



NOTICE TO ALL FIRMS

Date: March 28, 2022
To: All Prospective Bidders
From: Sam Li
Deputy Director for Purchasing
Re: Addendum Number 3
IFB C1519R – West Courtyard Roof Renovation

Notes:

1. **The bid due date is April 1, 2022, 12:00 PM. Your bid must be emailed to Purchasingbids@fitnyc.edu by April 1, 2022, on or before 12:00 PM.**
2. The following additions, deletions, and/or changes or clarifications to the drawings, specifications, and bidding documents for this project, shall become and are hereby made part of the Contract Documents. They change the original documents only in the manner and to the extent stated.

This addendum consists of (6) specifications, (6) drawings, and Bidder questions and response.

- I. Project Manual:
 - A. Division 00 – Building Procurement Requirements
 1. Section III, Para. XII, #2: Change '1-Year' to '5-Year'.
 - B. 011000 Summary
 2. See attached revised spec with revisions in BOLD.
 - C. 024119 Selective Demolition
 1. See attached revised spec with revisions in BOLD.
 - D. 070150.19 Preparation for Re-roofing
 1. See attached revised spec with revisions in BOLD.
 - E. 075216 Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing
 3. See attached revised spec with revisions in BOLD.
 - F. 075900 Leak Detection System
 1. See attached revised spec with revisions in BOLD.
 - G. 077100 Roof Specialties

1. See attached revised spec with revisions in BOLD.

II. Drawings:

A. Architectural, Sheet G-001.01 Cover, General Notes and Project Info

1. See revision clouds.

B. Architectural, Sheet A-102.01 Roof Plan

2. See revision clouds.

C. Architectural, Sheet A-201.01 Elevations and Section

1. See revision clouds.

E. Architectural, Sheet A-501.01 Details

2. See revision clouds.

F. Architectural, Sheet A-502.01 Details

1. See revision clouds.

G. Architectural, Sheet A-503.01 Details

1. See revision clouds.

Question:

Q1. Please confirm if the East elevation grade area will be closed off to all pedestrians. This area boundaries against a closed off area with construction equipment. Area is below 40 Feet, sidewalk sheds are not required. Is a Construction fence required to close off the area?

A1. Yes, I also suggest using the double doors outside Starbucks for job access and putting a porta potty there

Q2. Please verify that the South elevation, public space below, can be a Contract Access Zone (CAZ). There is about a 2'-3' opening between the height of the parapet, and the structure above, but the space is open to the public with egress doors. Area is below 40 Feet, sidewalk sheds are not required.

A2. The space to the south of the west courtyard roof is the public Breezeway space used heavily by students. This space CANNOT be used as a Construction Access Zone (CAZ). Also, the contractor shall be responsible for enclosing and protecting the approximately 2'-3" gap between the roof parapet on this south side and the ceiling/building underside above to ensure no construction debris may fall from the roof project and this student public space.

Q3. Please verify if the West elevation space, along the existing railing that is to be removed, repaired, and reinstalled, can be closed off with construction fencing along the terrace space for safety CAZ zone.

A3. Yes.

- Q4. Please verify that manpower can access the roof from the interior stairway entrance along 27th Ave., or if exterior access is required.
- A4. See answer to question 1.
- Q5. Please verify that all materials and debris should be handled via exterior hoist tower and not through the interior.
- A5. Yes, on 28th Street.
- Q6. Regarding the leak detection system, how far is the monitoring workstation from the roof area? The Sensor wire runs through building to the Monitoring panel, and we run a single data wire between monitoring panels. M2P's and or M2's hubs are located in the panel inside the building or one of the weather tight units on one of the roof areas., please confirm? The hubs require 110V power and can run on a non-dedicated power supply. Ingress into the building through the roof deck and any conduits into and through the building. Please verify.
- A6. LOCATION OF MONITORING WORKSTATION TO BE FINALIZED DURING PROJECT PERFORMANCE. PRELIMINARY PLAN CALLS FOR STATION TO BE LOCATED IN WEST COURTYARD ROOF STAIRWELL.
- Q7. Please confirm that the Cementitious board insulation by T-Clear, will require stainless steel straps fastened through the board at all joints, and if so, how wide should the straps be?
- A7. STAINLESS STEEL STRAPS FASTENED THROUGH THE CEMENTITIOUS BOARD INSULATION AT ALL JOINTS ARE NOT REQUIRED.
- Q8. Please confirm if there are any liquidated damages.
- A8. There are no liquidated damages.
- Q9. Please confirm all temporary protection required for the new mechanical equipment is by others.
- A9. CORRECT. PER THE SEPARATE MECHANICAL UNIT REPLACEMENT CONTRACT THAT AWARDED CONTRACTOR WILL PROVIDE TEMPORARY PROTECTION AND CAPPING OF THE HVAC SYSTEMS FOR THE DURATION OF THE ROOF RENOVATION PROJECT.
- Q10. Please confirm the flashing system at the parapets. 1st ply Paradiene 20, 2nd Ply Parapro 123? Some of the details show the flashing extending onto the top of parapet, and tying into the gravel stops, we assume this is Parapro 123.
- A10. SEE SECTION 075216, 2.3, FOR MATERIAL REQUIREMENTS FOR 2-PLY MEMBRANE FLASHINGS AT PARAPETS. STRIPPING AT GRAVEL STOPS SHALL BE SAME ASSEMBLY AS MEMBRANE FLASHING.
- Q11. Please confirm where the Siplast Veral Aluminum is intended to be used.
- A11. SEE SECTION 075216, 2.3 AND 3.3E, FOR MATERIAL AND EXECUTION REQUIREMENTS FOR 2-PLY MEMBRANE FLASHINGS.
- Q12. Please confirm that the Vapor Barrier is to remain 100% and should not include an allowance for replacement.
- A12. VAPOR BARRIER SHALL REMAIN AS SHOWN ON DRAWINGS.
- Q13. Please confirm if restrooms will be made available for manpower, or if Portasans should be figured.

A13. See answer to question 1.

Q14. Please confirm is a Site Safety Plan and Site Safety Manager are required.

A14. Yes.

Q15. Please confirm temporary power will be provided.

A15. Yes.

Q16. You guys have in the spec that there is a 5-year Contractor's Guaranty. This is an issue for the Bonding Company unless I get a clarification. Can you please confirm that the intent is to have a 5 years Contractor's Guaranty and a 30-year Manufacturer's Warranty that is exclusive of the P&P Bonds? Specifically, please confirm that the Maintenance Bond that comes with the P&P Bonds for this project, is the bonding company's standard 1 year term and not the length of the Contractor's Guaranty or Manufacturer's Warranty. They will not issue a bid bond unless this is confirmed.

A16. A separate maintenance bond is not required – the maintenance bond (1-year term) is included in the required payment and performance bond.

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

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 No. 1: Leak detection system.

1. Base Bid: Do not provide leak detection system.
2. Alternate: Provide leak detection system as indicated on drawings and as specified in Section 075900 "Leak Detection System."

END OF SECTION 012300

SECTION 075216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS
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:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. Roof insulation.
3. Walkway ~~and ballast~~ (ADD1) pavers.

B. Related Requirements:

1. Section 035216 "Lightweight Insulating Concrete" for insulating concrete substrate.
2. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
3. Section 077100 "Roof Specialties" for premanufactured metal copings and roof edge flashings.
4. Section 077129 "Manufactured Roof Expansion Joints" for premanufactured roof expansion-joint 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, roofing system manufacturer's representative, deck Installer, 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 type of 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. Performance Requirement Certificate: Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of complying with performance requirements.
 2. Guarantee Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for guarantee.
- 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 guarantee.

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 sheet, 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 guarantee.
- D. Project Acceptance: Submit a completed manufacturer's application for roof guarantee form along with shop drawings of the roofs showing all dimensions, penetrations, and details. The form shall contain all the technical information applicable to the project including 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. The form shall also contain accurate and complete information requested including proper names, addresses, zip codes and telephone numbers. 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: Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. 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 final inspection upon successful completion of the project.

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. **Roof SBS Waterproofing System (ADD1) Guarantee:** Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the roof system manufacturer's 30 year labor and materials roof system guarantee. The roof system guarantee shall include but not be limited to both the roofing and flashing membranes, and the specified new lightweight insulating concrete system consisting of aggregate fill, pre-generated foam, pre-formed polystyrene panels, and base sheet fasteners. All repair or replacement costs covered under the guarantee shall be borne by the roofing membrane

manufacturer. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and be issued at no additional cost to the Owner. Specific items covered under the roof system guarantee include:

1. The actual resistance to heat flow through the roof insulation will be at least 80 percent of the design thermal resistance, provided that the roofing membrane is free of leaks;
2. Should a roof leak occur, the insulating performance of the roof insulation will be at least 80 percent of the design thermal resistance within a 2 year period following repair of the leak.
3. The roof insulation will remain in a reroofable condition should the roof membrane require replacement (excluding damage caused by fastener pullout during removal of the old membrane.)
4. The roof insulation material will not cause structural damage to the building as a result of expansion from thermal or chemical action.
5. Warranty also includes lightweight insulating concrete system as specified in Section 035216 "Lightweight Insulating Concrete."
6. Warranty also includes coping and roof edge systems produced by roofing manufacturer and specified in Section 077100 "Roof Specialties."
7. Warranty also includes expansion joints produced by roofing manufacturer and specified in Section 077129 "Manufactured Roof Expansion Joints."
8. Warranty also includes removal and restoration of overburden for investigation and repair of deficiencies covered by warranty.

B. Insulation Warranty:

1. Manufacturer agrees to repair or replace components of insulation system that fail in materials or workmanship within specified warranty period.
 - a. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOFING SYSTEM, GENERAL

- A. Roofing Membrane Assembly: A roof membrane assembly consisting of a base sheet and two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate.
1. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend and coated one side with a torch grade SBS bitumen blend adhesive layer.
 2. The cross sectional area of the sheet material shall contain no oxidized or non-SBS modified bitumen.
 3. The adhesive layer shall be manufactured using a process that embosses the surface with a grooved pattern to provide optimum burn off of the plastic film and to maximize application rates.

4. The roof system shall pass 500 cycles of ASTM D5849 Resistance to Cyclic Joint Displacement (fatigue) at 14 deg. F. Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles.
5. The roof system shall pass 200 cycles of ASTM D5849 after heat conditioning performed in accordance with ASTM D 5147.
6. The assembly shall possess waterproofing capability, such that a phased roof application, with only the base sheet and modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

2.2 ROOFING SYSTEM PRODUCTS

- A. Lightweight Insulating Concrete Substrate: As specified in Section 035216 “Lightweight Insulating Concrete.”
- B. Base Sheet: ASTM D4601, Type II. Lightweight random fibrous glass mat, impregnated and coated with specially formulated, high quality oxidized asphalt and a polyolefin film backing; nailable.
 1. Basis-of-Design Product: Siplast Parabase FS.
- C. First Ply: ASTM D6163 Type II, Grade S. Fiberglass scrim/fiberglass mat composite impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen. The top surface is covered with a silica parting agent, and the back surface is embossed with a grooved pattern to provide optimum burnoff of the plastic film and maximize application rates.
 1. Basis-of-Design Product: Siplast Paradiene 20 EG TG.
- D. Second Ply: ASTM D6162 Type II, Grade S. Fiberglass scrim/polyester mat composite impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen. The top and bottom surfaces of the sheet are covered with a silica parting agent.
 1. Basis-of-Design Product: Siplast Teranap 1M Sand.

2.3 FLASHING

- A. Flashing, First Ply at Masonry and Metal: ASTM D6163 Type II, Grade S. Fiberglass scrim/fiberglass mat composite impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen. The top surface is covered with a silica parting agent, and the back surface is embossed with a grooved pattern to provide optimum burnoff of the plastic film and maximize application rates.
 1. Basis-of-Design Product: Siplast Paradiene 20 EG TG.
- B. Flashing, First Ply at Wood: lightweight random fibrous glass mat impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen. The back surface is coated with

a self-adhesive bitumen layer specifically formulated for optimum adhesion in low-slope membrane applications, and it is lined with a high strength polyolefin release film.

1. Basis-of-Design Product: Siplast Paradiene 20 SA.

C. Flashing, Second Ply: Prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.

1. Basis-of-Design Product: Siplast Veral Aluminum.

D. PMMA-Based Flashing: Catalyzed polymethyl methacrylate primer, basecoat and topcoat, combined with a non-woven polyester fleece.

1. Basis-of-Design Product: Siplast Parapro 123 Flashing System.

2.4 ROOFING ACCESSORIES

A. Primer at Masonry and Metal: Asphalt solvent blend meeting ASTM D41.

1. Basis-of-Design Product: Siplast PA-1125 Asphalt Primer.

B. Primer at Wood: Low-VOC, water-based resinous primer.

1. Basis-of-Design Product: Siplast TA-119 Primer.

C. Sealant: Moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.

1. Basis-of-Design Product: Siplast PS-304 Elastomeric Sealant.

D. Fastener: Single unit, precision formed, electro zinc coated steel fastener having a 2.7 inch diameter rib reinforced cap and 1 inch long rectangular legs, designed to expand when fully driven into the lightweight concrete. Fasteners for lightweight concrete shall meet FM Standard 4470 requirements for corrosion resistance.

1. Basis-of-Design Product: NVS Base Sheet Fastener.

E. **Lightweight Insulating Concrete Vent: OlyVent one-way vent, catalog no. OV1WAY, by OMG Roofing Products. (ADD1)**

2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards, approved by roof manufacturer for use above membrane.
- B. Extruded-Polystyrene Board Insulation: ASTM C578, Type VI, 40 PSI compressive strength.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Owens Corning Foamular 404, 3-1/2 inch thick total (2-inch + 1-1/2 inch)
- C. Cementitious Board Insulation: 3/8 inch thick latex modified concrete panel laminated to 3-inch closed-cell extruded polystyrene insulation board, ASTM C578, Type VI, 40 PSI compressive strength.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide T-Clear Corporation LightGUARD, or approved equal.
 - 2. Thickness: As indicated on drawings.
 - 3. Weight: 4.5 lb. per sq. ft.
 - 4. Shape: Flat.
 - 5. Edges: Tongue-and-groove.
 - 6. Color: Natural gray.
- D. Accessories:
 - 1. Perimeter Securement and Securement Strap for Cementitious Board Insulation:
 - a. Material: Minimum 22 gauge ASTM Grade 304 stainless steel.
 - b. Perimeter Securement Form:
 - 1) Horizontal leg 6-inch minimum on cementitious board insulation.
 - 2) Vertical leg varies in height for fastening as indicated on drawings.
 - 3) Minimum 1/2-inch and maximum 1-inch cant.
 - 4) Maximum 12 foot lengths.
 - c. Perimeter Strap Form: 3-inch wide minimum.
 - 2. Fasteners:
 - a. For fastening metal perimeter securement to perimeter of roof structure: Fastener appropriate to substrate, following recommendations of fastener manufacturer.
 - b. Fastener for Perimeter Securement and Securement Strap at Cementitious Board Insulation: Fab-Lok H3 (300 Series) stainless steel, trade designation EZJ-250/FAC-10-12, by Elko.
 - c. Fastener for Perimeter Securement Vertical Leg: As indicated on drawings and as specified herein.
- E. Drainage Mat: Formed polypropylene core covered on one side with a woven polypropylene filter fabric.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Paradrain Drainage Mat.
2. Flow Rate (ASTM D4491): 60 gpm/sq. ft.
3. Compressive Strength (ASTM D1621): 21,000 lb./sq. ft.

2.6 WALKWAY ~~AND BALLAST~~ (ADD1) PAVERS

- A. Roof Pavers: Heavyweight, hydraulically pressed concrete units, square edged, factory cast for use as roof pavers; absorption not greater than 5 percent according to ASTM C140/C140M; no breakage and maximum 1 percent mass loss when tested for freeze-thaw resistance according to ASTM C67; and as follows:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Hanover Prest Pavers, or approved equal.
 2. Size: 24 by 24 inches; manufactured to dimensional tolerances of plus or minus 1/16 inch in length, height, and thickness.
 3. Weight: 23 lb/sq. ft.
 4. Compressive Strength: 8500 psi, minimum.
 5. Colors and Textures: As selected by Architect from manufacturer's full range.

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 clamped in place.
 2. Verify that minimum curing period recommended by roofing system manufacturer for lightweight insulating concrete roof decks has passed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions.
1. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

1. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Base Sheet Securement to Prepared Substrate: Lay the base sheet over entire area to be roofed, lapping sides 3 inches and ends 6 inches. Using the specified fasteners, fasten each sheet every 9 inches through laps and stagger fasten the remainder of the sheet in 2 evenly spaced rows on nominal 12 inch centers with fasteners in each row on 12 inch centers.

