wood Preservation: Treating Practices.

- H. FS TT-W-572 - Wood Preservative, Water Repellent.
- I. FS MMM-A-130 - Adhesive, Contact.
- J. PS 1 - Construction and Industrial Plywood.
- K. PS 20 - American Softwood Lumber Standard.
- L. PS 51 - Hardwood and Decorative Plywood.
- M. PS 58 - Basic Hardwood.

1.05 QUALITY ASSURANCE

- A. Perform finish carpentry work in accordance with AWI Quality Standards, Premium grade.
- B. Fire retardant treatment to conform to requirements of Underwriters' Laboratories (UL).

1.06 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01300.
- B. Indicate materials, component profiles, fastening methods, jointing details, finishes, and accessories.
- C. Submit samples under provisions of Section 01300.

1.08 DELIVERY AND STORAGE

- A. Deliver wood materials under provisions of Section 01600.
- B. Store indoors, in ventilated areas with constant minimum temperature of 60 degrees F and maximum relative humidity of 55 percent.

PART 2 PRODUCTS

2.01 LUMBER MATERIALS

- A. Softwood Lumber: PS 20; premium grade in accordance with AWI; maximum moisture content of 6 percent for interior work and 10 percent for exterior work.
- B. Hardwood Lumber: PS 58; premium grade in accordance with AWI; maximum moisture content of 6 percent.

- C. Facias to be primelock factory primed with Alkyo - oil primer finger jointed Eastern White Pine 5/4" boards with maximum lengths for minimum jointing.

2.05 ACCESSORIES

- A. Bolts, Nuts, Washers, Lags, and Screws: Size and type to suit application; non-corrosive for exterior, high humidity, and treated wood locations; plain finish at other interior locations.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Set and secure materials and components in place, plumb, and level.
- B. Verify mechanical, electrical, and building items affecting this Section are placed and ready to receive this work.
- C. Prime paint surfaces of items or assemblies in contact with cementitious materials.

3.02 SITE TREATMENT OF WOOD MATERIALS

- A. Brush apply two coats of preservative treatment on exterior located finish carpentry items.
- B. Apply preservative treatment in accordance with manufacturer's instructions.
- C. Treat site-sawn ends. Allow preservative to cure prior to erecting materials.
- D. Prime paint surfaces in contact with cementitious materials.

3.03 PREPARATION FOR FINISHING

- A. Sand work smooth and set exposed nails and screws. Apply manufacturer's recommended filler in exposed screw indentations and at joints.

END OF SECTION

SECTION 06400 - ARCHITECTURAL WOODWORK

06400.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

06400.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations relating to the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.
2. Wood counters and cabinets as shown on the drawings.
3. Stone counter tops.
4. Wood trim, moldings, etc. All wood trim profiles are to match existing trim profiles unless otherwise determined by the Architect.
5. All other wood and/or finished carpentry items classified as cabinet work and as called for on the drawings.
6. Shop priming all finished woodwork and millwork which is not required to be stained or varnished.
7. All rough hardware, and furnishing and installing finishing hardware as required to be provided to complete the work of this Section.
8. All cutting and patching of work to permit the installation of new work.

06400.0300 SHOP DRAWINGS

1. Submit shop drawings in accordance with the requirements of the General Conditions based on the Contract Drawing and Specifications showing complete details of construction, size of members, kinds of material, assembly of work, and connections for the proper execution of the work of other divisions. Show the profiles of all profiles of all moldings and show methods of reinforcement, anchorage and support.

06400.0400 SAMPLES

1. Submit samples for approval in accordance with the general requirements including wood finishes, hardware, etc. All woods showing the graining, texture, color, etc. All finished work shall lie within the range of approved samples of each kind of wood.

2.

06400.0500 MATERIALS

1. Unless otherwise specified scribe or closure molding for painting shall be clear White Pine.
2. Trim: Solid stock, select grade of same species as adjoining work.
3. Drawers: Solid stock, birch or maple.

06400.0600 VERIFICATION OF DIMENSIONS AND CONDITIONS

1. Add dimensions and conditions at the building which affect the size, construction and installation of items or features provided under this Section shall be carefully checked, verified and compared with those given on the drawings. All discrepancies and conflicts shall be reported to the Architect.

06400.0700 GROUNDS, FURRING AND SCREEDS

1. Provide all wood grounds and/or furring required for the securing in place of all finished carpentry work, interior wood finish and other items furnished by this or other contractors including trim, moldings, shelving, frames, covers, stools, aprons, etc.

06400.0800 ANCHORS, BOLTS AND ATTACHMENTS

1. Furnish all anchors, bolts, wall plates bolted to masonry, corrugated wall plugs, nailing blocks, wood, bricks, etc., which are required for the proper fastening and installation.

06400.0900 HARDWARE

1. Provide all hardware required for cabinets and millwork. All cabinet doors shall be provided with fixed pin butts 2-1/2" x 2-1/2" for doors 18" wide or less and 3" x 3" for wider doors, spring catches, and door pulls all of design approved by the Architect and of brushed stainless-steel finish. Provide all necessary channel bases, pilaster strips, etc.
2. Assemble all work in conformity with the best cabinet work practice.

* * * * *

SECTION 07190 – MASONRY SEALANTS

07190.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

07190.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of caulking and all related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.
 - a. Seal all exterior masonry and precast with TAMMS CHEMSTOP WB HEAVY DUTY WATER REPELLENT

07190.0300 DELIVERY AND STORAGE

1. Deliver, store and handle materials in a manner to prevent the inclusion of foreign materials and damage. Deliver and store packaged materials in original sealed containers until ready for use. Deliver materials in ample time to facilitate inspection and test.

07190.0400 SAMPLES

1. Submit the following samples of material for approval, in accordance with the requirements of the Supplementary General Conditions:
 - a Field apply 24" x 24" sample for review

07190.0500 MATERIALS

1. CHEMSTOP WB HD is water based, oligomeric siloxane/silane, ready to use deep penetrating water repellent. CHEMSTOP WB HD is colorless when dry, non-staining, non-yellowing, and non-film sealer used for protecting concrete and masonry surfaces without altering the appearance or the texture of the treated surface. CHEMSTOP WB is breathable, non-flammable and complies with current federal AIM VOC regulations.
2. USES: CHEMSTOP WB HD repellent is used above grade on vertical surfaces to minimize water penetration, reduce efflorescence, and aid in minimizing spalling due to freeze-thaw cycles. It also protects against ultraviolet degradation, airborne dirt, smog, industrial fumes, acid rain, and most other atmospheric chemicals.

07190.0600 APPLICATION

1. General: Apply in accordance with the manufacturer's instructions as approved by the Architect and as herein specified.
2. Preparatory work:
 1. SURFACE PREPARATION: Cure new concrete 28 days before application. Surface must be structurally sound, clean, dry, free of dust, dirt, paint, efflorescence, laitance, and other contaminants that will prevent the proper penetration of CHEMSTOP WB. Prior to application joints or cracks must be properly sealed or filled. If acid is used for cleaning, neutralize completely before CHEMSTOP WB application. A dry substrate allows better penetration of the sealer.
 2. APPLICATION TECHNIQUES: Low pressure airless spray equipment is the method of application. Application should be from the bottom up to ensure uniform product distribution. Apply a saturation coat with a 6-8" controlled rundown. Two saturation coats of CHEMSTOP WB HD shall be required, applied using a "wet on wet" technique. Apply a test patch to evaluate surface appearance and effectiveness of the coverage rate.
 3. CLEAN-UP INSTRUCTIONS: Clean drips, runs, and overspray residue while still wet, using detergent and water. CHEMSTOP WB will not etch common glass and spills and overspray onto glass can be easily removed with a damp cloth. Dried material may require mechanical abrasion for removal. Clean application and spray equipment with detergent and water immediately following use.

SECTION 07 21 29- SPRAY POLYURETHANE FOAM INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Closed-cell spray polyurethane foam insulation.
2. Air-sealing insulation applied within wall, roof, and floor assemblies.
3. Accessories required for complete installation.

B. Related Sections:

1. Section 07 27 00 – Air Barriers.
2. Section 07 60 00 – Flashing and Sheet Metal.
3. Section 09 21 16 – Gypsum Board Assemblies.
4. Section 09 90 00 – Painting and Coating.

1.02 REFERENCES

- A. ASTM C1029 - Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
- B. ASTM C518 - Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM D1621 - Compressive Properties of Rigid Cellular Plastics.
- D. ASTM D1622 - Density of Rigid Cellular Plastics.
- E. ASTM D6226 - Open Cell Content of Rigid Cellular Plastics.
- F. ASTM E84 - Surface Burning Characteristics of Building Materials.
- G. ASTM E2178 - Air Permeance of Building Materials.
- H. ASTM E283 - Air Leakage Through Exterior Assemblies.
- I. ICC-ES Acceptance Criteria AC377.
- J. NFPA 286 - Evaluation of Fire Propagation Characteristics.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate installation with mechanical, electrical, plumbing, and fire protection Work.
- B. Verify that substrates are complete and ready to receive insulation.

1.04 SUBMITTALS

A. Product Data:

1. Manufacturer's technical literature.
2. Physical properties.
3. Code evaluation reports.

B. Shop Drawings:

1. Locations and extent of spray foam application.

C. Quality Assurance Submittals:

1. Installer qualifications.
2. Manufacturer certification.

D. Field Reports:

1. Daily installation logs.
2. Thickness verification reports.

E. Closeout Submittals:

1. Warranty documentation.
2. Maintenance recommendations.

1.05 QUALITY ASSURANCE

A. Manufacturer:

1. Minimum five years documented experience producing SPF insulation.

B. Installer:

1. Approved by insulation manufacturer.
2. Minimum three years experience with comparable projects.

C. Regulatory Requirements:

1. Comply with applicable building code requirements.
2. Products shall possess current ICC-ES evaluation reports.

1.06 MOCKUP

A. Provide mockup area not less than 100 square feet.

B. Mockup may remain as part of completed Work if approved.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original unopened containers.

B. Store materials in accordance with manufacturer requirements.

C. Protect materials from moisture, direct sunlight, and temperature extremes.

1.08 FIELD CONDITIONS

A. Do not apply insulation when environmental conditions are outside manufacturer recommendations.

B. Maintain substrate temperature within manufacturer's published limits.

1.09 WARRANTY

A. Manufacturer's standard material warranty.

B. Installer warranty:

1. Two years minimum from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product:

1. WALLTITE ONE Spray Polyurethane Foam

B. Subject to compliance with requirements, equivalent products by:

1. Carlisle Spray Foam Insulation.

2. Huntsman Building Solutions.

3. Dupont Corporation

4. Approved equal.

2.02 CLOSED-CELL SPRAY POLYURETHANE FOAM

A. Material:

1. Two-component spray-applied polyurethane foam.

2. Closed-cell formulation.

B. Physical Properties:

1. Density: Minimum 2.0 lb/cu ft.

2. Closed-cell content: Minimum 90 percent. 【1-4788a8】

3. Compressive Strength: Minimum 36 psi.

4. Water vapor transmission: 1.0 Perms min.

5. Air permeance: Comply with ASTM E2178.

C. Thermal Performance:

1. Aged R-value:
 - a. Minimum R-7.2 per inch.

D. Surface Burning Characteristics:

1. Flame Spread Index: 25 maximum.
2. Smoke Developed Index: 450 maximum.
3. Tested in accordance with ASTM E84.

E. Environmental Requirements:

1. No ozone-depleting blowing agents.
2. Comply with applicable federal, state, and local regulations.

2.03 ACCESSORIES

A. Primers:

1. As recommended by foam manufacturer.

B. Ignition or Thermal Barriers:

1. As required by applicable code.

C. Joint Sealants:

1. Compatible with insulation system.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify substrates are:

1. Structurally sound.
2. Dry.
3. Clean.
4. Free of contaminants.

- B. Do not begin installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect adjacent surfaces from overspray.

- B. Mask windows, doors, equipment, and finished surfaces.

- C. Ensure penetrations, blocking, and supports are installed prior to foam application.

3.03 INSTALLATION

- A. Install spray polyurethane foam in accordance with manufacturer's written instructions.
- B. Apply continuously to achieve thickness indicated on Drawings.
- C. Fill voids, cracks, joints, and penetrations to provide a continuous insulation layer.
- D. Apply insulation to:
 - 1. Exterior wall cavities.
 - 2. Roof deck undersides.
 - 3. Cantilevered floors.
 - 4. Other locations indicated.
- E. Minimum Installed Thickness:
 - 1. Exterior Walls: As required to achieve assembly R-value.
 - 2. Roof Assemblies: As required to achieve assembly R-value.
- F. Trim excess foam flush where required to receive subsequent finishes.

3.04 FIELD QUALITY CONTROL

- A. Inspect installed foam for:
 - 1. Uniformity.
 - 2. Adhesion.
 - 3. Thickness.
 - 4. Voids and gaps.
- B. Verify thickness using depth probes or other approved methods.
- C. Remove and replace defective areas.

3.05 PROTECTION

- A. Protect installed insulation from:
 - 1. Mechanical damage.
 - 2. Ultraviolet exposure.
 - 3. Weather exposure beyond manufacturer limitations.
- B. Cover exposed insulation with approved finish, coating, thermal barrier, or building component within manufacturer's recommended timeframe.

END OF SECTION 07 21 29

SECTION 07225 - EPS BOARD ROOF DECK INSULATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Tapered EPS board roof deck insulation system for use as an acceptable and recommended substrate for project roofing system.

1.02 REFERENCES

- A. American Society for Testing & Materials (ASTM): C578-87a preformed, Cellular Polystyrene Thermal Insulation Spec for.
- B. The Society of the Plastics Industry, Inc. (SPI): ACCU-R EPS Program for product quality control and labeling program.
- C. Factory Mutual Research Corporation (FMRC)
 - 1. Loss Prevention Data Sheet I-28, current edition.

1.03 SYSTEM DESCRIPTION

- A. Description: EPS tapered roof deck insulation product specifically manufactured and recommended by manufacturer for compatibility with project roofing system for R-value and other physical properties indicated herein when tested in accordance with ASTM C578.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for specific EPS board roof deck insulation proprietary products affirming products do not contain chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC).
- B. Samples: Submit three samples, 12" x 12" x 1" minimum, each specified EPS insulation product, identified with SPI ACCU-R quality assurance program label.
- C. Tapered Insulation Shop Drawings: Submit tapered EPS insulation shop drawings indicating layout, minimum and maximum thickness, slope direction, and placement sequence.

1.05 QUALITY ASSURANCE

- A. SPI ACCU-R Program: Comply with the quality assurance program of The Society of the Plastics Industry, Inc. (SPI) ACCU-R EPS program for appropriate testing, inspection, and review of product production practices for compliance with ASTM C578 requirements.
- B. Insurance Underwriter Requirements: Comply with owner's insurance underwriter's requirements for EPS roof deck insulation product for application with project roofing system.
- C. Factory Mutual Research Corporation (FMRC) Requirements: Comply with requirements for EPS roof deck insulation application with project roofing system.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Storage: Store and protect EPS roof deck insulation prior to installation from direct sunlight exposure and from weather to ensure insulation is dry when installed.

1.07 WARRANTY

- A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for EPS board insulation R-value when tested for conformance with ASTM C578. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.
 - 1. Warranty Period: 20 years from Date of Substantial Completion.
 - 2. Beneficiary: Issue warranty in the legal name of project Owner.
 - 3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty document.

PART 2 - PRODUCTS

- A. Tapered EPS Board:
 - 1. Thickness 3" Minimum.
 - 2. Slope: 1/8"/LF

2.01 INSULATION MATERIAL

A. Material Standard: Comply with ASTM C578 for EPS board roof insulation.

1. Type II.

2.02 ROOF INSULATION BOARD

A. Molded EPS Board Insulation: Rigid, closed cell, lightweight, thermal insulation formed by the composition of hydrogen and carbon atoms in a closed mold to comply with ASTM C578-87a for type indicated as follows:

1. Type II: 1.35 pcf minimum density, R-value of 4.55 and 4.17 at 40 degrees F and 75 degrees F (4.4 degrees C and 23.9 degrees C), respectively.

PART 3 - EXECUTION

3.01 INSULATION

A. General: Install EPS board insulation in single or multiple layers to achieve required R-value, extending EPS insulation over entire roof deck surface to be installed, cutting and fitting around projections and obstructions. Form cant strips, crickets, and tapered areas for positive drainage of roofing system.

B. Insulation Board Joints: Stagger EPS board insulation joints in one direction for each course. For multiple layers, stagger joints in both directions between courses with no gaps to form a complete thermal envelope.

C. Exposure: Do not install more EPS insulation in a day than can be covered with roofing membrane before end of work day or before start of weather conditions which can damage EPS insulation.

D. Adhered Single-Ply Membrane Re-Roof: Install EPS board insulation over roof deck fully adhered and mechanically secured to deck substrate.

E. Install boards with FM 60 fasteners at a rate of 1 fastener per 2 sq. ft. Provide fastener in each corner typical.

* * * * *

SECTION 07270 – FIRESTOPPING

PART 1 – GENERAL

1.01 SUMMARY

- A. Work Included: The work of this section shall include, but is not necessarily limited to the following:
 - 1. Penetrations through fire resistance rated construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - 2. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
 - 3. Sealant joints in fire resistance rated construction at intersection of dissimilar materials including at wall and deck locations, etc.
 - 4. Furnishing of dams, clips and closures for support and containment of fire safing materials and installation of dams, clips and closures where possible to install after completion of floors, walls or other construction.
- B. Related Sections:
 - 1. Section 03300 – Cast – In – Place Concrete
 - 2. Section 04200 – Unit Masonry
 - 3. Section 07210 – Building Insulation
 - 4. Section 07250 – Fireproofing
 - 5. Section 07900 – Joint Sealers
 - 6. Section 09255 – Gypsum Board Assemblies
 - 7. Division 15 and 16 – Mechanical and Electrical

1.02 QUALITY ASSURANCE

- A. Qualifications: The work of this section shall be performed by a qualified and experienced installer, acceptable to the Architect. The term “installer” as used herein, shall mean a firm of established reputation; which has been trained by the Manufacturer in the proper installation of fire safing materials and which is

regularly engaged in, and maintains a regular force of workmen skilled in the installation of fire safing materials of the type specified.

- B. Installer's Qualifications: Before proceeding with the work, submit three (3) copies of a list of several comparable projects of similar work that the installer has completed within the past five (5) years, giving the job locations, names of the owners, their telephone numbers and the date on which the work on each project was started and completed.

1.03 REFERENCES

- A. Codes and Regulations: Fire safing work shall conform to the New York State Fire Prevention and Building Code and all applicable regulations of governmental authorities having jurisdiction, including safety, health and anti-pollution regulations.

1.04 SUBMITTALS

- A. Product Data: Submit product data consisting of Manufacturer's latest published catalog information or technical description and installation instructions; obtain approval before materials are fabricated or delivered to the site.
- B. Test Reports: Submit three (3) certified copies of test reports, by an independent testing laboratory, approved by the Architect, indicating that the fire safing materials are in conformance with the requirements specified herein.
- C. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through penetration fire stop systems are installed per specified requirements.
- D. The School District may employ and pay a qualified inspection agency to check installed firestopping systems for compliance with requirements.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original tightly sealed containers or unopened packages, with legible mixing and application instructions.
- B. Store materials out of weather in original containers as recommended by manufacturer.

