

BERNARDON

A DIVISION OF CORE STATES GROUP

ARCHITECTURE

INTERIOR DESIGN

LANDSCAPE ARCHITECTURE

ADDENDUM NO. 01

Project Name: Aston Township Municipal Complex

Project No.: 2301.00-22

Date of Issue: April 9, 2024

Notice 1: Attach this addendum to the Project Manual for this project. It modifies and becomes part of the Bidding Documents. Work or material not specifically mentioned herein is to be as described in the main body of the Project Manual and as shown on the drawings.

Table of Contents: This Addendum includes the following:

- A. Written Addendum (five pages)
- B. Project Manual Clarifications (eighty pages)
- C. Sheet Revisions (seven sheets)

Responses (R) to Bidder Questions (Q) at Mandatory Pre-Bid Meeting held on April 4, 2024:

Q01: Is this a mandatory Pre-Bid Meeting?

R01: The Pre-Bid Meeting is a mandatory pre-bid meeting; therefore, those entities who did not attend the pre-bid meeting are disqualified from bidding. Refer to the attendance list, attached hereto, for confirmation of those attending.

Q02: What is the deadline for questions related to the Bid Package?

R02: April 19 is targeted as the last day for questions. Bernardon will endeavor to issue an addendum on April 23, 2024. Bernardon welcomes questions from Prime Contractors after April 19; however, Bernardon may not respond to the questions received in advance of the bid due date of April 30, 2024.

Clarifications to the PROJECT MANUAL:

1. Reference to Document 000100 – Table of Contents: Delete Document 000100 – Table of Contents in its entirety and replace with Document 000100 – Table of Contents that is included in its entirety as part of this addendum.
2. Reference to Document 004445 – RACP Compliance Guidelines; page 004440-1: This page was numbered incorrectly, and it incorrectly references the Berwyn Fire Company in two (2) places. Remove this page and replace it with page 004445-1 of Document 004445 – RACP Compliance Guidelines that is included as part of this addendum. Use this updated page when incorporating it into your bid response.



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3. Reference to Section 012300 – Alternates: Delete Section 012300 – Alternates in its entirety and replace with Section 012300 – Table of Contents that is included in its entirety as part of this addendum.
4. Reference to Section 055213 – Pipe and Tube Railings: Delete Section 055213 – Pipe and Tube Railings in its entirety and replace with Section 055213 – Pipe and Tube Railings that is included in its entirety as part of this addendum.
5. Reference to Section 071113 – Bituminous Dampproofing: Delete Section 071113 – Bituminous Dampproofing in its entirety and replace with Section 071113 – Bituminous Dampproofing that is included in its entirety as part of this addendum.
6. Reference to Section 074113.16 – Standing-Seam Metal Roof Panels: Delete Section 074113.16 – Standing-Seam Metal Roof Panels in its entirety and replace with Section 074113.16 – Standing-Seam Metal Roof Panels that is included in its entirety as part of this addendum.
7. Reference to Section 074213.19 – Insulated Metal Wall Panels: Delete Section 074213.19 – Insulated Metal Wall Panels in its entirety and replace with Section 074213.19 – Insulated Metal Wall Panels that is included in its entirety as part of this addendum.
8. Reference to Section 074213.23 – Metal Composite Material Wall Panels: Delete this section in its entirety and replace with Section 074213.23 – Metal Composite Material Wall Panels that is included as part of this Addendum.
9. Reference to Section 075323 – Ethylene-Propylene-Diene-Monomer (EPDM) Roofing; page 075323-4; Paragraph 2.3.A.1: Mule Hide Products Co., Inc. has been approved as a suitable manufacturer of the specified products and systems in Section 075323 and shall be listed as subparagraph as follows:
 - d. Mule-Hide Products Co., Inc.
10. Reference to Section 075323 – Ethylene-Propylene-Diene-Monomer (EPDM) Roofing; page 075323-4; Paragraph 2.5; Subparagraph C.: Replace this subparagraph with the following:
 - C. Tapered Insulation: Material: Match roof insulation.
 1. Minimum Thickness: 1/4 inch.
 2. Slope:
 - a. Roof Field: 1/4 inch per foot (1:48) unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/2 inch per foot (1:24) unless otherwise indicated on DrawingsProvide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.



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11. Reference to Section 077253 – Snow Guards: Delete this section in its entirety and replace with Section 077253 – Snow Guards that is included as part of this Addendum.
12. Reference to Section 105113.02 - Metal Personnel Lockers: Delete this section in its entirety and replace with Section 105113.02 - Metal Personnel Lockers that is included as part of this Addendum.
13. Reference to Section 111916 – Detention Gun Lockers; Paragraph 2.3; Subparagraph B: Delete the text “[4] <Insert safety factor>” and replace with “4”.
14. Reference to Section 111916 – Detention Gun Lockers; Paragraph 2.3; Subparagraph C: Delete this subparagraph in its entirety and replace with the following:
 - C. Proprietary Built-in Masonry Anchors: Fabricated from 0.134-inch nominal-thickness steel sheet into 4-inch-deep blocks matching size of concrete masonry units; with weld nuts attached on inside to receive field-bolted attachments.
15. Reference to Section 125500 – Detention Furniture: Section 125500 – Detention Furniture is included as part of this Addendum.
16. Reference to Section 323113 – Chain Link Fences and Gates: Section 323113 – Chain Link Fences and Gates is included as part of this Addendum.
17. Reference to Section 323119.53 – Decorative Metal Security Fences and Gates: Section 323119.53 – Decorative Metal Security Fences and Gates is included as part of this Addendum.

Clarifications to the SHEETS:

1. Reference to Sheet A-001 – Architectural Site Plan; Keynote Legend: For Keynote items 32A, 32B, 32D, and 32F, refer to Section 323119.53 – Decorative Metal Security Fences and Gates that is included as part of this addendum.
2. Reference to Sheet A-101 – First Floor Plan; Drawing 1/A-101 First Floor Plan: In room Sally Port 113, at east side of Sally Port, provide two (2) 10-foot high chain link fence and gates as specified in Section 323113 - Chain Link Fences and Gates that is included in its entirety as part of this addendum. Provide 84” high double gate in the 7’-4” wide opening, and a single 84” high gate (36” wide) with adjacent fence in the 10’-0” opening dimensioned on plan. At each fence, chain link fence panels shall extend along entire width of opening to 10’-0” AFF.



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3. Reference to Sheet A-102 – Second Floor Plan and Dumpster Enclosure; Drawing 1/A-102 Second Floor Plan: Exterior windows shown in Township Manager 217 and Township Assistant shall be numbered 20 in lieu of 21.
4. Reference to Sheet A-103 – Vehicle Shelter: Sheet A-103 – Vehicle Shelter is being reissued as part of this addendum. Formed metal downspouts have been added to the shelter plans and represented in section.
5. Reference to Sheet A-111 – Roof Plan and Details; Keynote Legend: The description for Keynote 7AA shall be revised to read as follows:

Enclosure at column extension for future addition. Refer to detail 2/A-111 for typical enclosure at standalone column. Conditions where column extensions engage the parapet wall shall be similar to detail 2/A-111.
6. Reference to Sheet A-201 – Elevations: Sheet A-201 – Elevations is being reissued as part of this addendum. Minor adjustments have been made to various elevations and clarification is provided for reference tags associated with exterior wall and roof system types.
7. Reference to Sheet A-311 – Wall Sections; drawing 1/A-311: Reference to “Exterior Wall System – W10” shall be replaced to read “Exterior Wall System – W11”
8. Reference to Sheet A-318 – Wall Sections; drawing 3/A-318: Reference to “Exterior Wall System – W8” shall be replaced to read “Exterior Wall System – W10”
9. Reference to Sheet A-318 – Wall Sections; drawing 4/A-318: Reference to “Exterior Wall System – W8” shall be replaced to read “Exterior Wall System – W10”
10. Reference to Sheet A-507 – Ornamental Stl Capital Plans, Elevations, and Details: Sheet A-507 – Ornamental Stl Capital Plans, Elevations, and Details is being issued as part of this addendum.
11. Reference to Sheet A-512 – Police Station - Enlarged Plans and Details: Sheet A-512 – Police Station - Enlarged Plans and Details is being reissued as part of this addendum. Adjustments have been made to the Weapons Cleaning 108 casework.
12. Reference to Sheet A-520 – Casework Details: Sheet A-520 – Casework Details is being issued as part of this addendum to reflect details through the casework in Weapons Cleaning 108.



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13. Reference to Sheet A-611 – Curtain Wall Elevations: Sheet A-611 – Curtain Wall Elevations is being reissued as part of this addendum. Minor adjustments have been made to various curtain wall elevations.
14. Reference to Sheet A-612 – Exterior Storefront Elevations: Sheet A-612 Exterior Storefront Elevations is being reissued as part of this addendum. Minor adjustments have been made to various storefront elevations.

END OF ADDENDUM NO. 01

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DOCUMENT 004445 – RACP COMPLIANCE REQUIREMENTS

**COMMONWEALTH OF PENNSYLVANIA – OFFICE OF BUDGET – BUREAU OF
REVENUE, CAPITAL & DEBT****REDEVELOPMENT ASSISTANCE CAPITAL PROGRAM (RACP)**

The construction contractor (“Contractor”) and its subcontractors recognize that compliance with these requirements is mandated by the Commonwealth of Pennsylvania in the performance of this construction contract (“Contract”). In the event the Alternate No. GC-01; PC-01; MC-01; or EC-01 pertaining to RACP Compliance Requirements is accepted, these requirements will be included in the Aston Township contract with the Contractor; and this document, Document 004445 – RACP Compliance Requirements, will be included as an attachment to the Standard Form of Agreement Between Owner and Contractor.

1.1 COMPLIANCE REQUIREMENTS

A. Key Compliance Guidelines of the Commonwealth of Pennsylvania – Office of Budget – Bureau of Revenue, Capital & Debt | Redevelopment Assistance Capital Program (RACP) is hereby incorporated into the Procurement and Contracting Requirements by reference.

1. A copy of the Key Compliance Guidelines is bound in this Project Manual.
2. A copy of the Guidance on Steel Certification Relative to the Redevelopment Assistance Capital Program (RACP) is bound in this Project Manual.

I am aware of the Compliance Requirements of the Commonwealth of Pennsylvania – Office of Budget – Bureau of Revenue, Capital & Debt | Redevelopment Assistance Capital Program (RACP) identified above. I certify that to the best of my knowledge the Aston Township Municipal Complex project will meet all of these requirements.

ATTEST:

Title

Title

Date

Date

Sworn to and Subscribed before me this _____ day of _____ 2023.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED

END OF DOCUMENT 004445

1 SECTION 012300 - ALTERNATES

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 other Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. This Section includes administrative and procedural requirements for alternates.

8 1.3 DEFINITIONS

- 9 A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the
10 Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to
11 accept a corresponding change either in the amount of construction to be completed or in the products,
12 materials, equipment, systems, or installation methods described in the Contract Documents.

- 13 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
14 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to
15 incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

16 1.4 PROCEDURES

- 17 A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the
18 alternate into Project.

- 19 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items
20 incidental to or required for a complete installation whether or not indicated as part of alternate.

- 21 B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the
22 status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later
23 consideration. Include a complete description of negotiated modifications to alternates.

- 24 C. Execute accepted alternates under the same conditions as other work of the Contract.

- 25 D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections
26 referenced in schedule contain requirements for materials necessary to achieve the work described under
27 each alternate.

28 PART 2 - PRODUCTS (Not Used)

29

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. The Schedule of Alternates shall be as noted on the contract documents and as enumerated on the Bid Form.
- B. Alternate No. GC-01: RACP Compliance Requirements
1. Base Bid: The base bid does not include RACP Compliance Requirements.
 2. Alternate: In addition to requirements of the base bid, provide all Work in accordance with Document 004445 RACP Compliance Requirements.
- C. Alternate No. GC-02: Vehicle Shelter
1. Base Bid: The base bid does not include the Vehicle Shelter.
 2. Alternate: Provide all Work of this contract associated with the Vehicle Shelter.
- D. Alternate No. GC-03: Scope of Elevator Construction Contract
1. Base Bid: The base bid does not include the scope of the elevator.
 2. Alternate: Provide all Work associated with the hydraulic elevator as documented on the drawings and as specified in Section 142400 – Hydraulic Elevators.
- E. Alternate No. PC-01: RACP Compliance Requirements
1. Base Bid: The base bid does not include RACP Compliance Requirements.
 2. Alternate: In addition to requirements of the base bid, provide all Work in accordance with Document 004445 RACP Compliance Requirements.
- F. Alternate No. MC-01: RACP Compliance Requirements
1. Base Bid: The base bid does not include RACP Compliance Requirements.
 2. Alternate: In addition to requirements of the base bid, provide all Work in accordance with Document 004445 RACP Compliance Requirements.
- G. Alternate No. EC-01: RACP Compliance Requirements
1. Base Bid: The base bid does not include RACP Compliance Requirements.
 2. Alternate: In addition to requirements of the base bid, provide all Work in accordance with Document 004445 RACP Compliance Requirements.
- H. Alternate No. EC-02: Vehicle Shelter
1. Base Bid: The base bid does not include the Vehicle Shelter.
 2. Alternate: Provide all Work of this contract associated with the Vehicle Shelter.

END OF SECTION 012300

1 SECTION 055213 - PIPE AND TUBE RAILINGS

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Aluminum railings.
9 2. Stainless steel railings.

- 10 B. Related Requirements:

11 .

- 12 1. Section 055113 "Metal Pan Stairs" for steel tube railings associated with metal pan stairs.
13 2. Section 057300 "Decorative Metal Railings" for ornamental railings fabricated from pipes and
14 tubes and guard-infill metals.

15 1.3 COORDINATION

- 16 A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and
17 coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible
18 with one another.

- 19 B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for
20 installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors,
21 that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

22 1.4 ACTION SUBMITTALS

- 23 A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- 24 B. Samples for Verification: For each type of exposed finish required.

- 25 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and
26 balusters, including finish.
27 2. Fittings and brackets.
28 3. Assembled Sample of railing system, made from full-size components, including top rail, post,
29 handrail, and infill. Sample need not be full height.

- 30 a. Show method of connecting and finishing members at intersections.

- C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For delegated-design professional engineer.
- B. Welding certificates.
- C. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface or guardrail assembly.

2.3 ALUMINUM RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

C. Extruded Tubing: ASTM B221, Alloy 6063-T5/T52.

D. Extruded Structural Round Tubing: ASTM B429/B429M, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

E. Drawn Seamless Tubing: ASTM B210/B210M, Alloy 6063-T832.

2.4 STAINLESS STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A554, Grade MT 304.

C. Pipe: ASTM A312/A312M, Grade TP 304.

D. Castings: ASTM A743/A743M, Grade CF 8 or CF 20.

E. Plate and Sheet: ASTM A240/A240M or ASTM A666, Type 304.

2.5 FASTENERS

A. Fastener Materials:

1. Aluminum Railing Components: Type 304 stainless steel fasteners.

2. Stainless Steel Railing Components: Type 304 stainless steel fasteners.

3. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.6 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast stainless steel.

B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

1. For aluminum and stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

D. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations and where indicated on Drawings, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.

- 1 2. Remove sharp or rough areas on exposed surfaces.
- 2 D. Form work true to line and level with accurate angles and surfaces.
- 3 E. Fabricate connections that are exposed to weather in a manner that excludes water.
- 4 1. Provide weep holes where water may accumulate.
- 5 2. Locate weep holes in inconspicuous locations.
- 6 F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- 7 G. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.
- 8 H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for
- 9 this purpose. Weld all around at connections, including at fittings.
- 10 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance
- 11 of base metals.
- 12 2. Obtain fusion without undercut or overlap.
- 13 3. Remove flux immediately.
- 14 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish
- 15 Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- 16 I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed
- 17 internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket
- 18 fittings.
- 19 J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate
- 20 members and fittings to produce flush, smooth, rigid, hairline joints.
- 21 1. Fabricate splice joints for field connection, using an epoxy structural adhesive, if this is
- 22 manufacturer's standard splicing method.
- 23 K. Form changes in direction as follows:
- 24 1. By bending to smallest radius that will not result in distortion of railing member.
- 25 L. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross
- 26 section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming
- 27 exposed surfaces of components.
- 28 M. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and
- 29 finish as railings.
- 30 N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns
- 31 unless clearance between end of rail and wall is 1/4 inch or less.
- 32 O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and
- 33 anchors to interconnect railing members to other work unless otherwise indicated.
- 34 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant
- 35 fillers or other means to transfer loads through wall finishes to structural supports and prevent
- 36 bracket or fitting rotation and crushing of substrate.
- 37 P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

Q. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.8 ALUMINUM FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Mill Finish: AA-M12, nonspecular as fabricated.

C. Clear Anodic Finish: AAMA 611, AA-M12C22A31.

2.9 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces.
3. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Pipe and Tubing Finishes:

1. 180-Grit Polished Finish: Uniform, directionally textured finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.

4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

3.4 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

C. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
2. For aluminum railings, attach posts as indicated, using fittings designed and engineered for this purpose.
3. For stainless steel railings, weld flanges to post and bolt to supporting surfaces.

D. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Attach handrails to guardrail assemblies as shown on Drawings.

- 1 3.6 CLEANING
- 2 A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with
3 clean water.
- 4 B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to
5 comply with ASTM A780/A780M.
- 6 3.7 PROTECTION
- 7 A. Protect finishes of railings from damage during construction period with temporary protective coverings
8 approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- 9 B. Restore finishes damaged during installation and construction period, so no evidence remains of
10 correction work. Return items that cannot be refinished in the field to the shop; make required alterations
11 and refinish entire unit, or provide new units.
- 12 END OF SECTION 055213

1 PART 1 - GENERAL

2 1.1 RELATED DOCUMENTS

- 3 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
4 Division 01 Specification Sections, apply to this Section.

5 1.2 SUMMARY

- 6 A. Section Includes:

- 7 1. Cold-applied, emulsified-asphalt dampproofing.

- 8 B. Related Requirements:

- 9 1. Section 033000 "Cast-in-Place Concrete" for bituminous vapor retarders under slabs-on-grade.
10 2. Section 042200 "Concrete Unit Masonry" for mortar parge coat on masonry surfaces.

11 1.3 ACTION SUBMITTALS

- 12 A. Product Data: For each type of product.

13 1.4 FIELD CONDITIONS

- 14 A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions
15 permit dampproofing to be performed according to manufacturers' written instructions.

- 16 B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces.
17 Maintain ventilation until dampproofing has cured.

18 PART 2 - PRODUCTS

19 2.1 MANUFACTURERS

- 20 A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single
21 manufacturer. Provide auxiliary materials recommended in writing by manufacturer of primary materials.

22 2.2 PERFORMANCE REQUIREMENTS

- 23 A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless
24 otherwise indicated.

25 2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- 26 A. Trowel Coats: ASTM D1227, Type II, Class 1.

1 B. Fibered Brush and Spray Coats: ASTM D1227, Type II, Class 1.

2 C. Brush and Spray Coats: ASTM D1227, Type III, Class 1.

3 2.4 AUXILIARY MATERIALS

4 A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and
5 compatible with bituminous dampproofing.

6 B. Emulsified-Asphalt Primer: ASTM D1227, Type III, Class 1, except diluted with water as recommended
7 in writing by manufacturer.

8 C. Asphalt-Coated Glass Fabric: ASTM D1668/D1668M, Type I.

9 D. Patching Compound: Epoxy or latex-modified repair mortar of type recommended in writing by
10 dampproofing manufacturer.

11 PART 3 - EXECUTION

12 3.1 EXAMINATION

13 A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for
14 surface smoothness, maximum surface moisture content, and other conditions affecting performance of
15 the Work.

16 B. Proceed with application only after substrate construction and penetrating work have been completed and
17 unsatisfactory conditions have been corrected.

18 3.2 PREPARATION

19 A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-
20 free, and dry substrates for dampproofing application.

21 B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with
22 dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

23 C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints,
24 and remove bond breakers if any.

25 D. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other
26 imperfections; cover with asphalt-coated glass fabric.

27 3.3 APPLICATION, GENERAL

28 A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats,
29 and drying time before backfilling unless otherwise indicated.

30 1. Apply dampproofing to provide continuous plane of protection.

31 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface
32 and uninterrupted coverage.

B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.

1. Extend dampproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch-wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

C. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least 1/4 inch onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

1. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe.

2. Lap dampproofing at least 1/4 inch onto shelf angles supporting veneer.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Unparged Masonry Foundation Walls: Apply primer and one trowel coat at not less than 5 gal./100 sq. ft..

B. Unexposed Face of Concrete Retaining Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft.

3.5 PROTECTION

A. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

B. Correct dampproofing that does not comply with requirements; repair substrates, and reapply dampproofing.

END OF SECTION 071113

1 SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Standing-seam metal roof panels.

- 9 B. Related Sections:

- 10 1. Section 074213.23 Metal Composite Material Wall Panels for metal panels used in horizontal
11 soffit applications.
12 2. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof
13 surface, allowing it to melt and drain off slowly.

14 1.3 PREINSTALLATION MEETINGS

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

- 16 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel
17 manufacturer's representative, structural-support Installer, and installers whose work interfaces
18 with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
19 2. Review and finalize construction schedule and verify availability of materials, Installer's
20 personnel, equipment, and facilities needed to make progress and avoid delays.
21 3. Review methods and procedures related to metal panel installation, including manufacturer's
22 written instructions.
23 4. Examine support conditions for compliance with requirements, including alignment between and
24 attachment to structural members.
25 5. Review structural loading limitations of deck during and after roofing.
26 6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other
27 construction that affect metal panels.
28 7. Review governing regulations and requirements for insurance, certificates, and tests and
29 inspections if applicable.
30 8. Review temporary protection requirements for metal panel systems during and after installation.
31 9. Review procedures for repair of metal panels damaged after installation.
32 10. Document proceedings, including corrective measures and actions required, and furnish copy of
33 record to each participant.

34 1.4 ACTION SUBMITTALS

- 35 A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 1. Build mockups for typical roof area only, including accessories.
 - a. Size: 12 feet long by 6 feet.
 - b. Each type of exposed seam and seam termination.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.
- E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
 1. Wind Loads: As indicated on Drawings.
 2. Other Design Loads: As indicated on Drawings.
 3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E1680 at the following test-pressure difference:
 1. Test-Pressure Difference: 6.24 lbf/sq. ft.
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E1646 at the following test-pressure difference:
 1. Test-Pressure Difference: 6.24 lbf/sq. ft.
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E2140.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 1. Uplift Rating: UL 90.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material.

2.2 STANDING-SEAM METAL ROOF PANELS

- A. Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports

using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1514.

- A. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.

1. Subject to compliance with requirements, provide one of the following products:

- a. Berridge Manufacturing Company; Zee-Lock Panel.
- b. Centria, SRS 3 Panel.
- c. Pac-Clad; PAC-150 90 degree Single Lock (smooth panel).

2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755.

- a. Nominal Thickness: 0.024 inch.
- b. Exterior Finish: Two-coat fluoropolymer.
- c. Colors: As follows, for types corresponding with designations on Drawings:

- 1) SMF-1: Custom color to match Architect' sample.

3. Clips: Two-piece floating to accommodate thermal movement.

- a. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

4. Joint Type: Single folded.
5. Panel Coverage: 16 inches.
6. Panel Height: 1.5 inches, 2.0 inches or 3.0 inch.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F; ASTM D1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D1970.

- B. Felt Underlayment: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felts.

- C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645; cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 coating designation

unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.

E. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot-long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.

F. Roof Curbs: Fabricated from same material as roof panels, **0.048-inch** nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of 0.060-inch-nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.

1. Insulate roof curb with 1-inch-thick, rigid insulation.

G. Panel Fasteners: Self-tapping screws designed to withstand design loads.

H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
- a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF UNDERLAYMENT

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Extend underlayment into gutter trough. Roll laps with roller. Cover underlayment within 14 days.
1. Apply over the entire roof surface.
- B. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.
- C. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 INSTALLATION OF STANDING SEAM METAL ROOF PANELS

- A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.

3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
 2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
 3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
 4. Stainless Steel Panels: Use stainless steel fasteners.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
1. Install clips to supports with self-tapping fasteners.
 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
 4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
 5. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.
2. Connect downspouts to underground drainage system indicated.

J. Roof Curbs: Install flashing around bases where they meet metal roof panels.

K. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

- 1 B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish
- 2 touchup or similar minor repair procedures.

- 3 END OF SECTION 074113.16

1 SECTION 074213.19 - INSULATED METAL WALL PANELS

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Foamed-insulation-core metal wall panels.

- 9 B. Related Requirements:

- 10 1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

11 1.3 PREINSTALLATION MEETINGS

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

13 .

- 14 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel
15 manufacturer's representative, structural-support Installer, and installers whose work interfaces
16 with or affects metal panels, including installers of doors, windows, and louvers.
17 2. Review and finalize construction schedule and verify availability of materials, Installer's
18 personnel, equipment, and facilities needed to make progress and avoid delays.
19 3. Review methods and procedures related to metal panel installation, including manufacturer's
20 written instructions.
21 4. Examine support conditions for compliance with requirements, including alignment between and
22 attachment to structural members.
23 5. Review flashings, special siding details, wall penetrations, openings, and condition of other
24 construction that affect metal panels.
25 6. Review governing regulations and requirements for insurance, certificates, and tests and
26 inspections if applicable.
27 7. Review temporary protection requirements for metal panel assembly during and after installation.
28 8. Review procedures for repair of metal panels damaged after installation.
29 9. Document proceedings, including corrective measures and actions required, and furnish copy of
30 record to each participant.

