



NOTICE TO ALL FIRMS

Date: February 19, 2024

To: All Prospective Bidders

From: Sam Li
Interim Director of Procurement Services

Re: Addendum Number 2
IFB # C1610 – East Courtyard Roof Replacement

Notes:

See Addendum #2 for clarification on scope adjoining the New Academic Building, (N.A.B) coordination of roof details, & coordination for exterior lighting with accompanying electrical specifications. See summary below.

-AD.100.00 – Clarification on area of relocated screen wall

-A.101.00 – Clarification on the section details beyond the expansion joint at the N.A.B.

-A.101.00 – Clarification that each bidder shall indicate their proposed waterproofing system manufacture with the submission of their bid (Basis of design is Siplast).

-A.201.00 – Clarifications to exterior lighting and accompanying electrical specifications (See Addendum #2 Project Manual for the addition of Sections 265000, 260159, 260533, & 265100)

-A.802.00 – Coordination of details 14 (storefront wall), 16 (metal wall panel), & 17-20 (scope adjacent to the N.A.B)

-A.803.00 – Clarification to detail 34 (concrete stairs)

Questions

Q1. Can you please confirm that the leak detection system will just be installed on Roof D?

A1. **Leak detection shall be included as Alternate Number 3 at Roof D only. See Specification 012300 for more information.**

THIS ADDENDUM IS PART OF THE CONTRACT DOCUMENT AND SHALL BE INCLUDED WITH YOUR REQUEST FOR PROPOSAL SUBMITTAL. YOUR SIGNATURE BELOW WARRANTS THAT YOU UNDERSTAND THIS ADDENDUM AND THAT YOU HAVE MADE THE APPROPRIATE ADJUSTMENTS IN YOUR PROPOSAL AND CALCULATIONS.

Signature

Print Name and Title of Authorized Representative

Print Name of Company/Partnership/Individual

Date

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DOCUMENT 006000 - PROJECT FORMS

1.1 GENERAL CONDITIONS

- A. The following form of the General Conditions shall be used for Project:
 - 1. Requirements as stipulated in Owner's document bound within this Document.

1.2 ADMINISTRATIVE FORMS

- A. Preconstruction Forms:
 - 1. Form of Performance Bond and Labor and Material Bond: Requirements as stipulated in Owner's document bound within this Document.
- B. Information and Modification Forms:
 - 1. Form for Request for Interpretation (RFI): Bound within this Document.
- C. Payment Forms:
 - 1. Requirements as stipulated in Owner's document bound within this Document.

END OF DOCUMENT 006000

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Access to site.
- 4. Indoor Air Quality during construction.
- 5. Coordination with occupants.
- 6. Work restrictions.
- 7. Specification and drawing conventions.
- 8. Correlation and Intent of the Contract Documents
- 9. Miscellaneous provisions.
 - a. Request for Interpretation.
 - b. Proposal Request.

1.3 PROJECT INFORMATION

Project Identification: Fashion Institute of Technology
East Courtyard Roof Renovations
New York, NY 10001

Owner: Fashion Institute of Technology (FIT)
Owner's Representative: Allen King
Tel: 212-219-4424

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Scope of Work for this Project generally consists of the following:
 - 1. Roofing removal and replacement work shall be coordinated with HVAC and HVAC dunnage work being performed under separate contract.

- a. The HVAC Contractor will remove the existing HVAC units and unit curbs, and all existing ductwork, leaving duct stubs extending approx. 8" above the deck surface.
 - b. The Roofing Contractor shall remove all existing duct supports.
 2. The Roofing Contractor shall be responsible for maintaining watertightness throughout the performance of the work, including (but not limited to) the duct stubs and deck openings around them, and areas from which HVAC unit curbs were removed.
 3. Remove and locate offsite for re-use existing concrete pavers in good condition.
 4. Remove paver pedestals, protection board, roofing membrane, roof insulation board, and base sheet down to the surface of the poured concrete roof decks and adjoining vertical flashing surfaces.
 5. Remove sheet metal flashings, partially or completely, as indicated on the Drawings.
 6. Install a new roofing system, comprising two different roofing assemblies: an Inverted Roof Membrane Assembly ("IRMA") system in Roof Areas A, B and C, and a Conventional system in Roof Area D – see Roof Plan for Roof Area designations.
 - a. The IRMA system includes cementitious fill to correct deck slope and form crickets; a 2-ply torch-applied modified bitumen membrane; drainage mat; extruded polystyrene insulation board, 7 inches thick; fabric mat; and, concrete pavers on pedestals and, as needed, shims.
 - b. The Conventional system includes a torch-applied modified bitumen base sheet; tapered isocyanurate insulation board in adhesive, with a starting thickness of 6"; a cover board in adhesive; and a 2-ply torch-applied modified bitumen membrane.
 7. The roofing system includes related membrane and metal flashings.
 8. Drain bodies shall remain in place. Fixed drain extensions shall be installed for the drains in the Conventional assembly. New scuppers shall be cut through existing concrete curbs.
 9. Existing access provisions between Roof Areas – steel steps and concrete steps – shall be renovated. A steel ladder shall be removed.
 10. Steel gates and screens shall be refinished and re-installed.
 11. Existing parapet-mounted guardrails and light fixtures shall be removed. New guardrails and light fixtures shall be installed.
 12. Existing wall mounted light fixtures shall be removed. New wall mounted light fixtures and controls shall be installed.
 13. The existing rooftop sheds on Areas A, B and C shall be removed in their entirety, including shed roofs and walls, all steel support and framing elements, and metal flashings at the shed roof, holes from which shall be patched in the adjoining buildings' walls.
- B. Types of Contracts: Project will be constructed a single Prime Contract.
- C. Prime Contractor: Work in the Prime Contract includes, but is not limited to, the following:
1. Roofing work.
 2. General trades work.
 3. Electrical work.
 4. Remaining work not identified as work under other contracts.
 5. Selective demolition and cutting and patching not identified as work under other contracts.

- D. Temporary facilities and controls in the Prime Contract include, but are not limited to, the following:
1. Temporary facilities and controls that are not otherwise specifically assigned to the Electrical Contract.
 2. Unpiped temporary toilet fixtures (if Owner's facilities are not available for use), wash facilities, and drinking water facilities, including disposable supplies.
 3. General waste disposal facilities.
 4. Barricades, warning signs, and lights.
 5. Security enclosure and lockup.
 6. Environmental protection.
 7. Restoration of Owner's existing facilities used as temporary facilities.
 8. Staging and scaffolding.

1.5 PROJECT COORDINATION

- A. Prime Contractor coordination activities of Project include, but are not limited to, the following:
1. Provide overall coordination of the Work, including that of owner's contracts at jobsite.
 2. Coordinate compliance with FIT's fire safety requirements during construction.
 3. Coordinate shared access to workspaces.
 4. Coordinate product selections for compatibility.
 5. Provide overall coordination of temporary facilities and controls.
 6. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
 7. Coordinate construction and operations of the Work with work performed by each Contract.
 8. Coordinate sequencing and scheduling of the Work. Include the following:
 - a. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.
 - b. Prepare a combined contractors' construction schedule for entire Project. Base schedule on preliminary construction schedule. Secure time commitments for performing critical construction activities from contractors. Show activities of each contract on a separate sheet. Prepare a simplified summary sheet indicating combined construction activities of contracts.
 - 1) Submit schedules for approval.
 - 2) Distribute copies of approved schedules to contractors.
 9. Provide photographic documentation.
 10. Provide quality-assurance and quality-control services.
 11. Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.
 12. Provide information necessary to adjust, move, or relocate existing utility structures affected by construction.
 13. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked.

14. Coordinate cutting and patching.
 15. Coordinate protection of the Work.
 16. Coordinate firestopping.
 17. Coordinate completion of interrelated punch list items.
 18. Coordinate preparation of Project record documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
 19. Print and submit record documents if installations by more than one contractor are indicated on the same contract drawing or shop drawing.
 20. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
 21. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
- B. Each Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of the Work. Each Contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
 2. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of each contract for its own work.
 3. Furnishing of access panels for the work of each contract shall be the work of each contract for its own work. Installation of access panels shall be the work of each contract for its own work.
 4. Painting for the work of each contract shall be the work of the General Construction Contract.
 5. Cutting and Patching: Provided under each contract for its own work.
 6. Through-penetration firestopping for the work of each contract shall be provided by each contract for its own work.
- C. Temporary facilities and controls in the Prime Contractors Contract include, but are not limited to, the following:
1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
 2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
 3. Temporary enclosures for its own construction activities.
 4. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
 5. Progress cleaning of work areas affected by its operations on a daily basis.
 6. Secure lockup of its own tools, materials, and equipment.
 7. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
 8. FIT's fire safety requirements during construction.

1.6 ACCESS TO SITE

- A. Prime Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Connections to Electrical Equipment and Systems: Contractor is not permitted to tie into electrical equipment or systems until the FIT Facilities Management Department has reviewed and approved the connection.
 - 1. Submit written procedures to the Owner's Representative, detailing the proposed connection Work.
 - 2. After procedures have been approved, notify the Owner's Representative at least three working days prior to the connection Work so that arrangements can be made to have a FIT Facilities Management Department Representative witness the Work.

1.7 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas where work is being performed. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: As indicated in Owner's General Requirements.

1. Unless noted otherwise, Work is to be performed between the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, legal and union holidays excluded.
2. Major mobilization if required is to be performed at night, between the hours of 9:00 p.m. to 6:00 a.m., Monday through Friday.
3. All work conducted which causes significant noise that is considered a disturbance to the school shall be conducted, at contractor's expense, during the time period between 9:00 p.m. and 6:00 a.m. Work considered to be a disturbance or a disruption to the school includes but is not necessarily limited to roof materials loading, roofing removal, scarification, and mechanical fastening operations.
4. Hours for Utility Shutdowns: As approved in writing by Owner with not less than 72 hours' notice. Shutdowns shall be conducted, at contractor's expense, during the time period between 10:00 p.m. and 6:00 a.m.
5. Hours for Core Drilling: As approved in writing by Owner with not less than 72 hours notice. Core drilling shall be conducted, at Contractor's expense, during the time period between 10:00 p.m. and 6:00 a.m.
6. 24 Hour Access: The Owner will make the work site available as needed, including three shifts (24 hour access) as coordinated and approved in writing by Owner. All additional costs associated with work outside of normal business working hours shall be accounted for in the Contractor's bid.
7. Weekend Hours: As approved in writing by Owner.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, any level of odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than 72 hours in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Employee Identification: Comply with the Facility's Visitor Identification Policy. A copy of the current policy will be distributed at the initial job meeting.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.10 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

- A. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work by the Contractor. The contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

- B. In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
- C. If an item is shown on the Drawings but not specified, the Contractor shall provide the item of the same quality as similar items specified, as determined by the Architect. If an item is specified but not shown on the Drawings, it shall be located as directed by the Architect.
- D. The Drawings are indications of the design intent as well as specific instructions. The "details" included on Drawings show the intent of all similar areas. If questions arise about the construction of an area not specifically detailed, consult with the Architect who will provide further "details" and instructions. Such further documentation, if consistent with the Contract Documents, shall not alter the Contract Sum.
- E. If the Contractor, in the course of construction, finds any conflict, error, or discrepancy on or between the Drawings and Specifications or any of the related Contract Documents, such conflict, error, or discrepancy shall be immediately referred to the Architect, in writing. Architect shall issue an interpretation, in writing, to the Contractor within (10) days after receipt of the written request. No additional compensation will be paid to the Contractor as a result of an interpretation of the Contract Documents.

1.11 MISCELLANEOUS PROVISIONS

- A. Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Request for Interpretation (RFI):
 - 1. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form bound in the Project Manual.
 - 2. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 3. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.
 - 4. On receipt of Architect's action, update RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within five days if contractor disagrees with response.
- C. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

- a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
- b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- c. Include costs of labor and supervision directly attributable to the change.
- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- e. Use form acceptable to Architect.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MANUFACTURER'S WARRANTY

- A. Furnish a 30-year Full System No-Dollar-Limit warranty against material and installation workmanship deficiencies, covering the full cost of materials and labor necessary to correct the deficiencies, for the IRMA and Conventional roof systems.
 1. The full system includes all materials produced by the Manufacturer.
 2. The warranty for the IRMA system shall include a provision whereby the Manufacturer is responsible for the cost of removing and restoring overburden components (drainage mat, insulation, fabric mat, pedestals, pavers) to investigate and repair a deficiency covered under the warranty.
 3. The warranty shall also include the manufactured coping and fascia assemblies included in this project.

3.2 CONTRACTOR'S GUARANTEE

- A. Furnish a 5-year guarantee covering performance and costs of correction of deficiencies in the materials installed by the Roofing Contractor and in the workmanship in installing them.
- B. Required Bonds: Labor & Material, and Performance.
- C. No maintenance guarantee or maintenance bond is required.

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 01:

1. Description: Install 0.50" aluminum base infill where masonry substrate for base flashing is missing
2. Unit of Measurement: Per linear foot.
3. Quantity Allowance: 35 linear feet.
4. See Section 076200.

B. Unit Price 02:

1. Description: Install 24" x 24" x 2" concrete pavers to match existing, to replace existing full size pavers which are broken
2. Unit of Measurement: Per paver .
3. Quantity Allowance: 50 pavers.
4. See Section 075000.

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other Work of the Contract.
- C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate Number 1 – Provide new ladder in lieu of refinishing and reinstalling existing ship's ladder.
 - 1. See specification section 055000 for more information.
- B. Alternate Number 2 – Provide new cast in place treads in lieu of precast treads.
 - 1. See specification section 034500 for more information.
- C. Alternate Number 3 – Provide Electronic Leak Detection system at Roof D. Base bid shall include no associated work.
 - 1. See specification section 075900 for more information.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific

- features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

REQUEST FOR INTERPRETATION

Client:
Project:
Comm. No.:
File No.:

DATE:
INITIATED BY:
DIRECTED TO:
RE:

SUBJECT:

RFI NO.:

SIGNED: _____

REPLY:

The Work shall be carried out in accordance with the supplemental information or clarifications included in the Reply and issued in accordance with the Contract Documents without change in the Contract Sum or Contract Time. Proceeding with the Work in accordance with the Reply indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.

Where the Reply requires a change to the Contract Sum or Contract Time, submit a detailed breakdown indicating the increased sum or time required. Proceed with the Reply ONLY when the Owner and the Architect give written authorization for the change to the Contract Sum or Contract Time.

REPLY ISSUED
BY:

FIRM:

DATE:

DISTRIBUTION:

____ Owner:
____ Contractor:
____ Mechanical Engineer:
____ Electrical Engineer:

____ Structural Engineer:
____ Other:
____ Other:
____ Other:

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
 - D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 1. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as part of permanent construction, consisting of multiple products, assemblies, and subassemblies.
 - E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
 - F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
 - G. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
 - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
 - I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
 - J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.
- 1.4 DELEGATED-DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups.
 - 1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.

5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.

8. Provide to Architect copy of Manufacturer's Technical Representative's written report to Contractor of each inspection performed by Representative. Include copy of report with other documents required for monthly payment request, for each inspection performed during that monthly period.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation

of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Architect's approval of mockups before starting corresponding work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 8. Demolish and remove mockups when directed unless otherwise indicated.
- K. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which

mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Payment for these services will be made from testing and inspection allowances, as authorized by Change Orders.
 - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections.
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.4 ACTION SUBMITTALS

- A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

- a. Name of product and manufacturer.
- b. Model and serial number.
- c. Capacity.
- d. Speed.
- e. Ratings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 1. Store products to allow for inspection and measurement of quantity or counting of units.
 2. Store materials in a manner that will not endanger Project structure.
 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 6. Protect stored products from damage and liquids from freezing.
 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: ..."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: ..."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.
 - a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 2. Evidence that proposed product provides specified warranty.
 - 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 4. Samples, if requested.
- B. Submittal Requirements: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Installation of the Work.
 - 2. Cutting and patching.
 - 3. Progress cleaning.
 - 4. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.

5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

- a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

- a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.

- e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 4. Verify existing structural members for replacement to verify if material is suitable for reuse.

- B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.

- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
- 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 024119 - SELECTIVE DEMOLITION

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. Demolition and removal of selected portions of building or structure.
 - 2. Removal and reinstallation of selected items.
 - 3. Salvage of existing items to be reused or recycled.

- B. Related Requirements:

- 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 017300 "Execution" for cutting and patching procedures.
 - 3. Section 070150.19 "Preparation for Reroofing" for selective demolition associated with roofing work.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain (ETR): Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of building.
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control, and for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, which might be misconstrued as damage caused by demolition operations. Submit before Work begins.
- E. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.

- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

- 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. At Great Hall below, perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
 - a. Following survey, Owner, Architect, and Contractor to examine Great Hall for any demolition disturbances.
 - 2. At Great Hall below, perform surveys as the Work progress to detect hazards resulting from construction activities.
 - a. Following survey, Owner, Architect, and Contractor to examine Great Hall for any construction disturbances.
 - 3. At the Great Hall below, perform final walk through with Owner, Architect, and Contractor to examine Great Hall is in satisfactory condition.
- C. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs or video.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 2. Arrange to shut off utilities with utility companies.
 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.

- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from lower to higher level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 9. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.

- D. Removed and Reinstalled Items: Including but not limited to steel screens and posts, fence posts and gates, ships' ladders, handrails, concrete pavers, and other items as indicated on drawings.
 - 1. Carefully remove items.
 - 2. Prepare and finish steel and galvanized items in accordance with Section 099600 "High-Performance Coatings."
 - 3. Reinstall items at removal locations. Provide new fasteners and anchorage as required.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 034500 - PRECAST ARCHITECTURAL CONCRETE

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. Architectural precast concrete stair treads and risers.

1.3 DEFINITIONS

- A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

1.4 PREINSTALLATION MEETINGS

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

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- C. Shop Drawings:
 - 1. Detail fabrication and installation of architectural precast concrete units.
 - 2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
 - 3. Indicate joints, and extent and location of each surface finish.
 - 4. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
 - 5. Include plans and elevations showing unit location and sequence of erection for special conditions.
 - 6. Indicate location of each architectural precast concrete unit by same identification mark placed on unit.
 - 7. Indicate relationship of architectural precast concrete units to adjacent materials.

8. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
- D. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.
- E. Delegated-Design Submittal: For architectural precast concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Show precast concrete stair tread and riser types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the precast concrete stair treads and risers, and loads imposed on the stair structure from these precast elements.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Material Certificates: For the following items:
 1. Cementitious materials.
 2. Reinforcing materials.
 3. Admixtures.
- C. Material Test Reports: For aggregates.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Installer shall demonstrate a record of at least five years of successful installation of precast units similar to those required for this project.
- B. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
 1. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with

PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."

1.8 COORDINATION

- A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.
- B. Support units during shipment on nonstaining shock-absorbing material.
- C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
- D. Place stored units so identification marks are clearly visible, and units can be inspected.
- E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
- F. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design architectural precast concrete units, including attachment to building construction.
- B. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.
- C. Structural Performance of Stairs: Precast architectural concrete tread and riser units shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Uniform Load: 100 lbf/sq. ft.
 - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Limit deflection of treads and risers to L/720 or amount allowed by precast architectural concrete stair tread and riser manufacturer, whichever is less.

- D. Finish: Walking surfaces shall have minimum coefficient of friction of 0.60, wet and dry.

2.2 MOLD MATERIALS

- A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

2.3 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A185/A185M, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded Wire Reinforcement: ASTM A497/A497M, flat sheet.
- D. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

2.4 MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II, gray, unless otherwise indicated.
- B. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C33/C33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
- C. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
 - 1. Air Entrainment Admixture: ASTM C260.
 - 2. Water-Reducing Admixtures: ASTM C494/C494M, Type A.
 - 3. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
- E. Grout: Cement shall be gray Portland cement, free from soluble salts and complying with ASTM C150, Type I or Type III High Early Strength, one brand throughout work. Strength shall be 4,000 psi in 28 days.
- F. Sealer: Apply one coat of penetrating sealer to all surfaces of precast architectural concrete units. Sealer shall be non-staining, penetrating material, suitable for exterior use, type which does not discolor or darken the surface.

2.5 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
- B. Normal-Weight Concrete Mixtures: Proportion full-depth mixture by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28 Days): 5000 psi minimum.
- C. Water Absorption: Maximum 6 percent by weight, tested according to ASTM C642.
- D. Air Entrainment: Precast elements exposed to weather or vulnerable to deicers shall have 6 percent +/- 1.5 percent air entrainment.
- E. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

2.6 MOLD FABRICATION

- A. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
 - 1. Form joints are not permitted on faces exposed to view in the finished work.

2.7 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- C. Cast-in accessories in architectural precast concrete units as indicated on the Contract Drawings.
- D. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings without Architect's approval.
- E. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.
 - 1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcing exceeds limits

- specified in ASTM A775/A775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
 3. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.
- F. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- G. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- H. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
- I. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
- J. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- K. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.
- L. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- M. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

2.8 FABRICATION TOLERANCES

- A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.
- B. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with the following product tolerances:
1. Overall Height and Width of Units, Measured at the Face Exposed to View: As follows:

- a. 10 feet or under, plus or minus 1/8 inch.
- b. 10 to 20 feet, plus 1/8 inch, minus 3/16 inch.
- c. 20 to 40 feet, plus or minus 1/4 inch.
- d. Each additional 10 feet, plus or minus 1/16 inch.

2. Local Smoothness: 1/8 inch/10 feet.

2.9 FINISHES

- A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp.

2.10 SOURCE QUALITY CONTROL

- A. General: Strength of precast concrete units is considered deficient if units fail to comply with ACI 318 requirements for concrete strength.
- B. Testing: If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, precaster will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C42/C42M and ACI 318.
1. A minimum of three representative cores shall be taken from units of suspect strength, from locations directed by Architect.
 2. Test cores in an air-dry condition.
 3. Strength of concrete for each series of three cores is considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
 4. Report test results in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports include the following:
 - a. Project identification name and number.
 - b. Date when tests were performed.
 - c. Name of precast concrete fabricator.
 - d. Name of concrete testing agency.
 - e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.
- C. Patching: If core test results are satisfactory and precast concrete units comply with requirements, clean and dampen core holes and solidly fill with precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.
- D. Defective Units: Discard and replace precast architectural concrete units that do not comply with acceptability requirements in PCI MNL 117, including concrete strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not

match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting structure and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.
- B. Do not install precast concrete units until supporting cast-in-place concrete has attained minimum allowable design compressive strength and supporting steel or other structure is structurally ready to receive loads from precast concrete units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.
- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
- C. Connect architectural precast concrete units in position as indicated on drawings and approved Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

3.3 ERECTION TOLERANCES

- A. Erect architectural precast concrete units level, plumb, square, and in alignment, without exceeding the following noncumulative erection tolerances:
 - 1. Comply with current New York City Building Codes

3.4 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, as determined by Architect.

- C. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.5 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.
- B. Clean deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
 - 1. Perform cleaning procedures according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
 - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034500

SECTION 055000 - METAL FABRICATIONS

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. Removal and reinstallation of existing steel items as indicated on drawings, including but not limited to the following:
 - a. Steel screens and posts.
 - b. Fence posts and gates.
 - c. Ships' ladders.
 - d. Ladders
 - e. Handrails.
 - 2. Miscellaneous framing and supports.

1.3 COORDINATION

- A. Coordinate installation of metal fabrications that are anchored to or that receive other work.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Show installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- B. Delegated-Design Submittal: For anchorage of all removed and reinstalled items, and miscellaneous framing and supports; including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design anchorage for steel railing and supports.
- 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.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.3 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- C. Galvanize all miscellaneous framing and supports.

2.4 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use. Select fasteners for type, grade, and class required.
- B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.
- C. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- D. Post-Installed Anchors: Chemical anchors.
 - 1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 FABRICATION, GENERAL

- A. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

3.2 REMOVAL AND REINSTALLATION OF STEEL ITEMS

- A. Remove steel items in accordance with Section 024119 "Selective Demolition."

- B. Reinstall steel items to comply with requirements of items being supported, including and requirements indicated on Shop Drawings and as determined during Delegated Design.

3.3 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

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. Wood blocking and nailers.
 - 2. Wood shims.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.

1.6 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of each new assembly, including but not limited to the following:
 - a. At each of the two types of parapets at which manufactured coping assemblies will be installed.
 - b. At the parapet at which a manufactured fascia assembly will be installed.
 - c. HVAC duct penetration curb.
 - 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. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Wood blocking: Douglas fir dimensional lumber, Grade 4 Common, moisture content 19 percent or less.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. Shims: Utility grade cedar, 10-inch wide, 3/4-inch thick tapered to 1/8-inch thick.

2.4 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 1. Where rough carpentry is exposed to weather, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M, or of Type 304 stainless steel.
- B. Nails: Common or roofing nails, min.6d , galvanized; or of Type 304 stainless steel.
- C. Screws: #11 or #12 wood screws, galvanized; or of Type 304 stainless steel.
- D. Concrete Screw: 300 Series stainless steel, 1/4 inch by 4 inch, Phillips head, as manufactured by DeWalt, trade name Aggre-Gator, or approved equal.

- E. Masonry Anchor: Stainless steel drive and zamac alloy body, length for minimum 1-1/2 inch embedment, as manufactured by Powers Fastening Inc., trade name Zamac Nailin, or approved equal.
- F. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- G. Threaded Rods and Nuts: 3/4" minimum diameter, 300-series stainless steel.
- H. Epoxy Adhesive: Two-part injection anchoring system, brand designation T308+ Epoxy, as manufactured by Powers Fastening, Inc., or approved equal.
- I. Mineral Wool Blanket Insulation: ASTM C 665 Type I, ASTM E 136, maximum flame spread index 0, smoke developed index 0.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- E. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
- G. Use minimum 6D nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.

Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

- H. Install fasteners within 3 inches of ends of wood blocking lengths, and at 8-inch spacing, staggered, between ends.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Install HVAC curb assemblies in two increments.
 - 1. First increment to enable installation of base flashings and temporary provisions to prevent water entry at and around the duct stubs.
 - 2. Second increment, in conjunction with installation of new ductwork (by others), to enable installation of base flashings at final required height and installation of metal counterflashings between ducts and curbs.

END OF SECTION 061000

SECTION 066116 - SOLID SURFACING FABRICATIONS

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. Solid surface material fabrications.

1.3 ACTION SUBMITTALS

- A. Product Data: For solid surfacing materials.
- B. Shop Drawings: For fabrications.
 - 1. Show direction of directional pattern, if any.
- C. Samples for Initial Selection: For each type of material exposed to view.
- D. Qualification Data: For fabricator.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate items similar to that required for this Project, and whose products have a record of successful in-service performance.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of solid surfacing fabrications by field measurements.

PART 2 - PRODUCTS

2.1 SOLID SURFACE MATERIALS

- A. Solid Surface Material: Quartz agglomerate solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with ICPA SS-1, except for composition.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. DuPont; DuPont de Nemours, Inc.
 - b. Formica Corporation.
 - c. Wilsonart LLC.
 - 2. Colors and Patterns: Matte Black

2.2 SOLID SURFACING FABRICATION

- A. Fabricate according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Premium.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material and conditions under which items will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum.

- B. Secure items to substrate with adhesive according to solid surface material manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

END OF SECTION 066116

SECTION 070150.19 - PREPARATION FOR REROOFING

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. Removal of existing membrane, damaged concrete pavers, protection board, pedestals, insulation boards, and base sheet down to existing deck.
 - 2. Removal of base flashings.
 - 3. Removal of other roofing-related components as indicated.
 - 4. Removal and setting aside for reuse undamaged concrete pavers.

- B. Related Requirements:

- 1. Section 011000 "Summary" for use of the premises and phasing requirements.
 - 2. Section 024119 "Selective Demolition" for removal and reinstallation of existing rooftop items.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, sections, and details.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Photographs or Videotape: At Roof level and Great Hall below, show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty specified herein.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Reroofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing system tear-off and replacement, including, but not limited to, the following:
 - a. Reroofing preparation, including roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system components that are to remain.
 - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
 - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
 - e. Existing roof deck conditions requiring notification of Architect.
 - f. Existing roof deck removal procedures and Owner notifications.
 - g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
 - h. Structural loading limitations of roof deck during reroofing.
 - i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
 - j. HVAC shutdown and sealing of air intakes.
 - k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
 - l. Asbestos removal and discovery of asbestos-containing materials.
 - m. Governing regulations and requirements for insurance and certificates if applicable.
 - n. Existing conditions that may require notification of Architect before proceeding.

1.7 FIELD CONDITIONS

- A. Existing Roofing System: As indicated on drawings.
- B. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Limit construction live loads on roof to 60 psf. Do not stockpile material on roof.
- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 1. Limit removal area to size which can be made watertight the same day.
- G. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. Expanded Polystyrene (EPS) Insulation: ASTM C 578.
- B. Plywood: DOC PS1, Grade CD Exposure 1.
- C. OSB: DOC PS2, Exposure 1.

2.2 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Where required, shut off rooftop utilities and service piping before beginning the Work.

- B. Test existing roof drain lines to verify that they are not blocked or restricted. Immediately notify Architect of any blockages or restrictions.
- C. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- E. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. Implement all necessary work to ensure primary drainage is fully functional throughout project, including when only base sheet or roofing membrane base ply is in place.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing roofing system components.

3.2 ROOF TEAR-OFF

- A. General:
 - 1. Notify Owner each day of location/area of roof tear-off proposed for that day.
- B. The work generally consists of the following:
 - 1. Removal of existing membrane, damaged concrete pavers, protection board, pedestals, insulation boards, and base sheet down to existing deck.
 - 2. Removal and setting aside for reuse undamaged concrete pavers.
 - 3. Removal of base flashings.
 - a. Leave metal cap flashing receivers in place. Do not disturb when removing existing cap flashing extensions and base flashings.
 - 4. Removal of gravel stops, hook strips, copings, underlayments, wood, and other roofing-related components as indicated on the Drawings. Install provisions as needed to maintain watertightness in areas and at components at which removals are performed.
 - 5. Removal of unused pipes, conduit, support brackets, and other deck-mounted or deck-penetrating items, unless otherwise indicated herein. Patch deck to match existing adjacent deck.
 - 6. Removal of existing duct supports and sheds, including shed metal panel walls and steel structural components, down to roof decks and vertical flashing surfaces.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. Verify that substrates are visibly dry and free of moisture.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.4 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - 1. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150.19

SECTION 072100 - THERMAL INSULATION

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. Water-repellent mineral-wool blanket.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

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

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MINERAL-WOOL BLANKETS

- A. Water-Repellent Mineral-Wool Blanket, Unfaced: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Industrial Insulation Group, LLC (IIG-LLC).

- b. Roxul Inc.
- c. Thermafiber, Inc.; an Owens Corning company.

2.2 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Mineral-Wool Insulation: ASTM C 665.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Mineral-Wool Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..

3.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 075000 - MEMBRANE ROOFING

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 a new roofing system, comprising two different roofing assemblies: An Inverted Roof Membrane Assembly (“IRMA”) system in Roof Areas A, B and C; and, a Conventional system in Roof Area D. See Roof Plan for Roof Area designations.
 - 1. The IRMA system includes cementitious fill and feathering paste to correct deck slope and form crickets; a 2-ply torch-applied modified bitumen membrane; base flashings; drainage mat; extruded polystyrene insulation board, 7 inches thick; fabric mat; and, concrete pavers on low profile or high profile pedestals.
 - 2. The Conventional system includes a torch-applied modified bitumen base sheet; tapered isocyanurate insulation board in adhesive, starting thickness 6 inches; a cover board in adhesive; a 2-ply torch-applied modified bitumen membrane; and, base flashings.
- B. Related Requirements:
 - 1. Section 024119 “Selective Demolition” for removed and reinstalled items, including but not limited to concrete pavers.
 - 2. Section 075900 “Leak Detection System” for leak detection system.
 - 3. Section 076200 "Sheet Metal Flashing and Accessories" for metal roof flashings and counterflashings.
 - 4. Section 077100 "Roof Specialties" for premanufactured metal coping and fascia assemblies.
 - 5. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Participate in conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer's project supervisor and foreman, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each specified product.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:
 1. Base flashings and membrane terminations.
 2. Flashing details at penetrations.
 3. Roof Insulation: Layout, profiles and product components, including anchorage, accessories and finishes of system to be installed

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, and testing agency.
- B. Manufacturer Certificates:
 1. Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for warranty.
- C. Product Test Reports: For roof membrane and insulation, tests performed by a qualified testing agency, indicating compliance with specified requirements.
- D. Field quality-control reports.
- E. Sample Warranties: For manufacturer's warranty(s).

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Acceptable Products: Provide primary roofing products, including each type of membrane sheet and insulation board, all manufactured in the United States, supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. Provide secondary or accessory products which are acceptable to the manufacturer of the primary roofing products.
- B. Product Quality Assurance Program: Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third party auditor under the ISO 9001 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.
- C. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- D. Project Acceptance: Submit a completed manufacturer's application for roof warranty form along with shop drawings of the roofs showing all dimensions, penetrations, and details.
 - 1. The form shall contain all the technical information applicable to the project including but not limited to deck types, roof slopes, base sheet and/or insulation assemblies (with method of attachment, and fastener type), and manufacturer's membrane assembly proposed for installation.
 - 2. The form shall also contain accurate and complete information requested including proper names, addresses, zip codes and telephone numbers.
 - 3. The project must receive approval, through this process, prior to shipment of materials to the project site.
- E. Scope of Work: The work to be performed under this specification shall include but is not limited to the following:
 - 1. Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, and all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification.
 - 2. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractor's Association, amended to include the acceptance of a phased roof system installation.
- F. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

- G. **Manufacturer Requirements:** The primary roofing materials manufacturer shall provide direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conduct a Punch List and final inspection upon substantial completion and final completion of the project, respectively.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. **Deliver roofing materials to Project site** in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. **Storage:** Store materials out of direct exposure to the elements. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives and asphalt cutback products away from open flames, sparks or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.
- C. **Handling:** Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.
- D. **Damaged Material:** Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed and replaced at the Contractor's expense.

1.10 FIELD CONDITIONS

- A. **Requirements Prior to Job Start:**
 - 1. **Notification:** Give a minimum of 5 days' notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
 - 2. **Safety:** Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

1.11 WARRANTY

- A. **Membrane Roofing System Warranty:** Upon successful completion of the project, and after all post-installation procedures have been completed, furnish a 30-year No-Dollar-Limit labor and material full system warranty for the IRMA and Conventional roof systems.
 - 1. The full system includes all materials produced by the Manufacturer.
 - 2. Warranty also includes coping and fascia assemblies specified in Section 077100 "Roof Specialties."

3. The warranty shall provide coverage against deficiencies in material and labor resulting in roof leakage, with the costs of material and labor to correct the deficiencies the responsibility of the Manufacturer.
4. The IRMA warranty shall include a provision whereby the Manufacturer is responsible for the cost of removing and restoring overburden components (drainage mat, insulation, fabric mat, pedestals, pavers) to investigate and repair a deficiency covered under the warranty.

PART 2 - PRODUCTS

2.1 IRMA ROOFING SYSTEM

- A. Cementitious Fill: One component, rapid hardening, early strength gain cementitious patching mortar, as manufactured by Sika Corp. under trade name SikaQuick-1000.
 1. For thickness greater than 1 inch, extend with 3/8 inch pea gravel.
- B. Roofing Membrane:
 1. Base Ply: Torch grade modified bitumen base ply, meeting ASTM D 6163 Type I, Grade S, as manufactured by Siplast under trade name Paradiene 20 EG TG.
 2. Top Ply: Torch grade modified bitumen waterproofing ply, meeting ASTM D 6163 Type II, Grade S, as manufactured by Siplast under trade name Teranap1M Sand/Sand.
- C. Base Flashing:
 1. Base Ply: Modified bitumen base ply meeting ASTM 6163 Type II, Grade S, as manufactured by Siplast under trade name Paradiene 20 EG TG.
 2. Base Ply, Wood: Modified bitumen base ply with adhesive backing, meeting ASTM 6163 Type I, Grade S, as manufactured by Siplast under trade name Paradiene 20 SA.
 3. Top Ply: Modified bitumen ply with continuous metal-foil surfacing, meeting ASTM 6298, as manufactured by Siplast under trade name Veral Aluminum.
 4. PMMA-Based Reinforced: Multi-component PMMA resin, cure catalyst, and reinforcing fleece, as manufactured by Siplast under trade names Parapro Flashing Resin, Pro Catalyst, and Pro Fleece.
- D. Drainage Mat: Molded polystyrene core, bonded geotextile fabric both sides, as manufactured by Siplast, under trade name Paradrain Extensive Drainage Mat.
- E. Insulation Board: Rigid extruded polystyrene, 3 inch thick (max.), 2-foot x 8-foot, edge drainage channels, ASTM D1621 compressive strength 60 psi, as manufactured by Dow Chemical Co., under brand name Styrofoam RoofMate. Total thickness: 7 inch.
- F. Fabric Mat: Nonwoven geotextile fabric, 3.8 oz/yard weight (min.), as manufactured by Siplast, under trade name Paradrain 40 Filter Fabric.
- G. Pedestals/Shims:

1. Low-profile, for field of roof: As manufactured by Hanover Architectural Products, under trade name Rubber Pedestal and Rubber Leveling Shims.
 2. High-profile, for pavers over north side crickets in min. 5/max.6 foot wide area in Areas A, B and C, and for aluminum plate over concrete curbs: As manufactured by Hanover Architectural Products, under trade name High-Tab Pedestal and Leveling Shims.
- H. Concrete Pavers: Precast, 23-1/2 inch x 23-1/2 inch x 2 inch thick, min. 7500 psi compressive strength, natural buff color and finish, as manufactured by Hanover Architectural Products, under brand name Prest Paver.

2.2 CONVENTIONAL ROOFING SYSTEM

- A. Base Sheet: Torch grade modified bitumen base sheet, meeting ASTM D 6163 Type I Grade S, as manufactured by Siplast under trade name Irex 40.
- B. Insulation Board: Closed cell polyisocyanurate foam core bonded both sides with fiber-reinforced felt facer, ASTM C1289 Type II, Class 1, Grade 3 (25 psi), tapered 1/8 inch per foot, except 1/4 inch per foot for crickets, and flat fill boards. All boards max. 4-ft x 4-ft. Maximum board thickness 2-1/2 inch within each layer. Starting thickness 6 inch. As manufactured by Siplast, under trade name Paratherm.
- C. Adhesive: Single component, solvent-free polyurethane, as manufactured by Siplast, under trade name Para-Stik Insulation Adhesive.
- D. Cover Board: Gypsum based, 3/8 inch thick, UL Class A, as manufactured by United States Gypsum Co., under trade name Securock.
- E. Roofing Membrane:
1. Base Ply: Torch grade modified bitumen base ply, meeting ASTM D 6163 Type I, Grade S, as manufactured by Siplast under trade name Paradiene 20 EG TG.
 2. Top Ply: Torch grade modified bitumen top ply, surfaced with highly reflective white granules, meeting ASTM D 6163 Type I Grade G, as manufactured by Siplast under trade name Paradiene 30 FR TG BW.
- F. Base Flashing:
1. Base Ply: Modified bitumen base ply meeting ASTM 6163 Type II, Grade S, as manufactured by Siplast under trade name Paradiene 20 EG TG.
 2. Base Ply, Wood: Modified bitumen base ply with adhesive backing, meeting ASTM 6163 Type I, Grade S, as manufactured by Siplast under trade name Paradiene 20 SA.
 3. Top Ply: Reinforced modified bitumen ply with continuous metal-foil surfacing, meeting ASTM 6298, as manufactured by Siplast under trade name Veral Aluminum.
 4. PMMA-Based Reinforced: Multi-component PMMA resin, cure catalyst, and reinforcing fleece, as manufactured by Siplast under trade names Parapro Flashing Resin, Pro Catalyst, and Pro Fleece.

2.3 ROOFING ACCESSORIES

- A. Tapered Edge: Factory fabricated from expanded perlite-based insulation boards.
- B. Backer Rod: Closed cell polyethylene foam, non-absorbent, compressible, chemically inert rod, in various sizes as needed for gaps of varying size between edge of deck and face of masonry.
- C. Paste: Multi-component fast curing PMMA paste, as manufactured by Siplast, under trade name Pro Paste.
- D. Primer, Concrete: Asphalt solvent blend, ASTM D41 Type II, as manufactured by Siplast, under trade name PA-917 LS Primer.
- E. Aluminum Plate: 1/4 inch thick, 6061-T6 aluminum, diamond plate, mill finish.
 - 1. Furnish with edges ground smooth.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with manufacturer's representative present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely embedded in the concrete deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Pick up pavers and set aside whole pavers in good condition for re-use. Remove damaged and partial pavers, and remove pedestals, shims, protection board, and other items.
- B. Remove duct support legs and related curbs and pitch pockets.
- C. Remove sheds, including metal shed walls, metal and plywood shed roofs, shed roof flashings at adjoining buildings, and shed support/structural posts and related steel elements. Fill openings at cut-off shed posts with cementitious fill, and smooth top of fill with paste feathered to deck surface.
- D. Remove existing roofing assemblies – roofing and flashing membranes, insulation board, and base sheet – down to the concrete deck surface and adjoining vertical flashing substrates.
- E. In areas in which cementitious fill shall be installed, grind/prepare deck surface to white concrete.

- F. At voids between edge of deck and vertical masonry substrate, remove debris to approximate 3-inch depth. Install backer rod. Apply paste to fill gap between top of backer rod and deck surface.
- G. Install first increment of wood blocking at duct openings in deck and install temporary watertightness provisions at each opening, including the open top of the duct stub.
- H. Maintain watertightness throughout project.

3.3 MEMBRANE ROOFING SYSTEM INSTALLATION

A. General:

- 1. Drawings show roofing membrane and base flashings in schematic form. Configure roofing membrane and base flashings in strict accordance with Roofing Manufacturer's requirements and recommendations.
- 2. All roofing membrane and base flashing plies shall be torch applied, except for adhesive-backed first ply at wood components and PMMA-based reinforced flashing.
- 3. Construction of an aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials, and exercise care in ensuring that the finished application is acceptable to the Owner.

B. Areas A, B, and C IRMA Roofing:

- 1. Install cementitious fill to infill deck irregularities as shown on Roof Plan.
- 2. Install cementitious fill to form 1/4 inch per foot crickets as shown on Roof Plan. Install paste at fill edges to feather to zero down to deck. Note existing deck slope is approximately 1/4 inch per foot south to north.
- 3. Install base ply of roofing membrane.
- 4. Install .050-inch aluminum base infill where masonry flashing substrate is missing at base of wall. Prime metal.
- 5. Install .050-inch aluminum base at juncture between Area A deck and adjoining building's metal sheathing panels. Prime metal.
- 6. Install top ply of roofing membrane.
- 7. Install base flashings.

C. Areas A, B, and C IRMA Overburden:

- 1. Install drainage mat.
- 2. Install insulation boards. Offset joints between layers minimum 1 foot. Hold boards back approximately 3 inches from drains.
- 3. Install fabric mat.
- 4. Install pedestals/shims, concrete pavers and drain grating.
 - a. Cut pavers as needed to fit approximately 1 inch from flashings.
 - b. Install concrete pavers on low-profile pedestals in field of roof.