PART 2 – PRODUCTS

2.01 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with “System Performance Requirements” article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems. Accessories include but are not limited to the following items:
 - 1. Permanent forming/damming/backing materials including the following:
 - a. Semirefractory fiber (mineral wool) insulation.
 - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - c. Fire rated form board.
 - d. Joint fillers for joint sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. Steel sleeves.
 - 6. Safing Clips.
 - 7. Metal support plates.
- C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.02 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

- A. Mineral Wool: Loose or formed mineral wool rated non-combustible when tested according to ASTM 136, free of asbestos and glass fiber, and suitable for stuffing to an in place density of 6 to 12 psf.
- B. Endothermic, Latex Compound Sealant: Single component, endothermic, latex formulation.
- C. Intumescent, Latex Sealant: Single component, intumescent, latex formulation.
- D. Intumescent Putty: Nonhardening, dielectric, water resistant putty containing no solvents inorganic fibers, or silicone compounds.
- E. Intumescent Wrap Strips: Single component, elastomeric sheet with aluminum foil on one side.
- F. Job Mixed Vinyl Compound: Prepackaged vinyl based powder product for mixing with water at project site to produce a paintable compound, passing ASTM E 136, with flame spread and smoke developed ratings of zero per ASTM E 84.
- G. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at project site to form a nonshrinking, homogenous mortar.
- H. Pillow/Bags: Re-usable, heat expanding pillows/bags composed of glass fiber cloth cases filled with a combination of mineral fiber, water insoluble expansion agents and fire retardant additives.
- I. Silicone Sealant: Moisture curing, single component, silicone based, neutral curing elastomeric sealant of grade indicated below:
 - 1. Grade: Pourable (self leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
 - 2. Grade for Horizontal Surfaces: Pourable (self leveling) grade for openings in floors and other horizontal surfaces.
 - 3. Grade for Vertical Surfaces: Nonsag grade for openings in vertical and other surfaces.
- J. Solvent Release Curing Intumescent Sealant: Solvent release curing, single component, synthetic polymer based sealant of grade indicated below:

1. Grade: Pourable (self leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
- K. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to the following:
1. Endothermic, Latex Sealant:
Fyre-Shield, Tremco Inc.
 2. Endothermic, Latex Compounds:
Flame-Safe FS500/600 Series, International Protective Coatings Corp.
Flame-Safe FS900/FST900 Series, International Protective Coatings Corp.
 3. Intumescent Latex Sealant:
Metacaulk 950, The RectorSeal Corporation
Fire Barrier CP 25WB Caulk, 3M Fire Protection Products.
 4. Intumescent Putty:
Series SSP, STI Spec Seal FireStop Products
Flame-Safe FSP1000 Putty, International Protective Coatings Corp.
Fire Barrier Moldable Putty, 3M Fire Protection Products.
 5. Intumescent Wrap Strips:
Series SSP, STI Spec Seal FireStop Products
Dow Corning Fire Stop Intumescent Wrap Strip 2002, Dow Corning Corp.
Fire Barrier FS-195 Wrap/Strip, 3M Fire Protection Products
 6. Job Mixed Vinyl Compound:
USG Firecode Compound, United States Gypsum Co.
 7. Mortar:
SpecSeal Mortar, STI Spec Seal FireStop Products
Novasit K-10 Firestop Mortar, Bio Fireshield, Inc.
KBS-Mortar Seal, International Protective Coatings Corp.
 8. Pillow/Bags:
Firestop Pillows, Bio Fireshield, Inc.
SpecSeal Pillows, STI Spec Seal FireStop Products
 9. Silicone Foams:
Pensil 200 Foam, STI Spec Seal FireStop Products
Dow Corning Fire Stop Foam 2001, Dow Corning Corp.

10. Silicone Sealants:

Dow Corning Firestop Sealant 2000, Dow Corning Corp.
Pensil 300, STI Spec Seal FireStop Products
CS240 Firestop Sealant, Hilti Construction Chemicals, Inc.
Metacaulk 880, The RectorSeal Corporation

11. Solvent Release Curing Intumescent Sealants:

Biostop 500 Intumescent Firestop Caulk, bio Fireshield, Inc.
Fire Barrier CP 25N/S Caulk, 3M Fire Protection Products
Fire Barrier CP25S/L Caulk, 3M Fire Protection Products

12. Mineral Fiber Fire Safing:

Therma Fiber Safing Insulation by USG Interiors Inc.
Fire Master Bulk, 3M
Fire Protection Products

2.03 MIXING

- A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
 1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
 4. Provide 20 gage minimum metal plates where required for fire safing support to comply with fire rating.
 5. For mineral safing insulation, apply in continuous length using manufacturer's standard safing clips compress insulation until stable without movement.

3.04 INSTALLING FIRE-RESISTIVE JOINT SEALANTS

- A. General: Comply with “System Performance Requirements” article in Part 1, with ASTM C 1193, and with the sealant manufacturer’s installation instructions and drawings pertaining to products and applications indicated.
- B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depth of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.
- C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement’s capability. Install sealants at the same time joint fillers are installed.
- D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begin. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.05 FIELD QUALITY CONTROL

- A. Inspecting agency employed and paid by Government will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.
- B. Inspecting agency will report observations promptly and in writing to Contractor and Architect.
- C. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.
- D. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.

3.06 CLEANING

- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

- B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

SECTION 07300 - ROOF SHINGLES

07300.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements" which form a part hereof whether attached hereto or not.

07300.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all roof shingles and grade ice and water shield underlayment and related work, complete, in strict accordance with the Contract Drawings and as herein specified, or reasonably implied. Provide stop flashings and related flashings at any and all junctions with dissimilar materials and surfaces.

07300.0300 SHOP DRAWINGS

1. Submit product literature for approval of the following items herein specified in accordance with the requirements of the Supplementary General Conditions.

07300.0400 SAMPLES

1. Submit for approval in accordance with the requirements of the Supplementary General Conditions, samples of all materials herein specified as requested by the Architect and as follows:

- a. Insulations

07300.0500 GUARANTEE

1. The Contractor shall and hereby does guarantee all workmanship and materials entering into this Section of the specifications to be free of all leaks and other defects for a period of five years. Should any defects in the work develop within the five year period, the Contractor shall and hereby does agree to repair such defective work and to make all repairs to work of others damaged in correcting the defective work, and further, he agrees to and shall repair or replace work of others damaged by leaks in his defective work without additional cost to the Owner. All repairs shall be made within five (5) days after notice to the Contractor. Such guarantee shall be made in writing to the Owner and transmitted to the Architect.
2. Submit manufacturer's 40 year warranty including 5 year sure start protection.

07300.0600 MATERIALS

1. General: Materials shall be delivered in unbroken containers, stored and handled so as

to prevent inclusion of foreign substances and damage by water or breakage. All manufactured materials shall bear the manufacturer's labels. All materials shall be the product of one manufacturer.

2. Roof shingles shall be GAF timberline with integral ridge and hip vents (shingle vent II) by Air Vent Inc.

07300.0700 PRELIMINARY INSPECTION

1. Before starting work, carefully examine surfaces on which work of this Section is dependent. Check and verify lines, elevations, contours, and general condition of preliminary work. Any defects in surfaces to which materials of this Section are to be applied must first be corrected. Report any unsatisfactory conditions to the Architect before starting work, and do not commence work until so directed by the Architect. Start of installation will be considered acceptance of preceding work and acceptance of responsibility for correcting defects.

07300.0800 INSTALLATION

1. Refer to the roof plan drawings for all systems and components to be installed in accordance with this section.
2. Comply with all manufacturers written installation requirements, guidelines and instructions which are incorporated herewith by reference..

07400.0800 COOPERATION

1. Coordinate work of this section with work of contiguous trades under this and other Contracts. Flashings built into masonry shall be formed in advance so as not to delay work.

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanically-seamed, standing seam metal roof panels, with related metal trim and accessories.

1.2 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel Framing" for structural steel framing supporting metal panels.
- B. Division 05 Section "Steel Decking" for continuous metal decking supporting metal panels.
- C. Division 07 Section "Air Barriers" for air barriers within roof assembly and adjacent to roof assembly.

1.3 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA):
 - 1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
 - 2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE):
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM):
 - 1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - 3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 4. ASTM A 980 - Standard Specification for Steel, Sheet, Carbon, Ultra High Strength Cold Rolled.
 - 5. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
 - 6. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 - 7. ASTM D 1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
 - 8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 - 9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
 - 10. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
 - 11. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

12. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
13. ASTM E 1980 - Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. International Accreditation Service (IAS):

1. IAS AC 472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

E. Underwriters Laboratories, Inc. (UL):

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.

1. Coordinate building framing in relation to metal panel system.
2. Coordinate openings and penetrations of metal panel system.
3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.5 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

- a. Product data, including certified independent test data indicating compliance with requirements.
- b. Samples of each component.
- c. Sample submittal from similar project.
- d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
- e. Sample warranty.
- f. IAS AC 472 certificate.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years experience with successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

1.6 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.
 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 2. Include data indicating compliance with performance requirements.
 3. Include structural data indicating compliance with requirements of authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch long section of each metal panel profile. Provide color chip verifying color selection.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.
- D. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
 1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
 2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

- A. Coordinate sizes, profiles, and locations of roof curbs and other roof-mounted equipment and roof penetrations, based upon sizes of actual selected equipment.

1.11 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.
- B. **Special Weathertightness Warranty:** On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail to remain weathertight, including leaks, without monetary limitation up to cost within 20 years from date of Substantial Completion.
- C. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within 25 years from date of Substantial Completion, including:
 - a. Color fading in excess of 5 Hunter units per ASTM D 2244.
 - b. Chalking in excess of No. 6 rating per ASTM D 4214.
 - c. Failure of adhesion, peeling, checking, or cracking.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: **Garland R-Mer Span.**
 - 1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:
 - 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
 - a. Wind Uplift Testing: Certify capacity of metal panels by actual testing of proposed assembly per ASTM E 1592.
 - 2. Snow Loads: 35 lbf/sq. ft.
 - 3. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/180 of the span with no evidence of failure.
 - 4. Seismic Performance: Comply with ASCE 7, Section 9, "Earthquake Loads."
- C. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-90.

- D. Air Infiltration, ASTM E 1680: Maximum 0.006 cfm/sq. ft. (1.27 L/s per sq. m) at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- E. Water Penetration Static Pressure, ASTM E 1646: No uncontrolled water penetration at a static pressure of 25 lbf/sq. ft..
- F. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.3 METAL ROOF PANELS

- A. Mechanically-seamed, Concealed Fastener, Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with vertical ribs at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.
 - 1. **Aluminum-Zinc Alloy-Coated Steel Sheet:** ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A 755/A 755M.
 - 2. Nominal Coated Thickness: 20 gage.
 - 3. Panel Surface: Smooth with striations in pan.
 - 4. Exterior Finish: Fluoropolymer two-coat system.
 - 5. Color: As selected by Architect from manufacturer's standard colors.
 - 6. Panel Width: 16 inches (406 mm).
 - 7. Panel Seam Height: 2 inch (50.8 mm).
 - 8. Joint Type: Mechanically seamed.

2.4 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in [manufacturer's standard profiles] [profiles as indicated]. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.
- C. Panel Clips: Provide panel clip of type specified, at spacing indicated on approved shop drawings.
 - 1. **Single-Piece Fixed:** ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.
- D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
 - 1. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
- F. **Steel Sheet Miscellaneous Framing Components:** ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

- G. **Snow Guards:** Approved by metal roof panel manufacturer. Refer to Section 07 72 53 "Snow Guards" for requirements for snow guards attached to metal roof panels.

2.5 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.
- C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.6 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- A. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621.
- B. Fluoropolymer Two-Coat Metallic System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF metallic fluoropolymer color coat, AAMA 621.
- C. Interior Finish: 0.5 mil (0.013 mm) total dry film thickness consisting of primer coat and wash coat of manufacturer's standard light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
 - 1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
 - 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
 - a. 1/4 inch (6 mm) in 20 foot (6.1 m) in any direction.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal roof panel system installation.

- A. Flashings: Provide flashings as required to complete metal roof panel system. Install in accordance with Section 07 62 00 "Sheet Metal Flashing and Trim" and approved shop drawings.

3.3 METAL PANEL INSTALLATION

- A. Mechanically-Seamed, Standing Seam Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Attach panels to supports using clips, screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
 - 1. Fasten metal panels to supports with concealed clips at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
 - 2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
 - 3. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
 - 4. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

3.4 ACCESSORY INSTALLATION

- A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
 - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
 - 3. Provide concealed fasteners except where noted on approved shop drawings.
 - 4. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.
 - 1. Seal panels in accordance with insulated panel manufacturer's instructions, and project design drawings.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage an independent testing and inspecting agency acceptable to Architect to perform field tests and inspections and to prepare test reports.

ELLENVILLE FIRE DISTRICT
NEW FIREHOUSE FACILITY
NYS RT. 209, ELLENVILLE, NY
3.6 CLEANING AND PROTECTION

METAL ROOF SYSTEM
DIVISION 7- METAL ROOFING
SECTION 074113

- A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION

SECTION 07550 - MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cold Applied 2-Ply Asphalt Roofing (StressPly)

1.2 RELATED SECTIONS

- A. Section 06114 - Wood Blocking and Curbing: Wood nailers and cant strips.
- B. Section 07220 - Insulation Board: Insulation and fastening.
- C. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.
- D. Section 15120 - Piping Specialties: Roof Drains, Sumps.

1.3 REFERENCES

- A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
- C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
- D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.
- E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
- F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
- G. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- H. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
- I. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- J. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

- K. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- L. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
- M. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
- N. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- O. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
- P. ASCE 7, Minimum Design Loads for Buildings and Other Structures

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings
- C. Design Requirements:
 - 1. Uniform Wind Uplift Load Capacity - Wind Uplift Calculation to be provided

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

- E. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.
- G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.
- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section.
- B. Review installation procedures and coordination required with related Work.
- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.

2.2 COLD APPLIED 2-PLY ROOF SYSTEM - STRESSPLY, OPTIMAX, OR VERSIPLY

- A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. FlexBase 80:
- B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. StressPly Plus FR Mineral:
- C. Interply Adhesive: (1 and 2)
 - 1. Weatherking :
- D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. FlexBase 80:
- E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. StressPly Plus FR Mineral:
- F. Flashing Ply Adhesive:
 - 1. Weatherking Flashing Adhesive:

2.3 ACCESSORIES:

- A. Roof Insulation: In accordance with Section 07220.
- B. Roof Insulation: Provide G-P Gypsum DenDeck Prime.
- C. Walkway Pads - Commercial Innovations Walkway Pads: As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.

- D. Pitch Pocket Sealer - Seal-Tite: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.
 - 1. Durometer, ASTM D 2240: 40-50 Shore
 - 2. Elongation, ASTM D 412: 250%
 - 3. Tensile Strength, ASTM D 412: 200 @ 100 mil
- E. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Pre-Manufactured Coping Cap: R-Mer Edge Coping Cap Cover and Splice Plate.
 - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24 gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
 - 2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .040" nom. or .050" nom. or .063" nom
- B. Pre-Manufactured Coping Cap: R-Mer Edge Coping Chairs
 - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
- C. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
- D. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
- E. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
- F. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- G. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

- H. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
 - 1. Tensile Strength, ASTM D 412: 400 psi
 - 2. Elongation, ASTM D 412: 300%
 - 3. Density @77 deg. F 8.5 lb/gal typical
- I. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
 - 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- J. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
 - 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
- C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. General: Clean surfaces thoroughly prior to installation.
 - 1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
 - 3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.

4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
 5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
 6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
 7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.
- B. Metal Deck: Metal deck shall be installed as specified in Section
1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
 2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
 3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
 4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
 5. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

3.3 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.

2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

- A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
 6. Install base flashing ply to all perimeter and projection details.
 7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.
- B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plys specified. Shingle in proper direction to shed water on each large area of roofing.
 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.

4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.
- C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
 2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
 3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
 4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
- E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.

3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Pre-manufactured Snap-On Coping Cap:
 - 1. Install miters first.
 - 2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening 8 inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 - 3. Install minimum 16 gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
 - 4. Install 6 inch wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.
- B. Liquid Flashing:
 - 1. Mask target area on roof membrane with tape.
 - 2. Clean all non-porous areas with isopropyl alcohol.
 - 3. Apply 32 wet mil base coat of liquid flashing over masked area.
 - 4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
 - 5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
 - 6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.
- C. Roof Drain:
 - 1. Plug drain to prevent debris from entering plumbing.
 - 2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
 - 3. Run roof system plies over drain. Cut out plies inside drain bowl.
 - 4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
 - 5. Install base flashing ply (40 inch square minimum) in bitumen.
 - 6. Install modified membrane (48 inch square minimum) in bitumen.
 - 7. Install clamping ring and assure that all plies are under the clamping ring.
 - 8. Remove drain plug and install strainer.

D. Pitch Pocket:

1. Run all plies up to the penetration.
2. Place the pitch pocket over the penetration and prime all flanges.
3. Strip in flange of pitch pocket with one ply of base flashing ply. Extend 6 inches (152 mm) onto field of roof.
4. Install second layer of modified membrane extending 9 inches (228 mm) onto field of the roof.
5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
6. Caulk joint between roof system and pitch pocket with roof cement.

3.6 CLEANING

- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
 1. Warranty shall be issued upon manufacturer's acceptance of the installation.
 2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.

3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:

1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.4 deg. C)

B. Modified Cap (Ply) Sheet:

1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:

1. Weatherking: Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
 - a. Non-Volatile Content ASTM D 4479 70%
 - b. Density ASTM D1475 8.9 lbs./gal.
 - c. Viscosity Stormer ASTM D562 400-500 grams
 - d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
 - e. Slope: up to 3:12

D. Flashing Base Ply:

1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%
 - d. Low Temperature Flexibility, ASTM D 5147:
 - 1) Passes -30 deg. F (-34.4 deg. C)

E. Flashing Ply Adhesive:

1. Weatherking Flashing Adhesive: Brush grade flashing adhesive.
 - a. Non-Volatile Content ASTM D 4479 70 min.
 - b. Density ASTM D 1475 8.6 lbs./gal. (1kg/l)
 - c. Flash Point ASTM D 93 100 deg. F (37 deg. C)

F. Surfacing:

1. Flashing Cap (Ply) Sheet:
 - a. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
 - 1) Tensile Strength, ASTM D 5147
 - a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m

- 2) Tear Strength, ASTM D 5147
 - a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
- 3) Elongation at Maximum Tensile, ASTM D 5147
 - a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
- 4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Paratet flashings.
- B. Scuppers.
- C. Roof and sill flashings.
- D. Counterflashings over roofing.
- E. Counterflashings at roof mounted mechanical equipment and vent stacks.
- F. Counterflashings for roof hatches and skylights.

1.02 RELATED WORK

- A. Section 07530 Roofing.
- B. Section 07724 - Roof Hatches.
- C. Section 07900 - Joint Sealers.

1.03 REFERENCES

- A. ASTM B370 - Copper Sheet and Strip for Building Construction.
- B. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- C. CDA (Copper Development Association) - Contemporary Copper, A Handbook of Sheet Copper Fundamentals, Design, Details and Specifications.
- D. CDA - Copper Roofing - A Practical Handbook.
- E. FS O-F-506 - Flux, Soldering, Paste and Liquid.
- F. FS QQ-S-571 - Solder, Tin Alloy.
- G. NRCA (National Roofing Contractors Association) - Roofing Manual.
- H. SMACNA - Architectural Sheet Metal Manual.

1.04 SYSTEM DESCRIPTION

- A. Work of this Section is to physically protect membrane roofing and cavity walls, heads and sills, etc. from damage that would permit water leakage to building interior.

1.05 QUALITY ASSURANCE

- A. Applicator: Company specializing in sheet metal flashing work with 5 years minimum experience.

1.06 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Describe material profile, jointing pattern, jointing details, fastening methods, and installation details.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.
- D. Submit samples under provisions of Section 01300.

1.07 STORAGE AND HANDLING

- A. Store products under provisions of Section 01600.
- B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Copper: ASTM B370, cold rolled; 20 oz/sq ft, thick; natural finish.

2.02 ACCESSORIES

- A. Fastener: Copper

- B. Underlayment: ASTM D266; No. 15 asphalt saturated roofing felt. 6 mil (0.15 mm) polyethylene.
- C. Slip Sheet: Rosin sized building paper.
- D. Bedding Compound: Rubber-asphalt type.
- E. Solder: FS QQ-S-571.
- F. Flux: FS O-F-506.

2.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.
- C. Form pieces in longest practical lengths.
- D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
- E. Form material with flat lock seam.
- F. Prein edges of copper sheet.
- G. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
- J. Fabricate flashings to allow toe to extend 6 inches over roofing. Return and brake edges.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

- B. Verify membrane termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.
- D. Coordinate all flashings at termination bars at flat roof area with roof installer.

3.02 PREPARATION

- A. Field measure site conditions prior to fabricating work.
- B. Install starter and edge strips, and cleats before starting installation.
- C. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- D. Insert flashings into reglets to form tight fit. Secure in place with lead wedges at maximum 24 inches on center. Seal flashings into reglets with sealant.
- E. Secure flashings in place using concealed fasteners.
- F. Lap and seal all joints.
- G. Apply plastic cement compound between metal flashings and felt flashings.
- H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- I. Seal metal joints watertight.

3.03 INSTALLATION

- A. Conform to drawing details and "Copper and Common Sense" handbook and NRCA manual.

* * * * *

SECTION 07715 - ALUMINUM GUTTERS & LEADERS

PART 1 GENERAL

1.01 DESCRIPTION

A. GUTTERS

1. Furnish and install Industrial Gutter System at all roof areas with accessories as manufactured by Perimeter Systems, Division of Southern Aluminum Finishing Company (SAF) “Colonial” style system, or equal. Provide Profile No. G4-(R) manufactured of Aluminum .063” thickness 14 gauge, Black Kynar 500 finish.
2. Gutters shall be manufactured in 10’-0” lengths, tapered and notched to provide a 1” telescoping lap joint. Gutters shall be pre-punched at 12” O.C. to provide for thermal movement after installation.
3. Provide manufacturer’s standard support brackets and interior straps for installation at 30” O.C. Bracketry shall be of a compatible material to gutter, with matching finish and color.