3.3 ROOF MEMBRANE INSTALLATION

A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet as a continuous operation.

B. Aesthetic Considerations: 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.

C. Priming: Prime metal, concrete, wood walls and curbs, and masonry surfaces with a uniform coating of the specified primer.

D. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.

1. Apply all layers of roofing perpendicular to the slope of the deck.

2. Fully bond the first ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator.

a. Offset side edge laps between base sheet and base ply.

b. Cut a dog ear angle at the end laps on overlapping selvage edges.

c. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application.

d. Stagger end laps a minimum of 3 feet.

3. Fully bond the second ply to the first ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator.

a. Stagger end laps of the finish ply a minimum 3 feet.

b. Cut a dog ear angle at the end laps on overlapping selvage edges.

c. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application.

d. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply.

e. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.

4. **Install lightweight insulating concrete vent in twelve (12) locations, to be determined by Architect immediately after installation of lightweight insulating concrete. Modify lightweight insulating concrete substrate at vent location, and flash vent to membrane, in strict accordance with roofing manufacturer's published requirements. (ADD1)**

E. Flashing Application:

1. Remove portions of vapor retarder extending more than 1" above surface of Lightweight Insulating Concrete. Apply primer to surfaces to which flashings shall be installed. Allow primer to thoroughly dry.
2. Torch apply the first ply of flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge.
3. Torch apply the second ply of flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the second flashing ply from lap seams in the first ply.
4. Exert pressure on the flashing sheet during application to ensure complete contact with the vertical/horizontal surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag.
5. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. See manufacturer's schematic for visual interpretation.

- F. PMMA-Based Flashing: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.

- G. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.4 ROOF INSULATION INSTALLATION

A. Drainage Mat and Insulation:

1. Lay drainage mat over area in which overburden is to be installed on same day. Install to within 1" of perimeters and penetrations. Overlap fabric 12" (min.) at adjoining sheets.
2. Lay insulation boards on drainage mat. Loosely butt boards together. Install to within 1" of perimeters and penetrations. Offset board end joints 2 feet (min.) between rows. Offset long board joints between layers 1 foot, and offset ends from first layer 2 feet (min.).

B. Cementitious Board Insulation ("CBI") (ADD1):

1. Lay Cementitious Board Insulation boards on surface of polystyrene insulation boards. Install to within 1/2" – 1" of perimeter and penetration flashings.
2. Offset board ends 2 feet between rows. Offset long board joints from long joints of polystyrene boards 1 foot.
3. Install continuous Perimeter Securement, leaving 1/2" between lengths.

4. Fasten Perimeter Securement to vertical substrates with fastener, and at frequency, indicated on Drawings.
5. Fasten Perimeter Securement to CBI with specified fastener spaced at 18" and minimum 3" from CBI joints, and at midpoint of horizontal leg.
6. Install Securement Straps where indicated on Drawings, and fasten to CBI with specified fastener spaced at 12" and minimum 3" from CBI joints, and at midpoint of strap.

3.5 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. 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.
- C. 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.
- D. Manufacturer's Field Services, Roof Insulation:
 1. Provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of installation.
 2. Number of site visits: One.
- E. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- F. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.6 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
 1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075216

SECTION 075900 – LEAK DETECTION SYSTEM

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 requirements for design, supply, and installation of permanently installed leak monitoring system, including but not limited to the following:

1. Access enclosures
2. Conductive layer installed under roof/waterproofing membrane, covering all horizontal areas.
3. Electrode cables installed under the roof/waterproofing membrane, on top of the conductive fleece. Spacing at 10 foot centers in grid pattern.
4. Counter Electrode installed on top of roof/waterproofing membrane.
5. Measuring unit
6. Commissioning of system when installation is complete.
7. Additional base sheet ply.

- B. Related Requirements:

1. Section 012300 “Alternates.”
 - a. Note: Leak detection system work described within this section is Alternate work.
2. Section 075216 “Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing.”

1.3 DEFINITIONS

- A. Electrical Isolation: Application of suitable sheet membrane and/or PMMA-based membrane materials, to isolate monitoring systems from direct electrical paths to ground.

1.4 REFERENCE STANDARDS

- A. National Electrical Manufacturer’s Association (NEMA):
 1. NEMA 250-2018, Enclosures for Electrical Equipment (1000 Volts Maximum)

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Meetings: Conduct a pre-construction meeting attended by Contractor performing work of this Section, others affected by work of this Section, and Architect to confirm installation requirements and sequencing affecting work of this Section.
- B. Coordination: Coordinate requirements affecting leak monitoring system installation including, but not limited to, the following:
 - 1. Membrane Roofing.
 - 2. Wiring and Cabling: Requirements for power connections, conduit and wiring for installation of permanent leak monitoring equipment
 - 3. Ethernet connection for measuring unit.

1.6 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data describing premanufactured components being used for the project including, but not limited to, the following:
 - 1. Conductive Layer
 - 2. Electrode Cables
 - 3. Measuring Unit
 - 4. Counter Electrode
 - 5. Additional Base Sheet Ply
- B. Shop Drawings: Submit shop drawings in identical scale used for project documents indicating, but not limited to, the following:
 - 1. Location and layout of electrode cables
 - 2. Location of access enclosure
 - 3. Location of wiring path from sensor strips and leads to access enclosure
 - 4. Wiring diagram of termination block and D-SUB connector used for lead sensor strips to the measuring unit

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installer and manufacturer.

1.8 QUALITY ASSURANCE

- A. Qualifications: Provide proof of qualifications.
 - 1. Monitoring System Manufacturer: Equipment manufacturer having a minimum of ten (10) years experience with requirements of this Section and with systems of similar extent and complexity.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store leak detection system components in dry spaces protected from the weather, with ambient temperatures maintained within the range recommended by manufacturer.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of leak detection system according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's standard two (2) year warranty for leak monitoring system components stating that repairs and replacement of defective components of the leak monitoring system will be performed as required in the event of a failure of installed electronic leak monitoring system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Products: Products named in this Section are used as the Basis-of-Design for the project; manufacturers listed as additional Acceptable Products and that offer similar products may be incorporated into the work of this Section provided they meet the performance requirements established by the named products.
- B. Additional Acceptable Products Manufacturers: Subject to compliance with performance requirements specified in this Section, as established by the Basis-of-Design Products, use any of the listed manufacturers' products in accordance with FIT Contract Terms and Conditions; the following manufacturers do not require submission of a request for substitutions provided required shop drawing and product data submissions are submitted before starting any work of Section:
 - 1. INTERNATIONAL LEAK DETECTION (866.282.5325)
 - 2. Alternates will be considered when submitted as indicated above.
- C. Substitutions: Architect may consider additional manufacturers having similar products to Acceptable Products Manufacturers listed above during the construction period, provided they meet the performance requirements established by the named products and provided they submit requests for substitution in accordance with FIT Contract Terms and Conditions before starting any work of this Section:
 - 1. Do not use substitute materials to establish Bid Price.

2. Substitutions that appear as a part of the project without review and acceptance by the Architect will be rejected and replaced with one of the specified materials.

2.2 MATERIALS

- A. Conductive Layer: Smartex nonwoven glass fiber fleece, 130 g/sq. m, 2m x 50m (6.6' x 164'), product designation F-120.
- B. Access Enclosure: Hinged enclosure cover fabricated from stainless steel, lockable in closed and open position having a NEMA 4, water- and dust-tight enclosure rating in accordance with NEMA 250 suitable for outdoor use and sized to accommodate test panel, circuit boards, D-SUB connector terminals, barrier blocks and electrodes cables.
- C. Electrical Conduit and Cable: Provide electrical cable and connections in configurations and sizes required to meet system design and installation requirements.
- D. Additional Base Sheet Ply: Irex 40, by Siplast.

2.3 EQUIPMENT

- A. Electronic Equipment and Accessories: Include remote measuring units, on site data processing unit, connections to remote monitoring centre, and other components required for a complete and operational leak monitoring system, and as follows:
 1. Basis-of-Design Products: Smartex ILD-MX

2.4 COMPONENTS

- A. Electrical Conductors: Flat conductors or wire capable of facilitating location of membrane breaches.
- B. Electrode Cables: Smartex pre-assembled electrodes Type MPLE-PEEL, outer dimension: 27 mm x 3,5 mm (1.06" x 0.14")
- C. Connecting Cable: cat.5e 4x2xAWG24
- D. Cable Hub: STV-PEEL
- E. Counter Electrode: Braided polyethylene rope with stainless steel conductors.
- F. Measuring Unit: model MEA-2000-usb, to operate the system, 100 to 230V~/6A, including software, dry contact alarm relay, acoustic signal, optic signal, data transfer installation (GPRS Router or Ethernet/Wi-Fi connector)
- G. Documentation: Shop Drawings and Owner's Manual

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Verify that substrate for leak monitoring system is acceptable before beginning of installation of products specified in this Section and as follows:
 - 1. Verify that electrical Isolation materials are to be installed to total deck area.
 - 2. Installation of products specified in this Section will denote acceptance of site conditions.

3.2 INSTALLATION

- A. Install permanent leak monitoring materials and components in accordance with manufacturer's written instruction and reviewed shop drawings.
- B. Torch apply additional base sheet ply to nailed base sheet. Heat surface of additional ply to liquify bitumen. Install electrode cables and conductive layer in liquid bitumen. Torch apply roofing membrane plies above conductive layer.

3.3 SYSTEM STARTUP

- A. Start-Up: Perform system start-up in accordance with manufacturer's recommended procedures.

3.4 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide demonstration and training for operation and monitoring of leak monitoring system.
- B. Commissioning: Provide verification of operation and reporting functions of installed system as follows:
 - 1. Verify system is online and reporting within 48 hours of connection to the internet.

END OF SECTION 075900

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing" for roof system.
 - 3. Section 077100 "Roof Specialties" for gravel stop and coping assemblies produced by roofing manufacturer.
 - 4. Section 077129 "Manufactured Roof Expansion Joints" for manufactured expansion joints.
 - 5. 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. Build mockup of each new sheet metal cap flashing assembly, comprising two full lengths of the cap flashing and gravel stop assemblies at East/South parapet and at West Parapet; and showing joint treatment, including supporting construction cleats, seams, attachments and accessories.
 - 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.

1.9 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. **Coated (ADD1) Copper Sheet:** ASTM B 370, cold-rolled copper sheet, H00 or CDA "H00 for Flashing"; 99 percent pure copper, 16 oz.
 1. Nonpatinated Exposed Finish: Freedom Gray **as produced by Revere Copper Products, Inc. (ADD1)**
- C. 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: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 4. Masonry Fasteners:
 - a. ~~Screw: Stainless steel screw and washer with neoprene insert, #11 min. (ADD1)~~
 - b. Drive: Stainless steel drive, zamac alloy body, 1/4" size, manufactured by Powers Fastening, Inc., trade name Zamac Nailin, or equal. **Install with neoprene washer when fastener shall be left exposed. (ADD1)**
 5. Wood Fasteners: Common or roofing nails, min. 6D, galvanized.
 6. **Exposed Fasteners at Wood or Metal Substrate: Stainless steel screw and washer with neoprene insert, #11 min. (ADD1)**
- C. Solder:
 1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead, or lead-free alternative of similar or greater strength.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

- E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight. Provide in accordance with Section 079200 "Joint Sealants."
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

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. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet 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.

2.5 ROOF SHEET METAL FABRICATIONS

- A. Gravel stop assemblies at East, South, and West parapets. Assembly also includes continuous hook strip; and 8" wide joint underplates matching profile of gravel stop.
 - 1. Material: .040 aluminum, Kynar 500 finish/color as selected from standard finish/colors by Architect.
 - 2. ~~Installation: Form and fasten assemblies in accordance with Drawings. Leave 1/4" gap between hook strip lengths. Apply 2 beads of sealant within each gravel stop/underplate lap— 4 beads total at each joint. Leave 1/4" gap between gravel stop lengths. Nail gravel stop 1" and 1-1/2" from edge, @ 3" staggered.~~ (ADD1)
- B. Cap flashings at East, South, and West parapets, ~~and at fan curbs.~~ (ADD1)
 - 1. Material: 16-oz tin-zinc-coated copper, Freedom Gray as manufactured by Revere Copper Products, Inc.
 - 2. ~~Installation: Overlap lengths 2". Apply 2 beads of sealant within each overlap, in the nailing flange portion only.~~ (ADD1)
- C. Cap flashing extensions at Shed (with cleats), and at North parapet and Bulkhead wall.
 - 1. Material: 16-oz tin-zinc-coated copper, Freedom Gray as manufactured by Revere Copper Products, Inc.
 - 2. ~~Installation: Form as indicated on Drawings and to fully interlock with existing cap flashing receivers. Overlap lengths 2". At North parapet and Bulkhead wall, fasten extension to receiver with blind copper rivets spaced at 8" and at each extension overlap. At Shed, apply sealant to extension end and insert into receiver; install 1" wide cleats spaced at 24", fastened with masonry anchors.~~ (ADD1)
- D. ~~Scupper linings at Bulkhead and at Retention Curbs.~~ (ADD1)
 - 1. ~~Material: 16-oz tin-zinc-coated copper, Freedom Gray as manufactured by Revere Copper Products, Inc.~~
 - 2. ~~Fabrication:~~

- ~~a. Size to snugly fit existing openings.~~
- ~~b. Bulkhead: Form in accordance with Drawing.~~
- ~~c. Retention Curb: Form to extend 4" all directions on both sides of curb.~~
- ~~d. Joints: Fold and solder; or, overlap 1-1/2" (min.), blind rivet @ 2", and solder.~~
- ~~e. Fabricate all parts in shop. Form and solder joints as much as possible in shop.~~

D. Scupper Lining at Bulkhead: (ADD1)

1. **Material:** 16-oz tin-zinc-coated copper, Freedom Gray as manufactured by Revere Copper Products, Inc.
2. **Fabrication:**
 - a. Size to snugly fit existing opening.
 - b. **Joints:** Fold and solder; or, overlap 1-1/2" (min.), blind rivet @ 2", and solder.
 - c. Fabricate all parts in shop. Form and solder joints as much as possible in shop.
 - d. Form to extend 4" all directions on both sides of parapet, except form top exterior flange to extend up under coping min. 1". Set top and side flanges in full sealant bed. Fasten corners and at midpoint between corners with masonry anchors.
 - e. Form bottom exterior flange as drip spilling into existing leader head.

E. Reglet-Mounted Cap Flashings: (ADD1)

1. **Material:** .040 aluminum, Kynar 500 finish/color as selected from standard finish/colors by Architect.

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 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.

3.3 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. Cap Flashing: Coordinate installation of cap flashing with installation of base flashing. Extend cap flashing 4 inches over base flashing.
- C. **Gravel stop assemblies at East, South, and West parapets. Form and fasten assemblies in accordance with Drawings. Leave 1/4" gap between hook strip lengths. Apply 2 beads of sealant within each gravel stop/underplate lap – 4 beads total at each joint. Leave 1/4" gap between gravel stop lengths. Nail gravel stop 1" and 1-1/2" from edge, @ 3" staggered. (ADD1)**
- D. **Cap flashings at East, South, and West parapets: Overlap lengths 2". Apply 2 beads of sealant within each overlap, in the nailing flange portion only. (ADD1)**
- E. **Cap flashing extensions at Shed (with cleats), and at North parapet and Bulkhead wall. Form as indicated on Drawings and to fully interlock with existing cap flashing receivers. Overlap lengths 2". At North parapet and Bulkhead wall, fasten extension to receiver with blind copper rivets spaced at 8" and at each extension overlap. At Shed, apply sealant to extension end and insert into receiver; install 1" wide cleats spaced at 24", fastened with masonry anchors. (ADD1)**
- F. **Reglet-Mounted Cap Flashings: (ADD1)**
1. **Form with 1" reglet leg with 1/2" return.**
 2. **Overlap lengths 2", with sealant within lap.**
 3. **Secure with lead wedge at each length end/overlap and no more than 2 feet apart between length ends.**

3.4 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."

3.5 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. Copings.
2. Grating at drains.
3. ~~Cast iron dome~~ **Drain refurbishment parts. (ADD1)**
4. **Pate-style support curbs. (ADD1)**

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous 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 077129 "Manufactured Roof Expansion Joints" for manufactured roof expansion-joint cover assemblies.
5. 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, roofing-system manufacturer's representative, Installer, structural-support 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 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous 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 mockup of each new roof specialty, comprising two full lengths of each component and showing joint treatment.
 - 2. Build mockup of full grating installation at one drain.
 - 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.

