Project Manual
FY-2021
Roof Replacement
Issued for Construction

FOR

Oak Ridge National Laboratory,
Oak Ridge, Tennessee

COPE ASSOCIATES
20040

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SET #

PROJECT MANUAL
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DRAWINGS-

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Rooftop equipment bases and support curbs.
2. Wood blocking and nailers.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.

C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Engineered wood products.

D. Shop drawings shall include the following note completed and signed by the Contractor:

1. THE DATA SUBMITTED DOES NOT CONTAIN MATERIAL DEVIATION FROM REQUIREMENTS OF CONTRACT DOCUMENTS EXCEPT AS FOLLOWS

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.

B. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.

B. For items of dimension lumber size, provide grade lumber with 19 percent maximum moisture content of any species.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Power-Driven Fasteners: NES NER-272.

C. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locatenailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.

D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.

END OF SECTION

SECTION 07 54 19 POLYVINYL CHLORIDE 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. Preparation of Substrate to Receive Roofing Materials
2. Temporary Roof Application to Prepared Substrate
3. Roof Insulation Application to Prepared Substrate
4. Roof Membrane Application
5. Roof Flashing Application
6. Incorporation of Sheet Metal Flashing Components and Roofing Accessories into the Roof System

B. Related Requirements:

1. Section 06 10 00 - Rough Carpentry
2. Section 07 62 00 - Sheet Metal Flashing and Trim

1.3 REFERENCES

Agencies which may be used as references throughout this specification section include:

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research Norwood, MA
NRCA	National Roofing Contractors Association Rosemont, IL
CERTA	Certified Roofing Torch Applicator Program National Roofing Contractors Association Rosemont, IL Midwest Roofing Contractors Association Lawrence, KS
OSHA	Occupational Safety and Health Administration Washington, DC

UL Underwriters Laboratories
Northbrook, IL

ICRI International Concrete Repair Institute
Des Plaines, IL

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review roofing requirements including, but not limited to, the following:

a. Surface preparation.
b. Minimum curing period.
c. Forecasted weather conditions.
d. Special details and sheet flashings.
e. Repairs.
f. Odor control

1.5 SUBMITTALS

A. Submittals Prior to Contract Award.
1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.

B. Design Submittals:

1. Shop Drawings: Include roof plans, sections, details, and attachments to other work,. Details shall be representative of actual project conditions (not manufacturers generic details). Drawing shall include the following:
a. Roof plan showing layout and thickness of insulation and slopes including tapered insulation. Plan shall indicate orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
b. Base flashings and membrane terminations and flashing details at penetrations.
c. Crickets, saddles, and tapered edge strips, including slopes.
d. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

2. Product data: Submit specifications, installation instructions, and general recommendations from the roofing system manufacturer.

3. Submit copy of job related manufacture’s standard details including flashings, base tie-ins, roof edges, terminations, penetrations, drains and any other relevant details.

4. Product Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, thickness, color, texture and surfacing and the

manufacture's current literature for each component.

5. Sample copy of the Manufacturer's warranty.

6. Sample copy of the Roofing Contractors warranty.

7. Material Safety Data sheets (MSDS) for all materials. Send directly to the owner.

8. FM / UL Testing data showing that the system assembly complies with the local wind uplift requirements and provides a Class A fire-rated roof assemblies.

1.6 QUALITY ASSURANCE

A. The Membrane Manufacture shall have not less than 10 years of successful experience in manufacturing materials of types required for this projects applications and requirements

B. Contractor specializing in performing the work of this section with (5) five years' experience and approved by system manufacture for warranted membrane installation. Contractor shall submit letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

C. 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 project must receive approval by the membrane manufacturer, through this process, prior to shipment of materials to the project site.

D. 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 membrane/flashing system installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: The membrane/flashing system 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. The Manufacture's Technical reprehensive shall provide the following inspections of the membrane application.

1. Job start inspection at the beginning of each phase of the project, to review special detailing conditions and substrate preparation.

2. Periodic in-progress inspections throughout duration of the project to evaluate membrane and flashing application.

3. Periodic in-progress inspections throughout duration of the project to evaluate membrane and flashing application.

4. Final punch-list inspection at completion of each phase of the project prior to an installation of any surfacing.

5. Warranty inspection to confirm completion of all punch list items and surfacing applications.

G. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build mockup for each typical roof installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.

   a. Size: 9 sq. ft. in area as directed by Architect.

   b. Description: Each type of roof installation.

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

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, coverboards, walkway products and other components of roofing system.

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

B. Roofing System Warranty: Submit warranty on Roofing System Warranty, Standard Form of Roofing System Warranty, at the front of the Project Manual. Warranty is to be signed by an authorized representative of the Roofing Manufacturer and shall cover the Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, coverboards, and walkway products.

C. Provide Three Year Roof Bond.

1.8 PROJECT / SITE CONDITIONS

A. Requirements Prior to Job Start

1. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

2. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NIOSH, NRCA and other industry or local governmental groups. Workers shall wear a long sleeve shirt with long pants and work boots. Workers shall use only butyl rubber or nitrile gloves when mixing or applying PMMA products. Safety glasses with side

shields are required for eye protection. Use local exhaust ventilation to maintain worker exposure below the published Threshold Limit Value (TLV). If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements published under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not appropriate for use with this product if TLV filtering levels have been exceeded.

B. Environmental Requirements

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - asphalt: At ambient temperatures of 40 F (4 C) and below, take precautions to ensure that the specified Type IV asphalt maintains a minimum acceptable 400 F (204 C) at the point of sheet application. Do not overheat asphalt to compensate for cold conditions. The use of insulated handling equipment is strongly recommended. Hot luggers, mop carts, and kettle-to-roof supply lines should be insulated. Hand mops should be constructed with a smaller yarn head to facilitate short moppings. Luggers and mop carts should never be more than half filled at all times.

3. Temperature Restrictions – self-adhesive sheets: The minimum required substrate temperature at point of application is 40 F (4 C). Maintain a minimum roof membrane material temperature above 50 F (10 C). In low temperature conditions, materials keep materials warm prior to application. Suspend application in situations where the self-adhered base ply cannot be kept at temperatures allowing for proper adhesion or the substrate temperature will not allow for proper adhesion.

C. Odor control

1. Contractor shall implement odor control and elimination measures prior to and during the application of the roofing/waterproofing materials. Control/elimination measures shall be field tested at off-hours and typically consists of one (1) or a multiple of the following measures:

   a. Sealing of air intakes with activated carbon filters. Install filters in accordance with requirements and recommendations of the filter manufacturer. Seal filters at joints and against building exterior walls to prevent leakage of unfiltered air.

   b. Sealing of doorways, windows, and skylights with duct tape and polyethylene sheeting to prevent leakage of air into the building.

   c. Contractor to provide industrial size fans to increase air circulcation across roof surface and placed as required to maximize timely evacuation of noxious fumes.

   d. Protection of Contractor personnel and occupants of the structure and surrounding buildings as necessary to comply with requirements of OSHA, NIOSH and/or governing local authority.

D. Protection Requirements

1. Membrane Protection: Provide protection against staining and mechanical damage for newly

applied roofing and adjacent surface.

1.9 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: The Contractor together with the Owner or designated Representative shall define a storage area for all components. Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Do not store resins or catalyst at temperatures below 32°F (0°C) or above 85°F (29°C). Keep away from open fire, flame or any ignition source. Store in a well ventilated area.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes when above the Threshold Limit Value (TLV). Do not eat, drink, or smoke in areas where roofing materials are stored or applied.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected, removed and replaced at the Contractor's expense.

E. Roll goods shall be stored horizontally on platforms sufficiently elevated to prevent contact with water and other contaminants. DO NOT use rolls that are wet, dirty or have damaged ends.

F. Roofing/waterproofing materials must be kept dry at all times. If stored outside, raise materials above ground or roof level on pallets and cover with a tarpaulin or other waterproof material. Plastic wrapping installed at the factory should **not** be used as outside storage covers.

1.10 COORDINATION & PROTECTION

A. Contractor to provide overhead protection for sidewalks and building entrances as required for protection of occupants durning construction.

B. Contractor to provide temporary protection as needed in occupied spaces below areas being re-roofed.

C. Coordinate the work with the installation of associated metal flashings, accessories, appurtenances, etc. as the work of this section proceeds.

D. Building components shall be protected adequately (tarp or other suitable material) from soil, stains, or spills at all hoisting points and areas of application. Contractor shall be responsible for preventing damage from any operation under its Contract. Any such damage shall be repaired at Contractor's expense to Owner's satisfaction or be restored to original condition.

E. Provide barricades, retaining ropes, safety elements (active/passive) and any appropriate signage required by OSHA, NIOSH, and NSC and/or the Owner or designated Representative.

F. Protect finished roofing/waterproofing membrane from damage by other trades by the use of a cushioning layer such as 1” thick expanded polystyrene insulation and an impact layer such as ½” thick exterior-grade plywood.

G. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the membrane unless approved by manufacturer's chemical resistance chart.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
   1. Accelerated Weathering: Roof membrane whall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Material Compatibility: Roof ing Materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

C. Wind Uplift Resistance: Design roofing system to resist the with uplift pressures indicated when tested according to FM Approvals 4474, UL 580, or UL 1897.

D. FM Approvals RoofNav Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in FM Approvals RoofNav for Class 1 or noncombustivle construction, as applicable. Identify materials with FM Approvals Certification Markings.
   1. Roofing system shall comply with RoofNav # 451106-0-0.
   2. Fire/Windstorm Classification: Class 1A-90
   3. Hail-Resistance Rating: SH.