B. DOWNSPOUTS

1. Furnish and install manufacturer’s standard downspout Profile No. DS manufactured of Aluminum, .050” thickness 16 gauge, Black Kynar 500 finish.
2. Downspout shall be manufactured in 10’-0” lengths, factory offset on one end to provide for a $\frac{3}{4}$ ” telescope joint. Downspout shall contain a factory mounted back, which is non-sealed to allow seepage of water in overflow conditions.
3. Elbows for downspouts shall be of welded construction, with matching finish applied after welding. Such finish shall be of quality equal to finish for non-welded parts. Grinding and spray painting of parts to match will not be permitted. Elbows will be provided with a factory offset on its lower end to allow a $\frac{3}{4}$ ” telescope joint.
4. Provide manufacturer’s standard wall brackets of compatible material to downspout with matching finish and color.
5. Provide & install PVC downspout adapter to connect to underground drainage system at each leader location, sized to accept leader. Field review to coordinate locations with designated leader locations.

1.02 QUALITY ASSURANCE

- A. Installing contractor shall be responsible for installing gutter system in accordance with manufacturer's printed instructions. Follow primary roofing material manufacturer's printed instructions for installation of joining eave trims.

1.03 SUBMITTALS

- A. Prior to start of installation, the installing contractor shall furnish details or catalog cuts indicating products to be used conform to these specifications.

1.04 DELIVERY & PRECAUTIONS

- A. All products delivered shall be stored in a clean, dry location prior to installation.
- B. Products furnished with strippable protective plastic film should have film removed prior to installation. Such film coated products shall not be exposed to sunlight for more than 30 minutes without removing film.
- C. Workmen shall use diligent care to avoid damage, scars, and abrasions to product when handling. Moreover, contractor shall wear protective gloves and clothing to avoid bodily injury when handling products.

PART 2 INSTALLATION

2.01 SUBSTRATE PREPARATION

- A. All horizontal blocking to receive gutters shall be installed true and straight and free of splinters, knots, or other irregularities. Follow local building codes or Factory Mutual Loss Prevention Data 1-49 (whichever is greater) for proper attachment of plates.
- B. Fascia boards shall be installed in a vertical fashion, true and straight and free of knots, splinters, or other irregularities. Soffits, extenders, or cladding to be applied to fascias shall be installed prior to gutter installation.
- C. Wall Conditions: Wall surfaces, which shall be subject to water runoff from gutters, shall be protected when project conditions do not allow immediate installation.

2.02 INSTALLATION PROCEDURES

- A. Review carefully and follow primary roof materials manufacturer's general recommendations as to installing waterproof membranes to this gutter system.

- B. Support Bracket Installation: Locate low and high points of gutter installation and chalk a guide line to allow a maximum $\frac{1}{4}$ "/40' slope. Install support brackets at 30" on center aligned with the chalk or other type of guideline. Take care to avoid locating bracket directly over downspout outlet locations. Attach brackets with 2" x #10 wood screw.
- C. Gutter Installation: Install gutter sections from left to right (roof side) into support brackets. Insert each telescoping section into previous section for a distance of 1" seal and rivet at 2" O.C. Provide sealants and fasteners as provided by manufacturer. Nail rear upper portion of gutter with 2" self-drilling screws through pre-punched elongated holes at 12" O.C.
- D. Inside Strap Installation: Install straps at 30" O.C. alternating with support brackets. Strap shall be hooked into leading edge (bead) of gutter and riveted at its rear side. In no case shall strap be nailed, screwed, or otherwise fastened which would restrain thermal movement of product.
- E. Expansion Joints: At 40'-0" intervals, or as shown on plans, install manufacturer's standard elastomeric expansion joint assembly.
 - 1. Provide manufacturer's standard elastomeric expansion joint assembly. Install in strict accordance with printed instructions taking diligent care to allow:
 - a. Proper spacing between gutter sections.
 - b. Ample curing time for primers and adhesives prior to application of membrane.
 - c. Smooth, wrinkle free application of membrane.
 - 2. Follow plans and details for proper location of expansion joints.
- F. Miter Corners: Install manufacturer's welded miter units at locations shown on plans. Corners shall have 30" legs, pre-punched, notched, and telescoping to match gutter. All units shall be finished after fabrication, grinding and touch-up painting will not be allowed.
- G. End Caps/Terminations: Install manufacturer's end caps at all end terminations. End caps shall be riveted at 2" O.C. and sealed.
- H. Outlets: Locate all outlet locations and field cut hole in a neat workmanlike manner. Hole shall be located a distance of 1" from backside of gutter. Insert manufacturer's stainless steel outlet, fasten in place with 4 rivets (one being located on each flange), and seal.

SECTION 07900 - CAULKING AND SEALANTS

07900.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

07900.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of caulking and all related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.
 - a. Complete caulking between structure and frames of all windows, doors, louvers, through wall conduit & piping, and any and all other items in exterior walls, between concrete, door saddles and other joints and/or openings without exception as required for tightness.
 - b. Caulking around all interior frames.
 - c. Caulking of control and/or expansion joints.
 - d. Other caulking as shown on the drawings, and not specified under other sections of the specifications.

07900.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Doors and Windows - Division 8.

07900.0400 DELIVERY AND STORAGE

1. Deliver, store and handle materials in a manner to prevent the inclusion of foreign materials and damage. Deliver and store packaged materials in original sealed containers until ready for use. Delivery materials in ample time to facilitate inspection and test.
2. Package materials showing evidence of damage will be rejected.

07900.0500 SAMPLES

1. Submit the following samples of material for approval, in accordance with the requirements of the Supplementary General Conditions:

- a. Caulking compound: 1/2 pint containers of each in original manufacturer's containers with labels intact and seals unbroken.
- b. Primer: Pint containers.
- c. Oakum: 1 pound.
- d. Joint Packing: 10'-0" strip.
- e. Install sample caulked joint of each type, at the site and obtain approval of same before proceeding with the work.

07900.0600 MATERIALS

1. Caulking and Sealing Compound (Exterior): Construction joints around door frames and window enframements, under sills and door saddles and where shown on the drawings; shall be Tremco Manufacturing Company's "Dymetric" plus or equal. Colors as selected by the Owner/Architect.
2. Caulking Compound (Interior): For around windows and interior door frames, for door saddles and where shown on the drawings; shall be "Tremco Manufacturing Company's "Spectrem" or other approved equal. Colors as selected by the Onwer/Architect.
3. Primers: Apply as required to the surfaces to be caulked; shall be as made by the manufacturer of the caulking and sealing compounds as approved by the Architect; of composition which will not stain or discolor the materials with which it comes in contact; and applied in accordance with the manufacturer's instructions.
4. Oakum: Hand picked dry spun oakum. Use for interior work only.
5. Joint Packing: Approved closed cell type as made by Everlastic or equal non-absorbing and non-staining.

07900.0700 APPLICATION

1. General: Apply in accordance with the manufacturer's instructions as approved by the Architect and as herein specified.
2. Preparatory work:
 - a. Joints and spaces to be caulked shall be cleaned thoroughly of mortar and other foreign and deleterious materials before caulking.

- b. Joints and spaces shall be not less than 1/4" wide and 1/2" deep.
- c. Joints and spaces shall be thoroughly dry before installing caulking compound.
- 3. Priming: Immediately prior to caulking, prime sides of joints as required with specified primer.
- 4. Caulking shall not be applied at a temperature of below 40 degrees F.
- 5. Caulking:
 - a. Unless otherwise indicated and specified herein, caulking joints and spaces which are open to depth greater than 3/4" shall be solidly filled with picked oakum or joint packing to within 3/4" of surface before caulking. Pack tightly and make continuous throughout length of joints.
 - b. In joints less than 1/4" wide, omit packing and completely fill with caulking compound. Solidly, fill open depth of joints with caulking compound. (For joints other than masonry).
 - c. If maximum depth of joint is less than 3/4", due to design, then fill completely with caulking compound.
- 6. Method of Application: Apply caulking compound by approved type of caulking gun in accordance with the manufacturer's instructions, and as herein specified. Where use of gun is not practicable, use suitable hand caulking tools. Avoid applying compound to surfaces outside caulking joints.
 - a. Frames: Caulk joints at perimeter of outside face of all exterior doors, window enframements, louver and other frames and penetrations. Perimeter includes sills, heads, jambs, also mullions where detail requires caulking.
 - b. Jambs and Mullions: Caulk joints at bottom of jambs and mullions at exterior openings.
 - c. Door Saddles: Spread bed of caulking compound over entire seat of exterior metal door saddles and sills. Thickness of compound shall be sufficient to form solid bed. Remove excess compound after setting and neatly point joints between sills or saddles and sub-sills. Caulk joints between sills, saddles and frames at jambs and mullions.
 - d. Caulk around items passing through walls, at outside faces.
 - e. Caulking Generally: Caulk joints where indicated, specified or required for

tightness.

f. Pointing: Neatly point caulking and finish to match adjacent mortar joints, unless otherwise required. Point exterior joints window, door and other frames to make a slightly concave joint, the edges flush with the surfaces of the frames. Caulked joints on the interior side of the frames shall be neatly pointed flush with adjoining work.

7. Cleaning: Immediately clean thoroughly adjacent materials which have been soiled. Leave work in neat and clean condition as approved.

07900.0800 DEFECTIVE WORK

1. Work under this Section shall be watertight. Repair defects in work due to faults in materials, method and workmanship. Do all work necessary to make work watertight. Correct other defects. Make good any work damaged by such defects or by renewal of caulking.

07900.0900 GUARANTEE

1. Guarantee in accordance with the Supplementary General Conditions that the caulked joints will be thoroughly watertight for a period of two years after completion and acceptance, as evidenced by date of final payment.

* * * * *

DIVISION 8 - DOORS AND WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

08100.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

08100.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.
2. Provide and install all hollow metal doors and steel door frames, as manufactured by Curries or equal as noted on schedule.
3. All material, labor and equipment necessary to furnish and deliver to the job site material as specified in this section.

08100.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Metal doors and frames; wood doors and frames; structural steel frames; finish hardware; automatic door closers; glass and glazing; caulking and weatherstripping; field painting.

08100.0400 QUALIFICATIONS

1. Hollow metal doors and steel door frames, including appropriate anchorage, shall be fabricated from prime materials in accordance with manufacturer's normal standards and accepted industry practice. Assembly and installation, including field modifications and custom fabrication, shall be done by a hollow metal contractor.

08100.0500 SHOP DRAWINGS

1. All doors, frames and hollow metal work shall be fabricated as shown on the shop drawings, submitted to and approved by the architect before fabrication.

08100.0600 DELIVERY AND STORAGE OF MATERIALS

1. Doors and frames shall be delivered to the contractor at the job site. They shall be handled so as to avoid damage and stored upright in a protected area on wood skids, covered with tarpaulins or plastic, vented to avoid condensation and entrapped moisture, until ready for installation. Damaged or deteriorated materials shall be removed from the premises.

08100.0700 PRODUCTS

1. Materials

- a. Doors - Hollow metal, full flush seamless Type D steel construction, Series 400 and UL400, 1-3/4" thick, completely filled with small cell phenolic resin-impregnated kraft honeycomb core bonded to 16 ga. skin sheets with heat and pressure-activated adhesive, 14 ga. channel perimeter reinforcement spot-welded to skin sheets top and bottom, skin sheets continuous lock-seamed along vertical edges. Top of exterior swing-out doors filled flush with additional channel to prevent moisture accumulation. Lock edge bevel 1/8" to 2". Provide R-7 polystyrene for all exterior doors as noted on our schedule.
- b. Hinge and lock reinforcements integral with vertical perimeter channel, additional reinforcing box for lock specified, internal reinforcing for overhead-surface mounted closers, and for surface-mounted hardware as required, for field drilling and tapping by contractor. Hinge mortise drilled and tapped, 3 full threads minimum, for standard weight 4 1/2" x 4 1/2" hinges.
- c. Doors to be cleaned, phosphatized and primed with oven-baked enamel of neutral color, ready for finish painting, and shipped in individual cartons. Cartons to be protected from moisture during shipping and handling.
- d. Door Accessories:

Kick plates – Plate size to equal door size less 2" x 12" high. Finish shall match door hardware and to be installed on both sides of door.

Glazing beads - 18 ga. steel, profile with max. 1/16" projection from door face, neatly coped and mitered at corners, (exterior sided nonremovable, interior side screw-attached) provided with all glassed styles.

- e. F-Line Frames - Prime, cold-rolled steel, assembled, arc-welded, ground and finished smooth, mortised, reinforced, drilled and tapped for standard weight, full mortise template hinges and template strike, mortar guards at all hardware preparations. Provide 1 welded-in floor anchor and 3 lock-in anchors each jamb for field insertion, 24" o.c. max., and furnish with rubber mutes, 3 for single

doors, 2 for pairs.

Frames to be cleaned, phosphatized and primed with oven-baked enamel or neutral color, ready for finish painting by general contractor. Coordinate finish paint color with Owner.

Series F416 frames, 16 ga., for 1 3/4" doors, hinge reinforcements 7 ga., strike reinforcement 14 ga. prepared for 1 1/2" pr. 4 1/2" x 4 1/2" hinges and ANSI 115.1 4 7/8" strike and UL-F416 labeled frames as required on above schedules.

Prepare frame for silencers, provide three (3) single rubber silencers for single doors on strike side, and two (2) single silencers on frame head at double doors without mullions.

- f. Labels - Nonremovable labels, of the hourly rating shown on door schedule, shall be permanently affixed to fire-rated doors and frames showing compliance with Underwriters Laboratories requirement (B-Label).
- g. Provide frames with special cut at latch for HES electrical strike devices (at interior doors receiving HES 5600 strikes). HES electric strike devices shall be provided and installed by General Contractor in coordination with electrical contractor for power/control wiring.

08100.0800 EXECUTION

1. Doors - Hang doors level and plumb, shimming as necessary at hardware mortises to provide proper clearances and smooth operation with no binding.
2. F-Line Frames - Set plumb and square, securely anchor to floor construction and brace for erection of surrounding walls. Apply 1 coat of bituminous paint to frame surfaces that will be concealed in masonry walls.
3. Labeled Frames - Install labeled frames in accordance with NFPA Publications No. 80 and No. 101, and all applicable codes.

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SECTION 08305 - ACCESS DOORS

1.01 GENERAL DESCRIPTION

- A. Bidding requirements, conditions of the contract and pertinent portions of sections in Division 1 of these specifications, apply to the section as fully as though repeated herein.
- B. Work under this section includes furnishing and installing SIX (6) 24" x 24" access panels. The panels are not indicated on the drawings. They shall be installed during the course of construction at locations deemed necessary. Provide framed openings as required to receive access panels.
- C. Related work:
 - 1. Section 09900, painting; field paint finish.

1.02 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Include sizes, types, finishes, and details of adjoining work.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.

1.03 DELIVERY

- A. Package, handle, deliver and store access panels at the project site in a manner that will avoid damage.

1.04 QUALITY ASSURANCE

- A. Manufacture's Fire Rated Access Doors and frames to conform to UL Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Access Panels listed as follows as provided by:
 - Larsen's Manufacturing Company
 - 7421 Commerce Lane N.E.
 - Minneapolis, MN 55432
 - (612) 571-1181

2.02 MATERIAL

- A. L-DWB: To be installed in sheetrock or drywall after the board is up.
- B. Latch to be knurled knob with interior release lever.
- C. Size as 24" X 24" for bidding purposes. Actual sizes in field will be determined.

2.03 FABRICATION

- A. Furnish as necessary each access panel assembly manufactured complete with all parts ready for installation.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that wall and ceiling openings are correctly dimensioned to receive walls.

3.02 INSTALLATION

- A. Install according to manufacturers instructions.

3.03 ADJUST AND CLEAN

- A. Adjust latch and lock mechanism to operate.

SECTION 08330 ROLL UP DOORS

1. Scope.
 - a. Provide manual roll up doors with stainless steel slats or grille where noted on the drawings.
2. Quality Assurance.
 - a. System shall be Atlas roll lite rolling fire door stainless steel finish complete with locks, hood 22 gauge with fusible link closing operation or approved equal.
3. Submittals.
 - a. Manufacturers product literature.
4. Installation
 - a. All materials, systems components, etc. shall be installed in strict compliance with the manufacturers printed product system specifications and installation instructions. Provide blockings, etc. as required to receive system installation.

DIVISION 8 – DOORS & WINDOWS

SECTION 08360

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial sectional doors.
- B. Electric Operators

1.2 RELATED SECTIONS

- A. Section 05 50 00 - Metal Fabrications: Miscellaneous for steel supports.
- B. Section 06 10 00 - Rough Carpentry. Door opening jamb and head members
- C. Section 08 71 00 - Door Hardware: Hardware, locks, access panels.
- D. Section 09 90 00 - Painting: Field painting.
- E. Section 11 12 00 - Parking Control Equipment: Parking control equipment for remote door controls.
- F. Section 26 05 00 - Common Work Results for Electrical.

1.3 REFERENCES

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- D. ANSI/DASMA 105 – American National Standard Institute Test Method for Thermal Transmittance and Air Infiltration of Garage Doors
- E. ASTM A 123 – Standard Specification for Zinc (hot-dipped galvanized) coatings on iron and steel products.
- F. ASTM A 229 - Steel wire, oil-tempered for mechanical springs.

- G. ASTM E 330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
- H. ASTM E 413 - Classification for Rating Sound Insulation
- I. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- J. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- K. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- L. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.
- M. ANSI/DASMA 108 - Standard Method for Testing Sectional Garage Doors, Rolling Doors and Flexible Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference
- N. ANSI/DASMA 102 - Specifications for Sectional Overhead-Type Doors
- O. ANSI/DASMA 115 - Standard Method for Testing Sectional Doors, Rolling Doors, and Flexible Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure
- P. FDA 21 CFR 177.1520 - Olefin polymers

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Performance Standards: Provide test data validating the following:
 - 1. Door Section: Gloss retention, fade resistance, FDA compliance, cold crack performance, load to rebound, dent resistance impact.
 - 2. Drive Train: Spring cycle life, track, hinges, rollers, cable assembly, cable strength.

3. Door Assembly: Thermal performance, deflection, wind load.
- D. Shop Drawings:
 1. Provide drawings indicating track details, head and jamb conditions, spring shafts, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.
 2. Regulatory Requirements and Approvals: Provide shop drawings in compliance with local Authority having Jurisdiction (AHJ).
- E. Certifications:
 1. Submit manufacturer's certificate that products meet or exceed specified requirements.
 2. Submit installer qualifications.
- F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an authorized installer of door manufacturer who has demonstrated experience on projects of similar size and complexity.
- B. Manufacturer Qualifications: Company with a minimum of five-year experience in producing the specified type of doors.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

- A. Provide manufacturer's standard warranty against defects in material and workmanship, as further described with each model in Part 2 of this Section.
- B. Raynor warrants the electrical operator and component parts for two (2) years against defects in material and workmanship when purchased as operator only.

- C. Raynor warrants the electrical operator and component parts against defects in material and workmanship for three (3) years, on the operator only, when purchased with any model of Raynor commercial sectional door.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Raynor, which is located at: 1101 East River Rd. P. O. Box 448; Dixon, IL 61021-0448; Toll Free Tel: 800-4-RAYNOR; Tel: 815-288-1431; Fax: 888-598-4790; Email: architectsupport@raynor.com; Web: www.raynor.com
- B. Substitutions: Not permitted unless authorized by Owner (Ellenville Fire District).
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SECTIONAL THERMAL SANDWICH DOOR

A. **ThermaSeal TM300 as manufactured by Raynor Garage Doors:**

- 1. Doors:
 - a. Operation:
 - 1) Provide doors designed for electric motor operation.
 - b. Jamb Construction:
 - 1) Masonry jambs with anchor bolt fasteners.
 - c. Structural Performance Requirements:
 - 1) Wind Loads: 13.3 psf design load/ 20 psf test load standard
 - d. International Energy Conservation Code (IECC) Requirements:
 - 1) Air Infiltration – Maximum air leakage of 0.4 cfm/ft² is required. Testing shall be in accordance with DASMA 105 test procedure.
 - 2) Raynor ThermaSeal TM300 provides an air leakage rating of 19 cfm/ft² with optional IECC Compliance Package.
 - 3) Raynor ThermaSeal TM300 provides an installed U-factor of 0.16
- 2. Sections:
 - a. **ThermaSeal TM300:**
 - 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 3 inches (76 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be

- constructed of 25 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
- 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) Color: Red polyester paint. (Coordinate custom color with Owner & manufacturer)
 - 4) Insulation: Expanded polyurethane with R-value of 24.54.
 - b. Seals: Interior and exterior skins to be separated by a molded thermal break and weather seal along section joint. Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional dual-durometer vinyl blade seal on top section to prevent airflow above header/
 - c. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.
3. Windows: Locations to comply with door elevation drawings.
- a. Window in Rectangular Two-Piece Black Frame:
 - 1) Size: 34 inches by 16 inches (864 mm by 406 mm) window in a rectangular two-piece black frame.
 - a) Insulated, two panes of 1/8 inch (3.2 mm) thick DSB glass
 - b. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powdercoat paint. Full View to be provided as follows.
 - 1) Impact Rated Glazing: Provide as follows.
 - a) **1/2 inch insulated glazing options**
 - 1) 1/2 inch (12.69 mm) **Insulated Clear Glass** consisting of two panes of 1/8 inch (3.2 mm) DSB insulated glass.
2. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.
 - b. Configuration Type: Normal Headroom.
 - c. Track Size: 2 inches (51 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. 13 gauge (2.2 mm) minimum continuous angles from floor to door header. Angle Size: 2-5/16 x 4 inches (59 x 102 mm)
 - d. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.