1.7 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 shall be included in warranty provisions in Section 075216 "Styrene-Butadiene-Styrene (SBS) Modified Bituminous 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 COPINGS

- A. Coping assembly at North parapet and at Bulkhead parapet.
 - 1. Coping: Siplast Paraguard M Coping Tapered Version, .040" aluminum, with **endwalls** **endwall flashings (coping version) (ADD1)** and miters as needed, in finish and color as selected by Architect.
 - a. Sizes vary – field measure each parapet, and see Drawings.
 - b. Order/use 300-series stainless steel fasteners for attachment to wood blocking.
 - 2. Cover Board: Dens-Deck Prime, 1/4" thick, by Georgia-Pacific, or approved equal.
 - 3. Underlayment: Vycor Ultra, by W.R. Grace, or approved equal
 - a. Snap-on Coping Anchor Plates: Concealed, 16-ga. galvanized-steel sheet, 12 inches wide, with integral cleats.

2.3 GRATING AT DRAINS

- A. Products
 - 1. Aluminum alloy 6063-T6, serrated surface rectangular bar 1-1/4" x 3/16", GAL-125, 19-S-4 spacing, swage-locked, by McNichols, or approved equal.

2. Shims: High-Tab Pedestal and Flexible Leveling Shims, by Hanover Architectural Products, or approved equal.

~~B. Install 2-foot x 2-foot grating centered over drain. Cut back LightGuard as needed. Support grating on pedestal/shims, 2 per corner, total 8 pedestal/shim assemblies per grating. Shim as needed for grating surface to meet LightGuard surface all sides. (ADD1)~~

2.4 ~~CAST IRON DOME DRAIN REFURBISHMENT PARTS (ADD1)~~

~~A. Cast Iron Dome: Size and type as required to fit existing roof drain assembly. (ADD1)~~

B. Parts: Cast iron cover, bolts (8), and reversible collar gaskets (2) for each drain, as manufactured by Jay R. Smith Manufacturing Co. (ADD1)

2.5 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:

2.6 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at 240 deg F.
 2. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus 20 deg F.
 3. No flow at 240 deg F in accordance with ASTM D 5147.

2.7 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 1. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
 2. Masonry Fasteners:

- a. Drive: Stainless steel drive, zamac alloy body, 1/4" size, manufactured by Powers Fastening, Inc., trade name Zamac Nailin, or equal.
 3. Wood Fasteners: Common or roofing nails, min. 6D, galvanized.
 4. **Exposed Fasteners at Wood or Metal Substrate: Stainless steel screw and washer with neoprene insert. (ADD1)**
- B. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application. Provide in accordance with Section 079200 "Joint Sealants."
- C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

2.8 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.

ROOF SPECIALTIES

077100 - 6

- 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 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 14 days.

3.3 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 roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. 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.
- C. 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.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal concealed joints as required by roofing-specialty manufacturer.

- F. 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.

3.4 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.

3.5 DRAINS (ADD1)

- A. **Remove and set aside for reuse the drain ring, extension sleeve, and collar. Remove and discard the drain cover, bolts, and gaskets.**
- B. **Reinstall the collar in the 'low' position and with new gaskets.**
- C. **Reinstall the extension sleeve in the position needed for installation of drain flashings in accordance with the roofing manufacturer's requirements.**
- D. **Reinstall existing drain components, and install new drain components, in accordance with the drain manufacturer's published requirements.**
- E. **Install new bolts.**

3.6 GRATING AT DRAINS INSTALLATION (ADD1)

- A. **Install 2-foot x 2-foot grating centered over drain. Cut back LightGuard as needed. Support grating on pedestal/shims, 2 per corner, total 8 pedestal/shim assemblies per grating. Shim as needed for grating surface to meet LightGuard surface all sides. (ADD1)**

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.

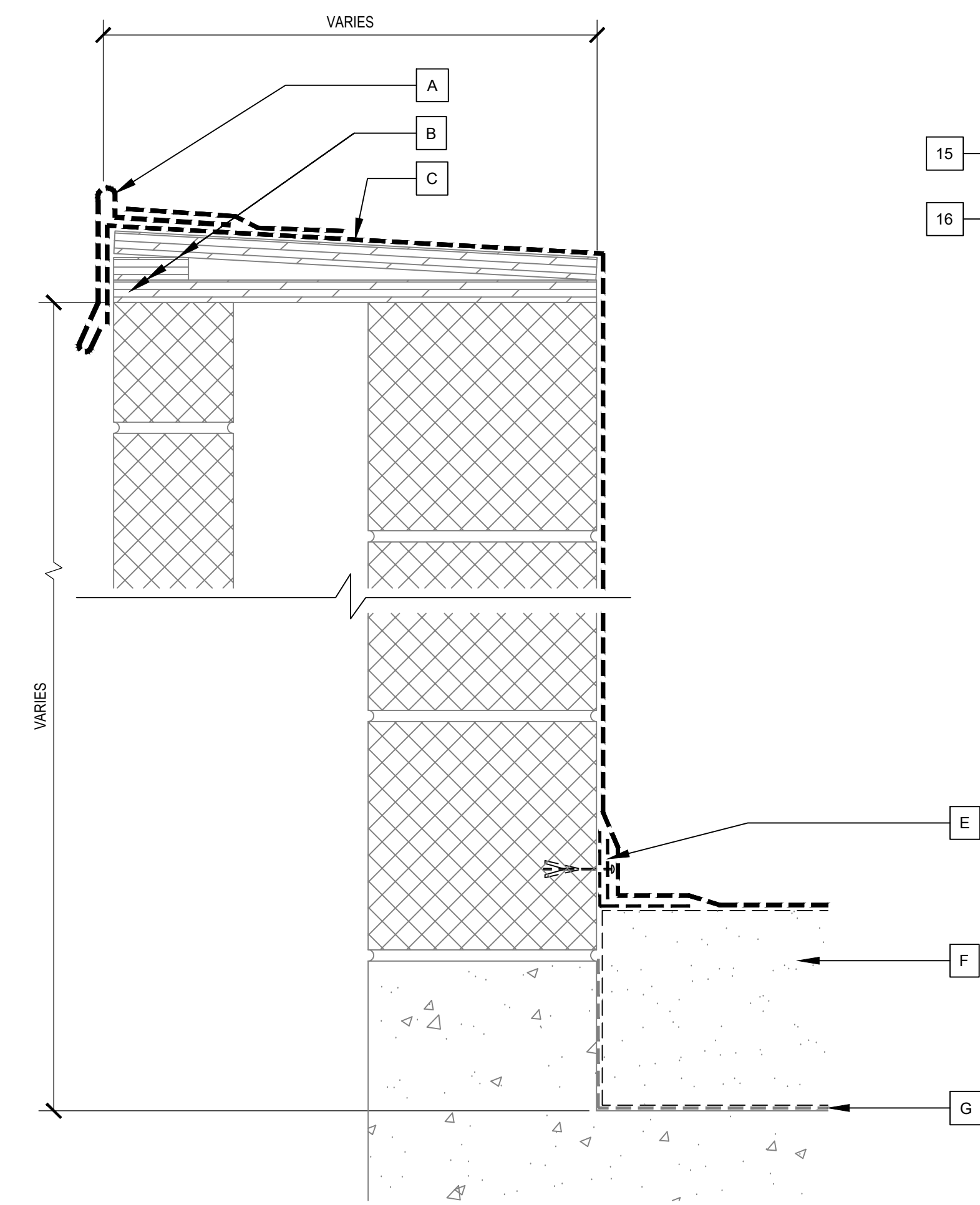
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DRAWING NOTES

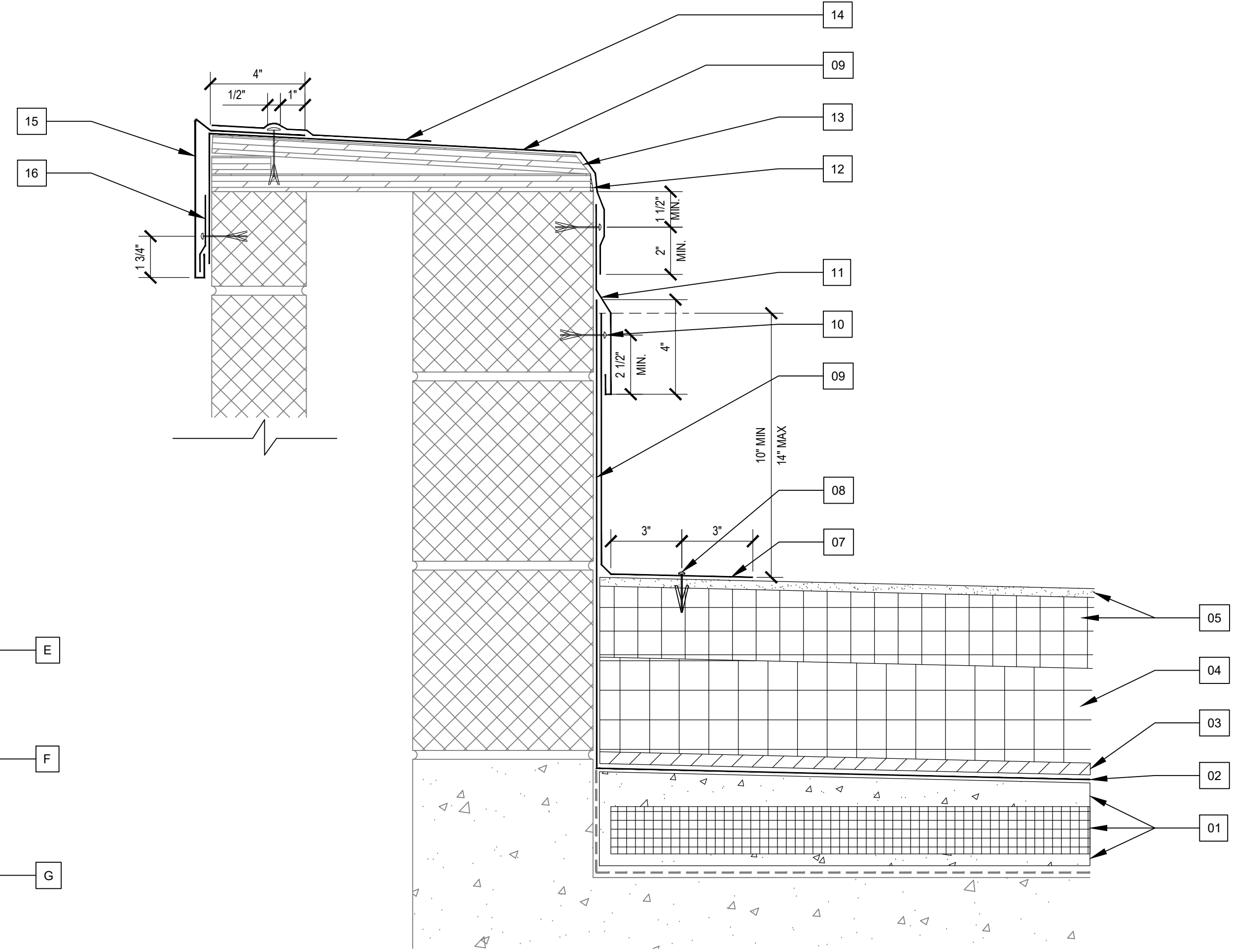
- EXISTING**
- A. GRAVEL STOP ASSEMBLY - REMOVE
 - B. PLYWOOD - REMAINS
 - C. EPDM MEMBRANE - REMOVE
 - D. FENCERAILING BRACKET - REMOVE AND SET ASIDE FOR RE-USE. THICKENED ROSS REMAINS.
 - E. ANCHORED PERIMETER STRIP - REMOVE
 - F. INSULATION BOARDS - REMOVE
 - G. BITUMINOUS VAPOR RETARDER - REMAINS
 - H. CAP FLASHING RECEIVER - REMAINS
 - I. FLASHING FASTENER - REMOVE
 - J. CAP FLASHING EXTENSION & CLEAT - REMOVE
 - K. SHEET METAL CORNER - REMOVE
 - L. COPING ASSEMBLY - REMOVE
 - M. HOUSEWRAP - REMOVE
 - N. PLYWOOD & RELATED ANCHORS - REMOVE
 - O. ADHERED UNDERLAYMENT - REMOVE
 - P. MASONRY CAP - REMAINS
 - Q. SIDING - REMAINS
 - R. CAP FLASHING - REMOVE
 - S. BACKER ROD - REMOVE
 - T. PLYWOOD TOP LAYER & SHIM - REMOVE
 - U. PLYWOOD BOTTOM LAYERS - REMAIN
 - V. HVAC HOUSING - REMAINS
 - W. METAL CURB - REMAINS
 - X. STEEL DUNNAGE - REMAINS
 - Y. CURB CAP - REMAINS
 - Z. FASTENER - REMOVE
 - AA. BITUMINOUS MEMBRANE - REMOVE
 - BB. DRAIN COVER - REMOVE
 - CC. DRAIN RING - REMOVE AND SET ASIDE FOR RE-USE
 - DD. EXTENSION REMOVE AND SET ASIDE FOR RE-USE
 - EE. GASKET - REMOVE
 - GG. COLLAR - REMOVE AND SET ASIDE FOR RE-USE
 - HH. DRAIN BODY - REMAINS
 - II. STRAP - 1/8" X 2" @ 16" - REMAINS