31 1.4 ACTION SUBMITTALS

- 32 A. Product Data: For each type of product.

- 33 1. Include construction details, material descriptions, dimensions of individual components and
34 profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Structural failures including rupturing, cracking, or puncturing.
- b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
- b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
- c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer: Metl-Span, a Nucor company; Lewisville, Texas Tel: 972.221.6656; Email: info@metlspan.com; Web: metlspan.com

B. Provide basis of design product or comparable product approved by Architect prior to bid.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E72:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/180 of the span.

- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F , ambient.

2.3 FOAMED-INSULATION-CORE METAL WALL PANELS

- A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.

- a. Closed-Cell Content: 90 percent when tested according to ASTM D6226.
- b. Density: 2.0 to 2.6 lb/cu. ft. when tested according to ASTM D1622.
- c. Compressive Strength: Minimum 20 psi when tested according to ASTM D1621.
- d. Shear Strength: 26 psi when tested according to ASTM C273/C273M.

- B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels (IMWP-1): Structural metal panel consisting of flush, smooth exterior metal sheet, and interior metal sheet with a Light Mesa profile, with factory foamed-in-place polyurethane core in thermally-separated profile, with tongue-and-groove panel edges, attached to supports using concealed fasteners.

1. Basis of Design: Metl-Span, CF Architectural.

2. G-90 galvanized coated steel conforming to ASTM A 653 or AZ-50 aluminum-zinc alloy coated steel, conforming to ASTM A 792/A 792M, minimum grade 33, pre-painted by the coil-coating process per ASTM A 755/A 755M.

- a. Exterior Face Sheet: 22 gauge thickness, with smooth unembossed surface.
- b. Exterior Finish: Fluoropolymer two-coat system.

- 1) Color: As selected by Architect from manufacturer's full range.
- c. Interior Face Sheet: 24 gauge thickness, with stucco-embossed Light Mesa profile.
- d. Interior Finish: Polyester two-coat system.
- 1) Color A: As selected by Architect from manufacturer's full range.
- 2) Color B: As selected by Architect from manufacturer's full range.
3. Panel Coverage: 30 inches and 24 inches nominal in pattern indicated on drawings.
4. Panel Thickness: 3.0 inches.
5. Thermal-Resistance Value (R-Value): 26.2 per ASTM C 518 at 35 degrees Fahrenheit mean temperature.
- C. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels (**IMWP-2**): Structural metal panels consisting of exterior metal sheet and interior metal sheet with matching 4 by 1/8 inch o.c. profile. Factory foamed-in-place polyurethane core in thermally-separated profile, with tongue-and-groove panel edges, attached to supports using concealed fasteners.
1. Basis of Design: Metl-Span, CF Mesa Wall Panel.
2. G-90 galvanized coated steel conforming to ASTM A 653 or AZ-50 aluminum-zinc alloy coated steel, conforming to ASTM A 792/A 792M, minimum grade 33, pre-painted by the coil-coating process per ASTM A 755/A 755M.
- a. Exterior Face Sheet: 24 gauge thickness, with smooth unembossed surface.
- b. Exterior Finish: Fluoropolymer two-coat system.
- 1) Color: As selected by Architect from manufacturer's full range.
- c. Interior Face Sheet: 26 gauge thickness, with stucco-embossed Light Mesa profile.
- d. Interior Finish: Polyester two-coat system.
- 1) Color: As selected by Architect from manufacturer's full range.
3. Panel Width: 42 inches.
4. Panel Thickness: 3.0 inches. Panel thickness measured from inside skin to top of high cell.
5. Thermal-Resistance Value (R-Value): 26.9 per ASTM C 518 at 35 degrees Fahrenheit mean temperature.
- 2.4 MISCELLANEOUS MATERIALS
- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to

match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

- a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
1. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
- D. Aluminum Panels and Accessories:
1. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
- a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

- B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.

1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 INSULATED METAL WALL PANEL INSTALLATION

- A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.

1. Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.
2. Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

3. Provide metal-backed washers under heads of exposed fasteners on weather side of insulated metal wall panels.
4. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
5. Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.
6. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.
7. Apply snap-on battens to exposed-fastener, insulated-core metal wall panel seams to conceal fasteners.

- B. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.

1. Install clips to supports with self-tapping fasteners.

- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

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- B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

- D. Metal wall panels will be considered defective if they do not pass test and inspections.

1 E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of
2 replaced or additional work with specified requirements.

3 F. Prepare test and inspection reports.

4 3.6 CLEANING AND PROTECTION

5 A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless
6 otherwise indicated in manufacturer's written installation instructions. On completion of metal panel
7 installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean
8 condition during construction.

9 B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

10 C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish
11 touchup or similar minor repair procedures.

12 END OF SECTION 074213.19

1 SECTION 074213.23 - METAL COMPOSITE MATERIAL WALL PANELS

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section includes metal composite material wall panels.

8 1.3 PREINSTALLATION MEETINGS

9 1.4 ACTION SUBMITTALS

- 10 A. Product Data: For each type of product.

- 11 1. Include construction details, material descriptions, dimensions of individual components and
12 profiles, and finishes for each type of panel and accessory.

- 13 B. Shop Drawings:

- 14 1. Include fabrication and installation layouts of metal composite material panels; details of edge
15 conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings,
16 closures, and accessories; and special details.
17 2. Accessories: Include details of the flashing, trim and anchorage, at a scale of not less than 1-1/2
18 inches per 12 inches.

- 19 C. Samples for Initial Selection: For each type of metal composite material panel indicated with factory-
20 applied color finishes.

- 21 1. Include similar Samples of trim and accessories involving color selection.

- 22 D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated
23 below.

- 24 1. Metal Composite Material Panels: 12 inches long by 12 inch wide. Include fasteners, closures, and
25 other metal composite material panel accessories.

26 1.5 INFORMATIONAL SUBMITTALS

- 27 A. Qualification Data: For Installer.

- 28 B. Product Test Reports: For each product, tests performed by a qualified testing agency.

- 29 C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal composite material panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal composite material panel assembly as shown on Drawings, including supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of mockup of metal composite material panel assembly, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal composite material panels, and other manufactured items so as not to be damaged or deformed. Package metal composite material panels for protection during transportation and handling.

B. Unload, store, and erect metal composite material panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal composite material panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal composite material panels to ensure dryness, with positive slope for drainage of water. Do not store metal composite material panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal composite material panels during installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal composite material panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal composite material panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Structural failures including rupturing, cracking, or puncturing.
- b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
- b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
- c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E330:

1. Wind Loads:

- a. Basic Wind Speed (3 second gust): 128 mph
 - b. Risk Category: IV
 - c. Wind Exposure Category: Exposure C
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL COMPOSITE MATERIAL WALL PANELS (MCMWP)

- A. Metal Composite Material Wall Panel Systems (MCMWP): Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assembly components, and accessories required for weathertight system.

1. Basis-of-Design product: BAMCO Inc. 30 Baekeland Ave, Middlesex, NJ 08846, (800-245-0210 or 732-3020889) www.bamcoinc.org

- a. Manufacturers: Subject to compliance with requirements, products may be provided by one of the following:

- 1) Alucobond USA:
 - a) Wet Sealed Alucobond Plus
- 2) PAC-CLAD/Petersen Aluminum
 - a) PAC-3000 CS

- B. Aluminum-Faced Composite Wall Panels: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable. All panels corners shall be routed/folded reinforced with structural sealant and reinforced with angles or extrusions. Panel edges shall have rivets at exposed panel edges. Formed with 0.0197-inch-thick, aluminum sheet facings.

1. Panel Thickness: .157 inch.
2. Core: Standard.
3. Coil coated KYNAR® 500 in conformance with the following general requirements of AAMA 2605.
 - a. Color: Match Architect's samples.
4. Acceptable raw material manufacturers:
 - a. ALUCOBOND material manufactured by 3A Composites USA, Inc. 208 West 5th Street, Benton, KY 42025 (800-626-3365 or 270-527-4200)
 - b. REYNOBOND PE material manufactured by Alcoa Architectural Products (USA), 50 Industrial Boulevard, Eastman, Georgia 31023 (800-841-7774 or 478-374-4746)
 - c. ALPOLIC material manufactured by Mitsubishi Chemical FP America Inc, 401 Volvo Parkway, Chesapeake, Virginia, 23320 (800-422-7270 or 757-548-7826)

- C. Attachment Assembly Components: Formed from extruded aluminum.

- D. Attachment Assembly: Manufacturer's standard.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.

- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.

- 1 C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material
2 panels as required to seal against weather and to provide finished appearance. Locations include, but are
3 not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps,
4 soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite
5 material panels.
- 6 D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with
7 heads matching color of metal composite material panels by means of plastic caps or factory-applied
8 coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- 9 E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use
10 classifications required to seal joints in metal composite material panels and remain weathertight; and as
11 recommended in writing by metal composite material panel manufacturer.

12 2.4 FABRICATION

- 13 A. General: Fabricate and finish metal composite material panels and accessories at the factory, by
14 manufacturer's standard procedures and processes, as necessary to fulfill indicated performance
15 requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional
16 and structural requirements.
- 17 B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips
18 that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from
19 movements.
- 20 C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's
21 recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to
22 design, dimensions, metal, and other characteristics of item indicated.
- 23 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool
24 marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- 25 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal
26 with epoxy seam sealer. Rivet joints for additional strength.
- 27 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams.
28 Tin edges to be seamed, form seams, and solder.
- 29 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to
30 comply with SMACNA standards.
- 31 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on
32 faces of accessories exposed to view.
- 33 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from
34 compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
- 35 a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall
36 panel manufacturer for application but not less than thickness of metal being secured.

37 2.5 FINISHES

- 38 A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable,
39 temporary protective covering before shipping.
- 40 B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if
41 they are within one-half of the range of approved Samples. Noticeable variations in same piece are not

acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal composite material panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal composite material wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal composite material wall panel manufacturer.

- a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

- B. Examine roughing-in for components and assemblies penetrating metal composite material panels to verify actual locations of penetrations relative to seam locations of metal composite material panels before installation.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal composite material panel manufacturer's written recommendations.

3.3 METAL COMPOSITE MATERIAL PANEL INSTALLATION

- A. General: Install metal composite material panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor metal composite material panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal composite material panels.
2. Flash and seal metal composite material panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal composite material panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.

5. Install flashing and trim as metal composite material panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal composite material panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
2. Copper Panels: Use copper, stainless-steel or hardware-bronze fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal composite material panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

E. Installation: Attach metal composite material wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.

1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
2. Dry Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with manufacturer's standard gasket system.
3. Rainscreen Systems: Do not apply sealants to joints unless otherwise indicated.

F. Clip Installation: Attach panel clips to supports at locations, spacings, and with fasteners recommended by manufacturer. Attach routed-and-turned flanges of wall panels to panel clips with manufacturer's standard fasteners.

1. Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
2. Seal horizontal and vertical joints between adjacent metal composite material wall panels with manufacturer's standard gaskets. Track-Support Installation: Install support assembly at locations, spacings, and with fasteners recommended by manufacturer. Use manufacturer's standard horizontal tracks and vertical tracks that provide support and secondary drainage assembly, draining to the exterior at horizontal joints through drain tube. Attach metal composite material wall panels to tracks by interlocking panel edges with manufacturer's standard "T" clips.
1. Attach routed-and-turned flanges of wall panels to perimeter extrusions with manufacturer's standard fasteners.
2. Install wall panels to allow individual panels to "free float" and be installed and removed without disturbing adjacent panels.
3. Do not apply sealants to joints unless otherwise indicated.

H. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal composite material panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal composite material panel manufacturer; or, if not indicated, provide types recommended in writing by metal composite material panel manufacturer.

I. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal composite material wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal composite material wall panel installation, including accessories.

B. Metal composite material wall panels will be considered defective if they do not pass test and inspections.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal composite material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal composite material panel installation, clean finished surfaces as recommended by metal composite material panel manufacturer. Maintain in a clean condition during construction.

B. After metal composite material panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal composite material panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

1 END OF SECTION 074213.23

1 SECTION 077253 - SNOW GUARDS

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Rail-type, seam-mounted snow guards.

9 1.3 ACTION SUBMITTALS

- 10 A. Product Data: For each type of product, include construction details, material descriptions, dimensions of
11 individual components and profiles, and finishes.

- 12 B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.

- 13 1. Include details of rail-type snow guards.

- 14 C. Samples:

- 15 1. Rail-Type Snow Guards: Bracket, 12-inch-long rail, and installation hardware.

- 16 a. For units with factory-applied finishes, submit manufacturer's standard color selections.

17 1.4 FIELD CONDITIONS

- 18 A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions
19 permit adhesive-mounted snow guards to be installed, and adhesive cured, according to adhesive
20 manufacturer's written instructions.

21 PART 2 - PRODUCTS

22 2.1 PERFORMANCE REQUIREMENTS

- 23 A. Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally
24 induced movement without failure, rattling, or fastener disengagement due to defective manufacture,
25 fabrication, installation, or other defects in construction.

- 26 1. Temperature Change: 120 deg , ambient; 180 deg F, material surfaces.

- B. Structural Performance: Snow guards shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Snow Loads: As indicated on Drawings.

2.2 RAIL-TYPE SNOW GUARDS

- A. Rail-Type, Seam-Mounted Snow Guards:

1. Rail-Type, Seam-Mounted Snow Guards: Snow guard rails fabricated from metal pipes, bars, or extrusions, anchored to brackets and equipped with one rail with color-matching inserts of material and finish used for metal roofing.
 - a. Basis of Design Product: Alpine SnowGuards, Div. of Vermont Slate & Copper Services, Inc.; S-5! ColorGard.
 - b. Color:
 - 1) Color: Color match Standing-Seam Metal Roof Panel.
2. Seam clamps: ASTM B221 aluminum extrusion or ASTM B85/B85M aluminum casting with stainless steel set screws incorporating round nonpenetrating point; designed for use with applicable roofing system to which clamp is attached.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.
1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare substrates for bonding snow guards.
- B. Prime substrates according to snow guard manufacturer's written instructions.

3.3 INSTALLATION

- A. Install snow guards according to manufacturer's written instructions.
1. Space rows as indicated on Drawings.
 2. Space rows as recommended by manufacturer.
- B. Attachment for Standing-Seam Metal Roofing:
1. Do not use fasteners that will penetrate metal roofing or fastening methods that void metal roofing finish warranty.

- 1 a. Solder to copper roofing according to manufacturer's instructions.
- 2 2. Rail-Type, Seam-Mounted Snow Guards:
 - 3 a. Install brackets to vertical ribs in straight rows.
 - 4 b. Secure with stainless steel set screws, incorporating round nonpenetrating point, on same
 - 5 side of standing seam.
 - 6 c. Torque set screw according to manufacturer's instructions.
 - 7 d. Install cross members to brackets.
- 8 END OF SECTION 077253

1 SECTION 105113.02 - METAL PERSONNEL LOCKERS

2 PART 1 GENERAL

3 1.1 SUMMARY

4 A. Section Includes:

- 5 1. Metal personnel locker units with hinged doors.

6 1.2 REFERENCES

- 7 A. ASTM International (ASTM) A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated
8 (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

9 1.3 SYSTEM DESCRIPTION

10 A. Metal Lockers:

- 11 1. Configuration: Single tier.
12 2. Size: 18 inches wide x 24 inches deep x 72 inches high.
13 3. Permit installation of an electrical system.
14 4. Drawer units: Same width as locker x 18 inches high x 24 inches deep, installed under locker
15 units.

16 1.4 SUBMITTALS

17
18 A. Submittals for Review:

- 19 1. Shop Drawings: Include dimensioned plans and elevations showing locker layout and
20 relationship to adjacent construction.
21 2. Product Data: Manufacturer's descriptive data.
22 3. Samples: 3-1/4 x 1-1/2 inch paint samples.

23 1.5 QUALITY ASSURANCE

- 24 A. Manufacturer Qualifications: Minimum 10 years documented experience in work of this Section.

25 1.6 WARRANTIES

- 26 A. Provide manufacturer's 5-year warranty against defects in materials and workmanship.

27 PART 2 PRODUCTS

28 2.1 MANUFACTURERS

- 29 A. Basis-of-Design Product: Subject to compliance with requirements, provide Personnel Lockers by
30 Steele Solutions or comparable products by one of the following manufacturers:

- 31 1. Southwest Solutions Group

32 2.2 MATERIALS

33 A. Steel Sheet:

- 34 1. ASTM A1008/A1008M.

2.3 FABRICATION

A. Construction:

1. Doors: Minimum 16 gauge steel.
2. Back panels, top panels, and inner panels except inner doors: Minimum 20 gauge steel.
3. Side and bottom panels: Minimum 18 gauge steel.

B. Doors:

1. Louvered top and bottom.
2. Door hinges: 14 gauge steel, continuous type, concealed, 180 degree opening.

C. Frames:

1. Formed and welded into integrated units with doors installed.
2. Body parts flanged and angled to provide rigidity; assembled by welding, bolting, or riveting using corrosion-resistant bolts and aluminum or stainless-steel rivets.
3. Provide mounting holes for attaching lockers back-to-back and side-by-side.

D. Internal Components:

1. Shelves:
 - a. One small and one large shelf.
 - b. One small shelf with valuables compartment.
2. Double hook for storage.
3. Single coat hook on each side panel.
4. Two (2) single prong hooks on inside of door.
5. Knockouts for electrical conduit; verify location in field.

E. Drawer Unit:

1. Minimum welded 18 gauge steel top, bottom, back, and sides.
2. Bottom and top open for access to fasten unit to floor and wall during installation, not requiring removal of drawer.
3. Provide holes for attaching bench seat.
4. Keyless locking mechanism securing drawer when the door is closed. Released by pull handle inside locker.
5. Maximum 200 pound load capacity on drawer slides.
6. Provide mounting tabs for attaching body armor drying rack.

F. Door Locks and Latches:

1. Lift latch operated, top and bottom bayonet style.
2. Recessed door latch, painted cup with integral door latch/pull, pry-resistant, not protruding beyond face of door.
3. Locking Mechanism: Padlock hasp- shackle diameter to be used on Steele Solutions Infinity Lockers is 0.250"-0.312".

G. Number Plates:

1. Number plates furnished loose and affixed to locker using pop rivets in pre-drilled holes in door.
2. Number doors as directed by Owner.

H. Accessories:

1. Continuous sloping tops, minimum 24 gauge steel. Field cut to size.
2. Finished end panels without exposed fasteners, minimum 16 gauge steel.
3. Filler panels, minimum 20 gauge steel. Field cut to size.
4. Modular electrical kit system with interior power strip reel.

1 2.4 FINISHES

2 A. Steel:

- 3 1. Minimum 3 mil thick factory-applied baked-on textured powder coat finish.
4 2. Color: To be selected from manufacturer's full color range.

5 PART 3 EXECUTION

6 3.1 INSTALLATION

7 A. Install in accordance with manufacturer's instructions and approved Shop Drawings.

8 B. Set plumb, level, and aligned.

9 C. Attach lockers to supporting construction with anchors best suited to substrate conditions.

10 D. Bolt adjacent locker units together to provide rigid installation.

11 E. Install slope tops, end panels, filler trim, drawer bases, and electrical.

12 3.2 ADJUSTING

13 A. Adjust doors and latches to operate correctly.

14 END OF SECTION

1 SECTION 125500 - DETENTION FURNITURE

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Detention seating.

9 1.3 COORDINATION

- 10 A. Coordinate installation of anchorages for detention furniture. Furnish setting drawings, templates, and
11 directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with
12 integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in
13 time for installation.

14 1.4 ACTION SUBMITTALS

- 15 A. Product Data: For each type of product.

- 16 1. Include construction details, material descriptions, dimensions of individual components and
17 profiles, and finishes for detention furniture.

- 18 B. Shop Drawings: For detention furniture.

- 19 1. Include plans, elevations, sections, and attachment details.
20 2. Indicate locations, dimensions, and profiles of wall and floor reinforcements.
21 3. Indicate locations and installation details of built-in anchors.
22 4. Show elevations of detention furniture and indicate dimensions of furniture, preparations for
23 receiving anchors, and locations of anchorage.
24 5. Show details of attachment of detention furniture to built-in anchors.

25 1.5 INFORMATIONAL SUBMITTALS

- 26 A. Welding certificates.

- 27 B. Examination reports, documenting inspections of substrates, areas, and conditions.

- 28 C. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.

1 1.6 CLOSEOUT SUBMITTALS

- 2 A. Maintenance Data: For detention mattresses to include in maintenance manuals.

3 1.7 MAINTENANCE MATERIAL SUBMITTALS

- 4 A. Furnish extra materials that match products installed and that are packaged with protective covering for
5 storage and identified with labels describing contents.

- 6 1. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each
7 type and size of security fastener installed.
8 2. Tools: Provide two sets of tools for installing and removing security fasteners.

9 1.8 QUALITY ASSURANCE

- 10 A. Welding Qualifications: Qualify procedures and personnel according to the following:

- 11 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
12 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
13 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

14 1.9 DELIVERY, STORAGE, AND HANDLING

- 15 A. Detention Mattresses: Deliver wrapped to provide protection during transit and Project-site storage.
16 Protect from contact with moisture.

17 1.10 FIELD CONDITIONS

- 18 A. Field Measurements: Verify openings for recessed detention furniture by field measurements before
19 fabrication.

20 PART 2 - PRODUCTS

21 2.1 DETENTION SEATING

- 22 A. Floor-Mounted Bench:

- 23 1. Basis-of-Design Product: Subject to compliance with requirements, provide G2 Automated
24 Technologies, LLC; Kryptomax Floor Mount Detention Bench, or comparable products by one of
25 the following manufacturers:

- 26 a. Norix Group, Inc.

- 27 2. Bench Top: Formed from 0.109-inch- thick, stainless-steel sheet, with minimum 1-1/2-inch
28 flanged edges with 0.109-inch-thick reinforcement plate welded to underside of bench top.

- 29 a. Size: Minimum 18 inches deep by 88 inches long.

3. Supports: Two-inch (2") diameter schedule 40 stainless steel pedestals that are welded to stainless steel reinforced plates on the underside of the bench and to the base plate for an overall bench height of not less than 18 inches. Provide minimum three (3) supports for bench or more as recommended by manufacturer.
4. Handcuff Ring: Formed from 3/8-inch- diameter, stainless-steel rod; welded to front of each support.
5. Base Plates: Minimum 8-inch-square by 1/4-inch-thick, steel plate punched with four holes for floor anchorage.

B. Materials:

1. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
4. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
5. Steel Tubing: ASTM A513/A513M, Type B unless otherwise indicated; thickness indicated or required by structural loads.
6. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless another weight is indicated or required by structural loads.

C. Finishes:

1. Stainless-Steel Finish:

- a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- b. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1) Run grain of directional finishes with long dimension of each piece.
 - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3) Directional Satin Finish: No 4.

2.2 FABRICATION

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention furniture with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form and grind edges and corners to be free of sharp edges or rough areas.
 1. Fabricate detention furniture with no more than 1/32-inch gap between component materials. Weld edges that cannot be crimped to meet tolerance so as to provide a seamless joint with no place for concealment of contraband.

- 1 E. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible
2 without causing grain separation or otherwise impairing the Work.
- 3 F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
- 4 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance
5 of base metals.
6 2. Obtain fusion without undercut or overlap.
7 3. Remove welding flux immediately.
8 4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no
9 roughness shows after finishing and contour of welded surface matches that of adjacent surface.
10 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding
11 oxides from exposed surfaces by descaling or grinding.
- 12 G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space
13 anchoring devices to secure detention furniture rigidly in place and to support expected loads. Build in
14 straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction.
15 Reinforce formed-metal units as needed to attach and support other construction.
- 16 H. Cut, reinforce, drill, and tap detention furniture as indicated to receive hardware, security fasteners, and
17 similar items.
- 18 I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.
- 19 J. Form exposed connections with hairline joints, flush and smooth using concealed fasteners where
20 possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk)
21 security fasteners. Locate joints where least conspicuous.

22 2.3 SECURITY FASTENERS

- 23 A. Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific
24 type of fastener. Drive-system type, head style, material, and protective coating as required for assembly,
25 installation, and strength, and as follows:
- 26 1. Drive-System Type: Pinned Torx-Plus.
27 2. Fastener Strength: 120,000 psi.
28 3. Socket Button Head Fasteners:
- 29 a. Stainless steel, ASTM F879, Group 1 CW.
- 30 4. Socket Flat Countersunk Head Fasteners:
- 31 a. Stainless steel, ASTM F879, Group 1 CW.
- 32 5. Socket Head Cap Fasteners:
- 33 a. Stainless steel, ASTM F837, Group 1 CW.
- 34 6. Protective Coatings for Heat-Treated Alloy Steel:
- 35 a. Zinc phosphate with oil, ASTM F1137, Grade I, or black oxide unless otherwise indicated.