- a) Mounting: Floor-to-header angles. 13 gauge (2.2 mm) minimum continuous angles from floor to door header.
Angle Size: 3-1/2 x 5 inches (89 x 127 mm) on 3-inch track.
- e. Finish:
 - 1) Galvanized.
 - 2) ArmorBrite Powdercoat Finish: Color as selected by Architect
 - a) Color: (Verify with Owner & Architect).
- 3. Counterbalance:
 - a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.
 - 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 4. Hardware:
 - a. Hinges and Brackets: Fabricated from galvanized steel.
 - b. Track Rollers: 2 inches (50.8 mm) diameter consistent with track size, with hardened steel ball bearings.
 - c. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.
 - d. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For angle mounted doors provide angle clip-on seal.
 - e. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - f. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
- 5. ThermaSeal Limited Warranty: Raynor warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Raynor also warrants the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components are warranted against defects in material and workmanship for one year from date of delivery to the original purchaser. Raynor warrants all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of delivery to the original purchaser. Additional Limited Warranty requirements in accordance with manufacturer's full standard limited warranty documentation.

2.3 ELECTRIC OPERATORS

- A. ControlHoist as manufactured by Raynor Garage Doors:

1. Model:
 - a. Raynor ControlHoist Optima:
 - 1) Type: Trolley.
 - 2) Motor Horsepower Rating: Continuous 1/2 HP.
 - 3) Motor Horsepower Rating: Continuous 3/4 HP.
 - 4) Motor Horsepower Rating: Continuous 1 HP.
 - 5) Motor Horsepower Rating: Continuous 1-1/2 HP.
 - 6) Motor Horsepower Rating: Continuous 2 HP.
 - 7) Electrical Requirements: 208-230 volt three phase.
 - 8) Duty Cycle: 30 cycles/hour or 300 cycles/day.
 - 9) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).
 - 10) Entrapment protection:
 - a) NEMA 1 Monitored photo electric eyes mounted on jambs.
 - b. Raynor ControlHoist Standard:
 - 1) Type: Jackshaft.
 - 2) Type: Jackshaft with manual chain hoist.
 - 3) Type: Trolley.
 - 4) Motor Horsepower Rating: Continuous 1/3 HP.
 - 5) Motor Horsepower Rating: Continuous 1/2 HP.
 - 6) Motor Horsepower Rating: Continuous 3/4 HP.
 - 7) Electrical Requirements: 115 volt single phase.
 - 8) Electrical Requirements: 230 volt single phase.
 - 9) Electrical Requirements: 208-230 volt three phase.
 - 10) Electrical Requirements: 460 volt three phase.
 - 11) Duty Cycle: 30 cycles/hour or 300 cycles/day.
- 12) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.

- a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).
 - b) Custom wiring.
- 13) Entrapment protection:
 - a) Wired Monitored electric reversing edge extending full width of door.
 - b) Wireless Monitored electric reversing edge extending full width of door.
 - c) NEMA 1 Monitored photo electric eyes mounted on jambs.
 - d) NEMA 4X Monitored photo electric eyes mounted on jambs.
- c. Raynor ControlHoist Basic:
 - 1) Type: Trolley.
 - 2) Motor Horsepower Rating: Intermittent 1/2 HP.
 - 3) Electrical Requirements: 115 volt single phase.
 - 4) Duty Cycle: 14 cycles/hour.
 - 5) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).
 - b) Two (2) three-button control operators shall be provided and installed by General Contractor for each overhead door. One (1) control shall be at the door location, one (1) control shall be located within the Radio Room (field coordinate locations as needed with Owner). Coordinate all control operator installs with project electrician.
 - 6) Entrapment protection:
 - a) Wired Monitored electric reversing edge extending full width of door.
 - b) Wireless Monitored electric reversing edge extending full width of door.
 - c) NEMA 1 Monitored photo electric eyes mounted on jambs.
 - d) NEMA 4X Monitored photo electric eyes mounted on jambs.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared. Verify that site conditions are acceptable for installation of doors, operators, controls and accessories. Ensure that openings are square, flush and plumb.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. General: Install door, track and operating equipment complete with all necessary accessories and hardware according to shop drawings, manufacturer's instructions.
- B. Lubricate bearings and sliding parts, and adjust doors for proper operation, balance, clearance and similar requirements.

3.4 PROTECTION

- A. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.
- B. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.
- C. Lubricate bearings and sliding parts, assure weather tight fit around door perimeter and adjust doors for proper operation, balance, clearance and similar requirements. Protect installed products until completion of project.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 08 52 16 – PLASTIC-CLAD WOOD WINDOWS

PART 1 GENERAL

1.1 SUMMARY

1. Section Includes: Vinyl-clad wood-framed windows of the following types:
Double Hung (standard & custom width / arch top)

B. Related Sections: Section(s) related to this section include:

1. Section 06100 – Rough Carpentry
2. Section 07900 – Caulking and Sealants

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. American Architectural Manufacturers Association (AAMA):

1. AAMA 450 - Voluntary Performance Rating Method for Muller Fenestration Assemblies.
2. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
3. AAMA 613 - Voluntary Performance Requirements and Test Procedures for Organic Coatings on Plastic Profiles.
4. AAMA 614 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Plastic Profiles.
5. AAMA 623 - Voluntary Specification, Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles.
6. AAMA 624 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Fiber Reinforced Thermoset Profiles.
7. AAMA 902 - Voluntary Specification for Sash Balances.
8. NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.

C. Andersen Corporation: Andersen 400 Series Installation Guide.

D. ASTM International (ASTM):

1. ASTM C1036 - Standard Specification for Flat Glass.
2. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
3. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
4. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
5. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
6. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
7. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
8. ASTM F2090 - Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms.

E. Insulating Glass Certification Council (IGCC): Insulating Glass Unit Certification.

F. International Standards Organization (ISO): ISO 14021 - Environmental Labels and Declarations -- Self-Declared Environmental Claims (Type II Environmental Labeling).

G. National Fenestration Rating Council (NFRC):

1. NFRC 100 - Procedure for Determining Fenestration Product U-Factors.
2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

H. U.S. Environmental Protection Agency (EPA): ENERGY STAR.

I. Window and Door Manufacturers Association (WDMA):

1. WDMA Hallmark Certification Program for Manufacturers.
2. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meetings: Conduct preinstallation meeting to clarify Project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements:

1. Comply with requirements of NAFS.

B. Windborne Debris Performance Requirements:

1. STM E1886 and ASTM E1996.

1.5 SUBMITTALS

A. Product Data: For each type of product required.

B. Shop Drawings: Showing methods of installation, plans, sections, elevations and details of walls, specified loads, flashings, vents, sealants, and interfaces with all materials not supplied by the window manufacturer, and identification of proposed component parts and finishes.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two complete sample sets of each type of material required.

D. Certificates: Signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer Instructions: Manufacturer installation, storage, and other instructions.

G. Qualification Statements: For manufacturer and installer.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Member in good standing of the Insulating Glass Certification Council (IGCC).
2. Hallmark Certified Manufacturer and member in good standing of the Window and Door Manufacturers Association (WDMA).
3. Member in good standing of U.S. Green Building Council.
4. U.S. ENERGY STAR Partner.
5. Capable of demonstrating an extended history of window and door design, production and innovation.

B. Installer Qualifications:

1. Minimum five years of experience in the commercial installation of products required for the Project.
2. Experience on at least five projects of similar size, type and complexity as the Project.
3. An entity utilizing workers competent in techniques required by manufacturer for product types and applications indicated.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver materials to Project in manufacturer's original unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials and accessories protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer off ground, under cover and not exposed to weather and construction activities.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's transferrable, non-prorated limited warranty.
 1. Warranty Period, Glass: 20 years.
 2. Warranty Period, Non-Glass Parts: 10 years.
- B. Special Warranty: Installer's standard form in which installer agrees to repair or replace wood windows that fail due to poor workmanship or faulty installation within the specified warranty period.
 1. Warranty Period: One year from date of Substantial Completion.

PART 2 PRODUCT

2.1 WOOD WINDOWS

- A. General: Provide windows complying with the performance requirements indicated and tested according to NAFS.
- B. Basis-of-Design Product: Subject to compliance with requirements provide Andersen Corporation; Andersen 400 Series (Storm Watch) windows.

C. Substitution Limitations: No substitutions

2.2 MATERIALS

A. Construction:

1. Frame: Finger-jointed or laminated veneer lumber capped with rigid vinyl, preservative treated WDMA I.S. 4.
2. Interior Sash: Solid lumber, kiln dried and suitable for stain or painted finish, preservative treated WDMA I.S. 4.
3. Exterior Sash: Co-extruded rigid vinyl or liquid-applied vinyl over finger-jointed lumber.
4. Interior Stop: Beveled

B. Wood Species: Clear Pine

C. Interior Finish:

1. Painted: Factory-applied before assembly, White

D. Exterior Finish:

1. Frame and Sash: AAMA 613 for color retention, Black
2. Trim: AAMA 623 for color retention, Black

2.3.1 WINDOW Designation 1 – 10.

A. Window Type: Double-Hung

B. Performance Grade Requirements:

1. Double-Hung Performance Class LC and Grade, Impact (Storm Watch Series)
Resistant: PG50

C. Air Infiltration Requirements:

1. Air Infiltration Rate: < 0.2 cfm/sf².

D. Environmental Certifications:

1. ENERGY STAR performance requirements.
2. Indoor air quality performance.

E. Weatherstrip:

1. Type and Material for Hung: Vinyl covered foam gasket at head and sill, compressible vinyl bulb at checkrail and vinyl fins at jambs.

F. Attachment Flange:

1. Type and Material for Double-Hung or Gliding: None

G. Hardware:

1. Sash Lock Material: Die-cast Zinc
2. Sash Lift Type and Material: Surface mounted, die-cast zinc.
3. Sash Lock and Sash Lift Finish: Satin Nickel
4. Sash Lock and Sash Lift Material and Style: Die-cast zinc Classic Series
5. Tilt-Wash Mechanism Material and Color: Injection molded polymer, White
6. Balance Type and Material: Spring-loaded block and tackle, galvanized steel.
7. Jamb Liner Material and Color: Rigid vinyl, White
8. Window Opening Control Device: Provide device to restrict operable sash to less than four inches maximum clear opening and releasable, in compliance with ASTM F2090.

H. Divided Lights:

1. Simulated Divided Light: Permanent exterior and interior attachment, no spacer between glass panes
 - a. Interior Style: Contoured Profile
 - b. Exterior Style: Contoured profile.
 - c. Width: 3/4 Inch
 - d. Pattern: Prairie
 - e. Exterior Color: Match Window
 - f. Interior Finish: Match Window

I. Insect Screens:

1. Type: Conventional.
 - a. Painted Finish and Color: Factory-applied baked-on silicone polyester enamel - Black.
 - b. Insect Screen Material: Aluminum wire cloth

J. Exterior Trim and Accessories:

1. Type: 1-15/16 inch Sill Nose.
2. Material: Fibrex Composite material
3. Finish and Color: Black

K. Mullions: Laminated Veneer Lumber configured to be structurally sound and designed in accordance with AAMA 450.

2.10 IMPACT-RESISTANT GLAZING for ALL WINDOWS

A. Thermal Transmission (U-Factor), NFRC 100:

1. Casement: 0.34 with grilles
2. Double-Hung: 0.36 with grilles

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

1. Casement: 0.29 with grilles
2. Double-Hung: 0.28 with grilles

C. Visible Light Transmittance (VLT), NFRC 200:

1. Casement: 0.48 with grilles
2. Double-Hung: 0.47 with grilles

D. Sound Transmission Class (STC)/Outdoor Indoor Transmission Classification (OITC), ASTM E90:

1. Casement: 30/26
2. Double-Hung: 32/28

E. Glass Units: Provide insulating glass units certified through Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190

1. Manufacturer Designation: Andersen Low-E4 Insulated Impact-Resistant Glass.
2. Glazing Configuration: Dual pane.
3. Tint: None
4. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless-steel spacers.
5. Glass Spacer Color: White
6. Glass Type: Annealed glass, ASTM C1036
7. Opacity: None

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that all substrate conditions are suitable for installation in compliance with manufacturer's recommendations.
- B. Do not begin installation until substrates have been properly prepared and any conditions not in compliance with manufacturer's recommendations have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's product recommendations, including but not limited to the Andersen Unit Installation Guide, installation information in product literature and on product packaging. Comply with Drawings [**and Shop Drawings**] for installing windows, hardware, accessories, and other components.
- B. Install windows plumb, level and square. Anchor windows securely to structure in correct orientation to flashing and adjacent construction as indicated. Comply with product installation instructions for proper flashing integration into wall system. Install windows so as to drain water penetration to the exterior.
- C. Adjust sashes, insect screens, ventilators, hardware and accessories as applicable for correct fit. Adjust weatherstrip for smooth operation and weather-tight closure.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: If requested by Owner, provide manufacturer's field service consisting of product use recommendations and periodic site visits for observation of product installation in accordance with manufacturer's recommendations.
 - 1. Site Visits: As required
- B. Field Testing: Provide field testing of installed units.
 - 1. Test units in compliance with AAMA 502.
 - 2. Use test equipment calibrated according to ASTM E1105.

3.4 CLEANING

- A. Refer to manufacturer for guidance on timing for when best to remove protective films and non-permanent labels after installation.

- B. Remove excess sealant, soiling, dirt and other substances. Clean window frame and glass surfaces. Avoid damaging coatings and finishes.
- C. Touch-up, repair or replace glass or other window components broken, scratched or damaged during construction prior to Substantial Completion.
- D. Remove and lawfully dispose of construction debris from Project site.

3.5 PROTECTION

- A. Protect installed windows and finish surfaces from damage during construction until completion of Project and acceptance by Owner.

SECTION 08700 FINISHING HARDWARE

08100.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms", whether attached hereto or not.

08700.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operation in connection with the installation of finishing hardware, complete, in strict accordance with the Contract Drawings, the Door Schedule and as herein specified or reasonably implied.
2. Provide all butts, locks, rosettes, estucheons, pulls, push plates, door closers, flush bolts, door stops, anti-panic bolts, kickplates, required panic hardware devices and all other items not specifically mentioned, but necessary and required to make a complete item of work in every respect.
3. All finishing hardware shall be received, stored and distributed and the responsibility for its safety assumed by the Contractor. The protection wrapped around pieces of hardware as it is installed and properly maintained until the final completion of the building.
4. Do not install finishing hardware in the building until all work has been fully completed and dry.
5. Hardware shall be accurately fitted and secured in place, adjusted to operate perfectly and free from scratches and/or other defacements.
6. The Contractor shall be responsible for the condition and operation of all finished hardware until the issuance of the Certificate of Final Acceptance or until the building is occupied, whichever event is sooner.
7. Face hardware shall, after being fitted, be removed before finish or painting is applied and neatly replaced after the finishing or painting is fully completed.
8. Install electric door strikes provided by owner in door frames. Coordinate wiring with the electrician.
9. Immediately prior to completion of all work, go over the entire building with the Architect and see that each piece of hardware is undamaged, in perfect working order.

08700.0300 QUALITY ASSURANCE

1. Manufacturer as quality standard for lock sets and latch sets: Schlage.
2. Standards for latch sets: Schlage.
3. Manufacturer as quality standard for hinges: Stanley Hardware.
4. All other requirements as noted on the drawings.
5. Provide lock sets on all exterior doors and doors called to be locked as called for in the door schedule. Panic bar all exterior doors.
6. Provide passage latch on all other doors not called for on the drawings and specifications.

08700.0400 SUBMITTALS

1. Manufacturer's literature.

08700.0500 PRODUCTS

1. Latch Sets

- A. All new lock and latch sets to be Schlage, "D" Series. (Verify with Owner)

1. Function:

- a. Passage Latch - D105 Rhodes 625
- b. Key Lock - D53PD, D405, D80PD, L9462, D12D Rhodes 626

2. Finish: Satin Chromium 626

3. Style: Rhodes

- B. Approved substitutions shall be listed BHMA performance standards.

- C. Install electric strikes provided by Owner in door frames to be coordinated with Electrician.

- D. Refer to hardware groups on drawings

2. Door Stops (All Doors shall include stops, not on schedule. Coordinate type per door with architect)

A. Floor type as FB13/FB14R by Glynn Johnson Corp.

B. Wall type as 50C by Glynn Johnson Corp.

3. Hinges

A. All doors to have 1 1/2" pair, 4 1/2" standard weight, full mortise hinges.

4. Templates

A. Provide templates for installation.

5. Door Closers

A. Norton - Series 1600 or equal. Provide integral closer at storefront type entry and exit doors to be supplied by door manufacturer.

08700.0600 FINISHES

1. All finishes to match that specified for lock and latch sets above. (Verify with Owner)

08700.0700 CUTTING, FITTING AND PATCHING

1. Do all cutting and fitting of woodwork necessary to accommodate the work of other trades, patch and make good and work cut or damaged from any cause.

08700.0800 KEYING

1. All locksets shall be keyed in compliance with key schedule to be reviewed with and approved by the Owner. Keying shall include four (4) key combinations as follows:

- Master key; all doors.
- Key level 1; select doors.
- Key level 2; select doors.
- Key level 3; select doors.

* * * * *

08730 WEATHERSTRIPPING AND THRESHOLDS

08730.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "General Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

08730.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.
2. Provide and install thresholds and weatherstripping on all exterior doors which must comply with ADA requirements for handicap access.
3. Provide thresholds on interior doors as noted on the drawings.
4. Provide carpet thresholds 404 Series.

08730.0300 MATERIALS

1. Provide thresholds and weatherstripping shall be aluminum alloy extrusions of 6063 hardness T-5 with mill finish complete with all fasteners as required for installation, as manufactured by National Guard Products, Inc

08730.0400 SUBMITTALS

1. Submit manufacturer's literature.

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DIVISION 9 - FINISHES

SECTION 09260 - GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Metal stud wall framing.
- B. Metal channel ceiling framing.
- C. Acoustic insulation.
- D. Gypsum board.
- E. Taped and sanded joint treatment.

1.02 RELATED WORK

1.03 Section 05400 - Cold Formed Metal Framing.

- A. Section 07213: Thermal insulation.
- C. Section 08111 - Standard Steel Doors and Frames.
- D. Section 08305 - Access Doors: Metal access panels.
- E. Section 09111 - Metal Stud Framing System.
- F. Section 09900 - Painting.

1.05 REFERENCES

- A. ANSI/ASTM C36 - Gypsum Wallboard.
- B. ANSI/ASTM C79 - Gypsum Sheathing Board.
- C. ANSI/ASTM C442 - Gypsum Backing Board.
- D. ANSI/ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
- E. ANSI/ASTM C557 - Adhesive for Fastening Gypsum Wallboard.
- F. ANSI/ASTM C630 - Water Resistant Gypsum Backing Board.

- G. ANSI/ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
 - H. ANSI/ASTM C646 - Steel Drill Screws for the Application of Gypsum Sheet Material to Light Gage Steel Studs.
 - I. ANSI/ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
 - J. ANSI/ASTM E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - K. ANSI/ASTM E119 - Fire Tests of Building Construction and Materials.
 - L. FS HH-I-521 - Insulation Blankets, Thermal (Mineral Fiber, for Ambient Temperatures).
 - M. GA-201 - Gypsum Board for Walls and Ceilings.
 - N. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
- 1.06 SYSTEM DESCRIPTION
- A. Acoustic Attenuation for Interior Partitions in accordance with ANSI/ASTM E90.
- 1.07 QUALITY ASSURANCE
- A. Applicator: Company specializing in gypsum board systems work with 5 years documented experience approved by manufacturer.
- 1.08 SUBMITTALS
- A. Submit product data under provisions of Section 01300.
 - B. Provide product data on metal framing, gypsum board, joint tape.
 - C. Submit samples under provisions of Section 01300.
 - D. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - GYPSUM BOARD SYSTEM

- A. Gold Bond or equal.

2.02 FRAMING MATERIALS

- A. Studs and Tracks: ANSI/ASTM C645; GA 201 and GA 216; galvanized sheet steel.
- B. Furring, Framing and Accessories: ANSI/ASTM C645.
- C. Fasteners: ANSI/ASTM C514.
- D. Adhesive: ANSI/ASTM C557.