DRAWING NOTES

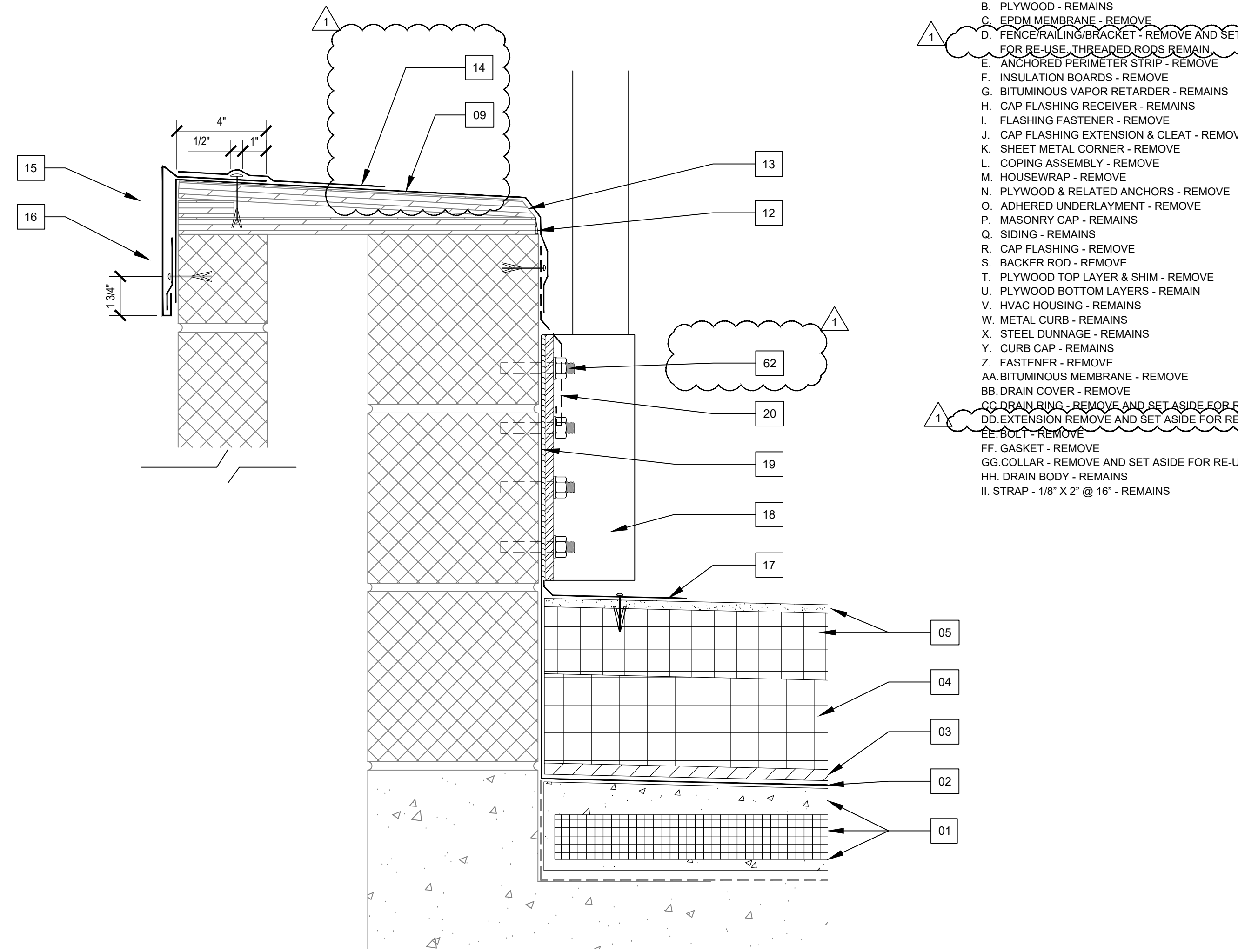
- REMOVED / NEW UNLESS NOTED AS EXISTING TO REMAIN**
1. LIGHTWEIGHT INSULATING CONCRETE - CONCRETE & EMBEDDED INSULATION THICKNESS VARIES
 2. ROOFING MEMBRANE - NAILED BASE, 2 TORCH-APPLIED PLYS
 3. DRAINAGE MAT
 4. EXTRUDED POLYSTYRENE INSULATION BOARDS
 5. CHANGING PLYWOOD INSULATION
 6. NOT USED
 7. STAINLESS STEEL PERIMETER SECUREMENT
 8. SECUREMENT FASTENER AT PANEL @ 18" +/- MIN. 3" FROM PANEL JOINTS
 9. MEMBRANE FLASHINGS - 2 PLYS
 10. MASONRY ANCHORS @ 9"
 11. COATED COPPER CAP FLASHING - MASONRY ANCHORS @ 12"
 12. FILL VOID WITH SEALANT
 13. CHANGING PLYWOOD EDGE
 14. MEMBRANE STRIPPING
 15. 3/4" ALUMINUM CONTINUOUS HOOK STRIP - 2" MIN. STAGGERED @ 3" O.C.
 16. .040" ALUMINUM CONTINUOUS HOOK STRIP - MASONRY ANCHORS @ 12"
 17. PERIMETER SECUREMENT BETWEEN BRACKETS
 18. RAILING/SCREEN POST BRACKET - SIZE VARIES - REMOVE, REFINISH, RESTORE
 19. FULL SEALANT BED BEHIND BRACKET PLATES
 20. COATED COPPER CAP FLASHING BETWEEN BRACKETS, END 1" FROM BRACKET PLATE SIDE EDGES
 21. SHIM AS NEEDED FOR BLOCKING ASSEMBLIES TO BE SECURE, LEVEL, & AT SAME ELEVATION
 22. WOOD BLOCKING - CONCRETE SCREWS @ 24" O.C., STAGGERED
 23. COVER BOARD - 1/4" THICK
 24. UNDERLAYMENT
 25. MANUFACTURED COPING ASSEMBLY
 26. COATED COPPER CAP FLASHING EXTENSION - RIVET @ 8"
 27. COATED COPPER CAP FLASHING - MASONRY ANCHORS @ 9" - END 1" FROM BRACKET PLATE SIDE EDGES
 28. STAINLESS STEEL SECUREMENT STRAP
 29. COATED COPPER CLEAT 1" WIDE @ 24"
 30. COATED COPPER CAP FLASHING EXTENSION - INTERLOCK IN SEALANT
 31. SEALANT
 32. CONTINUATION OF CAP FLASHING & PERIMETER SECUREMENT - SEE DETAIL 1R & DRA-501.00
 33. WOOD BLOCKING - ANCHOR BASE LAYER W/CONCRETE SCREWS @ 24" O.C., STAGGERED
 34. 3/4" PLYWOOD
 35. PLASTIC SHEET WITH MINERAL WOOL INSULATION FILL
 36. MANUFACTURED EXPANSION JOINT ASSEMBLY
 37. COATED COPPER CAP FLASHING - LEAD WEDGES @ 24"
 38. BITUMINOUS MEMBRANE STRIP TO EXTEND EXISTING BASE SHEET TO LIGHTWEIGHT CONCRETE SURFACE AS NEEDED
 39. SELF-ADHESIVE MEMBRANE - PRIME METAL
 40. STAINLESS STEEL SCREW & WASHER W/NEOPRENE INSERT @ 9"
 41. STAINLESS STEEL SCREW @ 9"
 42. MEMBRANE & FLASHING PLYS
 43. PLASTIC PEDESTALS/SHIMS AS NEEDED FOR GRATING & PANEL SURFACES TO MATCH
 44. ALUMINUM GRATING - 1-1/4" X 2" X 2", CENTERED ON DRAIN
 45. CAST IRON DOME
 46. BOLTS
 47. LEAD FLASHING - 30" X 30" - PRIME AND SET IN FULL ROOFING CEMENT BED
 48. GASKETS
 49. MINERAL WOOL INSULATION
 50. .040" ALUMINUM CAP FLASHING
 51. COPING ASSEMBLY ENDWALL FLASHING - EXTEND UNDERLAYMENT 3" UP ONTO MASONRY
 52. REGLET - 1-1/2" DEEP
 53. 1/2" X 1" GASKET
 54. WOOD BLOCKING
 55. REMOVE/DISCONNECT/RECONNECT FAN AS NEEDED
 56. PMMA-BASED FLASHING
 57. EXISTING STEEL DUNNAGE SUPPORT
 58. EXISTING REGLET
 59. COATED COPPER BASE FLASHING - FASTEN TO PARAPET ONLY
 60. FASTENER, TYP. INTO PLYWOOD
 61. BACKER ROD AND SEALANT AT BASE FLASHING ENDS
 62. STAINLESS STEEL NUT, TYP.
 63. COAT EXPOSED EDGES OF BOARDS
 64. STAINLESS STEEL SCREWS AND WASHERS WITH NEOPRENE INSERTS @ 24" O.C.



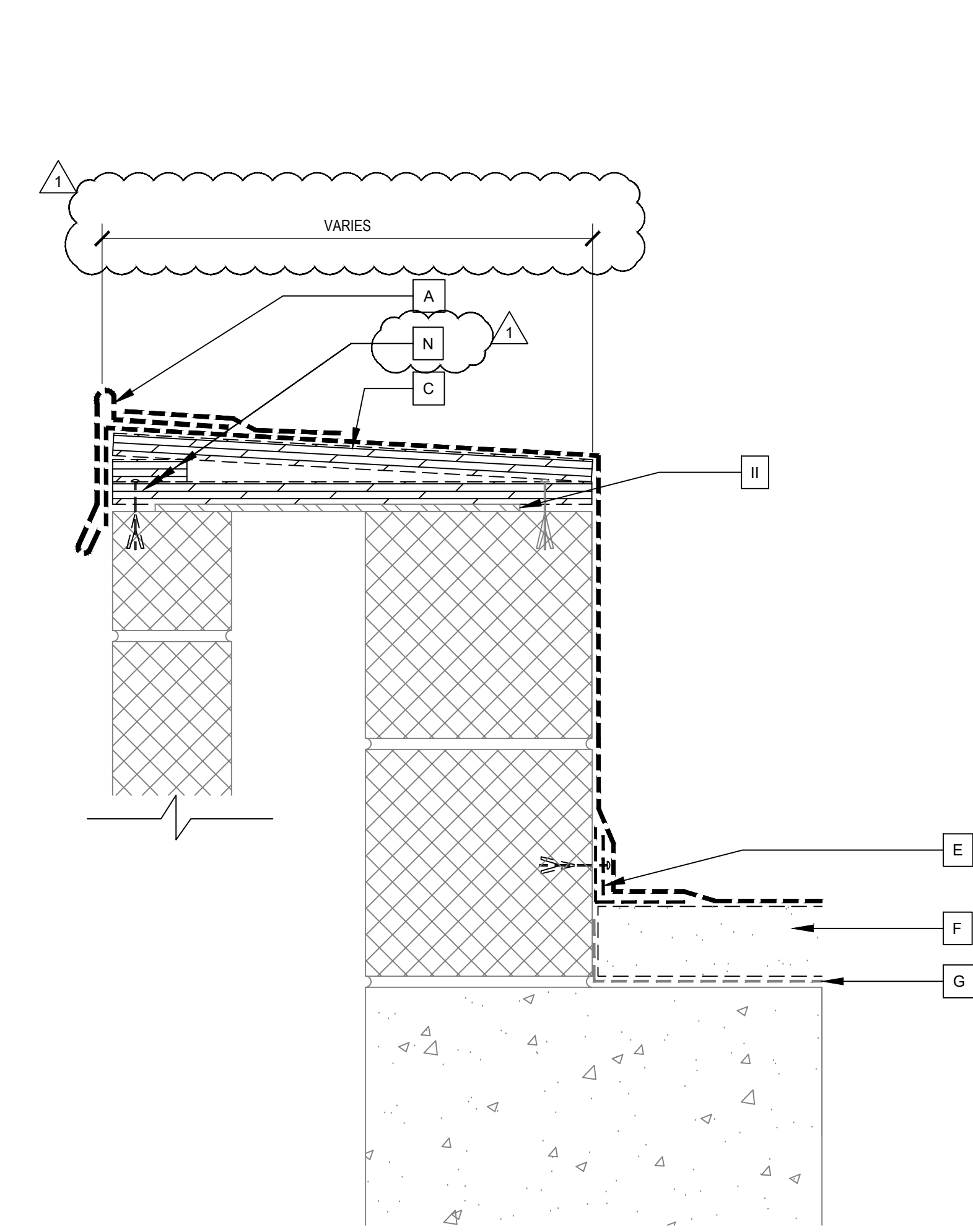
1E EXISTING PARAPET
3" = 1'-0"



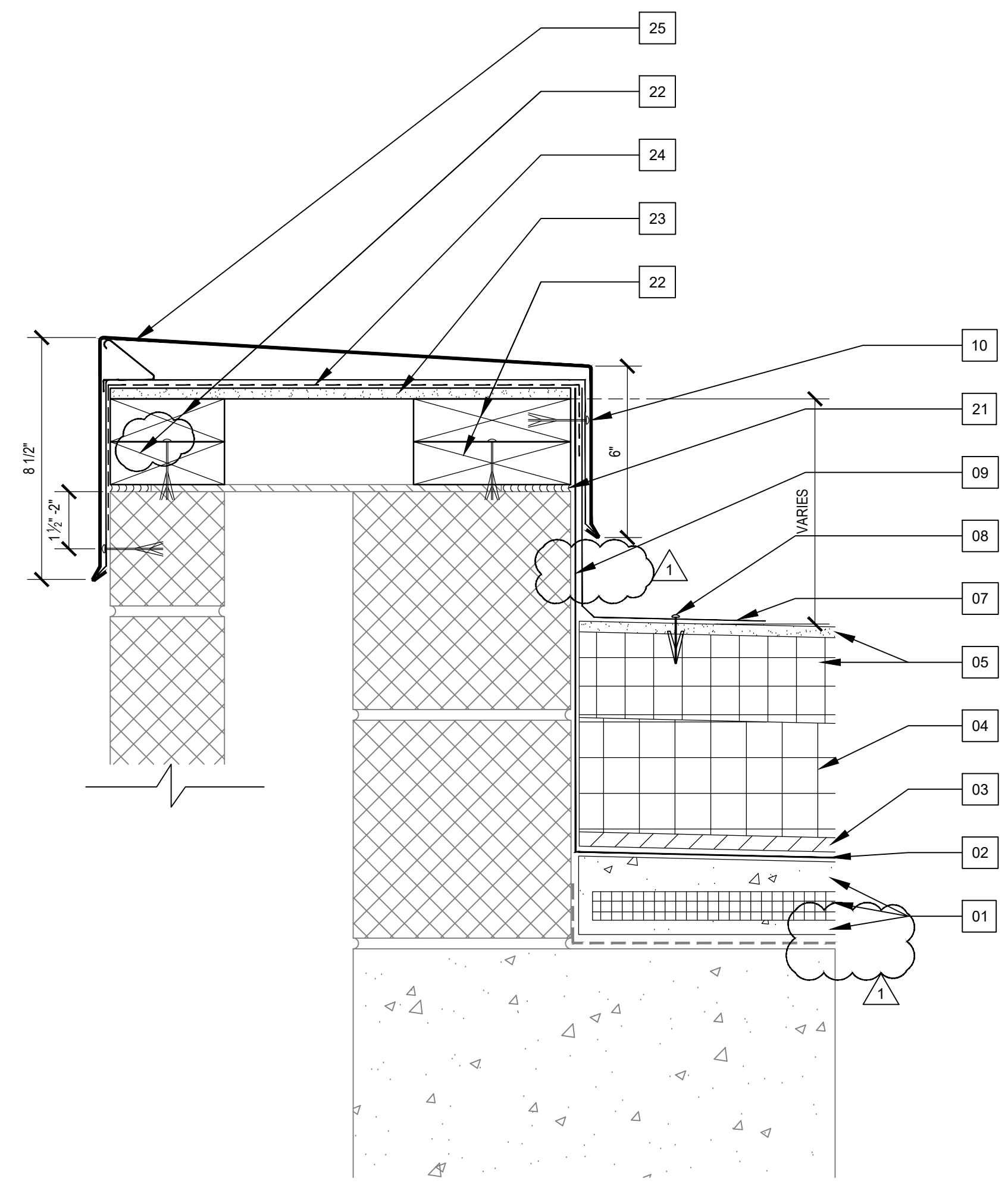
1R REVISED PARAPET
3" = 1'-0"



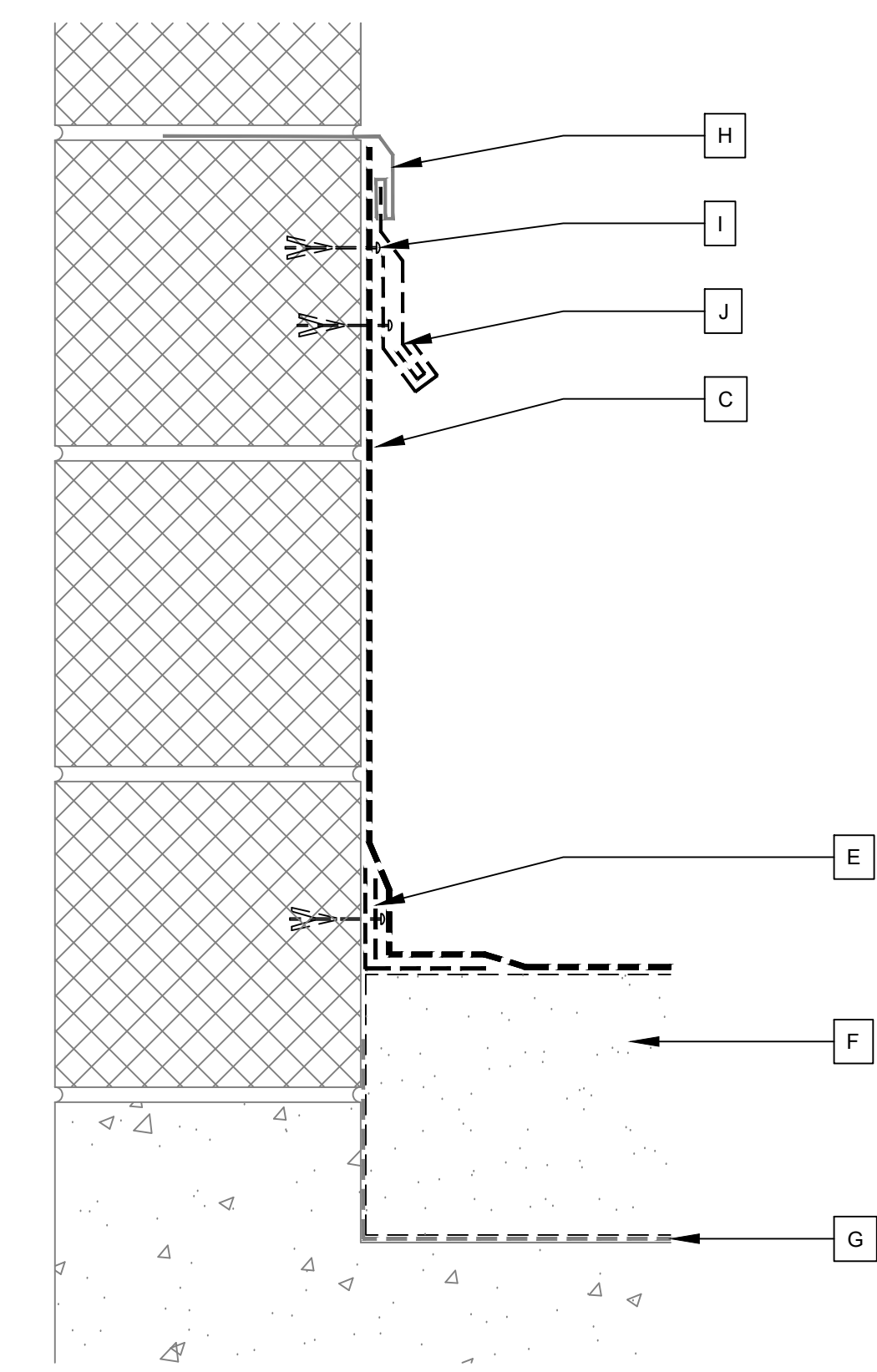
2R REVISED RAILING/SCREEN POST BRACKET
3" = 1'-0"