2.4 ACCESSORIES

- A. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
- B. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing per ASTM E488/E488M, conducted by a qualified testing agency; of type indicated below:
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed; hot-dip galvanized per ASTM A153/A153M or ASTM F2329/F2329M.
- C. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch thick; with minimum 1/2-inch- diameter, headed studs welded to back of plate.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention furniture.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention furniture before detention furniture installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention furniture.
- D. Inspect built-in and cast-in anchor installations, before installing detention furniture, to verify that anchor installations comply with requirements. Prepare inspection reports.
 - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
 - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations of detention furniture with those indicated on Shop Drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing detention furniture to in-place construction. Include threaded fasteners for concrete inserts, security fasteners, and other connectors.
- B. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention furniture. Set detention furniture accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- 1 C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or similar
2 construction.
- 3 D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be
4 left as exposed joints but cannot be shop welded because of shipping size limitations.
- 5 E. Assemble detention furniture requiring field assembly with security fasteners with no exposed fasteners
6 on exposed faces and frames.
- 7 F. Anchor furniture with security fasteners to floors.
- 8 1. Use security fasteners with head styles appropriate for installation requirements, strength, and
9 finish of adjacent materials, except that a maximum of two different sets of tools shall be required
10 to operate security fasteners for Project. Provide stainless-steel security fasteners in painted
11 materials.
- 12 2. Weld nuts onto cast-in-place anchors after installation so as to be nonremovable.
- 13 G. Apply polyurethane security sealant at all exposed gaps between detention furniture and adjacent
14 construction greater than 1/16 inch.
- 15 H. Install one detention mattress for each detention bunk.
- 16 3.3 FIELD QUALITY CONTROL
- 17 A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate
18 compliance with and deviations from the Contract Documents.
- 19 B. Remove and replace detention work if inspections indicate that work does not comply with specified
20 requirements. Remove malfunctioning units; replace with new units.
- 21 C. Perform additional inspections to determine compliance of replaced or additional work. Prepare
22 inspection reports.
- 23 END OF SECTION 125500

1 SECTION 323113 - CHAIN LINK FENCES AND GATES

2 PART 1 - GENERAL

3 1.1 RELATED DOCUMENTS

- 4 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
5 Division 01 Specification Sections, apply to this Section.

6 1.2 SUMMARY

- 7 A. Section Includes:

- 8 1. Chain-link fences.
9 2. Swing.

- 10 B. Related Requirements:

- 11 1. Section 033000 "Cast-in-Place Concrete.

12 1.3 ACTION SUBMITTALS

- 13 A. Product Data: For each type of product.

- 14 1. Include construction details, material descriptions, dimensions of individual components and
15 profiles, and finishes for the following:
16 a. Fence and gate posts, rails, and fittings.
17 b. Chain-link fabric, reinforcements, and attachments.
18 c. Gates and hardware.

- 19 B. Shop Drawings: For each type of fence and gate assembly.

- 20 1. Include plans, elevations, sections, details, and attachments to other work.
21 2. Include accessories, hardware, gate operation, and operational clearances.

- 22 C. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples
23 of size indicated below:

- 24 1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for
25 accessories.

- 26 D. Delegated-Design Submittal: For structural performance of chain-link fence and gate frameworks,
27 including analysis data signed and sealed by the qualified professional engineer responsible for their
28 preparation.

1 1.4 FIELD CONDITIONS

- 2 A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in
3 relation to property survey and existing structures. Verify dimensions by field measurements.

4 PART 2 - PRODUCTS

5 2.1 CHAIN-LINK FENCE FABRIC

- 6 A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage
7 knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

- 8 1. Fabric Height: 120 inches.
9 2. Steel Wire for Fabric: Wire diameter of 0.148 inch.
10 a. Mesh Size: 2 inches.
11 b. Polymer-Coated Fabric: ASTM F668, Class 2b over zinc-coated steel wire.
12 1) Color: Black, according to ASTM F934.

13 2.2 FENCE FRAMEWORK

- 14 A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts.
15 Provide members with minimum dimensions and wall thickness according to ASTM F1043 based on the
16 following:

- 17 1. Fence Height: 120 inches.
18 2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.
19 a. Line Post: 2.875 inches in diameter.
20 b. End, Corner, and Pull Posts: 2.875 inches in diameter.
21 3. Horizontal Framework Members: Intermediate, top, and bottom rails according to ASTM F1043.
22 a. Top Rail: 1.66 inches in diameter.
23 4. Brace Rails: ASTM F1043.
24 5. Polymer coating over metallic coating.
25 a. Color: Black, according to ASTM F934.

26 2.3 SWING GATES

- 27 A. General: ASTM F900 for gate posts and single and double swing gate types.
28 1. Gate Leaf Width: 36 inches.
29 2. Framework Member Sizes and Strength: Based on gate fabric height of more than 72 inches.
30 B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; protective coating and finish to match fence framework.
 2. Gate Posts: Round tubular steel.
 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: Welded or assembled with corner fittings.
- D. Hardware:
1. Hinges: 180-degree outward swing.
 2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
- 2.4 FITTINGS
- A. Provide fittings according to ASTM F626.
- B. Post Caps: Provide for each post.
1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails to posts.
- E. Tension and Brace Bands: Pressed steel.
- F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Tie Wires, Clips, and Fasteners: According to ASTM F626.
1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch-diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
- H. Finish:
1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.
 - a. Polymer coating over metallic coating.

2.5 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
- D. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- E. Intermediate and Bottom Rails: Secure to posts with fittings.
- F. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- G. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- H. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

- 1 I. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side.
2 Peen ends of bolts or score threads to prevent removal of nuts.
- 3 3.2 GATE INSTALLATION
- 4 A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening
5 without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed
6 means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.
- 7 3.3 ADJUSTING
- 8 A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection,
9 distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.
10 Confirm that latches and locks engage accurately and securely without forcing or binding.
- 11 END OF SECTION 323113

SECTION 323119.53 - DECORATIVE METAL SECURITY FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Decorative metallic-coated-steel security fences.
2. Swing gates.
3. Horizontal-slide gates.
4. Gate operators, including controls.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete bases for gate operators, drives, and controls, footings for fence posts, and post concrete fill.
2. Section 087100 "Door Hardware" for door hardware installed at controlled access gates.
3. Section 281300 "Electronic Access Control" for access control devices installed at gates and provided as part of a security system.
4. Division 26 Sections for electrical service and connections for system disconnect switches and powered devices including, but not limited to, motor operators, controls, and limit switches.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

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

- B. Shop Drawings: For fencing and gates.

1. Include plans, elevations, sections, gate locations, post spacing, mounting details, and grounding details.
2. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
3. Wiring Diagrams: Include diagrams for power, signal, and control wiring.

- C. Samples: For each fence material and for each color specified.

1. Provide Samples 12 inches in length for linear materials.

1 1.5 INFORMATIONAL SUBMITTALS

- 2 A. Field quality-control reports.

3 1.6 CLOSEOUT SUBMITTALS

- 4 A. Maintenance Data: For gate operators to include in maintenance manuals.

5 PART 2 - PRODUCTS

6 2.1 PERFORMANCE REQUIREMENTS

- 7 A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality
8 Requirements," to design decorative security fence and gate frameworks.

- 9 B. Structural Performance: Decorative security fence and gate frameworks shall withstand the design wind
10 loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

- 11 1. Design Wind Load: As indicated on Drawings.

12 2.2 DECORATIVE METALLIC-COATED-STEEL SECURITY FENCES

- 13 A. Decorative Metallic-Coated-Steel Security Fences:

- 14 1. Basis-of-Design Product: Subject to compliance with requirements, provide Ametco
15 Manufacturing Corporation, 4326 Hamann Parkway, P.O. Box 1210, Willoughby, Ohio 44096;
16 800-362-1360.

- 17 B. Fence System:

- 18 1. Type: Ornamental steel fencing system consisting of modular open grille fencing panels
19 fabricated by welding flat steel bars and rods, supported by steel posts and gates and gate
20 hardware; Ametco Fence System as manufactured by Ametco Manufacturing Corporation.

- 21 2. Fence panels: Fabricated from galvanized steel rods, flat bars, and louvers welded to form an
22 open grille pattern; Metro and Shadow 100 (where shown on Drawings) as manufactured by
23 Ametco Manufacturing Corporation.

- 24 a. Metro® fence panel:

- 25 1) Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [2-7/16 inches]
26 [62 mm].

- 27 2) Horizontal cross rods: 3/16 inch diameter rods spaced at 5-3/16 inches.

- 28 3) Top and bottom perimeter bars: 1 by 1/8 inch flat bars.

- 29 4) Panel height: 72 inches.]

- 30 5) Panel width: 78-7/16inches.

31

32

- 1 b. Shadow® fixed louver pattern fence panel.
- 2 1) Horizontal fixed louver bars: Formed louver shaped bars, 1-31/32 by 1/16 inch,
- 3 spaced at 1-13/16 inch. Extend louver flange to allow 100 percent direct visual
- 4 screening.
- 5 2) Cross rods: 5/32 inch diameter rods welded perpendicular to back side of louver
- 6 bars and spaced at 5-7/32 inches.
- 7 3) Perimeter side support bars: 2 by 1/4 inch flat bars.
- 8 4) Panel height: 72 inches.
- 9 5) Panel width: Provide in widths up to 64-21/32 inches.
- 10 3. Posts: Galvanized square steel tubes.
- 11 a. Size: 3-1/2 inch by 5/16 inch.
- 12 b. Weld flat steel bar top caps to tubular posts.
- 13 C. Fasteners: Stainless-steel carriage bolts with tamperproof nuts.
- 14 D. Finish: Powder coating.
- 15 2.3 CANTILEVERED HORIZONTAL SLIDING GATE
- 16 A. Gate Type and Configuration: Cantilevered horizontal sliding gate as indicated on Drawing.
- 17 B. Automated vehicular gates shall comply with ASTM F2200, Class IV.
- 18 C. Construction: Welded frame fabricated from steel tubing (minimum 3-1/2" by 5/16") with open grille
- 19 steel panels to match fencing material. Frame configuration shall be as indicated on Drawings and
- 20 approved shop drawings.
- 21 D. Cantilever mechanism:
- 22 1. Steel monorail track and wheeled carriers and top guide rollers. For gates up to 60 feet and under
- 23 3,500 lbs. with overhang of 30 to 60 percent of opening
- 24 2.4 SWING GATE (Gate numbered as Door 161 on plans):
- 25 A. Gate Type and Configuration: Hinged swinging gate as indicated on Drawing.
- 26 1. Panel Infill: Shadow® fixed louver pattern panel.
- 27 B. Construction: Welded frame fabricated from 3-1/2" by 5/16" steel tubing with infill panels as indicated
- 28 on Drawings.
- 29 C. Hardware: Prepare gate for installation of door hardware specified for Door 161 "Exterior Security Gate".
- 30 1. Power supply;
- 31 2. Exit Device;
- 32 3. Core; and
- 33 4. Cylinder.
- 34

- 1 D. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
- 2 1. Function: 39 - Full surface, triple weight, antifriction bearing.
- 3 2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.
- 4 2.5 SWING GATE (Double swing gate at Dumpster Enclosure):
- 5 A. Gate Type and Configuration: Hinged swinging gate as indicated on Drawing.
- 6 1. Panel Infill: Shadow® fixed louver pattern panel.
- 7 B. Construction: Welded frame fabricated from 3-1/2" by 5/16" steel tubing with infill panels as indicated
- 8 on Drawings.
- 9 C. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf
- 10 more than 5 feet wide. Provide center gate stops and cane bolts for pairs of gates. Fabricate latches with
- 11 integral eye openings for padlocking; padlock accessible from both sides of gate.
- 12 D. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
- 13 1. Function: 39 - Full surface, triple weight, antifriction bearing.
- 14 2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.
- 15 E. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from 3/4-inch-diameter, round steel
- 16 bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to
- 17 receive cane bolts in both open and closed positions.
- 18 2.6 SWING GATE (Double swing gate at west end of secured parking lot):
- 19 A. Gate Type and Configuration: Hinged swinging gate as indicated on Drawing.
- 20 1. Panel Infill: Metro® fence panel.
- 21 B. Construction: Welded frame fabricated from 3-1/2" by 5/16" steel tubing with infill panels as indicated
- 22 on Drawings.
- 23 C. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf
- 24 more than 5 feet wide. Provide center gate stops and cane bolts for pairs of gates. Fabricate latches with
- 25 integral eye openings for padlocking; padlock accessible from both sides of gate.
- 26 D. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
- 27 1. Function: 39 - Full surface, triple weight, antifriction bearing.
- 28 2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.
- 29 E. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from 3/4-inch-diameter, round steel
- 30 bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to
- 31 receive cane bolts in both open and closed positions.
- 32

2.7 GATE OPERATORS

A. Gate Operators:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Liftmaster CSL24UL 24VDC High-traffic Commercial Slide Gate Operator.

B. Provide factory-assembled automatic operating system designed for gate size, type, weight, and operation frequency. Provide operation control system with characteristics suitable for Project conditions, with remote-control stations, safety devices, and weatherproof enclosures; coordinate electrical requirements with building electrical system.

1. Provide operator designed so motor may be removed without disturbing limit-switch adjustment and without affecting auxiliary emergency operator.
2. Provide operator with UL approval approved components.
3. Provide electronic components with built-in troubleshooting diagnostic feature.
4. Provide unit designed and wired for both right-hand/left-hand opening, permitting universal installation.

C. Comply with NFPA 70.

D. UL Standard: Manufacturer and label gate operators to comply with UL 325.

E. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for automatic gate operators on gates that must provide emergency access.

F. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1 and the following:

1. Voltage: 24-V dc.

G. Remote Controls: Electric controls separated from gate and motor and drive mechanism. Provide the following remote-control device(s):

1. Radio Control: Digital system consisting of code-compatible universal receiver for each gate, located where indicated, with remote antenna with coaxial cable and mounting brackets designed to operate gates. Provide thirty (30) programmable transmitter(s) with multiple-code capability permitting validating or voiding of not less than 10,000 codes per channel configured for the following functions:
 - a. Transmitters: Single-button operated, with open and close function.
2. Telephone Entry System: Hands-free, voice-communication system for connection to building telephone system with digital-entry code activation of gate operator and auxiliary keypad entry.
 - a. Multiunit System: Designed to be wired to a dedicated telephone line, with capacity to access 20 telephones.

H. Vehicle Presence Detector: System includes automatic closing timer with adjustable time delay and presence detector designed to hold gate open until traffic clears. System includes retroreflective detector with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of a vehicle in gate pathway when infrared beam in zone pattern is interrupted, and to emit a signal activating the gate operator.

I. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s). Activation of sensor(s) causes operator to immediately function as follows:

1. Action: Reverse gate in both opening and closing cycles, and hold until clear of obstruction.
2. Action: Stop gate in opening cycle and reverse gate in closing cycle, and hold until clear of obstruction.
3. Internal Sensor: Built-in torque or current monitor senses gate is obstructed.
4. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connect to control circuit using gate edge transmitter and operator receiver system.
 - a. Along entire gate leaf leading edge.
 - b. Along entire gate leaf trailing edge.
 - c. Across entire gate leaf bottom edge.
 - d. Along entire length of gate posts.
 - e. Along entire length of gate guide posts.

J. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions.

K. Emergency Release Mechanism: Quick-disconnect release of operator drive system of the following type, permitting manual operation if operator fails. Design system so control-circuit power is disconnected during manual operation.

1. Type: Integral fail-safe release, allowing gate to be pushed open without mechanical devices, keys, cranks, or special knowledge.

L. Operating Features:

1. Maximum Run Timer: Designed to prevent damage to gate system by shutting down system if normal time to open gate is exceeded.

M. Accessories:

1. Warning Module: Visual-light alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving; compliant with the United States Access Board's ADA-ABA Accessibility Guidelines.
2. Battery Backup System: Battery-powered drive and access-control system, independent of primary drive system.
 - a. Fail-Safe: Gate opens and remains open until power is restored.

2.8 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A36/A36M.

B. Tubing: ASTM A500/A500M, cold-formed steel tubing.

C. Galvanized-Steel Sheet: ASTM A653, structural quality, Grade 50, with G90 coating.

D. Castings: Either gray or malleable iron unless otherwise indicated.

1. Gray Iron: ASTM A48/A48M, Class 30.
2. Malleable Iron: ASTM A47/A47M.

2.9 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M and specifically recommended by manufacturer for exterior applications.

2.10 GROUNDING MATERIALS

- A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
 - 1. Material above Finished Grade: Aluminum.
 - 2. Material on or below Finished Grade: Copper.
 - 3. Bonding Jumpers: Braided copper tape, 1-5/8 inch wide and 1/16 inch thick, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Grounding Connectors and Grounding Rods: Comply with UL 467.
 - 1. Connectors for Below-Grade Use: Exothermic-welded type.
 - 2. Grounding Rods: Copper-clad steel.
 - a. Size: 5/8 by 96 inches.

2.11 METALLIC-COATED-STEEL FINISHES

- A. Steel fence panels and posts shall be hot-dip galvanized to 1.25 ounces per square foot minimum zinc coating in accordance with ASTM A123. Standard size components shall receive polyester powder coating. Large gate panels shall be coated with 2-part polyurethane coating.
- B. Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.
 - 1. Minimum hardness measured in accordance with ASTM D3363: 2H.
 - 2. Direct impact resistance tested in accordance with ASTM D2794: Withstand 160 inch-pounds.
 - 3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than [3/16 inch] [5 mm] undercutting.
 - 4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.
- C. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 180 degrees F and aged 14 days shall resist the following test conditions without failure.
 - 1. 5 percent salt spray for 500 hours.
 - 2. 100 percent relative humidity for 1000 hours.
 - 3. Water immersion for 100 hours.
 - 4. 20 double rubs with cloth saturated with either lacquer thinner, acetone, MEK, gasoline, or xylene.
 - 5. Exposure to lubricating oils, hydraulic fluids, and cutting oils.
 - 6. 16 cycles of 24 hours at 100 percent humidity, 24 hours at 10 degrees F, and 24 hours at 77 degrees F.
 - 7. Hardness: H to 2H.
 - 8. Flexibility: 1/8 inch conical mandrel

1 D. Color and Gloss: Black Velvet as manufactured by Ametco Manufacturing Company.

2 PART 3 - EXECUTION

3 3.1 EXAMINATION

4 A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing,
5 earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

6 B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

7 C. Proceed with installation only after unsatisfactory conditions have been corrected.

8 3.2 PREPARATION

9 A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of
10 sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures,
11 benchmarks, and property monuments.

12 1. Construction layout and field engineering are specified in Section 017300 "Execution."

13 3.3 DECORATIVE SECURITY FENCE INSTALLATION

14 A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.

15 B. Install fence posts plumb and level by embedding post directly in concrete footing. Temporarily brace
16 fence posts with 2 by 4 wood supports until concrete is set.

17 1. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil. Excavate holes to
18 a diameter of not less than 4 times post size and a depth of not less than 30 inches plus 3 inches for
19 each foot or fraction of a foot that fence height exceeds 4 feet.

20 2. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer
21 than 3 inches to bottom of concrete.

22 3. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position
23 during setting with concrete or mechanical devices.

24 C. Secure fence panels with stainless steel anti-intruder bolts to fence posts after posts have been set in
25 footings.

26 1. Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site
27 and replace.

28 D. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

29 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position
30 during setting with concrete or mechanical devices.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.5 GATE OPERATOR INSTALLATION

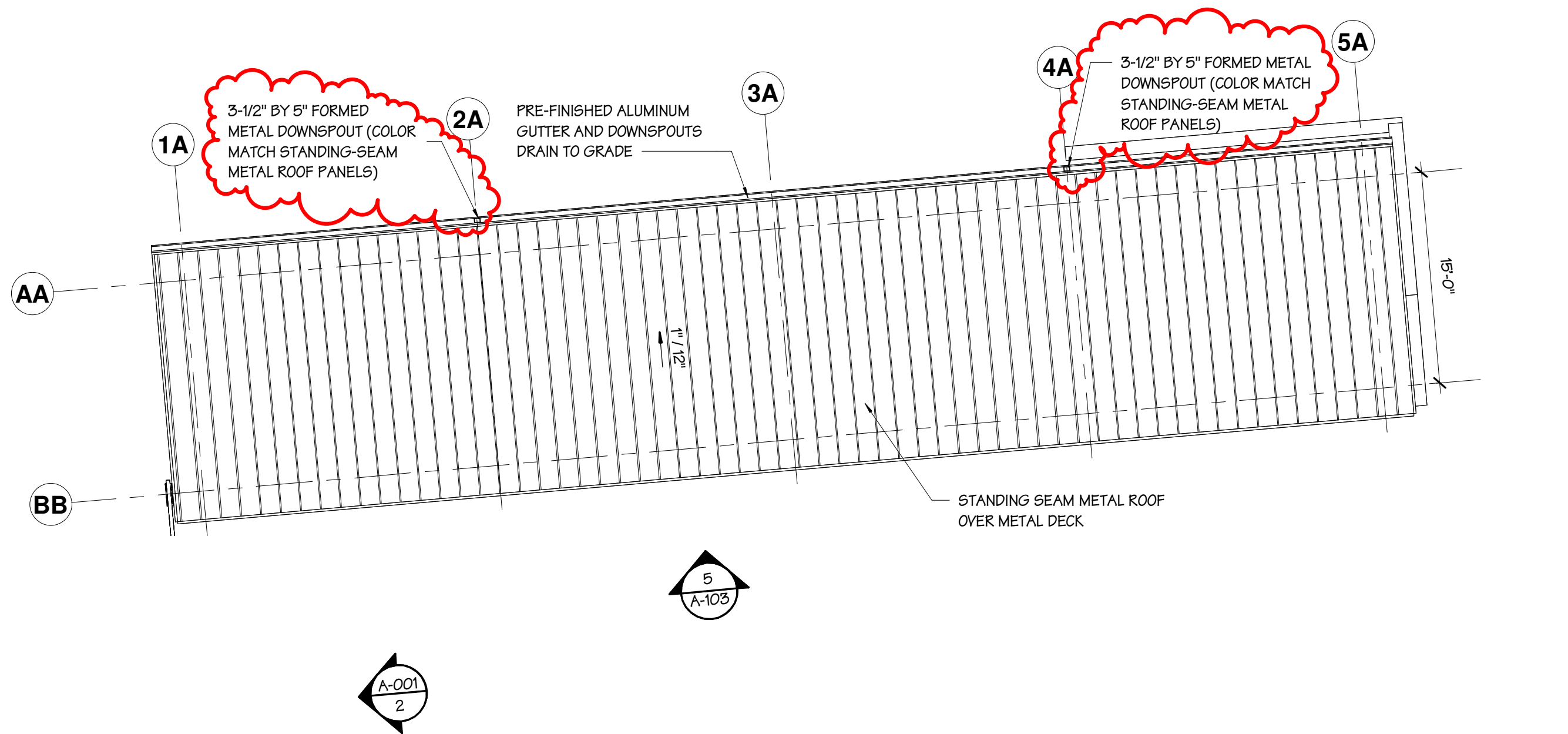
- A. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.
- B. Excavation for Support Posts and Concrete Bases: Hand-excavate holes for bases in firm, undisturbed soil to dimensions and depths and at locations as required by gate operator component manufacturer's written instructions and as indicated.
- C. Provide concrete center foundation depth and drop rod retainers at center of double swinging gate openings.
- D. Concrete Bases: Cast-in-place concrete, depth not less than 12 inches, dimensioned and reinforced according to gate operator component manufacturer's written instructions and as indicated on Drawings.
- E. Vehicle Loop Detector System: Cut grooves in pavement and bury and seal wire loop according to manufacturer's written instructions. Connect to equipment operated by detector.
- F. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

3.6 GROUNDING AND BONDING

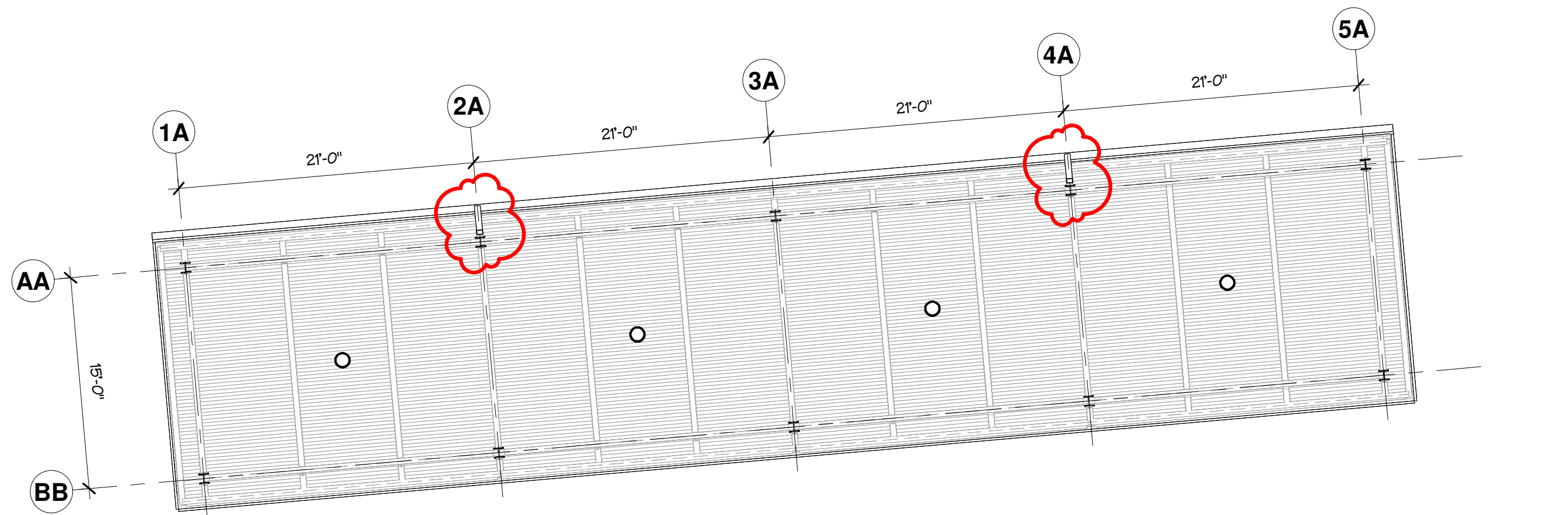
- A. Comply with Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- E. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 2. Make connections with clean, bare metal at points of contact.
 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