2.03 GYPSUM BOARD MATERIALS

- A. Standard Gypsum Board: ANSI/ASTM C36; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.
- B. Fire Rated Gypsum Board: ANSI/ASTM C36; fire resistive type, UL rated; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.
- C. Moisture Resistant Gypsum Board: ANSI/ASTM C630; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

2.04 ACCESSORIES

- A. Acoustical Insulation: FS-HH-I-521; preformed mineral wool, friction fit type without integral vapor barrier membrane.
- B. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
- C. Corner Beads: Metal.
- D. Edge Trim: GA 201 and GA 216; Type U exposed reveal bead.
- E. Joint Materials: ANSI/ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that site conditions are ready to receive work.
- B. Beginning of installation means acceptance of existing surfaces and substrate.

3.02 METAL STUD INSTALLATION

- A. Install studding in accordance with ANSI/ASTM C754.
- B. Metal Stud Spacing: 16 inches on center.
- C. Partition Heights: Full height to floor or roof construction above. Install additional bracing for partitions extending above ceiling.
- D. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
- E. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, etc.
- F. Coordinate installation of bucks, anchors, blocking, electrical and mechanical work placed in or behind partition framing.

3.03 WALL FURRING INSTALLATION

- A. Erect wall furring for direct attachment to concrete block and concrete walls.
- B. Erect Z furring channels vertically. Secure in place on alternate channel flanges at maximum 24 inches on center.
- C. Space furring channels maximum 24 inches on center, not more than 4 inches from abutting walls.
- D. Install thermal insulation vertically and hold in place with Z-furring channels spaced maximum 24 inches on center, not more than 3 inches at external corners and 12 inches at internal corners.

- E. Erect free-standing metal stud framing tight to concrete masonry walls, attached by adjustable furring brackets in accordance with manufacturer's instructions.

3.04 CEILING FRAMING INSTALLATION

- A. Install in accordance with ANSI/ASTM C754 manufacturer's instructions.
- B. Coordinate location of hangers with other work.
- C. Install ceiling framing independent of walls, columns, and above-ceiling work.

3.05 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with GA 201 and GA 216 manufacturer's instructions.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- E. Use screws when fastening gypsum board to metal furring or framing.
- F. Treat cut edges and holes in moisture resistant gypsum board with sealant.
- G. Place control joints consistent with lines of building spaces as directed.
- H. Place corner beads at external corners as indicated. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

- A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.
- C. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.
- D. Erect in accordance with manufacturer's instructions.

3.10 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09312 - CERAMIC TILE WALL FINISH

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Ceramic tile walls and base, installed using thinset method, with cementitious grouted joints.
- B. Ceramic washroom accessories.

1.02 RELATED WORK

- A. Section 09210 - Gypsum Plaster.
- B. Section 09220 - Portland Cement Plaster: Base coat for ceramic tile finish.
- C. Section 09311 - Ceramic Tile Floor Finish.

1.03 REFERENCES

- A. ANSI A108.1 - Ceramic Tile Installed with Portland Cement Mortar.
- B. ANSI A108.4 - Ceramic Tile Installed with Water-Resistant Organic Adhesives.
- C. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar.
- D. ANSI A108.6 - Ceramic Tile Installed with Chemical Resistant, Water Cleanable Tile-Setting Epoxy.
- E. ANSI A118.1 - Dry-Set Portland Cement Mortar.
- F. ANSI-A118.3 - Chemical Resistant, Water Cleanable Tile- Setting Epoxy.
- G. ANSI A118.4 - Latex-Portland Cement Mortar.
- H. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.
- I. TCA 137.1 - Recommended Standard Specifications for Ceramic Tile.

1.04 QUALITY ASSURANCE

- A. Conform to ANSI - American National Standard Specifications for the Installation of Ceramic Tile.
- B. Conform to ANSI - Recommended Standard Specifications for Ceramic Tile - TCA 137.1.

1.05 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Submit product data specifications and instructions for using adhesives and grouts.
- C. Submit samples under provisions of Section 01300 for color selection.
- D. Mount tile, adhesive, and grout on 16 x 16 inch plywood panel, representative of pattern, color variations, and grout joint size variations.
- E. Submit manufacturer's certification that tile materials supplied conform to TCA 137.1.

1.06 MAINTENANCE DATA

- A. Submit maintenance data.
- B. Include cleaning methods, cleaning solutions recommended, stain removal methods, and polishes and waxes recommended.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 TILE MATERIALS

- A. Refer to finish schedule, interior elevations & details.

2.02 MORTAR MATERIALS

- A. Mortar Materials: ANSI Ceramic Tile Standard A-2.

2.03 ADHESIVE MATERIALS

- A. Organic Adhesive: ANSI A136.1, thinset bond type.
- B. Epoxy Adhesive: ANSI A118.3, thinset bond type.

2.04 MORTAR BED

- A. Mortar Bed: ANSI A118.1, thinset bond coat, dry-set cementitious mortar.

2.05 GROUT TYPE

- A. Grout: Cementitious type; color to be selected; resistant to shrinking.

2.06 MORTAR MIX AND GROUT

- A. Mix and proportion pre-mix [setting bed and] grout materials in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install ceramic wall tile, in accordance with ANSI A108.1.
- B. Cut and fit tile tight to protrusions and perpendicular interruptions. Form corners and bases neatly.
- C. Form internal angles square and external angles bullnosed.
- D. Sound tile after setting. Replace hollow sounding units.
- E. Allow tile to set for minimum 48 hours prior to grouting.

3.02 PROTECTION

- A. Prohibit activities near wall finish for 48 hours after installation.

END OF SECTION

Division 0900-4000
Floor Resurfacing 4000
Flooring Specification

SECTION 1 – GENERAL

1.1 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, installation instructions and general recommendation for each resinous flooring material required. Include certification indicating compliance of materials with requirements.
- B. Samples: Submit, for verification purposes, 4-inch square samples of each type of resinous flooring required, applied to a rigid backing, in color and finish indicated.

1.2 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer/installer (no subcontractors) with not less than twenty years of successful experience in manufacturing and installing principal materials described in this section. Manufacturer and installer must furnish certified documentation regarding the successful completion of at least 15 projects of similar size and complexity.
- B. Pre-Installation Conference
 - 1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
 - 2. Attendance
 - a. General Contractor
 - b. Architect/Owner's Representative
 - c. Manufacturer/Installer

1.3 MATERIAL DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered to job site and be checked by flooring installer for completeness and shipping damage prior to job start.
- B. Material shall be stored in a dry enclosed area, protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F (16 and 30° C).

1.4 PROJECT CONDITIONS

- A. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier should be present for concrete subfloors on or below grade. Otherwise, contact the Engine Bay Floors Technical Department prior to the installation of the resinous flooring.
- B. Utilities, including electric, water, heat (air temperature between 60 and 85°F (16 and 30° C) and finished lighting to be supplied by the owner.
- C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

SECTION 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The products of Engine Bay Floors (800-573-9198) are identified below as the basis of design, or equal.

2.2 RESINOUS FLOORING SYSTEM

Floor Resurfacing 4000 Primer - a two component, greater than 95% solids, lower than 50 g/l VOC, epoxy primer cured with modified cycloaliphatic amine hardener with additive offering enhanced adhesion to concrete substrates.

Floor Resurfacing 4000 Mortar - a three component (epoxy resin, modified cycloaliphatic amine, silica sand mortar) with greater than 95% solids, lower than 50 g/l VOC, cementitious modified silica aggregate offering enhanced coefficient of thermal expansion resulting in better adhesion to concrete.

Floor Resurfacing 4000 Grout Coat - a three component (epoxy resin, modified cycloaliphatic amine, colorant) with greater than 95% solids, lower than 50 g/l VOC. The coating should be fast curing to minimize outgassing typically less than 6-7 hours and modified with adhesion promoters.

Floor Resurfacing 4000 Topcoat - a dimer aliphatic isocyanate urethane coating with UV blockers with greater than 92% solids, lower than 100 g/l VOC. Urethane cannot contain any extenders or diluents that are not reactive or do not come out of the film.

2.3 **SYSTEM CHARACTERISTICS**

- A. Color and Pattern: As selected by engineer/architect/owners agent from manufacturer's standard colors. A minimum of three colors will be used.
- B. Wearing Surface: Textured for slip resistance per engineer/architect/owner's agent from manufacturer's full range.
- C. Integral Cove Base: 6 inches high with 1-1/2 inch radius.
- D. Striping: Striping guide lines must be included. Striping shall be four inches in width. Color selected for these guide lines shall be one of three to be used. Exact location shall be confirmed by the engineer architect or owner.
- E. Physical Strength Qualification: Flooring system must be durable enough to resist the constant loads of heavy engines and apparatus. The floor must be capable of dissipating high temperatures from hot tires and guaranteed to stay bonded and resistant to delamination. The contractor, in conjunction with the manufacturer, is responsible for gathering the data in regards to engine weights, load points, and temperature exposure required to guarantee this qualification.

2.3 **SYSTEM COMPONENTS**

- A. Primer: Type recommended by manufacturer for substrate and body coat(s) indicated.
- B. Body Coat(s):
 - 1. Resin: Epoxy
 - 2. Application method: troweled
- C. Pigmented Grout Coating
 - 1. Resin: Epoxy
 - 2. Application method: squeegee/back roll
- D. Pigmented Top Coating
 - 1. Resin: Epoxy aliphatic polyester polyurethane
 - 2. Application method: squeegee/back roll

2.5 **ACCESSORY MATERIALS**

- A. Patching and Fill Material: Resinous product of resinous flooring manufacturer.

- B. Joint Sealant: Type produced by manufacturer or resinous flooring system for type of service and joint condition indicated.

SECTION 3 – EXECUTION

3.1 INSPECTION

- A. Ensure area is clean and dry with adequate heat, light and ventilation. The surface must be clean and dry, physically sound, and free of contamination. Surfaces must be free of holes, voids or defects. Cracks and abrupt changes in the surface profile must be corrected. Area shall be free of other trades to allow smooth flow of installation process to ensure optimum installation.

3.2 SURFACE PREPARATION

- A. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifiers, scabblers, etc.)
- B. Saw cut and chase perimeter edges to provide a “key-in” of material.
- C. Ensure all static (non-moving) cracks are filled as recommended by manufacturer/installer.
- D. Identify and mark all active (moving) joints.
- E. Enlarged cracks and spalled areas shall be filled and leveled with an epoxy fill material before coatings are applied (Engine Bay Floor’s fine crack fill).
- F. Pre-fill all divots/holes in the concrete surface that are larger than 2” with Engine Bay Floor’s epoxy patching compound.
- G. Existing coatings greater than 4 mils must be removed by the PrepMaster diamond grinding process. No other method of removal will be accepted.

3.3 INSTALLATION

- A. General: Apply components of flooring system according to manufacturer’s written instructions to produce a uniform monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer’s written instructions. Prevent contamination during application and curing process.

Ellenville Fire District
New Firehouse Facility

3. At substrate expansion and isolation joints, provide joint in flooring to comply with flooring manufacturer's written recommendations.
- B. Installation
1. Saw cut and chase perimeter edges to provide a "key-in" of material.
 2. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifiers, scabblers, etc.).
 3. Notched rake apply hybrid epoxy mortar overlayment at ¼" minimum thickness.
 4. Grind based after initial cure to ensure smooth appearance.
 5. Apply pigmented 100% solids epoxy grout coat.
 6. Broadcast for texture, (if desired).
 7. Apply pigmented aliphatic polyester polyurethane topcoat.
- C. Application
- System Installation – Epoxy mortar system to be installed at a minimum total thickness of 250 mils. Finish coat to achieve even color consistency and non-slip texture as specified by owner.

3.4 FIELD QUALITY CONTROL

- A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of floor application.
- B. If test results show material being used do not comply with specific requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.5 CURING, PROTECTION AND CLEANING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

SECTION 4 – WARRANTY

4.0 WARRANTY

- A. Guarantee and Warranty: Warranty shall be from a single source manufacturer/polymer systems applicator. The polymer system shall be warranted against defects in materials and workmanship for a period of ten years. Repair or replace any or all portions of the work that fail under normal conditions or use during the warranty period, promptly and at no cost to the customer and by using methods and materials specified for the initial construction.

SECTION 09500 - SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Suspended metal grid ceiling system.
- B. Acoustical tile.
- C. Fire rated assembly with gypsum board boxes over light fixtures.
- D. Hold down clips and access clips.
- E. Perimeter trim.

1.02 REFERENCES

- A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- C. Armstrong Specification and Installation Guidelines.
- D. UL - Underwriter's Laboratories System Ratings.

1.03 SYSTEM DESCRIPTION

- A. Installed System: Conform to UL Assembly rating noted on plans.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling tile 10 years minimum experience.
- B. Installer: Company with 5 years minimum experience.

1.05 SUBMITTALS

- A. Submit product data.
- B. Provide product data on metal grid system components, acoustic units, and related accessories.

- C. Submit samples of ceiling tile and grid components.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C) and humidity of 20 to 40 percent prior to, during, and after installation.

1.07 SEQUENCING/SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Schedule installation of acoustic units after interior wet work is dry.

1.08 EXTRA STOCK

- A. Provide one extra quantity of each type of acoustic units to Owner.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

- A. Refer to finish schedule for grid types.

2.02 SUSPENSION SYSTEM MATERIALS

- B. Grid: ASTM C635, heavy duty, fire rated to 2 hour assembly, exposed T; components die cut and interlocking.
- C. Accessories: Stabilizer bars clips splices edge moldings and hold down clips required for suspended grid system.
- D. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
- E. Grid Finish: White.

2.03 ACCEPTABLE MANUFACTURERS - ACOUSTIC UNITS

- A. Armstrong and Celotex tile as indicated on plans or equal.

2.04 ACOUSTIC UNIT MATERIALS

- A. Acoustic Panels shall conform to the Armstrong Physical Data (Refer to Finish Schedule for designations).

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that existing conditions are ready to receive work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install system in accordance with ASTM C636 and manufacturer's instructions and as supplemented in this Section.
- B. Install fire rated system in accordance with UL Design No. G250.
- C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
- D. Supply hangers with instructions for their correct placement. If metal deck is not supplied with hanger tabs, coordinate the installation of hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- E. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers to span the extra distance.
- G. Locate system on room axis according to reflected plan.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
- I. Do not eccentrically load system, or produce rotation of runners.

- J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Field rabbet panel edge. Where bullnose concrete block corners or round obstructions occur, provide preformed closers to match edge molding.
- K. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
- L. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border neatly against abutting surfaces.
- M. Install acoustic units level, in uniform plane, and free from twist, warp and dents.
- N. Install hold-down clips to retain panels tight to grid system.
- O. Install light fixture boxes constructed of gypsum board above light fixtures in accordance with UL assembly requirements.

3.03 TOLERANCES

- A. Variation from Flat and Level Surface: 1/8 inch in 10 ft.
- B. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

SECTION 09650 - RESILIENT FLOORING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Preparation of substrate surfaces.
- B. Rubber bases at all areas which are effected by new work.
- C. Application of vinyl tile with up to three (3) colors at any location with pattern as provided by Architect.
- D. Application of rubber stair treads from first floor to basement.
- E. Cleaning of all surfaces and areas of work.

1.02 RELATED WORK

- A. Section 03346 - Concrete Floor Finishing: Finish trowelling of floor slab.

1.03 REFERENCES

- A. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl- Asbestos.
- B. FS L-F-450 - Flooring, Vinyl Plastic.
- C. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.04 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01300.
- B. Describe floor pattern, scaled design, color of various materials, and location of floor accessories.
- C. Submit samples under provisions of Section 01300.]
- D. Include duplicate 12 x 12 inch sized samples of each flooring material, color, and pattern selected.

- E. Include duplicate 12 x 12 inch long samples of base and stair tread selected.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Maintain minimum 70 degrees F (21 degrees C) air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.
- B. Store flooring materials in area of application. Allow three days for material to reach equal temperature as area.

1.06 EXTRA STOCK

- A. Deliver 25 sq ft of each color and pattern of floor tile material required for project, for maintenance use.
- B. Clearly identify each box or roll.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Armstrong or equal.

2.02 FLOOR COVERING MATERIALS

- A. Vinyl Tile: 12 x 12 inch size x 1/8 inch thick, marbleized pattern; color; to match existing.

2.03 BASE MATERIALS

- A. Base: Conforming to FS SS-W-40, Type I rubber; top set coved, 4 inch high, 1/8 inch thick including premolded end stops and external corners, color as selected.

2.04 ACCESSORIES/ADHESIVES/SEALERS

- A. Edge Strips: rubber type; factory finish; color selected by Architect/Engineer.

- B. Sub-Floor Filler: White premix latex, mix with water to produce cementitious paste.
- C. Primers and Adhesives: Waterproof; of types recommended by resilient flooring manufacturer for specific material.
- D. Sealer and Wax: Type recommended by resilient flooring material manufacturer for material type and location.

PART 3 EXECUTION

3.01 INSPECTION

- A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet (1 1/960).
- B. Ensure concrete floors are dry (maximum 7 percent moisture content) and exhibit negative alkalinity, carbonization, or dusting.

3.02 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- B. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.

3.03 INSTALLATION - FLOORING

- A. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.
- B. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.
- C. Set flooring in place; press with heavy roller to ensure full adhesion.
- D. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

- E. Install with minimum tile width 1/2 full size at room or area perimeter, to square grid pattern with all joints aligned with pattern grain parallel for all units and parallel to width of room.
- F. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.
- G. Install edge strips at unprotected or exposed edges where flooring terminates.
- H. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.
- I. Install flooring in pan type floor access covers. Maintain floor pattern.
- J. Continue flooring through areas to receive moveable type partitions without interrupting floor pattern.
- K. Install feature strips and floor markings where indicated. Fit joints tightly.

3.04 INSTALLATION - BASE

- A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches (457 mm) between joints.
- B. Miter internal corners. Use premolded sections for external corners and exposed ends.
- C. Install base on solid backing. Adhere tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other obstructions.
- E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet (1/960).

3.06 PROTECTION

- A. Prohibit traffic from floor finish for 48 hours after installation.

3.07 CLEANING

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NEW FIREHOUSE FACILITY
NYS RT. 209, ELLENVILLE, NY

RESILITENT FLOORING
DIVISION 9 – FINISHES
SECTION 09650

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09688 - CARPETING GLUE DOWN

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Prepare surfaces to receive carpeting.
- B. Apply glue down carpeting on floor surfaces where indicated, complete with required accessories.
- C. Install edge strips where carpeting terminates at other floor finishes.

1.02 RELATED WORK

- A. Section 03346 - Concrete Floor Finishing: Finish trowelling of concrete floor slabs.

1.03 REFERENCES

- A. FS DDD-C-0095 - Carpet and Rugs, Wool, Nylon, Acrylic, Modacrylic, Polyester, Polypropylene.

1.04 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01300.
- B. Clearly indicate the location of all seams, method of joining seams, direction of carpet, type of adhesive to be used, method of integrating edge strips with carpet, and installation procedures.
- C. Submit samples under provisions of Section 01300.
- D. Submit one sample of each type of carpet to be used, sufficiently sized to clearly indicate construction. In addition, submit one duplicate sample of each color selected.
- E. Also submit one 12 inch long sample of each type of edge stripping to be used.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Do not commence with carpet installation until painting and finishing work is complete and ceilings and overhead work, tested, approved, and completed.
- B. Maintain room temperature at minimum 60 degrees F (15 degrees C) for at least 24 hours prior to installation, and relative humidity at approximately that at which the area is to be maintained.
- C. Provide sufficient lighting.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Lees 24" x 24" Modular Compositions Collection Volume II Commercial Carpets or equal.

2.02 MATERIALS

- A. Carpet: Ives Ellington manufactured by Lees.
- B. Adhesive: Type recommended by carpet manufacturer to suit application and expected service.
- C. Edge Strips: Rubber type; factory finish; color selected by Architect.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean floors of dust, dirt, solvents, oil, grease, paint, plaster, and other substances detrimental to proper performance of adhesive and carpet. Allow floors to thoroughly dry.
- B. Ensure floors are level, with maximum surface variation of 1/4 inch in 10 feet, noncumulative.
- C. Ensure concrete floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.
- D. Use an approved cementitious filler to patch cracks, small holes, and for levelling.

3.02 INSTALLATION

- A. Lay out pattern of carpet for Architect/Engineer approval.
- B. Check matching of carpet before cutting and ensure there is no visible variation between dye lots.
- C. Cut carpet, where required, in manner to allow proper seam and pattern match. Ensure cuts are straight and true and unfrayed.
- E. Join seams in recommended manner so as not to detract from the appearance of the carpet installation and decrease its life expectancy. Ensure seams are straight, not overlapped or peaked and free of gaps.
- F. Vacuum clean substrate. Spread adhesive in quantity recommended by manufacturer after primer application to ensure proper adhesion over full area of installation. Apply only enough adhesive to permit proper adhesion of carpet before initial set.
- I. Cut and fit carpet neatly around projections through floor and to walls and other vertical surfaces.
- J. Fit carpet snugly to walls or other vertical surfaces where no base is scheduled, leaving no gaps.
- K. Do not place heavy objects such as furniture on carpeted surfaces for minimum of 24 hours or until adhesive is set.
- L. Entire carpet installation is to be laid tight and flat to subfloor, well fastened at edges, and present a uniform pleasing appearance. Ensure monolithic color, pattern, and texture match within any one area.
- M. Install edging strips where carpet terminates at other floor coverings. Use full length pieces only. Butt tight to vertical surfaces. Where splicing cannot be avoided, butt ends tight and flush.
- N. Carpet in second floor lobby corridor, meeting room and conference room shall have 12" solid color edge and 8" accent strip at all perimeters typical.