- c. In areas above north side crickets, install concrete pavers on high-profile pedestals and shims as needed to achieve paver surface with slope of less than 1/8 inch per foot. Area above north side crickets extends from parapet to min. 5/max 6 feet from parapet.
 - d. At top of concrete stair in Area A, paver surfaces adjoining concrete landing shall be level with landing surface.
 - e. Above drains, install drain grating in place of a concrete paver. Apply 2 coats of acrylic coating to exposed surfaces of insulation board facing drain.
 - 5. Above approximate 12-inch-wide concrete curbs in HVAC roof areas, install aluminum plate in lieu of pavers to bridge over top of curb. Support plate using high-profile pedestals/shims.
- D. Area D Conventional Roofing:
- 1. Prime concrete deck surface and base of adjoining vertical substrates and allow to fully dry before installing base sheet.
 - 2. Install base sheet.
 - 3. Install .050-inch aluminum base infill where masonry flashing substrate is missing at base of wall. (See Unit Price.) Prime metal and strip bottom flange to base sheet.
 - 4. Install tapered insulation assembly. Secure insulation to base sheet and between layers in adhesive beads spaced at 4 inches throughout, in pattern as published by Manufacturer for this spacing. Offset joints minimum 12 inch within layer. Offset joints minimum 12 inch between layers. Cut boards as needed to achieve offsets.
 - 5. Install cover board. Secure to insulation in adhesive beads spaced at 4 inches throughout, in pattern as published by Manufacturer for this spacing. Offset joints minimum 12 inch within layer. Offset joints minimum 12 inch from top insulation/cricket board layer. Cut boards as needed to achieve offsets.
 - 6. Install roofing membrane and base flashings.

3.4 FIELD QUALITY CONTROL

- A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment, and related items after completion of job.
- B. Manufacturer's Field Services During Roof Installation:
 - 1. Arrange for a minimum of six manufacturer technical field representative inspections during installation of the manufacturer's roofing assembly materials, in accordance with the following protocol: first inspection to observe deck condition and initial installation of IRMA roofing membrane base ply; second, to observe initial installation of IRMA roofing membrane top ply; third, initial installation of IRMA base flashing; fourth, installation of IRMA roofing membrane base ply in second IRMA Roof Area; fifth, installation of IRMA roofing membrane top ply in second IRMA Roof Area; sixth, initial installation of tapered insulation assembly in Area D.
- C. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

- D. Final Inspection/Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.
- E. Issuance of the Warranty: Complete all post installation procedures and meet the manufacturer's requirements for issuance of the specified warranty.

3.5 PROTECTING AND CLEANING

- A. Protect newly installed roofing system from damage and wear during construction period.
- B. Repair, or remove and replace, as necessary, roofing system damaged as a result of the Contractor's construction activities.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075000

075900 – LEAK DETECTION SYSTEM

PART 1 – GENERAL

1.1 SYSTEM DESCRIPTION

Installation of the Leak Sentry leak monitoring system from Sentinel Roof Technologies that uses sensors and conductive media to actively monitor the roof for leakages and alert in real time on any anomalies. System is “always on”- manual testing is not required to know when there is a breach.

A. Sections include

1. Electronic leak detection system with s full time computer monitoring of roof envelope.
2. Monitoring grid establishing a single plane of testing at the base sheet level .
3. Testing and measuring apparatus.

1.2 RELATED SECTIONS

- A. Section 075000 Membrane Roofing.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate with other work having a direct bearing on work of this section including but not limited to, roofing.
- B. Pre-installation Meeting: Two (2) weeks before starting work of roofing membrane, with 1 month notice.
1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer’s data sheets for product components and accessories.
- B. Shop Drawings: Indicate plans, grid layout, dimensions, construction details, methods of anchorage, location and type of roof penetrations and roof drains.
- C. Indicate location of access closures, and wiring path from monitoring grids to access closures.

- D. Indicate location where grid cables will be terminated and area where monitoring electronics or future monitoring electronics will be installed.
- E. Test Reports: Test reports from approved ELD company verifying the integrity of the roof at the time of system activation.
- F. Installation Data: Manufacturer's written installation requirements.
- G. Test Protocol: Manufacturer's written description of testing method and protocol.

1.5 CLOSEOUT SUBMITTALS

Operation and Maintenance Data: Indicate maintenance requirements for installed products and provide an OEM manual.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Must source Leak Sentry directly from Sentinel Roof Technologies.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum five (5) years documented experience and approved by the manufacturer.
- C. Testing Agency Qualifications: Company specializing in performing the work of this Section with minimum ten (10) years documented experience and approved by the manufacturer.
- D. Testing agency shall examine all surfaces to be tested. Testing agency shall notify roofing contractor of any and all conditions which, in his opinion, will affect satisfactory execution of the testing.
- E. Installed sensors and cables must be protected from construction activities and traffic immediately (or as soon as possible).

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect electronic equipment and sensing and detection devices against potential damage from dust, moisture, and any other weathering elements.
- B. Receive materials from manufacturer and store them in secure place and deliver them to the project site on the specified installation date(s).

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install leak detection system to damp or frozen surfaces or during inclement weather.
- B. Do not perform ASTM D-7877 testing unless environmental conditions are within parameters of testing criteria.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide a two (2) year manufacturer's warranty on all components found inside the electrical panel to exclude coverage for failure to meet specified requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Sentinel Roof Technologies – www.sentinelrooftechnologies.com
leaksentry@sentinelrooftechnologies.com

2.2 EQUIPMENT

- A. Power Supply: Voltage supply to induce electrical potential to the light layer of water on top of membrane relative to the roof deck below. 110V Power to the panel must be supplied by others.
- B. Sensor Controller Board: Automated switching and measurement unit that facilitates the rapid connection to and testing of the monitoring grid installed in and on the roof assembly. Ingress into the panel location for the sensor wires must be provided by others.
- C. Data Collection Microcomputer: Device to collect data from the sensor controller board, send signals to the monitoring grid, and send data out to the cloud monitoring system.

2.3 COMPONENTS

- A. Moisture detection sensors: 2" or 1.5" Stainless Steel Sensor Pucks, 1/16" 316 Stainless Steel Cable, and any form of adhesion necessary shall be installed directly on top of the base sheet .
- B. Conduction Media: A conductive metal wire mesh shall be installed by roofing contractor below the coverboard.

- C. Access Closure: Metal box enclosure with space for cable terminations on terminal blocks and monitoring electronics and screw terminal barrier blocks for connecting grid cable and to provide field test access. Access closure to be watertight in exterior locations.
 - 1. Provide NEMA1 enclosure(s) built to the job specs directly below roof D in existing conference rooms with access panels.
 - 2. Coordinate exact installation location with Architect.
- D. Electrical Cable and Accessories: Network data cable to be supplied by others as well as a static IP internet connection or other system providing a broadband internet solution. Manufacturer to provide all other electrical and data communication cables. When multiple panels are necessary, others must provide conduits connecting each panel to pass data cables through.
- E. Monitoring Requirements:
 - 1. Provide a real time monitoring system which is “always on” and sends alert via email and/or SMS in the event of a breach.
 - 2. Provide quarterly reports on the condition and changes in the roof moisture readings.
 - 3. Generate roof maps of moisture content based on weather condition, conductive media status, and seasonality.
 - 4. Provide real time system status on all components and alert if any components go offline.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that membrane penetrations are of a non-conductive material or are electrically isolated or insulated by applying applications of additional layers of non-conductive waterproof material or other electrically insulating materials.
- B. Verify that flashing materials insulate exposed or other electrical ground.
- C. If low voltage Electronic Leak Detection is used for testing, verify availability of hose and water supply of sufficient length and at least 60 PSI to reach all points on surfaces to be surveyed by Electronic Leak Detection.
- D. Coordinate with responsible entity to correct unsatisfactory conditions.

3.2 PREPARATION (ELD)

- A. Membranes to be scanned to be broom clean and free of construction materials, equipment, and debris.
- B. Materials, debris, and equipment must be removed from area to be tested.
- C. Area to be tested must be dry.
- D. Grounds must be located for creating an electronic charge into the structural deck.

3.3 INSTALLATION – LEAK SENTRY MONITORING GRID

- A. Install monitoring grid to manufacturer's written instructions and approved shop drawings.
- B. Place a conductor with Type 316 stainless steel conductors in specified pattern on top of base sheet .
- C. Sensor spacing shall be a 10 x 10 foot grid.

3.4 INSTALLATION – ACCESS CLOSURE

- A. Install access closure to manufacturer's written instructions
- B. Install and terminate electrical cables from grid on approved screw terminal blocks or IDC connections blocks in access closure.

3.5 ELECTRONIC LEAK DETECTION

- A. Perform initial membrane scan to establish baseline conditions to equipment manufacturer's written requirements. (ELD ASTM D-7877-14)
- B. Verify wiring sequence, electrical continuity and the absence or shorts or grounds on grid system.
- C. Scan roof surfaces including inside and outside corners of parapets and equipment curbs. Use scanning equipment appropriate to the surfaces being scanned.
- D. Mark breach locations on membrane with a marker approved by the membrane installer and/or membrane manufacturer.
- E. Record location of membrane breach on sketch or drawings for communication with ELD installer and/or ELD inspector.

3.6 FIELD QUALITY CONTROL OF ELECTRONIC LEAK DETECTION

- A. Roofing Contractor Representative shall be present during leak detection testing.
- B. Roofing Contractor shall correct identified membrane defects or irregularities.
- C. Field Reports: Tester shall identify date, time, and weather conditions when surveys are conducted.
 - 1. Provide general description of scan/survey and process.
 - 2. Describe typical membrane breaches located and areas not accessible by scanning equipment.
 - 3. Document survey with photographs and plan view scale drawings with approximate locations of breaches noted.
 - 4. Document the retesting of breaches identified and repaired.

END OF SECTION 075900

SECTION 076200 - SHEET METAL FLASHING AND ACCESSORIES

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. Formed roof sheet metal fabrications.

- B. Related Requirements:

- 1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 075000 "Membrane Roofing" for roof system.
 - 3. Section 077100 "Roof Specialties" for manufactured coping and fascia assemblies.
 - 4. Section 079200 "Joint Sealants" for joint sealants at roof.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Participate in conference at Project site.
 - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 3. Review requirements for insurance and certificates if applicable.
 - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 6. Include details of termination points and assemblies.
 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 8. Include details of roof-penetration flashing.
 9. Include details of edge conditions.
 10. Include details of special conditions.
 11. Include details of connections to adjoining work.
 12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches.
- B. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- C. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
1. Construct a mock-up of the new cap flashing extension, comprising two full lengths of metal, and showing fastening to cap flashing receiver.
 2. Construct a mock-up of the new reglet-mounted cap flashing, comprising two full lengths of metal, and showing joint treatment and lead wedges. Do not apply sealant at reglet as part of mock-up.
 3. Construct a mock-up of the aluminum base infill, showing fastening to deck and wall. Do not install membrane flashing as part of mock-up.
 4. Construct a mock-up of the aluminum base and cap flashing at the juncture between Area A and the adjoining building's metal-sheathed wall, comprising two adjoining 4-foot-long (min.) sections, and showing joint treatments. Do not install membrane flashing as part of mock-up.
 5. Construct mock-up of repair to fastener holes in adjoining building metal sheathing panel. Apply sealant behind patch. Do not apply sealant at patch edge as part of mock-up.
 6. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 7. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows 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 D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- B. Special Project Warranty: Submit Installer's material and workmanship warranty, signed by Installer, covering Work of this Section, for the following warranty period:

1. Warranty Period: Five years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook" and current edition of Revere Copper Products "Copper and Common Sense." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Plain Copper: ASTM B 370, cold-rolled copper sheet, H00 or CDA "H00 for Flashing"; 99 percent pure copper, 16 oz.
- C. Tin-Coated Copper Sheet: Copper sheet, coated both sides with uniform coating of zinc and tin, nominal weight 16 ounces per square foot.
 1. Nonpatinated Exposed Finish: Freedom Gray as produced by Revere Copper Products, Inc.
- D. Aluminum Sheet: ASTM B 209, 3105-H14 alloy and temper; with smooth, flat surface.
 1. Exposed Coil-Coated Finish:
 - a. 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.

2. Color: As selected by Architect from manufacturer's standard color range.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners:
 1. Masonry Anchors: Stainless steel drive, zamac alloy body, 1/4 inch size, manufactured by Powers Fastening, Inc., under trade name Zamac Nailin.
 2. Rivets: 3/16 inch, stainless steel, blind rivet.
 3. Exposed Screws: Stainless steel screw and stainless steel washer with neoprene insert.
- C. Flux and Solder: For Area A built-in cap flashings and sill flashings.
 1. Flux: Tin-bearing, as manufactured by Johnson Manufacturing, under brand name Flux-N-Solder E127.
 2. Solder: Lead-free, as manufactured by Johnson Manufacturing, under brand designation No. 497.
- D. Gasket: Tubular neoprene or polyvinyl chloride, or block sponge neoprene.
- E. Waterproof Membrane: High-temperature resistant, self-adhesive membrane, by W. R. Grace, under trade name Vycor Ultra.
- F. Sealant: Polyether ASTM Class 25, as specified in Section 079200 "Joint Sealants."

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible.

- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving copper seams with flat-lock seams, or with 2-inch overlap and rivets spaced at 2- to 3-inches. Tin edges to be seamed, form seams, and solder.
- I. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- J. Do not use graphite pencils to mark metal surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove existing cap flashing extensions and related cleats. Do not bend or deform existing cap flashing receivers.
- B. Remove existing metal flashings at roof of Area A shed at adjoining building's metal sheathing panels.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 4. Torch cutting of sheet metal flashing and trim is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - 2. Use lapped expansion joints where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant.

When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder aluminum sheet.
2. Do not use torches without irons, or electric irons, for soldering.
3. Heat surfaces to receive solder by applying heated iron, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Fabricate and install new cap flashing extensions. Use 16-oz tin-coated copper, unless indicated otherwise. Insert extensions in existing cap flashing receivers, and fasten with a rivet at each metal length end and no more than 24 inch apart between ends.
- C. Cut new reglets where indicated, 1-1/2 inch deep. Form reglet-mounted cap flashing with 3/8 inch return. Use 16 oz tin-coated copper, unless otherwise indicated. Overlap flashing lengths 1 inch. Secure using lead wedges at each overlap and spaced no more than 24 inch apart between ends. Fill reglet with sealant, and extend sealant onto receiver's diagonal leg.
- D. Form .050 inch aluminum base at juncture of Area A and adjoining building's metal sheathing panels to extend from deck surface to within 1/2 inch of sheathing panels. Form base to follow/conform to facets of sheathing panels. Form joints in base by overlapping pieces 1 inch, with bead of sealant within overlap, and fasten laps with rivets spaced at no more than 3 inch.
- E. Form new built-in cap flashing at Area A East wall using 16-oz tin-coated copper. Overlap lengths 2 inch, install rivets in lap spaced at 3 inch, and sweat solder lap.
- F. Form new sill flashing at base of door/window assemblies using 16-oz tin-coated copper. Overlap lengths 2 inch, install rivets in lap spaced at 3 inch, and sweat solder lap.
- G. Form new cap flashing assembly at base of metal panel wall infill using 16-oz tin-coated copper. Overlap lengths 2 inch, install rivets in lap spaced at 3 inch, and sweat solder lap.

- H. Form surface-mounted cap flashings in .040 inch aluminum sheet, color and finish to match that of manufactured fascia and coping assemblies. Extend cap flashing 1 – 2 past side edges of metal or membrane flashing.
- I. Form 4 inch x 4 inch 16-oz plain copper squares with rounded corners to patch fastener holes in adjoining building's metal sheathing panels. Apply full bed of sealant between panel and patch. Fasten patch to panel with rivet in each corner and a rivet between corners. Apply sealant at patch edge.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

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. Remove existing metal copings, concrete copings, and through-wall metal flashings at parapets as indicated on the Drawings, and install new manufactured coping and fascia assemblies.
 - a. Coping and fascia assemblies shall be included in the Roofing Manufacturer's Warranty.
 - b. Existing metal coping and expansion joint assemblies at the West parapet shall remain.
2. Re-use existing cast iron drain bodies in their current positions. Install fixed (non-adjustable) drain extensions manufactured by the manufacturer of the existing drains, for Conventional/Area D roofing.
3. Install aluminum drain grating in lieu of a full size concrete paver above each drain for the IRMA roofing.
4. Install metal panel assembly at the West parapet (see Roof Plan) configured to integrate with existing parapet coping/expansion joint metalwork.

- B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 075000 "Membrane Roofing" for warranty requirements.
3. Section 076200 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
4. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

- C. Preinstallation Conference: Participate in conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, roofing-system testing and inspecting agency representative, roofing Installer's Supervisor and Foreman, roofing-system manufacturer's representative, roof specialties Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.

2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.
5. Include details of special conditions.

C. Samples: For each type of roof specialty and for each color and texture specified.

D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

E. Samples for Verification:

1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For each type of roof specialty.

C. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section 075000 "Membrane Roofing."
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.
 - 1. Build mockups for the following:
 - a. Drain extender.
 - b. Metal panel assembly.
 - 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. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and other roofing related construction to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Roofing-System Warranty: Coping and fascia assemblies shall be included in warranty provisions in Section 075000 "Membrane Roofing."
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

- 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. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: 120 psf minimum.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. 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 ROOF SPECIALTIES

- A. Manufactured Coping Assembly: .050 inch aluminum coping cover with anchor clips and splice plates, with end wall and end cap flashings and miters as needed, in finish and color as selected by Architect, manufactured by Siplast under trade name Paraguard M Coping Tapered Version.
 - 1. Sizes vary – field measure each parapet, and see Drawings.
 - 2. Order/use 300-series stainless steel screws for attachment to wood blocking.
- B. Manufactured Fascia Assembly: Extruded aluminum anchor bar, and .040 inch aluminum fascia cover in factory Kynar finish in standard color as selected by Architect, with end wall and end cap flashings as needed, manufactured by Siplast under trade name Paraguard Extruded Edge AT Fascia Standard Version.
 - 1. Order/use 300-series stainless steel screws for attachment to wood blocking.
- C. Drain Extension & Gasket Assembly: Steel or cast iron fixed height extension, with gasket, as manufactured by manufacturer of existing drains.
 - 1. Furnish with bolts and related components.

- D. Drain Grating: Aluminum alloy 6063-T6, Type 19-S-4 spacing, 1-1/2 inch x 3/16 inch rectangular bars, swage-locked, standard trim banded, serrated surface, 24 inch x 24 inch panels.
- E. Manufactured Wall Panel: .032 inch aluminum, interlocking V-groove profile, concealed fastener design, factory-finished Kynar 500, standard color as selected by Architect, as manufactured by Fabral under brand name Posi-Lock.
- F. Subgirt: Nominal 3/4 inch deep 20 gauge galvanized steel hat sections.
- G. Sealant: ASTM C920, Type S, Grade NS, Class 25, as Section 079200 "Joint Sealants."
- H. Cover Board: Gypsum based rigid board, 3/8 inch thick, UL Class A, as manufactured by United States Gypsum Co., under trade name Securock.
- I. Fasteners:
 - 1. Masonry Anchor: Stainless steel drive, zamac alloy body, 1/4 inch size, manufactured by Powers Fastening, Inc., under trade name Zamac Nailin.
 - 2. Screws (panels to subgirts): Self-tapping #8 x 3/4 inch, 300-series or 18/8 stainless steel.
- J. Waterproof Membrane: High-temperature resistant, self-adhesive membrane, manufactured by W. R. Grace, under trade name Vycor Ultra.

2.3 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- C. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Coil-Coated Aluminum Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. 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.
 - b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard 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, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove existing metal copings and related wood components, fasteners, and membranes, except metal coping/expansion joint assemblies shall remain at West parapet.
- B. Remove existing concrete copings and related through-wall flashings.
- C. Maintain parapets watertight throughout project.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches. Roll laps with roller. Cover underlayment within 60 days.

3.4 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use

fasteners, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install wood blocking, shim, cover board, waterproof membrane, and membrane flashings in accordance with the drawings and specification requirements herein.
 2. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 3. Provide uniform, neat seams with minimum exposure of solder and sealant.
 4. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 5. Torch cutting of roof specialties is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Install surface-mounted cap flashing where coping ends/turns up at walls and higher parapets. See Section 076200.
- C. Install surface-mounted cap flashing where fascia assembly ends/turns up at walls and higher parapets. See Section 076200. Extend membrane flashing at top of parapet 4" up onto wall/higher parapet.
- D. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
- E. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- F. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- G. Seal concealed joints as required by roofing-specialty manufacturer.
- H. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- 3.5 ROOF-EDGE SPECIALTIES INSTALLATION
- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.6 GRATING AT DRAINS INSTALLATION

- A. Install 2-foot x 2-foot grating instead of full paver at paver location closest to drain center. .
Install pedestal at each corner of drain grating and shim s needed for grating surface to be even with adjoining concrete paver surfaces.
 - 1. Provide high profile pedestals and shims in accordance with Section 075000 “Membrane Roofing.”

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

SECTION 079200 - JOINT SEALANTS

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. Polyether joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Participate in conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

- C. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
 - 1. Joint-sealant location and designation.
 - 2. Manufacturer and product name.
 - 3. Type of substrate material.
 - 4. Proposed test.
 - 5. Number of samples required.
- D. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- E. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- F. Field-Adhesion-Test Reports: For each sealant application tested.
- G. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.

3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with substrates.
 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 POLYETHER JOINT SEALANTS

- A. Polyether, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, polyether joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide ChemLink DuraLink Elastomeric Joint Sealant.
- B. Polyether, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, polyether joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ChemLink NovaLink Elastomeric Joint Sealant.

2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - 4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.

- c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical nontraffic surfaces.
 1. Joint Locations:
 - a. Perimeter joints at frames of doors and storefront systems.
 - b. Other joints as indicated on Drawings.
 2. Joint Sealant: Polyether, S, NS, 50, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints at sheet metal flashing and accessories.

1. Joint Locations
 - a. Where indicated in Section 076200 "Sheet Metal Flashing and Accessories"
 - b. Other joints as indicated on drawings.
2. Joint Sealant: Polyether, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed entrance and storefront systems.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

A. Product Data:

1. Aluminum-framed entrance and storefront systems.

B. Product Data Submittals: For each product.

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, and furnished accessories.

C. Shop Drawings:

1. Plans, elevations, sections, full-size details, and attachments to other work.
2. Details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
3. Full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrance and storefront systems, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
4. Connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
5. Signed and sealed by the qualified professional engineer responsible for their preparation.

D. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

- E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- F. Delegated Design Submittals: For aluminum-framed entrances and storefront systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: For aluminum-framed entrance and storefront systems, accessories, and components, from manufacturer.
 - 1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront system.
- B. Product Test Reports: For aluminum-framed entrance and storefront systems, for tests performed by a qualified testing agency.
- C. Qualification Statements:
 - 1. For Installer and egress door inspector.
- D. Delegated Design Engineer Qualifications: For aluminum-framed entrance and storefront systems.
- E. Sample Warranties: For aluminum-framed entrance and storefront systems.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For aluminum-framed entrance and storefront systems.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrance and storefront systems that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Faulty operation of doors.
 - c. Deterioration of metals and other materials beyond normal weathering and use.
 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed entrance and storefront systems.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrance and storefront systems representing those indicated for

this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrance and storefront systems to withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.

E. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 8 lbf/sq. ft..

G. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):
 - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.30 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
 - b. Entrance Doors: U-factor of not more than 0.77 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):
 - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.36 as determined in accordance with NFRC 200.
 - b. Entrance Doors: SHGC of not more than 0.36 as determined in accordance with NFRC 200.
 3. Air Leakage:
 - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.
 - b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
 4. Condensation Resistance Factor (CRF):
 - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 70 (frame) as determined in accordance with AAMA 1503.
 - b. Entrance Doors: CRF of not less than 57 (frame) as determined in accordance with AAMA 1503.
- H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Arcadia Inc.
 2. EFCO Corporation.
 3. Kawneer Company, Inc.; Arconic Corporation.
 4. OldCastle BuildingEnvelope (OBE).
 5. Tubelite Inc.
 6. YKK AP America Inc.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Exterior Framing Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Front.
 4. Finish: High-performance organic finish.
 5. Fabrication Method: Field-fabricated stick system.
 6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

7. Steel Reinforcement: As required by manufacturer.
- C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- E. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
 1. Door Construction: 2- to 2-1/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 2. Door Design: As indicated.
 3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.
 4. Finish: Match adjacent storefront framing finish.

2.4 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."
- B. General: Provide entrance door hardware to comply with requirements in this Section.
 1. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
- C. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- D. Weather Stripping: Manufacturer's standard replaceable components.
 1. Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.
 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- E. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

- F. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

2.5 GLAZING

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

2.6 MATERIALS

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

2.7 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, fabricated from 300 series stainless steel.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Storefront Framing: Fabricate components for assembly using shear-block system.
- F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
 - 1. At interior and exterior doors, provide compression weather stripping at fixed stops.
- G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
 - 1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- I. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.9 ALUMINUM FINISHES

- A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: Matte Black. As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Seal perimeter and other joints watertight unless otherwise indicated.
- G. Metal Protection:
 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.
- I. Install joint filler behind sealant as recommended by sealant manufacturer.
- J. Install components plumb and true in alignment with established lines and grades.
- K. Install entrance doors to produce smooth operation and tight fit at contact points.
 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.

2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

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

3.3 ERECTION TOLERANCES

- A. Install aluminum-framed entrance and storefront systems to comply with the following maximum tolerances:
 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 FIELD QUALITY CONTROL

- A. Inspection Agency: Engage a qualified inspector to perform inspections.
- B. Inspections:
 1. Egress Door Inspections: Inspect each aluminum-framed entrance door equipped with panic hardware, located in an exit enclosure, electrically controlled, and equipped with special locking arrangements, in accordance with NFPA 101, Ch. 7 "Means of Egress," Section "Means of Egress Components," Article "Inspection of Door Openings."
- C. Aluminum-framed entrance and storefront systems will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
- C. Related Sections:
 - 1. Section 084113 "Aluminum-Framed Entrances and Storefronts".
 - 2. Section 088000 "Glazing"
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
 - 8. New York City 2022 Building Codes and Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series.
 - 2. ANSI/UL 294 - Access Control System Units.
 - 3. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
 2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
 - B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
 - C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".
- 1.6 COORDINATION
- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to ASSA ABLOY ACCENTRA. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded ASSA ABLOY ACCENTRA.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01,

Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

2.3 CONTINUOUS HINGES

- A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
1. Manufacturers:.
 - a. Pemko (PE).

2.4 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 2. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - 3. Manufacturers:
 - a. Rockwood (RO).

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
 - 1. Threaded mortise cylinders with rings and cams to suit hardware application.
 - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 - 4. Tubular deadlocks and other auxiliary locks.
 - 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 6. Keyway: Match Facility Standard.
- C. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Field verify and key cylinders to match Owner's existing system.
- D. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Three (3).
 - 2. Master Keys (per Master Key Level/Group): Five (5).
 - 3. Construction Keys (where required): Ten (10).
- E. Construction Keying: Provide construction master keyed cylinders.
- F. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.

2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 CYLINDRICAL LOCKS AND LATCHING DEVICES

2.7 AUXILIARY LOCKS

- A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Manufacturers:

- a. Sargent Manufacturing (SA) - 4870 Series.

2.8 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

- B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.

Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

- B. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Manufacturers:

- a. Norton Rixson (NO) - Unitrol Series.

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

- a. Norton Rixson (RF).

2.11 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).

2.12 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.5 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.6 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.7 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handing and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Manufacturer's Abbreviations:
 - 1. PE - Pemko
 - 2. RO - Rockwood
 - 3. SA - SARGENT
 - 4. NO - Norton

Hardware Sets

Set: 1.0

2	Continuous Hinge	FM__SLF-HD1	-	C	PE
1	Dust Proof Strike	570		US26D	RO
2	Flush Bolt	555		US26D	RO
1	Mortise Deadlock	LC 4874		US26D	SA
2	Push Bar & Pull	BF15747		US32D	RO
2	Cylinder	Compatible with Facility's Existing System		US26D	
2	Door Closer	UNI7500		689	NO
2	Sweep	18061CNB			PE
1	Threshold	253x3AFG MSES10SS-2			PE

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulating glass.

1.2 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturers of fabricated glass units.
- B. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved by primary glass manufacturer.
- B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

- 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 - 2. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.
 - 3. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. NGA Publications: "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.

2.4 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Perimeter Spacer: Manufacturer's standard warm edge spacer material and construction.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Setting Blocks: Type recommended in writing by sealant or glass manufacturer.
- C. Edge Blocks: Type recommended in writing by sealant or glass manufacturer.

2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product

manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep systems.
 3. Minimum required face and edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

- D. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- E. Provide spacers for glass lites where length plus width is larger than 50 inches.
- F. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- G. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

3.4 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.5 INSULATING GLASS SCHEDULE

- A. Low-E-Coated, Clear Insulating Glass Type:
 - 1. Overall Unit Thickness: 1 inch.
 - 2. Minimum Thickness of Each Glass Lite: 6 mm.
 - 3. Outdoor Lite: Heat-strengthened float glass.
 - 4. Interspace Content: Argon.
 - 5. Indoor Lite: Heat-strengthened float glass.
 - 6. Low-E Coating: Sputtered on second surface.
 - 7. Winter Nighttime U-Factor: As required to achieve performance requirements specified in Section 084113 "Aluminum-Framed Entrances and Storefronts."
 - 8. SGHC: As required to achieve performance requirements specified in Section 084113 "Aluminum-Framed Entrances and Storefronts."
- B. Low-E-Coated, Fully Tempered Clear Insulating Glass Type:
 - 1. Overall Unit Thickness: 1 inch.
 - 2. Minimum Thickness of Each Glass Lite: 6 mm.
 - 3. Outdoor Lite: Fully tempered float glass.
 - 4. Interspace Content: Argon.

5. Indoor Lite: Fully tempered float glass.
6. Low-E Coating: Sputtered on second surface.
7. Winter Nighttime U-Factor: As required to achieve performance requirements specified in Section 084113 "Aluminum-Framed Entrances and Storefronts."
8. SGHC: As required to achieve performance requirements specified in Section 084113 "Aluminum-Framed Entrances and Storefronts."
9. Safety glazing required.

END OF SECTION 088000

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for exterior partitions.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft..

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645.
1. Steel Studs and Tracks:
 - a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.
 - b. Depth: As indicated on Drawings.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

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. Interior gypsum board.
- 2. Exterior gypsum board.

- B. Related Requirements:

- 1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing that support gypsum board panels.

1.3 ACTION SUBMITTALS

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

- B. Samples: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 GYPSUM BOARD

- A. Interior Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- B. Exterior Gypsum Sheathing: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.

2.3 TRIM ACCESSORIES

- A. Exterior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Exterior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

- a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 4 finish, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Stainless Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- D. Form control and expansion joints with space between edges of adjoining gypsum panels.
- E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 2. Fit gypsum panels around ducts, pipes, and conduits.
 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- F. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING GYPSUM BOARD

- A. Single-Layer Application:
1. On partitionnns/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 2: Where indicated on Drawings.

3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
4. Level 5: Not included

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

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. Thermoset-rubber straight profile base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexco Corporation.
 - 2. Johnsonite; a Tarkett company.
 - 3. Roppe Corporation; Roppe Holding Company.
- B. Product Standard: ASTM F1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Cove: Provide in areas with resilient floor coverings.
- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors: White

2.2 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter or cope corners to minimize open joints.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 096513

SECTION 099123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on interior substrates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 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.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Previously Painted Surfaces: Clean surface of all foreign material. Abrade existing painted surfaces. Apply test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, provide additional abrasion or remove previous coating down to substrate. Retest surface for adhesion, and perform additional surface preparation until adhesion testing is successful.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in occupied spaces:
 - a. Limit painting to new partition and patched areas at the interior.
 - 2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Gypsum Board Walls – Latex Finish
 - 1. Primer: 1 coat SW ProMar 200 Zero VOC Interior Latex Primer
 - 2. Finish: 2 coats SW ProMar 200 Zero VOC Interior Latex
 - a. Color: To match existing interior color.

END OF SECTION 099123

SECTION 099600 - HIGH-PERFORMANCE COATINGS

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 surface preparation and the application of high-performance coating systems on the following substrates:
 - 1. Exterior Substrates:
 - a. Steel.
 - b. Galvanized metal.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product indicated.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each coating system.
 - a. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
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.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by Tnemec Inc., or approved equal.
- B. Products: Subject to compliance with requirements, provide product listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
 3. Products shall be of same manufacturer for each coat in a coating system.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Coating Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample coating materials. Contractor will be notified in advance and may be present when samples are taken. If coating materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 3 Power Tool Cleaning.
- E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
 - 1. Contractor shall touch up and restore coated surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Uncoated Steel:
 - 1. Primer: Tnemec Series 135 Chembuild; 4.0 to 6.0 mils DFT.
 - 2. Finish Coat: Tnemec Series 1095 Endura-Shield; 2.0 to 5.0 mils.
 - 3. Color: Matte Black
- B. Galvanized Metal:
 - 1. Primer: Tnemec Series 135 Chembuild; 4.0 to 6.0 mils DFT.
 - 2. Finish Coat: Tnemec Series 1095 Endura-Shield; 2.0 to 5.0 mils.
 - 3. Color: Matte Black

END OF SECTION 099600

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

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. Electrical equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Fire Rated Sleeves for cables.
4. Grout.
5. Common electrical installation requirements.
6. Utility company coordination requirements.

1.3 REFERENCES

- A. Abbreviations and Acronyms for Electrical Terms and Units of Measure:

1. A: Ampere, unit of electrical current.
2. AC or ac: Alternating current.
3. AF : Amp Frame
4. AFCI: Arc-fault circuit interrupter.
5. AIC: Ampere interrupting capacity.
6. AL, Al, or ALUM: Aluminum.
7. AP: Wireless access point
8. ASD: Adjustable-speed drive.
9. AT: Amp Trip
10. ATS: Automatic transfer switch.
11. AV: Audio-Video, audio-visual
12. AWG: American wire gauge; see ASTM B258.
13. BAS: Building automation system.
14. BIL: Basic impulse insulation level.
15. BIM: Building information modeling.
16. BJ: Bonding jumper
17. BKR: Breaker
18. BMS: Building Management System
19. C: Conduit
20. CAD: Computer-aided design or drafting.
21. CATV: Community antenna television, Cable Television
22. CB: Circuit breaker.
23. CCTV: Closed circuit television

- 24. CFCI: Contractor furnished contractor installed
- 25. CKT: Circuit
- 26. CU or Cu: Copper.
- 27. CU-AL or AL-CU: Copper-aluminum.
- 28. dB or DB: Decibel, a unitless logarithmic ratio of two electrical, acoustical, or optical power values.
- 29. DC or dc: Direct current.
- 30. DDC: Direct digital control (HVAC).
- 31. DISC: Disconnect
- 32. DP: Distribution Panelboard
- 33. DW: Dishwasher
- 34. ECS: Emergency communication system
- 35. EGB: Electrical grounding busbar
- 36. EGC: Equipment grounding conductor.
- 37. EMD: Estimated maximum demand.
- 38. EMGB: Electrical main grounding busbar
- 39. EMI: Electromagnetic interference.
- 40. EP: Explosion proof
- 41. EPS: Emergency power supply.
- 42. EPSS: Emergency power supply system.
- 43. ER: Existing to be relocated
- 44. ERMS: Energy reduction maintenance switch
- 45. EV: Electric vehicle.
- 46. EWC: Electric water cooler
- 47. FA: Fire Alarm
- 48. FAA: Fire alarm annunciator
- 49. FACP: Fire alarm control panel
- 50. FC or fc: Footcandle, a unit of illuminance equal to one lumen per square foot.
- 51. FLA: Full load amps
- 52. FLC: Full-load current.
- 53. FS: Flow Switch
- 54. FSD: Fire smoke damper
- 55. ft.: Foot.
- 56. G or GND: Equipment grounding conductor
- 57. GEC: Grounding electrode conductor.
- 58. GEN: Generator
- 59. GFI or GFCI: Ground-fault circuit interrupter.
- 60. GFPE: Ground-fault protection of equipment.
- 61. HACR: Heating, air conditioning, and refrigeration.
- 62. HDPE: High-density polyethylene.
- 63. HH: Handhole
- 64. HOA: Hand-off-automatic
- 65. HP or hp: Horsepower.
- 66. HVAC: Heating, ventilating, and air conditioning.
- 67. Hz: Hertz.
- 68. IC: Intercom
- 69. IG: Isolated ground.
- 70. inch: Inch. To avoid confusion, the abbreviation "in." is not used.
- 71. IP: Ingress protection rating (enclosures); Internet protocol (communications).
- 72. IR: Infrared.
- 73. IS: Intrinsically safe.

- 74. ITE: Information technology equipment.
- 75. JB: Junction Box
- 76. KAIC or kAIC: Kiloampere interrupting capacity.
- 77. kcmil or MCM: One thousand circular mils.
- 78. KV or kV: Kilovolt.
- 79. KVA or kVA: Kilovolt-ampere.
- 80. kVAr or kVAR: Kilovolt-ampere reactive.
- 81. KW or kW: Kilowatt.
- 82. kWh: Kilowatt-hour.
- 83. LAN: Local area network.
- 84. LT: Light
- 85. LTG: Lighting
- 86. lb: Pound (weight).
- 87. LCD: Liquid-crystal display.
- 88. LED: Light-emitting diode.
- 89. LRC: Locked-rotor current.
- 90. MCA: Minimum circuit ampacity
- 91. MCB: Main circuit breaker
- 92. MCC: Motor-control center.
- 93. MH: Manhole
- 94. MLO: Main lugs only.
- 95. MOCP: Maximum overcurrent protection
- 96. MRTS: Motor rated toggle switch
- 97. MSB: Main switchboard
- 98. MTD: Mounted
- 99. MTG: Mounting
- 100. MTS: Main transfer switch
- 101. MVA: Megavolt-ampere.
- 102. N: Neutral
- 103. N.C. or NC: Normally closed.
- 104. NF: Non-fused
- 105. NiCd: Nickel cadmium.
- 106. NL: Night light.
- 107. N.O. or NO: Normally open.
- 108. OCPD: Overcurrent protective device.
- 109. OFCI: Owner furnished contractor installed.
- 110. ONT: Optical network terminal.
- 111. P: Pole – referring to an electrical position in a panel
- 112. PA: Public address
- 113. PB: Pull box
- 114. PC: Personal computer.
- 115. PF or pf: Power factor.
- 116. PH or ph: Phase
- 117. PHEV: Plug-in hybrid electric vehicle.
- 118. PIV: Post indicator valve.
- 119. PLFA: Power-limited fire alarm.
- 120. PoE: Power over Ethernet.
- 121. PV: Photovoltaic.
- 122. PVC: Polyvinyl chloride.
- 123. PWR: Power.
- 124. RCP: Reflected ceiling plan.

- 125. RECPT: Receptacle.
- 126. REF: Reference.
- 127. RFI: Radio-frequency interference (electrical); Request for interpretation (contract).
- 128. RMS or rms: Root-mean-square.
- 129. RPM or rpm: Revolutions per minute.
- 130. SCCR: Short circuit current rating.
- 131. SD: Smoke damper.
- 132. SEC: Secondary.
- 133. SPD: Surge protective device.
- 134. sq.: Square.
- 135. SWD: Switching duty.
- 136. SWBD: Switchboard.
- 137. TBB: Telecommunications bonding backbone.
- 138. TC: Time clock.
- 139. TCP/IP: Transmission control protocol/Internet protocol.
- 140. TGB: Telecommunications grounding busbar.
- 141. TMGB: Telecommunications main grounding busbar.
- 142. TO: Telecommunications outlet.
- 143. TR: Telecommunications room.
- 144. TR: Tamper resistant.
- 145. TS: Tamper switch.
- 146. TV: Television.
- 147. TVSS: Transient voltage surge suppressor.
- 148. UG : Underground.
- 149. UL: Underwriters Laboratories, Inc. (standards) or UL LLC (services).
- 150. UPS: Uninterruptible power supply.
- 151. USB: Universal serial bus.
- 152. UV: Ultraviolet.
- 153. V: Volt, unit of electromotive force.
- 154. Vac or V(ac): Volt, alternating current.
- 155. Vdc or V(dc): Volt, direct current.
- 156. VA: Volt-ampere, unit of complex electrical power.
- 157. VAR or VAr: Volt-ampere reactive, unit of reactive electrical power.
- 158. VFC: Variable-frequency controller.
- 159. VFD: Variable-frequency drive.
- 160. VRLA: Valve-regulated lead acid.
- 161. W: Watt, unit of real electrical power or Wire.
- 162. WG: Wire guard.
- 163. Wh: Watt-hour, unit of electrical energy usage.
- 164. WP: Weather proof.
- 165. WR: Weather resistant.
- 166. XFMR: Transformer.

1.4 DEFINITIONS

- A. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- B. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

- C. "Provide": Furnish and install, complete and ready for the intended use.

1.5 ACTION SUBMITTALS

- A. Product Data: For Fire Rated Sleeves for cables.

1.6 INFORMATION SUBMITTALS

A. Coordination Drawings

1. Provide coordinated layout drawings (composite drawings), prior to commencing site work. Coordinate with trades on the site such as but not limited to HVAC, Plumbing, Electrical, Technologies, Civil, Landscape, Cabinetry, Roofing, Finishes, Fire Protection, and Fire detection.
2. Coordination drawings shall include information furnished by trades Coordinate installation and location of but not limited to the following elements and trades: Civil, Landscape, HVAC, Plumbing, Fire Protection, Electrical, Technology Systems, Architectural, Structural, and Specialty Systems.
3. Coordinate with architectural system submittals (i.e. roofing) and structural system submittals, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.
4. Provide and indicate required maintenance access to equipment and maintain the clearances per manufacturer's and applicable code requirements.
5. Prepare Drawings in Revit Model as follows:
 - a. Utilize Revit Model release equal to design documents.
 - b. Drawings to be same sheet size and scale as Contract Drawings.
 - c. Indicate location, size and elevation above finished floor of equipment and distribution systems.
 - d. Incorporate Addenda items and change orders.
6. Advise Architect in the event conflict occurs. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.
7. Verify in field exact size, location, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.
8. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

1.7 COORDINATION

- A. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 26, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittal.
1. Luminaires and outlets:
 - a. Wall mounted luminaires and outlets:
 - 1) Use architectural elevation and section drawings to determine location unless indicated otherwise.

- 2) Coordinate location with consideration of owner provided equipment such as wall mounted televisions, white boards, furniture, cabinets and the like.
2. Electrical equipment: Utilize approved manufacturer's shop drawing dimensions to determine location of equipment in space. Comply with NEC 110.26 access, working space and dedicated equipment space requirements. Maintain manufacturer requirements for maintenance access.
3. Outdoor Electrical equipment: use location shown on civil plans unless indicated otherwise.
- B. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 26, Electrical specification sections for additional requirements for shop drawings outside of these requirements.
- C. Electrical connections to equipment supplied by owner or other trades:
 1. Prior to procurement of electrical equipment and field work coordinate with shop drawings and/or manufacturer's installation instructions the actual electrical characteristics of the equipment to be connected.
 2. Notify engineer of significant deviations or conflicts between the shop drawings and/or the manufacturer's installation instructions and information in the contract documents.
- D. Coordinate arrangement, mounting, and support of electrical equipment:
 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 3. To allow right of way for piping and conduit installed at required slope so connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- E. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
- F. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."
- G. Coordinate and install wiring for appliances and systems furnished under other specification Divisions or furnished by the Owner. Install electrical wiring in accordance with manufacturer's instructions.:
 1. Owner provided equipment

1.8 PERMITS AND FEES

- A. Owner will pay all charges and/or fees levied by the serving utility companies relative to this project.

- B. Obtain and pay all fees for permits, licensing, and inspections applicable to work of Division 26 and **28**

1.9 QUALITY ASSURANCE

- A. Regulatory Requirements: Install work and materials to conform with local, State and Federal codes, and other applicable laws and regulations.
- B. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. Drawings are not intended to show every item in its exact location, or details of equipment or proposed systems layout. Verify actual dimensions of systems and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.
- C. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.
- D. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Provide Qualified Personnel that are thoroughly knowledgeable of applicable codes related to electrical systems to perform the electrical work. Installations shall be performed by skilled electrical tradesmen fully aware of the latest techniques, practices, and standards of the industry. Refer to N.E.C. Article 100-Definitions, Qualified Person.
- F. Install electrical equipment and components in a neat and workmanlike manner in accordance with recognized practices and industry standards. Refer to N.E.C.110-12. Haphazard or poor installation practice will be cause for rejection of the work.