- 1 3.7 ADJUSTING
- 2 A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection,
3 distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.
4 Confirm that latches and locks engage accurately and securely without forcing or binding.
- 5 B. Automatic Gate Operators: Energize circuits to electrical equipment and devices. Adjust operators,
6 controls, safety devices, and limit switches.
- 7 1. Hydraulic Operators: Purge operating system, adjust pressure and fluid levels, and check for leaks.
8 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor
9 rotation and unit operation.
10 3. Test and adjust controls, and safeties. Replace damaged and malfunctioning controls and
11 equipment.
- 12 C. Lubricate hardware, gate operators, and other moving parts.
- 13 END OF SECTION 323119.53

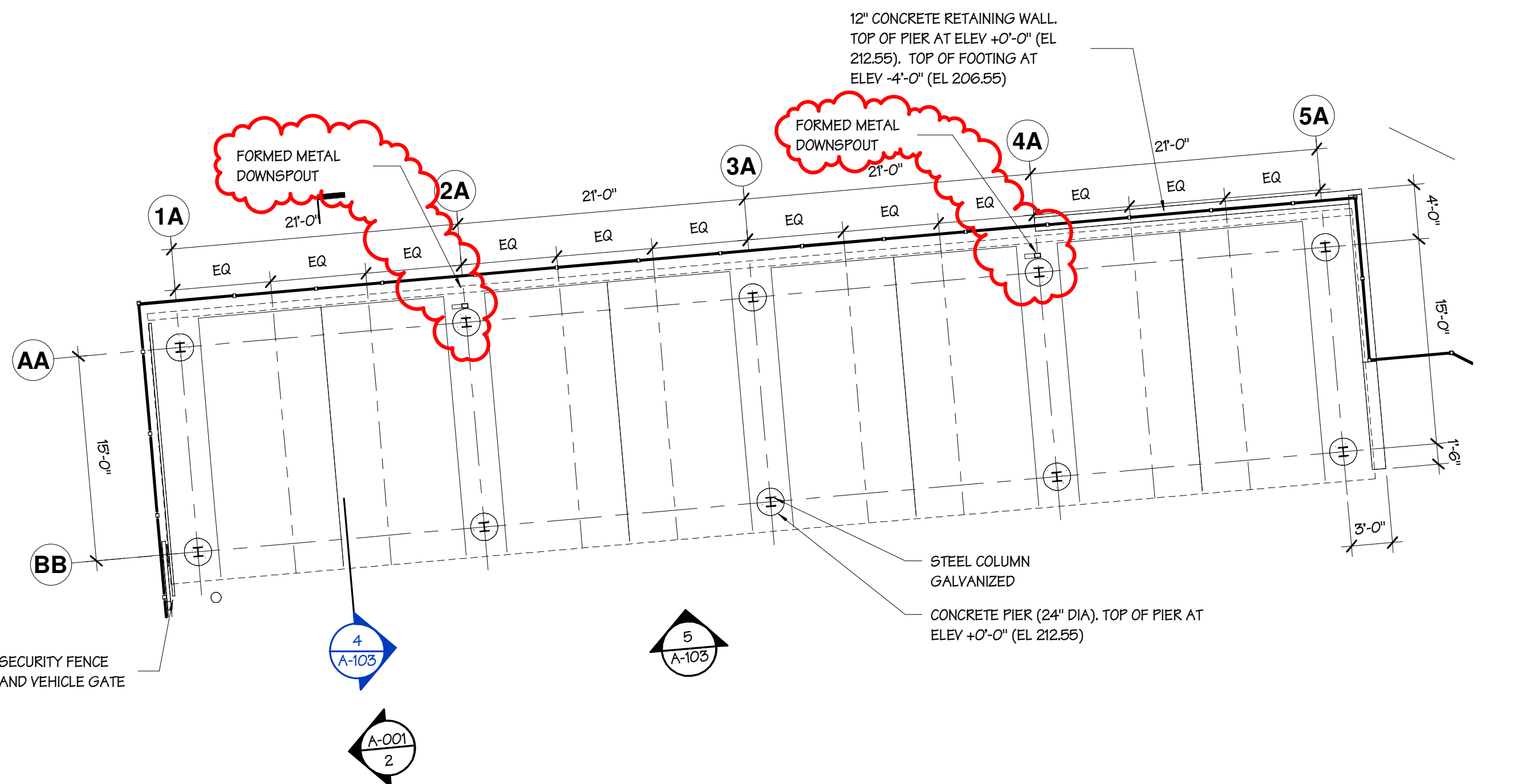
KEYNOTE LEGEND	
#	DESCRIPTION
5G	STEEL PIPE BOLLARD - CONCRETE-FILLED WITH PVC COVER
6A	TREATED WOOD BLOCKING
7G	FORMED METAL GUTTER
7J	FORMED METAL FLASHING
32A	DECORATIVE METAL SECURITY FENCE
32B	DECORATIVE METAL CANTILEVERED SECURITY GATE (MOTORIZED)
32F	DECORATIVE METAL SECURITY FENCE GATE OPERATOR



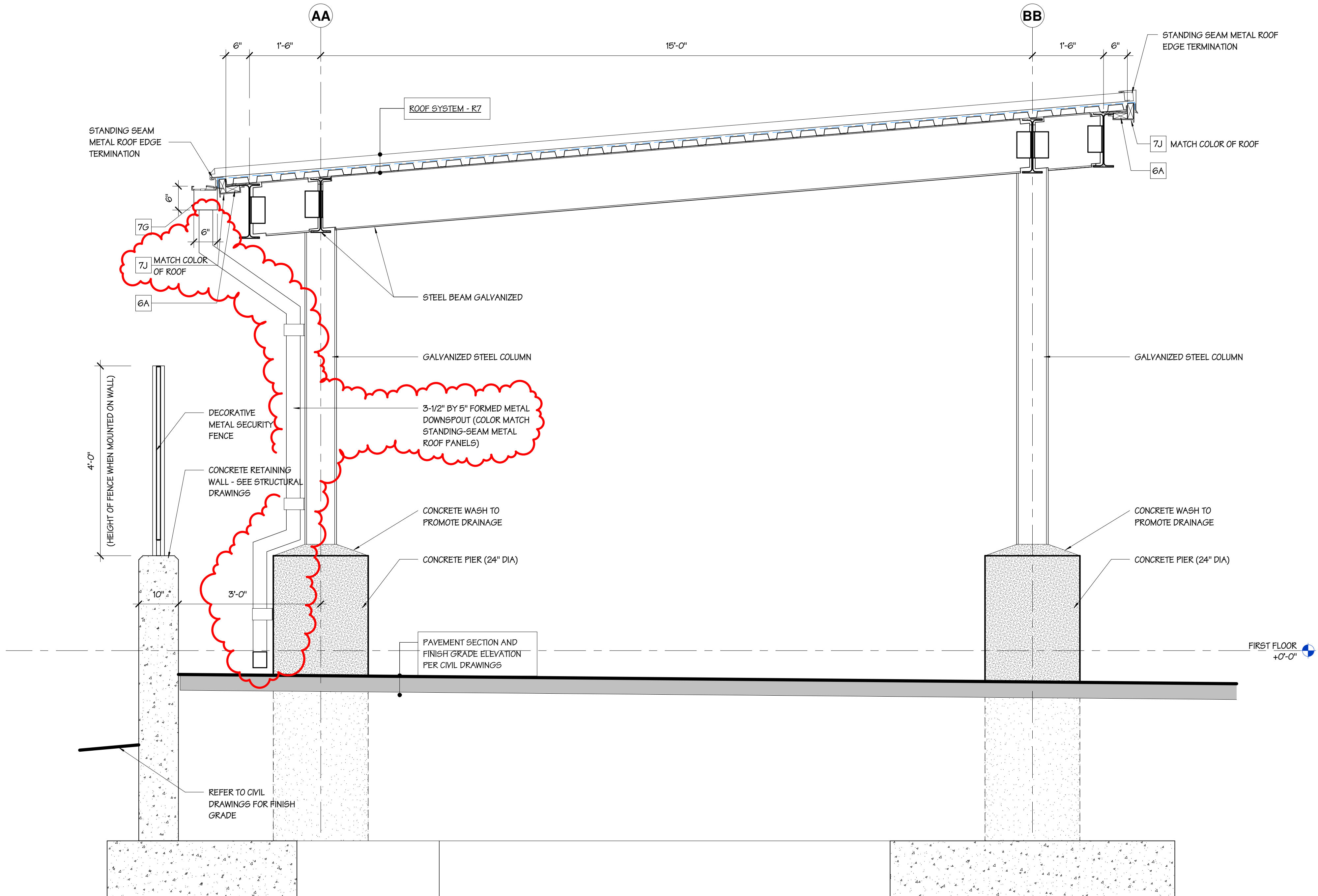
3 VEHICLE SHELTER ROOF PLAN
SCALE 1/8" = 1'-0"



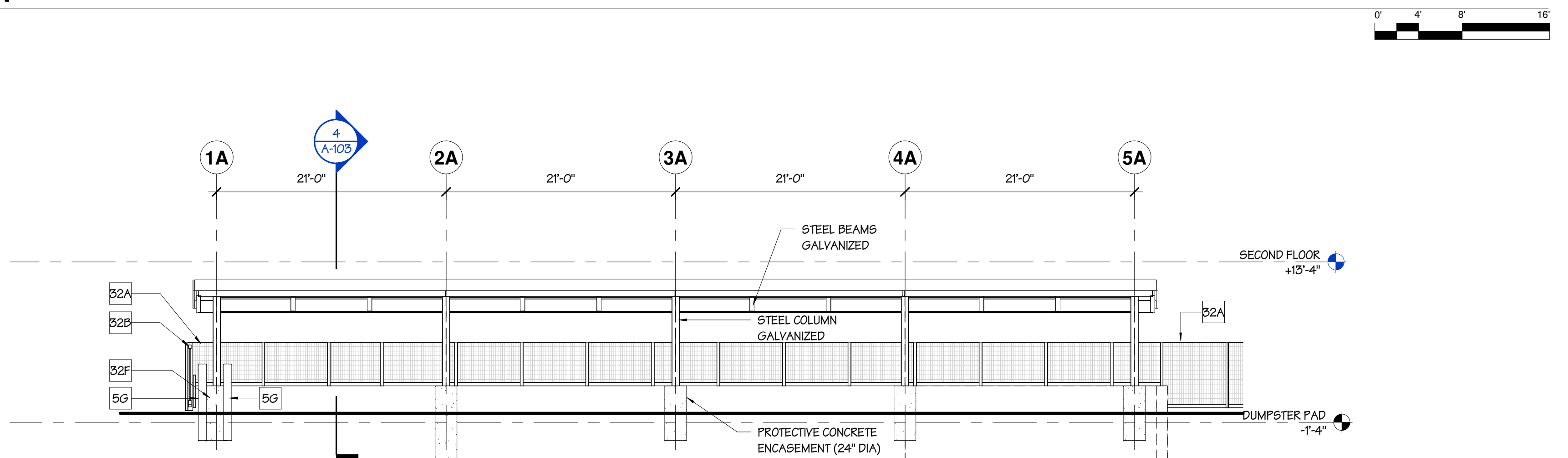
2 VEHICLE SHELTER REFLECTED CEILING PLAN RCP
SCALE 1/8" = 1'-0"



1 VEHICLE SHELTER PLAN
SCALE 1/8" = 1'-0"



4 SECTION
SCALE 3/4" = 1'-0"



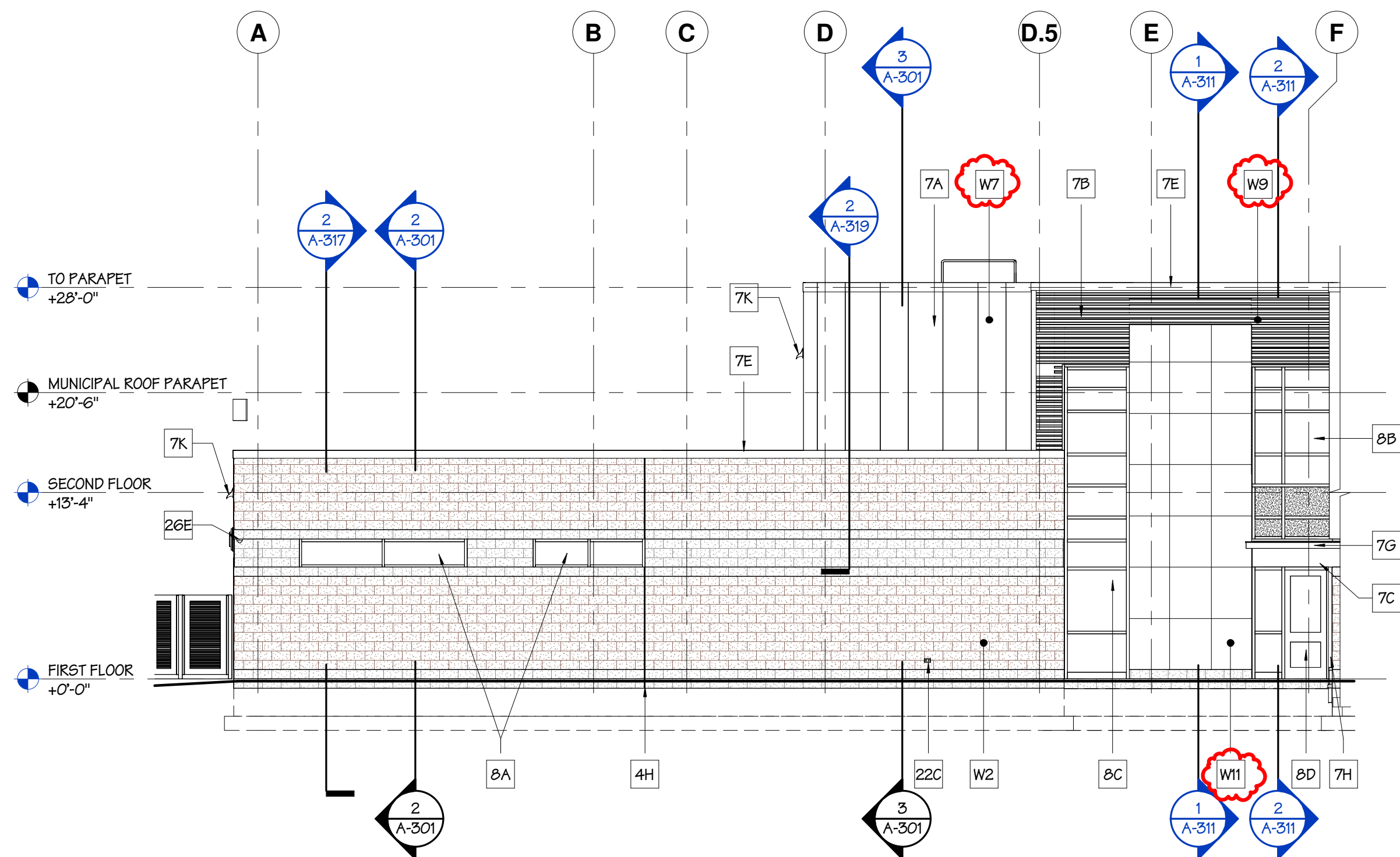
5 VEHICLE SHELTER ELEVATION (WEST)
SCALE 1/8" = 1'-0"

ELEVATION GENERAL NOTES

- REFER TO STRUCTURAL DRAWINGS FOR FOOTING AND FOUNDATION ELEVATION AND REQUIREMENTS. FOOTINGS AND FOUNDATIONS SHOWN ARE ILLUSTRATIVE.
- REFER TO STRUCTURAL DRAWINGS FOR ALL STRUCTURAL INFORMATION AND SIZES.
- REFER TO PLUMBING DRAWINGS FOR ROOF DRAIN / DOWNSPOUT CONNECTION AND TERMINATION CONDITIONS.
- COORDINATE EXACT LOCATIONS OF ROOFTOP EQUIPMENT WITH MEP DRAWINGS. EQUIPMENT SHOWN IS FOR REFERENCE AND COORDINATION ONLY.
- COORDINATE PERMETER GRADING ELEVATIONS WITH CIVIL DRAWINGS.
- IF BRICK SHELF ELEVATION NOTED IS LESS THAN 8" BELOW FINISH GRADE AT ANY GIVEN POINT NOTIFY ARCHITECT.
- PROVIDE CONTROL JOINT IN DECORATIVE CONCRETE MASONRY UNITS AS INDICATED ON ELEVATIONS. FILL CONTROL JOINT WITH SEALANT COLOR AS SELECTED BY ARCHITECT.
- KEYNOTE THAT BEGINS WITH [R_] REFER TO ROOF ASSEMBLY SHEET AND KEYNOTE THAT BEGINS WITH [W_] REFER TO WALL ASSEMBLY SHEET.

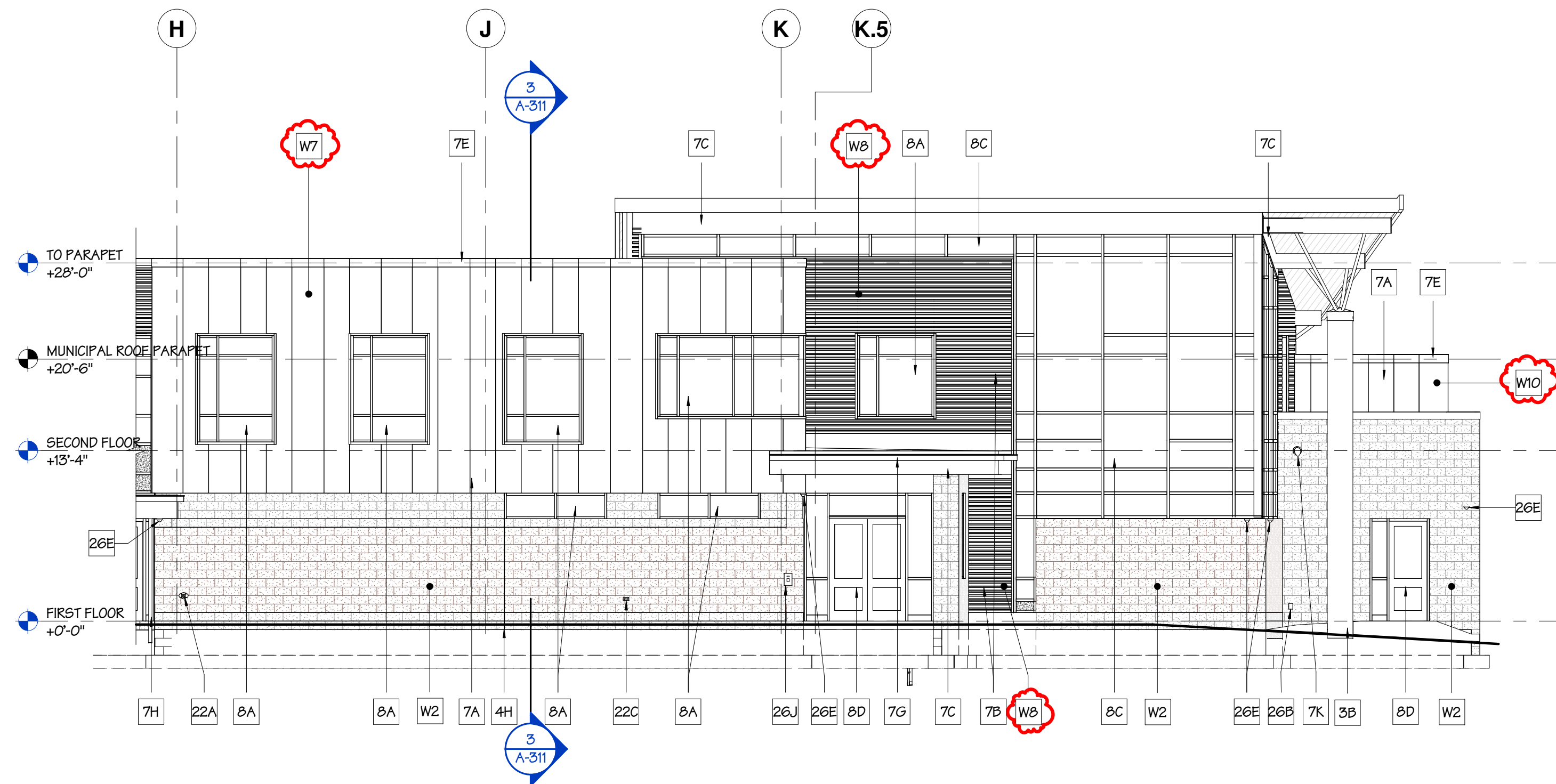
KEYNOTE LEGEND

#	DESCRIPTION
3B	CIP CONC COLUMN W/ORNAMENTAL STL CAPITAL
4C	DECORATIVE CONCRETE MASONRY UNIT (DCMU-3)
4F	CAST STONE SILL
4H	CONTROL JOINT
5B	STRUCTURAL STEEL BEAM
5G	STEEL PIPE BOLLARD - CONCRETE-FILLED WITH PVC COVER
7A	INSULATED METAL WALL PANEL (IMWP-1)
7B	INSULATED METAL WALL PANEL (IMWP-2)
7C	METAL COMPOSITE MATERIAL WALL PANEL (MCMWP)
7E	METAL ROOF EDGE TERMINATION
7F	METAL COUNTER FLASHING
7G	FORMED METAL GUTTER
7H	FORMED METAL DOWNSPOUT
7K	OVERFLOW SCUPPER
7M	SNOW GUARDS
8A	ALUMINUM STOREFRONT
8B	ALUMINUM CURTAIN WALL (6 INCH DEEP)
8C	ALUMINUM CURTAIN WALL (7-1/2 INCH DEEP)
8D	ALUMINUM STOREFRONT ENTRANCE
8F	SECTIONAL OVERHEAD DOOR
10A	SUN CONTROL DEVICE
10B	MANUFACTURED CANOPY
10J	DIMENSIONAL LETTER SIGNAGE (18" HIGH; COLOR MATCH CURTAIN WALL)
22A	FIRE DEPARTMENT CONNECTION
22C	RECESSED FROST-PROOF HOSE BIBB (REFER TO PLUMBING SHEETS)
26A	LIGHT FIXTURE (REFER TO ELECTRICAL SHEETS)
26B	ELECTRICAL OUTLET (REFER TO ELECTRICAL SHEETS)
26E	ACCESS CONTROL - VIDEO SURVEILLANCE
26J	WEATHERPROOF PHONE BOX
32A	DECORATIVE METAL SECURITY FENCE



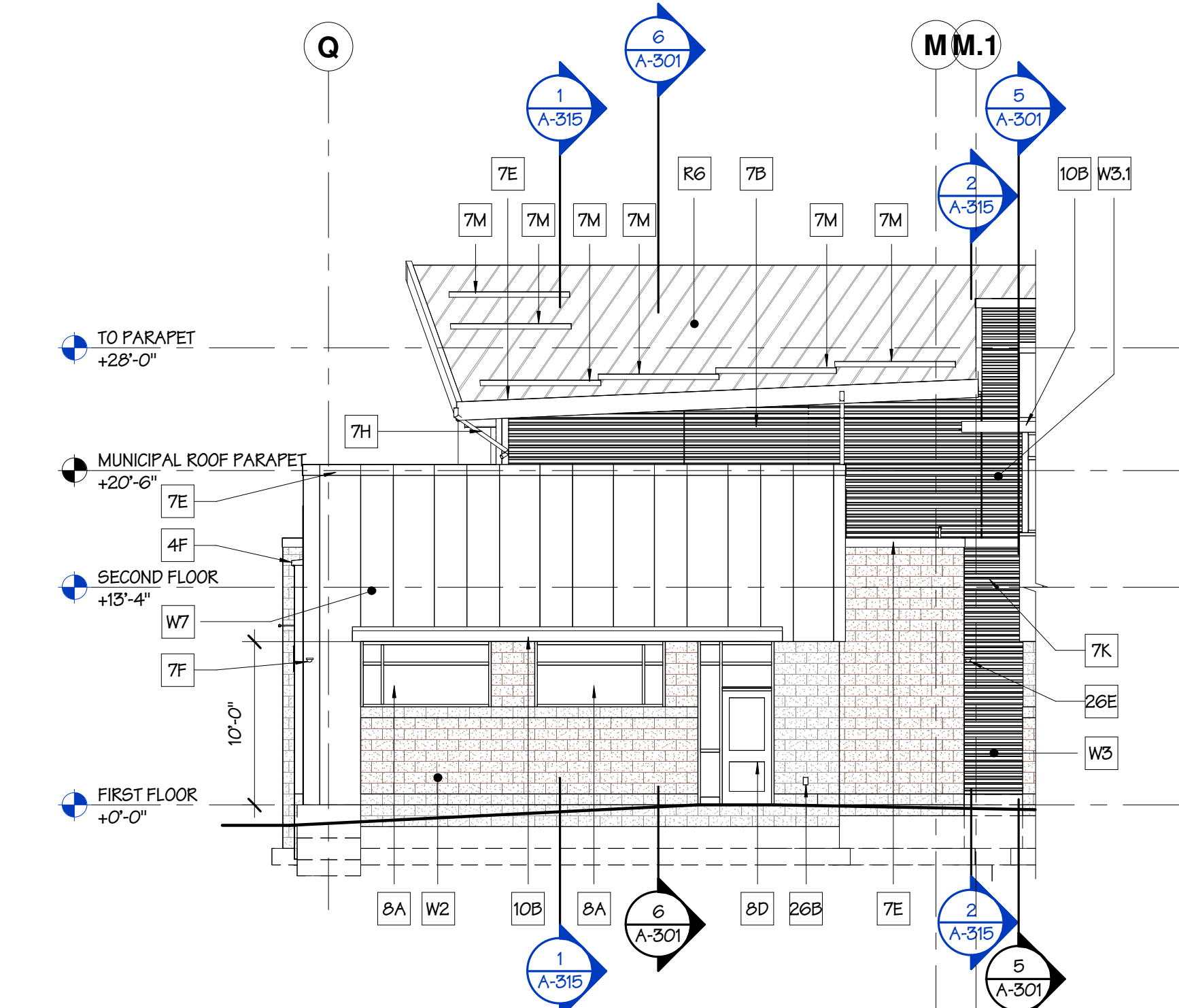
1 NORTH ELEVATION, EAST END

SCALE 1/8" = 1'-0"