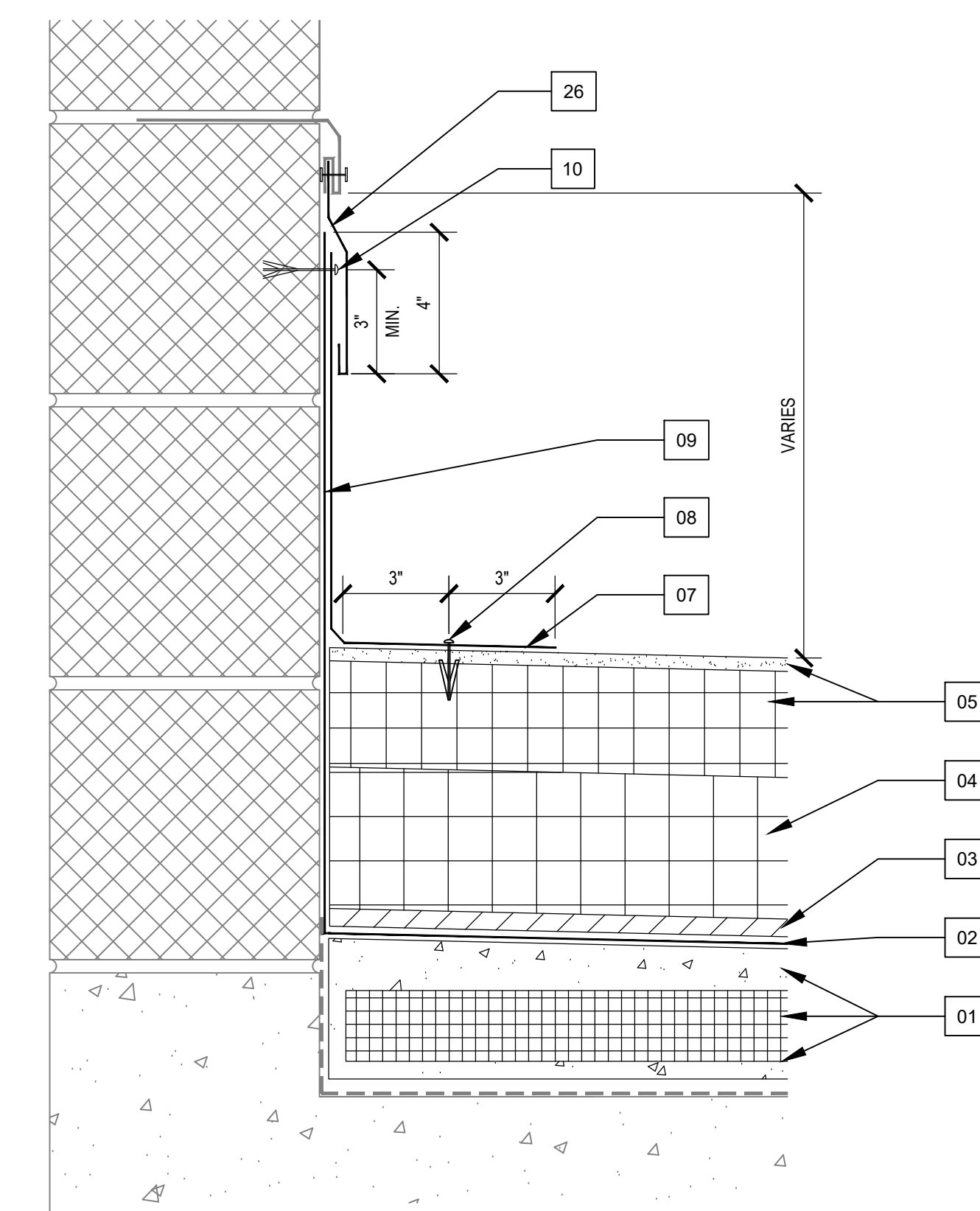
3E EXISTING BULKHEAD PARAPET
3" = 1'-0"



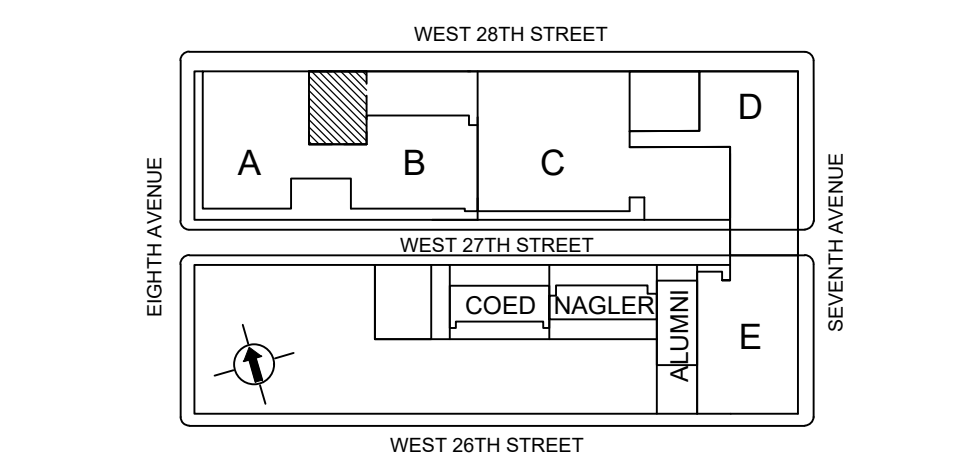
3R REVISED BULKHEAD PARAPET
3" = 1'-0"



4E EXISTING BASE
3" = 1'-0"



4R REVISED BASE
3" = 1'-0"



Client
Fasten Institute of Technology
West Courtyard Roof
Renovation
 340 8th Avenue
 New York, NY 10001
 Project No. 57-21104-00
 DOB # M00529324

DLR Group
 33 East 33rd Street
 Suite 401
 New York, New York 10016
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 www.dlrgroup.com

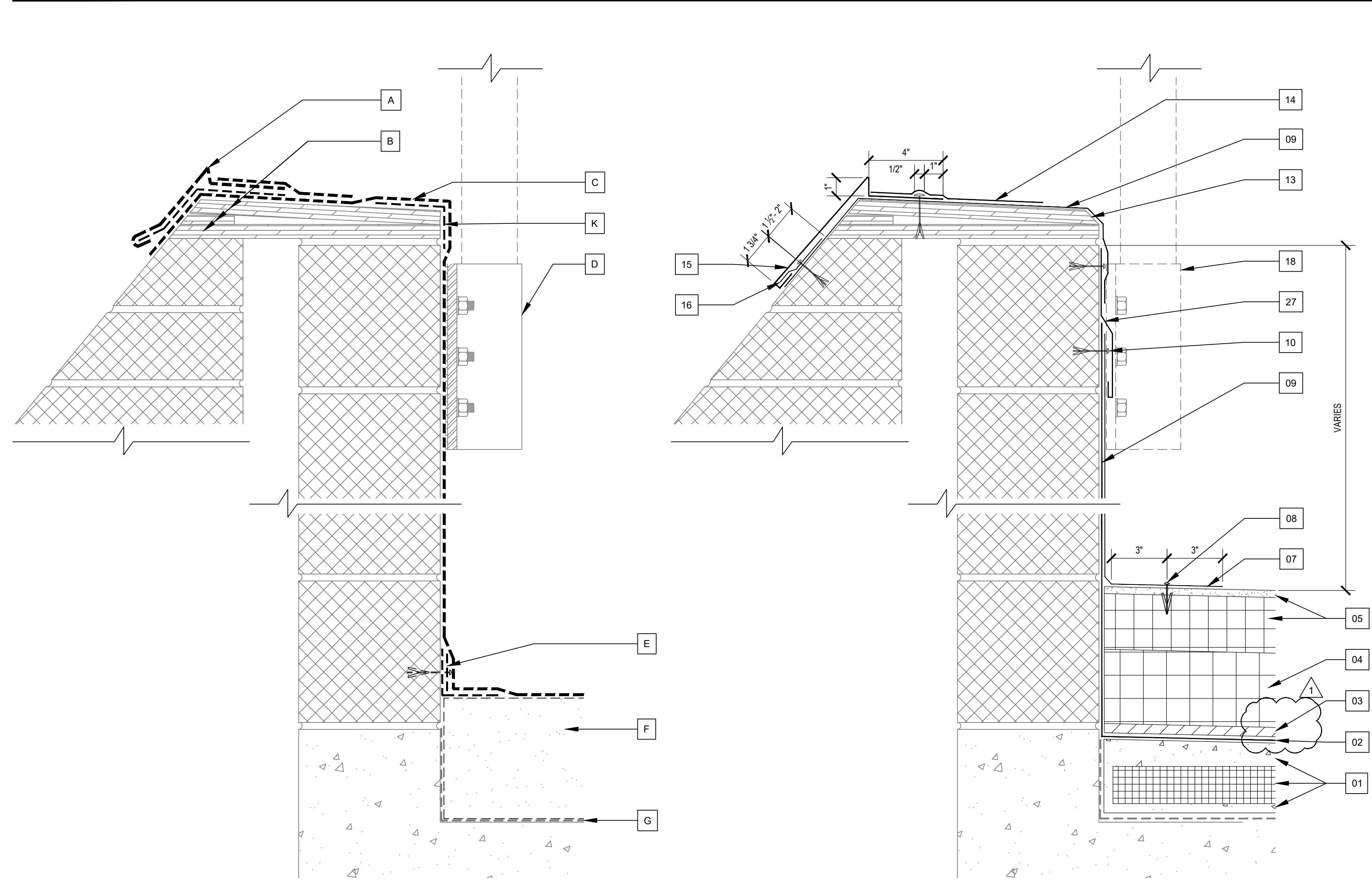
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DETAILS

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Checked by:

Drawn by:



5E EXISTING PARAPET
3" = 1'-0"

5R REVISED PARAPET
3" = 1'-0"

7E EXISTING BASE (SHED)
3" = 1'-0"

7R REVISED BASE (SHED)
3" = 1'-0"

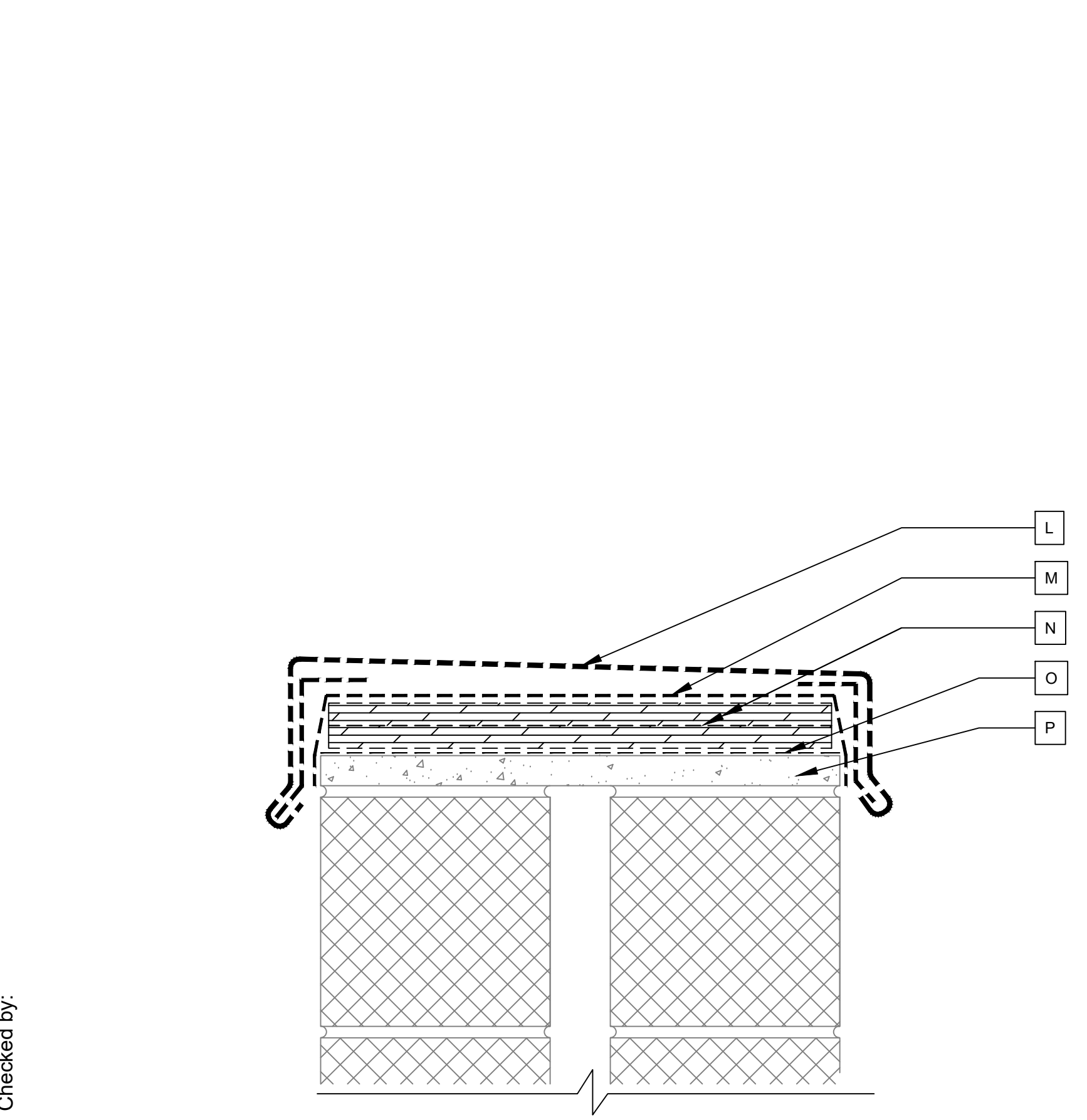
DRAWING NOTES

- EXISTING**
- A. GRAVEL STOP ASSEMBLY - REMOVE
 - B. PLYWOOD - REMAINS
 - C. FERM MEMBRANE - REMOVE
 - D. FENCERAILING/BACKET - REMOVE AND SET ASIDE FOR RE-USE. THREADED RODS REMAIN
 - E. ANCHORED PERIMETER STRIP - REMOVE
 - F. INSULATION BOARDS - REMOVE
 - G. BITUMINOUS VAPOR RETARDER - REMAINS
 - H. CAP FLASHING RECEIVER - REMAINS
 - I. FLASHING FASTENER - REMOVE
 - J. CAP FLASHING EXTENSION & CLEAT - REMOVE
 - K. SHEET METAL CORNER - REMOVE
 - L. COPING ASSEMBLY - REMOVE
 - M. HOUSEWRAP - REMOVE
 - N. PLYWOOD & RELATED ANCHORS - REMOVE
 - O. ADHERED UNDERLAYMENT - REMOVE
 - P. MASONRY CAP - REMAINS
 - Q. SIDING - REMAINS
 - R. CAP FLASHING - REMOVE
 - S. BACKER ROD - REMOVE
 - T. PLYWOOD TOP LAYER & SHIM - REMOVE
 - U. PLYWOOD BOTTOM LAYERS - REMAIN
 - V. HVAC HOUSING - REMAINS
 - W. METAL CURB - REMAINS
 - X. STEEL DUNNAGE - REMAINS
 - Y. CURB CAP - REMAINS
 - Z. FASTENER - REMOVE
 - AA. BITUMINOUS MEMBRANE - REMOVE
 - BB. DRAIN COVER - REMOVE
 - CC. DRAIN BODY - REMOVE AND SET ASIDE FOR RE-USE
 - DD. EXTENSION REMOVE AND SET ASIDE FOR RE-USE
 - EE. BOLT - REMOVE
 - FF. GASKET - REMOVE
 - GG. COLLAR - REMOVE AND SET ASIDE FOR RE-USE
 - HH. DRAIN BODY - REMAINS
 - II. STRAP - 1/8" X 2" @ 16" - REMAINS