END OF SECTION

SECTION 09900 PAINTING

09900.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

09900.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with painting and finishing and all related work, complete, in strict accordance with the Contract Drawings, the Schedule of Finishes and as specified herein.
2. Examine the Specifications and Drawings for the various other trades. Let it be understood that all surfaces normally requiring painting or colored finish that are left unfinished by the requirements of other Specifications shall be painted or finished as part of this Section.
3. All exposed surfaces, interior and exterior, of every description except glass and not designated in the contract drawings to be finished with a special coating as specified herein or to be factory finished or pre-finished, shall be finished as part of the work of this Section, all as required for a complete job or as specified herein including, but not limited to the following:
 - a. Painting of all exterior metal work excepting aluminum, copper and other non-ferrous metals unless otherwise noted on the drawings.
 - b. Painting of all interior metal work, trims, hollow metal work not factory finished as part of this contract and all exposed miscellaneous metal, etc., excepting non-ferrous metals.
 - c. Interior painting and/or finishing of all gypsum board, doors, miscellaneous trim, door frames, molding, concrete block walls, etc.
 - d. Exterior wood trim, fascias, soffits, wood siding, doors, etc., to be finished as hereinafter specified and as noted on drawings.
 - e. Painting of all ferrous metal access panels, ducts, registers and grilles and convactor enclosures, piping, conduit and component parts, etc., not factory finished. The inside of all ducts at register and grille openings shall be painted black.
 - f. Paint colors, textures, finishes, etc., shall be as selected by the Architect.

09900.0300 MATERIALS

1. Painting and finishing products for use in work shall be standard best or top brands produced for each particular kind of material required, as manufactured by Pittsburgh Plate Glass Co., Pratt and Lambert, Benjamin Moore & Co. or Sherwin Williams. All materials shall bear original manufacturer's identifying label on each container.
 - a. Each kind of coating for the several types of paint finish shall be factory mixed to match samples and colors and consistencies for immediate application to the surface involved.
2. Materials for succeeding coats on any one surface shall be products of same manufacturer furnishing first or primer-sealer coat for that particular surface, except where red lead paint or other metal primer is used. Compatibility with finish coats must be verified before application of finish.
3. Raw linseed oil: ASTM D-234
4. Boiled linseed oil: ASTM D-260
5. Turpentine: ASTM D-13
6. Shellac: Pure, white or orange gum, cut in pure denatured alcohol, using 5 pounds of gum to gallon. Orange shellac shall be used for painting over knots, sap and resinous woods.
7. Spackling Compound: Finely ground, grit-free; when dry shall set easily and take any finish.
8. Putty: ASTM D-219, Class "B", white lead whiting putty.
9. Patching Plaster: White, non-shrinking, containing no lime; uniform in set and quality.
10. Tinting colors: Where required for oil paint shall be ground in pure linseed oil. Colors shall be non-fading and shall be as recommended by manufacturer of tinting coating.
11. Required Samples and Colors:
 - a. Colors: As selected by the Architect. Obtain approval before starting work. Color shall include up to three (3) colors per area to allow for accent walls & soffits, etc.

- b. Following approval of manufacturers, submit samples of materials described herein in one pint containers. Approval of samples will be based upon information from paint manufacturers certifying that products proposed for use are standard, best or top brands produced by them for purpose intended and are readily obtainable as such in "over the counter" sales to consumer market. Do not proceed with work until samples are approved.
- c. Before placing orders for materials, submit name or names of paint manufacturers and brands for approval. Such submission to be made within 30 days after approval.
- d. Do not construe approval of advanced samples as total guarantee of acceptance of materials as they will be subjected to field inspection, from time to time, as work progresses.
- e. Where directed, prepare a Schedule of Colors as selected by the Architect. Prepare sample panels in accordance with the Schedule of Colors to be approved before work proceeds. panels will be considered standard for workmanship throughout.

12. Other materials as hereinafter specified:

- a. All materials used shall be in compliance with current Federal Regulations concerning use of lead in paint.
- b. All paints, stains and coatings applied shall be in conformance with current Federal and/or local regulations regarding hydrocarbon emissions. (air pollution, etc.)

09900.0400 RELATED WORK SPECIFIED ELSEWHERE

- 1. Priming, back painting, factory finishing, painting of concealed work as described under various Divisions of the Contract.
- 2. Finishes - Division 9.

09900.0500 GENERAL REQUIREMENTS

- 1. Order materials in advance, in large enough quantities. Deliver in unopened containers in ample time to facilitate work.
- 2. Store materials on premises where directed. Keep storage space clean and accessible. Remove oil, paint soaked rags, waste, overall and the like at close of each day's work.

Take every precaution to avoid damage by fire.

3. Provide suitable coverings, clean drop cloths and the like to protect work of this Section, adjacent surfaces, equipment, objects such as adjacent woodwork, glass and metal work and the like.
4. Upon completion of work, remove from premises surplus materials, protective coverings, empty containers, rags, dirt, other debris resulting from work of this Section. Retouch finished work where ever necessary, as directed. Remove daubs, paint spatters and the like from walls, floors, glass, metal and other surfaces.
5. The Contractor shall take every precaution he deems necessary to prevent damage by fire. In addition, keep two (2) fire extinguishers, 5 pounds, CO2 or dry chemical type, Underwriters' approved, in paint storage room at all times, prominently located one near entrance to room, another near windows. Keep not less than three (3) buckets of sand near materials at all times. Buckets shall have round bottoms, shall be prominently located and painted bright red and shall have the word "FIRE" stenciled thereon in large, white letters. All other precautions and requirements as required by the institution and other authorities having jurisdiction shall be adhered to.
6. Rooms or spaces assigned for the storage and mixing of paint shall be kept locked. At least one key of each room or space shall be deposited with the Owner's field representative or custodial service so as to provide access thereto during non-working hours.

09900.0600 PREPARATION OF SURFACES

1. General: Properly prepare surfaces required to receive paint and other finishes. Broom clean rooms and spaces before painting is started. Surfaces to be painted shall be perfectly dry.
2. Sandpaper woodwork required to be painted or finished. Remove roughness; brush and remove dust. Wash off grease, dirt with approved cleaner. Give knots and sappy streaks, two thin coats of orange shellac. Cracks, nail holes and surface defects shall be filled with putty after priming coat, filler or shellac has been applied. Putty shall be brought up flush with surface.
3. Plaster Surfaces: Clean thoroughly of grit, grease, dirt, loose material, etc. Cut off, fill with patching plaster of affected surfaces. Give patched portions coat of primer-sealer in addition to other specified coats.
 - a. The priming coat on plaster shall be tinted to the approximate shade of the final coat. All suction sports or "hot spots" in plaster or cement after the application of the first coat, shall be touched up before applying the second coat, to product an

even result in the finished coat. Obtain color schedules for rooms before priming walls.

4. Thoroughly clean bare metal surfaces required to be painted of foreign matter such as grease, rust, scale and dirt, before applying priming coat. Where solder flux has been used, clean with benzene before applying paint. Clean shop coated metal surfaces of foreign materials; touch up spots where marred. Remove rough surfaces by sandpapering.
5. Galvanized metal surfaces scheduled to be painted shall be thoroughly cleaned with solvent until they are completely free from dirt, oil and grease. Thoroughly treat the cleaned surface with phosphoric acid etch. Remove all excess etching solution and allow to dry completely before application of paint.
6. Dents, cracks and the like, hollow places, open joints and other irregularities in metal work to be painted shall be filled with approved metal filler suitable for purpose. After setting, sand to smooth hard finish.

09900.0700 MIXING

1. Mix materials thoroughly. Strain if necessary before using. Addition of thinners, such as linseed oil or turpentine shall be added to ready mixed materials only in accordance with paint manufacturers' printed instructions. If no printed instructions appear on containers, obtain this information in writing from paint manufacturer.

09900.0800 WORKMANSHIP

1. General

Use only qualified painters for the mixing and application of paint on exposed surfaces. In the acceptance or rejection of installed painting, no allowance will be made for lack of skill on the part of painters. All paint shall be applied in accordance with the materials manufacturer's instructions.

2. Environment

- a. Do no painting or finishing when air is dust laden nor where weather or temperature conditions are suitable. Temperature within building shall be maintained at a minimum of 60 degrees F. during painting and drying period.
- b. Plaster, mortar, brick, concrete or any masonry related surfaces shall not be painted if its moisture content exceeds 12% -- an alkali resistant primer is to be used in place of scheduled primer if moisture content is between 8% and 12%.

- c. Exterior wood shall not be painted if moisture content exceeds 15%.
- d. When necessary, an approved moisture meter will be used to determine moisture conditions.

3. Operating Units

When painting operating units, do not apply paint to sliding contact surfaces, where bare metal is necessary for proper operation.

- 4. Undercoats shall approximate shade of finish coat.
- 5. Exposed Duct Covering: Painted top, bottom, sides and ends, except where these surfaces are inaccessible.
- 6. Number of Coats: Except as otherwise specified under paragraph SCHEDULE, paint coats described herein are in addition to prime coats applied under this and other Sections: unless otherwise specified.
- 7. Mechanics: All work shall be executed by skilled mechanics in conformance with the requirements of the specifications.
- 8. Conditions for Painting: Surfaces shall be clean, dry and free from frost. Atmosphere must be free from dust and dirt, preventing the lodgement of foreign material on fresh paint. Floors must be broom swept clean before painting is started.
- 9. Sanding: Except for final coat, each coat on metal shall be thoroughly and uniformly sanded with No. 00 sandpaper, or other equal abrasive, removing all surface defects and providing a smooth, even surface for subsequent coats.
- 10. Puttying: Putty-stop nail holes, imperfections and defacements after priming coat of paint, filler or shellac has been applied. Putty stopping shall be brought flush with finished surface in a neat and workmanlike manner. Defacement about interior metal work shall be corrected. Open joints, broken surfaces by unused holes, screws; bolts and the like shall be closed and smoothed, producing a finished piece of work.
- 11. Fixture Removals: Hardware, lighting fixtures, switch and receptacle plates, etc., shall be removed wherever practicable before painting and replaced after completion of painting, or these items which are in place shall be adequately protected during painting operations.

Plumbing or heating equipment adjacent to surfaces which are to be painted shall be disconnected and removed if necessary to complete all of painting required by these Specifications and shall be replaced upon completion of painting, the removal and

replacement of fixtures and equipment shall be done by the trades responsible for the installation thereof.

12. All work where a coat of material has been applied must be inspected and approved by the Architect before the application of the succeeding specified coat, otherwise no credit for the coat applied will be given and the Contractor automatically assumes the responsibility to recoat the work in question. The Contractor shall furnish the Architect a report of the particular coat applied when completed for inspection and approval to comply with the above.

13. If this Contractor finds problems arising in connection with the successful application of the paint, stain or coating to a surface so as to prevent a good, workmanlike job, work on that area should be stopped at once. The Architect, paint supplier to be contacted directly to see what must be done to rectify the condition.

Failure to do so by the subcontractor shall be construed as acceptance of the surface and conditions with the full responsibility thereof to produce a satisfactory job.

14. Protection: Provide, install and maintain over entire period of painting work all drop cloths, barricades and other forms of protection as may be necessary to safeguard and keep clean such adjoining work of others as will not be painted and as required to preserve painted work free from damages of every nature. Freshly painted surfaces shall be legibly posted as such immediately following their completion.

09900.0900 COATS AND COLORS

1. The number of coats herein specified are the minimum to be applied over exposed surfaces or shop coats as designated. Each coat shall be of proper ground color for each succeeding coat and shall appreciably differ in tint. Colors shall be as selected by the Architect.
2. Unless otherwise specified, paint designation refers to the "Pittsburgh Paints". Products of equal quality as manufactured by other manufacturers may be used, as approved by the Architect.
3. Color in general will be limited to:
 - a. There shall be up to two (2) deep tone accent colors used in each space.
 - b. Colors in general will be soft pastel colors.

09900.1000 SCHEDULE

All references to products of PPG Industries (Pittsburgh Paints)

1. Exterior Ferrous Metal:

1 Coat PPG Speedhide Inhibitive Primer, 7-858; 2 coats PPG Speedhide Exterior/Interior Alkyd Enamel, 7-814 series.

2. Exterior Galvanized Metal:

1 coat PPG Speedhide Galvanized Steel Primer, 9-712; 2 coats PPG Speedhide Exterior/Interior or Alkyd enamel, 7-814 series.

3. Wood (not specified or noted elsewhere):

1 coat PPG Speedhide 6-855 Enamel Primer
2 coats PPG 7-814 Series Alkyd Gloss Enamel

4. Interior Ferrous Metal

- a. Prime with PPG Speedhide Interior Primer, 7-858 (red) or 6-208 (red) or 6-212 (white).
- b. Finish coat: 1 coat PPG Speedhide Alkyd enamel, semi-gloss 7-814 series or gloss, 6-250 series. (As designated by Architect).

5. Interior Galvanized Steel

Same as ferrous metal except that primer shall be PPG Speedhide Galvanized Steel Primer, 90-712.

6. Interior Dry Wall

- a. Ceilings: 1 coat PPG Speedhide Latex Sealer/Primer, 6-2; 2 coat PPG Speedhide Alkyd flat, 6-51 series.
- b. Walls: 1 coat PPG Speedhide Latex Sealer/Primer, 6-2; 2 coat PPG Speedhide Alkyd flat, 6-70 series.

7. Interior Conc. Block Walls

- a. 1 coat PPG Maestro-prime quick drying primer & Sealer 6-12 3.6 mils per coat.
- b. 2 coats PPG fast dry Alkyd Industrial Gloss Enamel 7-814 lines series. MWF 3.6 mils per coat. Color as selected by Architect.

8. Insulated Pipes, Conduits, Etc.

1 Coat PPG Speedhide Latex Sealer, 6-2

2 Coats to match adjacent wall/ceiling finish.

9. Uncovered Piping (Ducts)

PPG Speedhide Inhibitive Metal Primer (white) 6-70.

PPG Speedhide LoSheen Alkyd Enamel, 6-70 series.

10. Other items (requiring finishing as shown by the drawings, details or finish schedule).

09900.1100 CLEANING

1. When so directed by the Architect, the Contractor shall go over all of the building where he has worked, retouch where necessary, restore where damaged or defaced and clean off all paint spots from floors, walls, finish hardware, glass and other unpainted surfaces and shall leave all painted surfaces clean and in a satisfactory condition.
2. At the end of each working day and upon completion of all work, all surplus materials, empty packages and/or containers and all debris shall be removed from the site.

09900.1200 GUARANTEE

1. All work under this Section of the Specifications shall be guaranteed against checking, cracking, peeling, chalking, discoloration or other defects due to improper materials or workmanship, due to improper preparation of the surface, or due to the painting, varnishing, etc. of surfaces which were not in proper condition to receive, paint, varnish or other painters' materials and such unsatisfactory work shall be refinished at no additional cost to the Owner.

09900.1300 PAINT MANUFACTURER'S REPRESENTATIVE

1. Notify and permit representatives of paint manufacturers, whose materials are used, access to the premises for the purpose of inspecting materials and proper use thereof.

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SECTION 10200 LOUVERS & VENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Metal wall louvers and screens exposed to view in finish work, including:
 - 1. Exterior metal louvers.
 - 2. Louvers at locations where HVAC ductwork terminates at exterior walls.
 - 3. Other exposed exterior and interior louvers indicated on Drawings.
- B. Extent: Extent of exterior louvers is shown on architectural drawings. Coordinate requirements, quantities and sizes with mechanical drawings. Louvers not shown on architectural drawing, but indicated on mechanical drawings shall be provided as part of work of this section.
- C. Related Sections: Section(s) related to this section include:
 - 1. Sealant and Caulking: Division 7 Joint Treatment Section.
 - 2. Dampers and Ductwork: Division 15 Dampers and Ductwork Sections.
 - 3. Grilles and Registers: Division 15 Grilles and Registers Sections.

1.02 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM B209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM B221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- C. Air Movement and Control Association (AMCA):
 - 1. AMCA Standard 500 - Test Method for Louvers, Dampers, and Shutters.
 - 2. AMCA Publication 261 - Directory of License Products, current edition.
- D. Sheet Metal and Air Condition Contractors National Association (SMACNA)
 - 1. SMACNA - Architectural Sheet Metal Manual, current edition
- E. American Architectural Manufacturer's Association (AAMA):

1. AAMA Standard 605 - Voluntary Specification for High Performance Organic Coating on Architectural Extrusions and Panels.

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide louvers, which have been manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure.
- B. Louver Performance: where louvers are indicated to comply with specific performance requirements, provide units whose performance ratings have been determined in compliance with Air Movement and Control Association (AMCA) Standard 500.

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures section.
- B. Product Data: Submit product data sheet for specified products.
 1. Performance Certificates: Submit performance certification, if not included in product data
- C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
 1. Include information necessary for fabrication and installation of louvers. Indicate materials, sizes, thickness, fastenings and profiles.
- D. Quality Assurance Submittals: Submit the following:
 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - a. Submit certified test results from an approved testing laboratory showing that the louvers proposed meet the criteria specified herein.
 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.

1.05 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1. Deliver, store and handle products to avoid any distortion or damage due to moisture, physical abuse or other cause Louvers shall be free from nicks, scratches and blemishes. Replace defective or damaged materials with new.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.07 WARRANTY

- A. Project warranty refers to Conditions of the Contract for project warranty provisions. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under Contract Documents.

PART II PRODUCTS

2.01 WALL LOUVERS

- A. Manufacturer: Industrial Louvers Inc. (ILI).
 1. Contact: 511 South 7th Street, Delano, MN 55328; Telephone: (763) 972-2981; Fax: (763) 972-2911.
- B. Other Available Manufacturers – subject to compliance with requirements stated within.

2.02 DRAINABLE BLADE LOUVERS

- A. ILI Model 458XP:
 1. Extruded aluminum frame and blades shall be designed to collect and drain water to exterior at sill by means of gutters in front edges of blades and of channels in jambs. Frames and blade thickness to be .081" (2.06 mm) extruded aluminum 6063 alloy. Sill and jamb frames shall be continuously welded and caulked to prevent water penetration to interior wall construction. Blades are attached by means of all-welded construction.
 2. Louvers shall bear the AMCA Certified Ratings Seal for both air performance and water penetration. Louvers shall have a minimum of 8.91 sq. ft. (0.829 m²) (56 %) free area on 48" x48" (1219 x 1219) louver. Rating shall show a maximum water penetration of .01 oz. at an air flow rate of 1046 FPM. Static Pressure Loss shall be not more than 15 inch of water gauge at an air flow of 914 FPM free area velocity.

2.03 LOUVER ACCESSORIES

- A. Exterior Aluminum Sill: Provide sill flashing of same material and finish as louvers where indicated on the drawings.
- B. Louver Screens: Provide framed removable screens for exterior louvers.
 - 1. Screens shall be ½" (12.7 mm) mesh .063 (1.6 mm) flattened expanded aluminum mounted in extruded aluminum rewirable frames.
 - 2. Locate screens on inside face of louvers.
 - 1. Screen frames shall have welded corners and be secured to the louver frame with machine screws, at each corner and at 12" (304.8 mm) c.o. between.

2.04 MATERIALS

- A. Aluminum Sheet: ASTM B209 Alloy 3003 or 5005 with temper as required for forming or as otherwise recommended by metal producer to provide required finish.
- B. Aluminum Extrusions: ASTM B221, Alloy 6063.
- C. Fastenings: Provide stainless steel screws and fasteners for aluminum louvers and zinc-coated or stainless steel screws and fasteners for steel louvers. Provide other accessories as required for complete and proper installation.

2.05 FABRICATION

- A. Fabrication Requirements:
 - 1. Performance: Fabricate as required for optimum performance with respect to water penetration, strength, durability and uniform appearance.
 - 2. Size:
 - a. Fabricate louvers in masonry walls to outside dimensions indicated, with allowance of ¼" (6.4 mm) on each side for sealant joints.
 - b. Verify sizes with final HVAC shop drawings, including detail dimensions of ductwork, dampers or other fittings abutting louvers.
 - 3. Field Measurements: Verify size, location and placement of louver units prior to fabrication.
 - 4. Shop Assembly:
 - a. Fabricate to minimize field adjustments, splicing, mechanical joints and field assembly of units.
 - b. Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling.
 - c. Clearly mark units for reassemble and coordinated installation.
 - 5. Accessories: Include supports, anchorages and accessories required for complete assembly.
 - 6. Vertical Mullions: Provide vertical mullions of type and spacing indicated but not further apart than recommended by the manufacturer.
 - 7. Horizontal Mullions: Provide horizontal mullions at horizontal joints between louver units except where continuous vertical assemblies are indicated.