E. SPRI's Directory of Roof Assemblies Listing: Roof Membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this project.
   1. Wind Uploft Load Capacity: FM-90

F. Solar Reflectance Index: Minimum 3 year aged SRI of 64 in accordance with ASTM E-1980-01.

G. Energy Star Listing: Roofing system shall bbe listed on the DOE's Energy Star "Roof Products Qualified Product List" for low-slope roof products.

H. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

I. Fire-Resistant Ratings: Comply with the fire-resitance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.2 ROOFING SYSTEM ASSEMBLY/PRODUCTS

A. Basis of Design: Siplast. Other acceptable Manufacturers: Johns Manville, GAF, Firestone.

B. Temporary Roof

1. Torchable Modified Bitumen Ply Sheet: A fiberglass reinforced, specially modified asphalt coated sheet, having an minimum weight of 85 lb/sq.

   Basis of Design: Siplast Irex 40

J. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 8 feet where polyisocyanurate insulation is specified to be installed with insulation adhesive.

1. Polyisocyanurate: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 . Panels shall have a nominal thickness to match existing. Acceptable types are as follows:

   a. Paratherm by Siplast; Irving, TX
   b. ACFoam II by Atlas Roofing Corporation; Atlanta, GA
   c. H-Shield by Hunter Panels, LLC, Portland, ME

2. Polyisocyanurate Tapered Roof Insulation: Tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2. The tapered system shall provide for a roof slope of tomatch existing. Acceptable types are as follows:

   a. Tapered Paratherm by Siplast; Irving, TX
   b. ACFoam II Tapered Insulation Systems by Atlas Roofing Corporation; Atlanta, GA
   c. Tapered H-Shield by Hunter Panels, LLC, Portland, ME

3. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides. Provide panels having a nominal thickness of 1/2 inch. Acceptable types are as follows:

   a. DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

   b. Securock Brand Gypsum-Fiber, By United States Gypsum Company

2.3 DESCRIPTION OF SYSTEMS

A. Roof Membrane Ply: A roof membrane consisting of one ply of a prefabricated, polyester scrim-reinforced, polyvinyl chloride (PVC) membrane formulated with an Elvaloy® Ketone Ethylene Ester (KEE) copolymer, applied over a prepared substrate. The roof membrane shall have a factory-adhered polyester fleece backing on the bottom side. The roof membrane shall meet or exceed to the minimum

criteria established by ASTM D4434 Standard Specification for Poly(Vinyl Chloride) Sheet Roofing (Type III). The minimum thickness of the roof membrane shall be 80 mils (2 mm), as established by ASTM D751 Standard Test Method for Coated Fabrics. The minimum thickness of the roof membrane over the reinforcement scrim shall be 40 mils (1.02 mm), as established by ASTM D7635 Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement.

Basis of Design: Siplast Parasolo PVC KEE Fleece-Back roof membrane – 80 mil

B. Flashing Ply (fleece-back): A roof membrane consisting of one ply of a prefabricated, polyester scrim-reinforced, polyvinyl chloride (PVC) membrane formulated with an Elvaloy® Ketone Ethylene Ester (KEE) copolymer, applied over a prepared substrate. The flashing membrane shall have a factory-adhered polyester fleece backing on the bottom side. The flashing system shall meet or exceed to the minimum criteria established by ASTM D4434 Standard Specification for Poly(Vinyl Chloride) Sheet Roofing (Type III). The minimum thickness of the flashing membrane shall be 80 mils (2 mm), as established by ASTM D751 Standard Test Method for Coated Fabrics. The minimum thickness of the flashing membrane over the reinforcement scrim shall be 40 mils (1.02 mm), as established by ASTM D7635 Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement.

Basis of Design: Siplast Parasolo PVC KEE Fleece-Back roof membrane – 80 mil

B. Flashing Ply (smooth): A smooth-surface roof membrane consisting of one ply of a prefabricated, polyester scrim-reinforced, polyvinyl chloride (PVC) membrane formulated with an Elvaloy® Ketone Ethylene Ester (KEE) copolymer, applied over a prepared substrate. The roof system shall meet or exceed to the minimum criteria established by ASTM D4434 Standard Specification for Poly(Vinyl Chloride) Sheet Roofing (Type III). The minimum thickness of the flashing membrane shall be 80 mils (2 mm), as established by ASTM D751 Standard Test Method for Coated Fabrics. The minimum thickness of the flashing membrane over the reinforcement scrim shall be 40 mils (1.02 mm), as established by ASTM D7635 Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement.

Basis of Design: Siplast Parasolo PVC KEE Smooth roof membrane – 80 mil

C. Catalyzed Acrylic Resin Flashing System for Penetrations: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

Basis of Design: Parapro 123 Flashing System by Siplast; Irving, TX

2.4 ROOFING ACCESSORIES

A. Insulation Adhesives

1. Insulation Adhesive: A single component, moisture cured, polyurethane foam adhesive, dispensed from a portable, pre-pressurized container used to adhere insulation panels to the substrate, as well as to other insulation panels.

Basis of Design: Para-Stik Insulation Adhesive by Siplast; Irving, TX

2. Insulation Adhesive: A dual component, polyurethane foam adhesive used to adhere insulation panels to the substrate, as well as to other insulation panels.

   Basis of Design: Parafast Insulation Adhesive by Siplast; Irving, TX

3. Insulation Adhesive: A dual component, polyurethane foam adhesive used to adhere insulation panels to the substrate, as well as to other insulation panels.

   Basis of Design: Parafast Adhesive T by Siplast; Irving, TX

B. Roofing Adhesives

1. Membrane Adhesive: A dual component, polyurethane foam adhesive used to adhere the roof membrane to the substrate.

   Basis of Design: Parafast Adhesive T by Siplast; Irving, TX

2. Flashing Membrane Adhesive: A solvent-based, low VOC, rubberized adhesive designed for bonding PVC single-ply roofing membranes and flashings to various roofing substrates.

   Basis of Design: Parasolo PVC Bonding Adhesive by Siplast; Irving, TX

3. Pourable Sealer: A single component, moisture cure, self-leveling sealant designed for use around penetrations in pitch pan details.

   Basis of Design: Parasolo PVC 1-part Pourable Sealant White by Siplast; Irving, TX

C. Bituminous Cutback Materials for SBS Modified Bitumen Temporary Roof

1. Primer: An asphalt/solvent blend for use with SBS modified bitumen membrane ply applications meeting ASTM D 41, South Coast Air Quality District and Ozone Transport Commission requirements.

   Basis of Design: Siplast PA-917 LS Primer by Siplast; Irving, TX

D. Sealant: A solvent-based, UV resistant synthetic elastomeric sealant for the completion of details.

   Basis of Design: Parasolo Flexseal Caulk Grade by Siplast; Irving, TX

E. Water Block: A single component butyl-based high viscosity sealant for sealing the flashing membrane to the substrate behind exposed termination bars and at drain flanges.

   Basis of Design: Parasolo Water Block by Siplast; Irving, TX

F. Membrane Conditioner/Cleaner: A solvent-based agent used to clean exposed or contaminated seams prior to heat welding to remove any residue that may compromise lap welding.

   Basis of Design: Parasolo Membrane Conditioner by Siplast; Irving, TX

G. Membrane Separation Pad: A non-woven polyester mat, having a weight of 3 oz./yd. (85 g/m^2), used beneath mechanically attached single-ply membrane in re-cover applications or between single-ply flashing membrane and flashing substrates contaminated with asphalt residue.

Basis of Design: Parasolo Poly Separation Layer by Siplast; Irving, TX

H. PVC Membrane Flashing Accessories

1. Outside Corner Flashing: A molded PVC membrane having a thickness of 0.075 inch (1.9 mm), designed to accommodate outside corners of base and curb flashing details. The molded flashing component shall be hot-air welded directly to the specified PVC membrane.

   Basis of Design: Parasolo PVC Outside Corner by Siplast; Irving, TX

2. Inside Corner Flashing: A molded PVC membrane designed to accommodate inside corners of base and curb flashing details. The molded flashing component shall be hot-air welded directly to the specified PVC membrane.

   Basis of Design: Parasolo PVC Inside Corner by Siplast; Irving, TX

3. Fluted Corner Flashing: A molded PVC membrane having a thickness of 0.055 inch (1.4 mm), designed to accommodate corners of base and curb flashing details having dimensions that cannot be addressed using standard pre-formed PVC inside or outside corner flashing components. The molded flashing component shall be hot-air welded directly to the specified PVC membrane.

   Basis of Design: Parasolo PVC Fluted Corner by Siplast; Irving, TX

4. Flashing Strip: An 8-inch wide molded PVC membrane strip having a thickness of 0.045 inch (1.14 mm), designed for general repairs and to strip-in PVC coated metal flanges.

   Basis of Design: Parasolo PVC Flashing Strip by Siplast; Irving, TX

5. Termination Bar with Receiver: An extruded aluminum termination bar with rounded edges and an angled sealant receiver and lower leg bulb stiffener, having factory-punched, slotted holes spaced on 6-inch (152 mm) centers.

   Basis of Design: Parafast Lip Termination Bar 6 Inch on Center by Siplast; Irving, TX

6. Termination Bar with Receiver: An extruded aluminum termination bar with rounded edges and an angled sealant receiver and lower leg bulb stiffener, having factory-punched, slotted holes spaced on 8-inch (203 mm) centers.

   Basis of Design: Parafast Lip Termination Bar 8 Inch on Center by Siplast; Irving, TX

7. Flat Termination Bar: A flat, extruded aluminum termination bar with rounded edges, having factory-punched, slotted holes spaced on 6-inch (152 mm) centers.