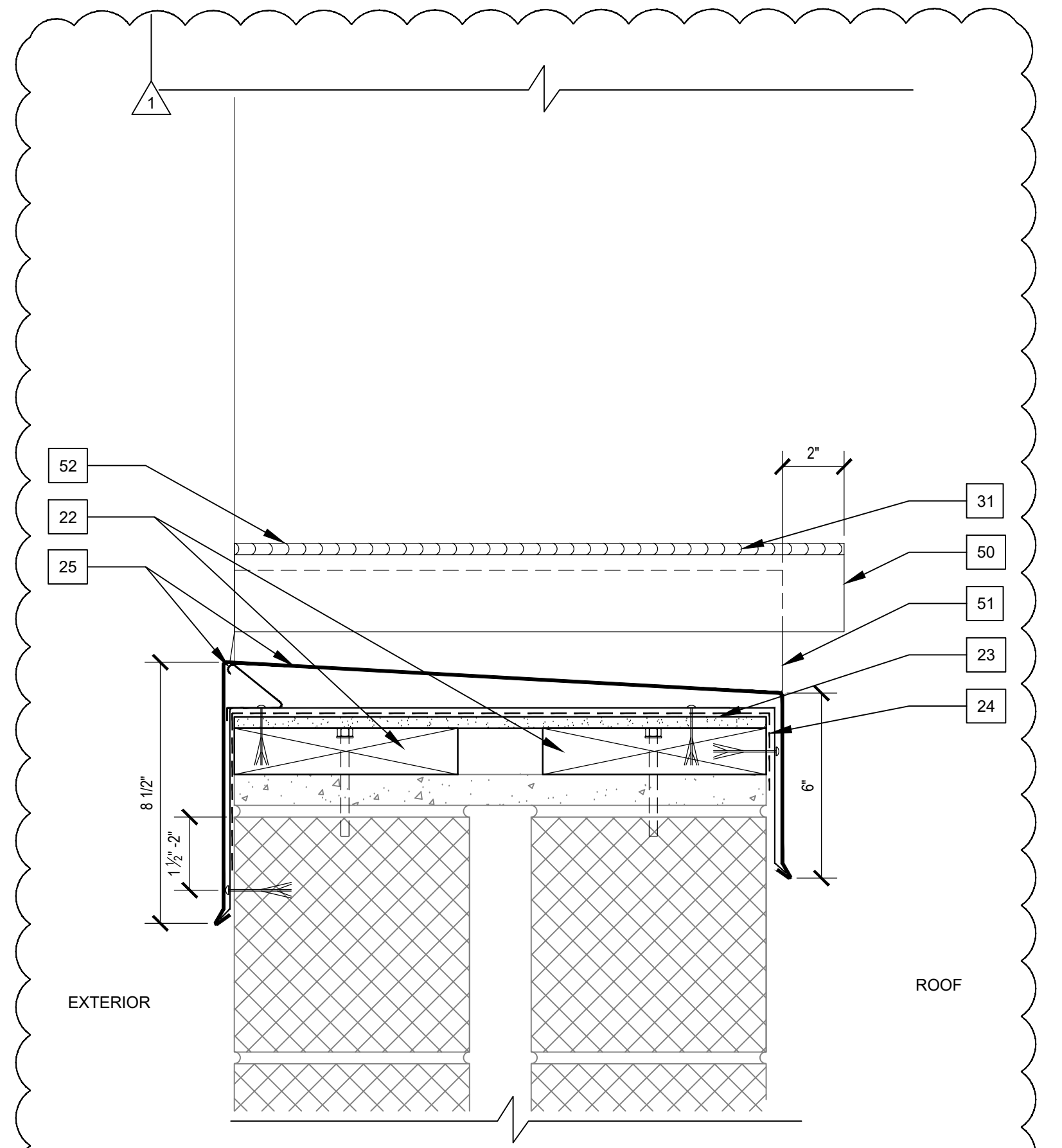
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No.	Date	Description
	06/01/2021	CONSTRUCTION DOCUMENTS
01	06/18/2021	ADDENDUM # 01

DRAWING NOTES

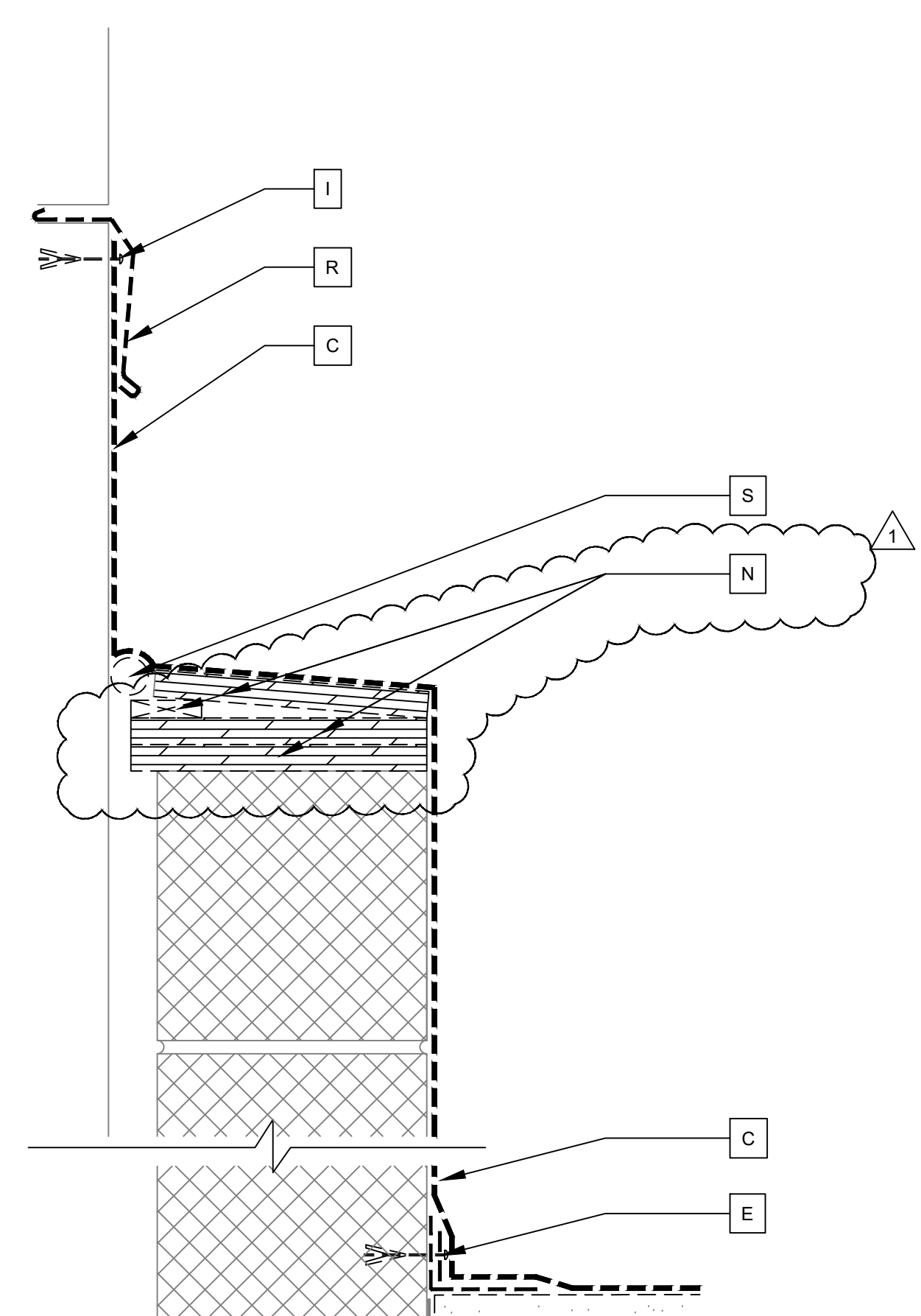
- REVISED / NEW UNLESS NOTED AS EXISTING TO REMAIN**
1. LIGHTWEIGHT INSULATING CONCRETE - CONCRETE & EMBEDDED INSULATION THICKNESS VARIES
 2. ROOFING MEMBRANE - NAILED BASE, 2 TORCH-APPLIED PLYS
 3. DRAINAGE MAT
 4. EXTRUDED POLYSTYRENE INSULATION BOARDS
 5. CHAMFER PLYWOOD EDGE
 6. NOT USED
 7. STAINLESS STEEL PERIMETER SECUREMENT
 8. SECUREMENT FASTENER AT PANEL @ 18" +/- MIN. 3" FROM PANEL JOINTS
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 14. MEMBRANE STRIPPING
 15. 30" ALUMINUM CONTINUOUS HOOK STRIP - 2" MIN. STAGGERED @ 3" O.C.
 16. .040" ALUMINUM CONTINUOUS HOOK STRIP - MASONRY ANCHORS @ 12"
 17. PERIMETER SECUREMENT BETWEEN BRACKETS
 18. RAINING-SCREEN POST BRACKET - SIZE VARIES - REMOVE, REFINISH, RESTORE
 19. FULL SEALANT BED BEHIND BRACKET PLATES
 20. COATED COPPER CAP FLASHING BETWEEN BRACKETS. END 1" FROM BRACKET PLATE SIDE EDGES
 21. SHIMS AS NEEDED FOR BLOCKING ASSEMBLIES TO BE SECURE, LEVEL, & AT SAME ELEVATION
 22. WOOD BLOCKING - CONCRETE SCREWS @ 24" O.C., STAGGERED
 23. COVER BOARD, 1/4" THICK
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 32. CONTINUATION OF CAP FLASHING & PERIMETER SECUREMENT - SEE DETAIL 1R & DRA-501.00
 33. WOOD BLOCKING - ANCHOR BASE LAYER W/CONCRETE SCREWS @ 24" O.C., STAGGERED
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 36. MANUFACTURED EXPANSION JOINT ASSEMBLY
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 39. SELF-ADHESIVE MEMBRANE - PRIME METAL
 40. STAINLESS STEEL SCREW & WASHER W/NEOPRENE INSERT @ 9"
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 43. PLASTIC PEDESTALS/SHIMS AS NEEDED FOR GRATING & PANEL SURFACES TO MATCH
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 45. CAST IRON DOME
 46. BOLTS
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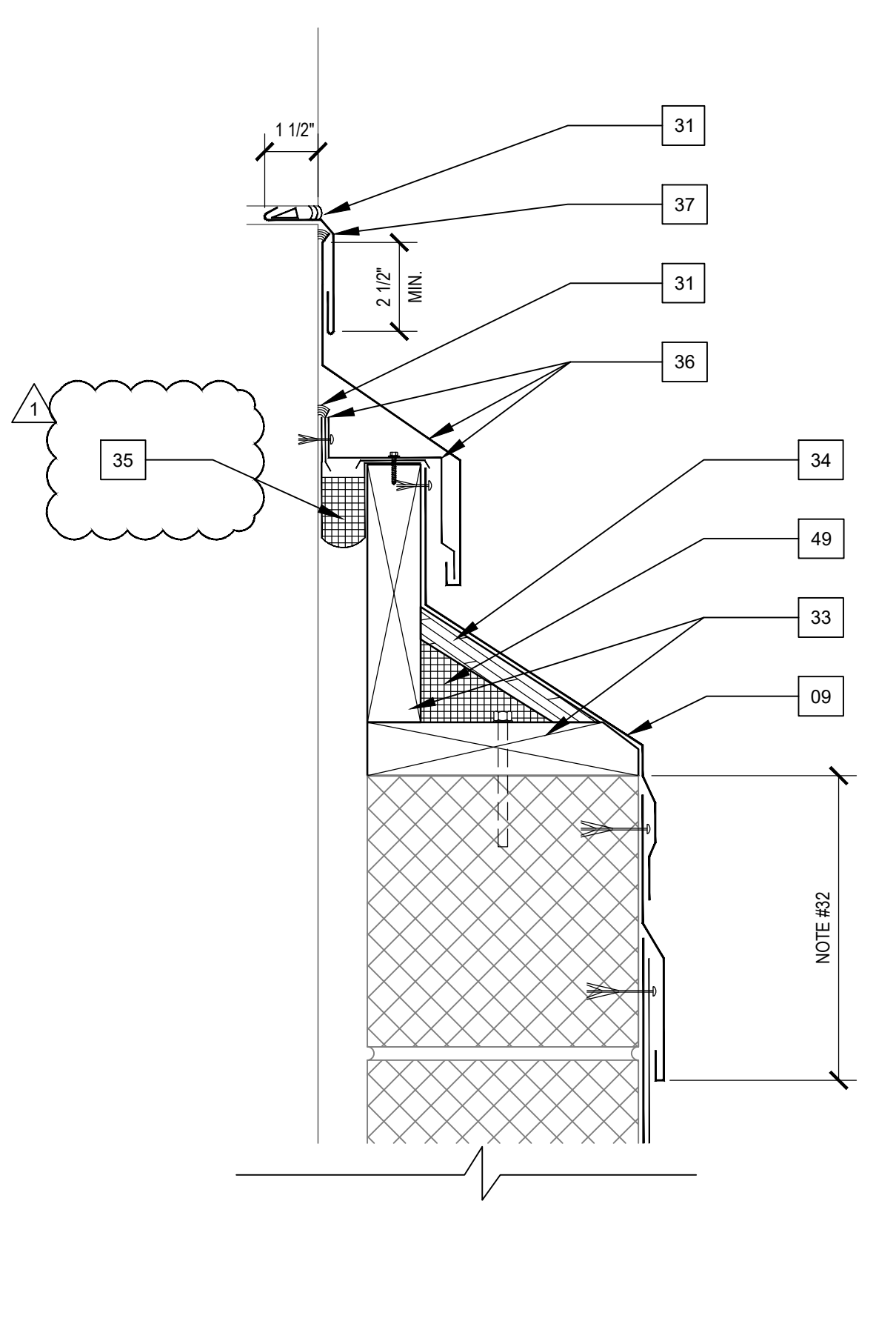
6E EXISTING COPING
3" = 1'-0"



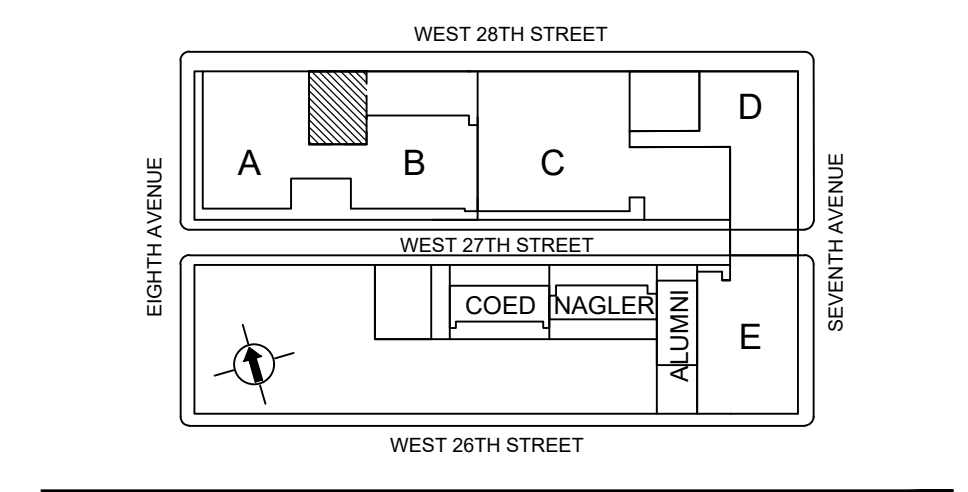
6R REVISED COPING
3" = 1'-0"



8E EXISTING EXPANSION JOINT
3" = 1'-0"



8R REVISED EXPANSION JOINT
3" = 1'-0"



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 Project No. 57-21104-00
 DOB # M00529324