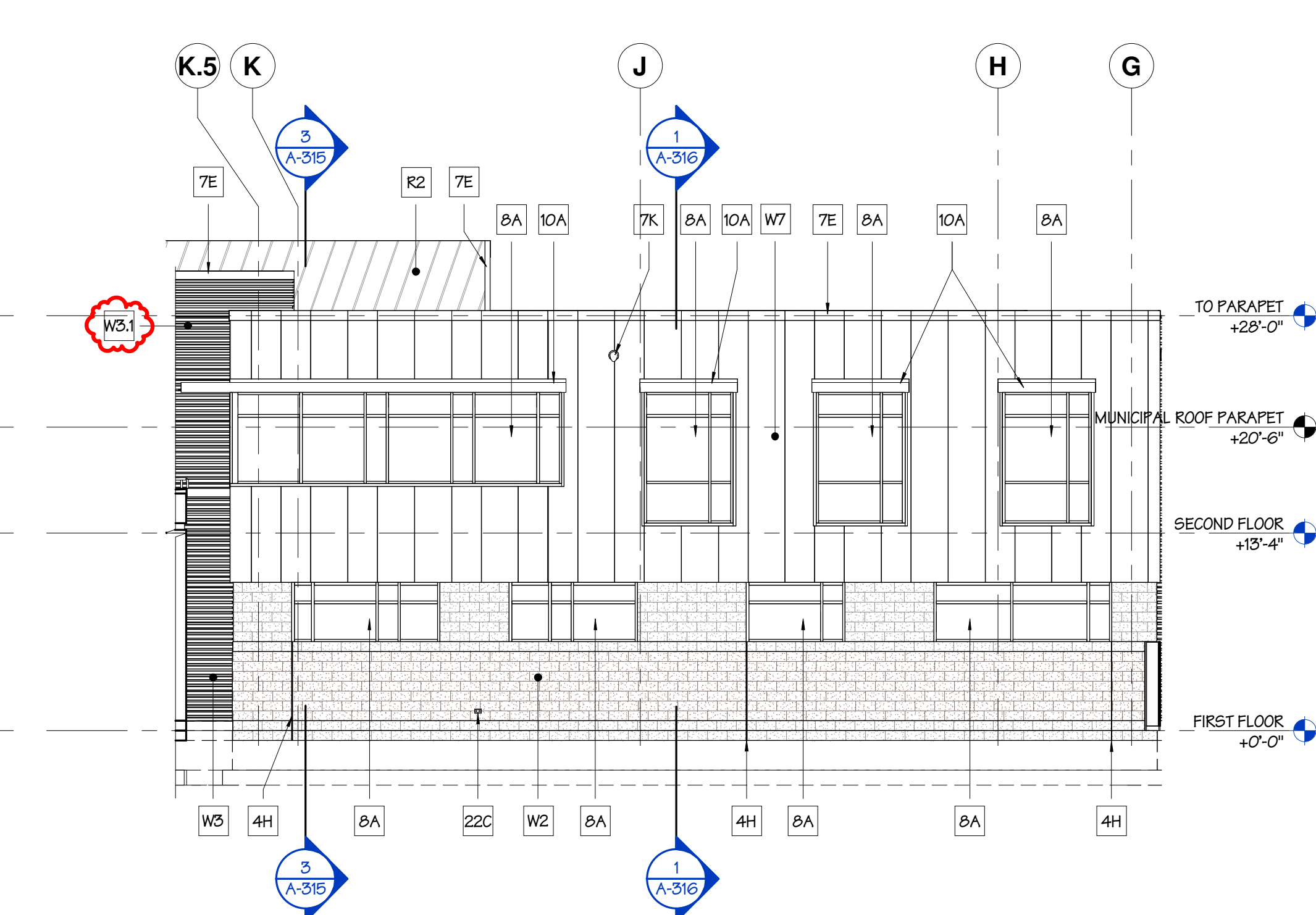
2 NORTH ELEVATION, WEST END

SCALE 1/8" = 1'-0"



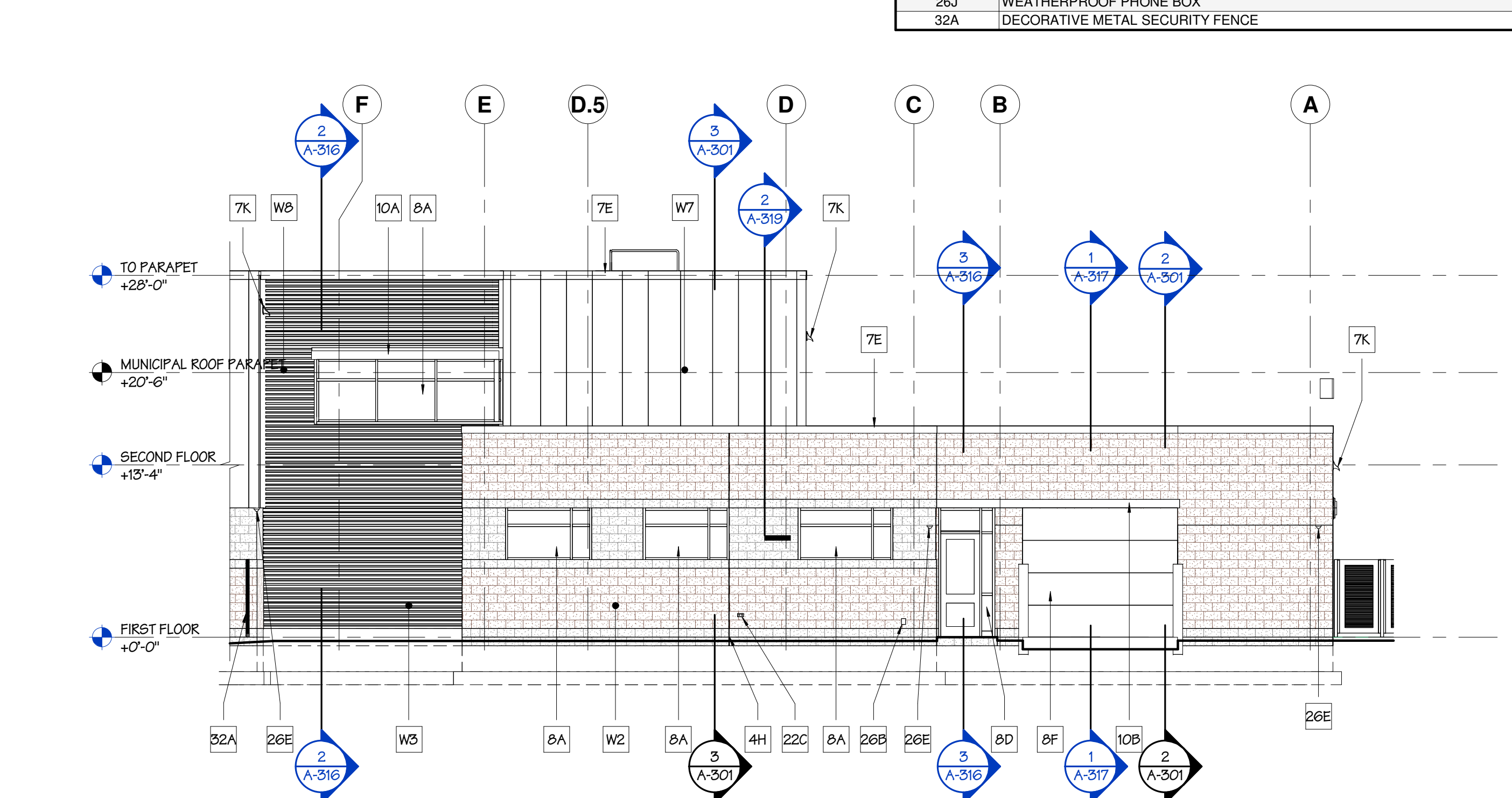
3 SOUTH ELEVATION, WEST END

SCALE 1/8" = 1'-0"



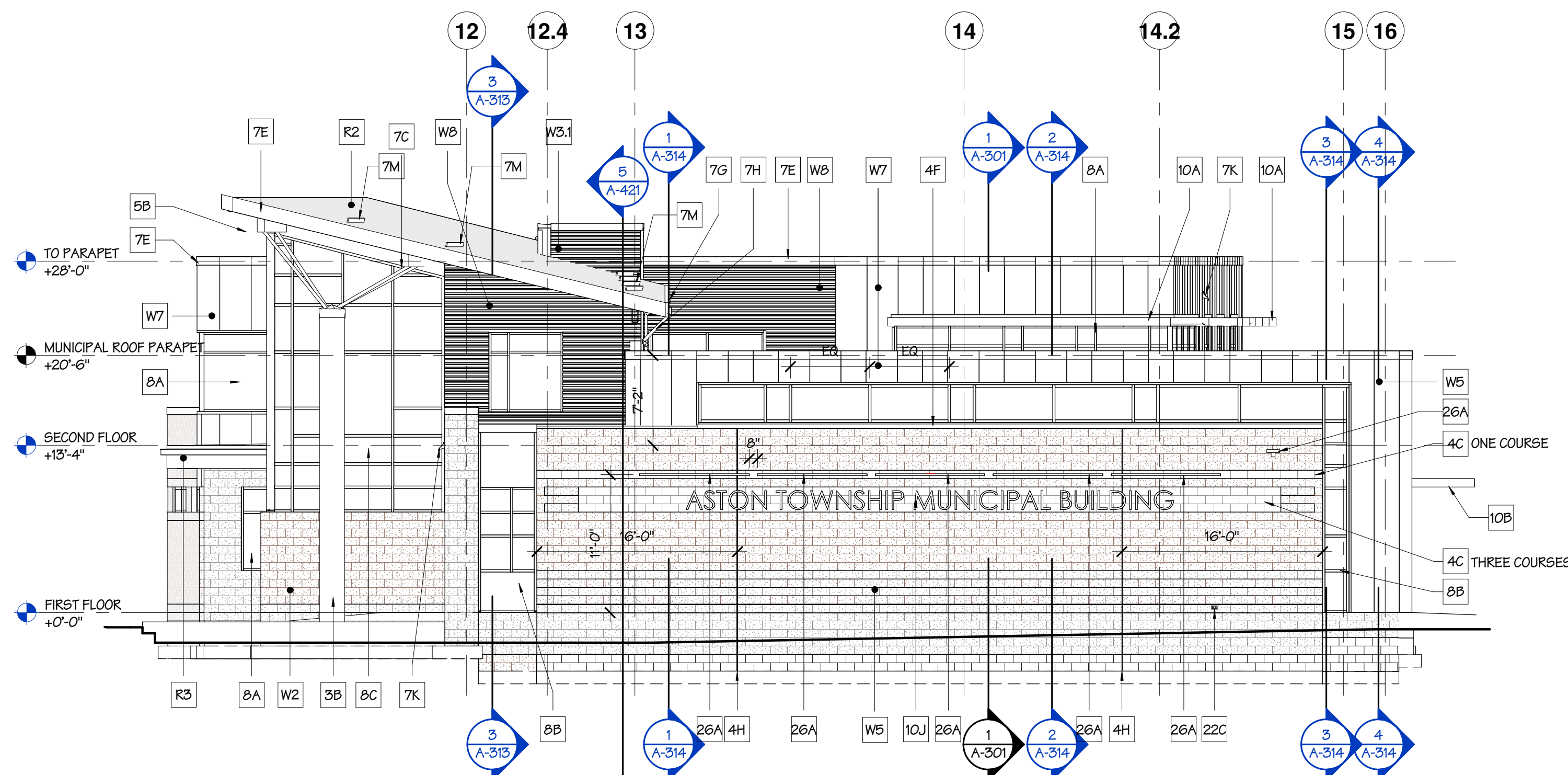
4 SOUTH ELEVATION, MIDDLE

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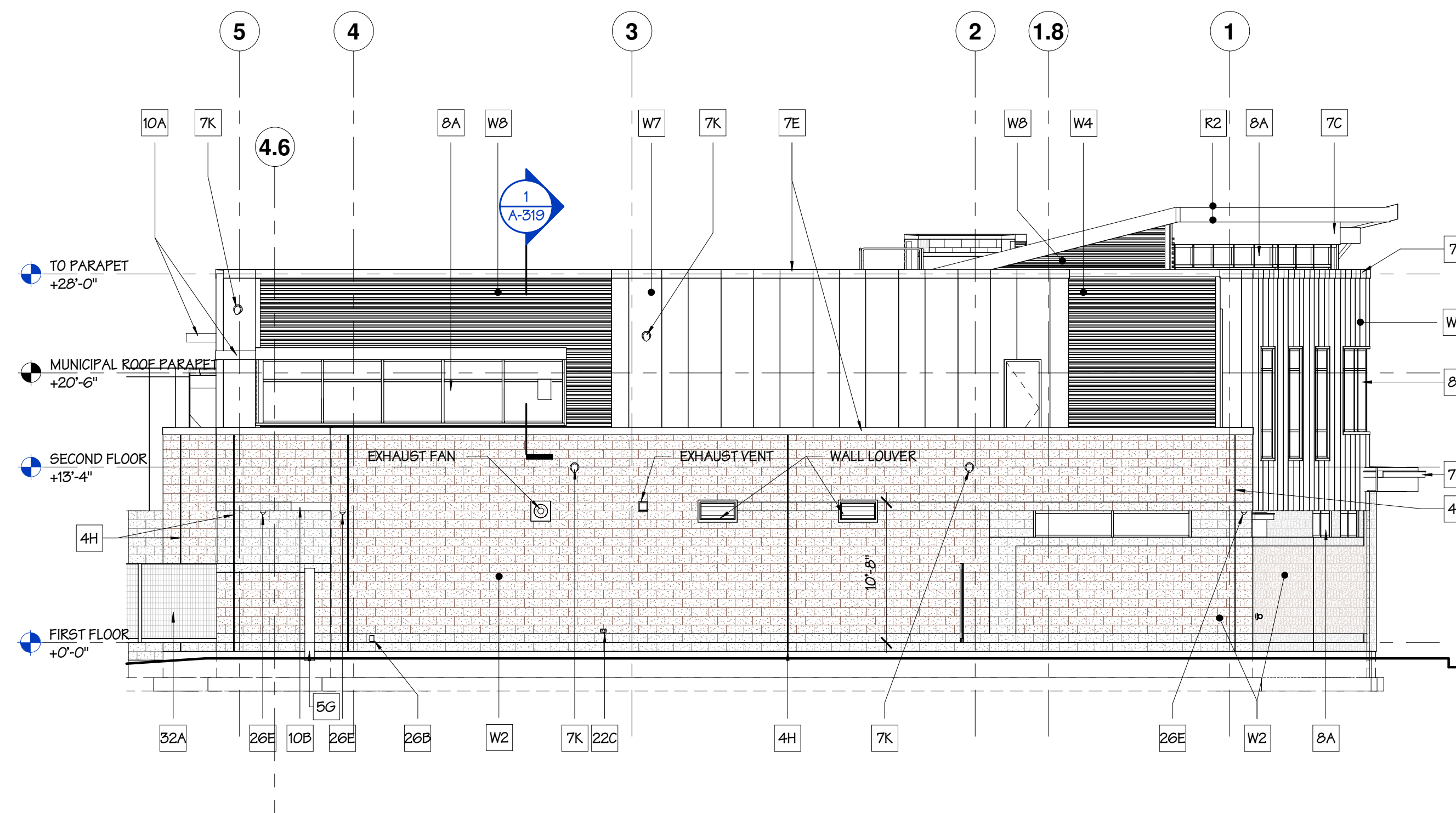
5 SOUTH ELEVATION, EAST END

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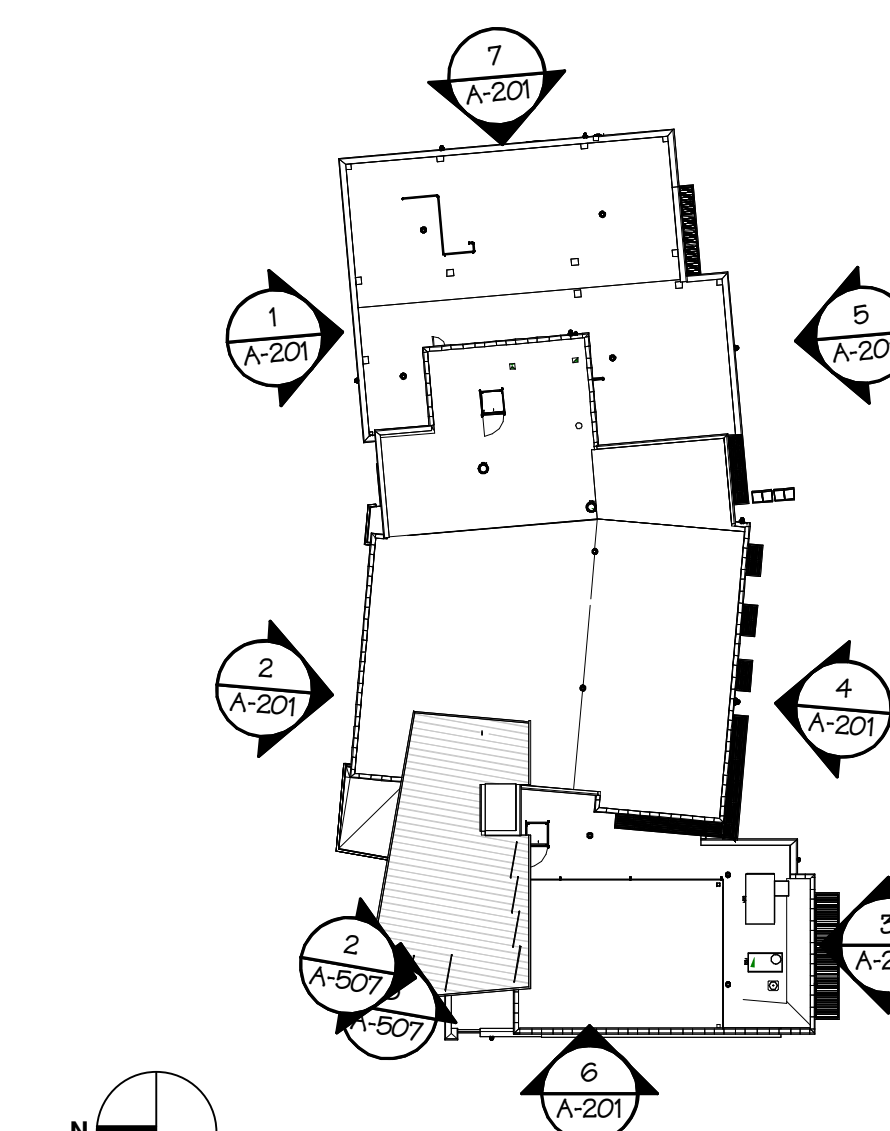
6 WEST ELEVATION

SCALE 1/8" = 1'-0"



7 EAST ELEVATION

SCALE 1/8" = 1'-0"



8 KEY PLAN

SCALE 1" = 40'-0"

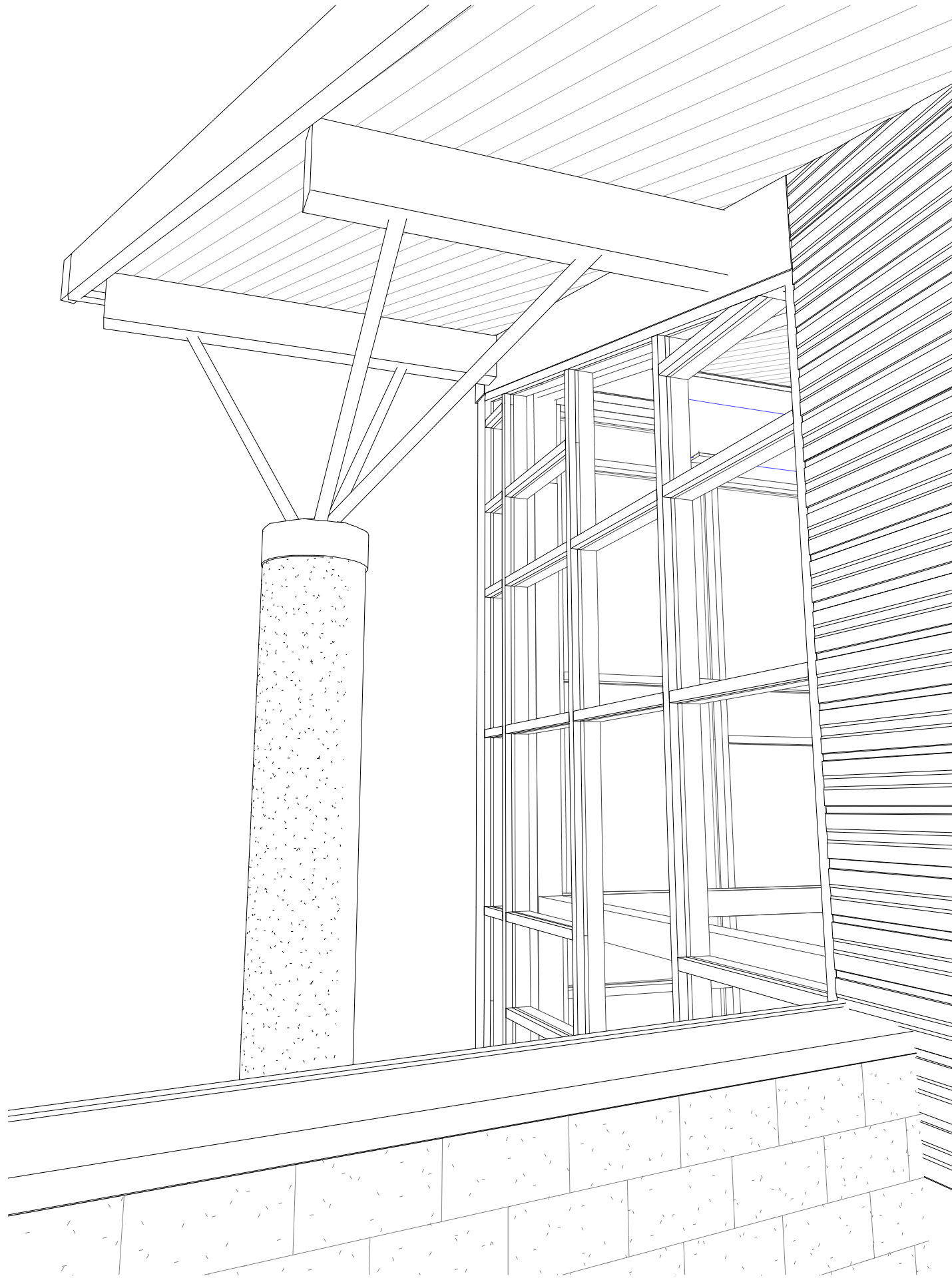
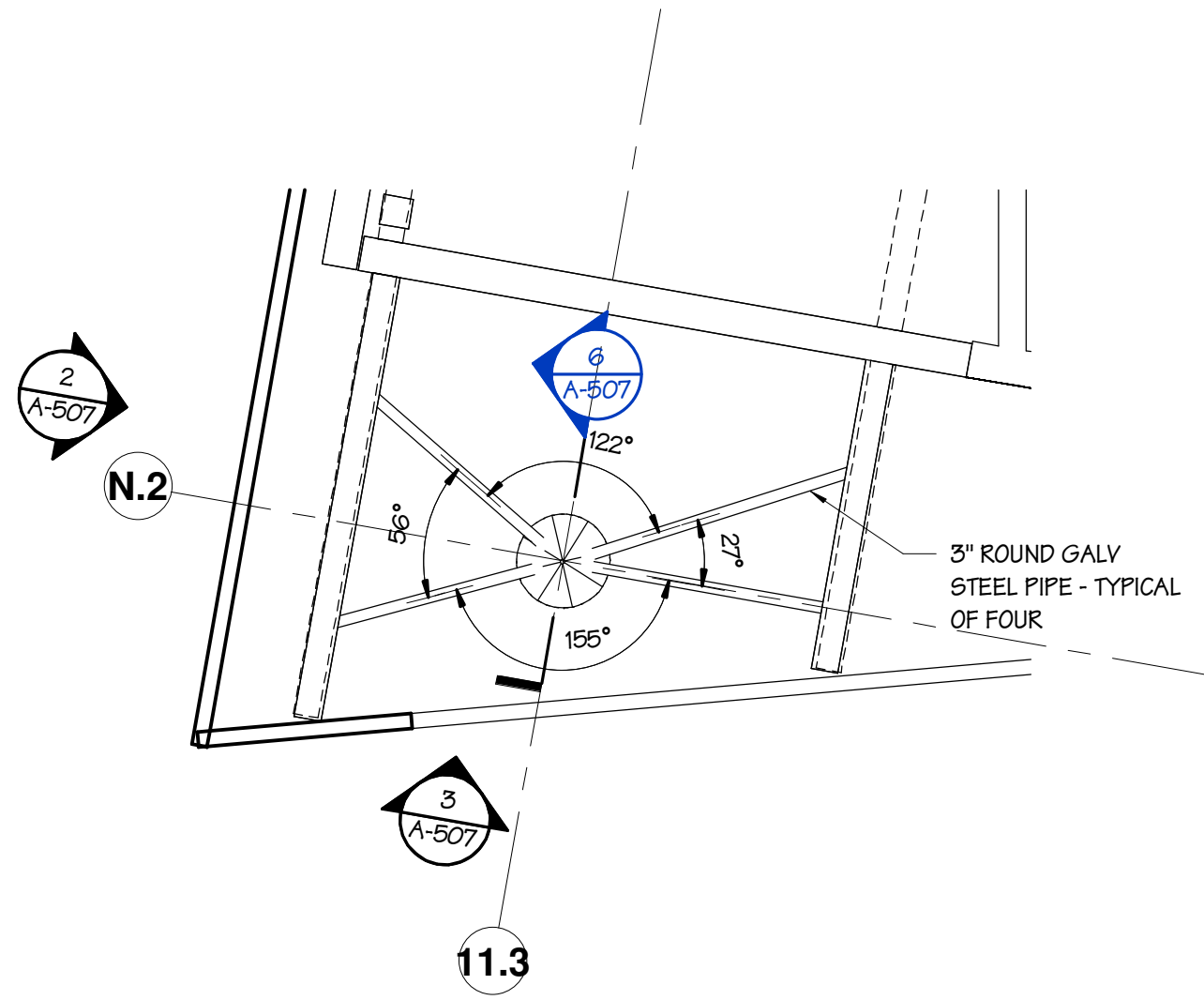
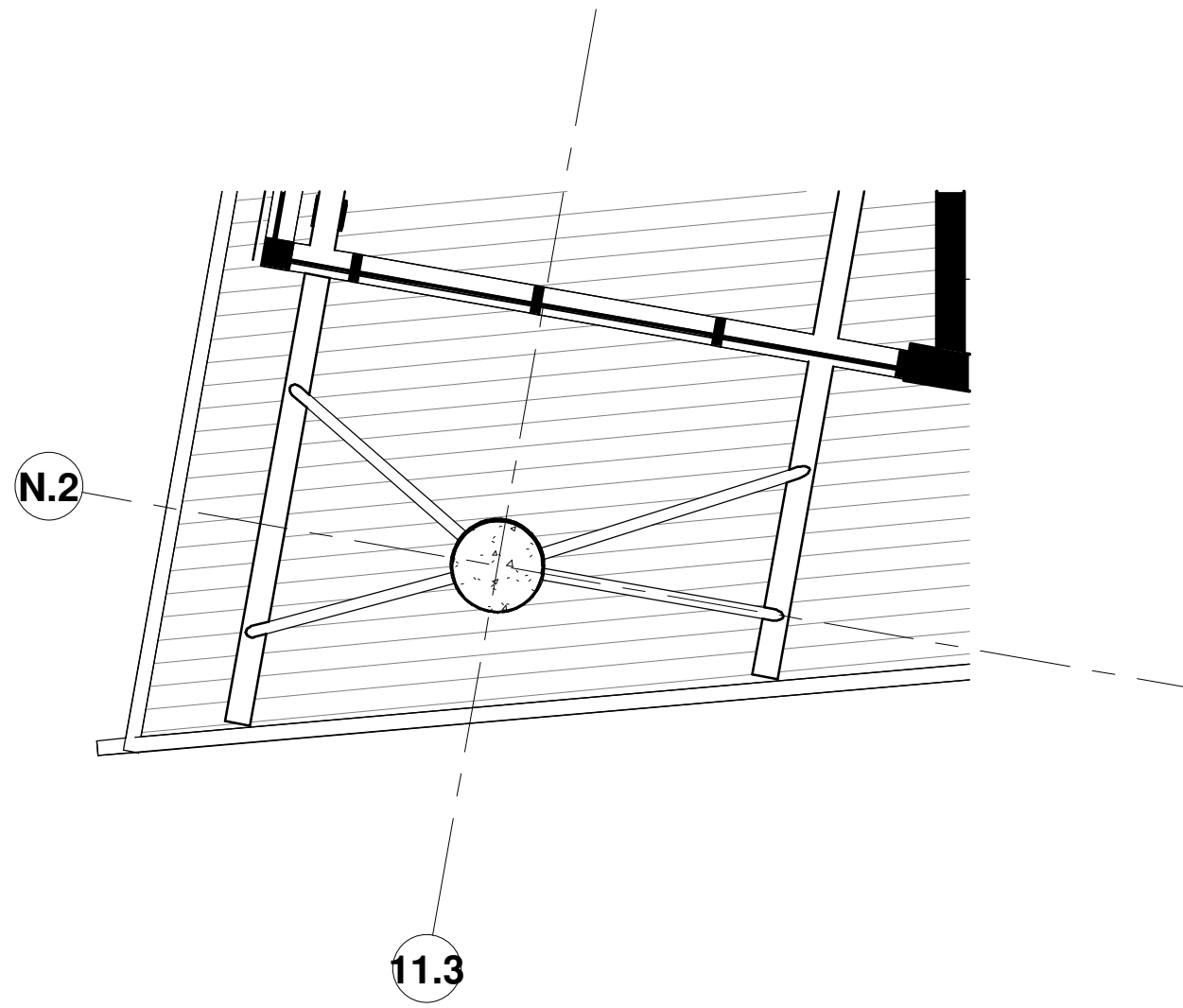