8. Connections: Join frame and blade members to one another by welding, except where field bolted connections between frame members are made necessary by size of louvers.
9. Spacing: Maintain equal blade spacing to produce uniform appearance.

1.06 FINISHES (FACTORY)

- A. Shop Finishing: Factory finish louvers and accessories with an organic coating.
 1. Organic Coating: Clean and prime exposed aluminum surfaces and apply a Kynar 500/Hylar 5000 2-coat finish conforming to AAMA 605 in a standard color. Minimum dry film thickness shall be 1.2 mil.
- B. Finish Protection: Provide finish protection as recommended by louver manufacturer.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.03 INSTALLATION Louver Installation:

1. Louvers shall be installed in accordance with manufacturers approved shop drawings and as shown. Provide all necessary fastenings and anchors required to a complete installation. Units to be installed plumb, level and in proper alignment with adjacent work.
2. Form tight joints within work of this Section. Fit exposed connections accurately.
3. Louvers shall be protected from damage from subsequent building operations.
4. Protect metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces, which shall be in contact with concrete, masonry or dissimilar metals.

SECTION 10155

PLASTIC TOILET COMPARTMENTS

10 2116-05 Solid Plastic Toilet Compartments (Eclipse - floor mounted, overhead braced)

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic toilet compartments and urinal screens.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 2. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.3 SYSTEM DESCRIPTION

- A. Compartment Configurations:
 - 1. Toilet partitions: Floor mounted, overhead braced.
 - 2. Urinal screens: Wall mounted.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories. Product Data: Manufacturer's descriptive data for panels, hardware, and accessories. Samples: [2 x 3] inch samples showing available colors.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum [5] years experience in manufacture of plastic toilet compartments with products in satisfactory use under similar service conditions.
- B. Installer Qualifications: Minimum [5] years experience in work of this Section.

1.6 WARRANTIES

- A. Provide manufacturer's 5 year warranty against breakage, corrosion, and delamination under normal conditions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract Documents are based on Resistal products by Scranton Products.
(www.scrantonproducts.com)

- B. Substitutions; Under provisions of Division 01.

2.2 MATERIALS

- A. Doors, Panels and Pilasters:
 - 1. Constructed of two sheets of 1/8 inch thick high density polyethylene (HDPE), thermoformed with touch points into single engineered panel, with structural inserts on top and middle rails.
 - 2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
 - 3. 1 inch thick with thermoformed edges.
 - 4. Color: To be selected from manufacturer's full color range.
- B. Aluminum Extrusions: ASTM B221, 6063-T5 alloy and temper.
- C. Stainless Steel: ASTM A167, Type 304.

2.3 HARDWARE

- A. Hinges:
 - 1. 8 inches long, fabricated from heavy-duty extruded aluminum with bright dip anodized finish, wrap-around flanges, through bolted to doors and pilasters with stainless steel, Torx head sex bolts.
 - 2. Hinges operate on field-adjustable nylon cams, field adjustable in 30 degree increments.
- B. Door Strike and Keeper:
 - 1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
 - 2. Bumper: Extruded black vinyl.
- C. Latch and Housing:
 - 1. Heavy-duty extruded aluminum.
 - 2. Latch housing: Bright dip anodized finish.
 - 3. Slide bolt and button: Black anodized finish.
- D. Coat Hook/Bumper:
 - 1. Combination type, chrome plated Zamak.
 - 2. Equip outswing handicapped doors with second door pull and door stop.
- E. Door Pulls: Chrome plated Zamak.

2.4 COMPONENTS

- A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.
- B. Pilasters: 82 inches high, fastened to 3 inch high pilaster sleeves with stainless steel tamper resistant Torx head sex bolt.
- C. Pilaster Sleeves: 3 inches high, [one-piece molded HDPE,] [20 gage stainless steel,] secured to pilaster with stainless steel tamper resistant Torx head sex bolt.
- D. Wall Brackets: 54 inches long, [Extruded PVC,] [heavy-duty aluminum, 1-1/2 inch stirrup type, bright dip anodized finish,] fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.
- E. Headrail: Heavy-duty extruded aluminum, anti-grip design, integrated curtain track, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.
- F. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel tamper

resistant Torx head screws.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install compartments in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install rigid, straight, plumb, and level.
- C. Locate bottom edge of doors and panels 14 inches above finished floor.
- D. Provide uniform, maximum 3/8 inch vertical clearance at doors.
- E. Not Acceptable: Evidence of cutting, drilling, or patching.

3.2 ADJUSTING

- A. Adjust doors and latches to operate correctly.

END OF SECTION

SECTION 10500 - LOCKERS

1. Scope:
 - a. Provide & install metal lockers where indicated on drawings.
2. Quality Assurance:
 - a. Lockers shall be all welded lockers by Gear Grid or equal.
3. Materials:
 - a. Prime, high grade Class I mild annealed, cold-rolled steel free from surface imperfections. A.S.T.M.-A1008 Galvanized steel available for high humidity atmospheres. A.S.T.M.-A653. Bolts to be zinc-plated or subjected to other rust retardant treatment.
 - b. All lockers shall be pre-assembled, with all seams and joints welded for rigidity and durability.
 - c. Body – 16 gauge steel, flanged to give double thickness of metal at back vertical corners. 18 gauge backs.
 - d. Door Frame – 16 gauge formed steel channels. Vertical members shall Have an additional flange to form continuous door strike. Corners Shall be lapped and welded into a rigid assembly. In addition, bottom cross members shall have tang at each end that fits through slot in rear flange of upright frame member to prevent twisting out of alignment. Top and bottom cross members shall provide support for front edge of locker top and locker bottom.
 - e. One-piece, 14 gauge steel on single, double and triple tier with both vertical edges formed into channel shaped formation; top and bottom shall be flanged at 90° angle. On multiple tier lockers, hinge sides shall be formed into channel shaped formation with other three sides flanged at 90° angle.
 - f. Ventilation – Six (6) 6” louvers top and bottom
4. Submittals:
 - a. Manufacturer's catalog cuts for specified items and shop drawing of installation based on field verified dimensions. Color chart required for Owner selection.
5. Products:
 - a. Lockers shall be 20”W x 20”D x 74 1/2”H standard sized locker with stainless steel recessed handle and padlock provisions.

- b. Lockers shall include:
 - 6"x6"x12" lockable/secure storage cabinet
 - top adjustable shelf
 - top standard power strip.
 - c. Wall mounted at walls and fixed legs at center locations.
 - d. Slip joint filler for mounting as required.
 - e. Recess trim at ends as required.
6. Installation:
- a. Assemble and mount lockers in strict accordance with manufacturer's specifications.

SECTION 10520 – FIRE EXTINGUISHER CABINETS

1. Scope:
 - a. Provide & install eight (8) fully recessed fire extinguisher cabinets, to be installed where directed by Architect.
2. Quality Assurance:
 - a. Materials will be Larsen or equal.
3. Submittals:
 - a. Manufacturers catalog cuts for specified items.
4. Products:
 - a. Larsen Cosmopolitan 1035 V10 Recessed Stainless Cabinet with Flat Trim Series 1835.
 - b. Provide double strength glass contemporary V profile.
 - c. Finish to be Brushed Stainless Steel.
5. Installation:
 - a. Mount to solid blocking as per manufacturers specifications. Trim vinyl wall cover to rough opening prior to installation.
 - b. Review & adjust wall thickness at all install locations to allow for fully recessed cabinet. Coordinate recesses with carpenter and mason for wall types as required.

SECTION 10800 - TOILET ACCESSORIES

1. Scope:
 - a. Provide accessories at all restroom locations, and where as indicated on drawings.
2. Quality Assurance:
 - a. Materials will be American Specialties, Inc. or equal.
3. Submittals:
 - a. Manufacturers catalog cuts for specified items.
4. Products:

Refer to drawings and schedules.
5. All finishes shall be #4 satin stainless steel.
6. Installation:
 - a. Mount all, accessories to solid blocking as per manufacturers specifications.

SECTION 10850 – MOVABLE PARTITIONS

Part 1 – General

1.1 Description

A. General:

1. Furnish and install operable partitions and suspension system. Provide all labor, materials, tools, equipment, and services for operable walls in accordance with provisions of contract documents.

1.2 Related work by others

- A. Preparation of opening will be by General Contractor. Any deviation of site conditions contrary to approved shop drawings must be called to the attention of the architect.
- B. All header, blocking, support structures, jambs, track enclosures, surrounding insulation, and sound baffles as required in 1.4 Quality Assurance.
- C. Pre-punching of support structure in accordance with approved shop drawings.
- C. Paint or otherwise finishing all trim and other materials adjoining head and jamb of operable partitions.

1.3 Submittals

- A. Complete shop drawings are to be provided prior to fabrication indicating construction and installation details. Shop drawings must be submitted within 60 days after receipt of signed contract.

1.4 Quality Assurance

- A. Installation shall be performed by an installer certified by the manufacturer.
- B. Preparation of the opening shall conform to the criteria set forth by ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions.
- C. The partition STC (Sound Transmission Classification) shall be achieved per the standard test method ASTM E90-99 and E413-87. Test run under ASTM procedures prior to E90-99 shall not be permitted. All tests must be from an independent, currently operating, NVLAP-accredited laboratory available to verify results.

1.5 Product delivery, storage, and handling

- A. Proper storage of partitions before installation, and continued protection during and after installation will be the responsibility of the General Contractor.

1.6 Warranty

- A. Partition panels shall be guaranteed for a period of five years with all mechanical parts including track and carriers guaranteed for a period of ten years. This guarantee is against defects in material or workmanship of manufacturer's product, excluding abuse.

Part 2 – Products

2.1 Manufacturers

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Moderco Inc.

2.2 Operation

- A. Signature 841 manually operated, top supported individual panels.
- B. Initial seal (select one):
 - 1. Bulb seal.
 - 2. Fixed wall jamb. (Optional)
- C. Final closure (select one):
 - 1. Telescopic closure panel equipped with a telescopic jamb mounted to a rack and pinion mechanism and extended with a lever handle.
 - 2. Hinged closure panel (up to 12'-0" [3658mm] height). (Optional)
 - a. Same construction and face finish as partition panels.
 - b. Standard hardware:
 - (i). Flush pulls and roller latch.
 - c. Optional hardware (select one):
 - (i). Panic bar with non-lockable lever.
 - (ii). Panic bar with lockable lever.
 - (iii). Deadbolt lock.

2.3 Panel construction

A. Nominal 4" [102mm] thick panels, up to 48 1/2" [1230mm] width. Framing members to be steel-braced mechanically fastened 6065-T5 aluminum alloy extrusions. Thinnest extrusion section to be no less than 3/32" [2.5mm]. Trolley pipes welded to 1 1/2" X 1 1/2" X 3/32" [38mm X 38mm X 2.5mm] steel tube mechanically fastened to top frame extrusion. Panel cavity to be filled with acoustical insulation. Panel faces to be removable and replaceable on site to accommodate changes in room function, interior finishes, etc.

B. Acoustical rating (53 STC):

C. Panel face construction:

1. STC 53, galvanized steel skins laminated to 1/2" [13mm] gypsum board. Steel thickness based on STC rating.
2. STC 53, 1/2" [13mm] tackable gypsum board with galvanized steel liner. Steel thickness based on STC rating.
3. STC 43: 1/2" [13mm] tackable gypsum board.
4. STC 53, with optional plastic laminate or wood veneer finish: 1/2" [13mm] Particle board with galvanized steel liner. Steel thickness based on STC rating.
 - a. Standard Particle board.
 - b. ULEF/NAUF Particle board.
5. STC 43 with optional plastic laminate or wood veneer finish: 1/2" [13mm] Particle board.
 - a. Standard Particle board.
 - b. ULEF/NAUF Particle board.

D. Hinges for pass door and pocket door:

1. (With protective trims) Discreet steel hinges blend into the shape of the frame extrusion.
2. (With trimless edges) Discreet steel hinges to project no more than 1/4" [6mm] from the panel face.

E. Vertical trims (select one):

1. Protective trims cover and protect all edges of the panel faces and face finish.
2. Trimless vertical edges.

F. Panel weight:

1. Between 6 to 10.5 lbs/sq.ft [29.5 to 51.5 kg/sq.m] (based on STC rating).

2.4 Panel finishes

- A. Face finish shall be (select as required):
1. Factory applied Class A reinforced vinyl wallcovering with woven backing, weighing 21 oz/lin.yard [545 g/lin.m]. Color selected from manufacturer's standard color selector.
 2. Factory applied Class A polyester or olefin/polyester stain-resistant fabric. Color selected from manufacturer's standard color selector.
 3. Factory applied Class A vertically ribbed polyester carpet (NRC 0.20). Color selected from manufacturer's standard color selector.
 4. Customer's own material (C.O.M.) supplied to and applied by manufacturer. (Subject to approval.)
 5. Customer's specified material (C.S.M.) procured and applied by manufacturer. (Subject to approval.)
 6. Full height steel marker board.
 7. Full height porcelain marker board (with protective trims only).
 8. Full height natural cork bulletin board (with protective trims only).
 9. Vinyl- or fabric-covered full height natural cork bulletin board.
 10. Full height Forbo bulletin board (with protective trims only).
 11. Formica high pressure laminate.
 12. Wood veneer.
 13. Uncovered (not available for 43 or 47 STC panels with trimless vertical edges).
- B. Panel frame finish shall be (select one):
1. Clear satin anodized.
 2. Powder coating. Color selected from RAL Classic color system.
 3. Custom powder coating. (Color chip to be supplied to Moderco. Moderco's color-match must be approved by architect prior to any material being released for fabrication)

2.5 Sound seals

- A. Vertical seals:
1. Dual aluminum and pvc tongue and groove interlocking seals in each panel edge.
- B. Horizontal seals (select one):
1. Type FA: 1" [25mm] fixed pvc top sweeps and automatically operated bottom seals. Bottom seals automatically drop as panel are positioned without use of a tool. Bottom seals retract automatically when panel is pulled away from wall or adjacent panel. (Not available on 53 and 55 STC.) The last panel will have fixed bottom sweeps.
 - a. FA-2:2" [51mm] floor clearance with 1 1/2" [38mm] operating range.

2. Type FM: 1" [25mm] fixed pvc top sweeps and manually operated bottom seals. Bottom seals extend and retract with half a turn of a removable lever handle. (Not available on 53 and 55 STC.)

(Select one)

- a. FM-1: 1" [25mm] floor clearance with 5/8" [16mm] operating range.
 - b. FM-1.5: 1 1/2" [38mm] floor clearance with 3/4" [19mm] operating range.
 - c. FM-2: 2" [51mm] floor clearance with 1" [25mm] operating range.
 - d. FM-2.5: 2 1/2" [64mm] floor clearance with 2" [51mm] operating range.
 - e. FM-4: 4" [102mm] floor clearance with 3 1/2" [89mm] operating range.
3. Type MM: Manually operated top and bottom seals. Top and bottom seals extend and retract simultaneously with half a turn of a removable lever handle. (Select one)
- a. MM-1 *: 1" [25mm] track clearance. 1" [25mm] floor clearance with 5/8" [16mm] operating range.
 - b. MM-1.5: 1" [25mm] track clearance. 1 1/2" [38mm] floor clearance with 3/4" [19mm] operating range.
 - c. MM-2: 1" [25mm] track clearance. 2" [51mm] floor clearance with 1" [25mm] operating range.
 - d. MM-2.5: 1" [25mm] track clearance. 2 1/2" [64mm] floor clearance with 2" [51mm] operating range.
 - e. MM-4: 1" [25mm] track clearance. 4" [102mm] floor clearance with 3 1/2" [89mm] operating range.

** Type MM-1 horizontal seals are standard for STC 53 panels. Type MM-1 horizontal seals are standard for STC 55 panels with the addition of fixed top sweeps.*

2.6 Suspension system

A. Track and trolleys (select one):

- 1. #23-T aluminum track: 6063-T6 aluminum alloy extrusion with integral soffit trim supported by pairs of 3/8" [10mm] dia. threaded rods connected to structural support, with or without optional hanger brackets.
 - a. #23 trolley: Each trolley shall have two counter-rotating precision ground ball bearing wheels with nylon tires.
 - b. Multi-directional design: Trolley shall allow the panel to navigate through L, T and X intersections without mechanical switching devices.
 - c. Usage: For panels up to 15'-3" [4648mm] height.
 - d. Each panel to be supported by two trolleys.

3. #72 steel track: 11 ga. roll-formed steel with integral soffit trim supported by pairs of 3/8" [10mm] dia. threaded rods connected to structural support with hanger brackets. (Optional)
 - a. #72 trolley: Each trolley shall have four precision ground ball bearing wheels with steel tires.
 - b. Multi-directional design: Trolleys shall be automatically guided through a pre-programmed stacking track switch.
 - c. Usage: For panels up to 15'-3" [4648mm] height.
 - d. Each panel to be supported by two trolleys.
4. #33-T aluminum track: 6063-T6 aluminum alloy extrusion with integral soffit trim supported by pairs of 3/8" [10mm] dia. threaded rods connected to structural support, with or without optional hanger brackets.
 - a. #33 trolley: Each trolley shall have two counter-rotating precision ground ball bearing wheels with nylon tires.
 - b. Multi-directional design: Trolley shall allow the panel to navigate through L, T and X intersections without mechanical switching devices.
 - c. Usage: For panels between 15'-3" [4648mm] and 22'-3" [6781mm] height.
 - d. Each panel to be supported by two trolleys.
5. #55-T aluminum track: 6063-T6 aluminum alloy extrusion with integral soffit trim supported by pairs of 3/8" [10mm] dia. threaded rods connected to structural support, with or without optional hanger brackets.
 - a. #55 trolley: Each trolley shall have four precision ground ball bearing wheels with steel tires.
 - b. Multi-directional design: Trolleys shall be automatically guided through pre-programmed or electrically operated track switches.
 - c. Usage: For panels over 22'-3" [6781mm] height.
 - d. Each panel to be supported by two trolleys.

B. Track finish (select applicable):

1. Aluminum track finish shall be (select one):

- a. Clear satin anodized.
- b. Powder coating. Color selected from RAL Classic color system.
- c. Custom powder coating. (Color chip to be supplied to Moderco. Moderco's color-match must be approved prior to any material being released for fabrication)

2. Steel track finish shall be (select one):

- a. White powder coating.
- b. Powder coating. Color selected from RAL Classic color system.
- c. Custom powder coating. (Color chip to be supplied to Moderco. Moderco's color-match must be approved prior to any material being released for fabrication)

Part 3 – Execution

3.1 Installation

- A. The complete installation of the operable wall system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer's installation instructions.

3.2 Cleaning

- A. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.
- B. Packing and other installation debris shall be removed from the job site.

3.3 Training

- A. Installer shall demonstrate proper operation and maintenance procedures to owner's representative.
- B. Operating handle and owner's manuals shall be provided to owner's representative.

DIVISION 11 – EQUIPMENT

SECTION 11132 – PROJECTION SCREENS

1. GENERAL

- a. The work under this section is subject to all applicable provisions of the “Bidding Requirements”, the “Conditions of the Contract”, “Contract Forms” and Division 1 – “General Requirements”, which form a part hereof whether attached hereto or not.

2. WORK INCLUDED

- a. Include all labor, materials, and appliances and perform all operations in connection with providing and installing projection screens.

3. MATERIALS

- a. Examine the Specifications and Drawings for the various other trades. Let it be understood that all surfaces normally requiring painting or colored finish that are left unfinished by the requirements of other Specifications shall be painted or finished as part of this Section
- b. DA-LITE or equal projection screens, 6 ft. (H) x 8 ft. (W), electrically operated 115 volt (60 Hz), 1.3 amps. Shall have specially designed motor mounted inside the roller with a patented noise silencer to be three wire quick reversal type, oiled for life, with automatic thermal overload cutout, integral gears, capacitor and an electric brake to prevent coasting. To have preset but adjustable limit switches to automatically stop picture surface in the “up” and “down” positions. The roller to be of rigid metal, 3” in diameter, mounted on two vibration and noise absorbing supports. Screen fabric to be flame retardant and mildew resistant fiberglass with glass beaded, matte white or spectra picture surface with black masking borders standard. Bottom of fabric shall be formed into a pocket holding a 3/8” metal rod. The ends of the rod shall be protected by heavy duty plastic caps. Case to be of wood with metal-lined wiring compartment. A section of the bottom of the case shall be an aluminum door equipped with hinges so that it opens and closes automatically with the lowering and raising of the picture surface. When the picture surface is being lowered, the door shall drop open by gravity. When the picture surface is being raised, the two ends of the slat in the bottom pocket of the screen fabric shall engage two hooks on the door to lift it to the closed position where a limit switch shall cut off the electrical current to the screen. The

balance of the bottom of the case shall be a second hinged aluminum

door with manual openings to provide access. Hinges shall be mounted to allow matching of the doors to the ceiling. Case to be finished with a primer coat, ready to accept final finish by others. To be complete with the three position control switch in box with cover plate. Screen to be listed by Underwriter's Laboratories and CSA.