   Basis of Design: Parafast Flat Termination Bar 6 Inch on Center by Siplast; Irving, TX

8. Flat Termination Bar: A flat, extruded aluminum termination bar with rounded edges, having factory-punched, slotted holes spaced on 8-inch (203 mm) centers.

Basis of Design: Parafast Flat Termination Bar 8 Inch on Center by Siplast; Irving, TX

9. Pre-formed Vent Boots: A molded PVC membrane used to flash pipe and conduit penetrations having a diameter of 1 to 6 inches (25 to 152 mm). The pre-formed vent boots shall be hot-air welded directly to the PVC roof membrane.

   Basis of Design: Parafast PVC Conical Pipe Boot by Siplast; Irving, TX

10. Cover Patches at T-Joints: A molded PVC membrane used to reinforce the T-joints of the specified PVC membrane system.

    Basis of Design: Parasolo PVC T-Joint Cover Patch by Siplast; Irving, TX

I. Fasteners for Dry-hung Flashing Installation

1. Membrane Fasteners for Dry-hung Flashing: Membrane fasteners shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The fasteners shall provide attachment required to meet the specified uplift performance. The fastener spacing for membrane laps shall be as recommended by the manufacturer of the primary roofing products. Acceptable membrane fastener manufacturers for specific deck types are listed below.

   a) Metal Substrates: Mechanical fasteners for metal decks shall be factory coated for corrosion resistance. The fasteners shall meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable fastener types for metal decks are listed below.

      - A fluorocarbon coated screw type roofing fastener having a minimum 0.245 inch thread diameter, used in conjunction with the specified seam plate.

        Basis of Design: Parafast HD Fastener by Siplast; Irving, TX

      - A fluorocarbon coated screw type roofing fastener having a minimum 0.275 inch thread diameter, used in conjunction with the specified seam plate.

        Basis of Design: Parafast XHD Fastener by Siplast; Irving, TX

      - A fluorocarbon coated screw type roofing fastener having a minimum 0.325 inch thread diameter, used in conjunction with the specified seam plate.

        Basis of Design: Parafast SXHD Fastener by Siplast; Irving, TX

   b) Wood/Plywood Substrates: Mechanical fasteners for wood/plywood decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable fastener types for wood/plywood decks are listed below.

      - A fluorocarbon coated screw type roofing fastener having a minimum 0.245 inch thread diameter, used in conjunction with the specified seam plate.

        Basis of Design: Parafast HD Fastener by Siplast; Irving, TX

- A fluorocarbon coated screw type roofing fastener having a minimum 0.275 inch thread diameter, used in conjunction with the specified seam plate.

  Basis of Design: Parafast XHD Fastener by Siplast; Irving, TX

c) Concrete/Masonry Substrates: Insulation mechanical fasteners for structural concrete decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable insulation fastener types for structural concrete decks are listed below.

- A fluorocarbon coated non-threaded, hammer-driven roofing fastener specifically manufactured for use in structural concrete decks, used in conjunction with the specified seam plate.

  Basis of Design: Parafast CD-10 Fastener by Siplast; Irving, TX
  Basis of Design: CD-10 by OMG; Agawam, MA

- A fluorocarbon coated screw type roofing fastener having a minimum 0.245 inch thread diameter, used in conjunction with the specified seam plate.

  Basis of Design: Parafast HD Fastener by Siplast; Irving, TX
  Basis of Design: Heavy Duty Roofing Fastener by OMG; Agawam, MA

2. Membrane Seam Plates: Membrane seam plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The plates shall be used with the specified seam fasteners to provide attachment required to meet the specified uplift performance. Acceptable seam plate manufacturers are listed below.

- Barbed plates used in conjunction with the fastener shall be a metal type having a minimum 2.375 inch diameter, as supplied by the fastener manufacturer.

  Basis of Design: Parafast XHD Plate by Siplast; Irving, TX

- Barbed plates used in conjunction with the fastener shall be a metal type having a minimum 2.75 inch diameter, as supplied by the fastener manufacturer.

  Basis of Design: Parafast SXHD Plate by Siplast; Irving, TX

- Barbed plates used in conjunction with the fastener shall be a metal type having a minimum 2.375 inch diameter and designed for use with a specialized stand-up attachment tool.

  Basis of Design: Parafast Eyehook AccuSeam Plate by Siplast; Irving, TX
  Basis of Design: AccuSeam Plate by OMG; Agawam, MA

J. Walktread: A prefabricated, extruded and embossed PVC protection pad with a skid-resistant surface.

1. Thickness: 1/8 inch (3.2 mm)
2. Width: 30 in (76.2 cm)

   Basis of Design: Parasolo Walkway by Siplast; Irving, TX

PART 3 EXECUTION

3.1 PREPARATION

A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

B. Remove All Existing:

- Surface gravel
- Roof membrane
- Insulation
- Base flashings
- Edge metal
- Flanged metal flashings
- Cants, wood blocking
- Walkways
- Non functional penetrations/curbs
- Drain assemblies
- Vapor retarder
- Metal trim, counterflashing

C. Asphaltic Primer for Modified Bitumen Membrane: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.

3.2 SUBSTRATE PREPARATION

A. General: Ensure that substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of the catalyzed primer and/or resin to the substrate. Some surfaces may require scarification, shotblasting, or grinding to achieve a suitable substrate.

B. Inspect substrates, and correct defects before application of new waterproofing. Fill all surface voids greater than 1/8 inch wide with an acceptable fill material. Remove all bubbles and blisters from existing roof surface.

C. The final substrate for waterproofing shall be clean, dry, free of loose, spalled or weak material including coatings, mineral aggregate, and flood coat/gravel surfacing, oil, grease, contaminants, abrupt changes in level, waterproofing agents, curing compounds, and free of projections which could damage membrane materials

D. Moisture Content Evaluation: Evaluate the level of moisture in the substrate to determine that the moisture content is acceptable for application of the specified waterproofing system. Concrete substrates shall have a maximum moisture content of 6% by weight and a maximum internal relative humidity of 75%.

E. Preparation of Existing Concrete/Masonry Substrates to Receive Resin Materials: Existing concrete substrates shall have a minimum compressive strength of 3,500 psi (24 N/mm^2). Following evaluation for moisture content and confirmation that the moisture content is at an

acceptable level, shot blast or scarify/shot-blast concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion of the specified primer. Generate a concrete surface profile of CSP-2 to CSP- 4 as defined by the ICRI. Grinding may be used as a preparation method for localized areas that cannot be reached by a shot blasting equipment provided that a surface can be prepared to a CSP- 2 to CSP 4. Repair spalls and voids on vertical or horizontal surfaces using the specified primer and preparation paste.

F. Static Crack and Cold Joint Preparation: Clean cracks/joints and treat with the specified PMMA primer. Fill the cracks and joints using the specified preparation paste prior to membrane/flashing application.

G. Rigid Insulation/Cover board Securement to Prepared Substrates: Install insulation/cover board panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers. Maintain a maximum panel size of 4 feet by 4 feet for polyisocyanurate insulation applied in insulation adhesive. Perimeter and corner areas are identified on the roof plan.

1. Install Insulation/Cover Board: Install only as much insulation and cover board as can be primed, sealed, and protected before the end of the day's work or before the onset of inclement weather.

2. Fit Insulation/Cover Board: Neatly fit insulation/cover board to all penetrations, projections, and nailers. Insulation shall be loosely butted, with gaps not greater than 1/4". All gaps greater than 1/4" must be filled. Cover board shall be loosely butted, with gaps not greater than 1/4”. All gaps greater than 1/8” shall be filled with primer and sand or polyurethane sealant.

3. Insulation - double layer: Install both layers in an application of the specified insulation adhesive in strict accordance with the requirements of the insulation adhesive manufacturer. Stagger the panel joints between insulation layers.

4. Tapered Edge at Transitions: Field-cut, shape and install tapered edge strip at transitions of 1/4 inch or greater between substrate components to provide a smooth transition and proper support for the subsequent insulation layer or membrane/flashing system components.

5. Two-Component Polyurethane Adhesive: Low VOC, FM-approved two component reactive- cured polyurethane adhesive. Adhesive application rate shall be in accordance with specified wind uplift rating for system application. Roofing adhesive shall be a type approved by membrane and insulation manufacturer.

6. Drain Sumps: Insulation shall be feathered or tapered to provide a sump area a minimum of 36" x 36" where possible at all drains. Taper insulation around roof drains so as to provideproper slope for drainage. In areas where feathered or tapered insulation leaves insulation core exposed, cover with an appropriate cover board or base sheet/cap sheet assembly to provide a sound and smooth substrate surface.

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 and/or insulation 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 including granules, and exercise care in ensuring that the finished application is acceptable to the Owner.

C. Membrane Adhesive Application: Membrane adhesive can be applied by brush or roller. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 60 square feet per gallon (1.47 sq. m/liter).

D. Roofing Application: Apply roofing to be free of wrinkles, creases or fishmouths. Use a blower and/or broom to remove any dirt or debris from the substrate surface.

1. Unroll the specified fleece-back PVC sheets in place and fold back sheets in the long dimension to allow adhering of membrane, one half of sheet at a time. Alternatively, align a full roll of membrane with the factory-applied lap line on the previously installed sheet. Roll out the roll approximately 20 feet (6.1 m) checking to see that the edge of the new roll is straight with the line. Pick up the tail end of the previously rolled-out membrane and pull back over top of the roll of membrane.