Illustration indicates design intent and may not reflect final details

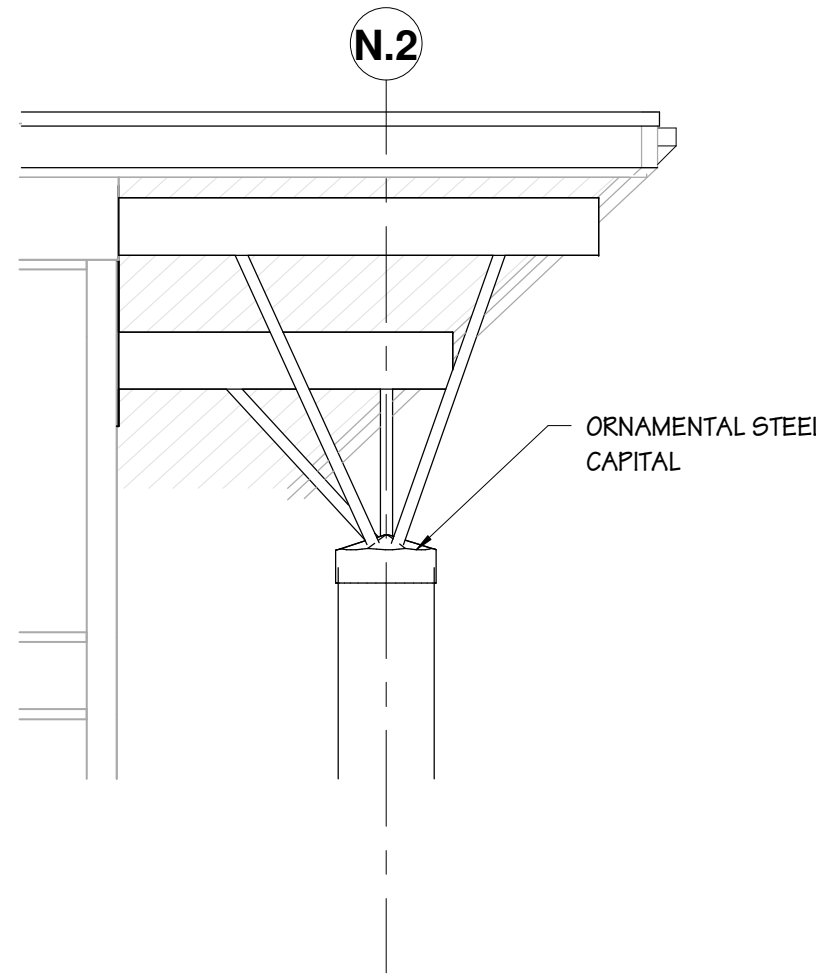
1 PERSPECTIVE



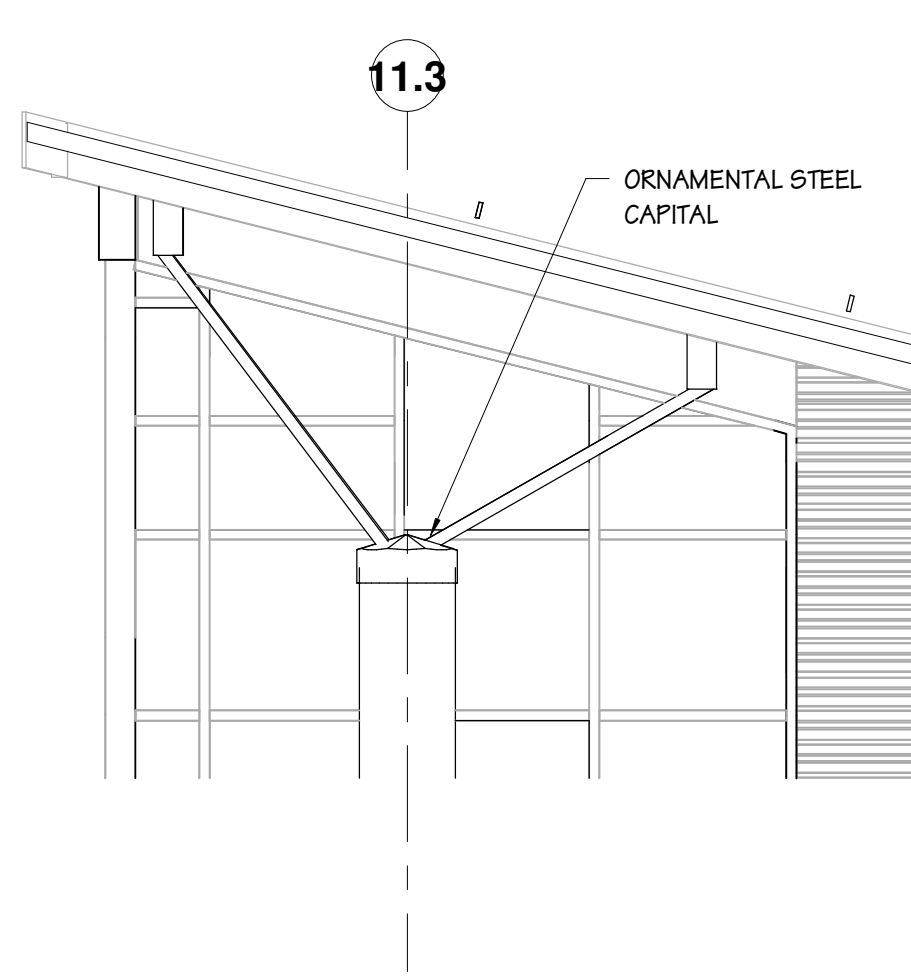
4 COLUMN CAPITAL PLAN



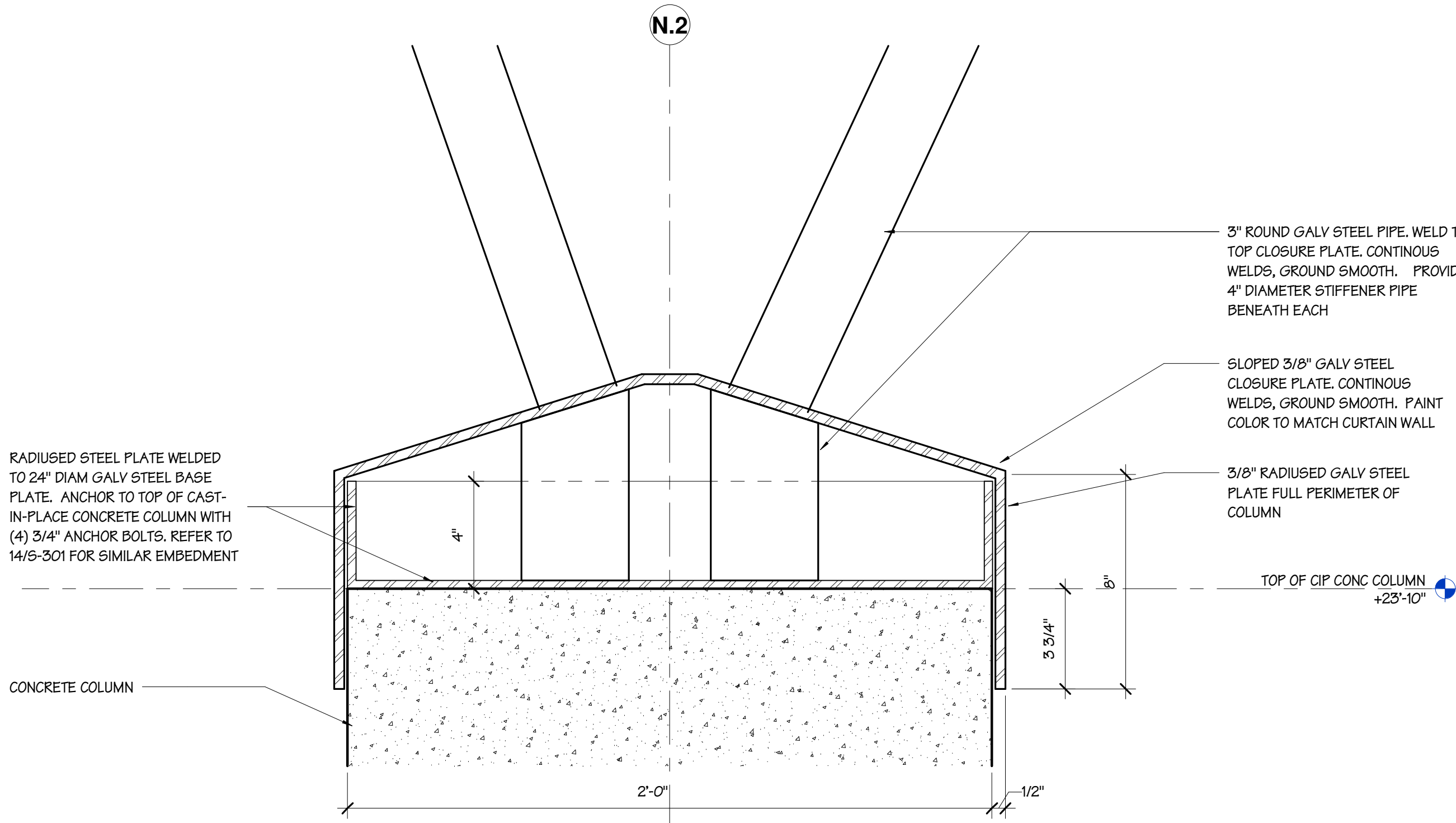
5 PARTIAL REFLECTED CEILING PLAN



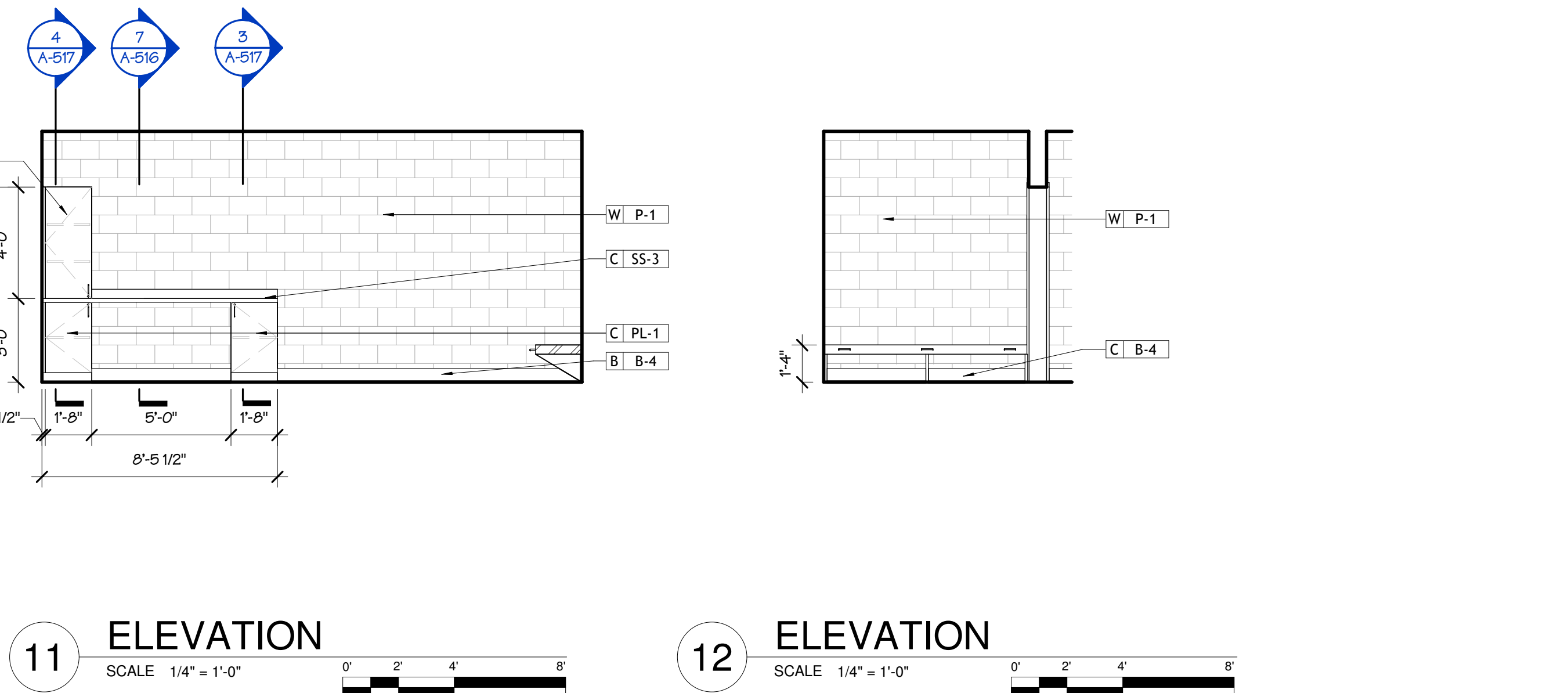
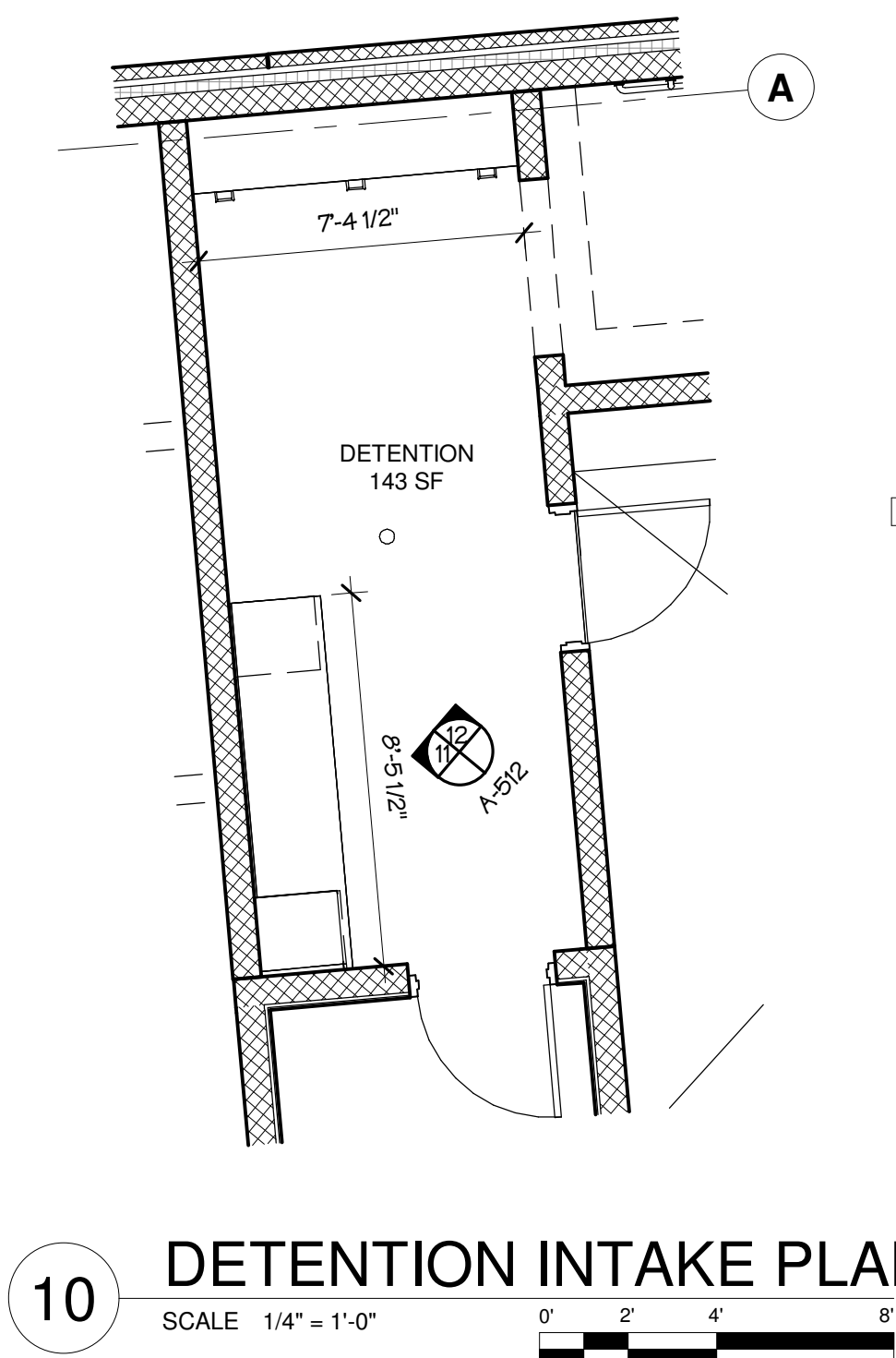
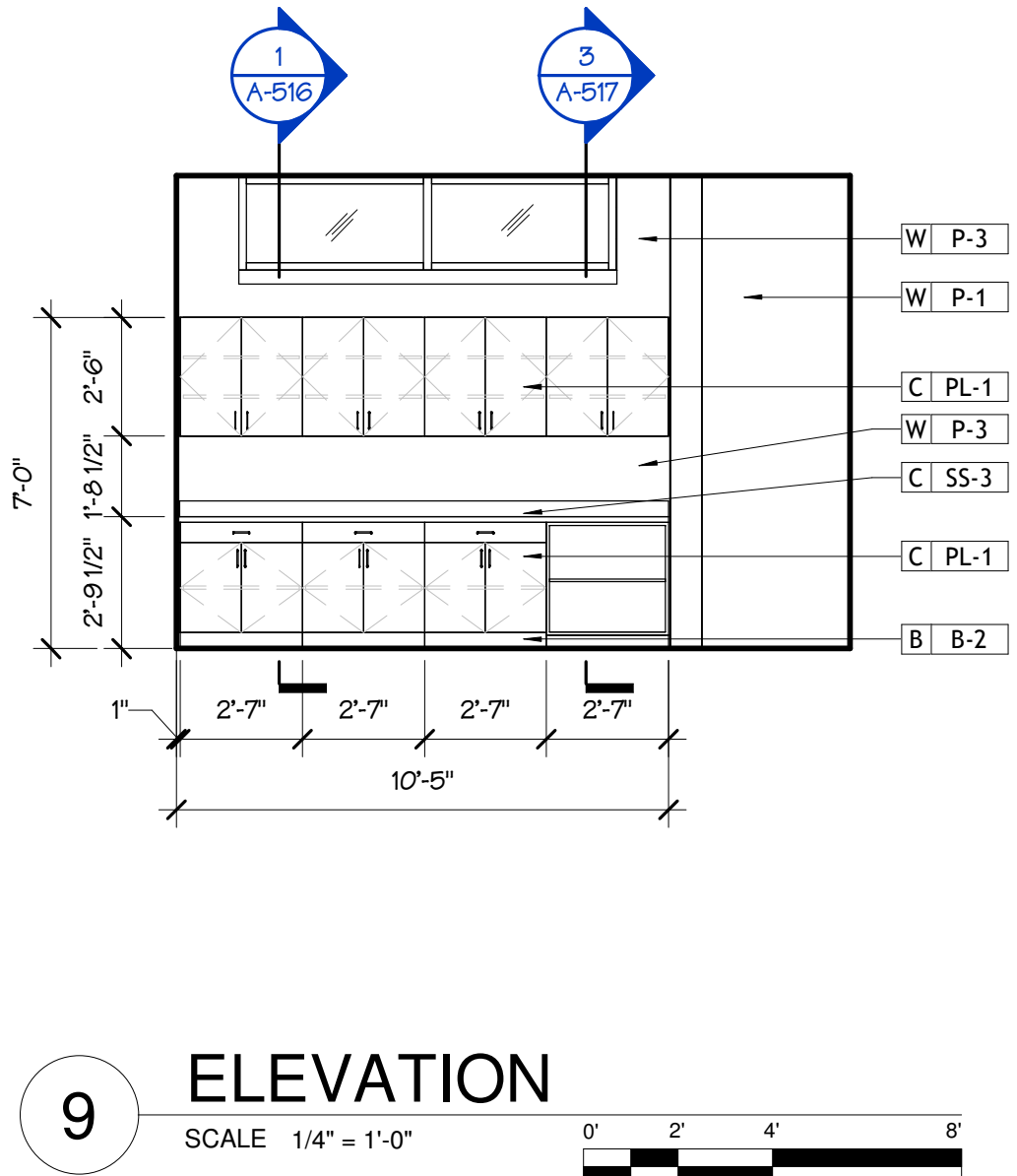