END OF SECTION

DIVISION 12 – KITCHEN EQUIPMENT

SECTION - SUMMARY OF WORK

GENERAL

1. Provide and install all kitchen and related equipment including but not limited to the following. Refer to the plans and equipment schedules for a complete scope of work.

- Provide and install all equipment shall be in accordance with the selected equipment as included on the kitchen plan, schedules and related drawings.
- Substitutions of equivalent equipment shall be subject to review and acceptance by the owner. If alternates are rejected, the specified item must be provided.
- Deliver the equipment to the site and transport it to the designated locations.
- Equipment shall be un-crated, assembled and installed including all final connections.
- All packing debris shall be removed from site and legally disposed of.
- Upon completion of all installations, provide demonstration and training to designated fire department personnel.
- Collate and bind all equipment catalogs, warranties, installation and operation instructions in a binder and turn over to owner's representative.

SECTION 14210 (14 21 23) - ELECTRIC TRACTION PASSENGER ELEVATORS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Electric traction passenger elevators.

1.2 RELATED SECTIONS

- A. Section 015000 – Temporary Facilities and Controls: Protection of floor openings and personnel barriers; temporary power and lighting.
- B. Section 033000 – Cast-in-Place Concrete: Elevator pits.
- C. Section 036000 – Grouts (Grouting): Grouting door frames and sills.
- D. Section 042000 – Masonry Units (Unit Masonry): Setting sleeves, inserts, and anchoring devices in masonry for guide-rail brackets.
- E. Section 051200 – Metal Stairs Structural Steel (Structural Steel Framing): Support steel, divider beams, and hoist beams.
- F. Section 055000 – Gypsum Metal Fabrications: Pit ladders, supports for entrances in drywall hoistways.
- G. Section 061053 – Miscellaneous Rough Carpentry: Temporary platform assembly.
- H. Section 071600 – Cementitious Waterproofing: Waterproofing of elevator pit.
- I. Section 092900 – Gypsum Board: Hoistway walls.
- J. Section 099000 – Paints and Coatings (Painting and Coating): Field painting of elevator entrances over primer.
- K. Section 283100 – Detection and Alarm (Fire Detection and Alarm): Heat, smoke, and products of combustion sensing devices, fire alarm signal lines to contacts in machine space.
- L. Section 23000 – Heating, Ventilating, and Air Conditioning Equipment (Heating, Ventilating, and Air-Conditioning (HVAC)): Heating, cooling, and ventilation of control and machinery space.
- M. Section 260500 – Wiring Methods (Common Work Results for Electrical): Light outlets, convenience outlets, light switches, and conduits.
- N. Section 262400 – Switchboards, Panelboards, and Control Centers (Switchboards and Panelboards): Disconnect switches.
- O. Section 265000 – Lighting: Light fixtures.
- P. Section 221429 – Sump Pumps: For sump pumps, sumps, and sump covers in elevator pits.
- Q. Section 271500 – Communications Horizontal Cabling: For Telephone service for elevators and for Internet connection to elevator controllers for remote monitoring.
- R. Section 273000 – Telephone and Intercommunication Equipment (Voice Communications): telephone outlets and elevator telephones.
- S. Section 31000 – Earthwork: Excavation of elevator pit.

1.3 REFERENCES

- A. ANSI/ASME A17.1/CAN/CSA B44 – Safety Code for Elevators and Escalators.
- B. ADAAG – Americans with Disabilities Act Accessibility Guidelines.
- C. ANSI/NFPA 70 – National Electrical Code.
- D. ANSI/NFPA 80 – Fire Doors and Windows.
- E. ANSI/UL 10B – Fire Tests of Door Assemblies.
- F. CAN/CSA C22.1 – Canadian Electrical Code.
- G. Model and Local Building CodesH. ISO 9001: 2000 - Quality Management Systems - Requirements.

1.4 DESIGN REQUIREMENTS

- A. Arrange elevator components in control closet or machinery space so equipment can be removed for repairs or replaced with minimal disturbance to other equipment and components.
- B. Where permitted by code, provide all elevator equipment including controls, drives, transformers, and rescue features within the elevator hoistway.

1.5 SUBMITTALS

- A. Comply with Section 013300 (01 33 00) – Submittal Procedures.
- B. Product Data: Submit manufacturer/installer's product data, including,
- C. Shop Drawings: Submit manufacturer/installer's shop drawings, including plans, elevations, sections, and details, indicating location of equipment, loads, dimensions, tolerances, materials, components, fabrication, fasteners, hardware, finish, options, accessories, and other information to render totally functional elevators.
 - a. Descriptive brochures or detail drawings of car and hall fixtures, cab ceilings, and product features.
 - b. Power Information: Horsepower, starting current, running current, machine and control heat release, and electrical requirements.
- D. Samples: Submit manufacturer/installer's samples of standard colors and finishes of finish materials.
- E. Operation and Maintenance Manual: Submit manufacturer/installer's operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; renewal parts catalogs; and electrical wiring diagrams.
- F. Warranty: Submit manufacturer/installer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer/Installer's Qualifications: Specialize in manufacturing and installing elevator equipment, with a minimum of 10 years successful experience.

B. Regulatory Requirements:

- a. Elevator design, clearances, construction, workmanship, materials, and installation, unless specified otherwise, shall be in accordance with ANSI/ASME A17.1, handicap accessibility, Americans with Disabilities Act, and other codes having legal jurisdiction.
- b. ANSI/ASME A17.1 shall govern, except where codes having legal jurisdiction include more rigid requirements or conflict with ANSI/ASME A17.1.
- c. Elevator shall follow design and manufacturing procedures certified in accordance with ISO 9001-2000 to meet product and service requirements for quality assurance for new products.
- d. Where product is in variance to the published ANSI/ASME A17.1 model code, provide a 3rd party AECO certification demonstrating equivalent function, safety, and performance.

C. Pre-installation Meeting:

- a. Convene pre-installation meeting before start of installation of elevators.
- b. Require attendance of parties directly affecting work of this section, including Contractor, Architect, and elevator manufacturer/installer.
- c. Review examination, installation, field quality control, adjusting, cleaning, protection, and coordination with other work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer/installer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer/installer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer/installer's instructions.
- C. Handling: Protect materials during handling and installation to prevent damage.

1.8 PROJECT CONDITIONS

A. Temporary Electrical Power:

- a. Owner will arrange for temporary 220 VAC, single-phase, 60 Hz., GFCI-protected electricity to be available for installation of elevator components.
- b. Comply with Section 015100 – Temporary Utilities.

B. Installation of the Elevator:

- a. General Contractor will provide permanent three-phase power prior to installation start.
- b. General Contractor will provide clear, rollable access to a 20' x 10' secure and dry storage area prior to delivery.
- c. General Contractor will provide a clean, dry, and complete hoistway along with temporary installation platform and all required OSHA-compliant barricades prior to delivery.

- C. Temporary Use of Elevator:
 - a. Owner will negotiate with manufacturer/installer for temporary use of elevator, if required.
 - b. Temporary use of elevator shall be in accordance with terms and conditions of manufacturer/installer's temporary acceptance form.

1.9 SCHEDULING

- A. Coordinate elevator work with work of other trades, for proper time and sequence to avoid construction delays.

1.10 WARRANTY

- A. Manufacturer/installer shall guarantee materials and workmanship of equipment installed under these specifications and make good, defects not due to ordinary wear or to improper use, which may develop within 1 year after completion of installation or acceptance thereof by beneficial use, whichever is earlier.

1.11 MAINTENANCE SERVICE

- A. Elevator maintenance service shall be performed by elevator manufacturer/installer.
- B. Elevators shall receive regular maintenance on each unit for period of 12 months after completion of work specified herein or acceptance thereof by beneficial use, whichever is earlier.
- C. Trained employees shall make periodic examinations and perform work including necessary adjusting, greasing, oiling, and replacing parts to keep elevators in operation, except parts that require replacement because of accidents, vandalism, misuse, or negligence by parties other than manufacturer/installer.
- D. Manufacturer/installer shall perform all Work, except emergency minor adjustment call-back service, during regular working hours. Manufacturer/installer shall provide emergency minor adjustment call-back service, during regular working hours.
- E. Should Owner request that examinations, cleaning, lubrication, adjustments, repairs, replacements, or emergency minor adjustment call-back service, unless specified herein, be performed on other than manufacturer/installer's regular working hours of regular working days, manufacturer/installer shall absorb straight-time labor charges and Owner will compensate manufacturer/installer for overtime premium, travel time, and expense at normal billing rates.
- F. Elevator Control System:
 - a. Include built-in remote diagnostic module to relay constant status of elevators and control system to a 24-hour, 7-days-a-week central-monitoring facility.
 - b. Remote Monitoring Device: Transmit information on current status of elevators, including malfunctions, system errors, and shutdown.

PART 2 – PRODUCTS

2.1 MANUFACTURER/INSTALLER

- A. Schindler Elevator Corporation, Website www.us.schindler.com.
- B. Elevator shall be installed by elevator manufacturer.

2.2 ELEVATOR SYSTEM AND COMPONENTS

- A. Electric Traction Passenger Elevators: Basis of design is the Schindler 5000 Gearless Traction Elevator.
- B. Elevator Equipment Summary:
 - a. Application: Machine Room Less (MRL)
 - b. Counterweight Location: Right side
 - c. Machine Location: Machine room Less
 - d. Control Space Location: Front Landing, Floor 2
 - e. Service: Hospital/service
 - f. Quantity: 1 Unit
 - g. Capacity: 5000 lbs
 - h. Speed: 150 fpm
 - i. Travel: 18'-8"
 - j. Landings: 2
 - k. Front Openings: 2
 - l. Rear Openings: 0
 - m. Rear Door Hand: N/A
 - n. Operation: Conventional selective collective
 - o. Clear Inside Dimensions: 5' 4.3" Wide X 8' 7.6" Deep
 - p. Cab Height: 7' 9"
 - q. Guide Rails: Equivalent to 12 lb. per foot
 - r. Entrance Type and Width: Two Speed Side Opening 4' 0" Wide X 7' 0" High doors
 - s. Entrance Height: 7'-0"
 - t. Power Supply: 208 Volts 3 Phase 60 Hz
- C. Performance:
 - a. Car Speed: -10% to +5% of contract speed under any loading condition or direction of travel.
 - b. Car Capacity: Safely lower, stop and hold up to 125% of rated load per code.
- D. Ride Quality:
 - a. Vertical Vibration (maximum): 25 mg
 - b. Horizontal Vibration (maximum): 15 mg
 - c. Vertical Jerk (maximum): 1.3 ft/sec³
 - d. Acceleration (maximum): 1.6 ft/sec²
 - e. In Car Noise: 53-60 dB(A)
 - f. Stopping Accuracy: ±5mm
 - g. Starts per hour (maximum): 180
- E. Elevator Operation:
 - a. Simplex Collective Operation: Using a microprocessor based controller, operation shall be automatic by means of the car and hall buttons. When all calls have been answered, the car shall park at the last landing served.
 - b. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching algorithm designed to minimize passenger waiting time.

F. Operating Features - Standard:

- a. Door Light Curtain Protection
- b. Static AC Drive
- c. Phase Monitor Relay
- d. Cab Overload with Indicator
- e. Load-weighing
- f. Central Alarm
- g. Remote Monitoring
- h. Firefighter's Operation
- i. Automatic Evacuation
 - 1. When the main line power is lost for longer than 5 seconds the emergency battery power supply provides power automatically to the elevator controller. If the car is at a floor when the power fails, it remains at that floor, opens its doors, and shuts down. If the car is between floors, it is raised or lowered to the first available landing, opens its doors, and shuts down.
- j. Independent Service

2.3 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

- A. Controller: Provide microprocessor based control system to perform all of the functions of safe elevator operation, as well as perform car and group operational control.
 - a. All high voltage (110v or above) contact points inside the inspection and test panel shall be protected from accidental contact in a situation where the access panels are open.
 - b. The controller shall be distributed throughout the elevator system located in the overhead, cab and inspection and test panel. The inverter will be mounted in the overhead adjacent to the hoist machine and an inspection and test panel will be located in the door jamb at the top floor or one floor below the top floor. No elevator equipment mechanical rooms or closets are required.
 - c. Provide multi-bus control architecture to reduce cabling, material and waste.
- B. Drive: Provide a Variable Voltage Variable Frequency AC Closed Loop drive system. Provide stable start without high peak current, quickly reaching a low energy consumption level.
- C. Inspection and Test Panel: Integrated control equipment, main inspection and test panel in door frame at top level served or at one floor below the top level served.

2.4 EQUIPMENT: HOISTWAY COMPONENTS

- A. Machine:
 - a. Gearless asynchronous AC motor with integral drive sheave, service and emergency brakes.
 - b. Design machine to enable direct power transfer, thereby avoiding loss of power.
 - c. Design machine to be compact, lightweight and durable to optimize material usage and save space.
 - d. Mount to structural support channels on top of guide rail system as applicable in hoistway overhead.

- B. Governor:
 - a. Tension type over-speed governor with remote manual reset.
 - b. Mount to structural support channels as applicable in hoistway overhead.
- C. Buffers, Car and Counterweight: Compression spring type buffers to meet code.
- D. Hoistway Operating Devices:
 - a. Emergency Stop switch in the pit.
 - b. Terminal stopping switches.
 - c. Emergency stop switch on the machine.
- E. Positioning System: System consisting of proximity sensors and door zone vanes.
- F. Guide Rails and Attachments: Provide Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.
- G. Suspension System: Non circular Elastomeric coated suspension media with high tensile grade steel cords.
- H. Governor rope: Steel wire rope with 6 mm diameter.

2.5 EQUIPMENT: HOISTWAY ENTRANCES

- A. Hoistway Doors and Frames:
 - a. UL rated with required fire rating.
 - b. Doors: Rigid flush panel construction with reinforcement ribs.
 - c. Frames: Securely fasten at corners to form unit frame. Frames shall be bolted.
- B. Finish:
 - a. Exposed Areas of Corridor Frames: Stainless Steel - All Floors
 - b. Doors: Stainless Steel - All Floors
 - c. Doors: Painted Primer - All Floors
 - d. Sills: Aluminum - All Floors
- C. Entrance Markings and Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors.
- D. Plate Mounting: Refer to manufacturer drawings.

2.6 EQUIPMENT: CAR COMPONENTS

- A. Car Frame and Safety: Provide car frame with adequate bracing to support the platform and car enclosure. The safety shall be integral to the car frame and shall be flexible guide clamp type.
- B. Platform: Provide platform of steel construction with plywood subfloor and aluminum threshold.
- C. Car Guides: Provide sliding guide shoes mounted to top and bottom of both car and counterweight frame. Arrange each guide shoe assembly to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.
- D. Provide central guiding system to reduce mechanical friction and energy consumption.

E. Steel Cab:

- a. Fire rating: Provide Class B fire rating for cab, or Class A fire rating where required by local Code.
- b. Design cab to comply with LEED Indoor Environmental Quality requirements through use of Low-Emitting Materials on walls, ceiling and subflooring.
- c. Car wall finish: Stainless Steel 304 5WL
- d. Base and frieze: Aluminum.
- e. Car front finish: Brushed stainless steel.
- f. Car door finish: Brushed stainless steel.
- g. Ceiling: Brushed Stainless Steel #441 Stainless Steel With Down Lit Led Lighting. Provide lighting consisting of round spot lights.
- h. Handrail: 1 3/8" Round And Curved brushed stainless steel 304. Provide at side and rear walls.
- i. Flooring: By others. Not to exceed 3/8" finished depth.
- j. Ventilation: Provide one-speed fan in canopy.
- k. Emergency Car Lighting: Provide an emergency power unit employing a 12 volt sealed rechargeable battery and static circuits to illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
- l. Emergency Siren: Provide siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged.
- m. Emergency Exit Switch: Provide an electrical contact to open the safety circuit when the emergency car top exit is opened. When the exit door is opened, the top exit switch shall signal the control and the car will be unable to move.
- n. Emergency Exit Lock: Provide an emergency exit lock where required by local code.
- o. Emergency Exit Guard: Provide emergency exit guard on top of car when required for hoistway wall to platform clearance exceeds 12" or for multiple cars in hoistway.

2.7 DOOR OPERATOR AND REOPENING DEVICES

- A. Door Operator: Provide a closed loop VVVF high performance door operator with frequency controlled drive for fast and reliable operation to open and close the car and hoistway doors simultaneously.
- B. In case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Provide emergency devices and keys for opening doors from the landing as required by local code.
- C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. Provide door open button in the car operating panel. Momentary pressing of this button shall reopen the doors and reset the time interval.
- D. Provide door hangers and tracks for each car and hoistway door. Contour tracks to match the hanger sheaves. Design hangers for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed for life bearings.

- E. Electronic Door Safety Device: Equip car doors with concealed transmitter and receiver infrared beam devices to detect presence of object in process of passing through hoistway entrance and car doorway (light curtain device).
 - 1. Use multi-beam scanning without moving parts to detect obstructions in door opening.
 - 2. Detector Device: Prevent doors from closing, or if they have already started closing, cause doors to reopen and remain open while object is within detection zone.

2.8 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: Provide a car operating panel with all push buttons, key switches and message indicators for elevator operation.
 - a. Full height car operating panel shall be surface-mounted on front return.
 - b. Comply with handicap requirements.
 - c. Push Buttons: Mechanical, illuminating using long-lasting LEDs for each floor served.
 - d. Emergency Buttons: Provide in accordance with code. Emergency alarm button, door open and door close buttons.
- B. Features of the Car Operating Panel Shall Include:
 - a. Audible chime to signal that the car is either stopping at or passing a floor served by the elevator.
 - b. Raised markings and Braille provided to the left hand side of each push button.
 - c. Car Lantern: Provide LED illuminated car lantern with direction arrows to comply with local code when hall lanterns are not provided.
 - d. Door open and close push buttons.
 - e. Firefighter's hat and Phase 2 Key-switch
 - f. Inspection key-switch.
 - g. Key-switch for optional Independent Service Operation
 - h. Illuminated alarm button with raised marking.
 - i. Elevator Data Plate marked with elevator capacity and car number.
 - j. Help Button: Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
- C. Hall Fixtures: Provide hall fixtures with necessary push buttons and key switches for elevator operation.
 - a. Push buttons: Metallic tactile push buttons, up button and down button at intermediate floors, single button at each terminal floor.
 - b. Height: Comply with handicap requirements.
 - c. Illumination: Illuminating using long-lasting low power LEDs.
- D. Hall Lanterns and Position Indicators.
 - a. LED illuminated direction arrows with audible and visible call acknowledgement.
- E. Hoistway access switches: Provide key-switch at top and/or bottom floor in entrance jamb as required by local code.
- F. Firefighter's Phase 1 Service: Key switch in brushed stainless steel cover plate.

- G. Fixture Cover Plates: For push buttons, hall lanterns and position indicators, resistant white back-printed glass, no screws required for mounting. Provide stainless steel cover plates for Firefighter's Phase I switch and hoistway access switches, with tamper resistant screws in same finish.
- H. Mounting: Mount hall fixtures in entrance frames.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine hoistways, hoistway openings, and pits before starting elevator installation.
- B. Verify hoistway, pit, overhead, and openings are of correct size, within tolerances, and are ready for work of this section.
- C. Verify walls are plumb where openings occur and ready for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.
- D. Verify hoistway is clear and plumb, with variations not to exceed -0 to +1 inch at any point. Verify projections greater than 4" must be beveled not less than 75 degrees from horizontal. No negative tolerance is permitted for minimum hoistway dimensions.
- E. Verify minimum 2-hour fire-resistance rating of hatch walls.
- F. Notify Architect in writing of dimensional discrepancies or other conditions detrimental to proper installation or performance of elevators.
- G. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to manufacturer/installer.

3.2 INSTALLATION

- A. Install elevators in accordance with manufacturer/installer's instructions and ANSI/ASME A17.1.
- B. Set entrances in vertical alignment with car openings, and aligned with plumb hoistway lines.

3.3 FIELD QUALITY CONTROL

- A. Perform tests of elevator as required by ANSI/ASME A17.1 and governing codes.

3.4 ADJUSTING

- A. Adjust elevators for proper operation in accordance with manufacturer/installer's instructions.
- B. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- C. Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.
- D. Adjust automatic floor leveling feature at each floor to within 1/4 inch of landing.
- E. Repair minor damages to finish in accordance with manufacturer/installer's instructions and as approved by Architect.
- F. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.5 CLEANING

- A. Clean elevators promptly after installation in accordance with manufacturer/installer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.6 PROTECTION

- A. Protect installed elevators from damage during construction in accordance with the negotiated temporary use agreement between Owner and manufacturer's installer.

END OF SECTION