2. Apply the specified low-rise foam adhesive in a “spatter pattern” over the substrate to yield a heavily textured, even coating of approximately 1/4- inch (6.2 mm) to 1/2- inch (12 mm) nominal thickness height on the peaks of the spattered adhesive. Allow the adhesive to rise and apply the roof membrane before the adhesive begins to “skin” over.

3. Lay half of the membrane into the wet adhesive and roll into place with a clean 150 lb. roller. Repeat the process for the other half of sheet. If following the alternative method, pull the sheet back to its original position, and roll into place. Make sure that the lap line is followed when re-installing the sheet.

4. Where the substrate angle changes in excess of 5 degrees (i.e. 1-inch slope), mechanically attach the membrane into the structural deck on 12-inch centers, keeping the fasteners 1/4 to 3/4 inch from the angle change. At curbs and walls, mechanically attach the membrane into the structural deck on 12-inch centers, keeping the fasteners 1/4 to 3/4 inch from the membrane edge. Alternatively, at walls/curbs extend the membrane a minimum of 3 inches up the vertical flashing substrate and mechanically attach the specified flat termination bar at the top edge of the membrane. The termination bar must be installed within 1.5 to 2 inches (38 to 51 mm) of the horizontal plane of the roof, with a minimum of 1-inch (25 mm) of membrane extending above the termination bar. Prior to mechanical attachment of the termination bar, apply the specified water block sealant on the flashing substrate behind the membrane where the termination bar will be installed.

5. Install a minimum of 4 fasteners evenly spaced around all round, square, “L”-beam or “H”-beam penetrations, keeping the fasteners 1/4 to 3/4 inches from the penetration. At penetrations having a larger diameter, install fasteners around the penetration on 12-inch centers.

6. Clean the laps of membrane that have become dirty or contaminated using the specified conditioner. Heat weld all side and end laps of the membrane during each day’s application. All welds must be continuous, without voids, and free of burns and scorch marks. Weld shall be a

minimum width of 1.5 inches (38 mm) for automatic machine welding and 2 inches (51 mm) for hand welding. Contact the manufacturer of the heat-welding equipment for specific guidelines on operating the equipment. Hand-roll the side laps and head laps of the membrane behind the heat welder when hand welding.

E. Flashing Application - General: Locate all penetrations at least 24 inches from curbs, walls, and edges to provide access for proper application of the specified flashing materials. Reinforce all coated metal and membrane flashing corners using preformed corners or non-reinforced membrane. Hot-air weld all flashing membranes, accessories, and coated metal to have a minimum 2-inch (51 mm) hand-welded or minimum 1.5-inch (38 mm) automatic machine-welded lap. Cover flashing substrates contaminated with asphalt residue with the specified membrane separation pad and mechanically attach at the top of the flashing condition. Reference the manufacturer's standard details for all flashing conditions. For dry-hung flashing over asphalt-contminated walls with smooth flashing membrane, loose lay the specified protection layer over the flashing substrate without any wrinkles of buckles. Overlap side and ends with the adjacent courses of the specified protection layer by a minimum of 6 inches.

F. Flashing Application - Coated Metal Flashings: Form coated metal flashings in accordance with SMACNA guidelines and the manufacturer's published specifications. Reference the manufacturer's standard details for all flashing conditions. Butt all joints of coated metal edge sections with a 1/4-inch (6 mm) gap to allow for expansion and contraction. Hot-air weld a 6-inch (152 mm) reinforced membrane flashing strip to both sides of the joint, with approximately 1-inch (25 mm) on either side of the joint left un-welded to allow for expansion and contraction. Apply 2-inch (51 mm) aluminum tape over the joint as a bond-breaker, to prevent welding in this area. Lap all joints of coated metal sealant pans, scupper inserts, corners of roof edging, and base flashing or pop-rivet a separate metal piece to create a continuous flange condition. Hot-air weld a 6-inch (152 mm) strip of reinforced membrane flashing over all seams that will not be sealed during subsequent flashing installation.

G. Reinforced Flashing Application – Dry-hung Membrane Flashing (horizontal lap orientation): Prior to installation, heat-weld the laps of the reinforced flashing sheet. Starting with the lowest lap of the flashing sheet, install the flashing membrane with the side laps running horizontally. mechanically attach the flashing membrane through the unadhered selvage into the flashing substrate using the specified fasteners on 12-inch centers. Mechanically attach subsequent side laps up the full height of the flashing condition using the same method. Terminate the top of the flashing membrane in accordance with the manufacturer's standard details.

G. Reinforced Flashing Application - Dry Hung Membrane Flashing (vertical lap orientation): Install the flashing membrane with the side laps running vertically. Mechanically attach each course of the flashing membrane through the selvage into the flashing substrate using the specified fasteners on 12-inch centers. Heat weld the laps over the fasteners and terminate the top of the flashing membrane in accordance with the manufacturer's standard details.

G. Reinforced Smooth Flashing Application - Adhered Membrane Flashing (solvent based adhesive): Apply the solvent-based bonding adhesive to both the underside of the membrane and the substrate at the minimum rate published by the manufacturer. Allow the bonding adhesive to dry until tacky to the touch before application of the flashing membrane.

H. Flashing Application - Adhered Un-Reinforced Membrane Flashing: Apply un-reinforced membrane at field-fabricated penetrations or as reinforcement flashings in locations where preformed corners and pipe boots cannot be properly installed. Apply un-reinforced flashing in strict accordance with the

published details and requirements of the roof membrane manufacturer. Allow the bonding adhesive to dry until tacky to the touch before application of the flashing membrane.

I. Catalyzed Acrylic Resin Flashing System (at penetrations): 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.

J. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Construct cut-offs to withstand protracted periods of service without leaking using materials and methods compatible with the specified roof membrane system. Cut-offs must be completely removed prior to the resumption of roofing.

3.4 ROOF SYSTEM INTERFACE WITH RELATED COMPONENTS

A. Walkway/Protection Pads: Install walkway rolls at all roof access locations and other designated locations includin1392g roof-mounted equipment, work locations and areas of repeated rooftop traffic. Cut the walktread into maximum 5 foot lengths and allow to relax until flat. Use a minimum spacing of 2 inches between sheets to allow for proper drainage. Heat-weld walkway rolls to the roof membrane surface continuously around the perimeter of the roll.

B. Roof Drains: Fit drains with clamping rings and strainer baskets. Provide a minimum 36-inch by 36-inch sump and a slope within the sump not exceeding 4:12. Extend the roof membrane over the drain opening and cut a hole in the membrane directly over the opening, leaving 1 inch of membrane to extending past the drain flange into the drain opening. Punch holes through the roofing membrane at drain bolt locations. Set the membrane in a full bed (use full tube) of the specified water block sealant over the drain flange prior to securement of the clamping ring. Lap seams within the sump area must be avoided. Where lap seams cannot be located outside of the sump area, apply a separate target of the specified roof membrane to extend a minimum of 12-inches in all directions from the sump area and mechanically attached on 12-inch centers around the drain with the specified screws and plates. Heat weld the flashing target beyond the screws and plates, extending over the drain flange.

C. Exposed Termination Bars: Prior to mechanical attachment of the specified termination bar with receiver, apply the specified water block sealant on the flashing substrate behind the membrane where the termination bar will be installed. Mechanically attach termination bars using the specified fasteners. Apply a continuous bead of the specified sealant at the top of termination bar sealant receiver lip.

3.5 FIELD QUALITY CONTROL AND INSPECTIONS

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

1. 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. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

End of Section

SECTION 07 56 00 FLUID-APPLIED ROOFING AND FLASHING

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. Preparation of Substrate to Receive Roofing Materials.
2. Base Sheet/Roof Insulation Application to Prepared Substrate.
3. Modified Bitumen Ply Sheet Application to Prepared Substrate.
4. Poly(methyl methacrylate) (PMMA)-based Roof Membrane Application.
5. PMMA-based Roof Flashing Application.

B. Related Requirements:

1. Section 06 10 00 - Rough Carpentry
2. Section 07 62 00 - Sheet Metal Flashing and Trim

1.3 REFERENCES

Agencies which may be used as references throughout this specification section include:

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research Norwood, MA
NRCA	National Roofing Contractors Association Rosemont, IL
CERTA	Certified Roofing Torch Applicator Program National Roofing Contractors Association Rosemont, IL Midwest Roofing Contractors Association Lawrence, KS
OSHA	Occupational Safety and Health Administration Washington, DC
UL	Underwriters Laboratories Northbrook, IL
ICRI	International Concrete Repair Institute

Des Plaines, IL

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review roofing requirements including, but not limited to, the following:

a. Surface preparation.
b. Minimum curing period.
c. Forecasted weather conditions.
d. Special details and sheet flashings.
e. Repairs.
f. Odor control

1.5 SUBMITTALS

A. Submittals Prior to Contract Award.
1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.

B. Design Submittals:

1. Product data: Submit specifications, installation instructions, and general recommendations from the roofing system manufacturer.

2. Submit copy of job related manufacture’s standard details including flashings, base tie-ins, roof edges, terminations, penetrations, drains and any other relevant details.

3. Product Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, thickness, color, texture and surfacing and the manufacture’s current literature for each component.

4. Sample copy of the Manufacturer’s warranty.

5. Sample copy of the Roofing Contractors warranty.

6. Material Safety Data sheets (MSDS) for all materials. Send directly to the owner.

7. FM / UL Testing data showing that the system assembly complies with the local wind uplift requirements and provides a Class A fire-rated roof assembly.

1.6 QUALITY ASSURANCE

A. The Membrane Manufacture shall have not less than 10 years of successful experience in manufacturing materials of types required for this projects applications and requirements

B. Contractor specializing in performing the work of this section with (3) three years' experience and approved by system manufacture for warranted membrane installation. Contractor shall submit letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

C. 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 project must receive approval by the membrane manufacturer, through this process, prior to shipment of materials to the project site.