PART 2 - PRODUCTS

2.1 SUBSTITUTION LIMITATIONS FOR ELECTRICAL EQUIPMENT

- A. Substitution requests for electrical equipment will be entertained under the following conditions:
 - 1. Substitution requests may be submitted for consideration if accompanied by value analysis data indicating that substitution will comply with Project performance requirements while significantly increasing value for Owner throughout life of facility.
 - 2. Substitution requests may be submitted for consideration concurrently with submission of power system study reports when those reports indicate that substitution is necessary for safety of maintenance personnel and facility occupants.
 - 3. Contractor is responsible for sequencing and scheduling power system studies and electrical equipment procurement. Insufficient lead time for electrical equipment delivery will not be considered a valid reason for substitution.

B. Substitution and Variation from Basis of Design:

1. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
2. Proposed substitutions: Verify that that proposed substitution If substitutions are proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

2.2 SLEEVES FOR RACEWAYS AND CABLES

- A. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water stop, unless otherwise indicated.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).
- C. EMT: Electrical Metallic Tubing.
- D. PVC: Schedule 40 or 80.

2.3 FIRE RATED SLEEVES FOR CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. 3M
 2. Hilti
 3. Specified Technologies, Inc (STI)
 4. Wiremold.

- B. Factory assembled rectangular steel pathway containing an intumescent insert material that adjusts automatically to cable addition or subtraction.
- C. Sleeve shall have an F Rating equal to or greater than the rating of the wall in which the sleeve is installed.
- D. Sleeve shall be UL listed and bear the UL Classification marking.
- E. Sleeve shall be tested in accordance with ASTM E814 (ANSI/UL1479).
- F. Provide square wall plate kits for single sleeve applications. Provide multi-gang wall/floor plate kits for ganged applications.
- G. Subject to compatibility with requirements and field conditions, i.e. sleeve size, wall thickness, etc., acceptable products include the following:
 - 1. 3M Fire Barrier Pass-Through Devices
 - 2. Hilti Speed Sleeves
 - 3. Specified Technologies Inc. EZ-Path Fire Rated Pathway (series 33).
 - 4. Wiremold Flamestopper FS4 Series

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL WORK

- A. Unless more stringent requirements are specified in the Contract Documents or manufacturers' written instructions, comply with NFPA 70 and NECA NEIS 1 for installation of Work specified in Division 26. Consult Architect for resolution of conflicting requirements.
- B. Comply with NECA 1.
- C. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- D. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- E. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- F. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete, masonry and gypsum board walls, or fire-rated floor and wall assemblies.
- B. Sleeves are required where cables (not in raceway) penetrate walls or floors. Sleeves are not required where raceways penetrate walls, except where raceways penetrate exterior walls/foundations below grade.
- C. Concrete Slabs and Walls: Install sleeves during erection of slabs and walls.
- D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- F. Provide insulated bushings on EMT sleeves for cable not in conduit. Bushings shall be plenum rated where installed in a plenum.
- G. Extend sleeves installed in floors 4 inches (100 mm) above finished floor level unless noted otherwise.
- H. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- I. Seal space outside of sleeves with grout for penetrations of concrete and masonry.
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- L. Fire Rated Sleeves for cables: Fabricate openings in wall or floor assemblies per manufacturer's recommendations.

3.3 SLEEVE APPLICATION

- A. Sleeves for cables not in conduit:
 - 1. Through Non-Rated Interior Walls: EMT sleeves.
 - 2. Through Non-Rated Floors: EMT sleeves.

3. Through Fire Rated Interior Walls: Fire Rated Sleeves for cables.
4. Through Fire Rated Floors: Fire Rated Sleeves for cables.

B. Sleeves for conduits:

1. Through Exterior Walls Below Grade: Refer to details on structural Drawings. Absent any such details provide cast iron pipe or PVC, Schedule 40 or 80, sleeve two trade sizes larger than the conduit.

C. Sleeves for Cable Trays:

1. Through Non-Rated Interior Walls: Rectangular galvanized sheet metal opening.
2. Through Fire Rated Walls: Stop cable tray 6 inches maximum for each side of wall and provide multiple fire rated sleeves for cables with combined allowable area for cable equal to the capacity of the cable tray unless noted otherwise.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 260500

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Copper building wire rated 600 V or less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

- B. Related Requirements:

- 1. Section 260533 "Raceway and Boxes for Electrical Systems" for allowable applications of raceways and cable assemblies. Cable assemblies, such as Type MC cable, shall not be permitted unless noted otherwise.

1.3 ACTION SUBMITTALS

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

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alan Wire Company
2. Cerro Wire
3. CME Wire and Cable
4. Encore Wire Corporation
5. General Cable.
6. Houston Wire & Cable Company.
7. Okonite Company (The)
8. Southwire Company.

B. Copper Building Wire

1. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
2. Conductors: complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type XHHW-2: Comply with UL 44.

E. Temperature Ratings: All conductors shall be rated **90**-degree C minimum.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. 3M Electrical Products
2. AFC Cable Systems, a part of Atkore International
3. Appleton, a brand of Emerson
4. Gardner Bender
5. Hubbell Power Systems
6. Ideal Industries, Inc
7. IlSCO
8. Neer, a brand of Emerson
9. NSI Industries

- 10. O-Z Gedney, a brand of Emerson
- 11. Thomas & Betts Corporation
- B. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Lugs for attachment to telecommunications systems grounding busbars shall be two-hole with long barrels and irreversible crimp terminations.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Branch Circuits: Copper. Solid [or stranded] for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exterior Feeders and branch circuits routed horizontally on roofs: Type XHHW-2, single conductors in raceway.
- B. Other Feeders and Branch Circuits: Type THHN-THWN, single conductors in raceway.
- C. Feeders connected from the load-side of VFDs to electric motors: Type XHHW-2 single conductors installed in a raceway or Type XHHW-2 MC cable where permitted.

Conductors serving circuits downstream of a device with GFCI or GFP protection shall have XHHW-2 insulation.

3.3 CONDUCTOR SIZES

- A. Minimum Wire Size (Interior Work): No. 12 AWG, except No. 14 AWG shall be permitted for signal, pilot control circuits and fixture whips.
- B. Minimum Wire Size (Exterior Work): No 10 AWG.
- C. Use #10 AWG minimum conductor size in lieu of #12 AWG minimum for 20 ampere, 120 volt branch circuits where homeruns are longer than 75 feet and for 20 ampere, 277 volt branch

circuits where homeruns are longer than 175 feet. Increase in size as required for a maximum of 3 percent voltage drop from panel to load.

- D. Derate conductors based on quantity of current carrying conductors in each conduit. Refer to the NEC for derating factors.
- E. Derate conductors for high ambient temperatures. Refer to the NEC for derating factors.

3.4 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Branch circuits serving receptacles and lighting loads shall have dedicated neutral conductors and shall not share a common neutral conductor. The use of handle ties across single pole circuit breakers to allow the use of a common neutral is not acceptable.
- G. Multiwire Branch Circuits and Shared Neutrals:
 - 1. Multiwire branch circuits (as defined by the NEC) and shared neutrals (common grounded conductors) are not permitted, except as follows:
 - a. Wherever a multiwire branch circuit is specifically indicated on the Drawings and a multi-pole breaker is provided in the panel from which it originates as a means to simultaneously disconnect all ungrounded conductors.
 - 2. Derating factors shall be applied, per NEC Article 310, to multiple current-carrying conductors installed within the same conduit. Neutral conductors shall be regarded as current-carrying conductors. Wire sizes shall be increased as needed to maintain the ampacity that corresponds to the overcurrent protection device rating.

3.5 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

- 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.]

- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.6 IDENTIFICATION

- A. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

END OF SECTION 260519

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

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. Metal conduits and fittings.
 - 2. Nonmetallic conduits and fittings.
 - 3. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:
 - 1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. GRC: Comply with ANSI C80.1 and UL 6.
 - 3. IMC: Comply with ANSI C80.6 and UL 1242.
 - 4. EMT: Comply with ANSI C80.3 and UL 797.
 - 5. FMC: Comply with UL 1; zinc-coated steel.
 - 6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

- B. Metal Fittings:
 - 1. Comply with NEMA FB 1 and UL 514B.
 - 2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 3. Fittings, General: Listed and labeled for type of conduit, location, and use.
 - 4. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: compression.
 - 5. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

- A. Nonmetallic Conduit:
 - 1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
 - 3. Rigid HDPE: Comply with UL 651A.
 - 4. Continuous HDPE: Comply with UL 651B.
- B. Nonmetallic Fittings:
 - 1. Fittings, General: Listed and labeled for type of conduit, location, and use.
 - 2. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
 - 3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- D. Metal Floor Boxes:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell

- b. ABB
- c. Legrand/Wiremold
- d. Steel City
- e. FSR
- 2. Material: sheet metal.
- 3. Type: Fully adjustable.
- 4. Shape: Rectangular.
- 5. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Above Grade Exposed Conduit: GRC or IMC.
 - 2. Concealed Conduit, Aboveground: GRC or IMC.
 - 3. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 4. Damp or Wet Locations: IMC.
 - 5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
 - 6. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 - 7. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- C. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

2.5 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Do not install raceways or electrical items on any rotating equipment.
- C. Do not fasten conduits onto the bottom side of a metal deck roof.
- D. Complete raceway installation before starting conductor installation.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

- F. Install no more than the equivalent of four 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- G. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- H. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines. The following are exceptions for concealing conduits:
 - 1. Where specifically noted or indicated on the drawings
 - 2. Electrical rooms with surface mounted panels
 - 3. Mechanical rooms
 - 4. Existing spaces as allowed below:
 - a. Existing concrete or block walls
- I. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- J. Stub-Ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
- M. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- N. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- O. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- P. Locate boxes so that cover or plate will not span different building finishes.
- Q. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

- R. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- S. Set metal floor boxes level and flush with finished floor surface.

2.6 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

2.7 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 265100 - LIGHTING

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. LED exterior lighting.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. EPA: Effective projected area (as it relates to the wind force exerted on an object, in accordance with the standard, AASHTO LTS-5).
- D. Fixture: See "Luminaire."
- E. IP: International Protection or Ingress Protection Rating.
- F. LED: Light-emitting diode.
- G. Lumen: Measured delivered output of luminaire.
- H. Luminaire: Complete lighting unit, including light source, reflector, integral or remote driver, circuitry, lens, diffuser, housing, and accessories.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Arrange in order of luminaire designation.
 - 2. Include data on features, accessories, and finishes.
 - 3. Include physical description, profiles, and dimensions of luminaires.
 - 4. Include data on EPA, cable entrances, materials, dimensions, weight, rated design load, and ultimate strength of individual components.
 - 5. Include finishes for luminaire-supporting devices.
 - 6. Include life, output (lumens, CCT, and CRI), and energy-efficiency data.

7. Photometric data and adjustment factors based on laboratory tests, complying with IES LM-79 and IES LM-80.
8. Use same luminaire designations as indicated on Drawings.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, unique configurations, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Finish/Color Samples for Initial Selection or Verification: As specified for specific luminaire types on the Luminaire Schedule for each type of luminaire requiring a custom factory-applied finishes/colors.

1. Include samples of luminaires and accessories involving color and finish selection.
2. Include samples for each type of standard and luminaire-supporting device and for each color and texture specified.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
- B. Warranty documents.

1.6 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications:
 1. Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
- B. IESNA RP-16-05 Addendum "A": Industry-standard nomenclature and definitions of lighting terms and lighting technologies, including solid-state (LED) luminaires.
- C. UL Compliance: Comply with UL 1598 and listed for wet locations, as specified.
- D. Source Limitations:
 1. Provide luminaires from a single manufacturer for each luminaire type.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.8 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
 - 1. Structural failures, including luminaire support components.
 - 2. Faulty operation of luminaires and accessories.
 - 3. Deterioration or corrosion of metals, metal finishes, color retention, and other materials beyond normal weathering.
- B. Luminaire Warranty Period: Greater than four (4) years from date of Substantial Completion.
 - 1. If the manufacturer's warranty commences upon the date materials are delivered, then the manufacturer's warranty period must be at least five (5) years to meet the requirement stated above.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. LF-01: BEGA 24 816 Wall Luminaire Surface Washer, 3000K, Black.
- B. LF-02: BEGA 33 816 Wall Luminaire, Directed Light, 3000K, Black. Luminaire attachment provisions: Use galvanized steel fasteners and/or stainless steel.
 - 1. Shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- C. All conduits shall be galvanized and shall not penetrate the roof water protection layer
- D. Lights shall be controlled in two zones with a manual on/off switches and photoelectric relay.
- E. Luminaire-Mounted Photoelectric Relays – 1 for entire roof
 - 1. Verify mounting location in field for optimum sunlight exposure.
 - 2. Comply with UL 773/773A
 - 3. Contact Relays: Factory mounted, designed to fail in the on position, and factory set to turn light unit on at 1.5 – 3 fc (16 – 32 lx) and off at 4.5 to 10 fc (48 – 108 lx) with 15

2.2 PERFORMANCE REQUIREMENTS

- A. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.
- B. Exterior Temperature (Outdoor Lighting): minus 20 to plus 120 deg F (-29 to +50 deg C).
- C. Altitude: Sea level to 1000 feet (300 m).

2.3 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Factory-Applied Labels: Comply with UL 1598. Include CCT and CRI ratings. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
- C. Recessed luminaires shall comply with NEMA LE 4.

2.4 LED LUMINAIRES

- A. IESNA LM-79 compliant, latest edition.
- B. IESNA LM-80 compliant, latest edition; 50,000 hours minimum, unless otherwise noted.
- C. CRI and CCT as indicated in accordance with ANSI C78.377.
- D. NEMA SSL-1 compliant for operational characteristics and electrical safety of LED drivers and power supplies. ANSI/NEMA C82.77 compliant for maximum allowable harmonic distortion produced by power supplies/drivers.
- E. Power Factor > 0.9, unless noted otherwise.
- F. Total Harmonic Distortion (THD) < 20%, unless noted otherwise.

2.5 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.
- B. Steel:
 - 1. ASTM A36/A36M for carbon structural steel.
 - 2. ASTM A568/A568M for sheet steel.
 - 3. Epoxy-coated.
- C. Stainless Steel:
 - 1. Manufacturer's standard grade.
 - 2. Manufacturer's standard type, ASTM A240/240M.
- D. Galvanized Steel: ASTM A653/A653M.
- E. Aluminum: ASTM B209. Corrosion-resistant.

- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit servicing without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during servicing and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.
- G. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation (UV-stabilized). Lens Thickness: At least 0.125 inch minimum, unless otherwise indicated.
- H. Glass Lenses, Diffusers, or Globes: Annealed crystal glass, tempered Fresnel glass, unless otherwise indicated. Acrylic lenses

2.6 FINISHES

- A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Finishes and Color Selections: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping.
 - 1. Finishes/colors to be selected by the Architect/Engineer from the manufacturer's full range of standard finishes/colors during the review of action submittals, unless the color is specifically indicated in this specification.
- D. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 2. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
- E. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

- F. Powder-Coat Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces according to SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair powder coat bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, according to SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
 - 2. Powder Coat: Comply with AAMA 2604. Electrostatic-applied powder coating; single application and cured to a minimum 2.5- to 3.5-mil dry film thickness. Coat interior and exterior of pole for equal corrosion protection

2.7 LUMINAIRE SUPPORT

A. Mounting Hardware

- 1. Anchor Bolts: Manufactured to ASTM F1554, Grade 55 with a minimum yield strength of 55,000 psi (380 000 kPa).
 - a. Galvanizing: Hot-dipped galvanized according to ASTM A153, Class C.
 - b. Threading: Uniform National Coarse, Class 2A.
- 2. Nuts: ASTM A563, Grade A, Heavy-Hex.
 - a. Galvanizing: Hot-dipped galvanized according to ASTM A153, Class C.
 - b. Two (2) nuts provided per anchor bolt, shipped with nuts pre-assembled to the anchor bolts.
- 3. Washers: ASTM F436, Type 1.
 - a. Galvanizing: Hot-dipped galvanized according to ASTM A153, Class C.
 - b. Two (2) washers provided per anchor bolt.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Disconnect existing light fixtures and abandon in place if lights are not functioning.
- B. Provide conduit from nearest electric panel to light control source to light fixture location.
- C. Examine masonry areas for attachment.
- D. Coordinate attachment onto guardrail post. See specification section 055000 Metal Fabrications.
- E. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- F. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.

- G. Examine walls for suitable conditions where luminaires will be installed.
- H. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with NECA 1.
- B. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.
- C. Coordinate layout and installation of luminaires with other construction. Do not modify layout or locations of luminaires without documented approval to do so, unless indicated otherwise on the Drawings.
- D. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- E. Adjust luminaires that require field adjustment or aiming to provide optimum illumination. Coordinate and confirm final adjustments with Owner.
- F. Fasten luminaire to structural support.
- G. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and servicing.
 - 3. Provide support for luminaire without causing deflection of wall.
 - 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- H. Wall-Mounted Luminaires:
 - 1. Attached to structural members in walls or a minimum 20-gauge or 1/8-inch thick backing plate attached to wall structural members.
 - 2. Attached using through bolts and backing plates on either side of wall as recommended by luminaire manufacturer.

3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

3.4 IDENTIFICATION

- A. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.5 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Perform the following tests and inspections:
 - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 - 2. Verify settings, programming, functions, and operation of components integral to the luminaire, whether dimming drivers, integral presence sensors, or photoelectric sensors—in addition to other control systems.
 - 3. Inspect luminaires for nicks, mars, dents, scratches, and other damage.
- C. Luminaire will be considered defective if it does not pass operation tests and inspections.
- D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
- E. CLEANING
 - 1. Thoroughly clean each installed luminaire within one month of substantial completion.

END OF SECTION 265100

EXHIBIT D: DRAWINGS

EAST COURTYARD ROOF

FASHION INSTITUTE OF TECHNOLOGY

300 7TH AVENUE
NEW YORK, NY 10001

ADDENDUM #2

02 / 16 / 2024

GENERAL NOTES

- GENERAL NOTES APPLY TO ALL SHEETS.
- WORK: ALL ASPECTS OF THE WORK AND ITEMS NOT SPECIFICALLY MENTIONED, BUT NECESSARY TO MAKE A COMPLETE WORKING INSTALLATION, SHALL BE INCLUDED AND INDICATED IN THE CONTRACTOR'S BID.
- THE PLANS INDICATE THE GENERAL ARRANGEMENT OF PIPES, CONDUIT, WIRING, EQUIPMENT, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING AND EXISTING CONDITION. LOCATION OF THESE ITEMS MAY BE ADJUSTED CONDITIONAL UPON THE SATISFACTORY COMPLIANCE WITH ALL OTHER REQUIREMENTS.
- DO NOT SCALE DRAWINGS. DIMENSIONS NOTED PREVAIL. NOTIFY ARCHITECT IN CASE OF DISCREPANCY.
- DIMENSIONS ARE ACTUAL AND ARE TO FACE OF STUDS, FACE OF CONCRETE WALLS, FACE OF CMU WALLS, FACE OF FRAMES, OR CENTERLINE OF COLUMNS, UNLESS NOTED OTHERWISE.
- COORDINATE WITH MECHANICAL AND ELECTRICAL CONTRACTORS THE SIZE AND LOCATION OF EQUIPMENT PADS, MECHANICAL CHASE SIZES, AND CUT-PUTS FOR EQUIPMENT.
- ARCHITECTURAL FINISH FLOOR ELEVATION ARE RELATIVE TO FIRST FLOOR ELEVATION (0'-0") UNLESS OTHERWISE NOTED.
- ALL PENETRATIONS THROUGH WALLS AND FLOORS SHALL BE SEALED WITH PENETRATION FIRE STOPPING MATERIALS AS REQUIRED TO ACHIEVE THE RESPECTIVE FIRE-RESISTANCE RATING AND SMOKE STOPPAGE.
- CONSTRUCTION DOCUMENTS ARE COMPLEMENTARY. SEE DRAWING FOR QUANTITIES AND LOCATION OF WORK. SEE SPECIFICATIONS FOR QUALITIES AND CONDITIONS OF WORK.
- GENERAL SHEET NOTES ONLY APPLY TO PARTICULAR DRAWING OR SERIES OF DRAWINGS.
- HORIZONTAL AND VERTICAL DIMENSIONS ARE MINIMUM DIMENSIONS. CLEARANCES ARE GIVEN TO FINISH SURFACES. GO TO VERIFY ALL CLEARANCES. NOTIFY ARCHITECT IN CASE OF DISCREPANCY.
- NO ASBESTOS OR PCB CONTAINING MATERIALS SHALL BE USED ON THIS PROJECT.
- THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS ARE RESPONSIBLE FOR PROPER REMOVAL AND DISPOSAL OF ALL DEBRIS GENERATED DURING CONSTRUCTION. THE REMOVAL AND DISPOSAL OF ALL CONSTRUCTION DEBRIS SHALL BE IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. THE PREMISES SHALL BE KEPT CLEAN AND FREE FROM ALL WASTE MATERIALS.
- GENERAL CONTRACTOR SHALL PROTECT NEW CONSTRUCTION FROM DAMAGE BY ALL TRADES. ALL SUCH DAMAGE CAUSED BY THE CONTRACTOR DURING THE COURSE OF THIS WORK SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.

BUILDING DEPARTMENT NOTES

- THE FOLLOWING NOTES SHALL APPLY THROUGHOUT:
 - WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LAWS AND BYLAWS BEARING ON THE PERFORMANCE AND EXECUTION OF THE WORK.
- THIS APPLICATION IS SUBJECTED TO BUILDING CODE 2022 FOR COMPLIANCE WITH CHAPTERS 1, 17, & 33 REGARDING ADMINISTRATION, INSPECTIONS, AND SAFETY REQUIREMENTS.
 - THE ROOF OF THIS IS NOT OCCUPIABLE AND WILL REMAIN NON OCCUPIABLE. THE BUILDING IS CLASSIFIED AS ONE STORY AND THE MAIN BUILDING OCCUPANCY GROUP CLASSIFICATION F-1B (AMPHITHEATRE) & CONSTRUCTION CLASSIFICATION 1B (FIREPROOF CONSTRUCTION)
 - AVAILABLE RECORDS INDICATE THE AMPHITHEATRE RECEIVED AN AMENDED CERTIFICATE OF OCCUPANCY DATED ON 02/21/02 FOR THE CELLAR AND FIRST FLOOR.
- ALL MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING REQUIREMENTS:
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE STANDARDS AND APPEALS (OR)
 - THEY SHALL HAVE BEEN ACCEPTED FOR THE USE UNDER THE PRESCRIBED TEST METHODS BY THE COMMISSIONER (OR)
 - APPROVED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH (OTCR)
- MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING:
 - THEY SHALL CONFIRM WITH THE AISG FIRE RESISTANCE RATING DATED 1986 (OR)
 - THEY SHALL HAVE BEEN TESTED WITH ASTM E119, STANDARD METHODS OF FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS AND ACCEPTED BY THE COMMISSIONER (OR)
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR THE EFFECTIVE DATE OF THE CODE (OR)
 - APPROVED BY THE OTCR
- THESE DRAWINGS HAVE BEEN PREPARED BY OR AT THE DIRECTION OF THE UNDERSIGNED AND TO THE BEST OF THE UNDERSIGNED'S KNOWLEDGE, INFORMATION AND BELIEF MEET THE REQUIREMENTS OF THE BUILDING CODE
- ALL NEW WORK SHALL COMPLY WITH THE 2020 NYCDEC
- TR-1 SHALL BE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE OWNER PRIOR TO APPLYING FOR CONSTRUCTION PERMITS
- FOLLOWING CHAPTER 33 OF THE 2013 NYCDC, PROTECTIONS OF THE PUBLIC AND THE ADJACENT PROPERTIES. REFERENCES IN THE SPECIFICATIONS AND THE DRAWINGS TO THE 1988 BUILDING CODE PARAGRAPHS REGARDING PROTECTION SHALL BE CONSIDERED TO BE THAT OF CHAPTER 33 OF THE NYCDC.

PROTECTIVE OVERHEAD BRIDGING

- NYC DOB REQUIRED PROTECTIVE SIDEWALK BRIDGING TO BE INCLUDED IN CONTRACT WORK
- MINIMUM 8'-0" HIGH CLEARANCE AT SIDEWALK, WATERPROOF PLANNING DECK AND 4'-0" PARAPETS
- PROVIDE 24 HR LIGHTING AND SECURITY SYSTEMS.
- PROVIDE PROTECTIVE BRIDGE STEEL POST & BOLTS AT PEDESTRIAN LEVEL
- ALL WORK TO BE PERFORMED BY EXPERIENCED CREW AND LICENSED INSURED CONTRACTOR
- PROTECT ALL PLANTING AREAS & TREES AGAINST DAMAGE
- COORDINATION SHED WITH EXISTING SHED AT NEW ACADEMIC BUILDING

CODE REFERENCES

- | | |
|------|---|
| 1988 | NEW YORK CITY BUILDING CODE |
| 2022 | BUILDING CODE OF THE CITY OF NEW YORK (2022 NYC) |
| 2022 | PLUMBING CODE OF THE CITY OF NEW YORK |
| 2022 | MECHANICAL CODE OF THE CITY OF NEW YORK |
| 2022 | FUEL GAS CODE OF THE CITY OF NEW YORK |
| 2020 | NEW YORK CITY ENERGY CONSERVATION CODE (NYCECC) |
| 2022 | NEW YORK CITY ELECTRICAL CODE WITH AMENDMENTS TO NFPA-70 2020 |
| 2022 | NEW YORK CITY FIRE CODE WITH AMENDMENTS TO NFPA-72 2010 |
| 2009 | ICC / ANSI 117.1-2009 |

REQ. CONTROLLED INSPECTIONS

- | | |
|----------------------------------|-----------------------------------|
| SPECIAL INSPECTION ITEMS: | |
| INSULATION & R VALUES | 1RCN9000-01(H)(1)&(2) |
| ENERGY CODE COMPLIANCE | BC110.3.5 |
| FINAL INSPECTION | BC108.5/110.5 DIRECTIVE 14 / 1975 |

ENERGY CODE

TO THE BEST OF KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THIS APPLICATION IS IN COMPLIANCE WITH THE NYCDEC 2020 AND THE NEW YORK STATE ENERGY CONSERVATION CODE 2020

FLOOD ZONE

THIS PROJECT IS LOCATED WITHIN FLOOD ZONE X ACCORDING TO FEMA FIRM MAP #3064970201F EFFECTIVE 08/05/07

ZONING NOTES

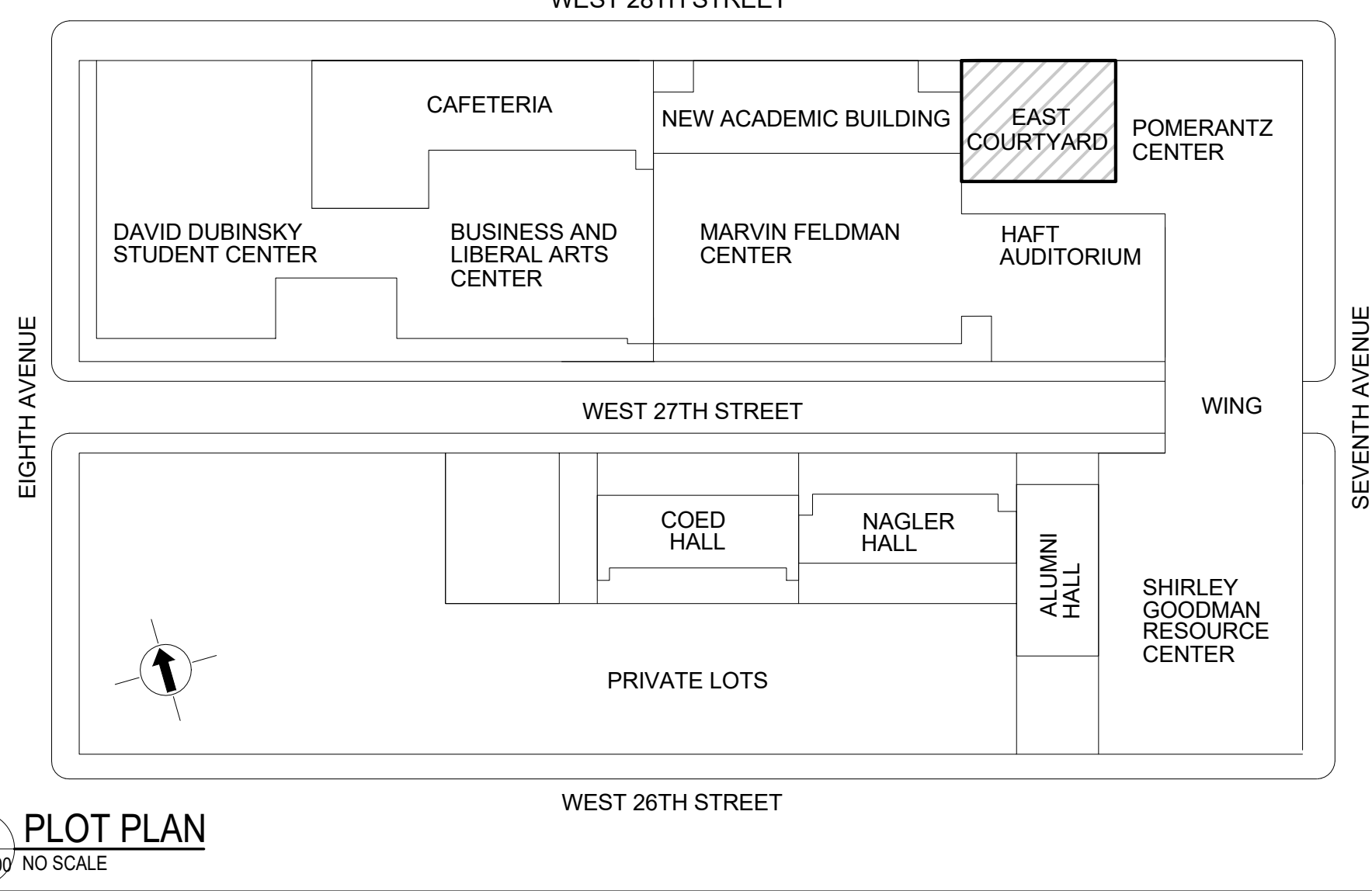
ADDRESS: 300 SEVENTH AVE, NY, NY 10001
LOT: 37
ZONING MAP: 37
ZONING DISTRICT: C6-2A
NO CHANGE TO USE, EGRESS, OR OCCUPANCY

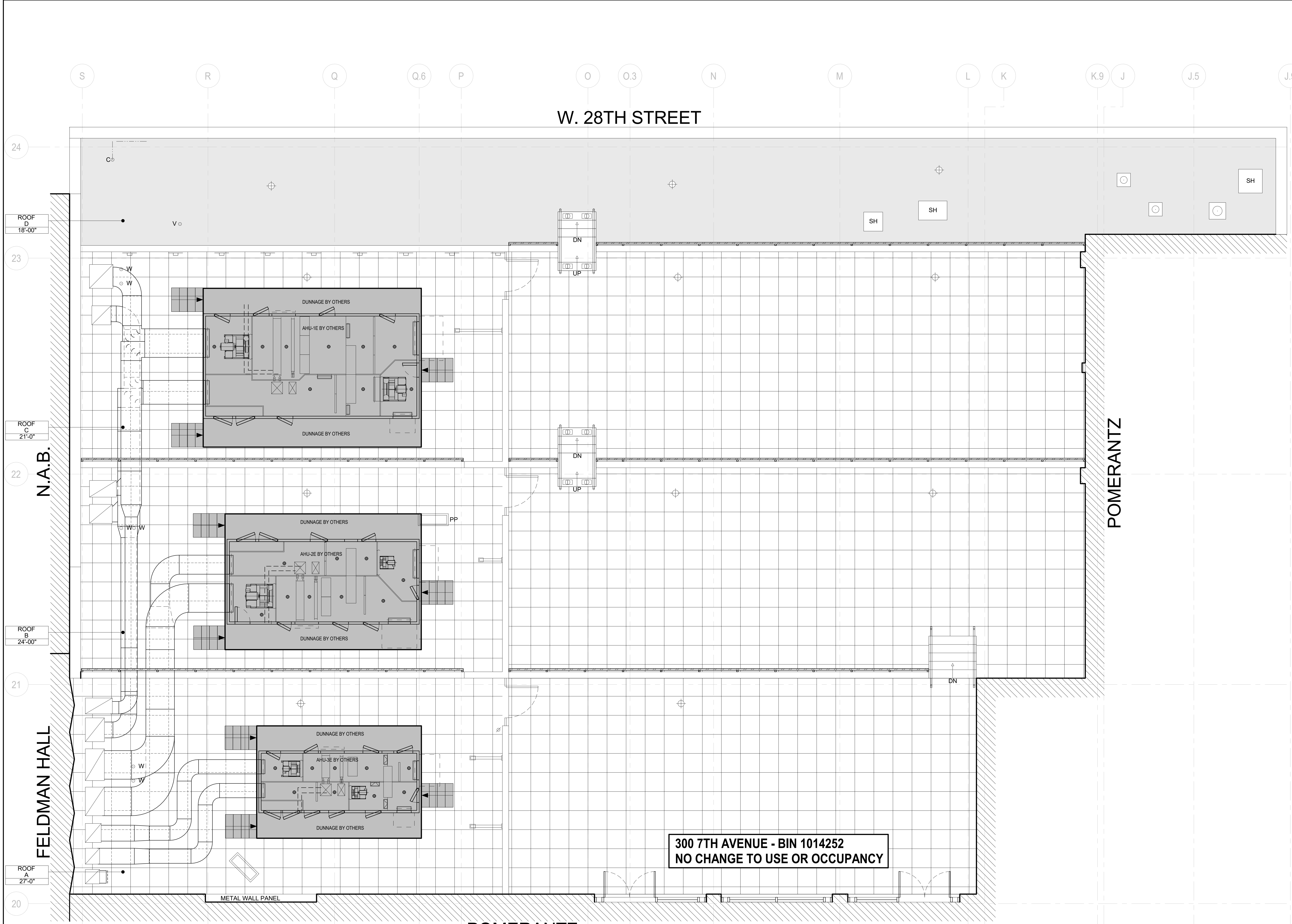
PROJECT DESCRIPTION

THE SCOPE OF THE PROJECT INCLUDES REMOVALS OF EXISTING ROOFING SYSTEMS, STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, METAL FLASHING AND LIGHT FIXTURES. ALL EXISTING MECHANICAL EQUIPMENT TO BE REPLACED UNDER SEPARATE PROJECT WITH FIT. THE REMOVAL, RESTORATION, AND REPLACEMENT OF ROOFING MATERIAL AT MECHANICAL UNITS WILL BE IN COORDINATION WITH THE NEW HVAC UNITS.

THE SCOPE ALSO INCLUDES THE INSTALLATION OF NEW ROOFING SYSTEMS, NEW METAL FLASHING, AND REINSTALLATION OF THE STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, AND EXTERIOR LIGHTING. THIS PORTION OF THE BUILDING WAS BUILT IN 2002 AND THE OCCUPIED FLOOR BELOW THE ROOF INCLUDES AN PUBLIC ASSEMBLY HALL & SUPPORTING PROGRAM.

DRAWING LIST.				GENERAL ABBREVIATIONS				GENERAL SYMBOLS				HATCH KEY																																																																																																																																																																																																																																																																																																																																																			
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Energy</td><td></td><td></td><td></td></tr><tr><td>EN.001.00</td><td>ROOF PLAN - ENERGY CODE</td><td></td><td>02/16/24</td></tr></table>				00 - General			ISSUE DATE	G.000.00	COVER SHEET		02/16/24	03 - Code				CP.001.00	ROOF PLAN - BUILDING CODE		02/16/24	10 - Architectural				AD.100.00	ROOF PLAN - DEMOLITION		02/16/24	A.101.00	ROOF PLAN - NEW CONSTRUCTION		02/16/24	A.201.00	ROOF PLAN - EXTERIOR LIGHTING		02/16/24	A.601.00	SIGHT LINE DIAGRAM		02/16/24	A.701.00	EXTERIOR ELEVATIONS		02/16/24	A.801.00	DETAILS 1/3		02/16/24	A.802.00	DETAILS 2/3		02/16/24	A.803.00	DETAILS 3/3		02/16/24	40 - Energy				EN.001.00	ROOF PLAN - ENERGY CODE		02/16/24	<table><tr><td>#</td><td>NUMBER</td><td>IBC</td><td>INTERNATIONAL BUILDING CODE</td></tr><tr><td>&</td><td>AND</td><td>IN</td><td>INCH</td></tr><tr><td>@</td><td>AT</td><td>INT</td><td>INTERIOR</td></tr><tr><td>ADA</td><td>AMERICANS WITH DISABILITY ACT</td><td>LB(S)</td><td>POUND(S)</td></tr><tr><td>ADDN</td><td>ADDITION OR ADDITIONAL</td><td>M</td><td>METER</td></tr><tr><td>AFF</td><td>ABOVE FINISHED FLOOR</td><td>MAX</td><td>MAXIMUM</td></tr><tr><td>AFG</td><td>ABOVE FINISHED GRADE</td><td>MC</td><td>MECHANICAL CONTRACTOR</td></tr><tr><td>AHJ</td><td>AUTHORITY HAVING JURISDICTION</td><td>MECH</td><td>MECHANICAL</td></tr><tr><td>ALT</td><td>ALTERNATE</td><td>MEZZ</td><td>MEZZANINE</td></tr><tr><td>ANSI</td><td>AMERICAN NATIONAL STANDARDS INSTITUTE</td><td>MFR</td><td>MANUFACTURER</td></tr><tr><td>APPROX</td><td>APPROXIMATE</td><td>MIN</td><td>MINIMUM</td></tr><tr><td>ARCH</td><td>ARCHITECTURAL</td><td>MISC</td><td>MISCELLANEOUS</td></tr><tr><td>BLDG</td><td>BUILDING</td><td>MM</td><td>MILLIMETER</td></tr><tr><td>BSMT</td><td>BASEMENT</td><td>N</td><td>NORTH</td></tr><tr><td>CL</td><td>CENTER LINE</td><td>N/A</td><td>NOT APPLICABLE</td></tr><tr><td>CLG</td><td>CEILING</td><td>NIC</td><td>NOT IN CONTRACT</td></tr><tr><td>CM</td><td>CENTIMETER</td><td>NTS</td><td>NOT TO 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ROOF PLAN - BUILDING CODE
SCALE: 1/4" = 1'-0"

ARCHITECTURAL LEGEND

	EXISTING BUILDING
	IRMA ROOFING WITH 2X2 CONCRETE PAVERS
	CONVENTIONAL TAPERED INSULATION ROOFING

BUILDING DEPARTMENT NOTES

- THE FOLLOWING NOTES SHALL APPLY THROUGHOUT:
 - WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LAWS AND BY-LAWS BEARING ON THE PERFORMANCE AND EXECUTION OF THE WORK.
 - THIS APPLICATION IS SUBJECTED TO BUILDING CODE 2022 FOR COMPLIANCE WITH CHAPTERS 1, 17, & 33 REGARDING ADMINISTRATION, INSPECTIONS, AND SAFETY REQUIREMENTS.
 - THE ROOF OF THIS IS NOT OCCUPIABLE AND WILL REMAIN NON OCCUPIABLE. THE BUILDING IS CLASSIFIED AS ONE STORY AND THE MAIN BUILDING OCCUPANCY GROUP CLASSIFICATION F-1B (AMPHITHEATRE) & CONSTRUCTION CLASSIFICATION 1B (FIREPROOF CONSTRUCTION).
 - AVAILABLE RECORDS INDICATE THE AMPHITHEATRE RECEIVED AN AMENDED CERTIFICATE OF OCCUPANCY DATED ON 02/21/02 FOR THE CELLAR AND FIRST FLOOR.
 - ALL MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING REQUIREMENTS:
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE BY THE BOARD OF STANDARDS AND APPEALS (OR).
 - THEY SHALL HAVE BEEN ACCEPTED FOR THE USE UNDER THE PRESCRIBED TEST METHODS BY THE COMMISSIONER (OR).
 - APPROVED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH (OTCR).
 - MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING:
 - THEY SHALL CONFORM WITH THE AISI FIRE RESISTANCE RATING DATED 1985 (OR).
 - THEY SHALL HAVE BEEN TESTED WITH ASTM E119, STANDARD METHODS OF FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS AND ACCEPTED BY THE COMMISSIONER (OR).
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE (OR).
 - APPROVED BY THE OTCR.
- THESE DRAWINGS HAVE BEEN PREPARED BY OR AT THE DIRECTION OF THE UNDERSIGNED AND TO THE BEST OF THE UNDERSIGNED'S KNOWLEDGE, INFORMATION AND BELIEF MEET THE REQUIREMENTS OF THE BUILDING CODE.
- ALL NEW WORK SHALL COMPLY WITH THE 2020 NYCECC.
- TR-1 SHALL BE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE OWNER PRIOR TO APPLYING FOR CONSTRUCTION PERMITS.
- FOLLOWING CHAPTER 33 OF THE 2013 NYCECC, PROTECTIONS OF THE PUBLIC AND THE ADJACENT PROPERTIES REFERENCES IN THE SPECIFICATIONS AND THE DRAWINGS TO THE 1988 BUILDING CODE PARAGRAPHS REGARDING PROTECTION SHALL BE CONSIDERED TO BE THAT OF CHAPTER 33 OF THE NYCECC.

PROTECTIVE OVERHEAD BRIDGING

- NYC DOB REQUIRED PROTECTIVE SIDEWALK BRIDGING TO BE INCLUDED IN CONTRACT WORK.
- MINIMUM 8'-0" HIGH CLEARANCE AT SIDEWALK, WATERPROOF PLANKING DECK AND 4'-0" PARAPETS.
- PROVIDE 24 HR. LIGHTING AND SECURITY SYSTEMS.
- PROVIDE PROTECTIVE BRIDGE STEEL POST & BOLTS AT PEDESTRIAN LEVEL.
- ALL WORK TO BE PERFORMED BY EXPERIENCED CREW AND LICENSED INSURED CONTRACTOR.
- PROTECT ALL PLANTING AREAS & TREES AGAINST DAMAGE.
- COORDINATION SHED WITH EXISTING SHED AT NEW ACADEMIC BUILDING.

CODE REFERENCES

1988	NEW YORK CITY BUILDING CODE
2022	BUILDING CODE OF THE CITY OF NEW YORK (2022 NYC)
2022	PLUMBING CODE OF THE CITY OF NEW YORK
2022	MECHANICAL CODE OF THE CITY OF NEW YORK
2022	FUEL GAS CODE OF THE CITY OF NEW YORK
2020	NEW YORK CITY ENERGY CONSERVATION CODE (NYCECC)
2022	NEW YORK CITY ELECTRICAL CODE WITH AMENDMENTS TO NFPA-70 2008
2022	NEW YORK CITY FIRE CODE WITH AMENDMENTS TO NFPA-72 2010
2009	ICC / ANSI 117.1-2009

REQ. CONTROLLED INSPECTIONS

SPECIAL INSPECTION ITEMS:	
INSULATION & R VALUES	1RCNY5000-01(H)(1)&(2)
ENERGY CODE COMPLIANCE	BC110.3.5
FINAL INSPECTION	BC109.5.110.5 DIRECTIVE 14 / 1975

ENERGY CODE

TO THE BEST OF KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THIS APPLICATION IS IN COMPLIANCE WITH THE NYCECC 2020 AND THE NEW YORK STATE ENERGY CONSERVATION CODE 2020.