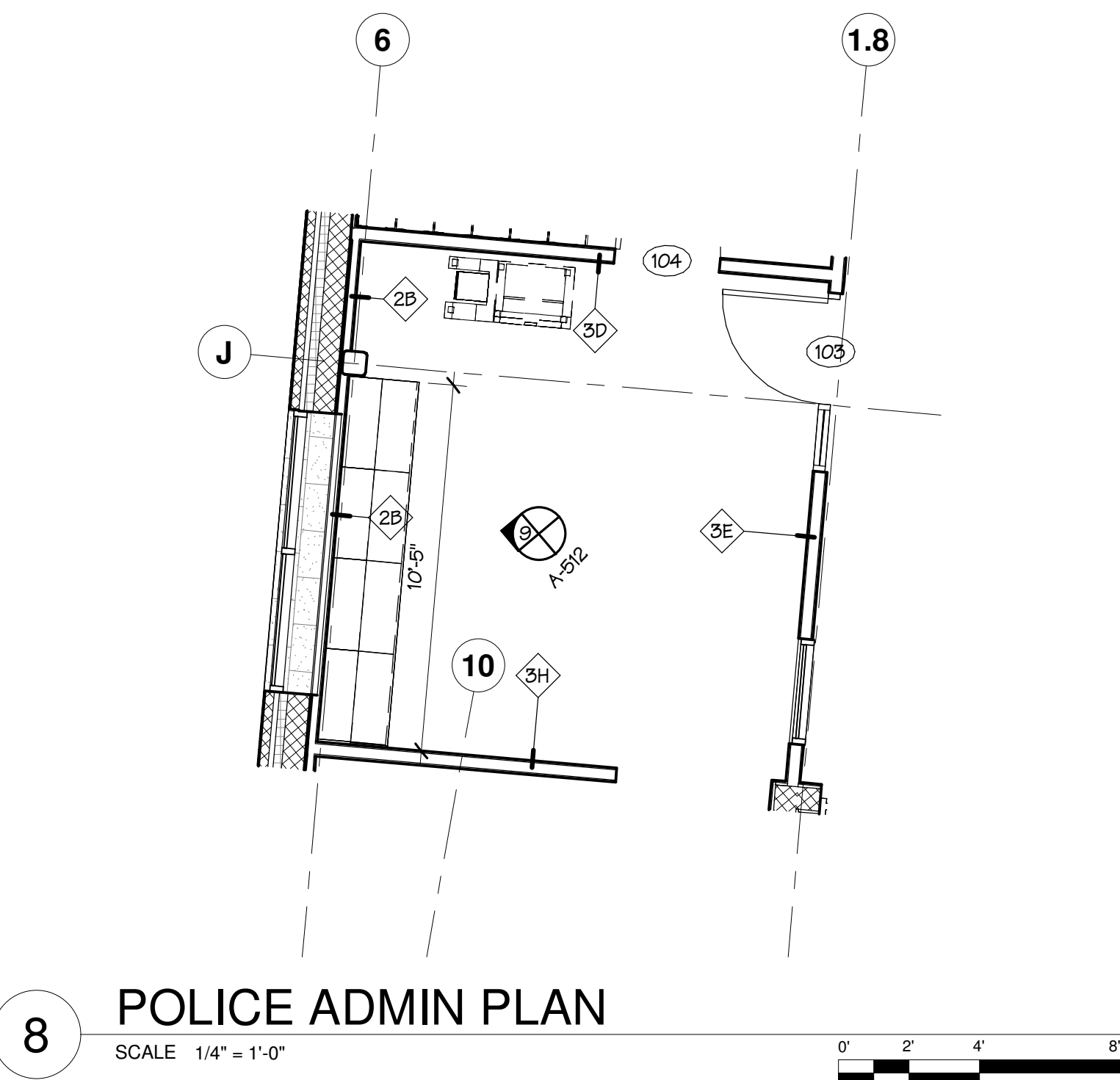
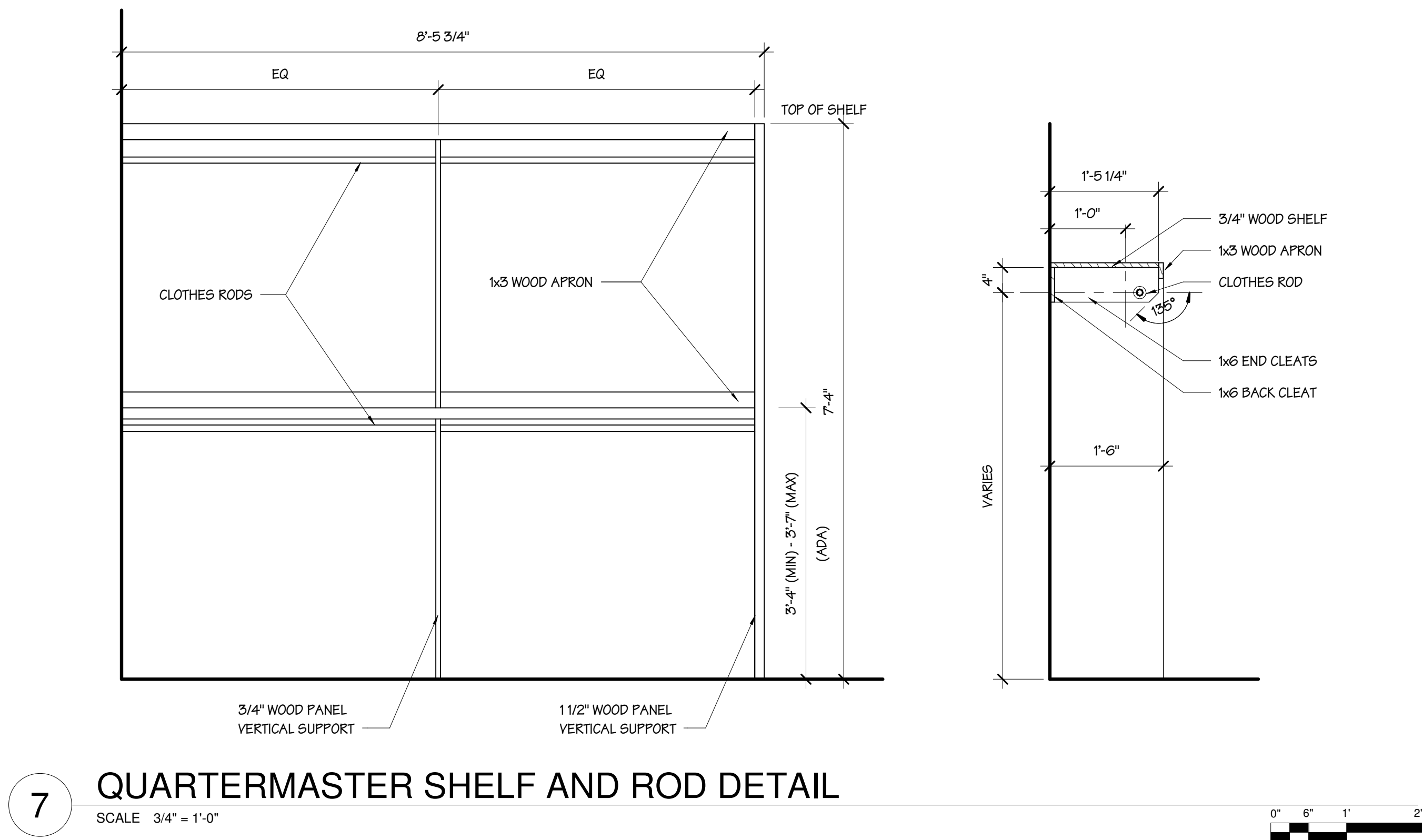
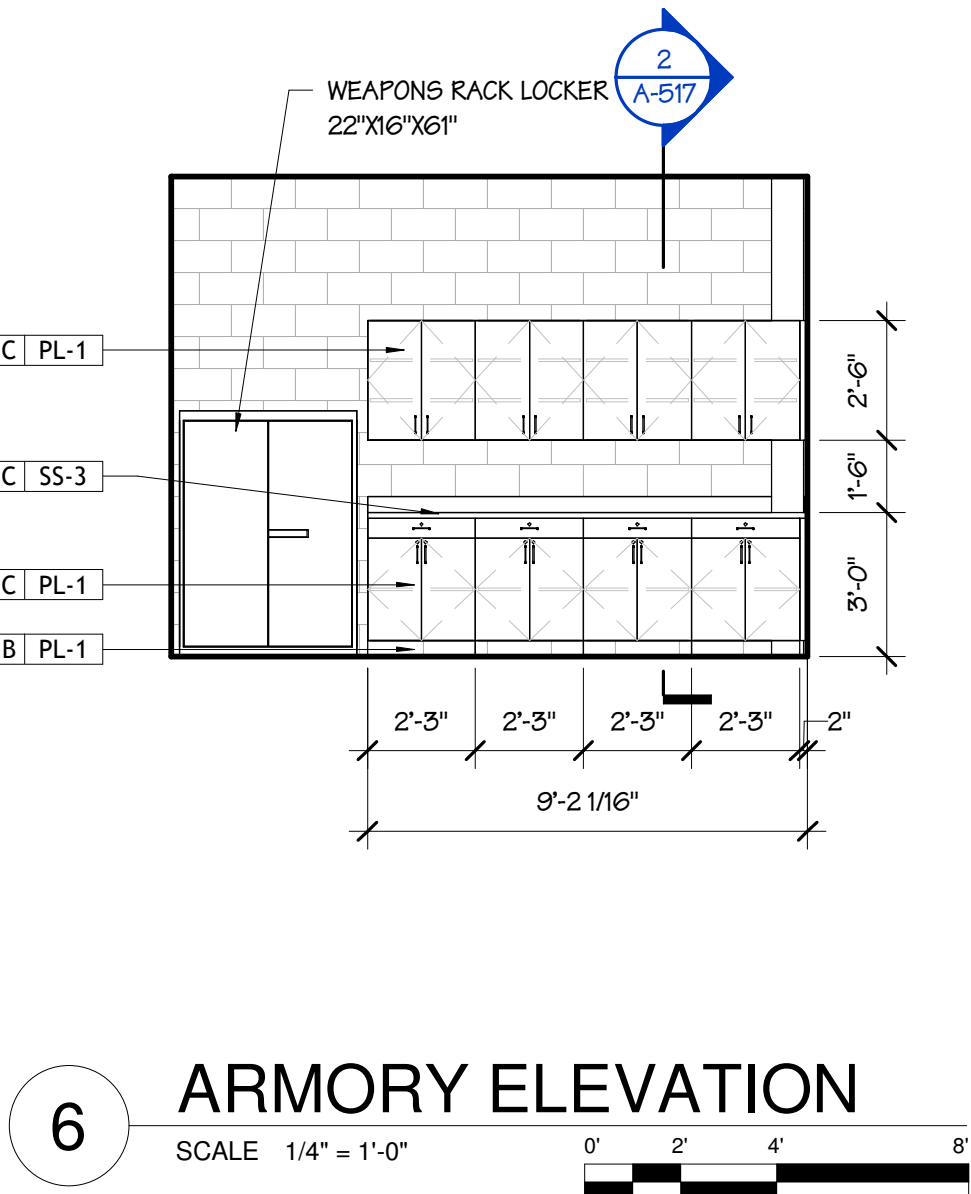
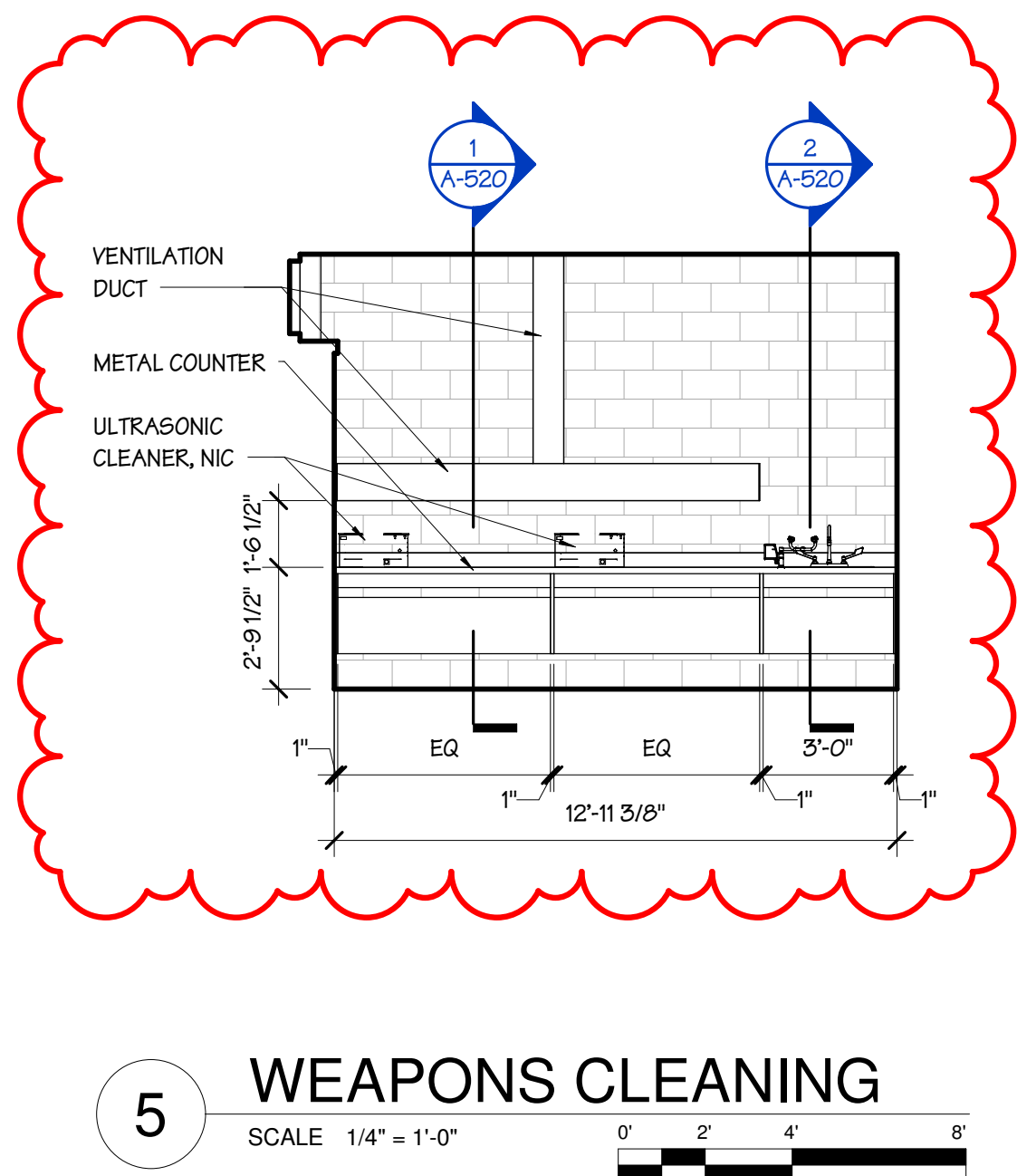
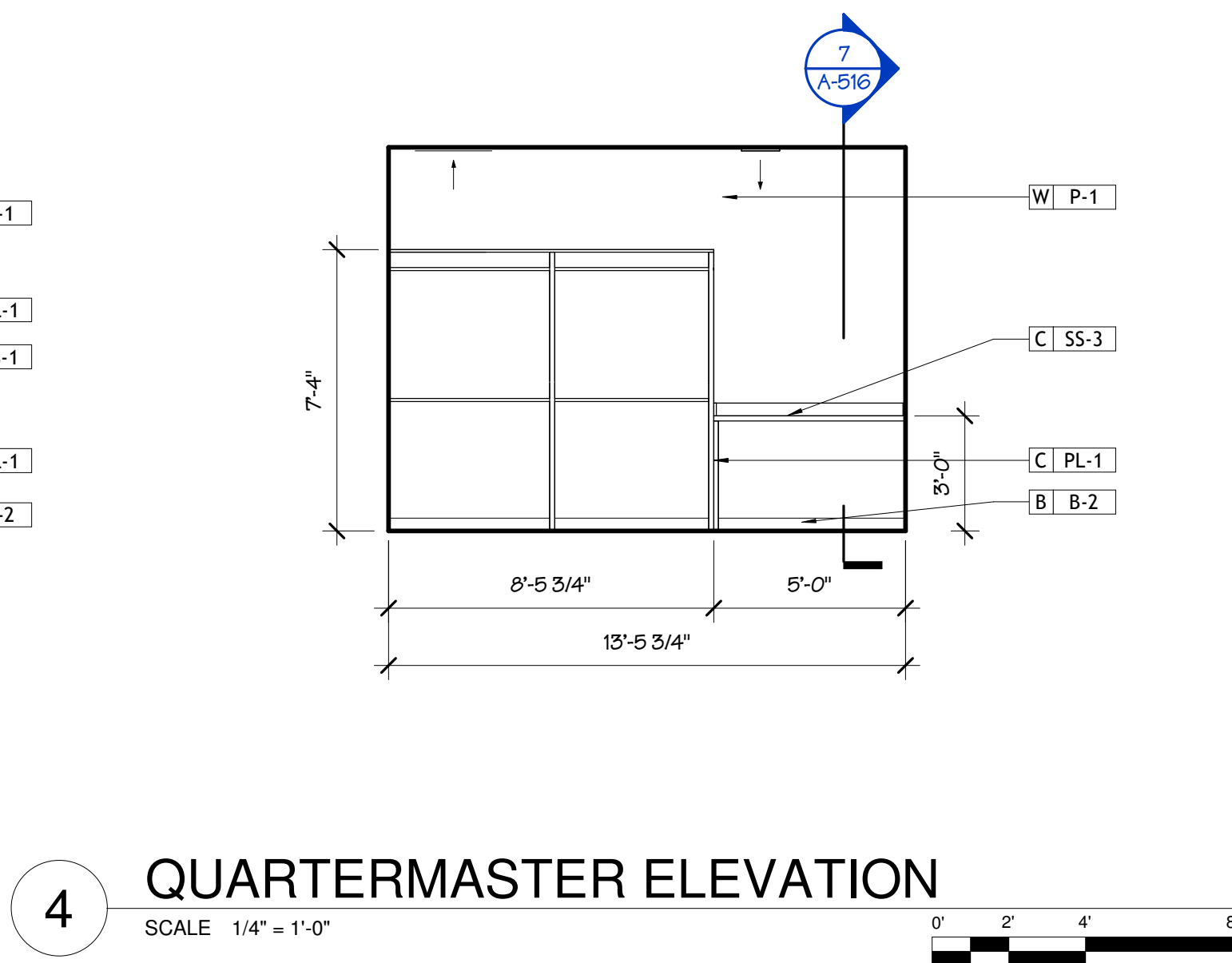
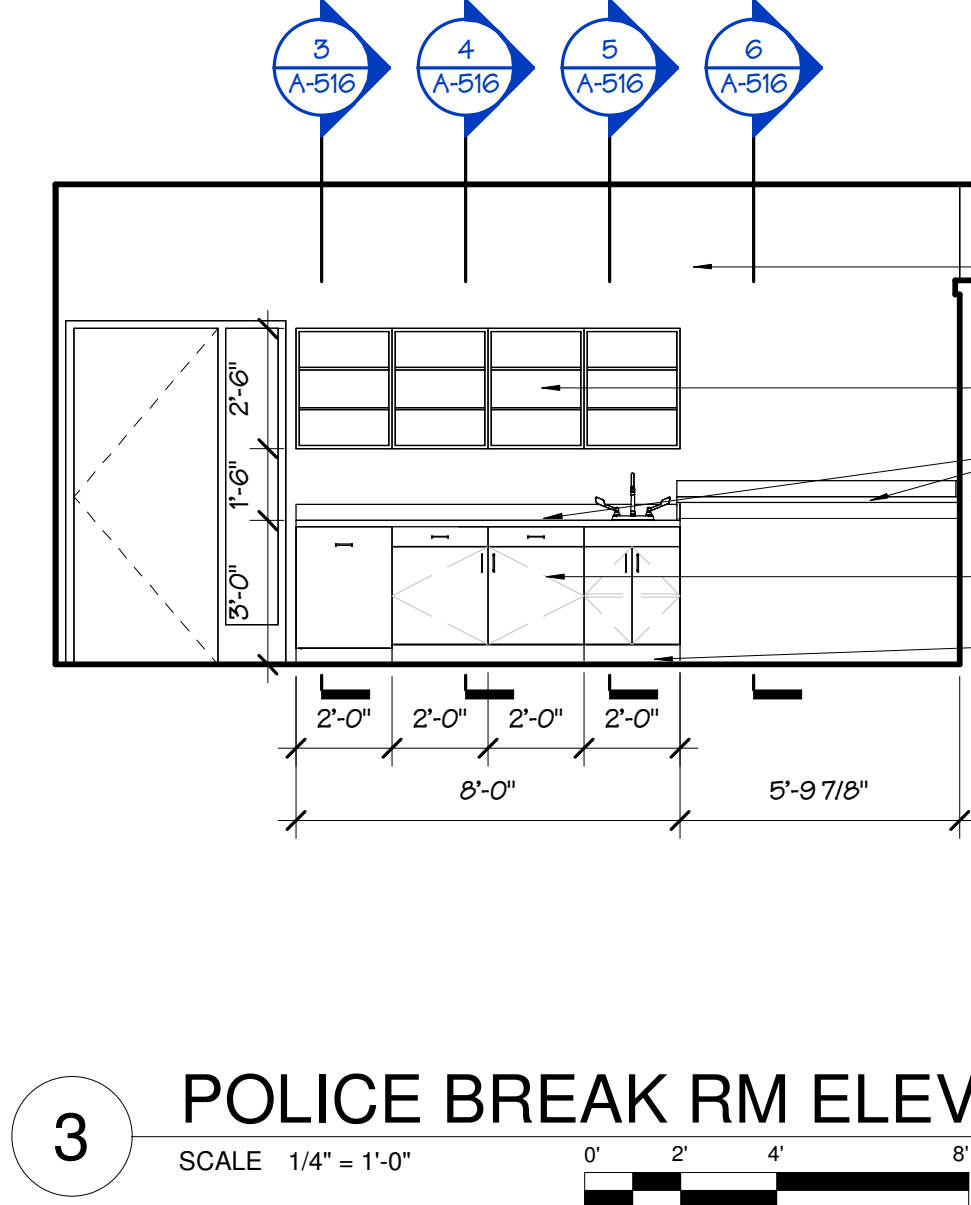
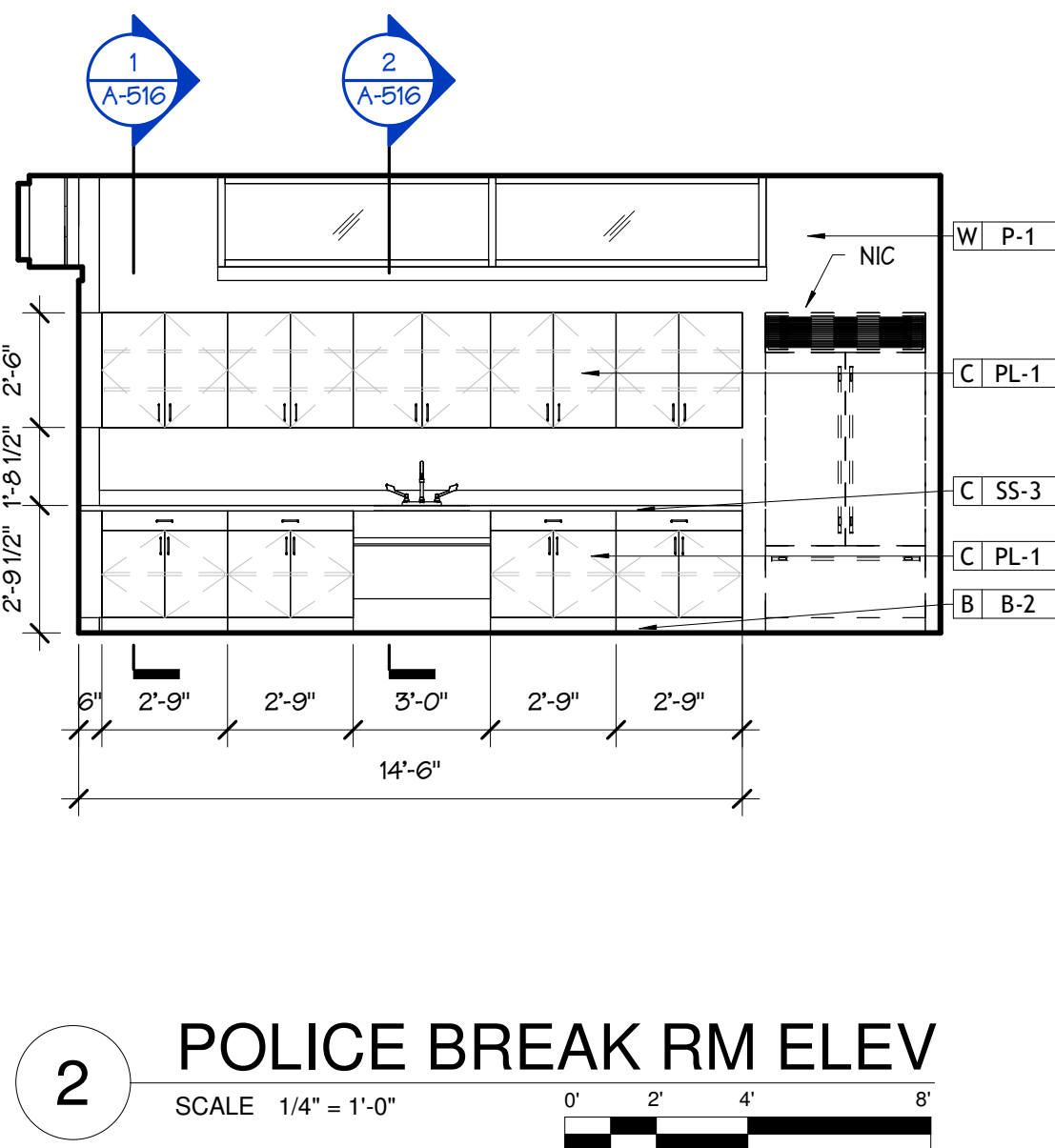
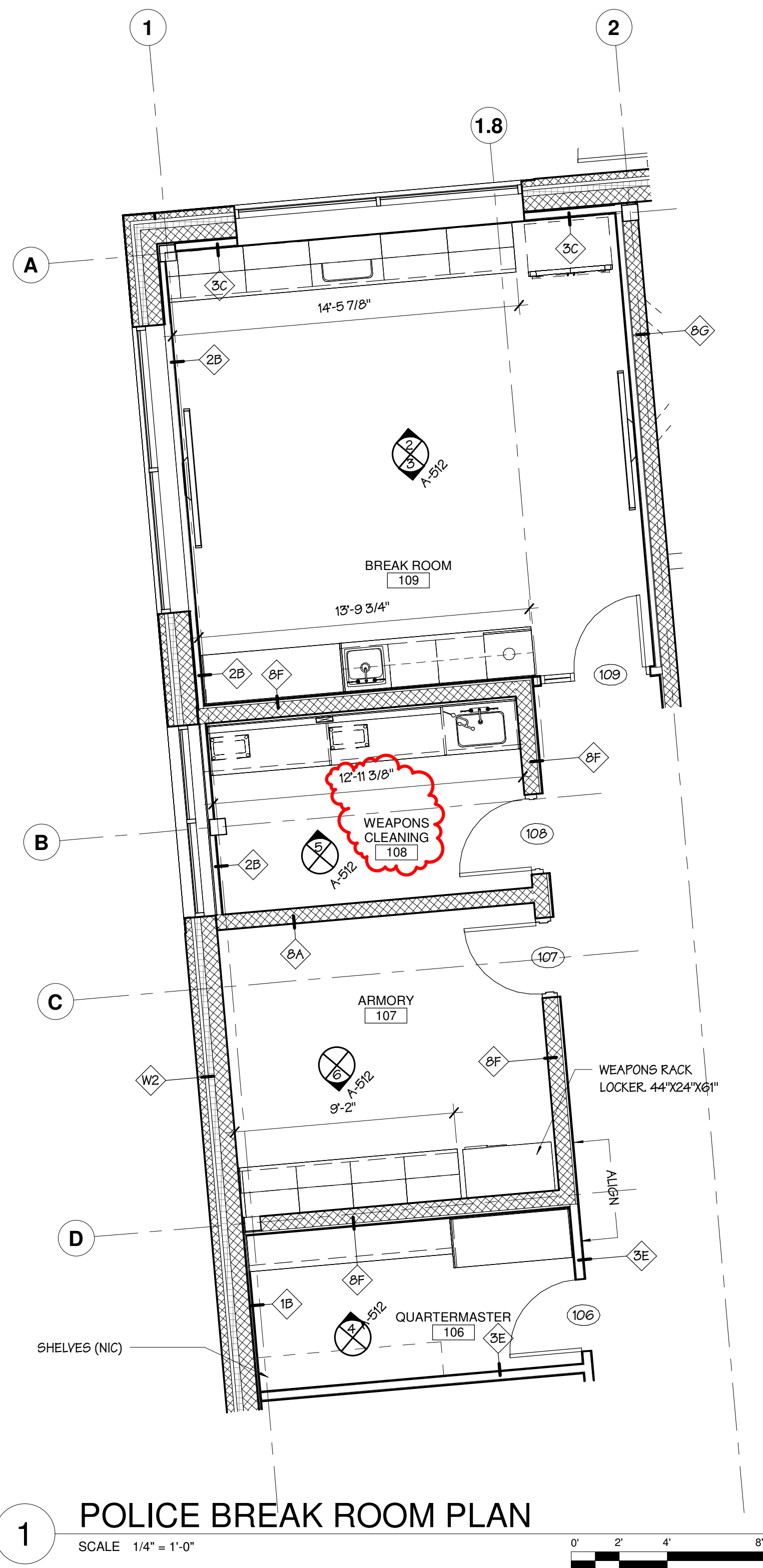
2 PARTIAL NORTH ELEVATION