D. 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 membrane/flashing system installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: The membrane/flashing system 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. The Manufacture's Technical reprehensive shall provide the following inspections of the membrane application.

1. Job start inspection at the beginning of each phase of the project, to review special detailing conditions and substrate preparation.

2. Periodic in-progress inspections throughout duration of the project to evaluate membrane and flashing application.

3. Periodic in-progress inspections throughout duration of the project to evaluate membrane and flashing application.

4. Final punch-list inspection at completion of each phase of the project prior to an installation of any surfacing.

5. Warranty inspection to confirm completion of all punch list items and surfacing applications.

G. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build mockup for each typical roof installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.

   a. Size: 9 sq. ft. in area as directed by Architect.

b. Description: Each type of roof installation.

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

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, coverboards, walkway products and other components of roofing system.

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

B. Roofing System Warranty: Submit warranty on Roofing System Warranty, Standard Form of Roofing System Warranty, at the front of the Project Manual. Warranty is to be signed by an authorized representative of the Roofing Manufacturer and shall cover the Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, coverboards, and walkway products.

C. Provide Three Year Roof Bond as specified in Section 00 61 43

1.8 PROJECT / SITE CONDITIONS

A. Requirements Prior to Job Start

1. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

2. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NIOSH, NRCA and other industry or local governmental groups. Workers shall wear a long sleeve shirt with long pants and work boots. Workers shall use only butyl rubber or nitrile gloves when mixing or applying PMMA products. Safety glasses with side shields are required for eye protection. Use local exhaust ventilation to maintain worker exposure below the published Threshold Limit Value (TLV). If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements published under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not appropriate for use with this product if TLV filtering levels have been exceeded.

B. Environmental Requirements

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that

materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - asphalt: At ambient temperatures of 40 F (4 C) and below, take precautions to ensure that the specified Type IV asphalt maintains a minimum acceptable 400 F (204 C) at the point of sheet application. Do not overheat asphalt to compensate for cold conditions. The use of insulated handling equipment is strongly recommended. Hot luggers, mop carts, and kettle-to-roof supply lines should be insulated. Hand mops should be constructed with a smaller yarn head to facilitate short moppings. Luggers and mop carts should never be more than half filled at all times.

3. Temperature Restrictions – self-adhesive sheets: The minimum required substrate temperature at point of application is 40 F (4 C). Maintain a minimum roof membrane material temperature above 50 F (10 C). In low temperature conditions, materials keep materials warm prior to application. Suspend application in situations where the self-adhered base ply cannot be kept at temperatures allowing for proper adhesion or the substrate temperature will not allow for proper adhesion.

4. Temperature Restrictions – PMMA-based Materials: Do not apply catalyzed resin materials if there is a threat of inclement weather. Follow the resin manufacturer's specifications for minimum and maximum ambient, material and substrate temperatures. Do not apply catalyzed resin materials unless ambient and substrate temperatures fall within the resin manufacturer's published range.

C. Odor control

1. Contractor shall implement odor control and elimination measures prior to and during the application of the roofing/waterproofing materials. Control/elimination measures shall be field tested at off-hours and typically consists of one (1) or a multiple of the following measures:

   a. Sealing of air intakes with activated carbon filters. Install filters in accordance with requirements and recommendations of the filter manufacturer. Seal filters at joints and against building exterior walls to prevent leakage of unfiltered air.

   b. Sealing of doorways, windows, and skylights with duct tape and polyethylene sheeting to prevent leakage of air into the building.

   c. Contractor to provide industrial size fans to increase air circulcation across roof surface and placed as required to maximize timely evacuation of noxious fumes.

   d. Protection of Contractor personnel and occupants of the structure and surrounding buildings as necessary to comply with requirements of OSHA, NIOSH and/or governing local authority.

D. Protection Requirements

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces.

1.9 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: The Contractor together with the Owner or designated Representative shall define a storage area for all components. Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Do not store resins or catalyst at temperatures below 32°F (0°C) or above 85°F (29°C). Keep away from open fire, flame or any ignition source. Store in a well ventilated area.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes when above the Threshold Limit Value (TLV). Do not eat, drink, or smoke in areas where roofing materials are stored or applied.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected, removed and replaced at the Contractor's expense.

E. Roll goods shall be stored horizontally on platforms sufficiently elevated to prevent contact with water and other contaminants. DO NOT use rolls that are wet, dirty or have damaged ends.

F. Roofing/waterproofing materials must be kept dry at all times. If stored outside, raise materials above ground or roof level on pallets and cover with a tarpaulin or other waterproof material. Plastic wrapping installed at the factory should **not** be used as outside storage covers.

1.1 COORDINATION & PROTECTION

A. Contractor to provide overhead protection for sidewalks and building entrances as required for protection of occupants durning construction.

B. Contractor to provide temporary protection as needed in occupied spaces below areas being re-roofed.

C. Coordinate the work with the installation of associated metal flashings, accessories, appurtenances, etc. as the work of this section proceeds.

D. Building components shall be protected adequately (tarp or other suitable material) from soil, stains, or spills at all hoisting points and areas of application. Contractor shall be responsible for preventing damage from any operation under its Contract. Any such damage shall be repaired at Contractor's expense to Owner's satisfaction or be restored to original condition.

E. Provide barricades, retaining ropes, safety elements (active/passive) and any appropriate signage required by OSHA, NIOSH, and NSC and/or the Owner or designated Representative.

F. Protect finished roofing/waterproofing membrane from damage by other trades by the use of a cushioning layer such as 1” thick expanded polystyrene insulation and an impact layer such as ½” thick exterior-grade plywood.

G. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the membrane unless approved by manufacturer's chemical resistance chart.

PART 2 - PRODUCTS

2.1 GENERAL

A. These specifications are to be considered MINIMUM STANDARDS. If a listed manufacture wishes to add value to his specifications, it will be acceptable.

B. Provide products which are recommended by manufacture to be fully compatible with indicated substrates. Products and roof system shall be approved for application over existing material as indicated.

2.2 ROOFING SYSTEM COMPONENTS

A. Roofing Membrane Assembly: The roof membrane assembly consist of one self-adhered base ply over the existing substrate, covered with liquid applied flexible, PMMA based monolithic membrane formed by the combination of resin and fleece fabric, minimum two coats.

1. Basis of design is Parapro PMMA Liquid Applied Roofing, by Siplast of Irving TX other acceptable manufactures are as follows:

    a. Kemper System

2. Self-Adhesive Modified Bitumen Base Ply: A roof membrane assembly consisting of one ply of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane applied over a prepared substrate, The back of the modified bitumen base ply shall be coated with factory applied polymer modified asphalt self-adhesive coating covered with a removable film. The top surface of the modified bitumen ply sheet shall be coated with a white acrylic coating to enhance resin bond and to minimize surface temperatures. Priming may be required prior to application of PMMA roof system.

    a. Paradiene 20 SA P by Siplast; Irving, TX

3. Self-Adhesive Modified Bitumen Flashing Reinforcing Sheet

4. Fleece for Membrane Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the membrane system manufacturer.

    a. Pro Fleece by Siplast; Irving, TX

5. Resin for field Membrane construction: A flexible, PMMA-Based Resin for use in combination with fleece fabric to form a monolithic rein forced roof membrane. Minimum 90 mil resin thickness.

6. Natural Quartz Anti-Skid Surfacing: A natural-colored, kiln-dried, quartz aggregate suitable for broadcast into a PMMA-based resin wearing layer.

7. PMMA Primer for use over masonry, concrete repair materials, vertical and horizontal concrete, wood, plywood and rigid insulation substrates.

8. Membrane flashing: Two part component, with catalyst, cold fluid applied reinforcined (PMMA) flashing /vertical grade water proofing membrane.

2.3 ROOFING SYSTEM ACCESSORIES

A. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 8 feet where polyisocyanurate insulation is specified to be installed with insulation adhesive.

1. Polyisocyanurate: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 . Panels shall have a nominal thickness to match existing. Acceptable types are as follows:

   a. Paratherm by Siplast; Irving, TX
   b. ACFoam II by Atlas Roofing Corporation; Atlanta, GA
   c. H-Shield by Hunter Panels, LLC, Portland, ME

2. Polyisocyanurate Tapered Roof Insulation: Tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2. The tapered system shall provide for a roof slope of tomatch existing. Acceptable types are as follows:

   a. Tapered Paratherm by Siplast; Irving, TX
   b. ACFoam II Tapered Insulation Systems by Atlas Roofing Corporation; Atlanta, GA
   c. Tapered H-Shield by Hunter Panels, LLC, Portland, ME

3. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides. Provide panels having a nominal thickness of 1/2 inch. Acceptable types are as follows:

   a. DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

   b. Securock Brand Gypsum-Fiber, By United States Gypsum Company

1. Asphalt Primer: An asphalt, solvent blend conforming to ASTM D 41 Type I or II requirements and meeting local VOC regulations.

   > PA-1125 Asphalt Primer by Siplast; Irving, TX

2. Asphalt Primer: An asphalt/solvent blend meeting ASTM D 41, South Coast Air Quality District and Ozone Transport Commission requirements.

   > PA-917 LS Asphalt Primer by Siplast; Irving, TX

3. Primer for Self-Adhesive Sheets: A quick drying, low-VOC, water-based, high-tack primer specifically designed to promote adhesion of roofing and waterproofing sheets to approved substrates. Primer shall meet South Coast Air Quality District and Ozone Transport Commission requirements.