FLOOD ZONE

THIS PROJECT IS LOCATED WITHIN FLOOD ZONE X ACCORDING TO FEMA FIRM MAP #5804570201F EFFECTIVE 08/05/07

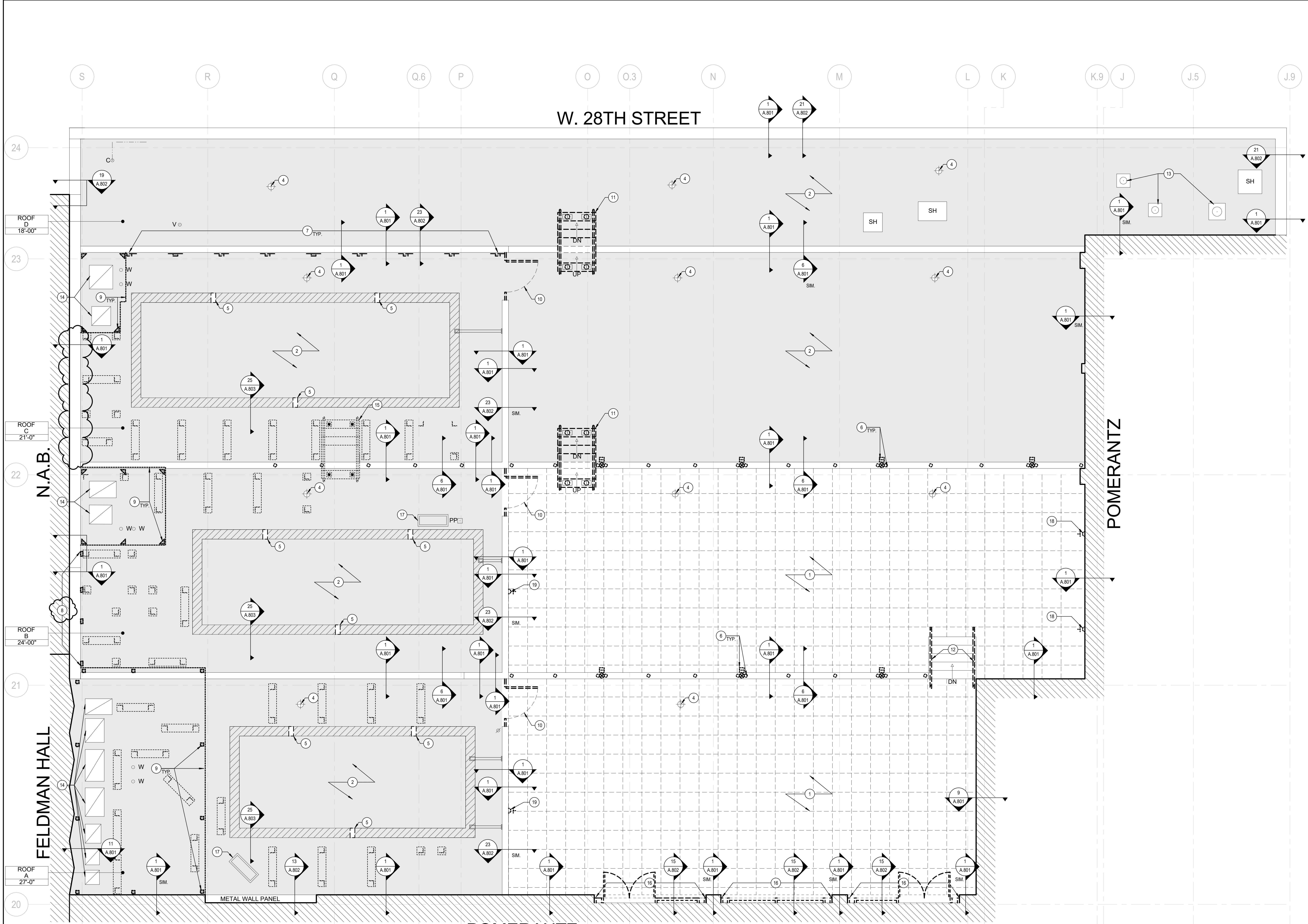
ZONING NOTES

ADDRESS:	300 SEVENTH AVE, NY, NY 10001
BLOCK:	777
LOT:	37
ZONING MAP:	8D
ZONING DISTRICT:	C6-2A
NO CHANGE TO USE, EGRESS, OR OCCUPANCY	

PROJECT DESCRIPTION

THE SCOPE OF THE PROJECT INCLUDES REMOVALS OF EXISTING ROOFING SYSTEMS, STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, METAL FLASHING AND LIGHT FIXTURES. ALL EXISTING MECHANICAL EQUIPMENT TO BE REPLACED UNDER SEPERATE PROJECT WITH FIT. THE REMOVAL, RESTORATION, AND REPLACEMENT OF ROOFING MATERIAL AT MECHANICAL UNITS WILL BE IN COORDINATION WITH THE NEW HVAC UNITS.

THE SCOPE ALSO INCLUDES THE INSTALLATION OF NEW ROOFING SYSTEMS, NEW METAL FLASHING, AND REINSTALLATION OF THE STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, AND EXTERIOR LIGHTING. THIS PORTION OF THE BUILDING WAS BUILT IN 2002 AND THE OCCUPIED FLOOR BELOW THE ROOF INCLUDES AN A PUBLIC ASSEMBLY HALL & SUPPORTING PROGRAM.



ROOF PLAN - DEMOLITION
SCALE: 1/4" = 1'-0"

ARCHITECTURAL LEGEND

- EXISTING BUILDING
- MODIFIED BITUMEN ROOFING WITH 2X2 CONCRETE PAVERS.
- MODIFIED BITUMEN ROOFING, EXPOSED
- DEMOLISH COMPONENT
- REPAIR & REFINISH COMPONENT

ROOF SYMBOL # SHEET NOTES

- ROOF DRAIN (4)
- DUCT THROUGH ROOF (14)
- DUCT SUPPORT STEEL ANGLE LEG (3)
- DUCT SUPPORT STEEL ANGLE LEG ON METAL CURB (3)
- CONCRETE CURB (5)
- PARAPET MOUNTED FENCE POST (6)
- PARAPET MOUNTED LIGHT FIXTURE (6)
- ELECTRICAL COVER (6)
- WALL MOUNTED LIGHT FIXTURE
- SCREEN POST BRACKETS (2 PER POST) (7)
- STAIR SUPPORT LEG IN PITCH POCKET (1) (2)
- STEEL POST (4"x4") SHED SUPPORT (9)
- METAL SHED PANELS ABOVE ROOF (9)
- STEEL ANGLE SHED SUPPORT (9)
- STEEL LADDER POST (3"x3") IN PITCH POCKET (1) (2)
- STEEL ANGLE BRACE IN PITCH POCKET END PLATE (2)
- STAIR RAILING POST (15)
- SMOKE HATCH
- FAN
- CONDUIT IN PITCH POCKET (2)
- HVAC WATER PIPE
- VENT PIPE
- PLUMBING PIPE
- WATER OUTLET
- CONDENSER (17)
- CONDUIT
- SHED BASE ABOVE ROOFING (9)
- PITCH POCKET (1) (2)

DEMOLITION GENERAL NOTES

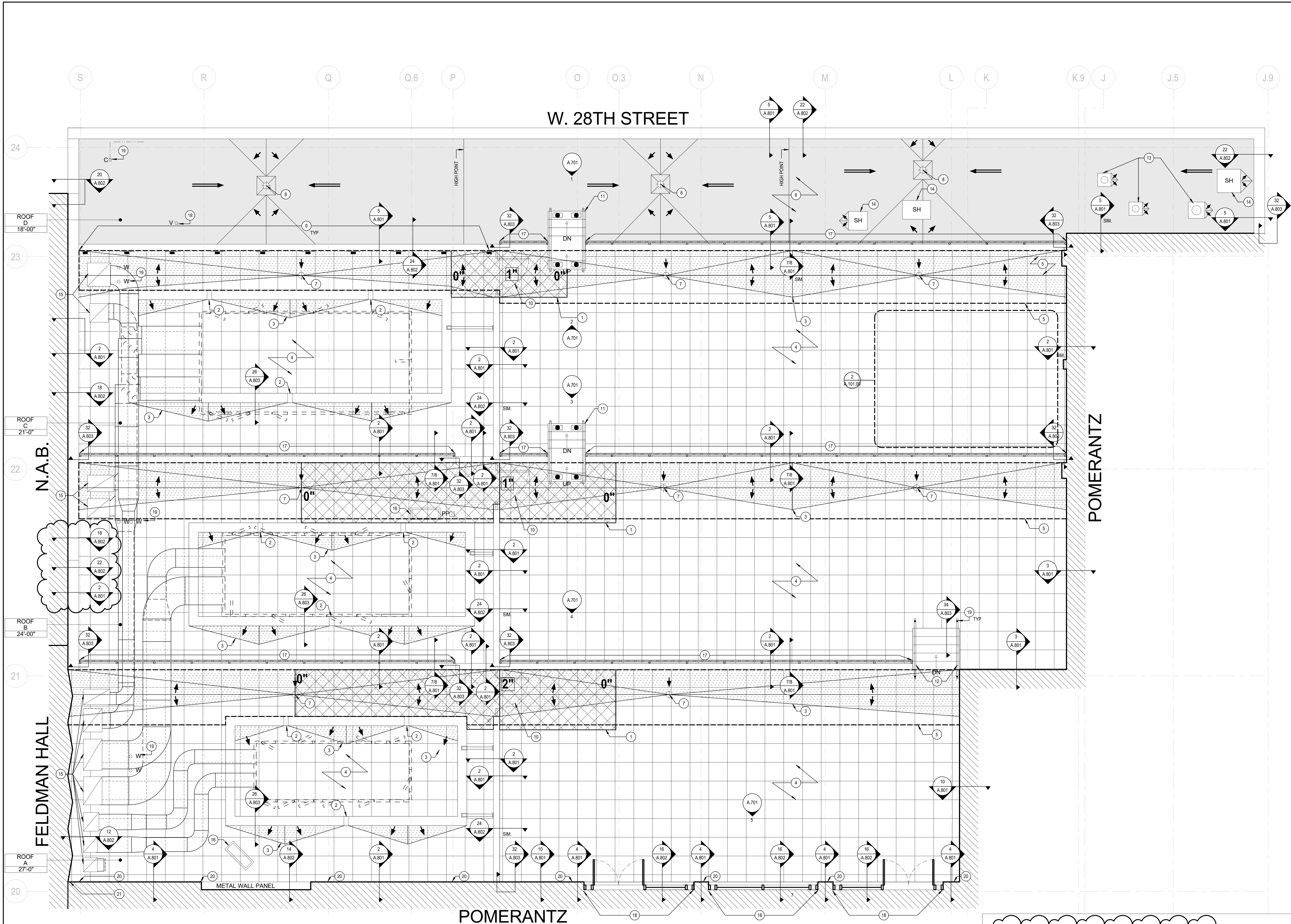
- COORDINATE ALL DEMOLITION AND PHASING EFFORTS WITH THE ARCHITECT AND OWNER'S REPRESENTATIVE. EVERY EFFORT SHALL BE MADE TO MINIMIZE DISRUPTION OF OWNER'S OPERATIONS. EXCESSIVE NOISE OR VIBRATION SHALL BE PRE-APPROVED AND COORDINATED WITH THE OWNER'S REPRESENTATIVE. IN ALL CASES, PROVISIONS SHALL BE MADE FOR USER'S SAFETY.
- COORDINATE ANY DISRUPTION OF UTILITY SERVICES WITH THE OWNER AND AS SPECIFIED.
- VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
- THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
- PROVIDE PROTECTION FOR ALL EXISTING BUILDING MATERIALS AND EQUIPMENT FROM DAMAGE DUE TO ANY DEMOLITION OR CONSTRUCTION-RELATED INCIDENT PERFORMED UNDER THIS CONTRACT.
- REPAIR OR REPLACE ITEMS THAT ARE DAMAGED AS A RESULT OF DEMOLITION OR CONSTRUCTION TO MATCH EXISTING FINISH AND/OR CONDITION.

DEMOLITION NOTES

- EXISTING ROOF DECK IS CONCRETE SLAB ON METAL DECK.
- REMOVE BASE SHEET, INSULATION BOARDS, ROOFING MEMBRANE, AND MEMBRANE FLASHINGS - ALL ADHERED IN SOLID MOPPINGS OF ASPHALT - DOWN TO THE DECK SURFACE.
- SALVAGE NON-DAMAGED FULL-SIZE PAVERS FOR RE-USE. MAKE PROVISIONS TO REPLACE 20 DAMAGED FULL-SIZE PAVERS.
- REMOVE AND REPAIR STEEL STAIRS, STEEL GATE, AND STEEL SCREEN, AND RE-INSTALL.
- CLEAN AND PREP ROOF DRAINS FOR NEW FLASHINGS.
- REMOVE PITCH POCKETS AND ASSOCIATED FILL AND FLASHINGS.
- SEE SHEET NOTES FOR MORE SCOPE.

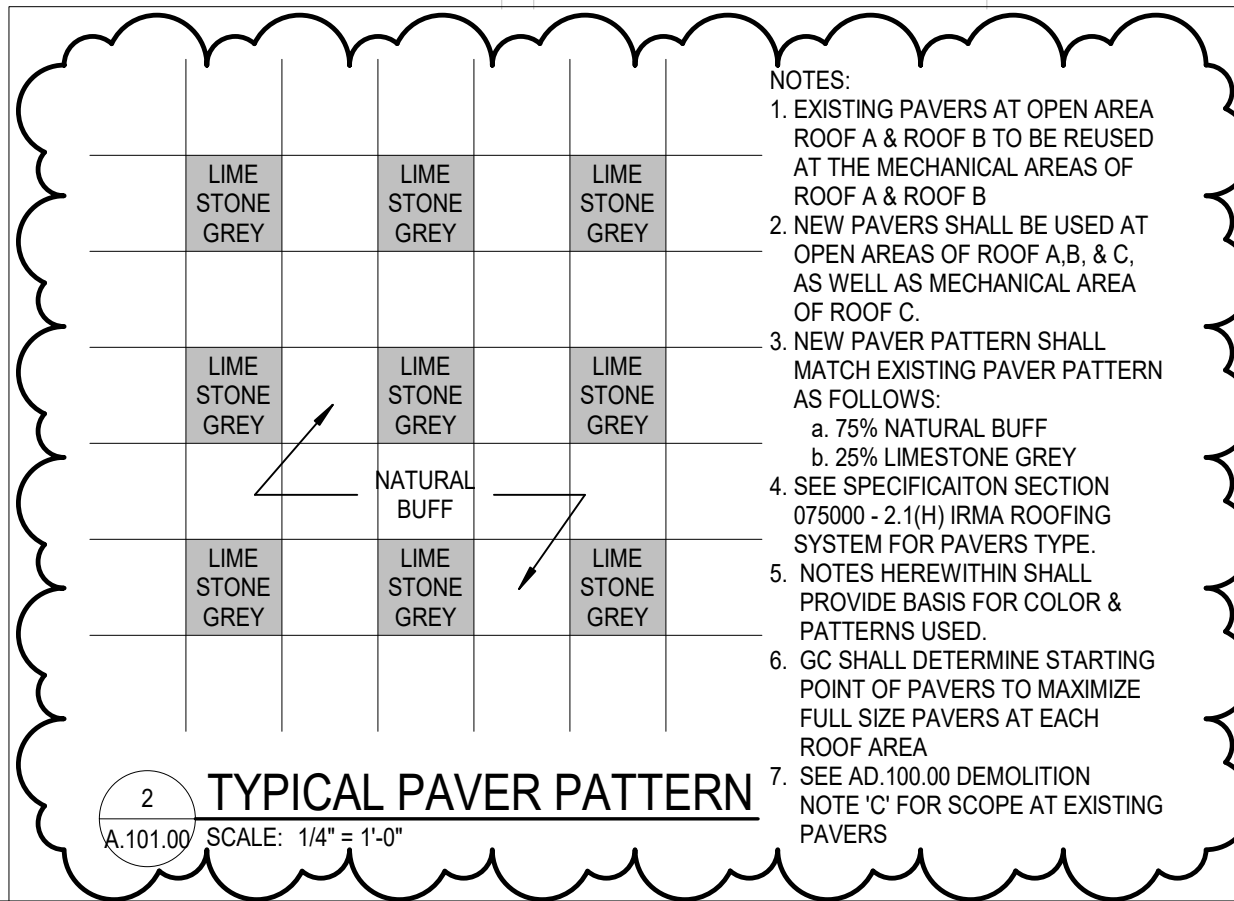
SHEET NOTES

- DEMOLISH EXISTING ROOFING MEMBRANE, PROTECTION BOARD, PEDESTALS, INSULATION BOARDS, AND BASE SHEET TO EXISTING POURED CONCRETE DECK SURFACE. SET SALVAGED CONCRETE PAVERS OFFSITE FOR RE-USE.
- DEMOLISH EXISTING ROOFING MEMBRANE, INSULATION BOARDS, AND BASE SHEET TO EXISTING POURED CONCRETE DECK SURFACE.
- DEMOLISH SUPPORT STEEL ANGLE LEG AND METAL CURB TO CONCRETE DECK.
- CLEAN AND PREP ROOF DRAINS.
- REMOVE PLYS COVERING CURB. DEMOLISH 6" WIDE OF CURB & FULL HEIGHT (W/RES) FOR NEW SCUPPERS.
- REMOVE COPING, PARAPET MOUNTED FENCE POST, LIGHT FIXTURE, AND ELECTRICAL COVER. PROTECT PARAPET TO RECEIVE NEW FLASHINGS AND GUARDRAILS.
- REMOVE STEEL SCREEN AND STEEL POST FOR RE-INSTALLATION AT CENTERPOINT BETWEEN EXISTING POSTS. SEE DRAWING #2 (A-701.00) FOR MORE INFORMATION.
- REUSE METAL SCREENS ADJACENT TO NEW ACADEMIC BUILDING. GC TO COORDINATE WITH OWNER. SEE DRAWING #2 (A-701.00) FOR MORE INFORMATION.
- DEMOLISH SHED/DROUHOUSE ROOF, WALLS, POSTS, SUPPORTS, AND ASSOCIATED FRAMING. CUT OFF POSTS AND SUPPORTS AT TOP OF DECK. INFILL VOIDS IN CUT-OFF POSTS WITH CEMENTITIOUS FILL. SMOOTH TOP SURFACE WITH PASTE.
- REMOVE FENCE POST AND GATE. REFINISH AND REINSTALL AT THE SAME LOCATION.
- REMOVE SHPLADDER. REFINISH AND REINSTALL AT THE SAME LOCATION.
- REMOVE HANDRAIL. INSTALL NEW HANDRAIL AT THE SAME LOCATION.
- EXHAUST FAN CURB BY OTHERS.
- DUCTWORK FROM NEW ROOFTOP UNITS TO CONNECT TO TUBES EXTENDING UP THROUGH THE DECK AT EXISTING OPENINGS BY OTHERS. GC TO COORDINATE.
- REMOVE LADDER AND PLATFORM.
- DEMOLISH WINDOW WALL INCLUSIVE OF JAMBS, GLAZING, DOORS, SADDLE AND SILL PLATE.
- REMOVE EXISTING CURB, CONDENSOR AND REFRIGERANT LINES TO BE LOCATED AND RECONNECTED BY OTHERS.
- REMOVE LIGHT FIXTURE AND FASTEN WITH BLACK PAINTED GALVANIZED PLATE. PROVIDE SEALANT AROUND ALL EDGES.
- REMOVE LIGHTS AND REPLACE IN KIND. SEE A-201.00 FOR MORE INFORMATION.



ROOF PLAN - NEW CONSTRUCTION

SCALE: 1/4" = 1'-0"



ARCHITECTURAL LEGEND

- RMA ROOFING WITH 2X2 CONCRETE PAVERS. SEE SHEET NOTE #4
- APPROX. AREA WITH PAVERS SET ON HIGH PROFILE PEDESTALS & SHIMS, INSTALL WITH SURFACE SLOPE OF LESS THAN 1/8" PER FOOT. SEE SHEET NOTE #5
- CONVENTIONAL TAPERED INSULATION ROOFING. SEE SHEET NOTE #6
- AREA OF CEMENTITIOUS FILL CRICKETS. SEE SHEET NOTE #3
- AREA OF CORRECTIVE CEMENTITIOUS FILL. SEE SHEET NOTE #1

ROOF SYMBOL # SHEET NOTES

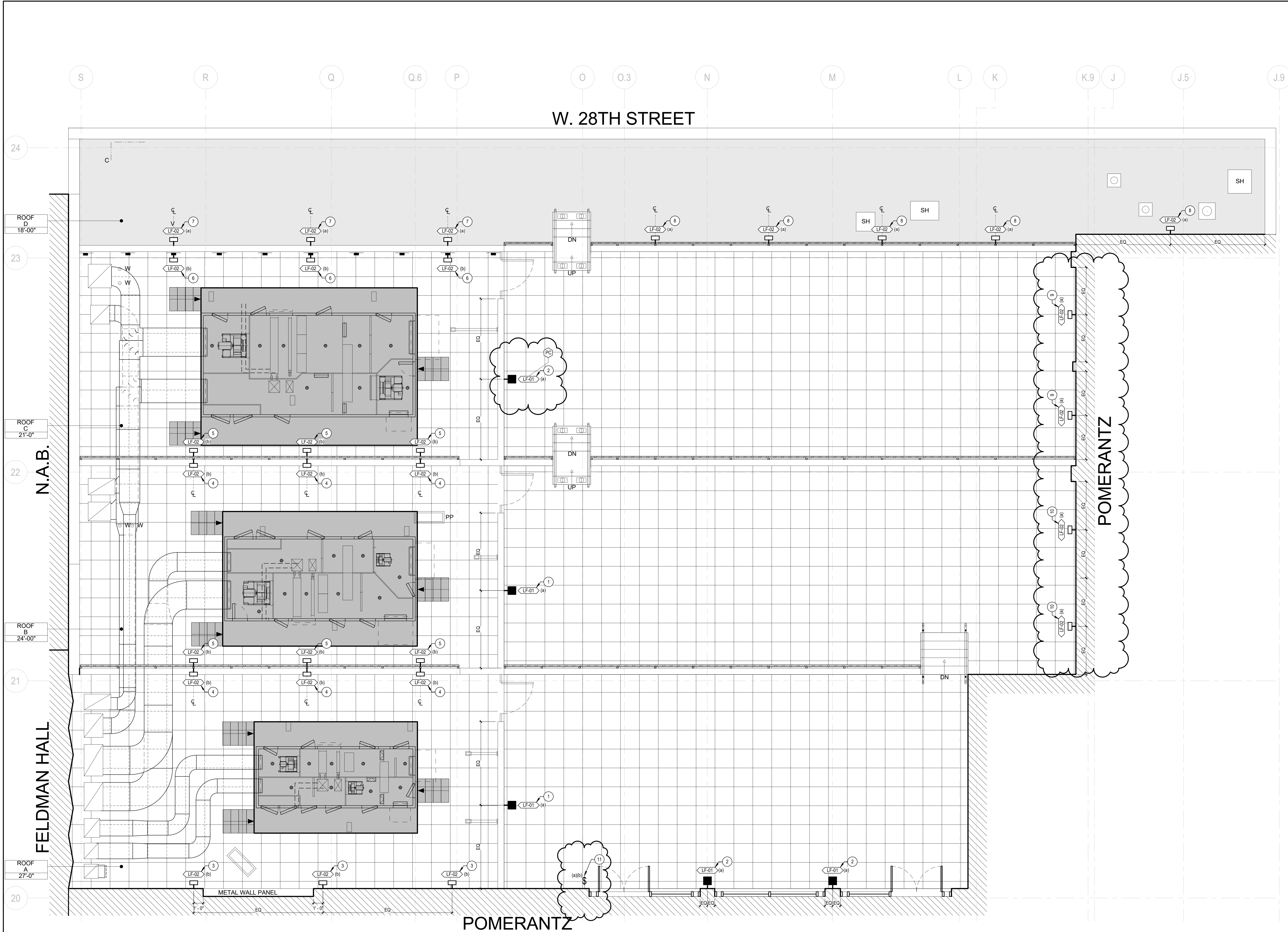
- ROOF DRAIN (7)
- ROOF DRAIN IN TAPERED SUMP (8)
- DUCT THROUGH ROOF (15)
- CONCRETE CURB (2)
- SCREEN POST BRACKETS (2 PER POST) (9)
- STAIR SUPPORT LEG (11)
- STEEL ANGLE BRACE (10)
- STAIR RAILING POST (10)
- SMOKE HATCH (14)
- FAN (13)
- HVAC WATER PIPE (19)
- VENT PIPE (19)
- PLUMBING PIPE (19)
- WATER OUTLET (19)
- CONDENSER (16)
- CONDUIT PENETRATION (19)
- CRICKET SLOPE
- TAPERED SLOPE

ARCHITECTURAL NOTES

- A. DRAWINGS SHOW ROOFING MEMBRANE AND FLASHING PILES SCHEMATICALLY, CONFIGURE AND INSTALL MEMBRANE AND FLASHING PILES IN CONFORMANCE WITH ROOFING MANUFACTURERS PUBLISHED REQUIREMENTS AND RECOMMENDATIONS.
- B. ONLY CERTAIN FASTENERS ARE SHOWN ON THE DRAWINGS. REFER TO THE SPECIFICATIONS FOR ADDITIONAL FASTENER REQUIREMENTS.
- C. SEE SPECIFICATIONS FOR MORE INFORMATION.
- D. UNDER ROOF TOP DUCTWORK (BY OTHERS), DRAINAGE MAT, INSULATION BOARD, FABRIC MAT, PEDESTALS, CONCRETE PAVERS, AND (ABOVE CONCRETE CURBS) ALUMINUM PLATE INSTALLATION SHALL BE SUBMITTED FOR REVIEW.
- E. BIDDER SHALL INDICATE PROPOSED ROOFING MANUFACTURE WITH SUBMISSION OF BID. SEE SECTION 07500 & 07600

SHEET NOTES

- 1. INSTALL CEMENTITIOUS FILL TO CORRECT IRREGULARITIES IN THE DECK SURFACE IN THE AREAS INDICATED. APPROXIMATE LOCATIONS OF MAXIMUM THICKNESS OF FILL, AND WHERE DECK SLOPE IRREGULARITIES END, ARE INDICATED. FILL THICKNESS IN BETWEEN WILL VARY. INSTALL FILL AS NEEDED FOR CONSISTENT SURFACE ELEVATION FOR INSTALLATION OF CEMENTITIOUS FILL CRICKETS.
- 2. CUT NEW SCUPPER THROUGH CONCRETE CURB AND FLASH. DO NOT CUT STEEL REINFORCEMENT IN CONCRETE. IF REINFORCEMENT IS TOO CLOSE TO DECK TO ALLOW FLASHING, ADVISE ARCHITECT.
- 3. CEMENTITIOUS FILL CRICKETS SHALL SLOPE @ 1/4" PER FOOT.
- 4. NEW RMA SYSTEM: 2-PLY TORCH-APPLIED MEMBRANE, 2-PLY MEMBRANE AND REINFORCED PMMA-BASED FLASHINGS, DRAINAGE MAT, INSULATION BOARD, FABRIC MAT, AND CONCRETE PAVERS ON LOW PROFILE PEDESTALS (EXCEPT IN APPROX. AREA OVER CEMENTITIOUS CRICKETS - SEE SHEET NOTE #5). REINSTALL UNDAMAGED PAVERS FROM AREAS A AND B DEMOLITION.
- 5. INSTALL PAVERS ON HIGH PROFILE PEDESTALS & SHIMS OVER INDICATED AREA OVER CRICKETS (APPROX.) AT LESS THAN 1/8 INCH PER FOOT SLOPE. SURFACE OF AREA A PAVERS ADJOINING CONCRETE LANDING SHALL BE EVEN WITH LANDING SURFACE.
- 6. NEW CONVENTIONAL ROOFING SYSTEM: TORCH-APPLIED BASE SHEET, TAPERED INSULATION ASSEMBLY AND COVER BOARD IN ADHESIVE BEADS, AND 2-PLY TORCH-APPLIED MEMBRANE, AND 2-PLY MEMBRANE AND REINFORCED PMMA-BASED FLASHINGS.
- 7. DRAIN BOWL SHALL REMAIN IN CURRENT POSITION. INSTALL DRAIN GRATING IN PLACE OF CONCRETE PAVES NEAREST TO CENTER OF DRAIN. SHIM GRATING FOR TOP TO BE EVEN WITH TOP OF ADJOINING PAVERS. SEE DRAWING NO. 27/A.803 FOR MORE INFORMATION.
- 8. DRAIN BOWLS SHALL REMAIN IN CURRENT POSITION. INSTALL FIXED/NON-ADJUSTABLE DRAIN EXTENSION TO FLASH DRAIN AT 2'-0" X 2'-0" SUMP. SEE DRAWING NO. 28/A.803 FOR MORE INFORMATION.
- 9. FOR STEEL SCREEN AND STEEL POST, STRIP EXISTING PAINT, REFINISH AND LOCATE AT CENTERPOINT BETWEEN EXISTING POSTS. NOTE: 2 METAL PANELS ADJACENT TO NEW ACADEMIC BUILDING REUSE. SEE ELEVATION #2 / A.701.00 AND SECTION #24 / A.802.00 FOR MORE INFORMATION.
- 10. FOR FENCE POST AND GATE, STRIP, REFINISH, AND RE-INSTALL AT SAME LOCATION.
- 11. FOR SHIP LADDER, STRIP, REFINISH, AND RE-INSTALL AT SAME LOCATION. ADD ALT #1: PROVIDE LADDER IN LIEU OF SHIP LADDER.
- 12. PROVIDE NEW HANDRAIL AT SAME LOCATION. SEE DETAIL 33 / A.803.00 FOR MORE INFORMATION.
- 13. INSTALL FLASHINGS AT MODIFIED EXHAUST FAN CURB (BY OTHERS). SEE DRAWING NO. 30/A.803.00 FOR MORE INFORMATION.
- 14. MODIFY SMOKE HATCH CURB HEIGHT. SEE DRAWING NO. 31/A.803.00 FOR MORE INFORMATION.
- 15. DUCTWORK FOR NEW ROOF TOP HVAC UNITS WILL BE CONNECTED TO EXISTING STUBS BY OTHERS. SEE DRAWING NO. 29/A.803.00 FOR MORE INFORMATION.
- 16. EXISTING CONDENSER CURB TO BE REMOVED, AND REFRIGERANT LINES DISCONNECTED AND RECONNECTED TO NEW LOCATION, BY OTHERS.
- 17. NEW GUARDRAIL AT SHORT PARAPET. SEE GUARDRAIL ELEVATION #1: 3 & 4 / A.701.00 FOR MORE INFORMATION. SEE LIGHTING PLAN A.201.00 FOR LIGHT FIXTURE COORDINATION.
- 18. NEW STOREFRONT SYSTEM. SEE ELEVATION #3 / A.701.00 FOR MORE INFORMATION.
- 19. FLASH PIPE AND PENETRATIONS WITH PMMA-BASED REINFORCED FLASHING.
- 20. BASED ON ORIGINAL BUILDING CONSTRUCTION DRAWINGS, INCLUDE ALLOWANCE IN BASE BID FOR INSTALLATION OF APPROX. 2' FOOT LONG, .030" ALUMINUM INFILL AT BASE OF WALL AT THIS LOCATION - SEE A.801.00.
- 21. EXTEND METAL BASE AT FELDMAN 12" ONTO MEMBRANE BASE FLASHING ON POMERANTZ WALL. SECURE EDGES OF METAL BASE THROUGH ROOFING MEMBRANE AND FLASHING WITH MASONRY ANCHORS @ 8". PREP/PRIME METAL BASE, AND STRIP TO ROOFING MEMBRANE AND BASE FLASHING WITH 2 TORCHED PILES.



ROOF PLAN - EXTERIOR LIGHTING
SCALE: 1/4" = 1'-0"

LIGHTING PLAN LEGEND

- LF-01 BEGA 24 816 - BLACK WALL LUMINAIRE SURFACE WASHER 3000K, 55.3 WATTS 5 TOTAL 276.5W
- LF-02 BEGA 33 816 - BLACK WALL LUMINAIRE DIRECTED LIGHT 3000K, 13.9 WATTS 30 TOTAL 417.0 W
- LF-02 (ab) (a) = OPEN AREA (b) = MECH. AREA 35 TOTAL 693.5 W
- PC PHOTOCELL

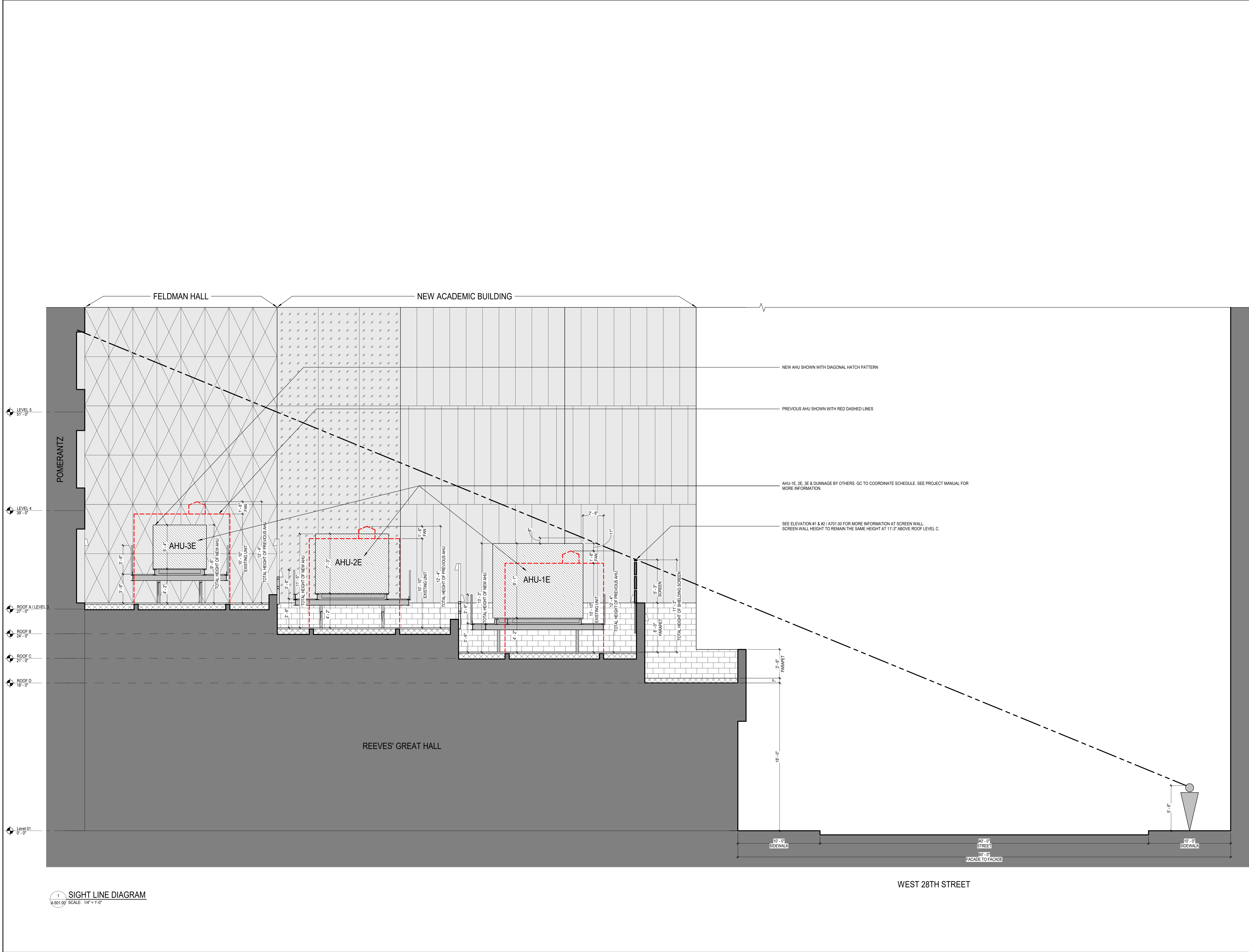
LIGHTING NOTES

- ALL LIGHTS SHALL BE CONTROLLED BY ONE PHOTOCELL AND A MANUAL ON/OFF LOCATED AT THE EXTERIOR AT ROOF LEVEL. A LOCATION TO BE VERIFIED IN FIELD FOR OPTIMUM DAYLIGHT.
- ADDENDUM #1 - ONE PHOTOCELL REQUIRED, NOT FOUR.
- ALL CONDUIT SHALL BE GALVANIZED AND EXTERIOR RATED.
- CONDUIT MAY NOT PENETRATE THE ROOFING ASSEMBLY.
- SEE SHEET NOTES FOR MOUNTING HEIGHTS ABOVE NEAREST PAVES.
- ADDENDUM #1 CLARIFIES SHEET NOTES FOR MOUNTING HEIGHTS: 265000, 265159, 265533, & 265100 FOR ELECTRICAL, WIRE, AND CONDUIT INFORMATION. ADDENDUM #1 ADDS ELECTRICAL SPECIFICATION TO THE PROJECT MANUAL.

SHEET NOTES

- WALL MOUNT LIGHT FIXTURE AT EXISTING LIGHT LOCATION. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES. PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- WALL MOUNT LIGHT FIXTURE AT NEW LIGHT LOCATION. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES. PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- WALL MOUNT LIGHT FIXTURE AT NEW LOCATION. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES. PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING MECHANICAL AREA
- POST MOUNTED LIGHT FIXTURE AT TOP OF POST. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES. PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING MECHANICAL AREA
- POST MOUNTED LIGHT FIXTURE AT TOP OF GUARDRAIL. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES (ROOF BELOW). PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING MECHANICAL AREA
- SCREEN MOUNTED LIGHT FIXTURE AT BOTTOM OF SCREEN. MOUNTING HEIGHT 7'-0" ABOVE PAVES (VPI). PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING MECHANICAL AREA
- SCREEN MOUNTED LIGHT FIXTURE. MATCH HEIGHT OF LIGHT FIXTURES ALONG ROOF D. PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- POST MOUNTED LIGHT FIXTURE AT TOP OF GUARDRAIL. MOUNTING HEIGHT 7'-0" ABOVE ROOF PAVES (ROOF BELOW). PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- WALL MOUNTED LIGHT FIXTURE. MATCH HEIGHT OF LOW LIGHT FIXTURES AT ROOF LEVEL ABOVE (B). PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- WALL MOUNTED LIGHT FIXTURE. PROVIDE IN KIND AT LOW LIGHT FIXTURES AT ROOF LEVEL ABOVE (B). PROVIDE CONDUIT AND CONNECT TO SWITCH CONTROLLING OPEN AREA
- EXISTING WALL MOUNT ON/OFF SWITCH CONTROLLING ZONE A AND ZONE B. ALL FIXTURES SHALL BE CONTROLLED FROM THIS LOCATION AND OVERRIDE BY PHOTOCELLS.