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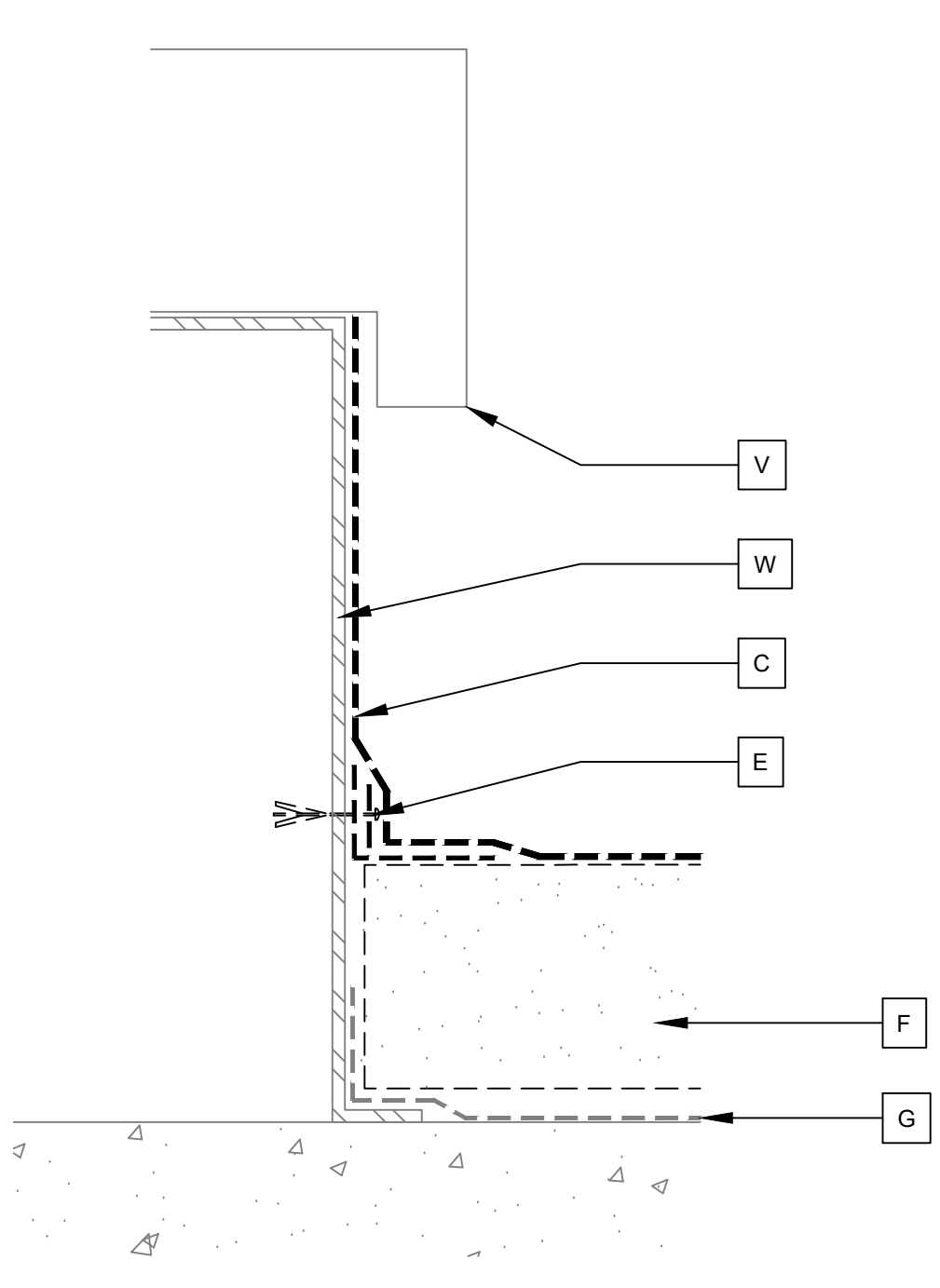
DRAWING NOTES

- EXISTING**
- A. GRAVEL STOP ASSEMBLY - REMOVE
 - B. PLYWOOD - REMAINS
 - C. EPDM MEMBRANE - REMOVE
 - D. FENCERAILING BRACKET - REMOVE AND SET ASIDE FOR RE-USE
 - E. ANCHORED PERIMETER STRIP - REMOVE
 - F. INSULATION BOARDS - REMOVE
 - G. BITUMINOUS VAPOR RETARDER - REMAINS
 - H. CAP FLASHING RECEIVER - REMAINS
 - I. FLASHING FASTENER - REMOVE
 - J. CAP FLASHING EXTENSION & CLEAT - REMOVE
 - K. SHEET METAL CORNER - REMOVE
 - L. COPING ASSEMBLY - REMOVE
 - M. HOUSEWRAP - REMOVE
 - N. PLYWOOD & RELATED ANCHORS - REMOVE
 - O. ADHERED UNDERLAYMENT - REMOVE
 - P. MASONRY CAP - REMAINS
 - Q. SIDING - REMAINS
 - R. CAP FLASHING - REMOVE
 - S. BACKER ROD - REMOVE
 - T. PLYWOOD TOP LAYER & SHIM - REMOVE
 - U. PLYWOOD BOTTOM LAYERS - REMAIN
 - V. HVAC HOUSING - REMAINS
 - W. METAL CURB - REMAINS
 - X. STEEL DUNNAGE - REMAINS
 - Y. CURB CAP - REMAINS
 - Z. FASTENER - REMOVE
 - AA. BITUMINOUS MEMBRANE - REMOVE
 - BB. DRAIN COVER - REMOVE
 - CC. DRAIN RING - REMOVE AND SET ASIDE FOR RE-USE
 - DD. EXTENSION REMOVE AND SET ASIDE FOR RE-USE
 - EE. BOLT - REMOVE
 - FF. GASKET - REMOVE
 - GG. COLLAR - REMOVE AND SET ASIDE FOR RE-USE
 - HH. DRAIN BODY - REMAINS
 - II. STRAP - 1/8" X 2" @ 16" - REMAINS

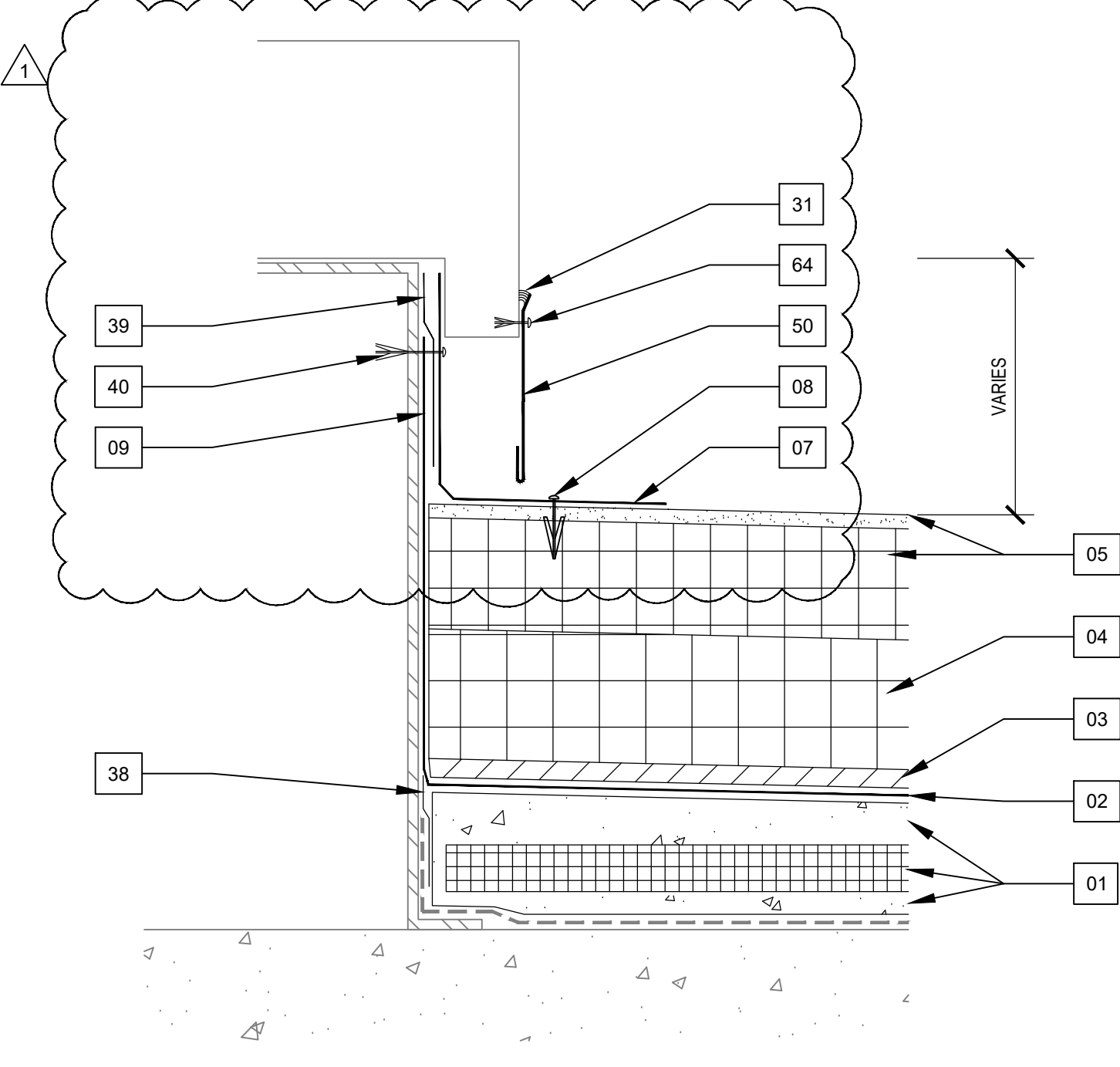
Issued / Revised		
No.	Date	Description
	06/01/2021	CONSTRUCTION DOCUMENTS
01	06/18/2021	ADDENDUM #1

DRAWING NOTES

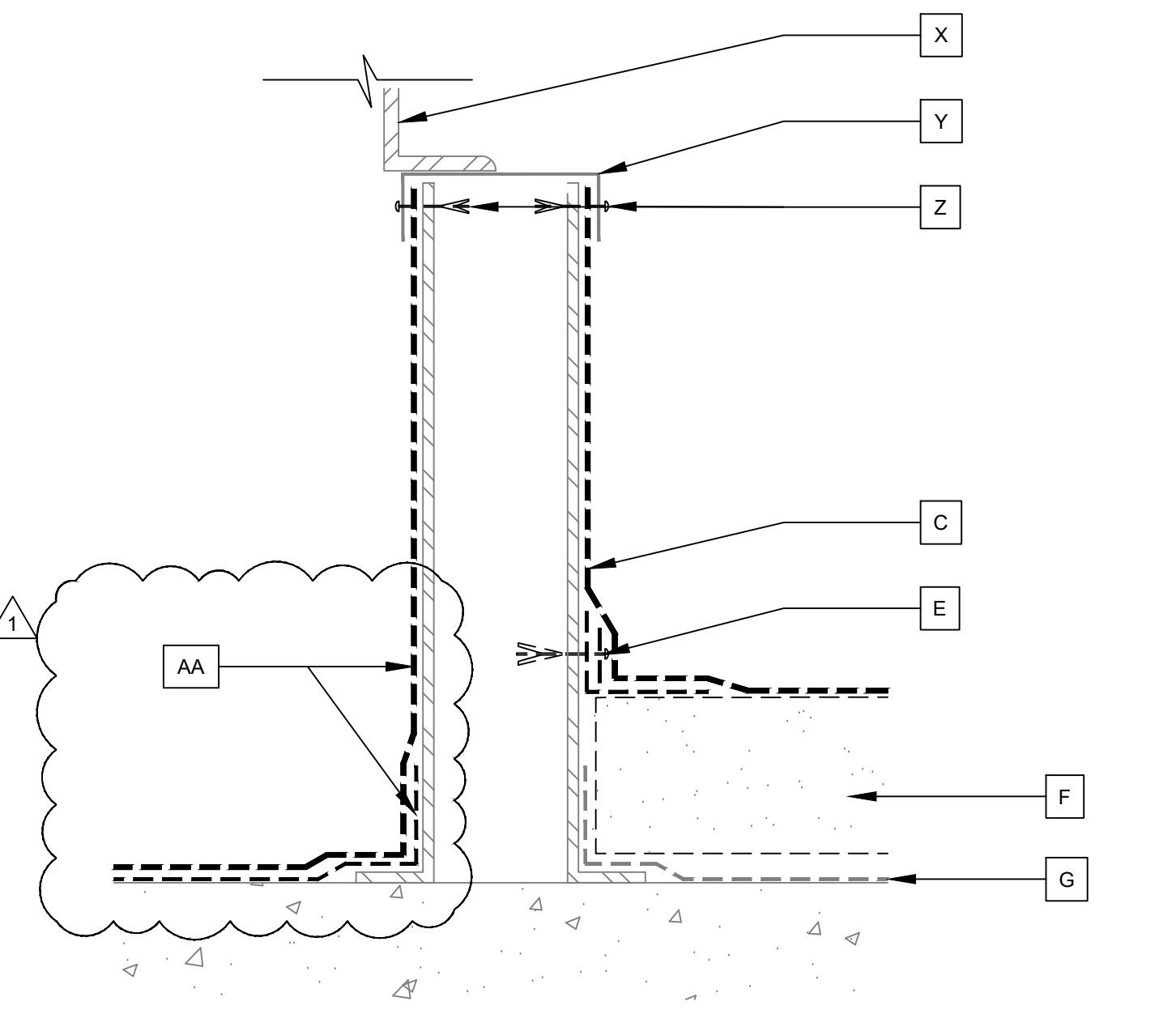
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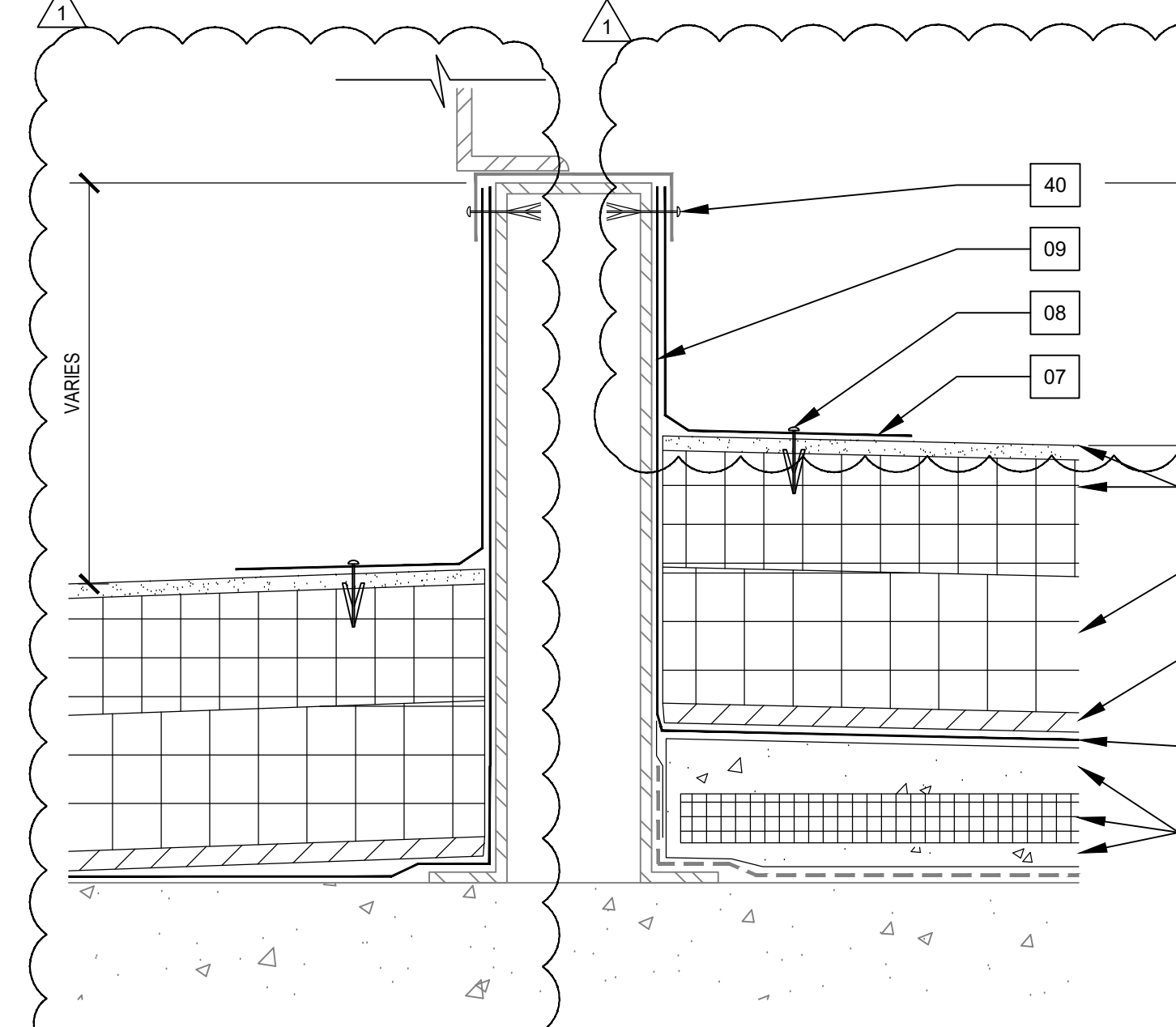
9E EXISTING BASE AT HVAC HOUSING
3" = 1'-0"