3 PARTIAL WEST ELEVATION



6 COLUMN CAPITAL DETAIL



Project:
**ASTON TOWNSHIP
MUNICIPAL COMPLEX**
3264 Concord Road
Aston, PA 19014

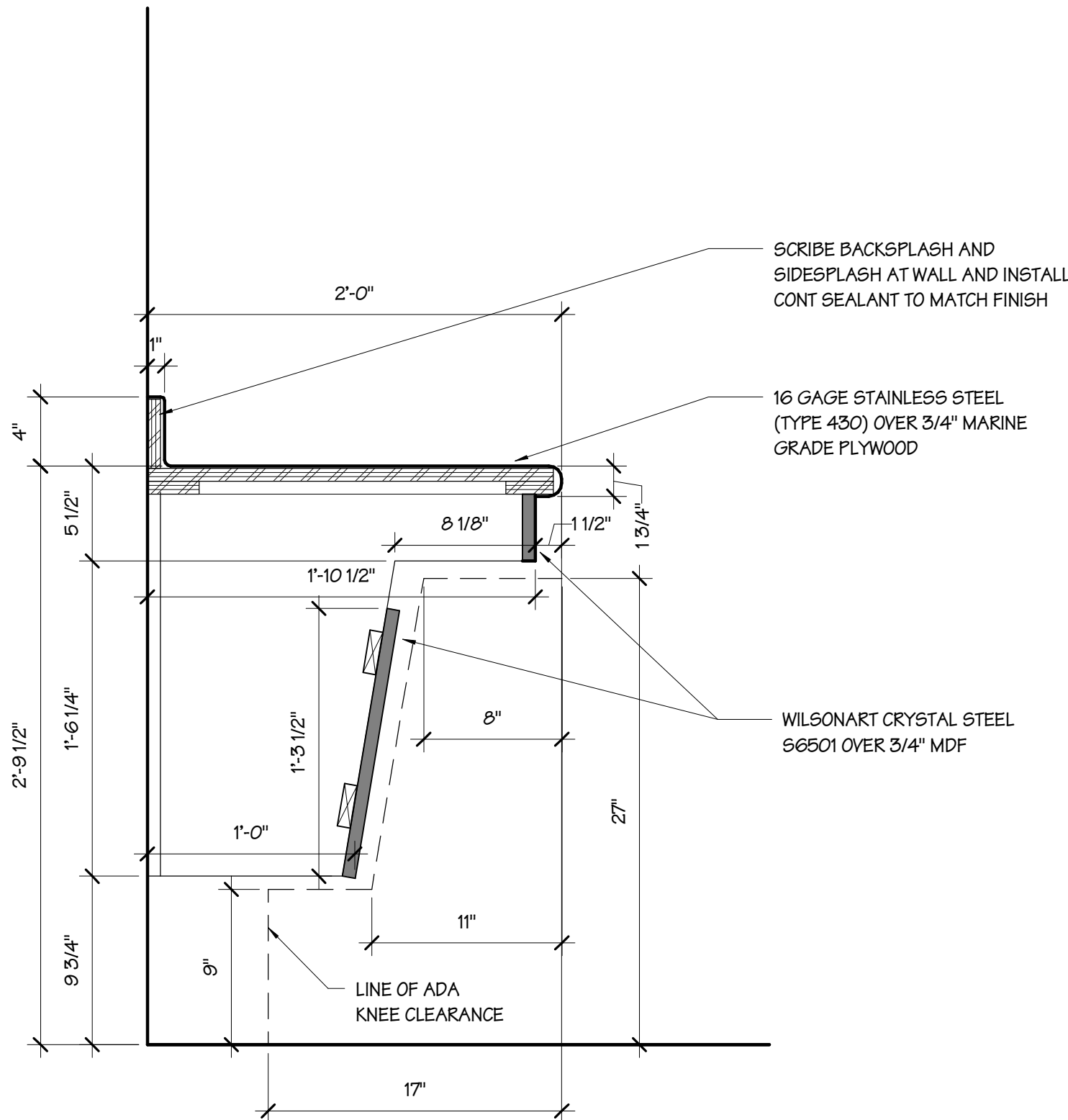
Owner:
ASTON TOWNSHIP
2 New Road
Suite 123
Aston, PA 19014

Revision/Issue:
0 04/09/24 Issued

Drawn: EHJ
Reviewed: PAS
Contact: Paul Andrew Sgroi
Project Number: 2301.00-22

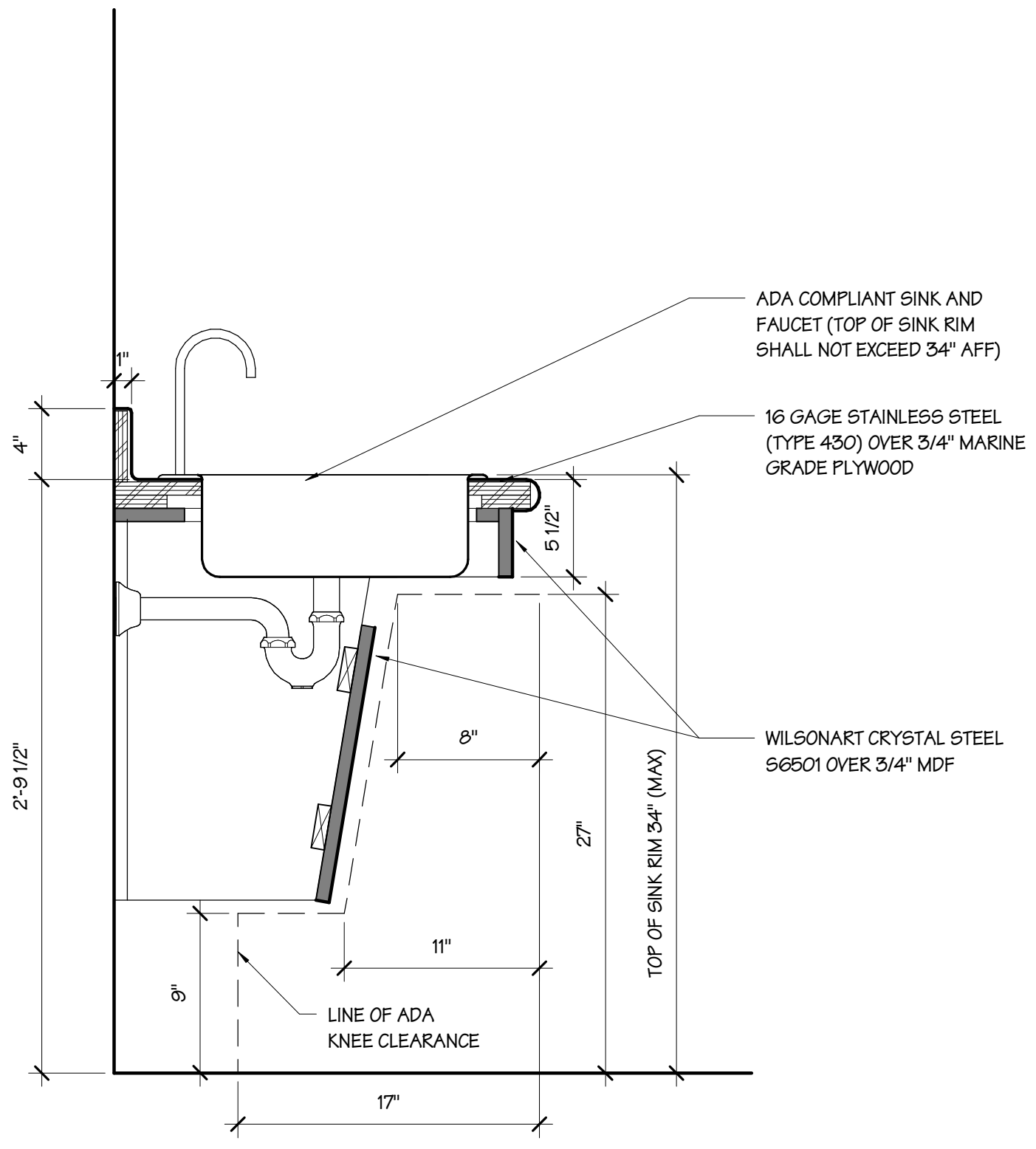
Sheet Title:
**CASEWORK
DETAILS**

Sheet Number:
A-520



1 ADA COUNTER

SCALE 1 1/2" = 1'-0"



2 ADA COUNTER WITH SINK

SCALE 1 1/2" = 1'-0"

GENERAL NOTES

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF WINDOW UNIT DIMENSIONS SHOWN AND THEIR ROUGH OPENINGS. IF DIFFERENT STOREFRONT AND CURTAIN WALL SYSTEMS ARE INSTALLED OTHER THAN SPECIFIED BASIS-OF-DESIGN UNITS, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF WINDOW SIZES, PERFORMANCE, OPERATION, EGRESS COMPLIANCE, AND FOR RESUBMITTING PROOF OF ENERGY COMPLIANCE TO THE AHJ.

STOREFRONT AND CURTAIN WALL GENERAL NOTES

- PERIMETER DIMENSIONS ARE TO EDGE OF MULLION FRAME.
- INTERIOR DIMENSIONS ARE TO EDGE OF MULLION.
- PRIMARY BACKER ROD AND SEALANT SHALL BE INSTALLED AROUND WINDOW FRAME (BOTH SIDES). DO NOT BLOCK WINDOW DRAIN SYSTEM. SECONDARY SEALANT SHALL BE INSTALLED AT WINDOW FRAME HEAD AND BOTH JAMBS ONLY. SILL TO REMAIN SEALANT FREE TO MAINTAIN DRAINAGE. SECONDARY SEALANT AT HEAD AND JAMBS, TO BE SELECTED BY ARCHITECT.

GLAZING LEGEND

MG-1:	MONOLITHIC GLASS (TEMPERED)
MG-2:	FIRE-RATED GLAZING
IGU-1:	INSULATED GLASS UNIT
IGU-2:	INSULATED GLASS UNIT (TEMPERED)
IGU-3:	INSULATED GLASS UNIT (CERAMIC-COATED SPANDREL)
IGU-4:	INSULATED GLASS UNIT (TEMPERED; ONE-WAY)
MSP:	METAL SPANDREL PANEL

Project:
**ASTON TOWNSHIP
MUNICIPAL COMPLEX**
3264 Concord Road
Aston, PA 19014

Owner:
ASTON TOWNSHIP
2 New Road
Suite 123
Aston, PA 19014

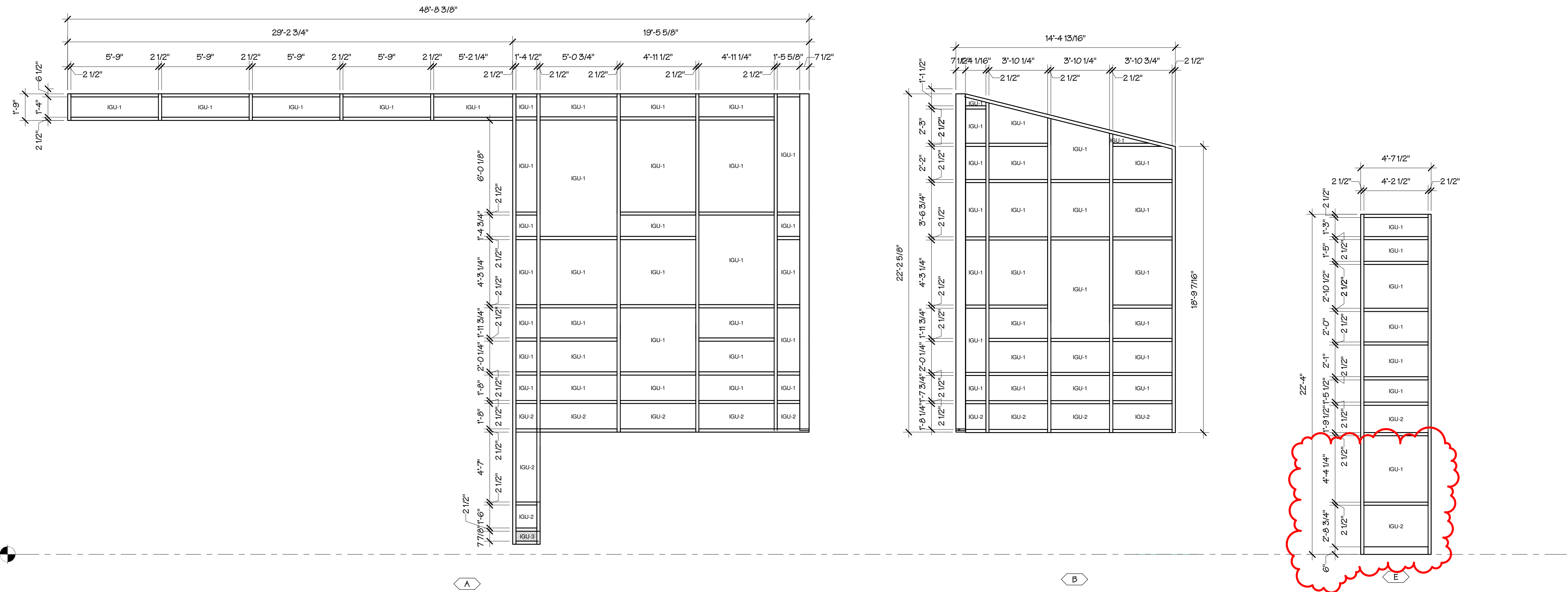
Revision/Issue:
0 03/29/24 Issued
1 04/09/24 Revisions

Drawn: Author
Reviewed: PAS
Contact: Paul Andrew Sgroi
Project Number: 2301.00-22

Sheet Title:
**CURTAIN WALL
ELEVATIONS**

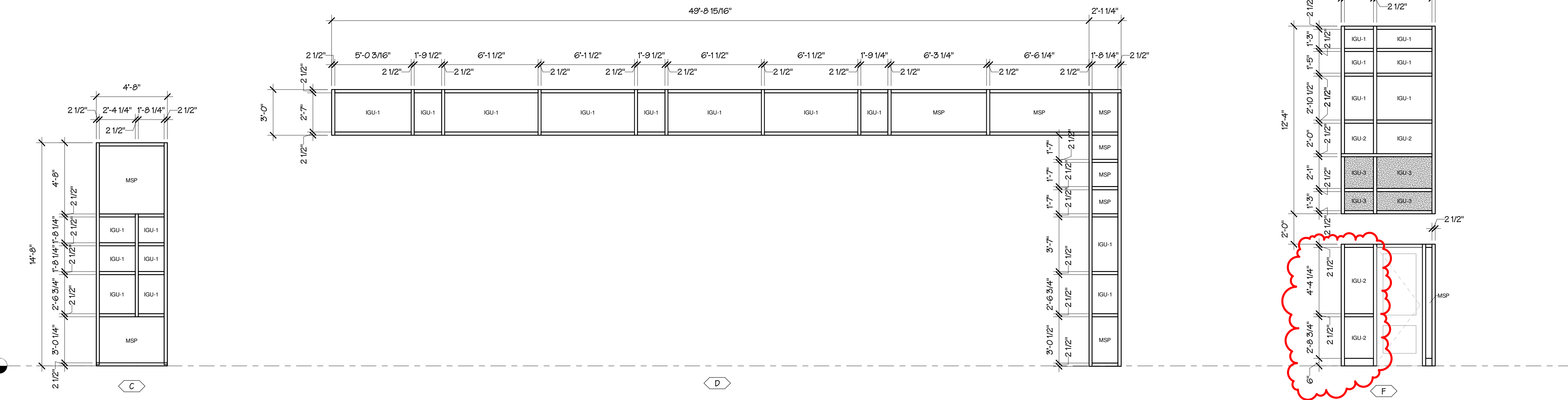
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CURTAIN WALL ELEVATIONS, 7 1/2" MULLIONS

SCALE 1/4" = 1'-0"



CURTAIN WALL ELEVATIONS, 6" MULLIONS

SCALE 1/4" = 1'-0"

GENERAL NOTES

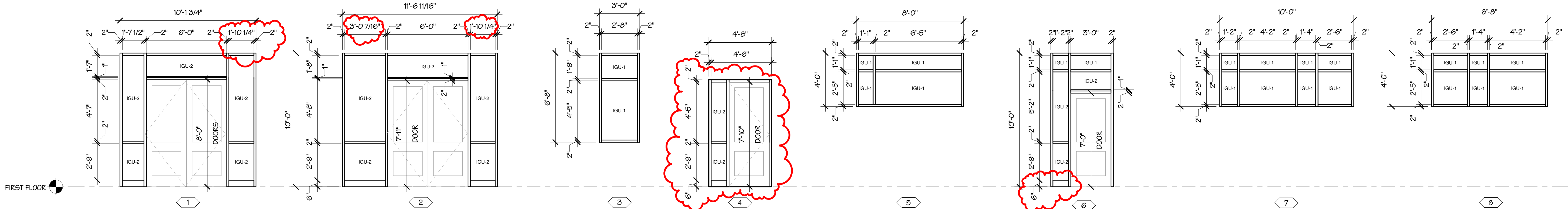
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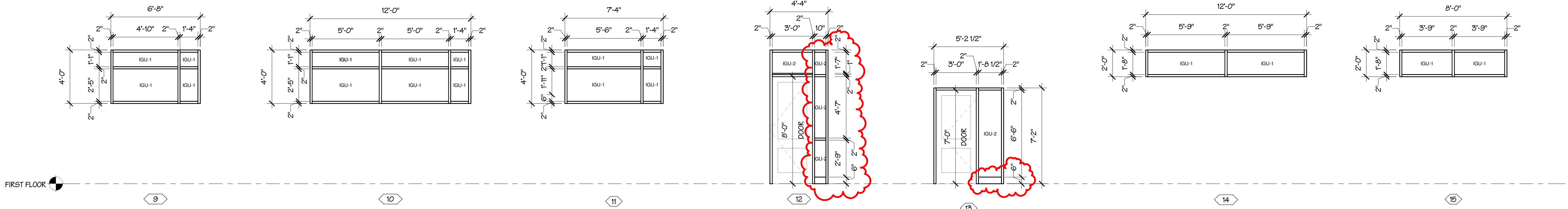
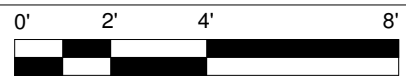
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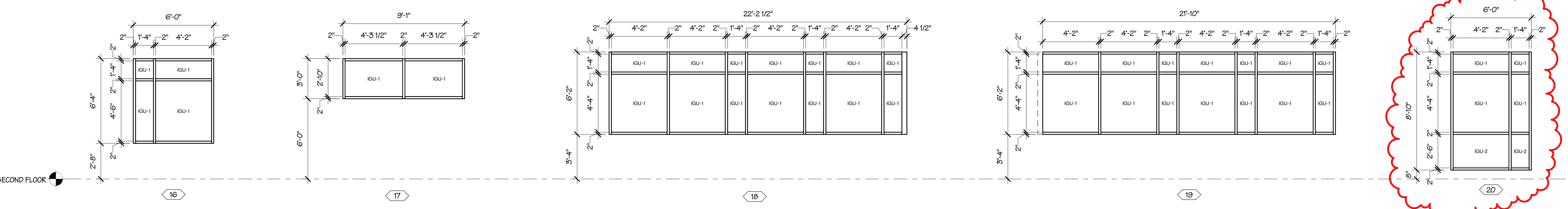
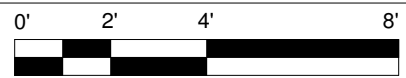
FIRST FLOOR ELEVATIONS

SCALE 1/4" = 1'-0"



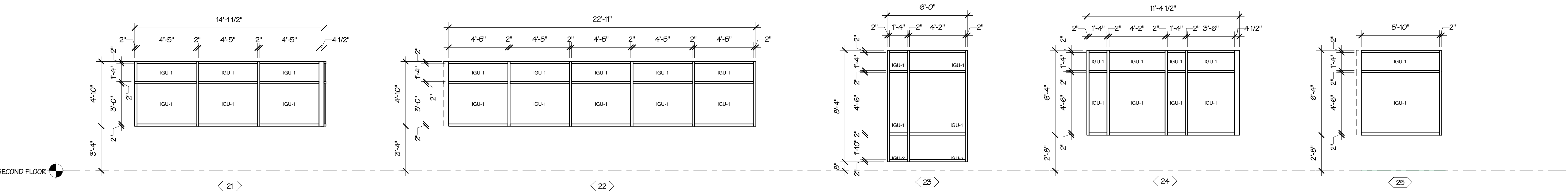
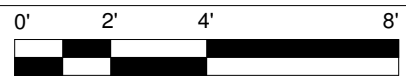
FIRST FLOOR ELEVATIONS

SCALE 1/4" = 1'-0"



SECOND FLOOR ELEVATIONS

SCALE 1/4" = 1'-0"



SECOND FLOOR ELEVATIONS

SCALE 1/4" = 1'-0"