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1 SIGHT LINE DIAGRAM
A.601.00 SCALE: 1/4" = 1'-0"

1 SCREEN WALL & GUARDRAIL ELEVATION - ROOF D - LOOKING SOUTH
A.701.00 SCALE: 1/4" = 1'-0"

2 SCREEN WALL & GUARDRAIL ELEVATION - ROOF C - LOOKING NORTH
A.701.00 SCALE: 1/4" = 1'-0"

3 GUARDRAIL ELEVATION - ROOF C - LOOKING SOUTH
A.701.00 SCALE: 1/4" = 1'-0"

4 GUARDRAIL ELEVATION - ROOF B - LOOKING SOUTH
A.701.00 SCALE: 1/4" = 1'-0"

5 WINDOW WALL ELEVATION - ROOF A - LOOKING SOUTH
A.701.00 SCALE: 1/4" = 1'-0"

NOTES:

1. FIXED WINDOW ASSEMBLY U-Factor = .30 & SHGC = .36

2. DOOR ASSEMBLY U-Factor = 0.77 & SHGC = .36

3. SEE DRAWING #16 / A802.00 FOR REVISION BASE

4. FOR FULL SCOPE, SEE SPECIFICATION SECTIONS 084113 (ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS), 087100 (GLAZING), AND 088000 (DOOR HARDWARE)

GLAZING SCHEDULE:

GL-01 = LOW-E COATED, FULLY TEMPERATED TEMPERED, CLEAR INSULATING GLASS

GL-02 = LOW-E COATED, CLEAR INSULATING GLASS

HARDWARE SCHEDULE:

SET #1 (1 PER DOOR)

QTY.	PRODUCT	SKU	FINISH	MANUFACTURER
2	CONTINUOUS HINGE	FLM_SF-HD1	C	PE
1	DUST PROOF STRIKE		RO US260	RO
2	FLUSH BOLT	556	US260	RO
1	MORTISE DEADLOCK	LC_4674		RO
2	PUSH BAR & PULL	6710247		NO
2	CYLINDER	COMPATIBLE W/ EXISTING SYSTEM	US260	NO
2	DOOR CLOSER		689	NO
2	SWEEP	1501C0NB		PE
1	THRESHOLD	253X3AF6 MSE/ST/SS-2		PE

NOTE:

1. SEE HARDWARE SPECIFICATION SECTION 087100 FOR MORE INFORMATION.

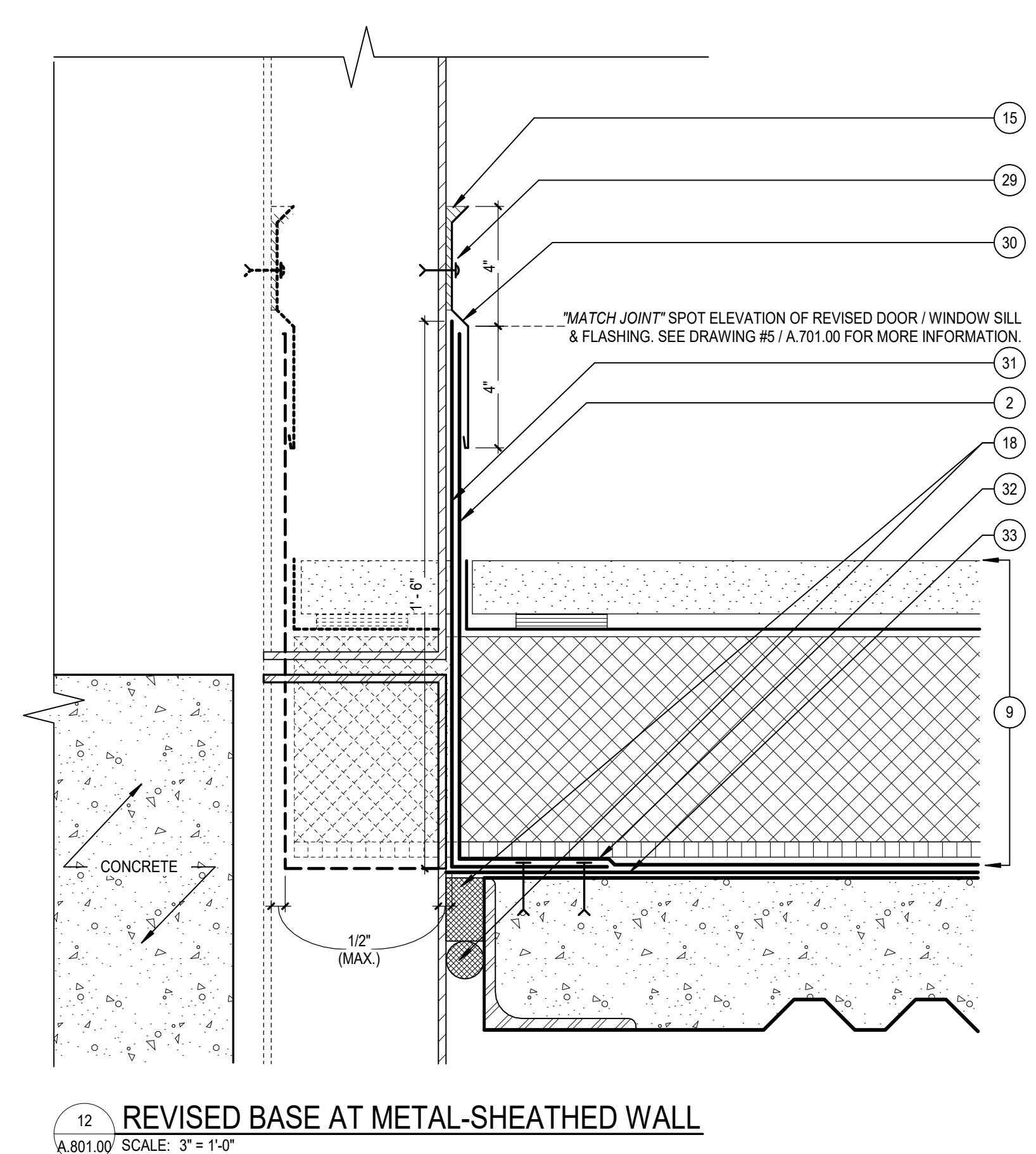
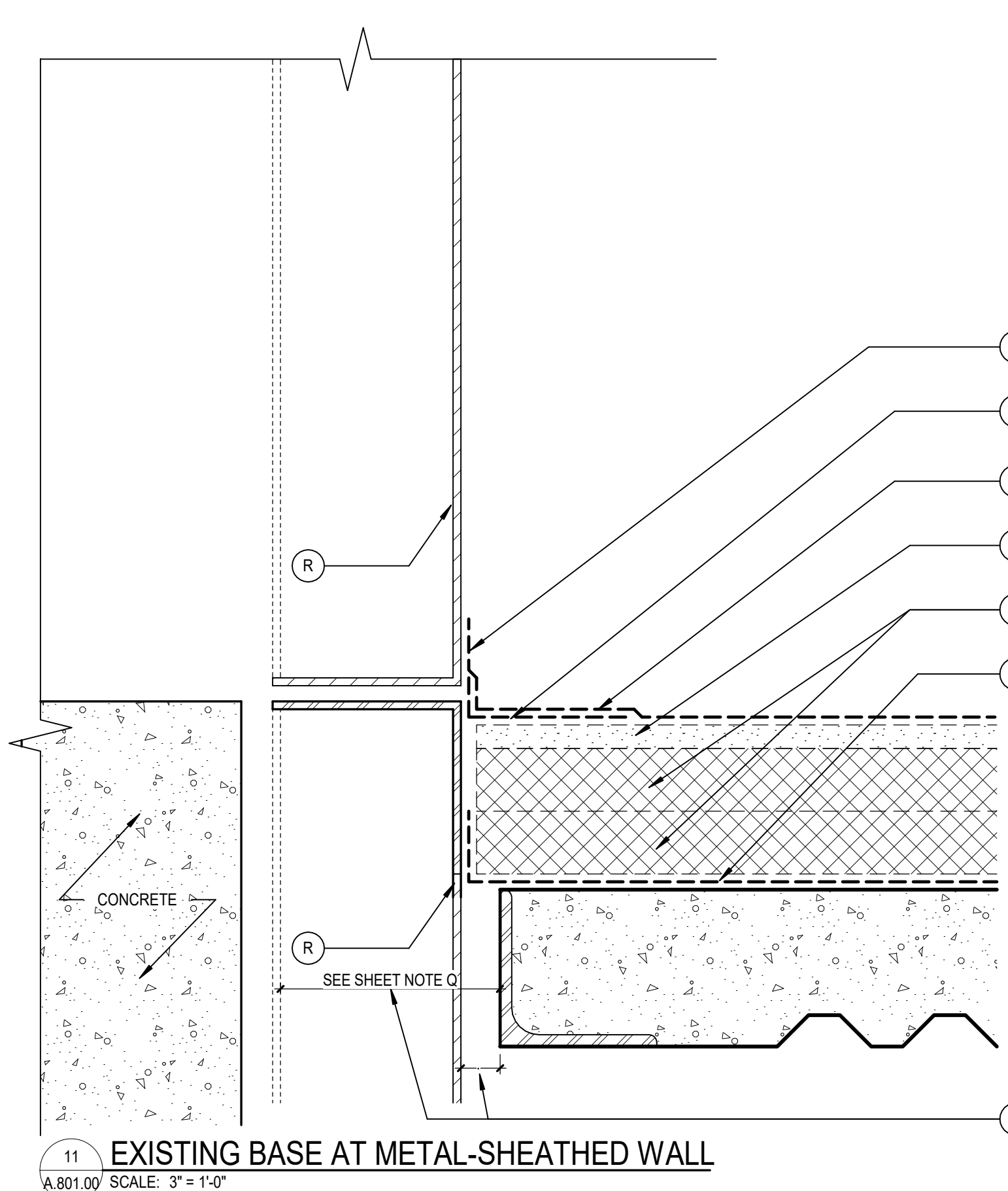
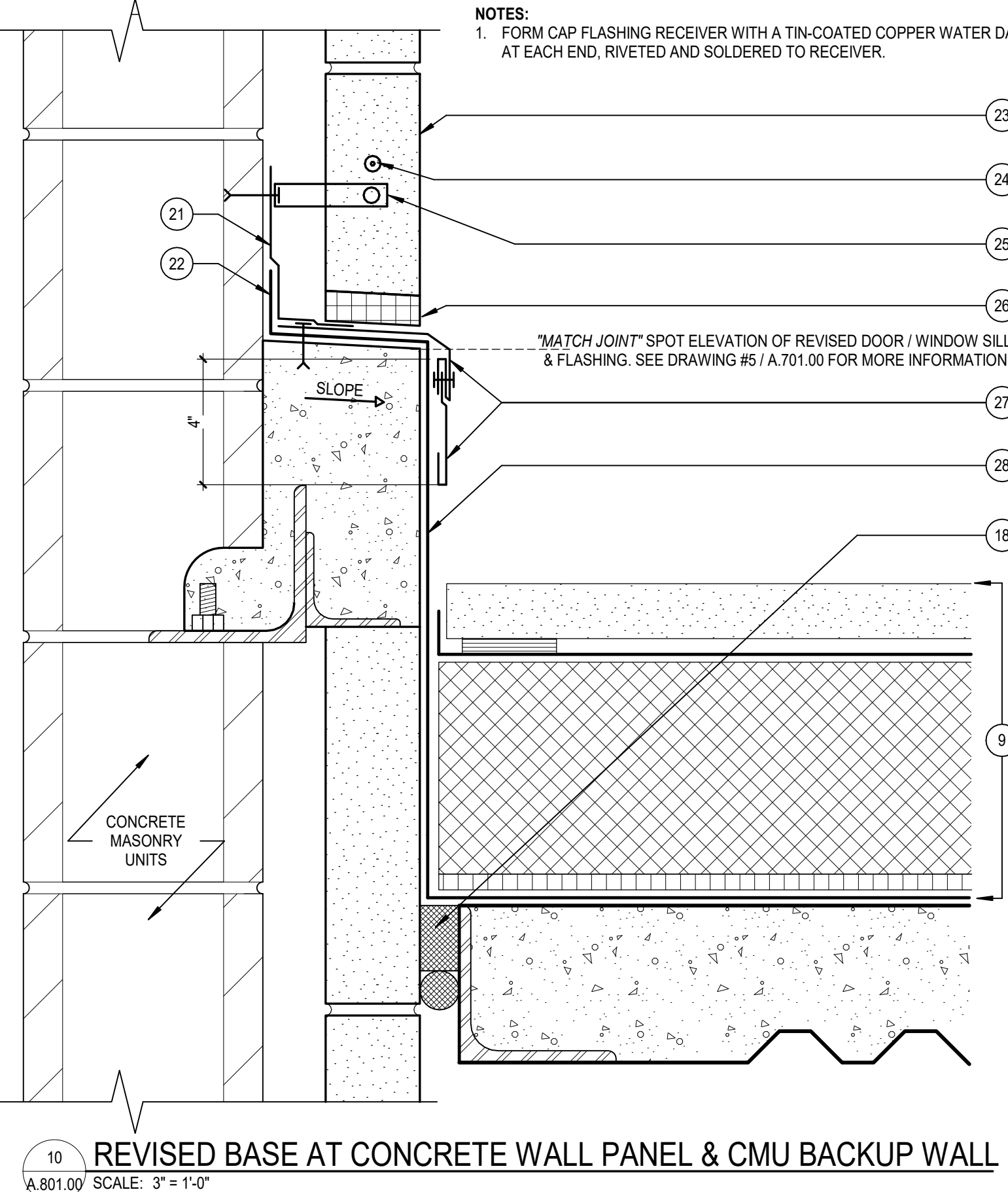
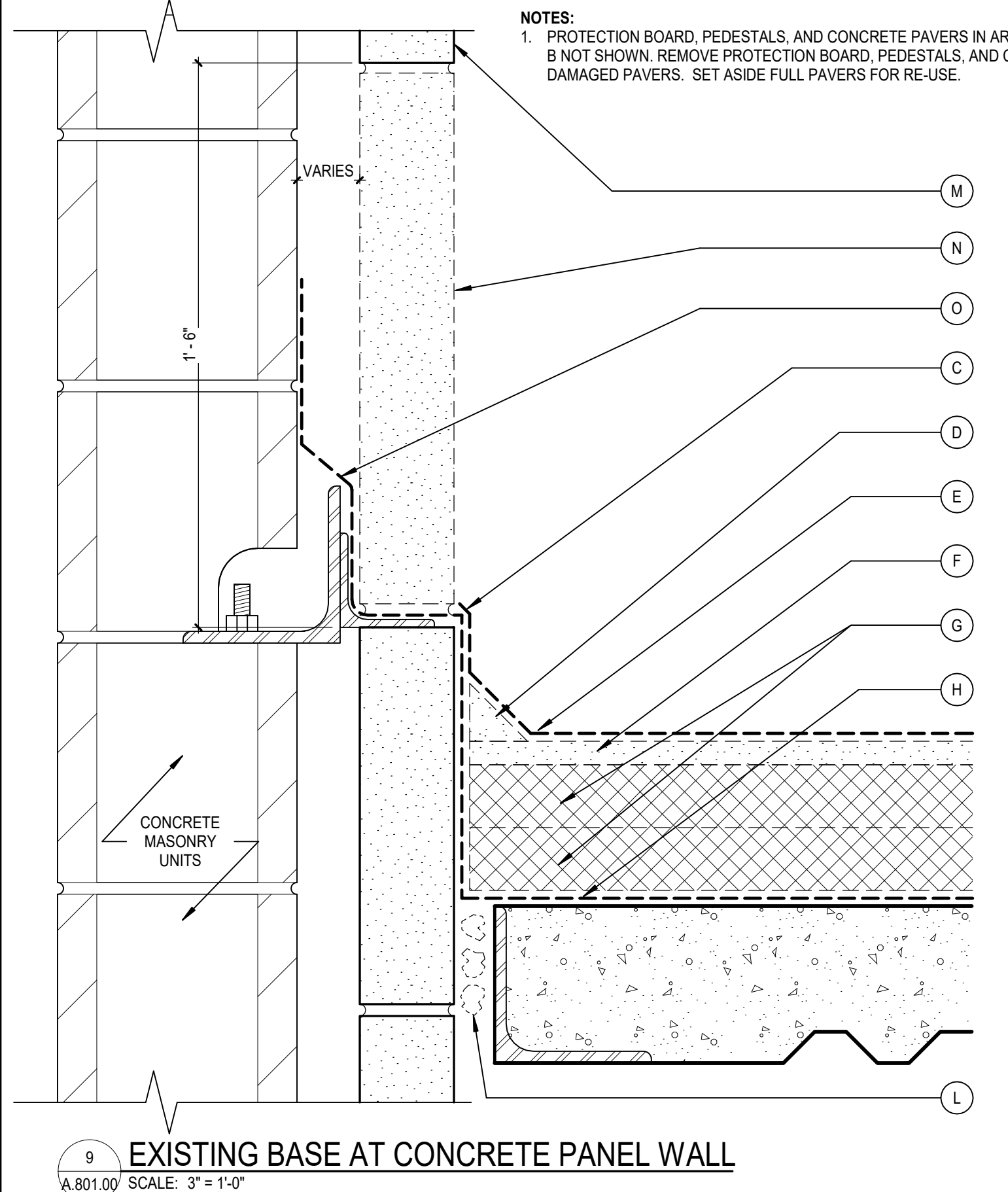
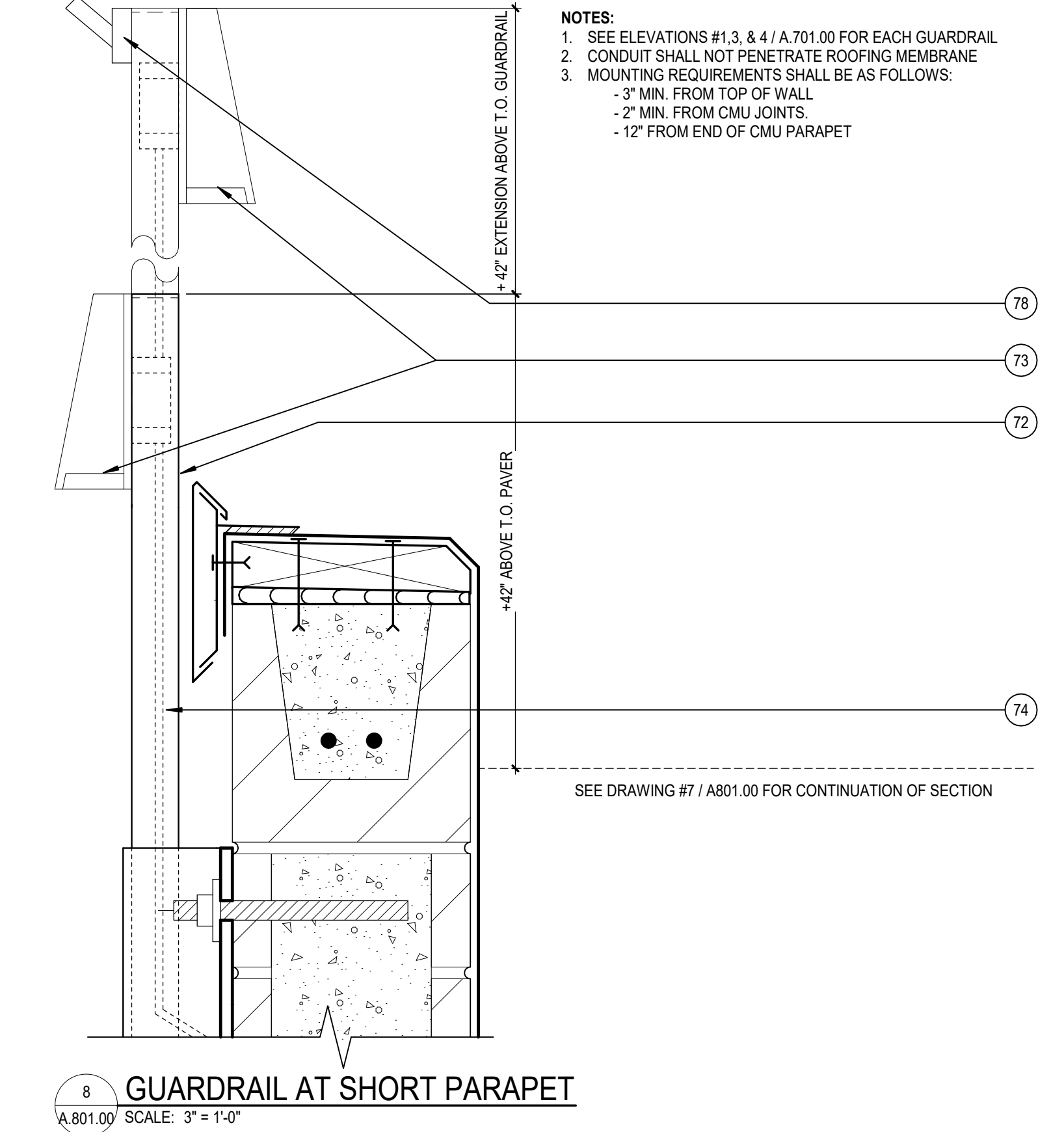
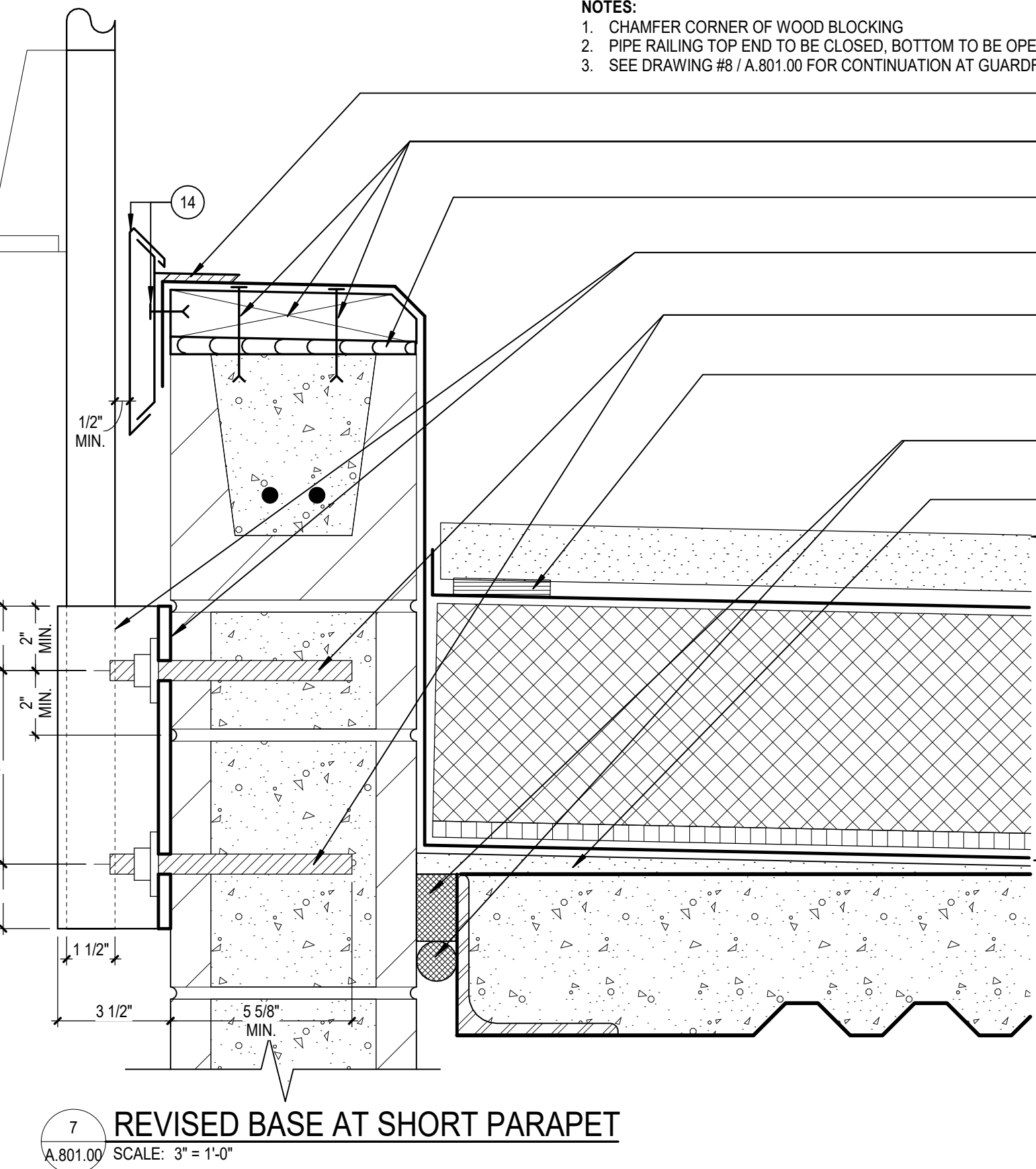
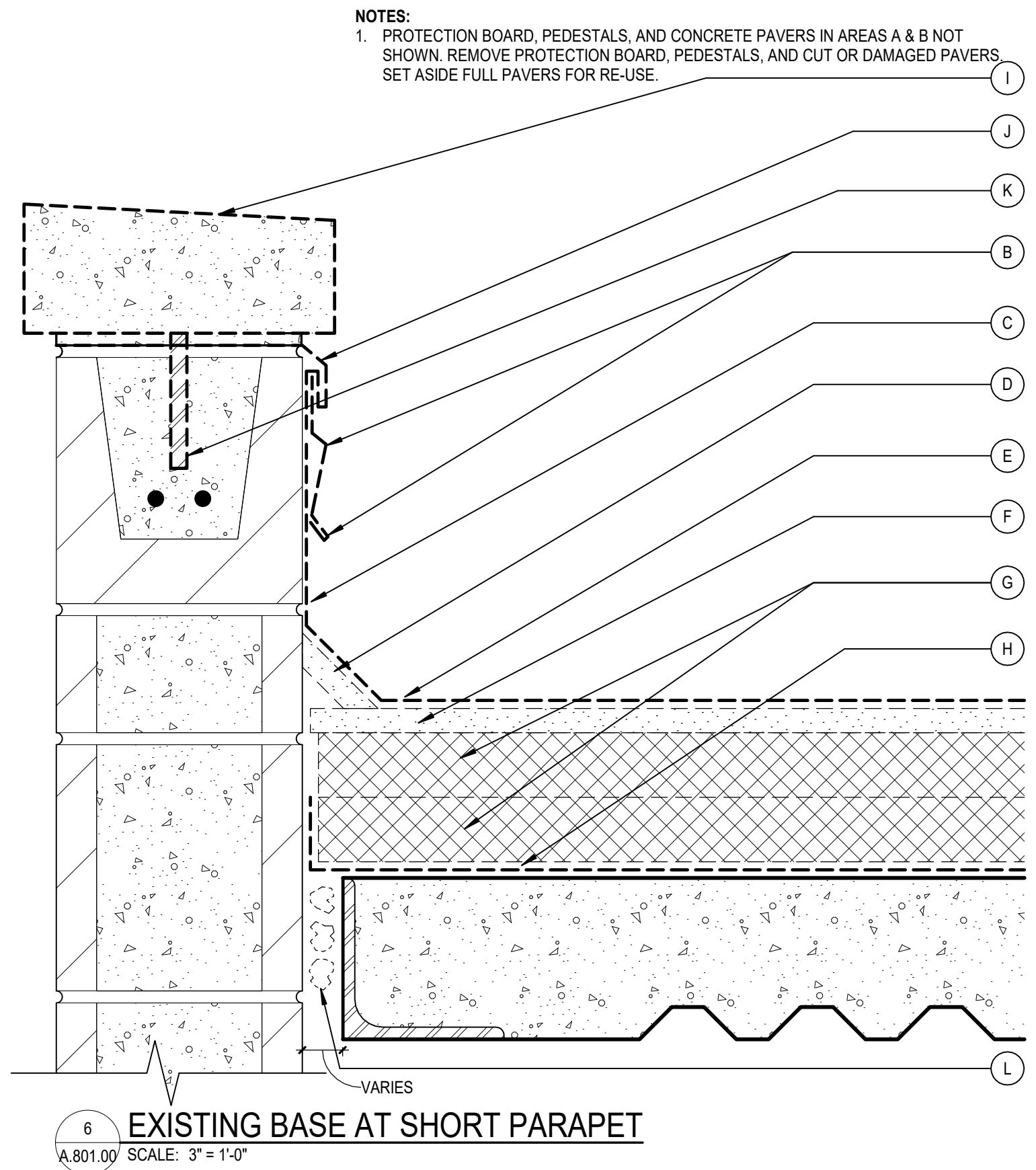
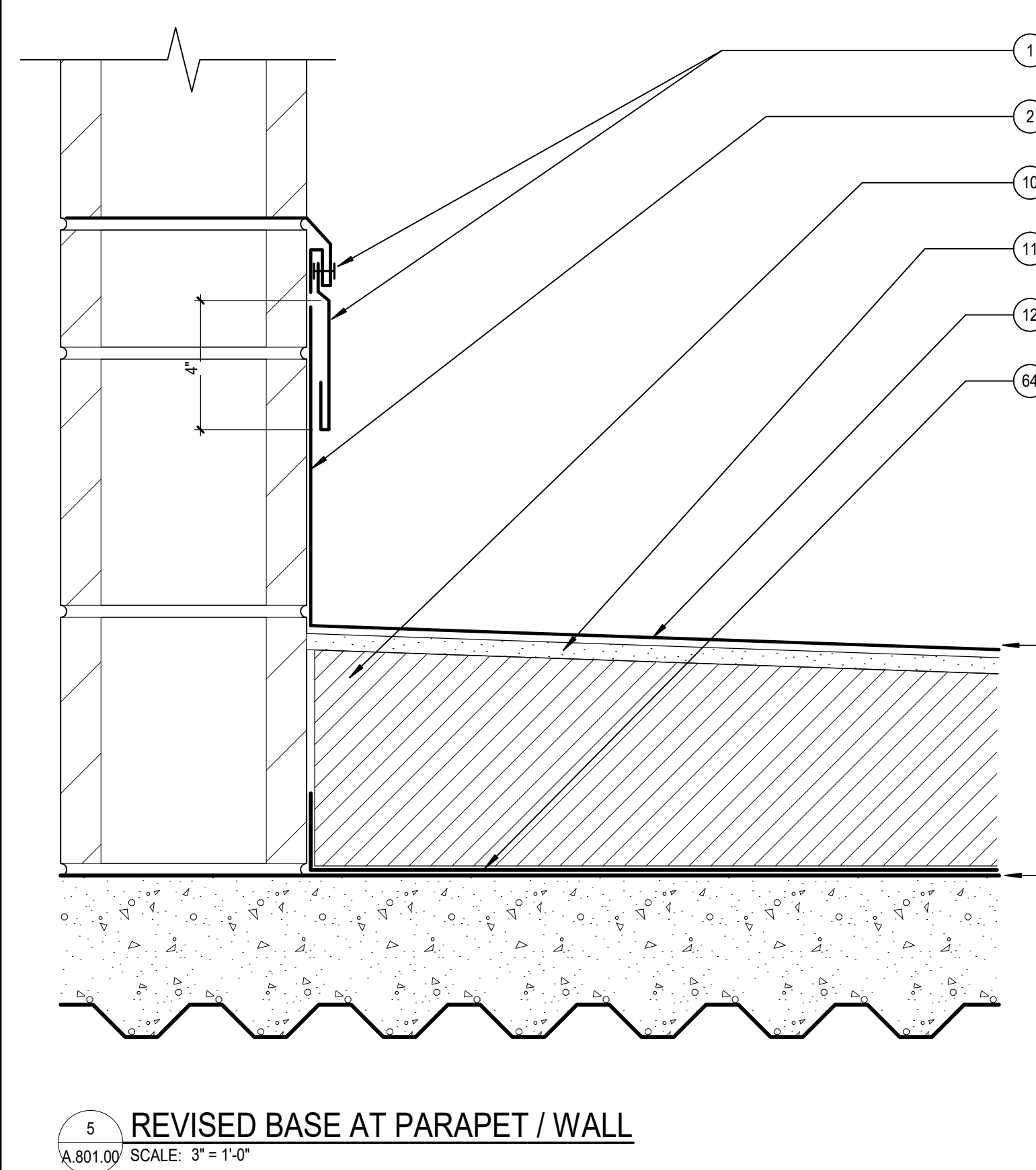
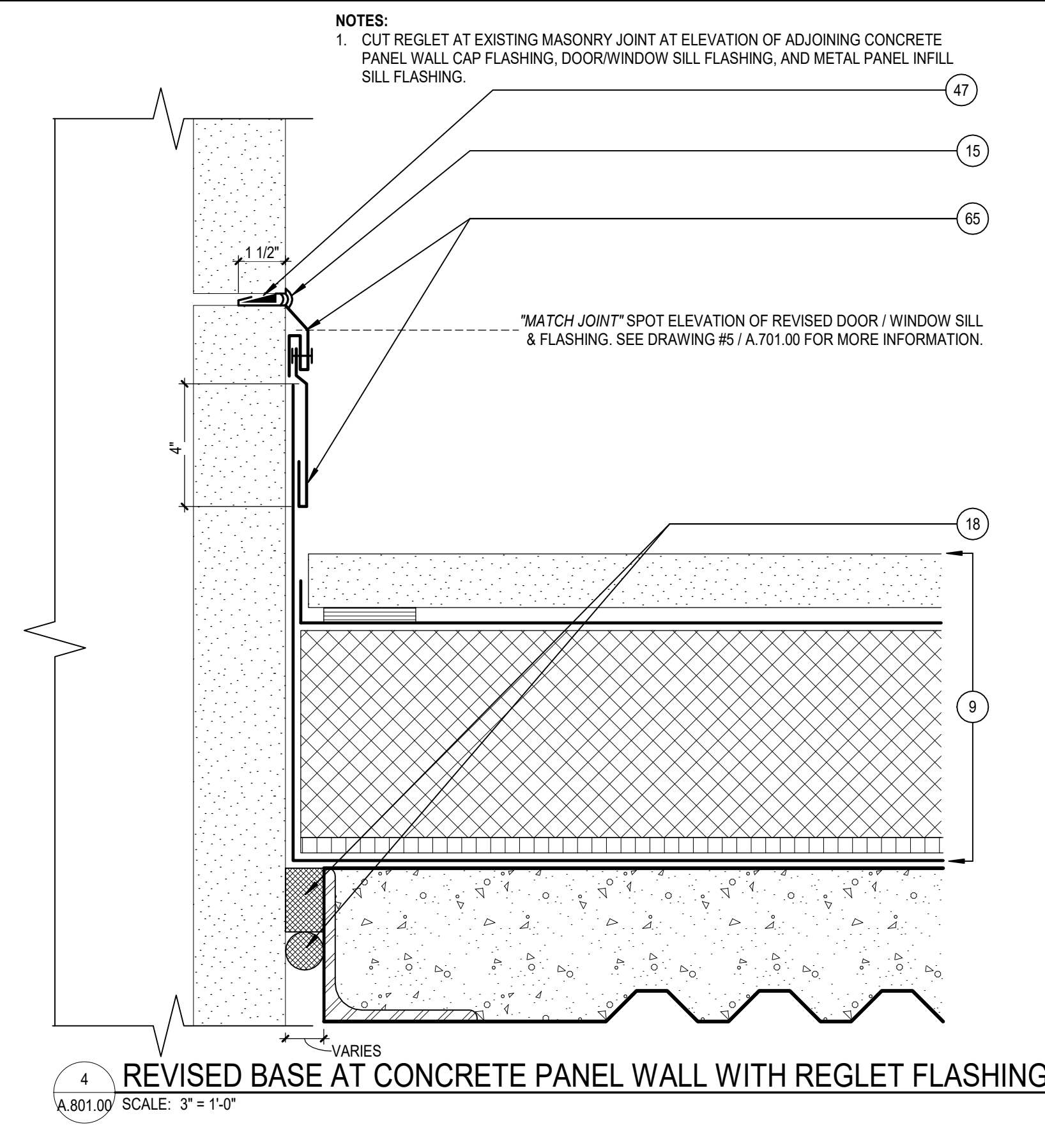
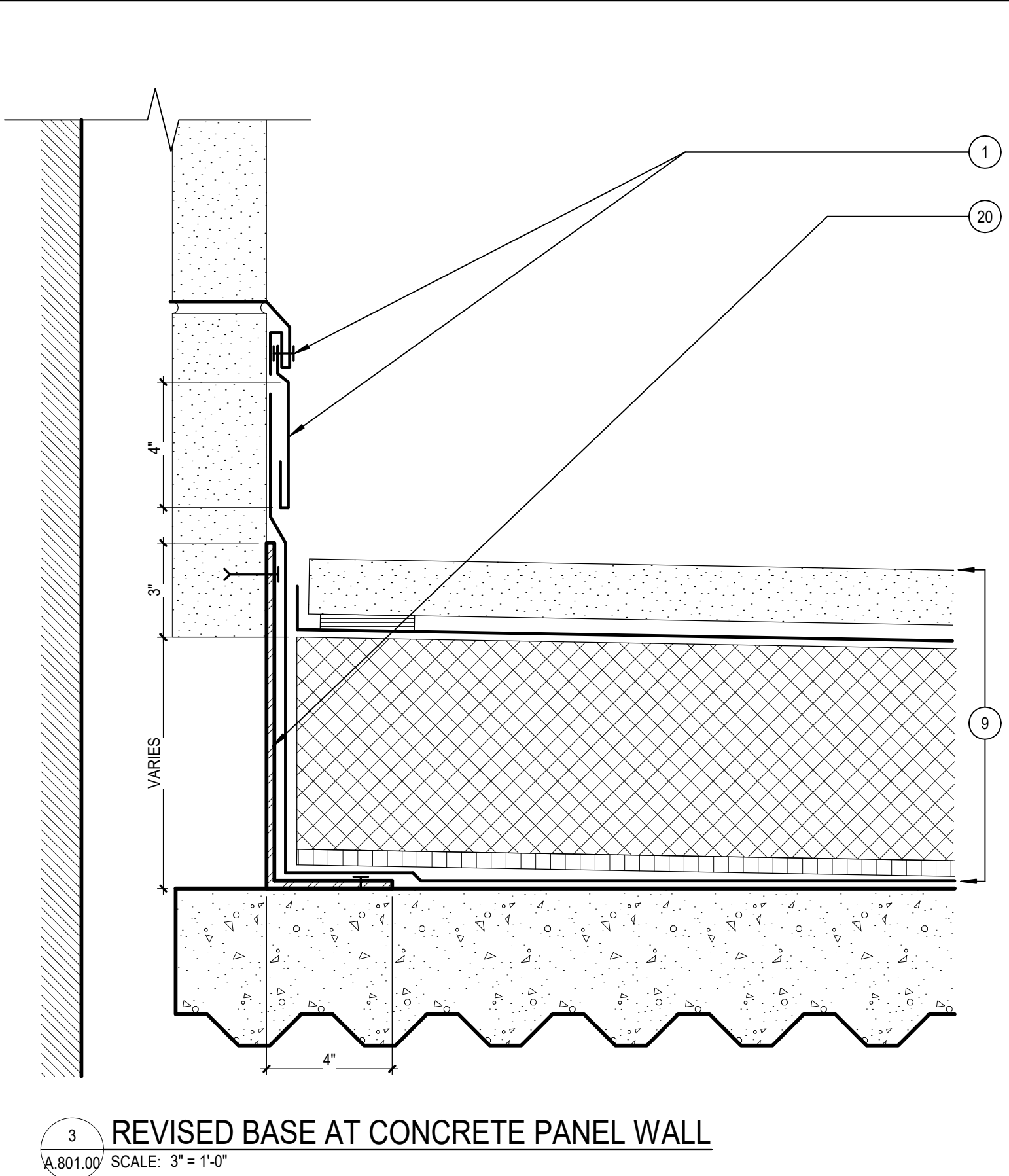
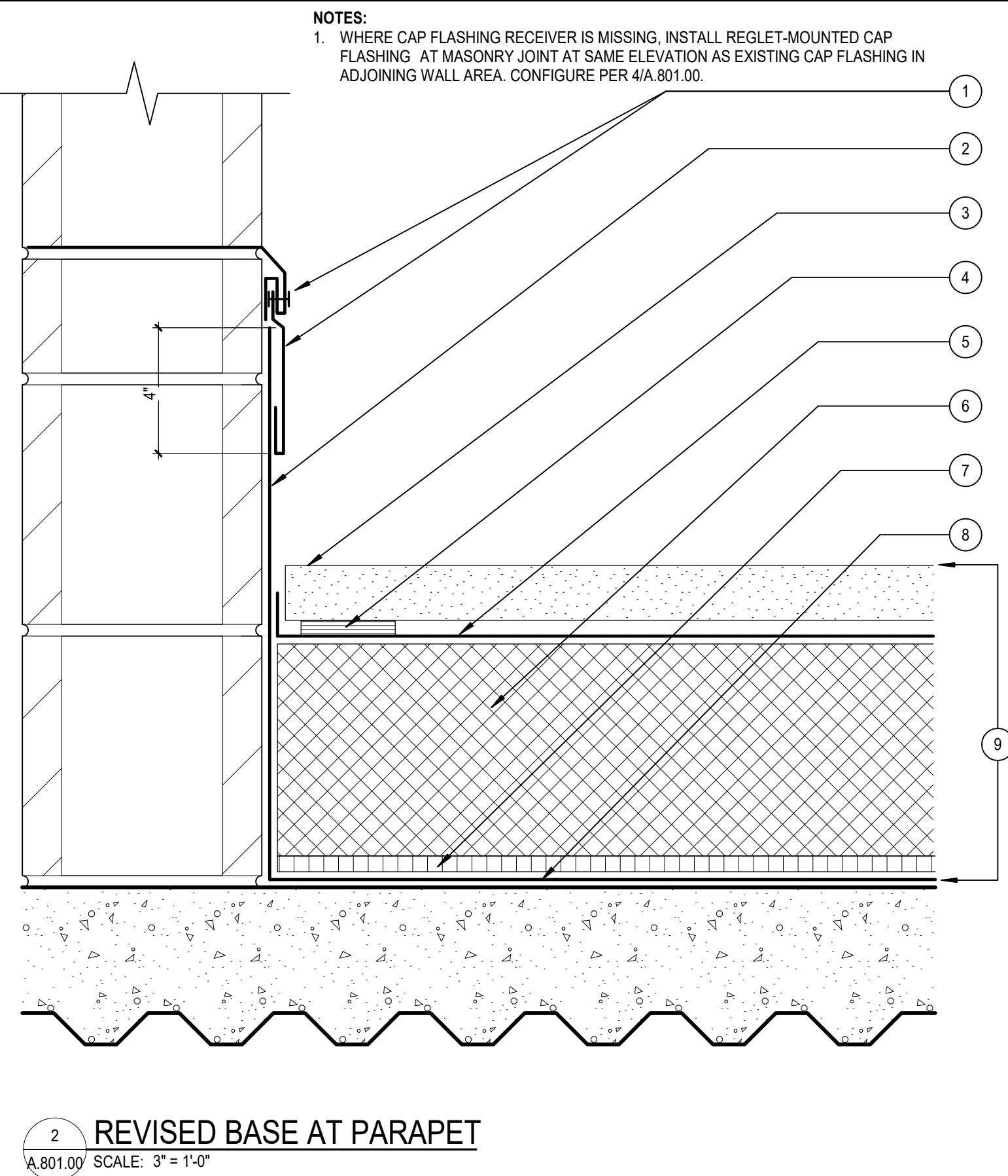
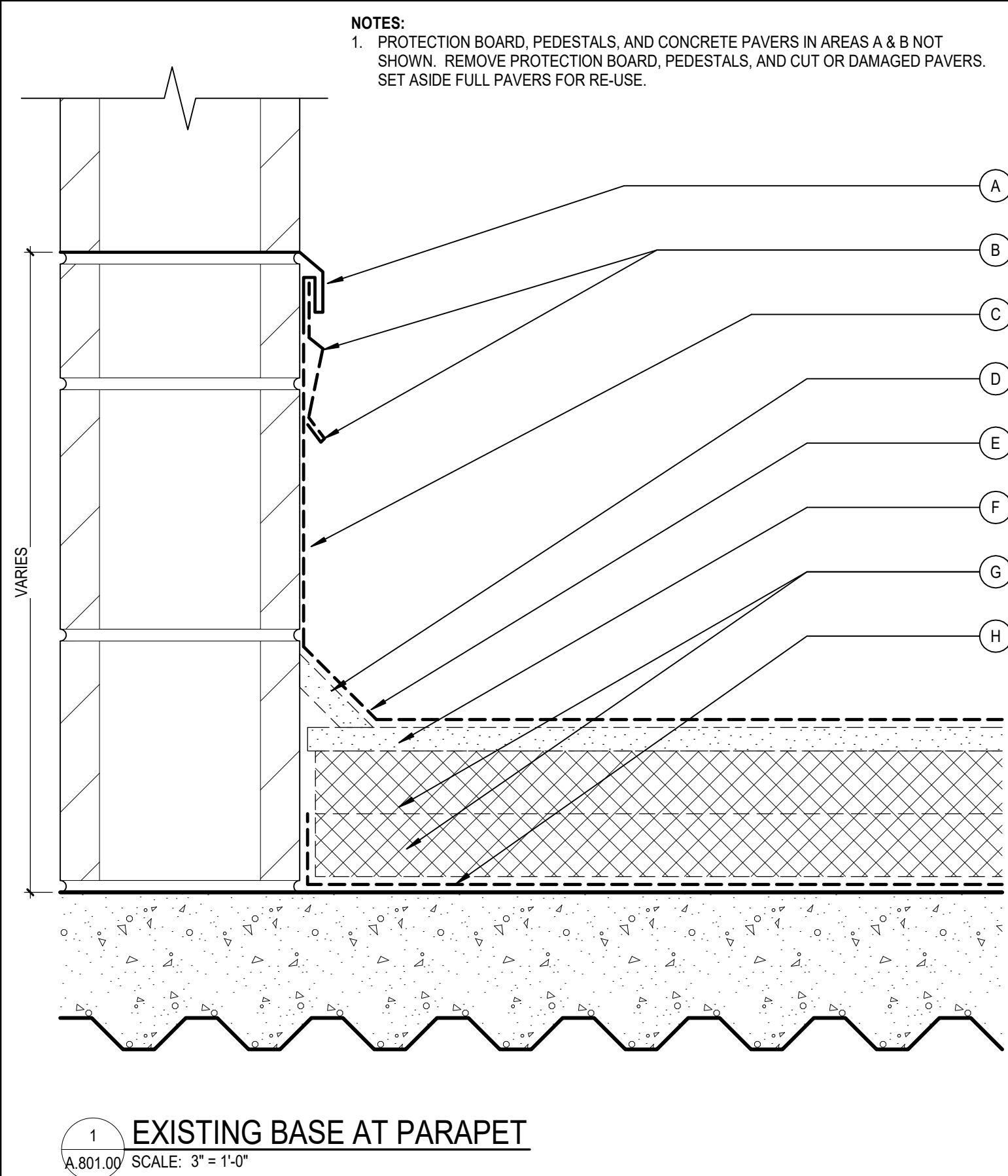
2. MANUFACTURER ABBREVIATIONS AS FOLLOWS:

PE - PEMKO

RO - ROCKWOOD

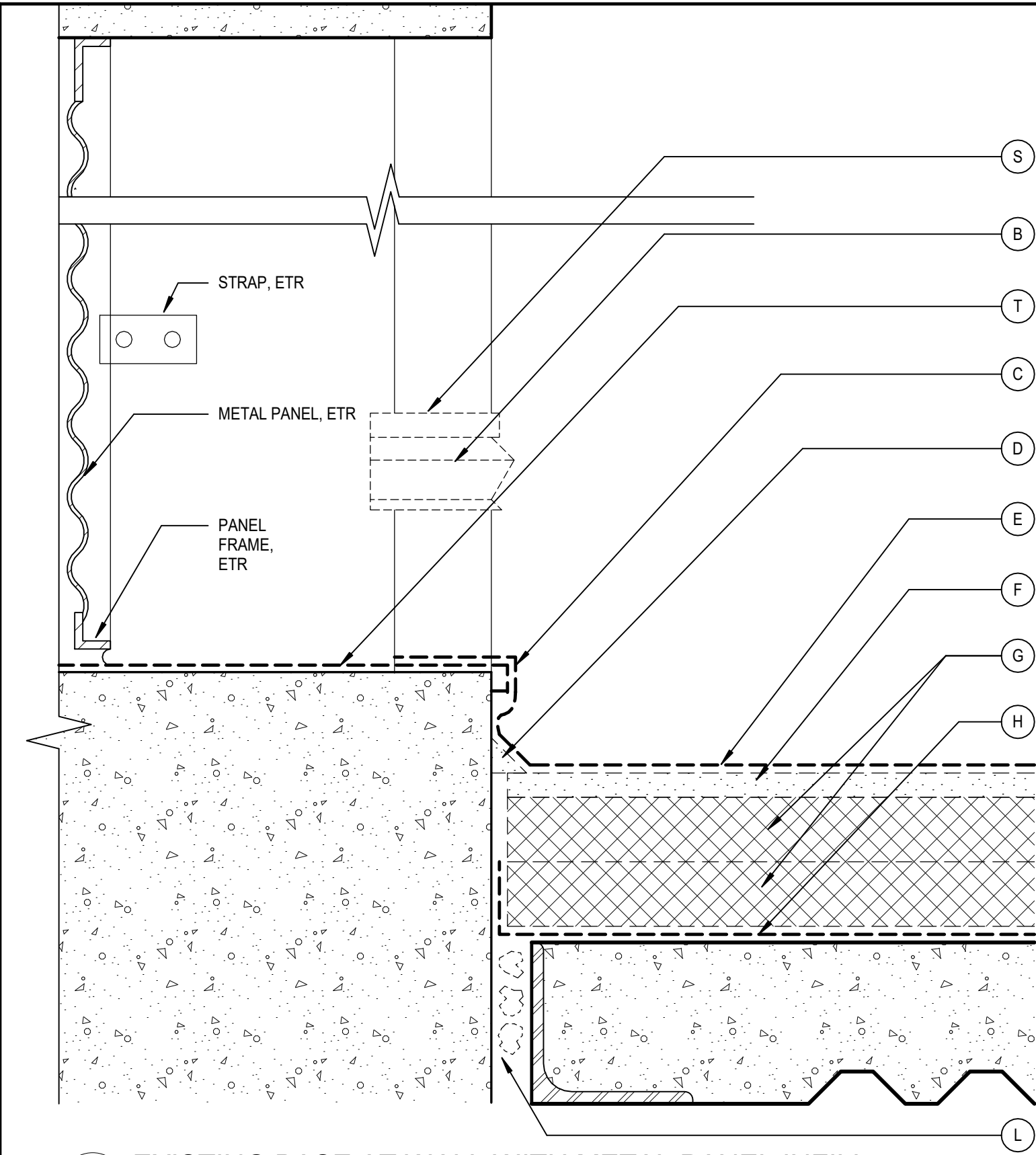
SA - SARGENT

NO - NORTON

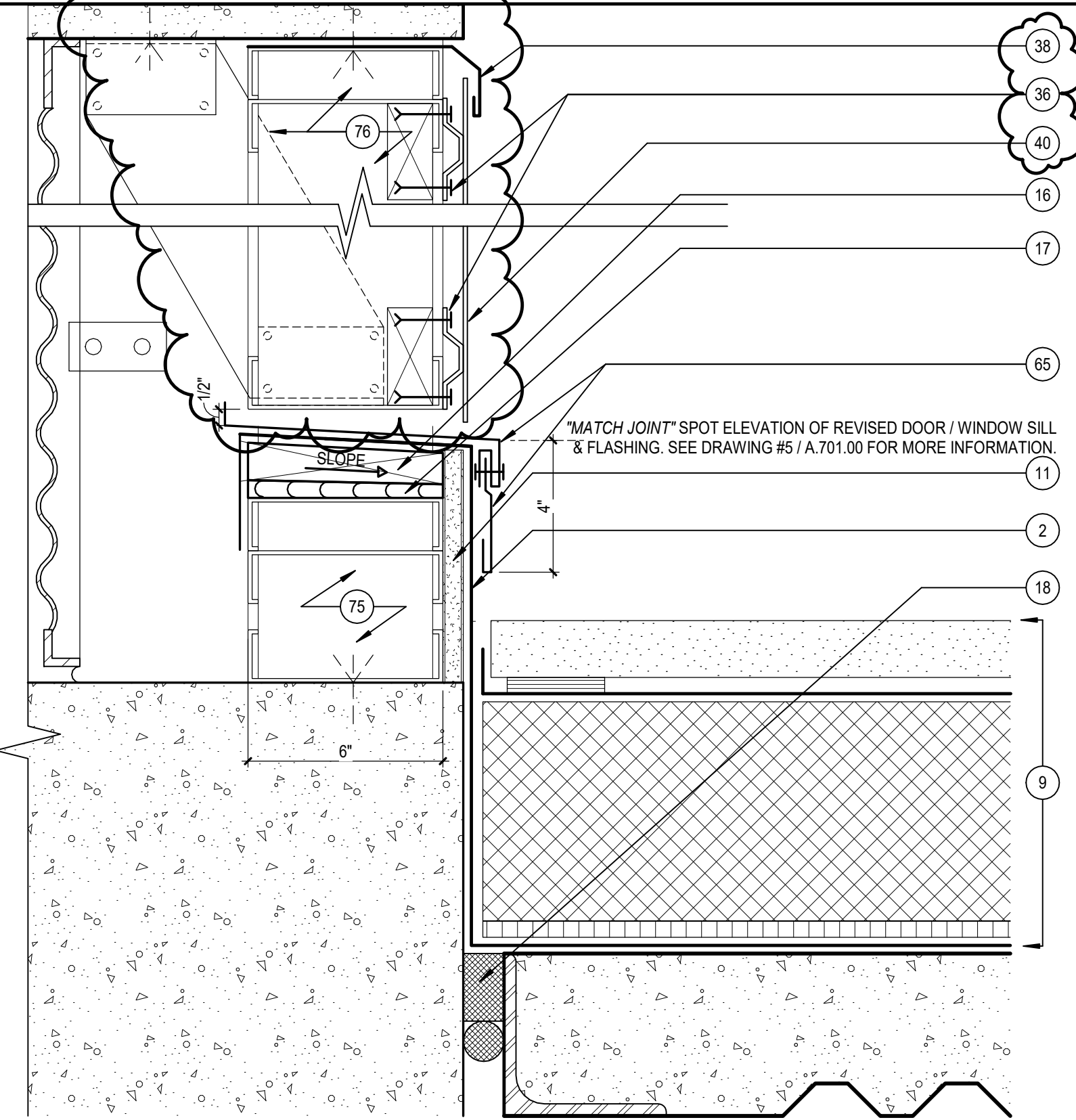


#	EXISTING - SHEET NOTES
A	CAP FLASHING RECEIVER - REMAINS - DO NOT BEND
B	CAP FLASHING EXTENSION AND CLEAT - REMOVE
C	CAP FLASHING - REMOVE
D	CANT - REMOVE
E	ROOFING MEMBRANE - REMOVE
F	COVER BOARD - REMOVE
G	INSULATION BOARD - REMOVE - THICKNESS VARIES
H	BASE SHEET - REMOVE
I	CONCRETE COPING - REMOVE
J	THROUGH-WALL FLASHING - REMOVE
K	STEEL ROD OR FENCE POST - CUT OFF EVEN WITH TOP OF CONCRETE MASONRY UNIT
L	MORTAR & DEBRIS - REMOVE TO 3" DEPTH
M	PRECAST CONCRETE PANELS - REMAIN - INSTALL AND MAINTAIN TEMPORARY SUPPORT
N	PRECAST CONCRETE PANEL - REMOVE AND SET ASIDE FOR REINSTALLATION
O	WATERPROOFING MEMBRANE - REMOVE
P	METAL SUBSTRATE EXTENSION - REMOVE
Q	MIN. AND MAX. DISTANCE BETWEEN METAL SHEATHING PANEL AND ROOF DECK EDGE
R	METAL SHEATHING PANEL TO REMAIN
S	REMOVE CAP FLASHING AT SIDES/ENDS OF CONCRETE PANELS
T	METAL SILL FLASHING - REMOVE EXPOSED PORTION
U	METAL TREAD - REMOVE
V	CONCRETE PAVERS - REMOVE AND DISCARD CUT PAVERS - SET ASIDE WHOLE PAVERS FOR RE-USE (TYP.)
W	SHIMS - REMOVE (TYP.)
X	PROTECTION BOARD - REMOVE (TYP.)
Y	METAL COPING, CLEATS, AND FASTENERS - REMOVE
Z	PLYWOOD SUBSTRATE AND FASTENERS - REMOVE
ZA	WALL STRAP AND STRAP FASTENERS - REMAIN
ZB	HVAC METAL CURB TO BE REMOVED BY OTHERS - PERFORM ALL NECESSARY WORK TO MAINTAIN ROOFING WATER/TIGHTNESS - CONCRETE CURB TO REMAIN
ZC	CUT OFF ANCHORS, COVER OPENINGS WITH URETHANE SEALANT, METAL ANGLES, HSS TUBE, AND METAL SCREEN TO BE REFINISHED AND REINSTALLED WITH NEW ANCHORS AND SPACERS. NOTE: USE CAUTION TO NOT HARM EXISTING ANGLES WHILE REMOVING ANCHORS
ZD	METAL COPING OR EXPANSION JOINT ASSEMBLY - REMAINS
ZE	COLD FLUID-APPLIED ROOFING - REMAINS
ZF	BARE CMU PARAPET: GC TO PREP FOR NEW BASE FLASHING

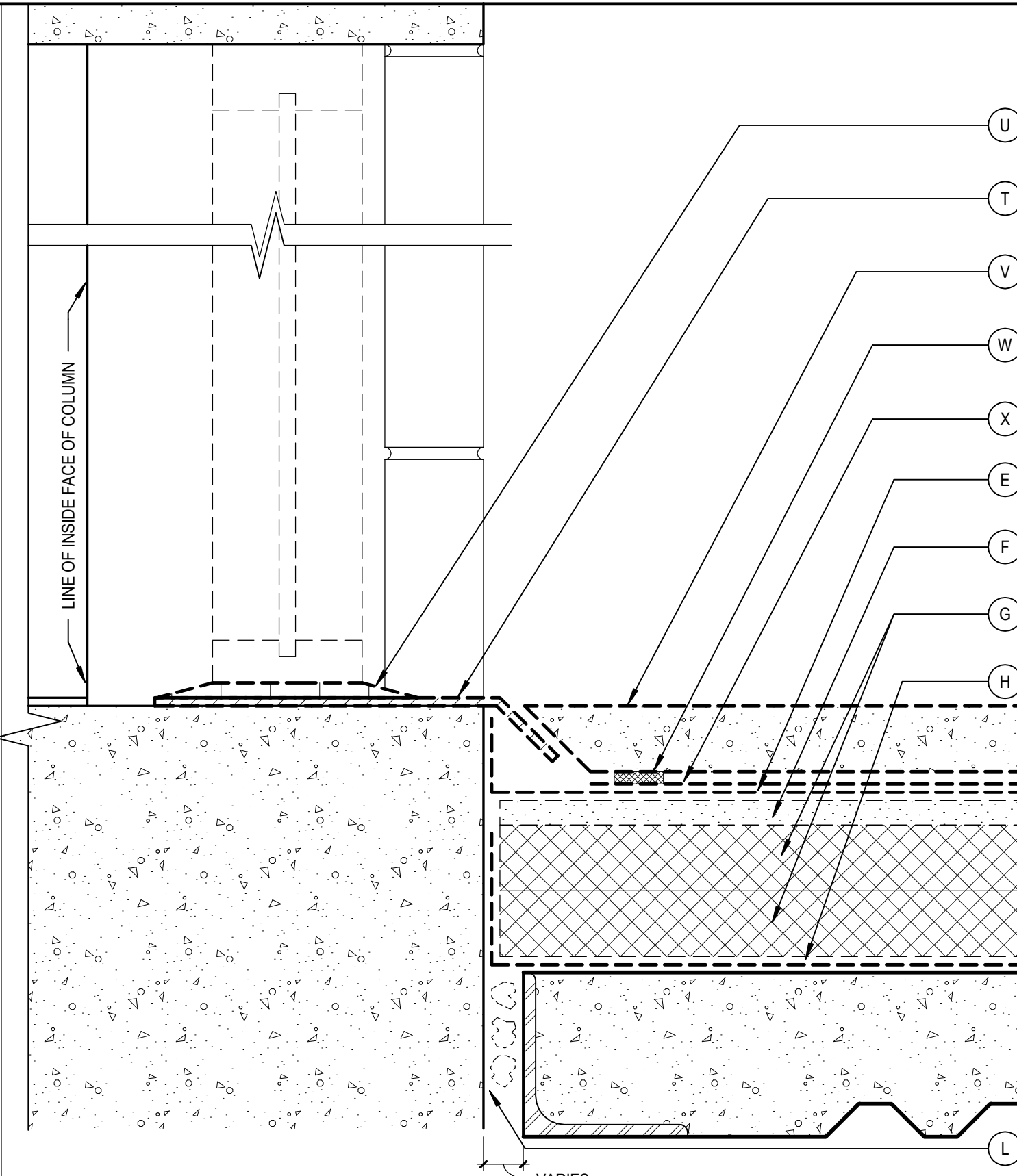
#	REVISED - SHEET NOTES
1	CAP FLASHING EXTENSION - RIVETS @ 24" O.C.
2	BASE FLASHING
3	CONCRETE PAVER
4	LOW PROFILE PEDESTAL
5	FABRIC MAT
6	INSULATION BOARD, IRMA
7	DRAINAGE MAT
8	ROOFING MEMBRANE, IRMA
9	INVERTED ROOF MEMBRANE ASSEMBLY "IRMA" - TYPICAL
10	INSULATION BOARD, CONVENTIONAL
11	COVER BOARD
12	ROOFING MEMBRANE, CONVENTIONAL
13	CONVENTIONAL ROOF ASSEMBLY ("CONVENTIONAL") - TYPICAL
14	MANUFACTURED FASCIA ASSEMBLY
15	SEALANT
16	WOOD BLOCKING - CONCRETE SCREWS, 2 ROWS - AT EACH END & 24" O.C. BETWEEN ENDS
17	WOOD SHIM, CONTINUOUS
18	BACKER ROD AND PASTE
19	CEMENTITIOUS FILL - THICKNESS VARIES
20	3057 ALUMINUM BASE INFILL - MASONRY ANCHORS @ 12" O.C. 1" FROM TOP, BOTTOM, AND SIDE EDGES
21	WATERPROOFING MEMBRANE
22	PMMA-BASED REINFORCED FLASHING
23	CUT PANEL TO FIT REVISED OPENING - RE-INSTALL
24	1/4" STAINLESS STEEL CONNECTING PIN 3" INTO EACH PANEL
25	1" WIDE 16 GAUGE GALVANIZED STRAP AT PANEL ENDS
26	FULL HEAD WEEP
27	TIN-COATED COPPER CAP FLASHING RECEIVER & EXTENSION - RIVETS @ 24" - FASTEN W/ MASONRY ANCHORS - 18" O.C.
28	CONCRETE FILL
29	S.S. SCREW & WASHER W/ W/OPRENE INSERT @ 12" O.C.
30	TIN-COATED COPPER SURFACE-MOUNTED CAP FLASHING @ 12" O.C. STAGGERED
31	3057 ALUMINUM BASE - MASONRY ANCHORS IN 2 ROWS, EACH ROW @ 12" O.C.
32	MEMBRANE TOP PLY
33	MEMBRANE BASE PLY
34	SILL FLASHING TURNS UP AT JAMB - FASTEN TO JAMB WITH 2 MASONRY ANCHORS - STRIP TO JAMB WITH REINFORCED PMMA-BASED FLASHING
35	NOT USED
36	SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH WOOD ANCHORS SPACED @ 24" EACH ROW, STAGGERED
37	EXPANSION JOINT/COPING ASSEMBLY - BY OTHERS
38	4047 ALUMINUM CAP FLASHING MATCHING COLOR/FINISH OF MANUFACTURED COPING/FASCIA ASSEMBLY
39	SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH MASONRY ANCHORS SPACED @ 24" EACH ROW, STAGGERED
40	3032 ALUMINUM MANUFACTURED WALL PANEL
41	MANUFACTURED COPING ASSEMBLY
42	WOOD BLOCKING
43	WOOD BLOCKING - 2X12 - MATCH WIDTH OF PARAPET - INSTALL BETWEEN WALL STRAPS WITH 4 CONCRETE SCREWS PER PIECE
44	ALUMINUM PLATE, NON-SKID
45	HIGH PROFILE PEDESTALS & SHIMS
46	LEAD WEDGE @ RECEIVER ENDS & 24" BETWEEN ENDS
47	WOOD BLOCKING - TOP OF BLOCKING 2" SHORTER THAN TOP OF DUCT STUB - CONCRETE SCREWS @ 12"
48	HVAC DUCT STUB
49	WOOD BLOCKING - INSTALL AND FLASH AFTER DUCT EXTENSION IS INSTALLED (BY OTHERS)
50	HVAC DUCT EXTENSION
51	4047 ALUMINUM DUCT CURB CAP FLASHING - FASTEN TO DUCT EXTENSION WITH STAINLESS STEEL SCREWS @ 8"
52	DRAIN GRATING
53	PASTE
54	EXISTING CAST IRON DRAIN ASSEMBLY - REMAINS - FURNISH CAST IRON COVER WHERE EXISTING COVER IS PLASTIC OR DAMAGED
55	DRAIN EXTENSION & GASKET ASSEMBLY - NON-ADJUSTABLE
56	TAPERED EDGE
57	EXISTING FAN CURB - REMAINS
58	EXISTING FAN CURB - REMOVE AND RESTORE AS NEEDED
59	GASKET
60	WOOD BLOCKING - BY OTHERS
61	REMOVED EXISTING SMOKE HATCH AND RESET ON BLOCKING
62	WOOD BLOCKING MATCHING THICKNESS OF ROOF
63	BASE SHEET
64	TIN-COATED COPPER SILL FLASHING & RECEIVER - RIVETS @ 24"
65	MEMBRANE OR METAL FLASHING EXTENDING UP FROM PARAPET
66	HOT DIPPED GALVANIZED 58 INCH DIAMETER X 6 1/2" LONG HILTI KWK HUZ EZ DRILLED INTO SOLID GROUTED CMU
67	WELD AND TAP ANCHOR LOCATIONS ON NEW HSS (10"x20"x3/8") SPACER. SPACER LENGTH SHALL BE 11" LONG TO MATCH L-ANGLE HEIGHT. WELD HSS TO ALL EDGES OF EXISTING L-ANGLE (5"x3"x3/8") SUPPORTING SQUARE TUBE (2"x2"x3/8") SCREEN. GC MAY SUBSTITUTE SPACER.
68	EXISTING L-ANGLE (5"x3"x3/8")
69	EXISTING SQUARE TUBE (2"x2"x3/8") SCREEN
70	3.5"x3.5"x3/8" GALVANIZED L-ANGLE WELDED TO 1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL
71	1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL, INTERMEDIATE MEMBERS SHALL BE INSTALLED NO MORE THAN 19 INCHES APART.
72	BEGA 33 816 WALL LUMINAIR DIRECT LIGHT, FASTENED FUTURE, ADAPTER PLATE, AND JUNCTION BOX TO GUARDRAIL. SEE LIGHTING PLAN FOR LOCATION
73	GALVANIZED CONDUIT
74	6" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE SLAB BELOW
75	18 GA 8" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE ABOVE. PROVIDE KICKERS TO BRACE WALL
76	DELEGATED DESIGN - GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE SLAB BELOW. "MATCH JOINT" SPOT ELEVATION
77	AT EACH ROOF: PROVIDE 1 PHOTOCELL AT TOP OF POST. (4 TOTAL)
78	BLACK 3/4" THICK (30M) SOLID SURFACE SHODLE
79	PAINT NEW INTERIOR WALL TO MATCH EXIST
80	4" TALL WHITE RESILIENT STRAIGHT BASE
81	1.5" GALVANIZED SQUARE TUBE GUARDRAIL, PAINTED BLACK
82	1.5" GALVANIZED SQUARE 8"x8"x1/4" PLATE (4) HOT-DIPPED GALVANIZED 58 INCH DIAMETER X 4 INCH LONG HILTI KWK HUZ EZ DRILLED INTO CONCRETE SLAB
83	CAST IN PLACE CONCRETE TREADS WITH CAST ABRASIVE NOSING. SET ON S.S. KEYS 12 INCHES O.C. SEE SECTION 054500.
84	WRAP EXISTING CONCRETE WITH REINFORCED PMMA-BASED FLASHING - BELOW RISERTREAD, INSTALL ADDITIONAL WEATHERING LAYER OF PMMA-BASED FLASHING, WHILE WET EMBED QUARTZ. TO REJECTION
85	POUR CAST IN PLACE CONCRETE AT TOP TREAD



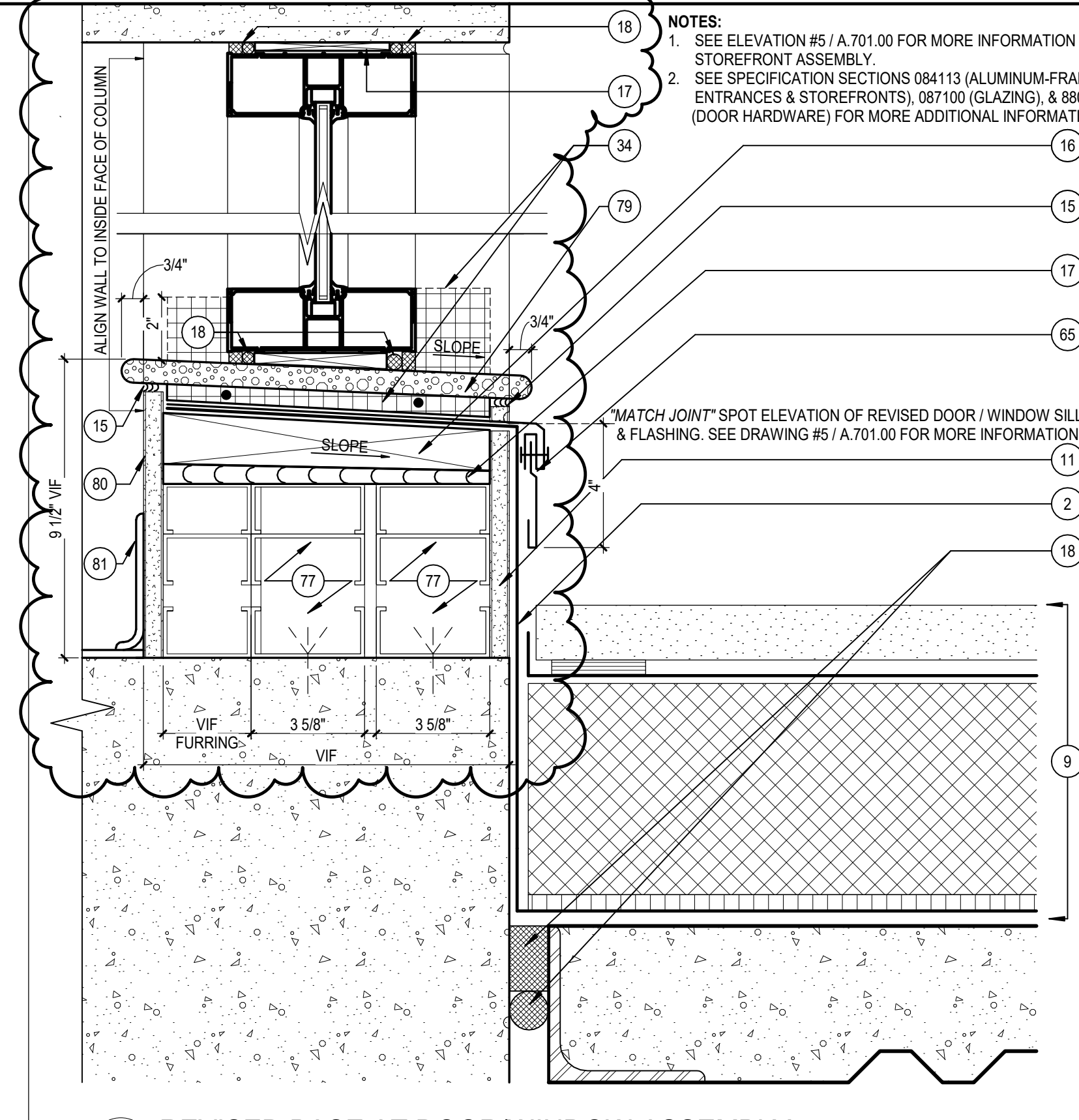
13 EXISTING BASE AT WALL WITH METAL PANEL INFILL
A.802.00 SCALE: 3" = 1'-0"



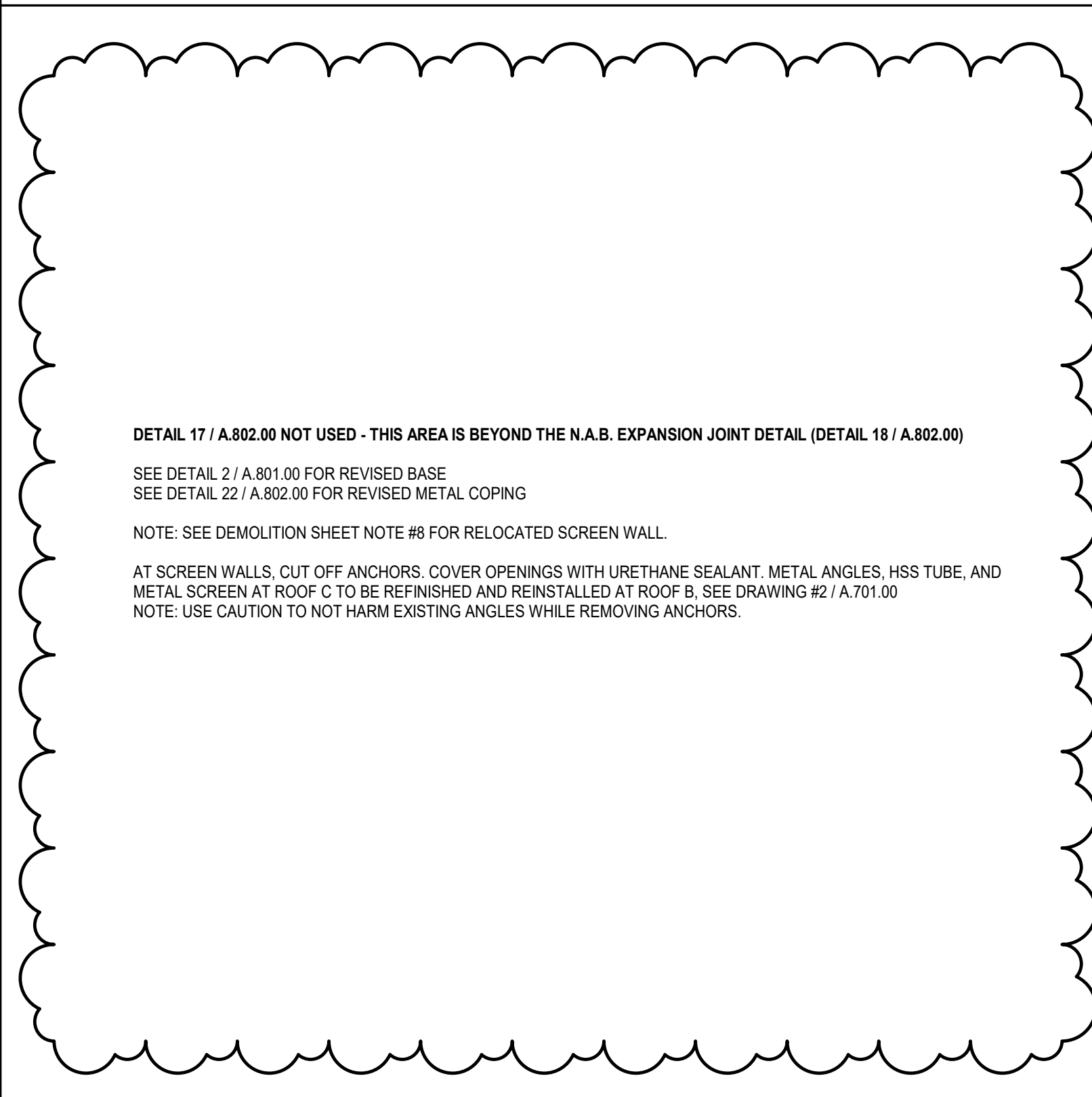
14 REVISED BASE AT WALL WITH METAL PANEL INFILL
A.802.00 SCALE: 3" = 1'-0"



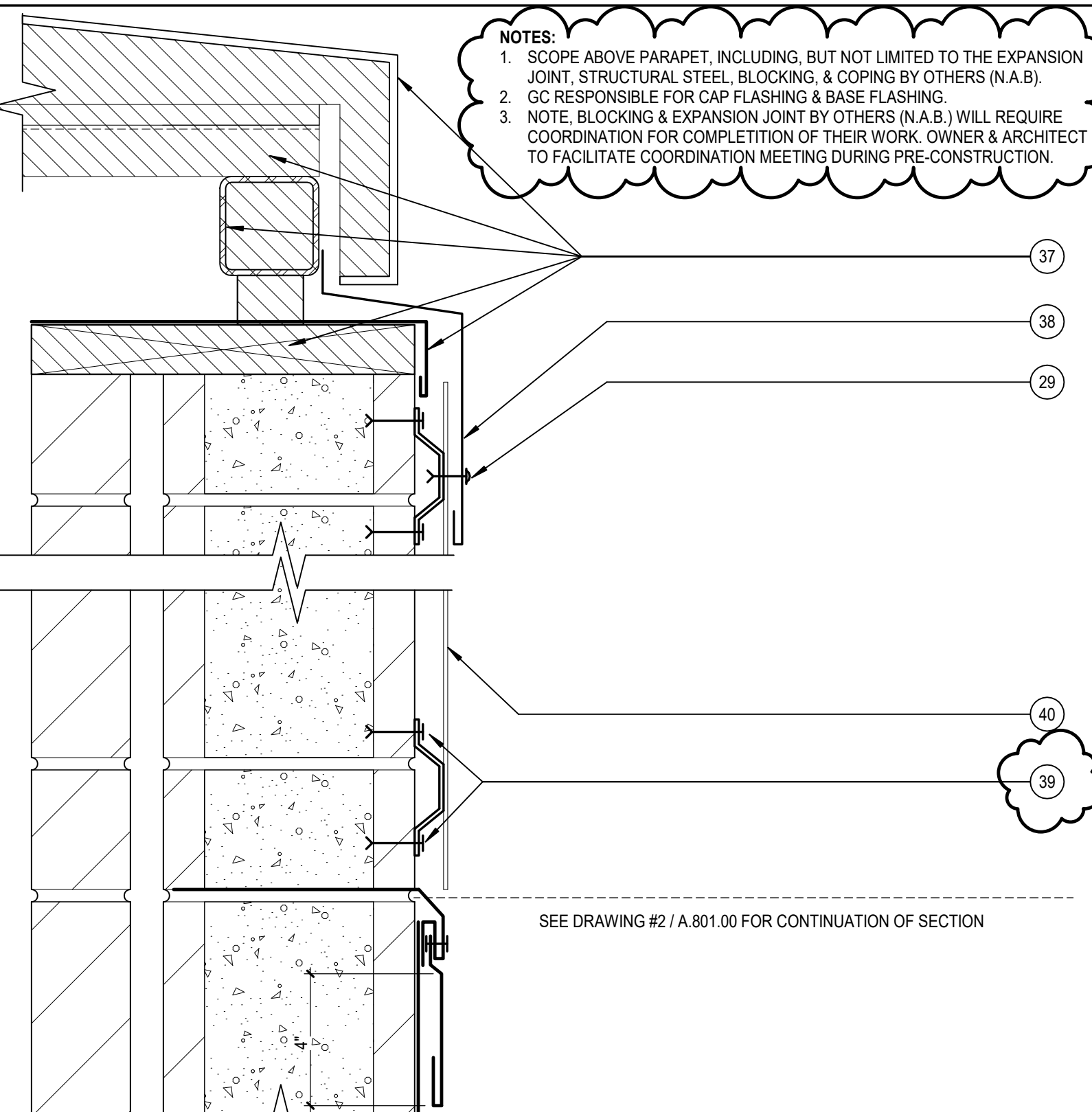
15 EXISTING BASE AT DOOR / WINDOW ASSEMBLY
A.802.00 SCALE: 3" = 1'-0"



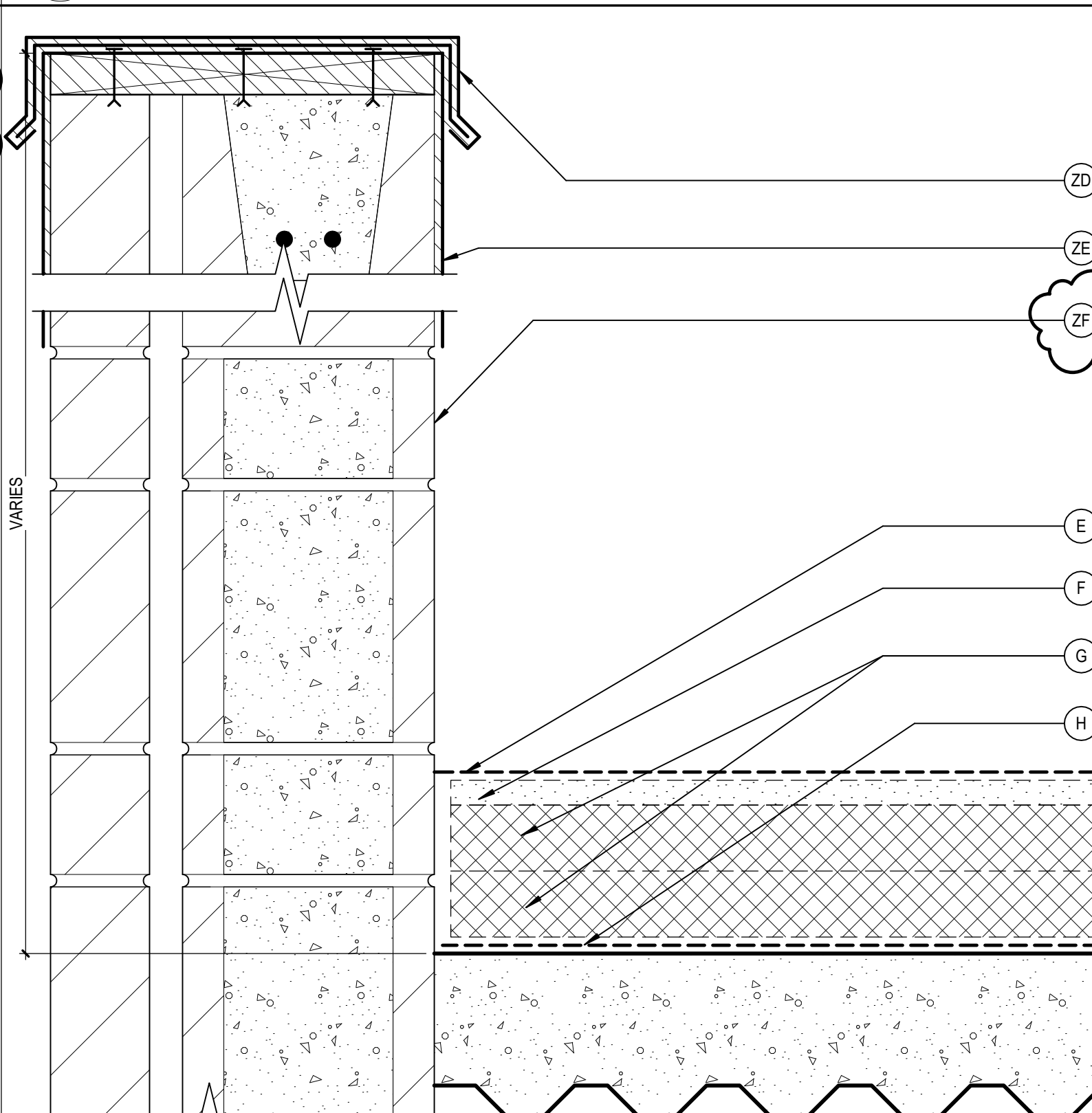
16 REVISED BASE AT DOOR/WINDOW ASSEMBLY
A.802.00 SCALE: 3" = 1'-0"



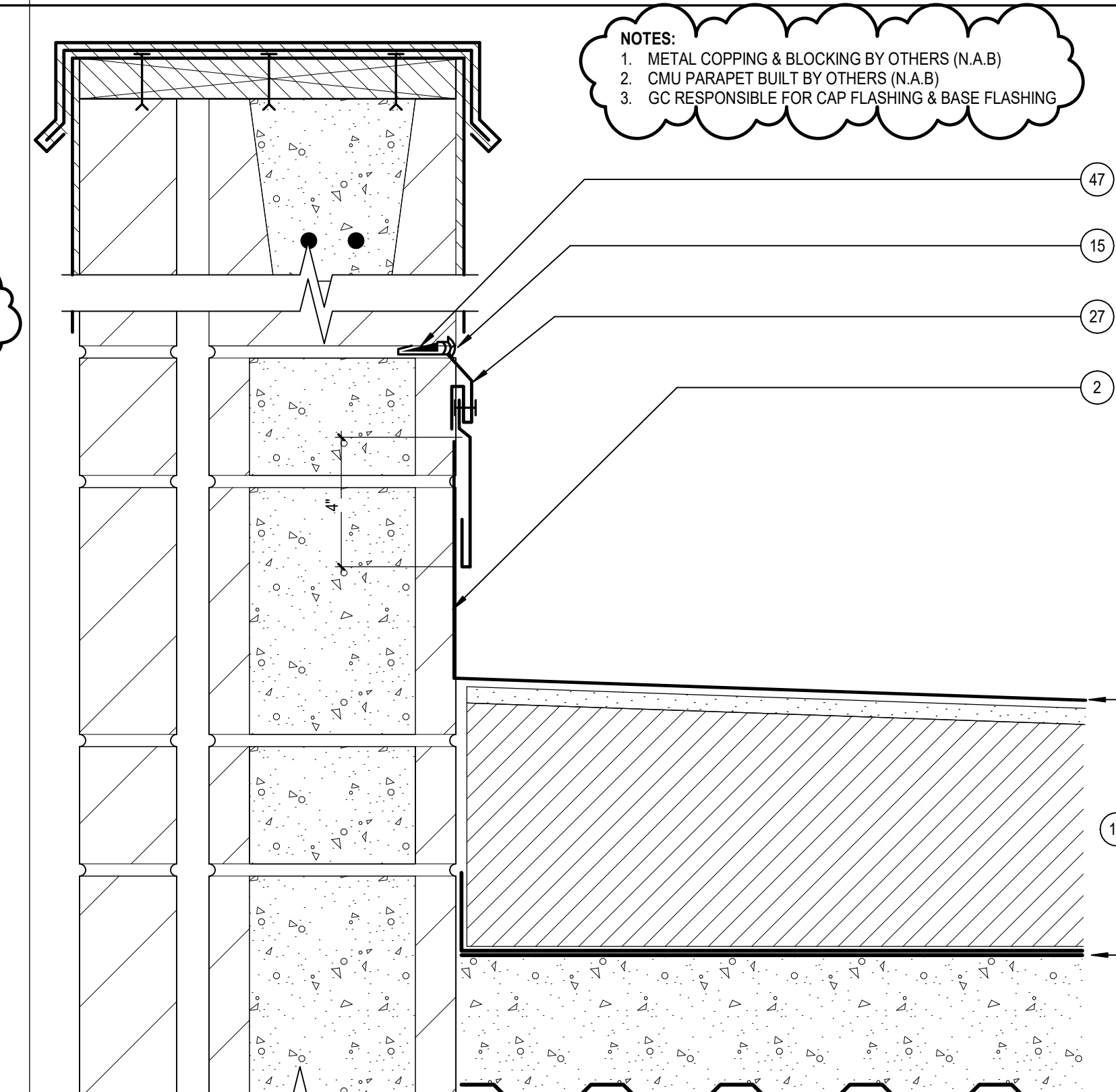
17 REVISED PARAPET - ROOF B @ NEW ACADEMIC BUILDING
A.802.00 SCALE: 3" = 1'-0"



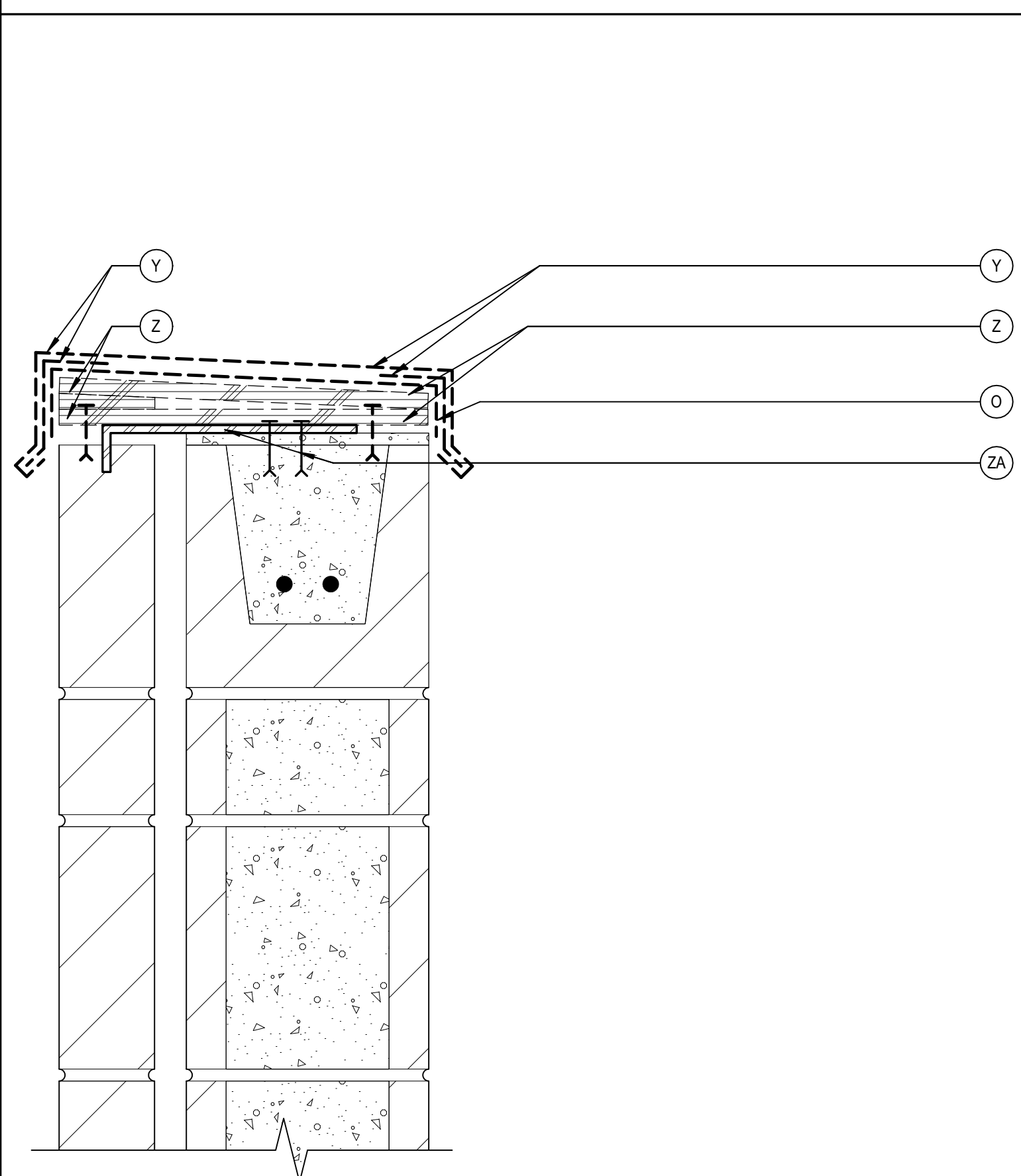
18 REVISED PARAPET - ROOF C (@ NEW ACADEMIC BUILDING)
A.802.00 SCALE: NOT TO SCALE