   > TA-119 Primer by Siplast; Irving, TX

4. Elastomeric Sealant: A 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. Acceptable types are as follows:

   > PS-304 Elastomeric Sealant by Siplast; Irving, TX

E. Resin Accessories

1. Cleaning Solution/Solvent: A clear solvent used to clean and prepare transition areas of in-place catalyzed resin to receive subsequent coats of resin and to clean substrate materials to receive resin.

   > Pro Prep by Siplast; Irving, TX

2. Preparation Paste: A PMMA-based paste used for remediation of depressions in substrate surfaces or other irregularities.

   > Pro Paste Resin by Siplast; Irving, TX

3. Repair Mortar: A two-component, PMMA-based, aggregate filled mortar used for patching concrete substrates.

   > Pro Mortar by Siplast; Irving, TX

4. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA-based resin products, allowing the resins to be applied over sloped substrates.

   > Pro Thixo by Siplast; Irving, TX

5. Color Finish Resin: A pigmented, PMMA-based resin for used to provide a color finish for both field and flashing membranes.

   > Pro Color Finish by Siplast; Irving, TX

6. Catalyst: A peroxide-based reactive agent used to induce curing of PMMA-based resins.

   > Pro Catalyst Powder by Siplast; Irving, TX

F. PMMA Primers

1. Primer for Wood, Plywood and Rigid Insulation, Masonry and Vertical Concrete Substrates: A fast-curing PMMA-based primer for use in over wood, plywood and rigid insulation substrates.

   > Pro Primer W by Siplast; Irving, TX

2. Primer for Horizontal Concrete Substrates: A fast-curing PMMA-based primer for use over horizontal concrete substrates.

   > Pro Primer T by Siplast; Irving, TX

G. Accessories

1. Natural Quartz Anti-Skid Surfacing: A natural-colored, kiln-dried, quartz aggregate suitable for broadcast into a PMMA-based resin wearing layer.

   > Pro Natural Quartz by Siplast; Irving, TX

2. Ceramic Granule Anti-Skid Surfacing: No. 11 grade specification ceramic granules suitable for broadcast into a PMMA-based resin wearing layer.

   > No. 11 Granules by Siplast; Irving, TX

3. Joint Tape: A thermoplastic/rubber based sheet having a woven polyester backing used to treat joints between rigid insulation, flashing substrate panels and joints at cover plates used over sheet metal components. The tape shall have a minimum width of 4 inches.

   > Eternabond Webseal by Eternabond, Inc., Mundelein, IL

4. Glass Beads: A natural-colored glass bead for broadcast into the color finish layer of the waterproofing system to generate a skid resistant surface. Glass beads shall be supplied by the manufacturer of the waterproofing membrane.

   > Pro Texture Beads by Siplast; Irving, TX

PART 3 - EXECUTION

3.1 SUBSTRATE EXAMINATION/PREPARATION

A. General: Ensure that substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of the catalyzed primer and/or resin to the substrate. Some surfaces may require scarification, shotblasting, or grinding to achieve a suitable substrate.

B. Remove areas of saturated or deteriated insulation / roof system.

C. Inspect substrates, and correct defects before application of new waterproofing. Fill all surface voids greater than 1/8 inch wide with an acceptable fill material. Remove all bubbles and blisters from existing roof surface.

D. The final substrate for waterproofing shall be clean, dry, free of loose, spalled or weak material including coatings, mineral aggregate, and flood coat/gravel surfacing, oil, grease, contaminants, abrupt changes in level, waterproofing agents, curing compounds, and free of projections which could damage membrane materials.

E. Moisture Content Evaluation: Evaluate the level of moisture in the substrate to determine that the moisture content is acceptable for application of the specified waterproofing system. Concrete substrates shall have a maximum moisture content of 6% by weight and a maximum internal relative humidity of 75%.

F. Preparation of Existing Concrete/Masonry Substrates to Receive Resin Materials: Existing concrete substrates shall have a minimum compressive strength of 3,500 psi (24 N/mm^2). Following evaluation for moisture content and confirmation that the moisture content is at an acceptable level, shot blast or scarify/shot-blast concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion of the specified primer. Generate a concrete surface profile of CSP-2 to CSP-4 as defined by the ICRI. Grinding may be used as a preparation method for localized areas that cannot be reached by a shot blasting equipment provided that a surface can be prepared to a CSP-2 to CSP 4. Repair spalls and voids on vertical or horizontal surfaces using the specified primer and preparation paste.

G. Static Crack and Cold Joint Preparation: Clean cracks/joints and treat with the specified PMMA primer. Fill the cracks and joints using the specified preparation paste prior to membrane/flashing application.

H. Rigid Insulation/Cover board Securement to Prepared Substrates: Install insulation/cover board panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers. Maintain a maximum panel size of 4 feet by 4 feet for polyisocyanurate insulation applied in insulation adhesive. Perimeter and corner areas are identified on the roof plan.

1. Install Insulation/Cover Board: Install only as much insulation and cover board as can be primed, sealed, and protected before the end of the day's work or before the onset of inclement weather.

2. Fit Insulation/Cover Board: Neatly fit insulation/cover board to all penetrations, projections, and nailers. Insulation shall be loosely butted, with gaps not greater than 1/4". All gaps greater than 1/4" must be filled. Cover board shall be loosely butted, with gaps not greater than 1/4”. All gaps greater than 1/8” shall be filled with primer and sand or polyurethane sealant.

3. Insulation - double layer: Install both layers in an application of the specified insulation adhesive in strict accordance with the requirements of the insulation adhesive manufacturer. Stagger the panel joints between insulation layers.

4. Tapered Edge at Transitions: Field-cut, shape and install tapered edge strip at transitions of 1/4 inch or greater between substrate components to provide a smooth transition and proper support for the subsequent insulation layer or membrane/flashing system components.

5. Two-Component Polyurethane Adhesive: Low VOC, FM-approved two component reactive-cured polyurethane adhesive. Adhesive application rate shall be in accordance with specified wind uplift rating for system application. Roofing adhesive shall be a type approved by membrane and insulation manufacturer.

6. Drain Sumps: Insulation shall be feathered or tapered to provide a sump area a minimum of 36" x 36" where possible at all drains. Taper insulation around roof drains so as to provide

proper slope for drainage. In areas where feathered or tapered insulation leaves insulation core exposed, cover with an appropriate cover board or base sheet/cap sheet assembly to provide a sound and smooth substrate surface.

I. Self-Adhesive Base Sheet : Unroll the base ply, and set the roll into place utilizing minimum 3 inch side and end laps. Fold one end of the roll back onto itself by 24 inches. Peel the release film off of the back of the 24 inch end section of the sheet and lay into place, pressing the 24 inch end section of the sheet firmly into place over the substrate. Pull the release film free from the underside of the remainder of the sheet while pressing the material into place with a follow tool as the film is being removed, leaving the end laps unadhered. Prior to adhering the end laps, cut a dog ear angle at each end lap on overlapping selvage edges. Heat weld end laps, ensuring that the self-adhesive blend on the underside of the overlapping sheet and the top surface of the underlying sheet flow into a layer of continuously bonded or fused modified bitumen. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet. Laps of the base ply shall not be left exposed overnight. The base ply application shall be immediately followed by the application of the finish ply. A phased application between the base and finish plies is not approved. In cases where rapid onset of inclement weather occurs, seal exposed lap edges with a hot-air welder and trowel.

J. Preparation of Steel/Aluminum Substrates: Grind to generate a "white-metal" surface and remove loose particles. Extend preparation area a minimum of 1/2-inch (13 mm) beyond the termination of the roofing/flashing system. Notch steel surfaces to provide a rust-stop where detailed.

K. Preparation of DensDeck Prime Substrates to Self-Adhesive sheet: Ensure that the insulation panels have been properly secured. Inspect the surface of the panel insulation system to ensure that edges are level and even between adjoining panels.

3.2 MIXING OF RESIN PRODUCTS

A. Preparation/Mixing/Catalyzing Resin Products: Pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid for the time period specified by the resin manufacturer. Calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin component. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before pot life expires.

3.3 PREPARATION PASTE AND PRIMER MIXING/APPLICATION

A. Primer Application: Apply primer resin using a roller or brush at the rate specified by the primer manufacturer over qualified and prepared substrates. Apply primer resin at the increased rate specified by the primer manufacturer over DensDeck Prime or other porous substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation. Make allowances for waste, including saturation of roller covers and application equipment.

B. Paste Application: Apply catalyzed preparation paste using a trowel over prepared and primed substrates. Before application of any resin product over cured paste, wipe the surface of the paste

using the specified cleaner/solvent and allow to dry. Treat the surface again if not followed up by resin application within 60 minutes.

3.4 FLASHING AND FIELD MEMBRANE APPLICATION

A. Base Flashing Application

1. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to cure.

2. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.

3. Apply an even, generous base coat of flashing resin to prepared surfaces using a roller at the rate specified by the resin manufacturer. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin immediately following embedment of the fleece at the rate specified by the resin manufacturer, ensuring that the fleece is fully saturated. Ensure that the flashing resin is applied to extend beyond the fleece (maximum ¼-inch (6 mm). Remove the tape before the catalyzed resin cures. Make allowances for waste, including saturation of roller covers and application equipment.

4. Should work be interrupted for more than 12 hours or the surface of the cured resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.

B. B. Field Membrane Application

1. Using the specified cleaner/solvent, wipe flashing membrane surfaces to be lapped with field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.