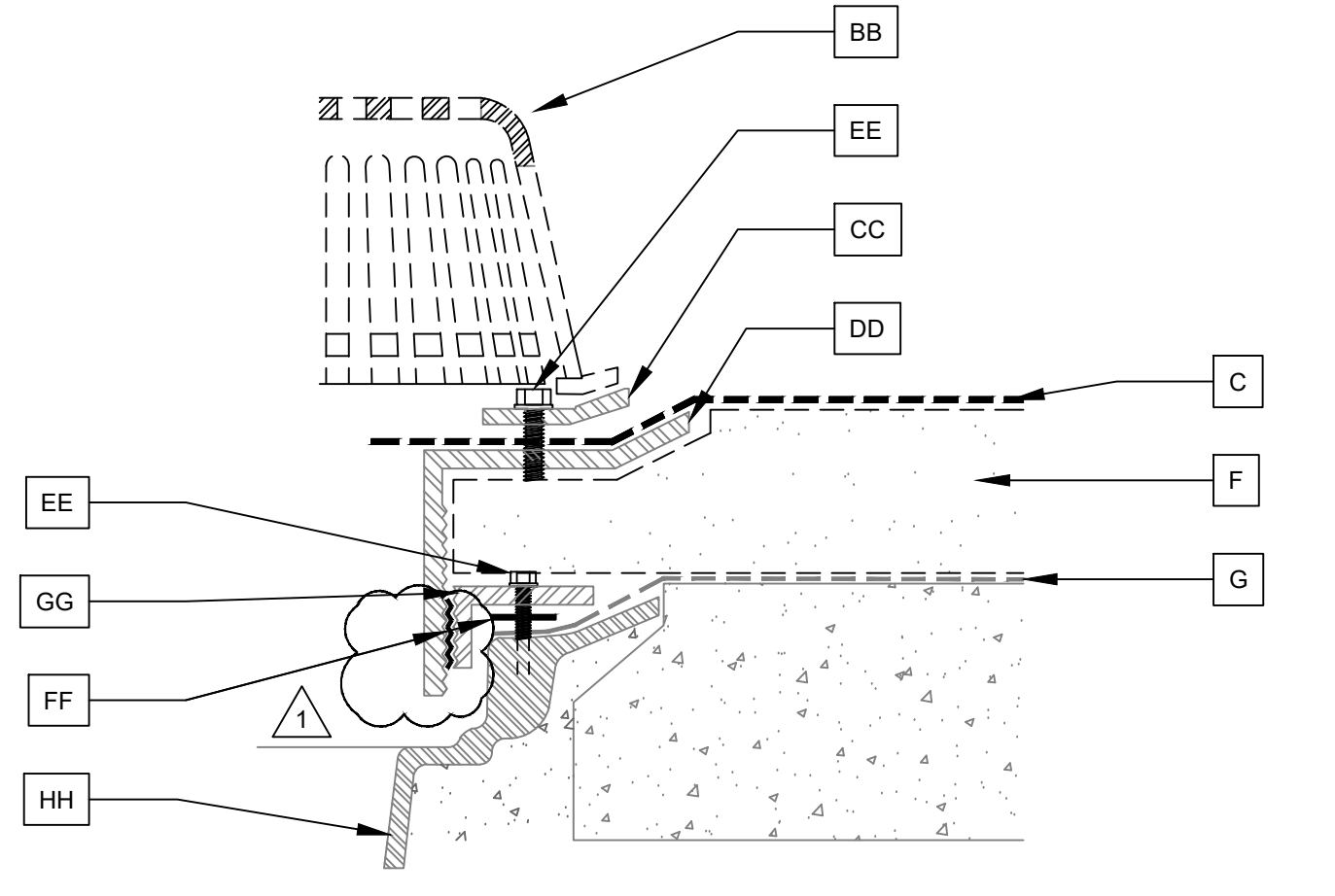
9R REVISED BASE AT HVAC HOUSING
3" = 1'-0"



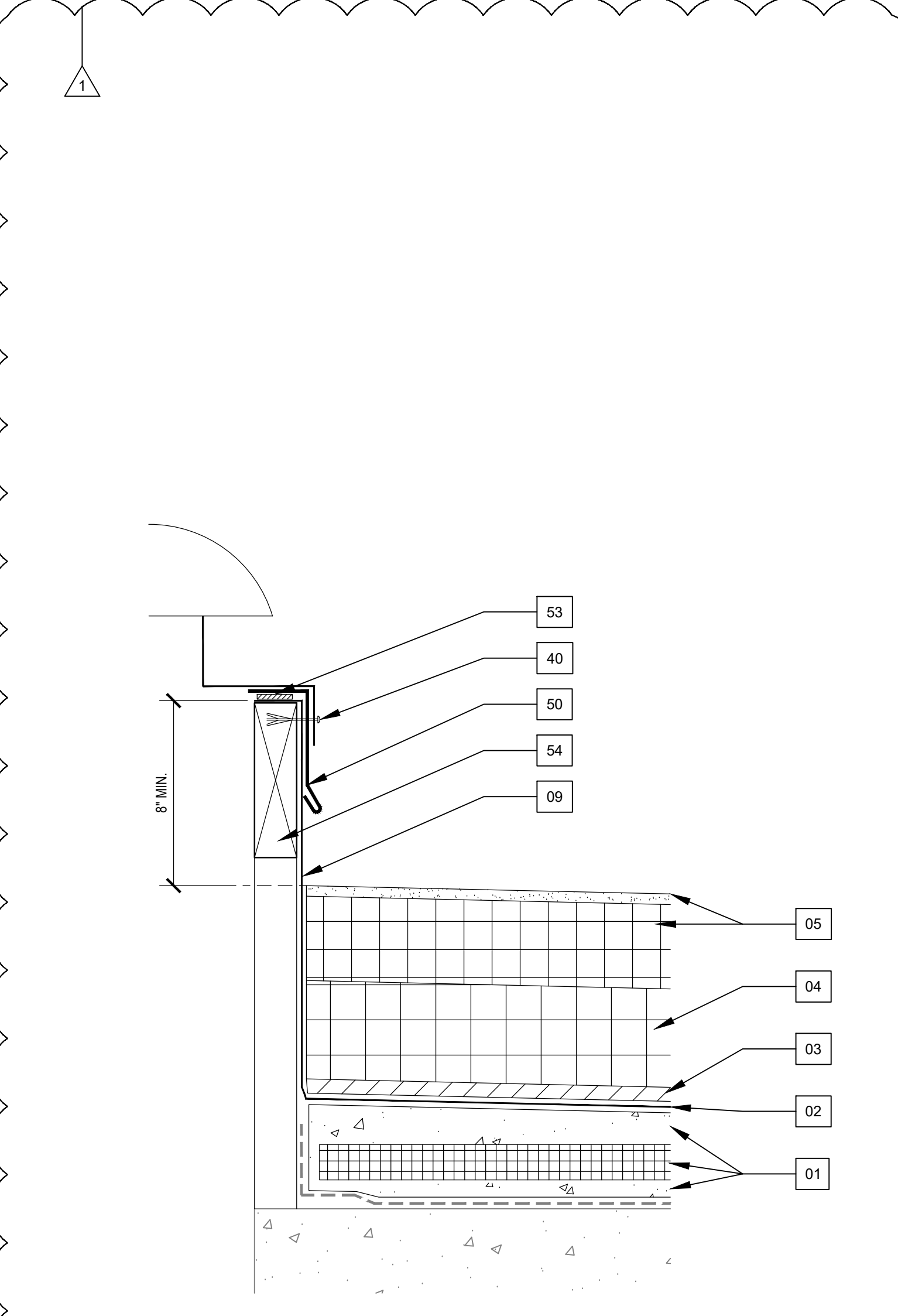
10E EXISTING RETENTION CURB
3" = 1'-0"



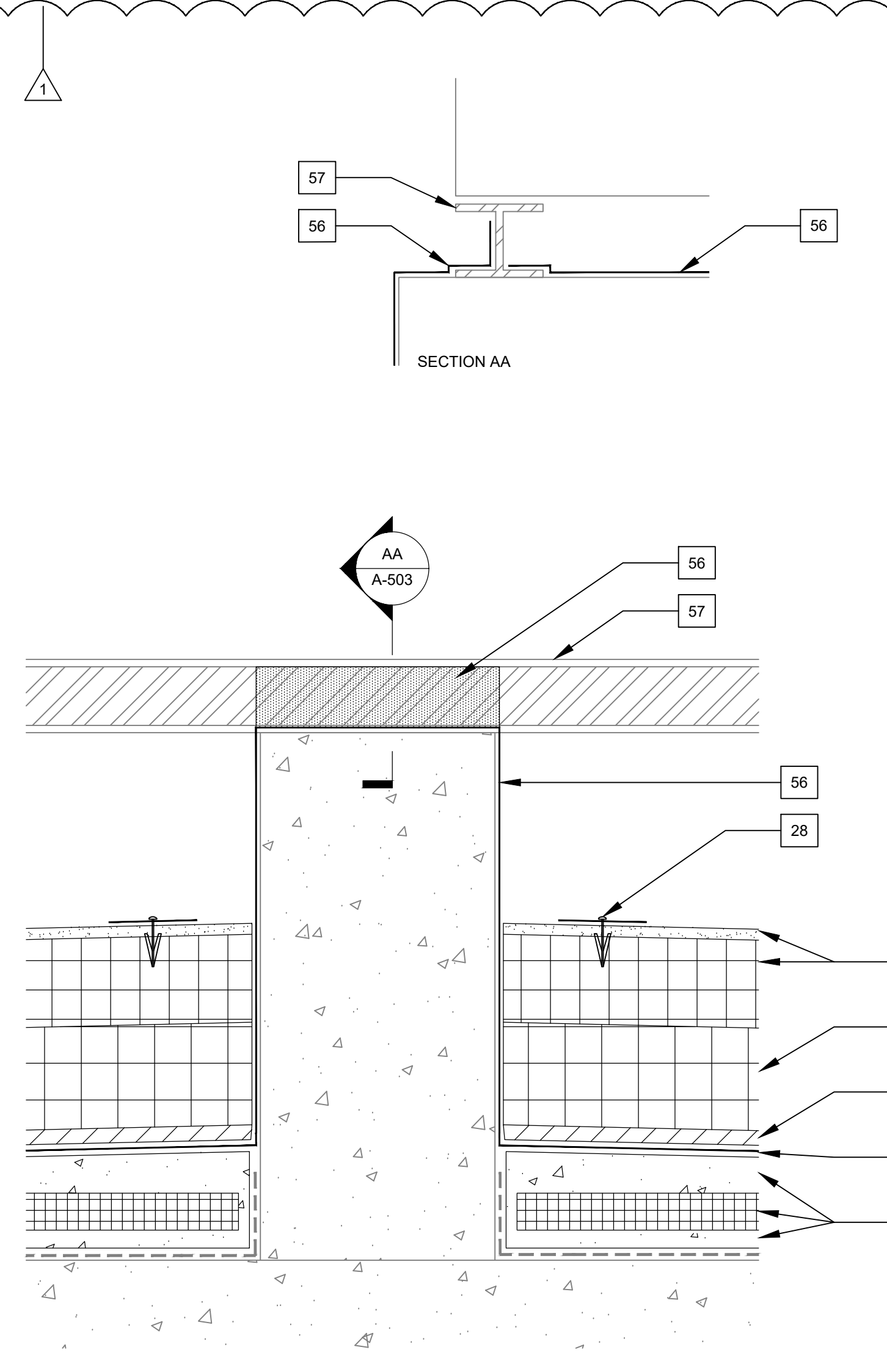
10R REVISED RETENTION CURB
3" = 1'-0"



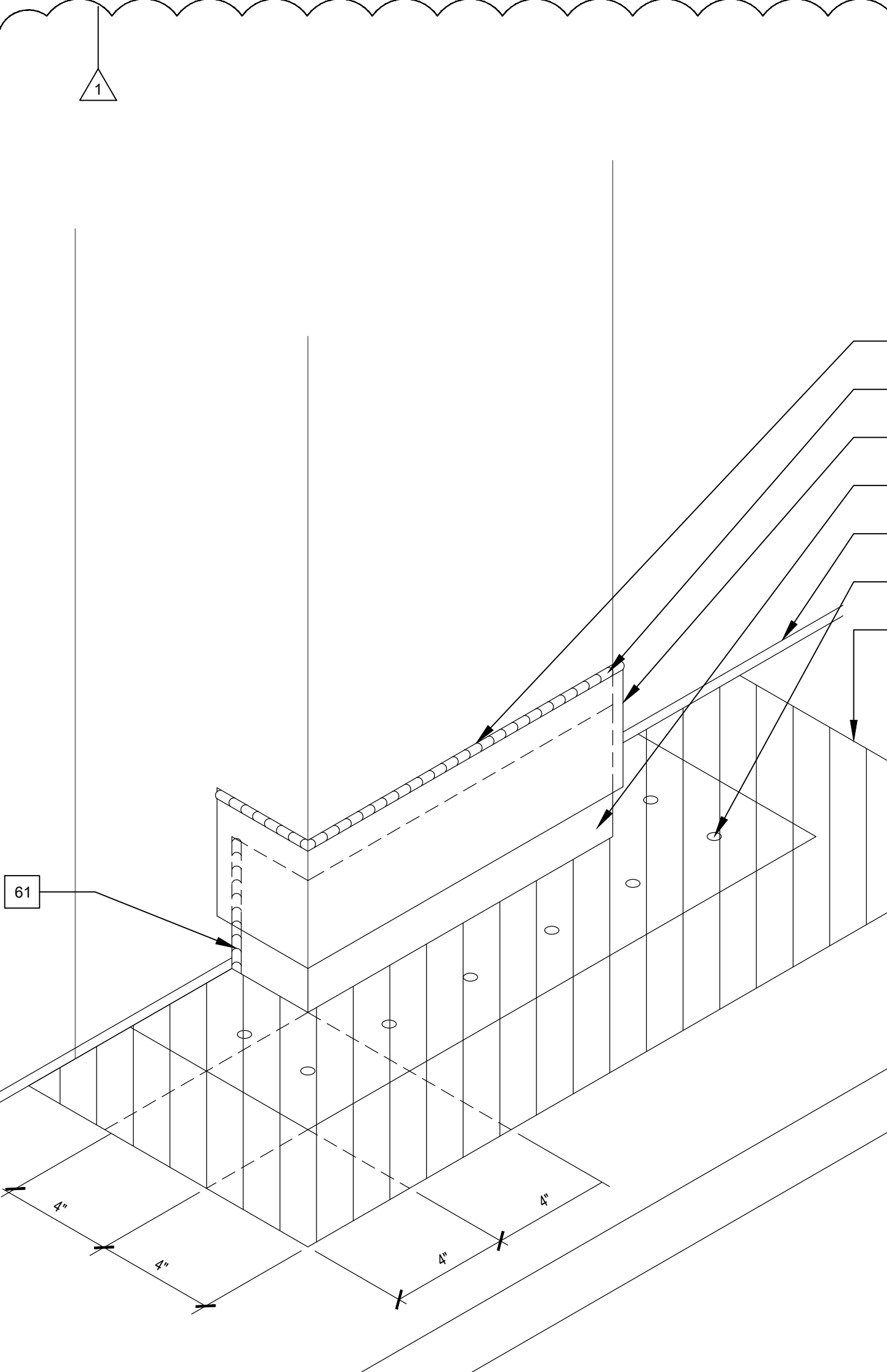
11E EXISTING DRAIN
3" = 1'-0"



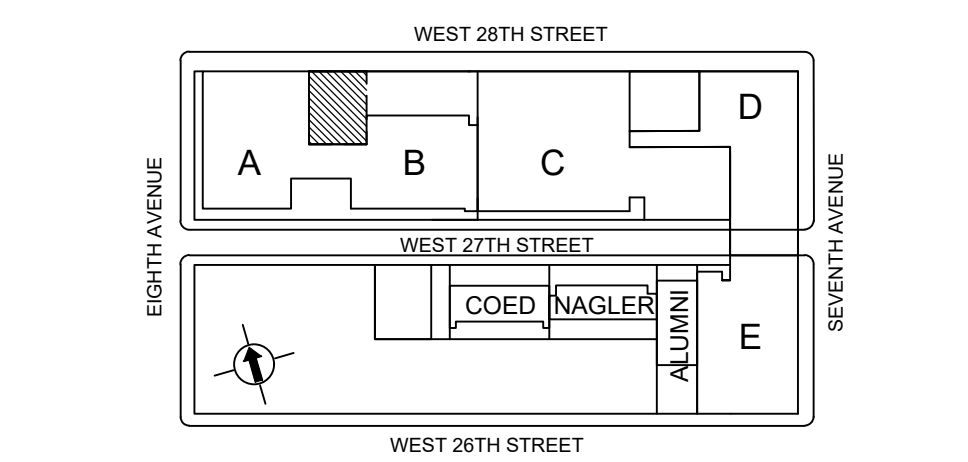
12R REVISED FAN ON CURB
3" = 1'-0"



13R REVISED CONCRETE CURB
3" = 1'-0"



14R REVISED EXPANSION JOINT AT WEST PARAPET COLUMN
3" = 1'-0"



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