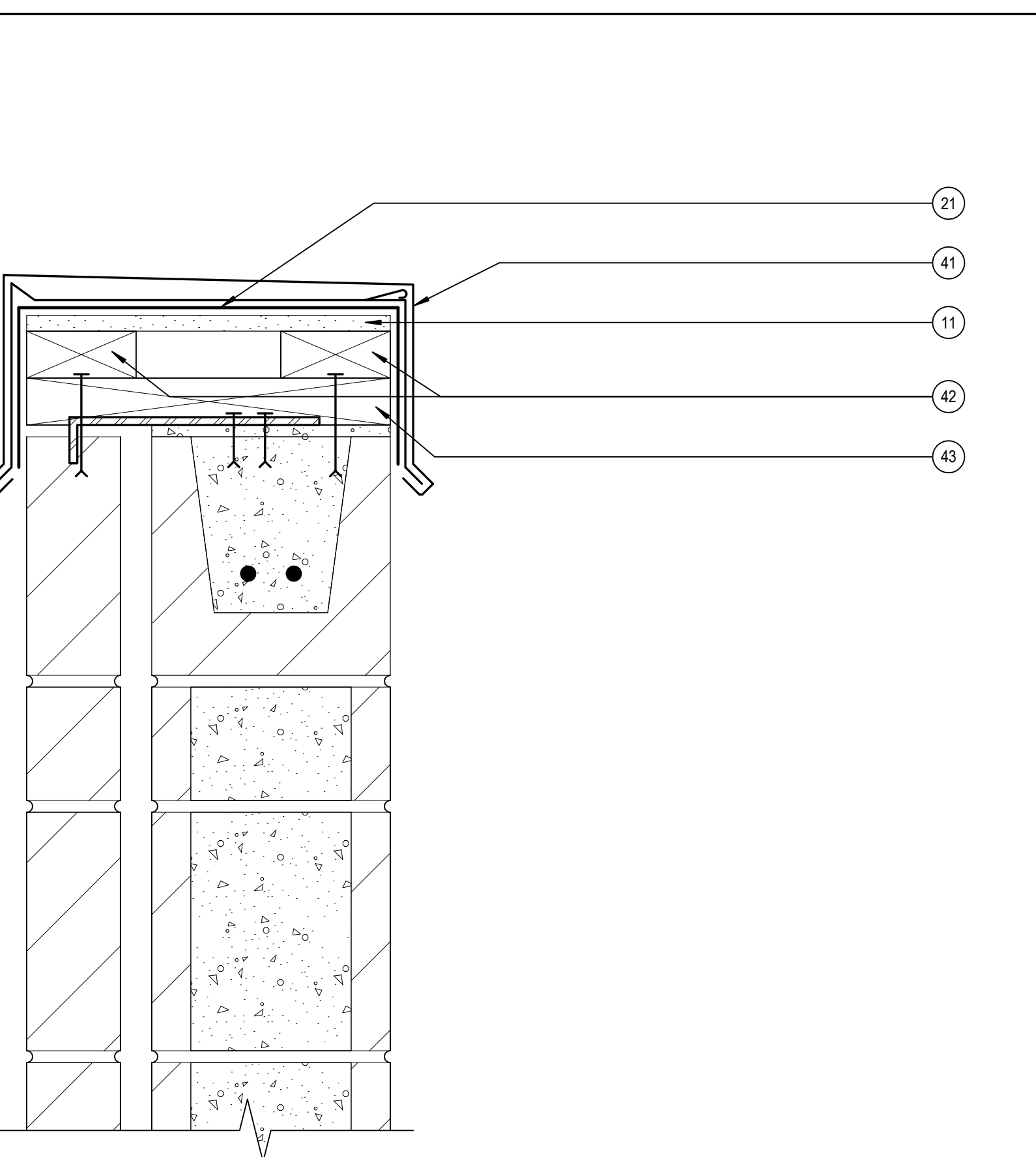
19 EXISTING WEST PARAPET - ROOF D (@ NEW ACADEMIC BUILDING)
A.802.00 SCALE: 3" = 1'-0"



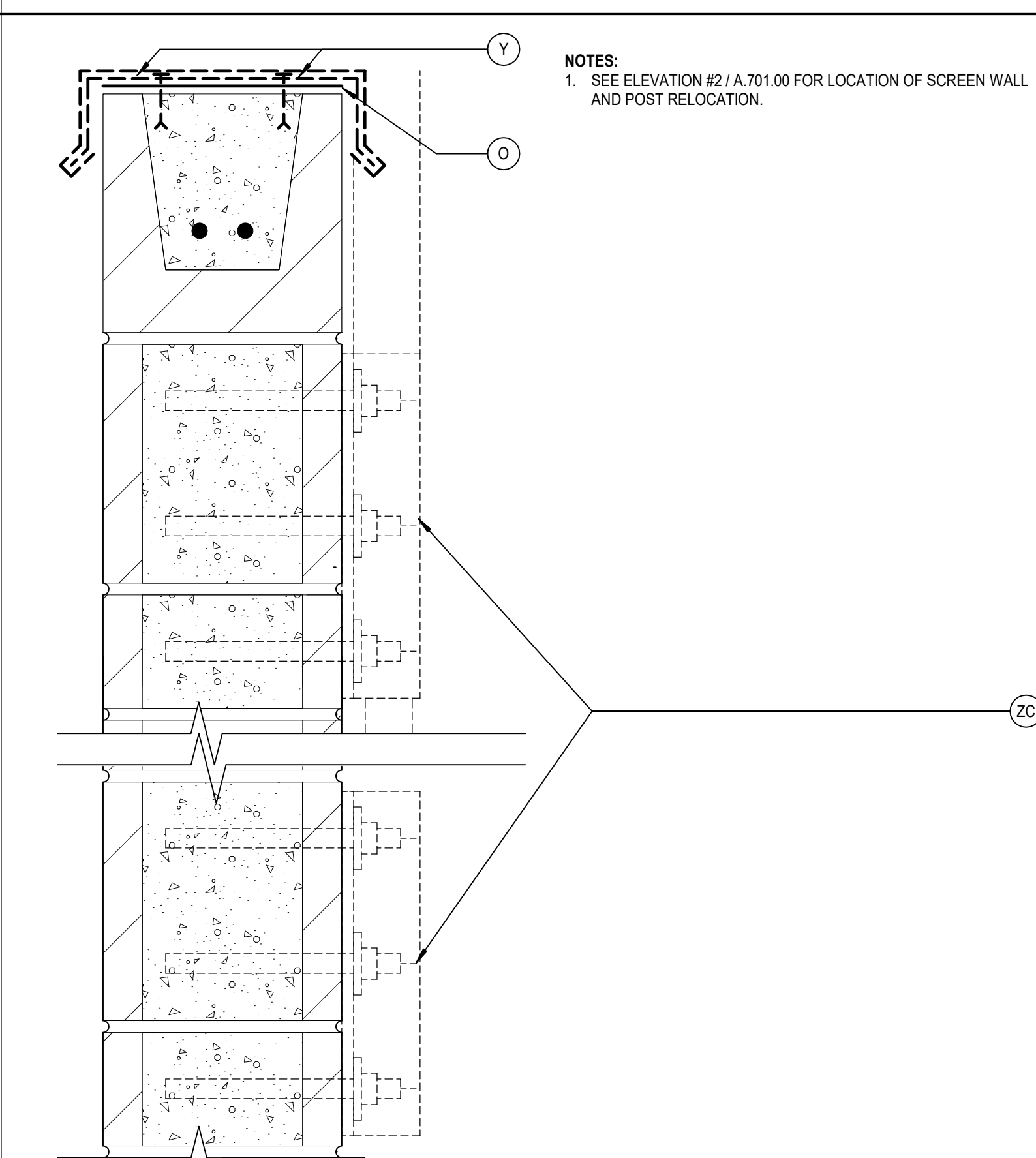
20 REVISED WEST PARAPET - ROOF D (@ NEW ACADEMIC BUILDING)
A.802.00 SCALE: 3" = 1'-0"



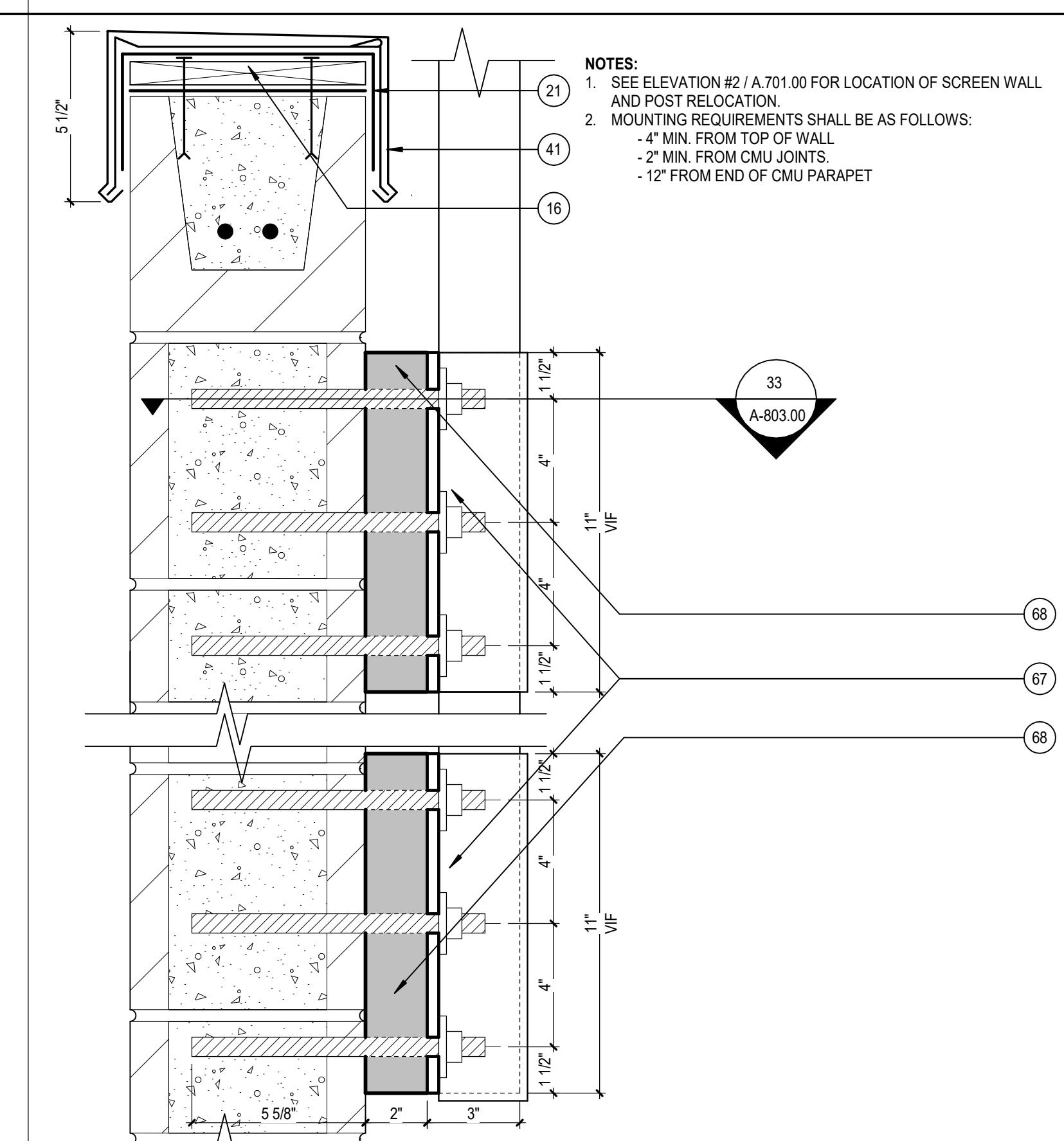
21 EXISTING TOP OF PARAPET - TYPE I
A.802.00 SCALE: 3" = 1'-0"



22 REVISED TOP OF PARAPET - TYPE I
A.802.00 SCALE: 3" = 1'-0"



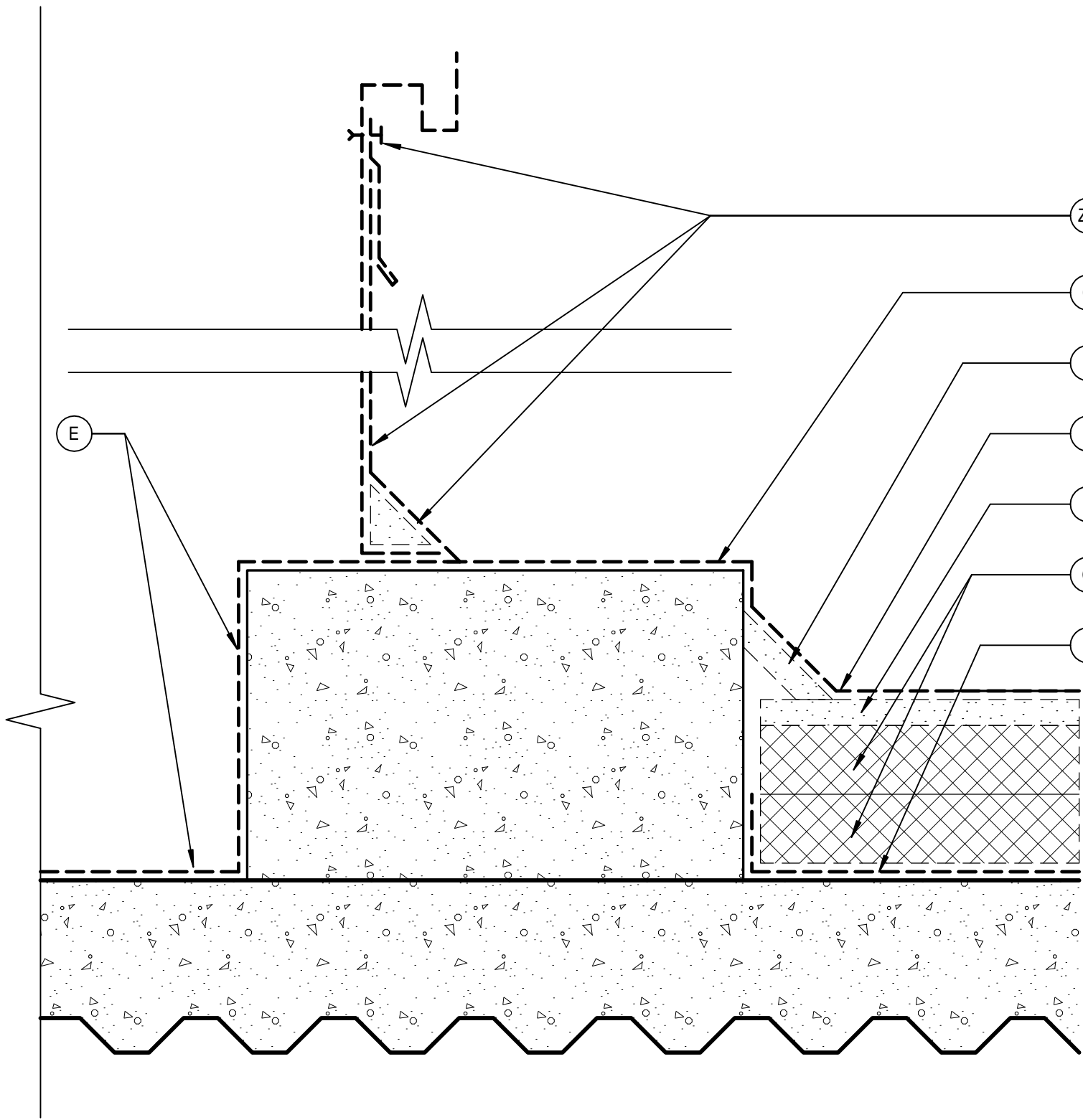
23 EXISTING TOP OF PARAPET - TYPE II
A.802.00 SCALE: 3" = 1'-0"



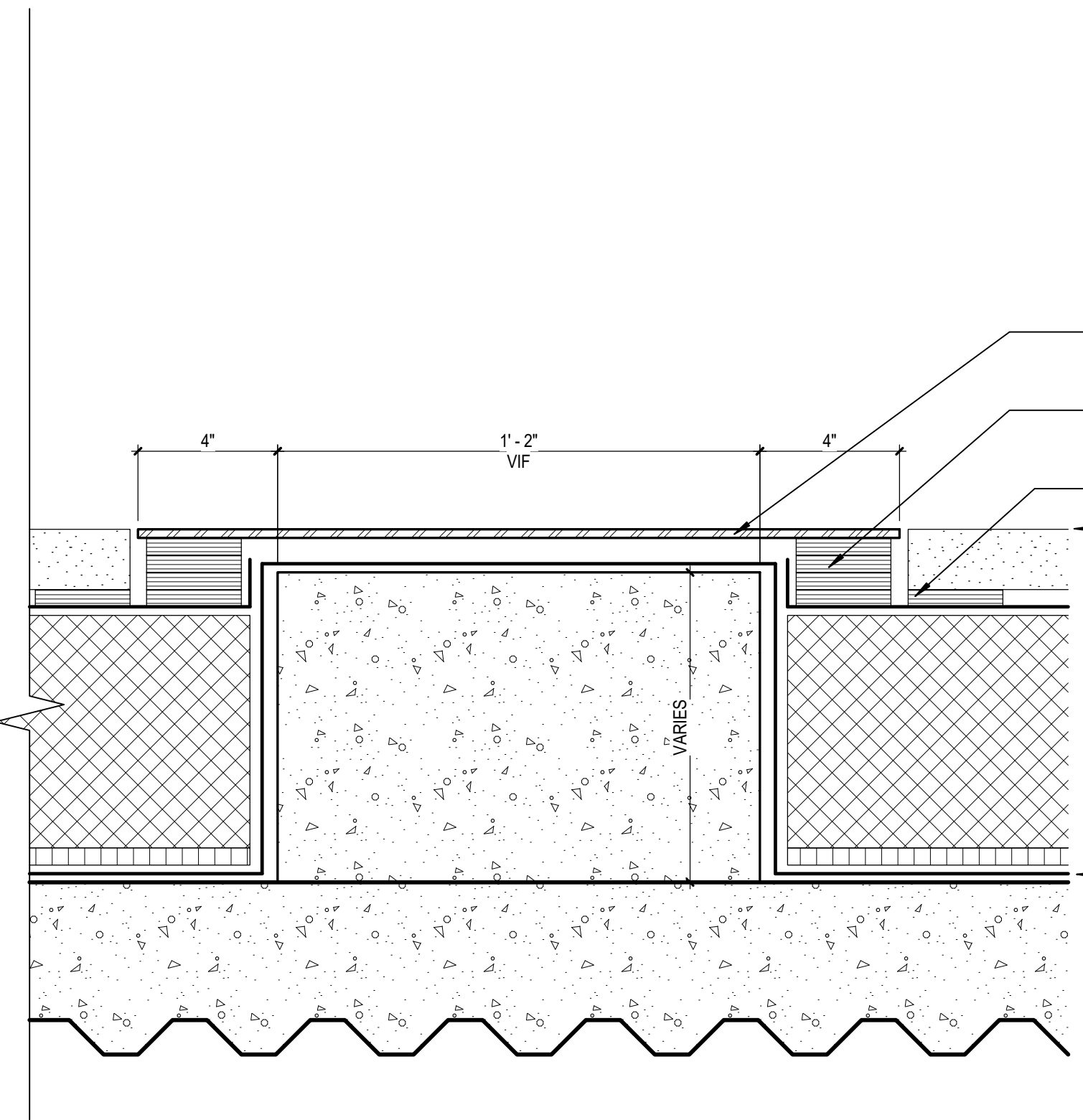
24 REVISED TOP OF PARAPET - TYPE II
A.802.00 SCALE: 3" = 1'-0"

- # EXISTING - SHEET NOTES
- CAP FLASHING RECEIVER - REMAINS - DO NOT BEND
 - CAP FLASHING EXTENSION AND CLEAT - REMOVE
 - CAP FLASHING - REMOVE
 - CANT - REMOVE
 - ROOFING MEMBRANE - REMOVE
 - COVER BOARD - REMOVE
 - INSULATION BOARD - REMOVE - THICKNESS VARIES
 - BASE SHEET - REMOVE
 - CONCRETE COPING - REMOVE
 - THROUGH-WALL FLASHING - REMOVE
 - STEEL ROD OR FENCE POST - CUT OFF EVEN WITH TOP OF CONCRETE MASONRY UNIT
 - MORTAR & DEBRIS - REMOVE TO 3" DEPTH
 - PRECAST CONCRETE PANELS - REMAIN - INSTALL AND MAINTAIN TEMPORARY SUPPORT
 - PRECAST CONCRETE PANEL - REMOVE AND SET ASIDE FOR REINSTALLATION
 - WATERPROOFING MEMBRANE - REMOVE
 - METAL SUBSTRATE EXTENSION - REMOVE
 - MIN. AND MAX. DISTANCE BETWEEN METAL SHEATHING PANEL AND ROOF DECK EDGE
 - METAL SHEATHING PANEL TO REMAIN
 - REMOVE CAP FLASHING AT SIDES/ENDS OF CONCRETE PANELS
 - METAL SILL FLASHING - REMOVE EXPOSED PORTION
 - METAL TREAD - REMOVE
 - CONCRETE PAVERS - REMOVE AND DISCARD CUT PAVERS - SET ASIDE WHOLE PAVERS FOR RE-USE (TYP.)
 - SHIMS - REMOVE (TYP.)
 - PROTECTION BOARD - REMOVE (TYP.)
 - METAL COPING, CLEATS, AND FASTENERS - REMOVE
 - PLYWOOD SUBSTRATE AND FASTENERS - REMOVE
 - WALL STRAP AND STRAP FASTENERS - REMAIN
 - HVAC METAL CURB TO BE REMOVED BY OTHERS - PERFORM ALL NECESSARY WORK TO MAINTAIN ROOFING WATER/TIGHTNESS - CONCRETE CURB TO REMAIN
 - CUT OFF ANCHORS, COVER OPENINGS WITH URETHANE SEALANT, METAL ANGLES, HSS TUBE, AND METAL SCREEN TO BE REFINISHED AND REINSTALLED WITH NEW ANCHORS AND SPACERS. NOTE: USE CAUTION TO NOT HARM EXISTING ANGLES WHILE REMOVING ANCHORS
 - METAL COPING OR EXPANSION JOINT ASSEMBLY - REMAINS
 - COLD FLUID-APPLIED ROOFING - REMAINS
 - BARE CMU PARAPET. GC TO PREP FOR NEW BASE FLASHING

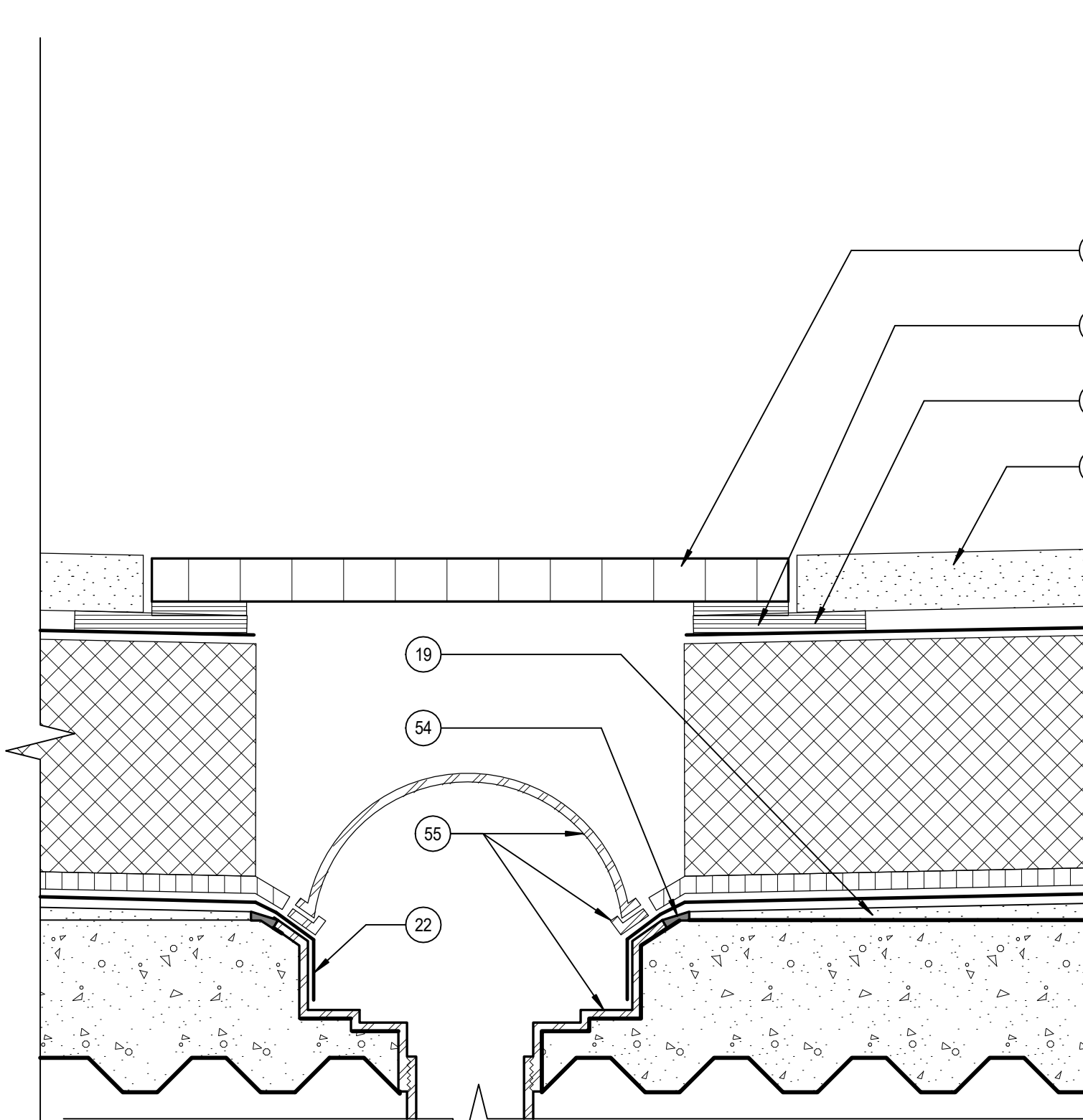
- # REVISED - SHEET NOTES
- CAP FLASHING EXTENSION - RIVETS @ 24" O.C.
 - BASE FLASHING
 - CONCRETE PAVER
 - LOW PROFILE PEDESTAL
 - FABRIC MAT
 - INSULATION BOARD, IRMA
 - DRAINAGE MAT
 - PROTECTION BOARD, IRMA
 - INVERTED ROOF MEMBRANE ASSEMBLY "IRMA" - TYPICAL
 - INSULATION BOARD, CONVENTIONAL
 - COVER BOARD
 - ROOFING MEMBRANE, CONVENTIONAL
 - CONVENTIONAL ROOF ASSEMBLY ("CONVENTIONAL") - TYPICAL
 - MANUFACTURED FASCIA ASSEMBLY
 - SEALANT
 - WOOD BLOCKING - CONCRETE SCREWS, 2 ROWS - AT EACH END & 24" O.C. BETWEEN ENDS
 - WOOD SHIM, CONTINUOUS
 - BACKER ROD AND PASTE
 - CEMENTITIOUS FILL - THICKNESS VARIES
 - 350" ALUMINUM BASE INFILL - MASONRY ANCHORS @ 12" O.C. 1" FROM TOP, BOTTOM, AND SIDE EDGES
 - WATERPROOFING MEMBRANE
 - PMMA-BASED REINFORCED FLASHING
 - CUT PANEL TO FIT REVISED OPENING - RE-INSTALL
 - 1/4" STAINLESS STEEL, CONNECTING PIN 1/2" INTO EACH PANEL
 - 1" WIDE 16 GAUGE GALVANIZED STRAP AT PANEL ENDS
 - FULL HEAD WEEP
 - TIN-COATED COPPER CAP FLASHING RECEIVER & EXTENSION - RIVETS @ 24" - FASTEN WIMSONRY ANCHORS - 18" O.C.
 - CONCRETE FILL
 - S.S. SCREW & WASHER W/INOPRENE INSERT @ 12" O.C.
 - TIN-COATED COPPER SURFACE-MOUNTED CAP FLASHING @ 12" O.C., STAGGERED
 - MEMBRANE TOP PLY
 - 33 MEMBRANE BASE PLY
 - SILL FLASHING TURNS UP AT JAMB - FASTEN TO JAMB WITH 2 MASONRY ANCHORS - STRIP TO JAMB WITH REINFORCED PMMA-BASED FLASHING
 - NOT USED
 - SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH WOOD ANCHORS SPACED @ 24" EACH ROW, STAGGERED
 - EXPANSION JOINT/COPING ASSEMBLY - BY OTHERS
 - 3/4" ALUMINUM CAP FLASHING MATCHING COLOR/FINISH OF MANUFACTURED COPING/FASCIA ASSEMBLIES
 - SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH MASONRY ANCHORS SPACED @ 24" EACH ROW, STAGGERED
 - 3/32" ALUMINUM MANUFACTURED WALL PANEL
 - MANUFACTURED COPING ASSEMBLY
 - WOOD BLOCKING
 - WOOD BLOCKING - 2X12 - MATCH WIDTH OF PARAPET - INSTALL BETWEEN WALL STRAPS WITH 4 CONCRETE SCREWS PER PIECE
 - ALUMINUM PLATE, NON-SKID
 - 100% PROFILE PEDESTALS & SHIMS
 - LEAD WEDGE @ RECEIVER ENDS & 24" BETWEEN ENDS
 - WOOD BLOCKING - TOP OF BLOCKING 2" SHORTER THAN TOP OF DUCT STUB - CONCRETE SCREWS @ 12"
 - HVAC DUCT STUB
 - WOOD BLOCKING - INSTALL AND FLASH AFTER DUCT EXTENSION IS INSTALLED (BY OTHERS)
 - HVAC DUCT EXTENSION
 - 3/4" ALUMINUM DUCT CURB CAP FLASHING - FASTEN TO DUCT EXTENSION WITH STAINLESS STEEL SCREWS @ 8"
 - DRAIN GRATING
 - PASTE
 - EXISTING CAST IRON DRAIN ASSEMBLY - REMAINS - FURNISH CAST IRON COVER WHERE EXISTING COVER IS PLASTIC OR DAMAGED
 - DRAIN EXTENSION & GASKET ASSEMBLY - NON-ADJUSTABLE
 - TAPERED EDGE
 - EXISTING FAN CURB - REMAINS
 - EXISTING FAN CURB - REMOVE AND RESTORE AS NEEDED
 - GASKET
 - WOOD BLOCKING - BY OTHERS
 - REMOVED EXISTING SMOKE HATCH AND RESET ON BLOCKING
 - WOOD BLOCKING MATCHING THICKNESS OF ROOF
 - BASE SHEET
 - TIN-COATED COPPER SILL FLASHING & RECEIVER - RIVETS @ 24"
 - MEMBRANE OR METAL FLASHING EXTENDING UP FROM PARAPET
 - HOT-DIPPED GALVANIZED 5/8 INCH DIAMETER X 1/2" LONG HILTI Kwik-HUZ EZ DRILLED INTO SOLID GROUTED CMU
 - WELD AND TAP ANCHOR LOCATIONS ON NEW HSS (10"x20"x3/16") SPACER. SPACER LENGTH SHALL BE 11" LONG TO MATCH L-ANGLE HEIGHT. WELD HSS TO ALL EDGES OF EXISTING L-ANGLE (5"x3"x3/16") SUPPORTING SQUARE TUBE (2"x2"x3/16") SCREEN. GC MAY SUBMIT SUBSTITUTE SPACER.
 - EXISTING L-ANGLE (5"x3"x3/16")
 - EXISTING SQUARE TUBE (2"x2"x3/16") SCREEN
 - 3.5"x3.5"x3/16" GALVANIZED L-ANGLE WELDED TO 1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL
 - 1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL, INTERMEDIATE MEMBERS SHALL BE INSTALLED NO MORE THAN 19 INCHES APART
 - BEGA 33 816 WALL LUMINAIR DIRECT LIGHT, FASTENED FIXTURE, ADAPTER PLATE, AND JUNCTION BOX TO GUARDRAIL. SEE LIGHTING PLAN FOR LOCATION
 - GALVANIZED CONDUIT
 - 6" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH END & CONCRETE SLAB BELOW
 - 16 GA 16" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH END & CONCRETE ABOVE. PROVIDE KICKERS TO BRACE WALL
 - DELEGATED DESIGN - GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH END & CONCRETE SLAB BELOW. "MATCH JOINT" SPOT ELEVATION
 - AT EACH ROOF, PROVIDE 1 PHOTOCELL AT TOP OF POST. (4 TOTAL)
 - BLACK 3/4" THICK (30M) SOLID SURFACE SHODOLE
 - PAINT NEW INTERIOR WALL TO MATCH EXIST
 - 4" TALL WHITE RESILIENT STRAIGHT BASE
 - 1.5" GALVANIZED SQUARE TUBE GUARDRAIL, PAINTED BLACK
 - 1.5" GALVANIZED SQUARE 8"x8"x1/4" PLATE (4) HOT-DIPPED GALVANIZED 5/8 INCH DIAMETER X 4 INCH LONG HILTI Kwik-HUZ EZ DRILLED INTO CONCRETE SLAB
 - CAST IN PLACE CONCRETE TREADS WITH CAST ABRASIVE NOISING. SET ON S.S. KEYS 12 INCHES O.C. SEE SECTION 054500.
 - WRAP EXISTING CONCRETE WITH REINFORCED PMMA-BASED FLASHING - BELOW RISERTREAD. INSTALL ADDITIONAL WEATHERING LAYER OF PMMA-BASED FLASHING, WHILE WET EMBED QUARTZ TO REJECTION
 - POUR CAST IN PLACE CONCRETE AT TOP TREAD



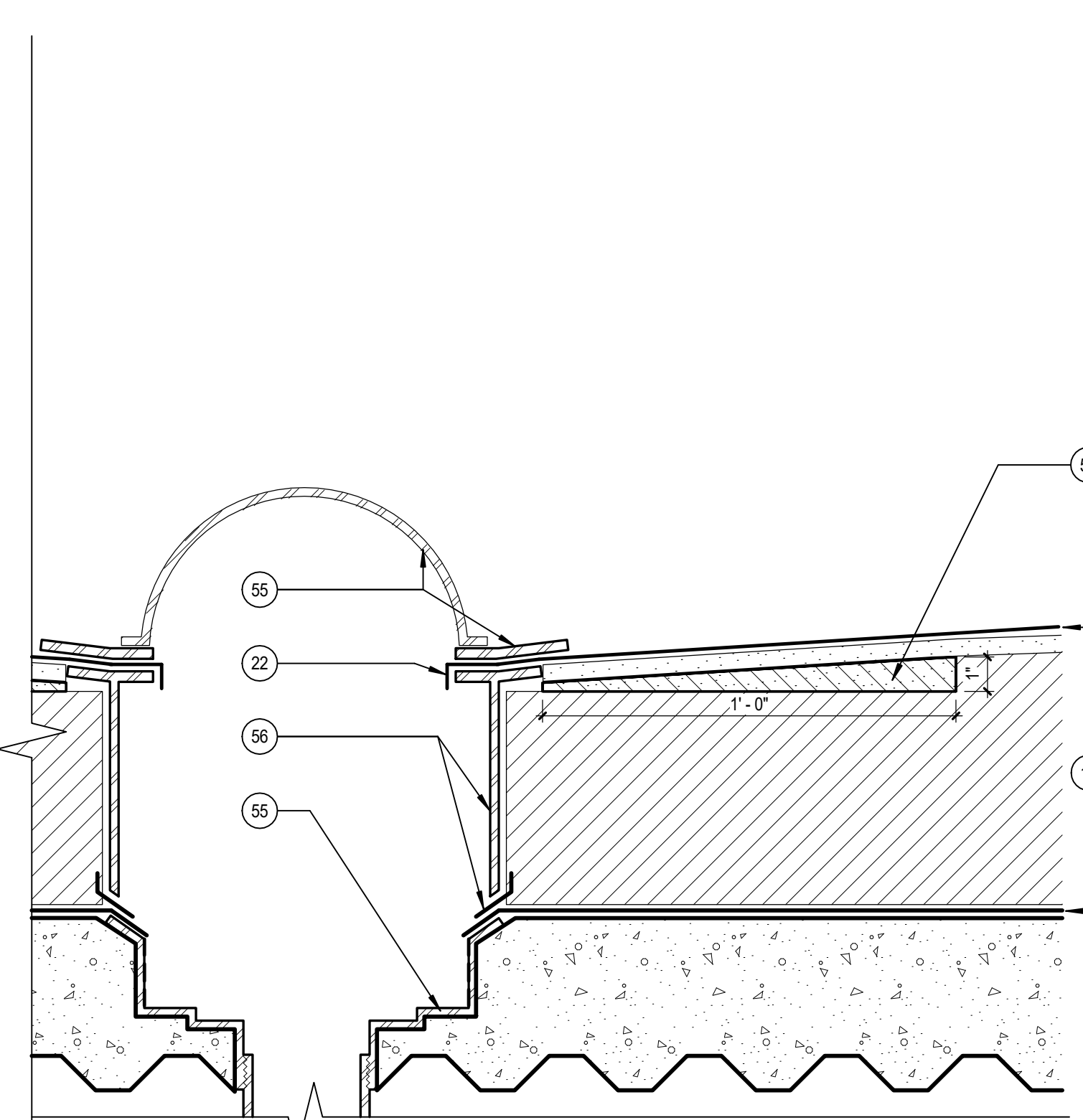
25 EXISTING CONCRETE CURB
A.803.00 SCALE: 3" = 1'-0"



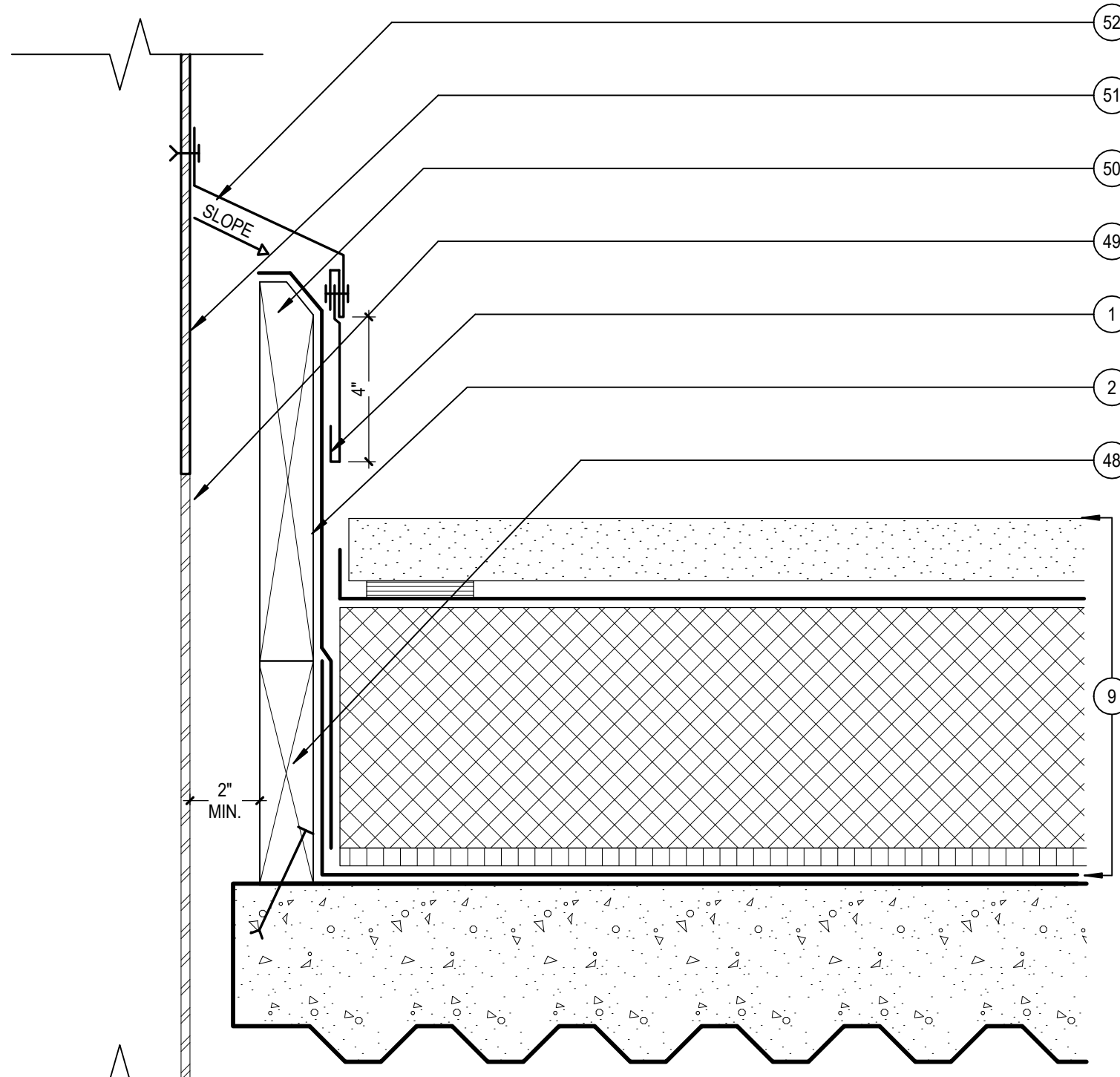
26 REVISED CONCRETE CURB
A.803.00 SCALE: 3" = 1'-0"



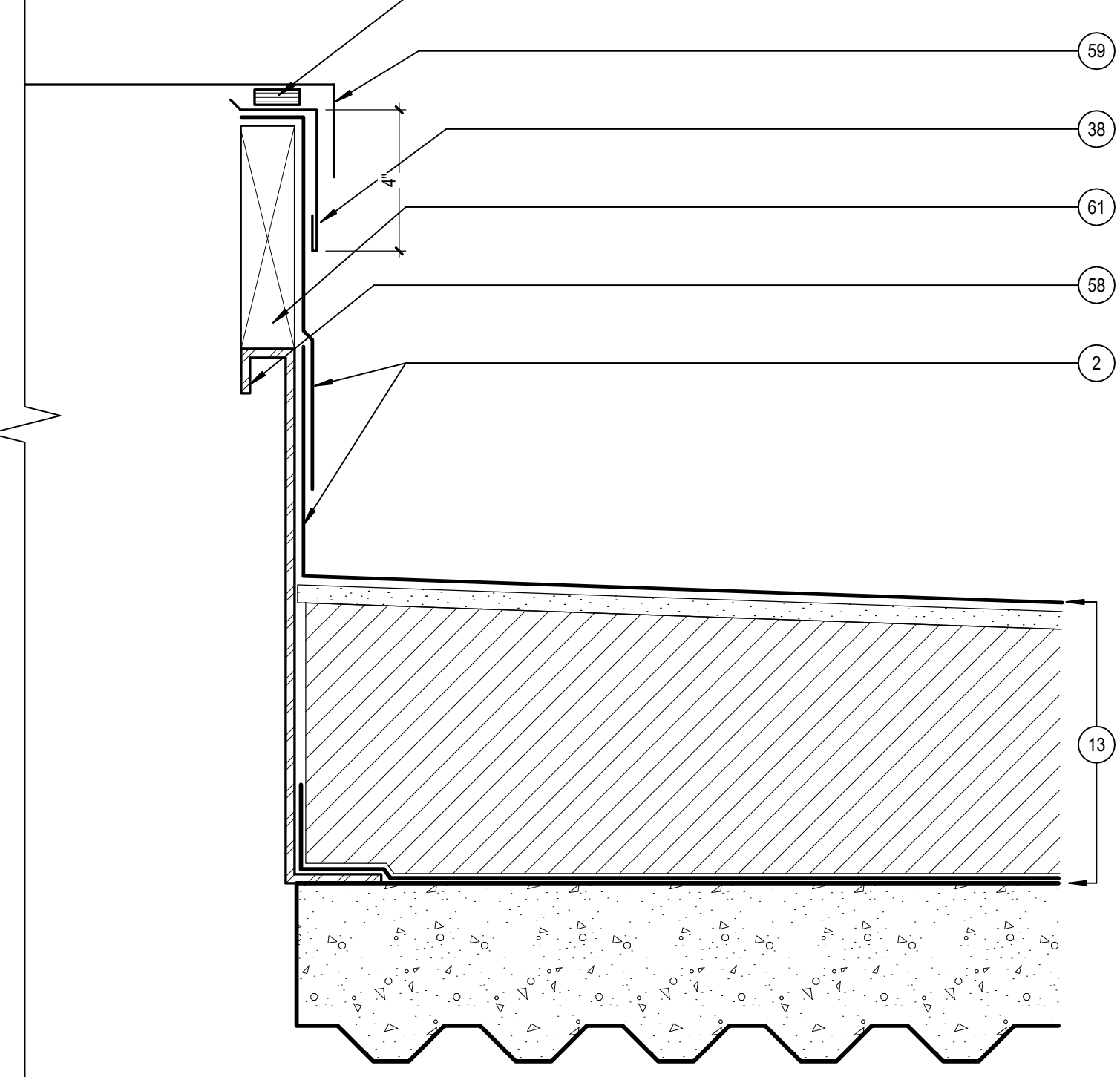
27 REVISED DRAIN - IRMA - ROOF A, B, & C
A.803.00 SCALE: NOT TO SCALE