2. Apply an even, generous base coat of field membrane resin to prepared surfaces using a roller at the rate specified by the resin manufacturer. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin immediately following embedment of the fleece at the rate specified by the resin manufacturer, ensuring that the fleece is fully saturated. Ensure that the flashing resin is applied to extend beyond the fleece (maximum ¼-inch (6 mm)). Make allowances for waste, including saturation of roller covers and application equipment. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

C. Color Finish Application

1. Ensure that the field and flashing membrane and has been in place for a minimum 2 hours. Using the specified cleaner/solvent, wipe field membrane surfaces to receive the color finish layer. Allow the surface to dry for a minimum 20 minutes before continuing work.
2. Apply an even top coat of catalyzed color finish resin at the rate specified by the resin manufacturer. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

3.5 WALKTREAD/SKID RESISTANT SURFACING

A. Granule Anti-Skid Application: Mask the areas to receive the anti-skid system using masking tape. Apply an additional top coat of catalyzed roof resin at the rate specified by the resin manufacturer, immediately broadcast granules to refusal, and allow to cure. Remove tape before the resin cures. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

B. Glass Bead Anti-Skid Application: Apply a layer of color finish using a prepared roof surface at the rate specified by the roofing system manufacturer. Immediately broadcast glass beads into the wet color finish using a hopper gun at the rate specified by the waterproofing system manufacturer and backroll to embed the beads.

3.6 FIELD QUALITY CONTROL AND INSPECTIONS

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

D. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

E. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

End of Section

SECTION 07 62 00 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Formed Products:

a. Formed sheet metal fabrications.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated 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. Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing, trim, soffits, gutters, and downspouts; including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Shop drawings shall include a roof plan, sections, and details, and attachments to the work. Details shall be representative of actual project conditions (not manufacturer's generic details).

C. Qualification Data for firms specified in the “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses of Architect and owners.

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

E. Shop drawings shall include the following note completed and signed by the Contractor:

1. THE DATA SUBMITTED DOES NOT CONTAIN MATERIAL DEVIATION FROM REQUIREMENTS OF CONTRACT DOCUMENTS EXCEPT AS FOLLOWS

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that 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. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

1.6 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 the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

1. Surface: Smooth, flat.
   a. Color: As selected by Architect from full range of industry colors and color densities.

b. Color Range: Noticeable variations in same piece are not acceptable. 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.

2. Exposed Coil-Coated Finishes:

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

3. Color: As selected by Architect from manufacturer's full range.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.

1. Finish: 2D (dull, cold rolled).
2. Surface: Smooth, flat.

D. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
2. Surface: Smooth, flat.
3. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Color: As selected by Architect from manufacturer's full range.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item 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 or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
4. Fasteners for Zinc Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.3 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the 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 without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed 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 as indicated 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. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

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 SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

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.

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.

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. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. 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, welding rods, 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 and levels indicated. 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. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.
7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws, metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as shown and as required for watertight construction.

1. Where sealant-filled joints are used, 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 moderate, 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 Division 7 Section "Joint Sealants."

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

1. Do not solder metallic-coated steel sheet.
2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Division 4 Section "Unit Masonry Assemblies."

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 as indicated 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 installation, remove unused materials and clean finished surfaces. Maintain in a 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

SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Roof curbs.

B. Related Sections include the following:
   1. Division 6 Section "Rough Carpentry" for wood nailers.

1.3 SUBMITTALS

A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Pack, handle, and ship roof accessories properly labeled in heavy-duty packaging to prevent damage.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers listed in other Part 2 articles.

2.2 MISCELLANEOUS MATERIALS

A. Glass-Fiber Board Insulation: ASTM C 726, 1 inch thick.

B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches thick.

C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

D. Elastomeric Sealant: ASTM C 920, silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, and heavy bodied for hooked-type expansion joints with limited movement.

2.3 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

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

    a. AES Industries, Inc.
    b. Roof Curb Systems.
    c. Thybar Corporation.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Supported Load Capacity: Coordinate load capacity with information on Shop Drawings of equipment to be supported.

D. Material: Zinc-coated (galvanized) steel sheet, 0.079 inch thick.

1. Finish: Factory prime coating.
2. Color: As selected by Architect from manufacturer's full range.

E. Construction:

1. Curb Profile: Manufacturer's standard compatible with roofing system.
2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
3. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
5. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
6. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
7. Liner: Same material as curb, of manufacturer's standard thickness and finish.
8. Nailer: Factory-installed wood nailer under top flange on side of curb, continuous around curb perimeter.
9. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb, of size and spacing required to meet wind uplift requirements.
10. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch-thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
11. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.
12. Security Grille: Provide where indicated.

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 work.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Install roof accessories to fit substrates and to result in watertight performance.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.

E. Seal joints with sealant as required by manufacturer of roof accessories.

3.3 TOUCH UP AND FINISH

A. Touch up factory-primed surfaces with compatible primer ready for field painting. Priming and finished coats of paint to be provided and applied in accordance with Division 9 painting Sections.

3.4 CLEANING

A. Clean exposed surfaces according to manufacturer's written instructions.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
2. Exterior joints in horizontal traffic surfaces.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Compatibility and adhesion test reports.

C. Product test reports.

1.4 QUALITY ASSURANCE

A. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.

1.5 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

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

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant:

1. Products:

   a. Pecora Corporation; 898.
   b. Tremco; Tremsil 600 White.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

D. Single-Component Nonsag Urethane Sealant:

1. Products:

    a. Sika Corporation, Inc.; Sikaflex - 1a.
    b. Sonneborn, Division of ChemRex Inc.; Ultra.
    c. Sonneborn, Division of ChemRex Inc.; NP 1.
    d. Tremco; Vulkem 116.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

2.4 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type O P, Grade NF.

B. Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Sonneborn, Division of ChemRex Inc.; Sonolac.
4. Tremco; Tremflex 834.

C. Specialty Sealant: Comply with ASTM E 814 (UL 1479) and ASTM E 1966 (UL 2079).

1. 3M “FireDam 150+”.

2.5 PREFORMED JOINT SEALANTS

A. Preformed Silicone-Sealant System: Manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

1. Products:
    a. Dow Corning Corporation; 123 Silicone Seal.
    b. GE Silicones; UltraSpan US1100.
    c. Pecora Corporation; Sil-Span.
    d. Tremco; Spectrem Ez Seal.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

    a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

2. Remove laitance and form-release agents from concrete.

    a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install Specialty Sealants in strict accordance with manufacturer's written instructions for purpose intended.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

H. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.

I. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

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

END OF SECTION

GENERAL ROOF NOTES

1. BASIS OF DESIGN IS SIPLAST.
2. ALL DIMENSIONS AND ROOF SLOPES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AT SITE BY MEASUREMENT.
3. THIS DRAWING GRAPHICALLY REPRESENTS THE EQUIPMENT, PIPING AND ELECTRICAL CONDUIT. CONTRACTOR IS TO VERIFY SIZE, LOCATION & QUANTITY OF ALL PENETRATIONS AND EQUIPMENT.
4. PRECAUTIONS SHALL BE TAKEN WITH CONSTRUCTION MATERIALS AND EQUIPMENT TO PREVENT OVERLOADING OF ROOF STRUCTURE. ALL STORED MATERIALS SHALL BE COVERED AND PROTECTED FROM THE WEATHER UNTIL INSTALLATION. MATERIAL NOT STORED ON ROOF SHALL BE STORED IN ENCLOSURES OR FENCED AREAS.
5. CONTRACTOR SHALL EXERCISE CARE IN REMOVAL OF EXISTING ROOF MATERIALS AND ACCESSORIES AS REQUIRED SO AS TO NOT DAMAGE PERMANENTLY INSTALLED EQUIPMENT AND FEATURES. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROMPT REPAIR OF ANY DAMAGE THUS CAUSED.
6. EQUIPMENT SHALL BE SECURED FROM ACCESS WHEN WORKERS ARE AWAY FROM THE SITE.
7. THE CONTRACTOR SHALL MAINTAIN THE ROOF AND SITE CLEAN OF ALL MATERIALS AND DEBRIS ON A DAILY BASIS. WASTE SHALL BE DEPOSITED DAILY INTO THE CONTAINER FOR DISPOSAL AT AN APPROVED AND LEGAL DUMP SITE. FULL WASTE CONTAINERS SHALL BE REMOVED FROM THE SITE IMMEDIATELY. GUTTERS SHALL BE CLEANED OF DEBRIS. NAILS SHALL BE PICKED UP, ETC. SITE SHALL BE LEFT IN A CONDITION AS RECEIVED.
8. ALL ASSOCIATED ROOFING TO BE SUPPLIED AND/OR APPROVED BY SAME ROOFING SYSTEM MANUFACTURER.
9. ALL WOOD BLOCKING SHALL BE PRESSURE TREATED TO MINIMUM RETENTION AS DESCRIBED IN THE SPECIFICATIONS OF CHEMICAL PER CUBIC FOOT OF LUMBER. ALL BOLTS, SCREWS, NAILS, AND OTHER FASTENING DEVICES WHICH WILL PENETRATE OR BE IN CONTACT WITH PRESSURE TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED.
10. ALL SHEET METAL FABRICATIONS AND FLASHING SHALL BE PREFINISHED SHEET STEEL EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE. ALL CORNER UNITS SHALL BE SHOP FABRICATED AND SOLDERED AS UNITS. OVERLAPPING, SCREWED, RIVETED, OR CAULKED FABRICATIONS WILL NOT BE ACCEPTABLE UNLESS SPECIFICALLY NOTED OTHERWISE.
11. CONTRACTOR MAY REQUEST PERMISSION TO VARY FROM DETAILS SHOWN ON THE CONTRACT DOCUMENTS, BUT ONLY IF TIMELY SUBMITTED TO THE ARCHITECT IN WRITING WITH SUPPORTING GRAPHICAL DETAILS OR PHYSICAL SAMPLES. ANY VARIANCES FROM THE DETAILS OTHERWISE SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE FOR LABOR AND MATERIALS.
12. CONTRACTOR SHALL SCHEDULE ITS WORK IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACTOR DOCUMENTS AND COORDINATE WITH THE BUILDING'S OWNER OR REPRESENTATIVE.
13. CONTRACTOR SHALL PROVIDE A FIRE EXTINGUISHER ON THE ROOF AT ALL TIMES WHILE WORK IS PROCEEDING.
14. CONTRACTOR SHALL SUBMIT PHYSICAL SAMPLES OF METAL FABRICATIONS FOR REVIEW BY THE ARCHITECT PRIOR TO INSTALLING SUCH ITEMS IN THE WORK. FABRICATION INCLUDE, BUT ARE NOT LIMITED TO: FASCIA, EXPANSION JOINT, AND CORNER UNITS. SUBMIT SAMPLES ASSEMBLED WITH BLOCKING ON 3/4" THICK PLYWOOD BASE. SAMPLES SHALL BE 12" MAXIMUM IN ANY DIRECTION.
15. CONTRACTOR SHALL SCHEDULE THE SUBSTANTIAL COMPLETION INSPECTION AND THE WARRANTY INSPECTION (12 MONTH) AND BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT AND OWNER ACCORDINGLY.
16. CONTRACTOR TO PROVIDE WRITTEN AND CLEAR PHOTOGRAPHIC DOCUMENTATION OF ALL DAMAGED OR UNSATISFACTORY MATERIALS THAT REQUIRES REPLACING UNDER THE UNIT PRICE SECTION OF THE SPECIFICATION. PROVIDE A MARKED-UP DRAWING(S) LOCATING ANY UNSATISFACTORY MATERIAL FOR REVIEW BY THE ARCHITECT AND OWNER.
17. WHERE REQUIRED, REMOVE AND RE-INSTALL ALL MISCELLANEOUS ITEMS (LIGHTS, ANTENNAS, CONDUIT, FLASHING, LIGHTNING PROTECTION RODS AND CONDUIT, ETC.) INTERFERING WITH REMOVAL AND INSTALLATION OF ROOF EDGE TRIM, SOFFIT, RAKE, FLASHING AND ROOF MEMBRANE.
18. REMOVE THE ROOFING SYSTEM AND INSULATION DOWN TO THE EXISTING DECK.
19. WHERE EXISTING COPING IS REMOVED, PROTECT COPING FROM DAMAGE SO IT CAN BE REINSTALLED.