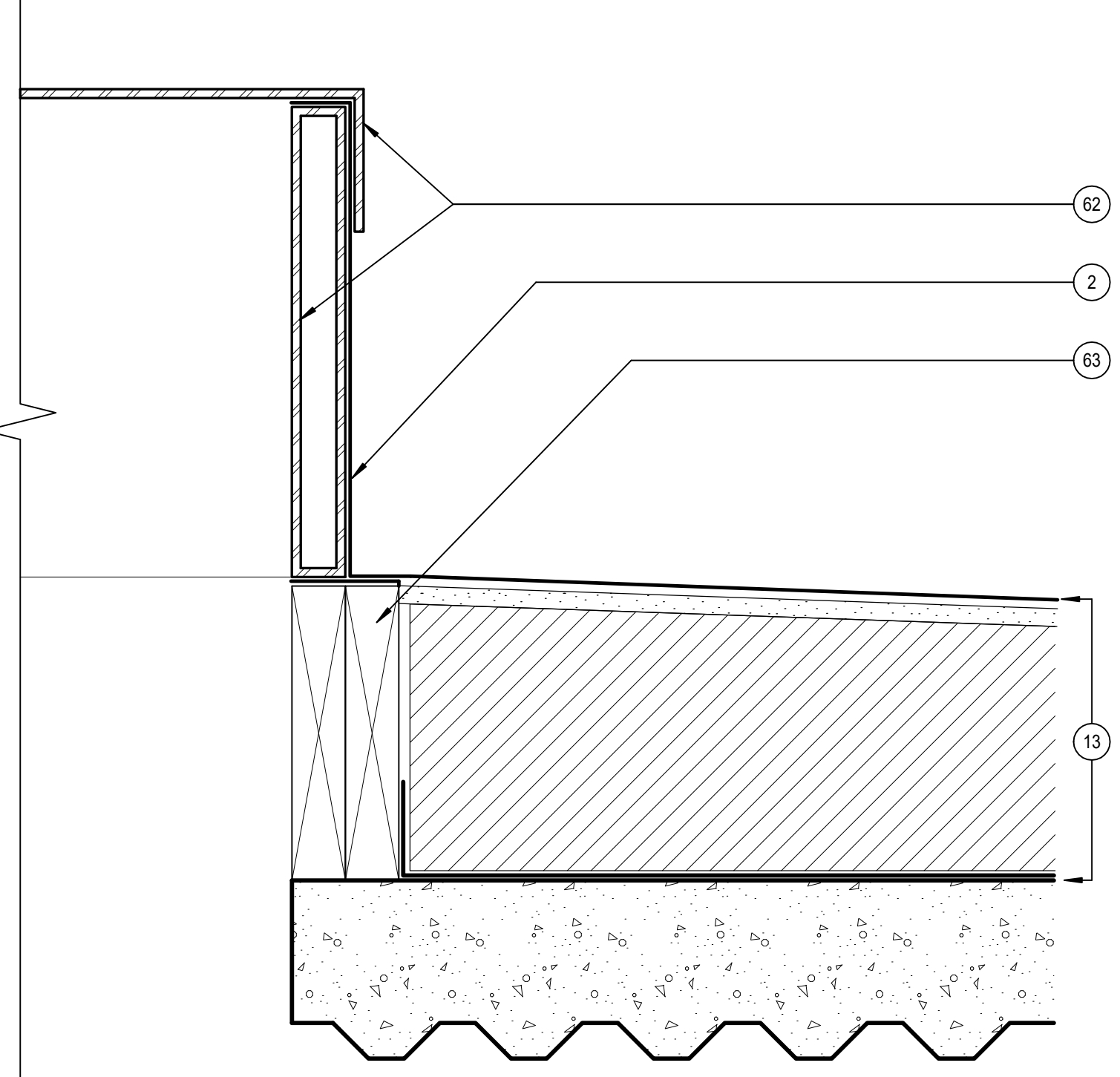
28 REVISED DRAIN - CONVENTIONAL - ROOF D
A.803.00 SCALE: NOT TO SCALE



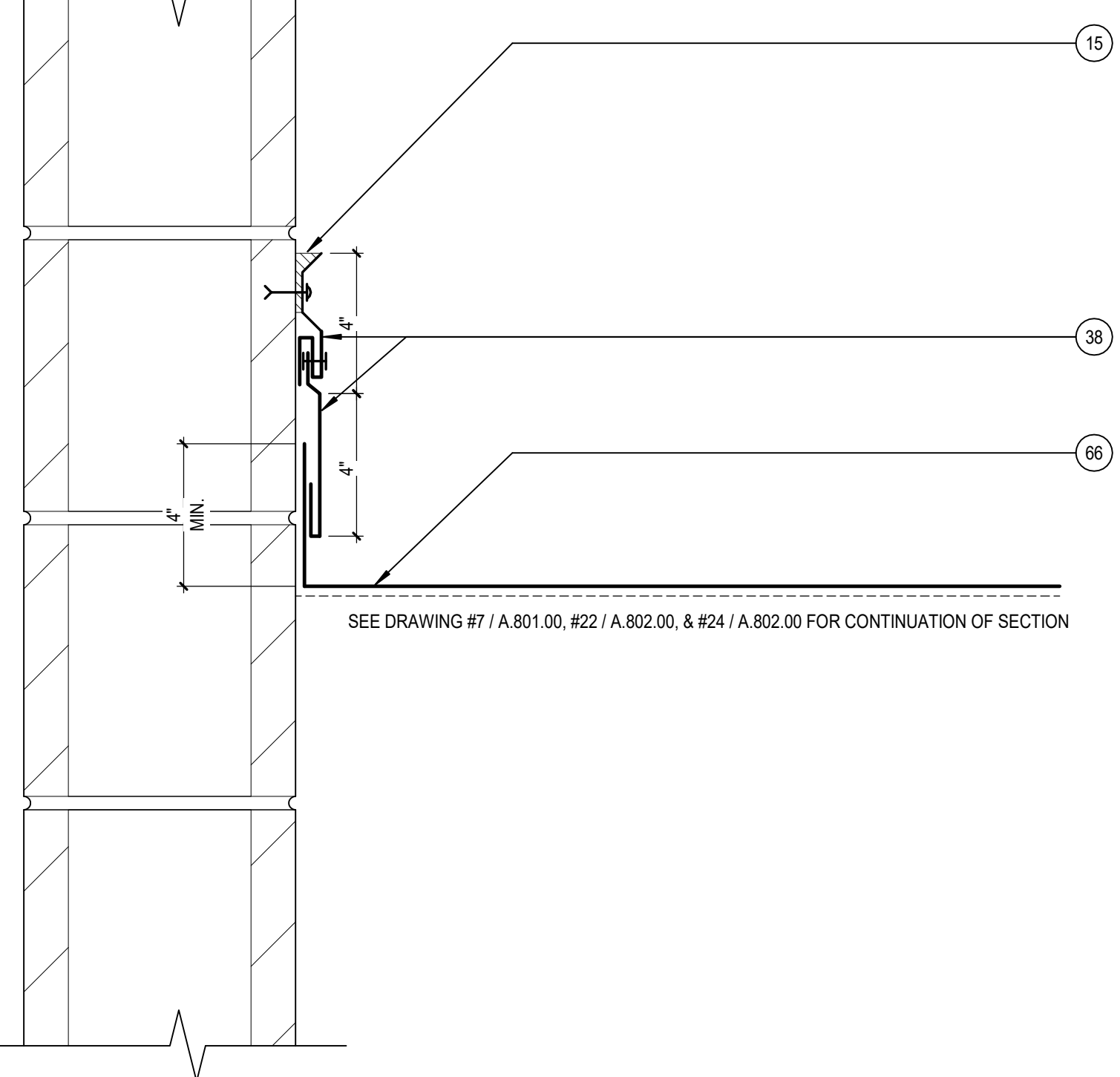
29 REVISED DUCT PENETRATION
A.803.00 SCALE: 3" = 1'-0"



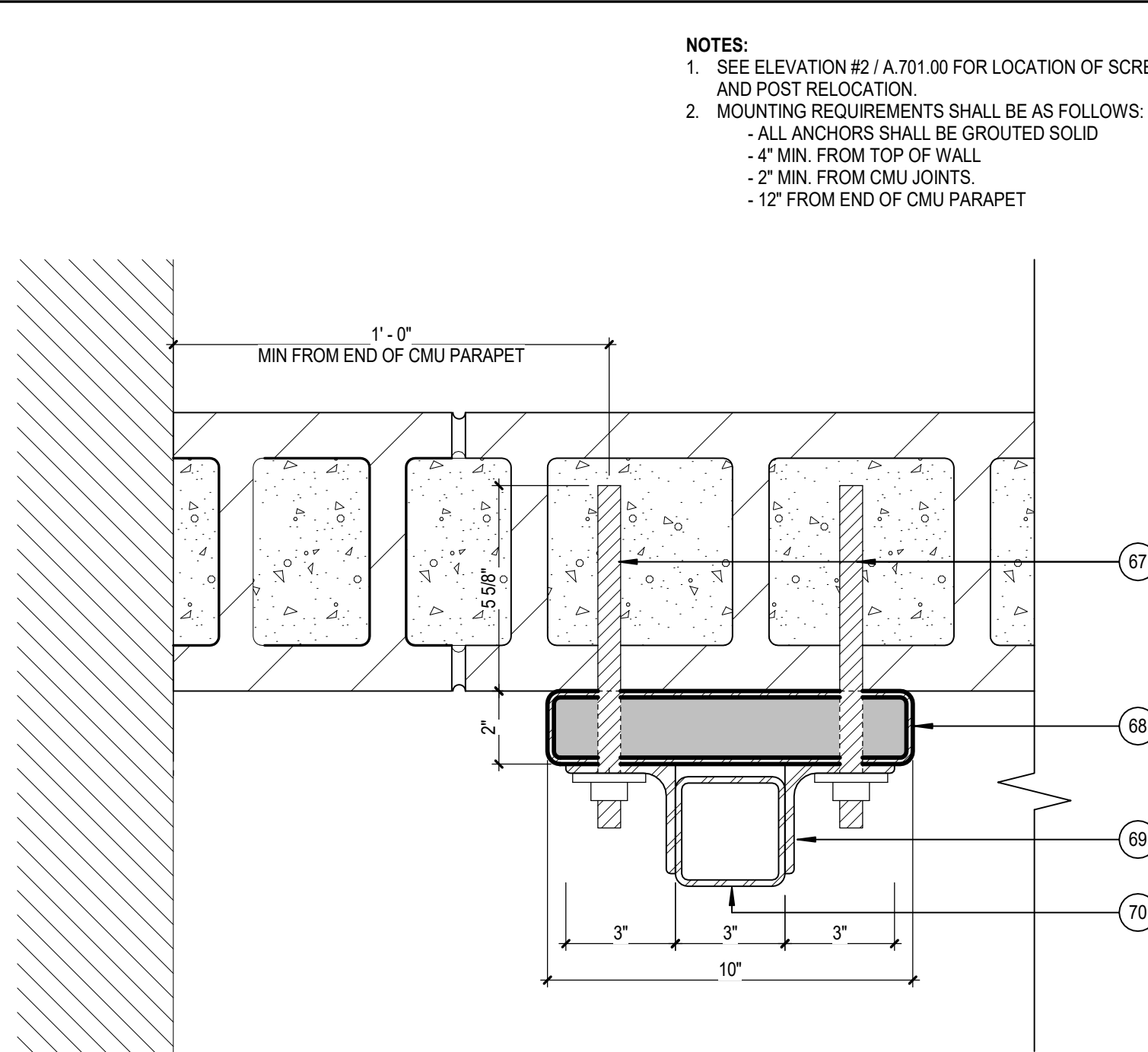
30 REVISED FAN CURB - ROOF D
A.803.00 SCALE: 3" = 1'-0"



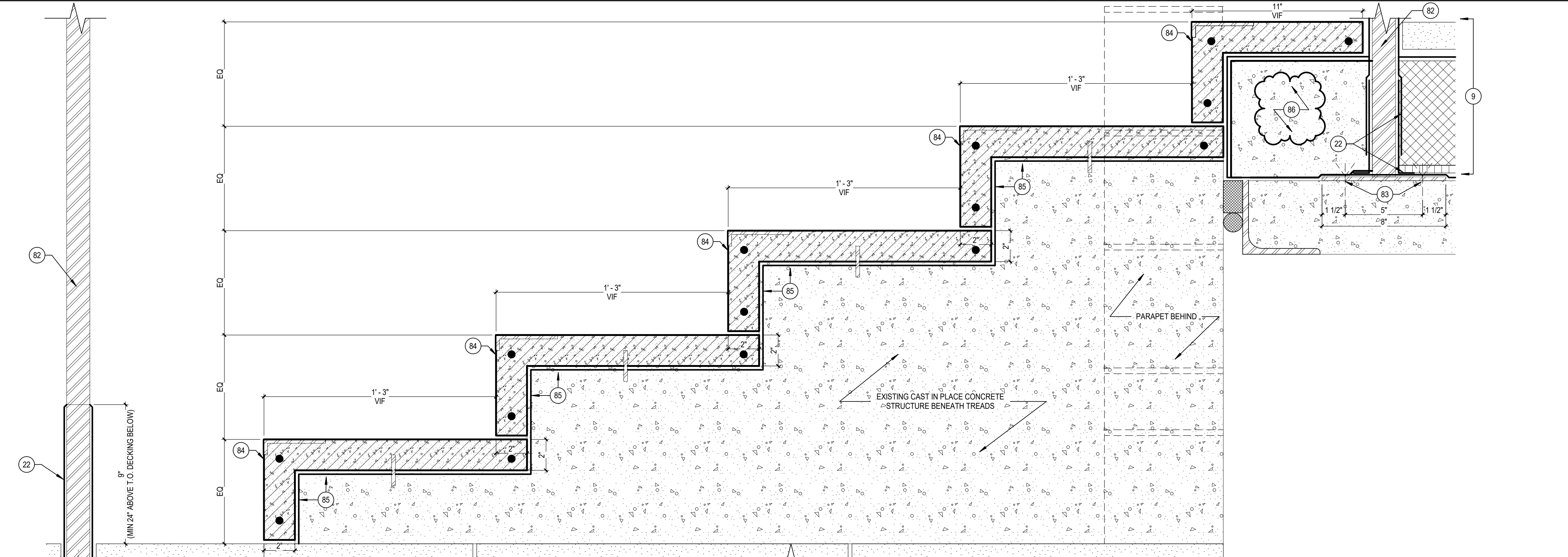
31 REVISED SMOKE HATCH - ROOF D
A.803.00 SCALE: 3" = 1'-0"



32 SURFACE MOUNTED CAP FLASHING
A.803.00 SCALE: 3" = 1'-0"



33 REVISED TOP OF PARAPET - TYPE II (PLAN SECTION)
A.803.00 SCALE: 3" = 1'-0"



34 NEW TREADS AND RAILING AT EXISTING STAIR
A.803.00 SCALE: 3" = 1'-0"

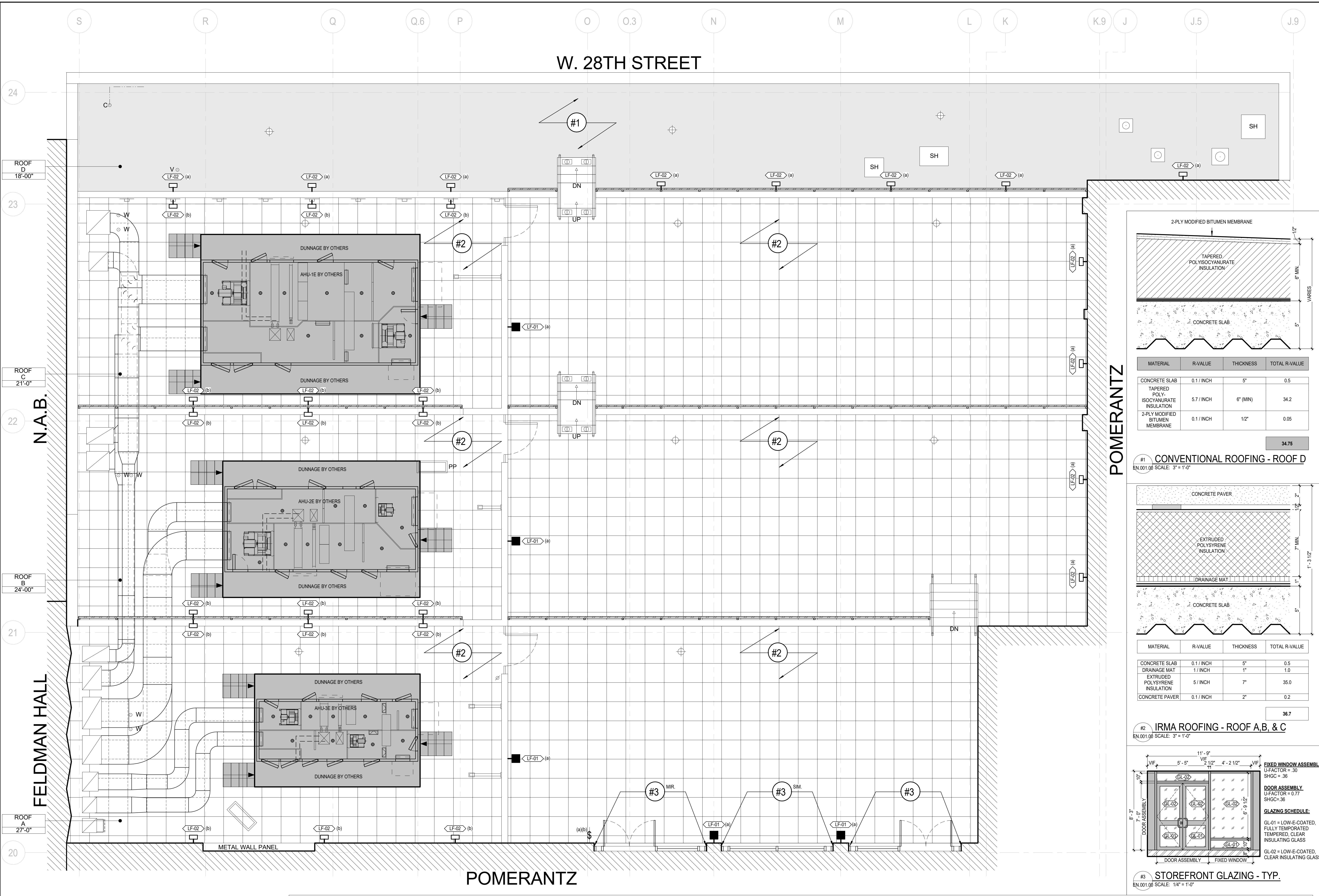
EXISTING - SHEET NOTES

- A CAP FLASHING RECEIVER - REMAINS - DO NOT BEND
- B CAP FLASHING EXTENSION AND CLEAT - REMOVE
- C CAP FLASHING - REMOVE
- D CANT - REMOVE
- E ROOFING MEMBRANE - REMOVE
- F COVER BOARD - REMOVE
- G INSULATION BOARD - REMOVE - THICKNESS VARIES
- H BASE SHEET - REMOVE
- I CONCRETE COPING - REMOVE
- J THROUGH-WALL FLASHING - REMOVE
- K STEEL ROD OR FENCE POST - CUT OFF EVEN WITH TOP OF CONCRETE MASONRY UNIT
- L MORTAR & DEBRIS - REMOVE TO 3" DEPTH
- M PRECAST CONCRETE PANELS - REMAIN - INSTALL AND MAINTAIN TEMPORARY SUPPORT
- N PRECAST CONCRETE PANEL - REMOVE AND SET ASIDE FOR REINSTALLATION
- O WATERPROOFING MEMBRANE - REMOVE
- P METAL SUBSTRATE EXTENSION - REMOVE
- Q MIN. AND MAX. DISTANCE BETWEEN METAL SHEATHING PANEL AND ROOF DECK EDGE
- R METAL SHEATHING PANEL TO REMAIN
- S REMOVE CAP FLASHING AT SIDES/ENDS OF CONCRETE PANELS
- T METAL SILL FLASHING - REMOVE EXPOSED PORTION
- U METAL TREAD - REMOVE
- V CONCRETE PAVERS - REMOVE AND DISCARD CUT PAVERS - SET ASIDE WHOLE PAVERS FOR RE-USE (TYP.)
- W SHIMS - REMOVE (TYP.)
- X PROTECTION BOARD - REMOVE (TYP.)
- Y METAL COPING, CLEATS, AND FASTENERS - REMOVE
- Z PLYWOOD SUBSTRATE AND FASTENERS - REMOVE
- ZA WALL STRAP AND STRAP FASTENERS - REMAIN
- ZB HVAC METAL CURB TO BE REMOVED BY OTHERS - PERFORM ALL NECESSARY WORK TO MAINTAIN ROOFING WATER-TIGHTNESS - CONCRETE CURB TO REMAIN
- 2C CUT OFF ANCHORS. COVER OPENINGS WITH URETHANE SEALANT. METAL ANCHORS, HSS TUBE, AND METAL SCREEN TO BE REFINISHED AND REINSTALLED WITH NEW ANCHORS AND SPACERS. NOTE: USE CAUTION TO NOT HARM EXISTING ANGLES WHILE REMOVING ANCHORS.
- 2D METAL COPING OR EXPANSION JOINT ASSEMBLY - REMAINS
- 2E COLD FLUID-APPLIED ROOFING - REMAINS
- 2F BARE CMU PARAPET. GC TO PREP FOR NEW BASE FLASHING

REVISED - SHEET NOTES

- 1 CAP FLASHING EXTENSION - RIVETS @ 24" O.C.
- 2 BASE FLASHING
- 3 CONCRETE PAVER
- 4 LOW PROFILE PEDESTAL
- 5 FABRIC MAT
- 6 INSULATION BOARD, IRMA
- 7 DRAINAGE MAT
- 8 ROOFING MEMBRANE, IRMA
- 9 INVERTED ROOF MEMBRANE ASSEMBLY "IRMA" - TYPICAL
- 10 INSULATION BOARD, CONVENTIONAL
- 11 COVER BOARD
- 12 ROOFING MEMBRANE, CONVENTIONAL
- 13 CONVENTIONAL ROOF ASSEMBLY ("CONVENTIONAL") - TYPICAL
- 14 MANUFACTURED FASCIA ASSEMBLY
- 15 SEALANT
- 16 WOOD BLOCKING - CONCRETE SCREWS, 2 ROWS - AT EACH END & 24" O.C. BETWEEN ENDS
- 17 WOOD SHIM, CONTINUOUS
- 18 BACKER ROD AND PASTE
- 19 CEMENTITIOUS FILL - THICKNESS VARIES
- 20 .050" ALUMINUM BASE INFILL - MASONRY ANCHORS @ 12" O.C. 1" FROM TOP, BOTTOM, AND SIDE EDGES
- 21 WATERPROOFING MEMBRANE
- 22 PMMA-BASED REINFORCED FLASHING
- 23 CUT PANEL TO FIT REVISED OPENING - RE-INSTALL
- 24 1/4" STAINLESS STEEL CONNECTING PIN 1/2" INTO EACH PANEL
- 25 1" WIDE 16 GAUGE GALVANIZED STRAP AT PANEL ENDS
- 26 FULL HEAD WEEP
- 27 TIN-COATED COPPER CAP FLASHING RECEIVER & EXTENSION - RIVETS @ 24" - FASTEN W/ MASONRY ANCHORS - 18" O.C.
- 28 CONCRETE FILL
- 29 S.S. SCREW & WASHER W/NEOPRENE INSERT @ 12" O.C.
- 30 TIN-COATED COPPER SURFACE-MOUNTED CAP FLASHING @ 12" O.C., STAGGERED
- 31 MEMBRANE TOP PLY
- 32 SILL FLASHING TURNS UP AT JAMB - FASTEN TO JAMB WITH 2 MASONRY ANCHORS - STRIP TO JAMB WITH REINFORCED PMMA-BASED FLASHING
- 33 NOT USED
- 34 SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH WOOD ANCHORS SPACED @ 24" EACH ROW, STAGGERED
- 35 EXPANSION JOINT/COPING ASSEMBLY - BY OTHERS
- 36 .040" ALUMINUM CAP FLASHING MATCHING COLOR/FINISH OF MANUFACTURED COPING/FASCIA ASSEMBLIES
- 37 SUBMIT SPACED HORIZONTALLY 24 INCHES APART - FASTEN WITH MASONRY ANCHORS SPACED @ 24" EACH ROW, STAGGERED
- 38 .032" ALUMINUM MANUFACTURED WALL PANEL
- 39 MANUFACTURED COPING ASSEMBLY
- 40 WOOD BLOCKING
- 41 WOOD BLOCKING - 2X12 - MATCH WIDTH OF PARAPET - INSTALL BETWEEN WALL STRAPS WITH 4 CONCRETE SCREWS PER PIECE
- 42 ALUMINUM PLATE, NON-SKID
- 43 HIGH PROFILE PEDESTALS & SHIMS
- 44 LEAD WEDGE @ RECEIVER ENDS & 24" BETWEEN ENDS
- 45 WOOD BLOCKING - TOP OF BLOCKING 2" SHORTER THAN TOP OF DUCT STUB - CONCRETE SCREWS @ 12"
- 46 HVAC DUCT STUB
- 47 WOOD BLOCKING - INSTALL AND FLASH AFTER DUCT EXTENSION IS INSTALLED (BY OTHERS)
- 48 HVAC DUCT EXTENSION
- 49 .040" ALUMINUM DUCT CURB CAP FLASHING - FASTEN TO DUCT EXTENSION WITH STAINLESS STEEL SCREWS @ 8"
- 50 DRAIN GRATING
- 51 PASTE
- 52 EXISTING CAST IRON DRAIN ASSEMBLY - REMAINS - FURNISH CAST IRON COVER WHERE EXISTING COVER IS PLASTIC OR DAMAGED
- 53 DRAIN EXTENSION & GASKET ASSEMBLY - NON-ADJUSTABLE
- 54 TAPERED EDGE
- 55 EXISTING FAN CURB - REMAINS
- 56 EXISTING FAN CURB - REMOVE AND RESTORE AS NEEDED
- 57 GASKET
- 58 WOOD BLOCKING - BY OTHERS
- 59 REMOVED EXISTING SMOKE HATCH AND RESET ON BLOCKING
- 60 WOOD BLOCKING MATCHING THICKNESS OF ROOF
- 61 BASE SHEET
- 62 TIN-COATED COPPER SILL FLASHING & RECEIVER - RIVETS @ 24"
- 63 HOT DIPPED GALVANIZED 5/8 INCH DIAMETER X 6 1/2" LONG HILTI Kwik-HUZ EZ DRILLED INTO SOLID GROUTED CMU
- 64 WELD AND TAP ANCHOR LOCATIONS ON NEW HSS (10"x20"x3/16") SPACER. SPACER LENGTH SHALL BE 11" LONG TO MATCH L-ANGLE HEIGHT. WELD HSS TO ALL EDGES @ EXISTING L-ANGLE (5"x3"x3/16") SUPPORTING SQUARE TUBE (2"x2"x3/16") SCREEN. GC MAY SUBMIT SUBSTITUTE SPACER.
- 65 EXISTING L-ANGLE (1"x2"x3/16")
- 66 EXISTING SQUARE TUBE (2"x2"x3/16") SCREEN
- 67 3.5"x3.5"x3/16" GALVANIZED L-ANGLE WELDED TO 1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL
- 68 1.5" GALVANIZED SQUARE TUBE RAILING GUARDRAIL, INTERMEDIATE MEMBERS SHALL BE INSTALLED NO MORE THAN 19 INCHES APART.
- 69 BEGA 33 818 WALL LUMINAIR DIRECT LIGHT, FASTENED FIXTURE, ADAPTER PLATE, AND JUNCTION BOX TO GUARDRAIL. SEE LIGHTING PLAN FOR LOCATION
- 70 GALVANIZED CONDUIT
- 71 6" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE SLAB BELOW
- 72 16 GA 8" GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE ABOVE. PROVIDE KICKERS TO BRACE WALL
- 73 DELEGATED DESIGN - GALVANIZED COLD FORM FRAMING WITH MASONRY ANCHORS - 24" OC @ EACH ENDS & CONCRETE SLAB BELOW. "MATCH JOINT" SPOT ELEVATION
- 74 AT EACH ROOF, PROVIDE 1 PHOTOCELL AT TOP OF POST. (4 TOTAL)
- 75 BLACK 3/4" THICK (30M) SOLID SURFACE SADDLE
- 76 PAINT NEW INTERIOR WALL TO MATCH EXIST
- 77 4" TALL WHITE RESILIENT STRAIGHT BASE
- 78 1.5" GALVANIZED SQUARE TUBE GUARDRAIL, PAINTED BLACK
- 79 1.5" GALVANIZED SQUARE 8"x8"x1/4" PLATE. (4) HOT-DIPPED GALVANIZED 5/8 INCH DIAMETER X 4 INCH LONG HILTI KWIK HUZ EZ DRILLED INTO CONCRETE SLAB
- 80 CAST IN PLACE CONCRETE TREADS WITH CAST ABRASIVE NOISING. SET ON S.S. KEYS 12 INCHES O.C. SEE SECTION 054500.
- 81 WRAP EXISTING CONCRETE WITH REINFORCED PMMA-BASED FLASHING - BELOW RISERTREAD. INSTALL ADDITIONAL WEATHERING LAYER OF PMMA-BASED FLASHING, WHILE WET EMBED QUARTZ. TO REJECTION
- 82 POUR CAST IN PLACE CONCRETE AT TOP TREAD

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ROOF PLAN - ENERGY CODE

SCALE: 1/4" = 1'-0"

NYCECC 2020 TABULAR ANALYSIS					
NYCECC CITATION	PROVISION	ITEM DESCRIPTION	CODE PRESCRIPTIVE VALUE	PROPOSED DESIGN VALUE	DOCUMENTATION
C401.2.2	PREScriptive COMPLIANCE PATH	APPLICABILITY	THE REQUIREMENTS OF SECTIONS C402 THROUGH C405 AND C408. IN ADDITION, COMMERCIAL BUILDINGS SHALL COMPLY WITH SECTION C406 AND TENANT SPACES SHALL COMPLY WITH SECTION C406.1.1	PREScriptive COMPLIANCE PATH	EN.001.00
C402.1.3	OPAQUE THERMAL ENVELOPE INSULATION COMPONENT (TABLE)	INSULATION ENTIRELY ABOVE ROOF DECK	CLIMATE ZONE 4 = R-C33gi	SEE IRMA A CONVENTIONAL ROOFING PREScriptive CALCULATIONS #1 & #2	EN.001.00
C402.1.3	OPAQUE THERMAL ENVELOPE INSULATION COMPONENT (TABLE)	WALLS, ABOVE GRADE, WALLS, BELOW GRADE, FLOORS, SLABS-ON-GRADE, OPAQUE DOORS	N/A, NO SCOPE	N/A	N/A
C402.1.4	OPAQUE THERMAL ENVELOPE INSULATION COMPONENT (TABLE)	INSULATION ENTIRELY ABOVE ROOF DECK	CLIMATE ZONE 4 = U=0.030	SEE IRMA A CONVENTIONAL ROOFING PREScriptive CALCULATIONS #1 & #2	EN.001.00
C402.1.4	OPAQUE THERMAL ENVELOPE INSULATION COMPONENT (TABLE)	WALLS, ABOVE GRADE, WALLS, BELOW GRADE, FLOORS, SLABS-ON-GRADE, OPAQUE DOORS	N/A, NO SCOPE	N/A	N/A
C402.2.1	ROOF ASSEMBLY	THE MINIMUM THERMAL RESISTANCE (R-VALUE) OF THE INSULATING MATERIAL INSTALLED EITHER BETWEEN THE ROOF FRAMING OR CONTINUOUSLY ON THE ROOF ASSEMBLY SHALL BE AS SPECIFIED IN TABLE C402.1.3, BASED ON CONSTRUCTION MATERIALS USED IN THE ROOF ASSEMBLY. CONTINUOUS INSULATION BOARD SHALL BE INSTALLED IN NOT LESS THAN 2 LAYERS AND THE EDGE JOINTS BETWEEN EACH LAYER OF INSULATION SHALL BE STAGGERED.	CLIMATE ZONE 4 = R-C33gi	R-VALUE TABULATION FACTORS MINIMUM REQUIRED INSULATION	EN.001.00
C402.3	ROOF SOLAR REFLECTANCE AND THERMAL EMITTANCE	LOW-SLOPED ROOFS DIRECTLY ABOVE COOLED CONDITIONED SPACES IN CLIMATE ZONES 1, 2 AND 3 SHALL COMPLY WITH ONE OR MORE OF THE OPTIONS IN TABLE C402.3	THREE-YEAR-AGED SOLAR REFLECTANCE INDEX OF 55 AND 3 YEAR AGED THERMAL EMITTANCE OF 0.75 OR THREE-YEAR-AGED SOLAR REFLECTANCE INDEX OF 64	N/A, CLIMATE ZONE 4	N/A
C402.4 (TABLE)	BUILDING ENVELOPE FENESTRATION MAXIMUM U-FACTOR AND SHGC REQUIREMENTS	METAL FRAMING FIXED (BELOW 95) = 0.30 U-FACTOR & 0.36 SHGC. ENTRANCE DOORS (BELOW 95) = 0.77 U-FACTOR & 0.36 SHGC		SEE STOREFRONT ELEVATION DETAIL #3	EN.001.00
C405.2.6	EXTERIOR LIGHTING CONTROLS	EXTERIOR LIGHTING SYSTEMS SHALL BE PROVIDED WITH CONTROLS THAT COMPLY WITH SECTIONS C405.2.6.1 THROUGH C405.2.6.5	COMPLIES WITH C405.2.6.1	SEE LIGHTING NOTE #1	EN.001.00
C405.2.6.1	DAYLIGHT SHUTOFF	LIGHTS SHALL BE AUTOMATICALLY TURNED OFF WHEN DAYLIGHT IS PRESENT AND SATISFIES THE LIGHTING NEEDS.	COMPLIES WITH C405.2.6.1	SEE LIGHTING NOTE #1	EN.001.00
C405.4.2(1) TABLE	EXTERIOR LIGHTING ZONES	(1) DEVELOPED AREAS OF NATIONAL PARKS, STATE PARKS, FOREST LAND, AND RURAL AREAS. (2) AREAS PREDOMINANTLY CONSISTING OF RESIDENTIAL ZONING, NEIGHBORHOOD BUSINESS DISTRICTS, LIGHT INDUSTRIAL WITH LIMITED NIGHTTIME USE AND RESIDENTIAL MIXED-USE AREAS (3) ALL OTHER AREAS NOT CLASSIFIED AS LIGHTING ZONE 1, 2 OR 4. (4) HIGH-ACTIVITY COMMERCIAL DISTRICTS IN MAJOR METROPOLITAN AREAS AS DESIGNATED BY THE LOCAL LAND USE PLANNING AUTHORITY	ZONE 3 - ALL OTHER AREAS NOT CLASSIFIED AS LIGHTING ZONE 1, 2 OR 4	LIGHTING ZONE 3	EN.001.00
C405.4.2(2) TABLE	LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS	ZONE 3 WALKWAY AND RAMPS 10 FEET WIDE OR GREATER, PLAZA AREAS, SPECIAL FEATURE AREAS - 11W / SQ. FT.	11 W / SQ. FT. = 880 WATTS ALLOWED @ 800 SF	693.5 WATTS < 880 WATTS ALLOWED FOR 8,000 SF	EN.001.00

ARCHITECTURAL LEGEND

EXISTING BUILDING

IRMA ROOFING WITH 2X2 CONCRETE PAVERS

CONVENTIONAL TAPERED INSULATION ROOFING

LIGHTING PLAN LEGEND

LF-01

LF-02

LF-02 (a)

LF-02 (b)

PC

PHOTOCELL

LIGHTING NOTES

A. ALL LIGHTS SHALL BE CONTROLLED BY ONE PHOTOCELL AND A MANUAL ON/OFF LOCATED AT THE EXTERIOR AT ROOF LEVEL. A LOCATION TO BE VERIFIED IN FIELD FOR OPTIMUM DAYLIGHT.

B. LIGHTS SHALL HAVE 2 ZONES TOTAL. 1 FOR THE LIGHTS AT THE ROOFTOP MECHANICAL UNITS AND 1 FOR THE OPEN AREA.

C. ALL CONDUIT SHALL BE GALVANIZED AND EXTERIOR RATED.

D. CONDUIT MAY NOT PENETRATE THE ROOFING ASSEMBLY.

E. SEE SHEET NOTES FOR MOUNTING HEIGHTS ABOVE NEAREST PAVEMENT.

F. REFER TO SPECIFICATION SECTIONS 285000, 260159, 260533, & 265100 FOR ELECTRICAL, WIRE, AND CONDUIT INFORMATION.

ADDITION #1 ADDS ELECTRICAL SPECIFICATION TO THE PROJECT MANUAL

BUILDING DEPARTMENT NOTES

1. THE FOLLOWING NOTES SHALL APPLY THROUGHOUT:

A. WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LAWS AND BY-LAWS BEARING ON THE PERFORMANCE AND EXECUTION OF THE WORK.

B. THIS APPLICATION IS SUBJECT TO BUILDING CODE 2022 FOR COMPLIANCE WITH CHAPTERS 1, 17, & 33 REGARDING ADMINISTRATION, INSPECTIONS, AND SAFETY REQUIREMENTS. A. THE ROOF OF THIS IS NOT OCCUPABLE AND WILL REMAIN NON OCCUPABLE. THE BUILDING IS CLASSIFIED AS ONE STORY AND THE MAIN BUILDING OCCUPANCY GROUP CLASSIFICATION F-1B (AMPHITHEATRE) & CONSTRUCTION CLASSIFICATION 1B (FIREPROOF CONSTRUCTION)

C. AVAILABLE RECORDS INDICATE THE AMPHITHEATRE RECEIVED AN AMENDED CERTIFICATE OF OCCUPANCY DATED ON 02/11/02 FOR THE CELLAR AND FIRST FLOOR.

D. ALL MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING REQUIREMENTS:

A. THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE BY THE BOARD OF STANDARDS AND APPEALS (OR)

B. THEY SHALL HAVE BEEN ACCEPTED FOR THE USE UNDER THE PRESCRIBED TEST METHODS BY THE COMMISSIONER (OR)

C. APPROVED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH (OTCR)

D. APPROVED BY THE OTCR

E. THESE DRAWINGS HAVE BEEN PREPARED BY OR AT THE DIRECTION OF THE UNDERSIGNED AND TO THE BEST OF THE UNDERSIGNED'S KNOWLEDGE, INFORMATION AND BELIEF MEET THE REQUIREMENTS OF THE BUILDING CODE

F. ALL NEW WORK SHALL COMPLY WITH THE 2022 NYCECC

G. TR-1 SHALL BE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE OWNER PRIOR TO APPLYING FOR CONSTRUCTION PERMITS.

H. FOLLOWING CHAPTER 33 OF THE 2013 NYCECC, PROTECTIONS OF THE PUBLIC AND THE ADJACENT PROPERTIES REFERENCES IN THE SPECIFICATIONS AND THE DRAWINGS TO THE 1988 BUILDING CODE PARAGRAPHS REGARDING PROTECTION SHALL BE CONSIDERED TO BE THAT OF CHAPTER 33 OF THE NYCECC.

PROTECTIVE OVERHEAD BRIDGING

1. NYC DOB REQUIRED PROTECTIVE SIDEWALK BRIDGING TO BE INCLUDED IN CONTRACT WORK.

2. MINIMUM 6'-0" HIGH CLEARANCE AT SIDEWALK, WATERPROOF PLANKING DECK AND 4'-0" PARAPETS.

3. PROVIDE 24 HR. LIGHTING AND SECURITY SYSTEMS.

4. PROVIDE PROTECTIVE BRIDGE STEEL POST & BOLTS AT PEDESTRIAN LEVEL.

5. ALL WORK TO BE PERFORMED BY EXPERIENCED CREW AND LICENSED INSURED CONTRACTOR.

6. PROTECT ALL PLANTING AREAS & TREES AGAINST DAMAGE.

7. COORDINATION SHED WITH EXISTING SHED AT NEW ACADEMIC BUILDING.

CODE REFERENCES

1988 NEW YORK CITY BUILDING CODE

2022 BUILDING CODE OF THE CITY OF NEW YORK (2022 NYC)

2022 PLUMBING CODE OF THE CITY OF NEW YORK

2022 MECHANICAL CODE OF THE CITY OF NEW YORK

2022 FUEL GAS CODE OF THE CITY OF NEW YORK

2020 NEW YORK CITY ENERGY CONSERVATION CODE (NYCECC)

2022 NEW YORK CITY ELECTRICAL CODE WITH AMENDMENTS TO NFPA-70 2010

2022 NEW YORK CITY FIRE CODE WITH AMENDMENTS TO NFPA-72 2010

2009 CC/ANSI 11.1-2009

REQ. CONTROLLED INSPECTIONS

SPECIAL INSPECTION ITEMS:

INSULATION & R-VALUES

ENERGY CODE COMPLIANCE

FINAL INSPECTION

1RCNY5000-01(H)(1)&(2)

BC110.3.5

BC109.5110.5 DIRECTIVE 14 / 1975

ENERGY CODE

TO THE BEST OF KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THIS APPLICATION IS IN COMPLIANCE WITH THE NYCECC 2020 AND THE NEW YORK STATE ENERGY CONSERVATION CODE 2020

FLOOD ZONE

THIS PROJECT IS LOCATED WITHIN FLOOD ZONE X ACCORDING TO FEMA FIRM MAP 450640201F EFFECTIVE 05/05/07

ZONING NOTES

ADDRESS: 300 SEVENTH AVE, NY, NY 10001

BLOCK: 777

LOT: 37

ZONING MAP: 8D

ZONING DISTRICT: 26-2A

NO CHANGE TO USE, EGRESS, OR OCCUPANCY

PROJECT DESCRIPTION

THE SCOPE OF THE PROJECT INCLUDES REMOVALS OF EXISTING ROOFING SYSTEMS, STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, METAL FLASHING AND LIGHT FIXTURES. ALL EXISTING MECHANICAL EQUIPMENT TO BE REPLACED UNDER SEPARATE PROJECT WITH FIT. THE REMOVAL, RESTORATION, AND REPLACEMENT OF ROOFING MATERIAL AT MECHANICAL UNITS WILL BE IN COORDINATION WITH THE NEW HVAC UNITS.

THE SCOPE ALSO INCLUDES THE INSTALLATION OF NEW ROOFING SYSTEMS, NEW METAL FLASHING, AND REINSTALLATION OF THE STEEL GUARDRAILS, STEEL SCREEN, STEEL STAIRS, AND EXTERIOR LIGHTING. THIS PORTION OF THE BUILDING WAS BUILT IN 2002 AND THE OCCUPIED FLOOR BELOW THE ROOF INCLUDES AN PUBLIC ASSEMBLY HALL & SUPPORTING PROGRAM.

DLR GROUP

© DLR Group

EAST COURTYARD ROOF REPLACEMENT

57-23106

ADDENDUM #2

02/16/24

REVISIONS

57-23106

ROOF PLAN - ENERGY CODE

EN.001.00