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PROJECT NOTES

1. THE CONTRACTOR AND SUB-CONTRACTORS SHALL BE LICENSED BY THE STATE OF TENNESSEE.
2. CONTRACTOR SHALL REVIEW ALL FIELD CONDITIONS PRIOR TO THE START OF CONSTRUCTION. NOTIFY ARCHITECT OF ANY DISCREPENCIES FROM DIMENSIONS SHOWN, NOTED, OR REQUIRED. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL OBTAIN CLARIFICATION, IN WRITING, FROM THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.
3. THESE DRAWINGS ARE ONE PORTION OF THE CONTRACT DOCUMENTS. AS SUCH, THEY ARE NOT TO BE DIVIDED INTO PARTIAL SETS AND DISTRIBUTED TO DIFFERENT PARTIES/TRADES WITHOUT THE REMAINING PORTIONS OF THE CONTRACT DOCUMENTS. IF PARTIAL SETS ARE DISTRIBUTED BY THE GENERAL CONTRACTOR, THE GENERAL CONTRACTOR SHALL THEN BE RESPONSIBLE FOR ALL COORDINATION AND FOR ANY ADDITIONAL COSTS RELATED TO THE COORDINATION OR ANY REMEDIATION WORK ARISING FROM THE PARTIAL DISTRIBUTION OF THE CONTRACT DOCUMENTS. THIS PAYMENT SHALL OCCUR AT NO ADDITIONAL COSTS TO THE OWNER, ARCHITECT, OR ANY OF THEIR EMPLOYEES OR CONSULTANTS.
4. THE CONTRACTOR SHALL ENSURE ALL WORK DEVELOPED WITHIN THE SCOPE OF WORK SHOWN IN THE DOCUMENTS IS IN CONFORMANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CODES LISTED IN THE DRAWINGS. IN THE EVENT OF ANY DISCREPANCIES BETWEEN AGENCY REQUIREMENTS, THE CONTRACTOR SHALL OBSERVE THE MOST STRINGENT AND/OR DISCUSS WITH THE ARCHITECT PRIOR TO PROCEEDING WITH WORK.
5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, LICENSES, AND APPROVALS PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMIT AND APPROVAL FEES UNLESS SPECIFICALLY EXCLUDED IN OTHER PARTS OF THE CONTRACT DOCUMENTS. GIVE ALL NECESSARY NOTICES AND PAY COSTS OF ALL INCIDENTAL FEES, INCLUDING THE CERTIFICATE OF OCCUPANCY.
6. THE CONTRACTOR SHALL MAINTAIN ADEQUATE PROTECTION OF EXISTING FACILITIES AND ALL HIS WORK FROM DAMAGE AND SHALL PROTECT THE OWNER'S PROPERTY, ADJACENT PROPERTY, AND PUBLIC PROPERTY FROM DAMGES. THE CONTRACTOR SHALL MAKE GOOD ANY SUCH DAMAGES OR INJURY AT NO COST TO THE OWNER, ARCHITECT, AND CONSULTANT AND ASSUMES AND BEARS ALL RISKS OF DAMAGES TO OR FAILURE OF THE WORK DURING CONSTRUCTION.
7. UNLESS OTHERWISE NOTED, ALL MATERIALS FURNISHED AND INCORPORATED INTO THE WORK SHALL BE NEW, UNUSED, AND OF QUALITY STANDARD TO THE INDUSTRY. INSTALL MATERIALS TO THE MANUFACTURER'S RECOMMENDATIONS AND BEST STANDARDS OF CORRESPONDING TRADES.
8. THE CONTRACTOR SHALL MAKE REQUIRED ADJUSTMENTS TO CONNECTIONS TO EXISTING BUILDING SYSTEM COMPONENTS AS REQUIRED BY ACTUAL FIELD CONDITIONS AND TO NO COST TO THE OWNER OR DESIGN PROFESSIONALS.
9. THE CONTRACTOR IS TO OBTAIN AND PROVIDE SHOP DRAWINGS AND/OR MATERIAL SAMPLES OF BUILDING COMPONENTS AS OUTLINED WITHIN THE SPECIFICATIONS FOR OWNER AND ARCHITECT APPROVAL. THE CONTRACTOR SHALL ALLOW ADEQUATE TIME FOR SUCH REVIEW (2 WEEKS) OR AS OUTLINED IN THE SPECIFICATIONS AND WILL HOLD THE OWNER AND ARCHITECT HARMLESS FOR DELAYS RELATED TO THE REVIEW AND DELIVERY TIMING PROCESS. ALL WORK SHALL COMPLY WITH THE CONSTRUCTION INDUSTRY STANDARDS OF PRACTICE AS SET FORTH IN THE BUILDING CODES, MANUFACTURER'S GUIDELINES, AND HANDBOOKS FOR STANDARDS OF PRACTICE. ACCESS TO THE SITE AND ALL WORK AND DELIVERIES WITHIN OR ADJACENT TO EXISTING FACILITIES IS TO BE COORDINATED WITH THE OWNER. THE CONTRACTOR IS TO MEET WITH THE OWNER AND THE ARCHITECT PRIOR TO STARTING CONSTRUCTION AS DESCRIBED WITHIN THE SPECIFICATIONS. THE CONTRACTOR WILL PRESENT, TO THE OWNER AND THE ARCHITECT, THE BUILDING PERMIT AND INSURANCE CERTIFICATES PRIOR TO STARTING CONSTRUCTION.
10. THE GENERAL CONTRACTOR SHALL PROVIDE ALL NECESSARY TOOLS, LABOR, EQUIPMENT, MATERIALS, AND OTHER REQUIRED SUPPLIES AND SERVICES TO COMPLETE THE WORK IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS OF THE LOCAL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL ENSURE THAT ALL OPERATIONS ARE CARRIED OUT IN CONFORMANCE WITH ALL APPLICABLE STATE AND FEDERAL CODES, STATUTES AND REGULATIONS CONCERNING, BUT NOT LIMITED TO, THE PROTECTION OF LIFE AND PROPERTY.
11. GENERAL CONTRACTOR SHALL COORDINATE AND MANAGE ALL TRADES AND ASPECTS OF THE WORK AS DESCRIBED IN THE CONTRACT DOCUMENTS.
12. GENERAL CONTRACTOR SHALL RETAIN ONE SET OF PLANS IN GOOD CONDITION TO NOTE AND DOCUMENT ALL CHANGES DURING CONSTRUCTION. THIS SET OF PLANS SHALL BE RETURNED TO THE OWNER AS PART OF THE REQUIRED CLOSE-OUT PACKAGE.
13. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE GENERAL CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR CONDITION AT THE JOB SITE INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THE REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL INCLUDE, BUT NOT BE LIMITED TO, MAINTAINING ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS, AND TRAFFIC CONTROL DEVICES DURING CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND SAFETY REQUIREMENTS.
14. ALL DISSIMILAR METALS SHALL BE ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.

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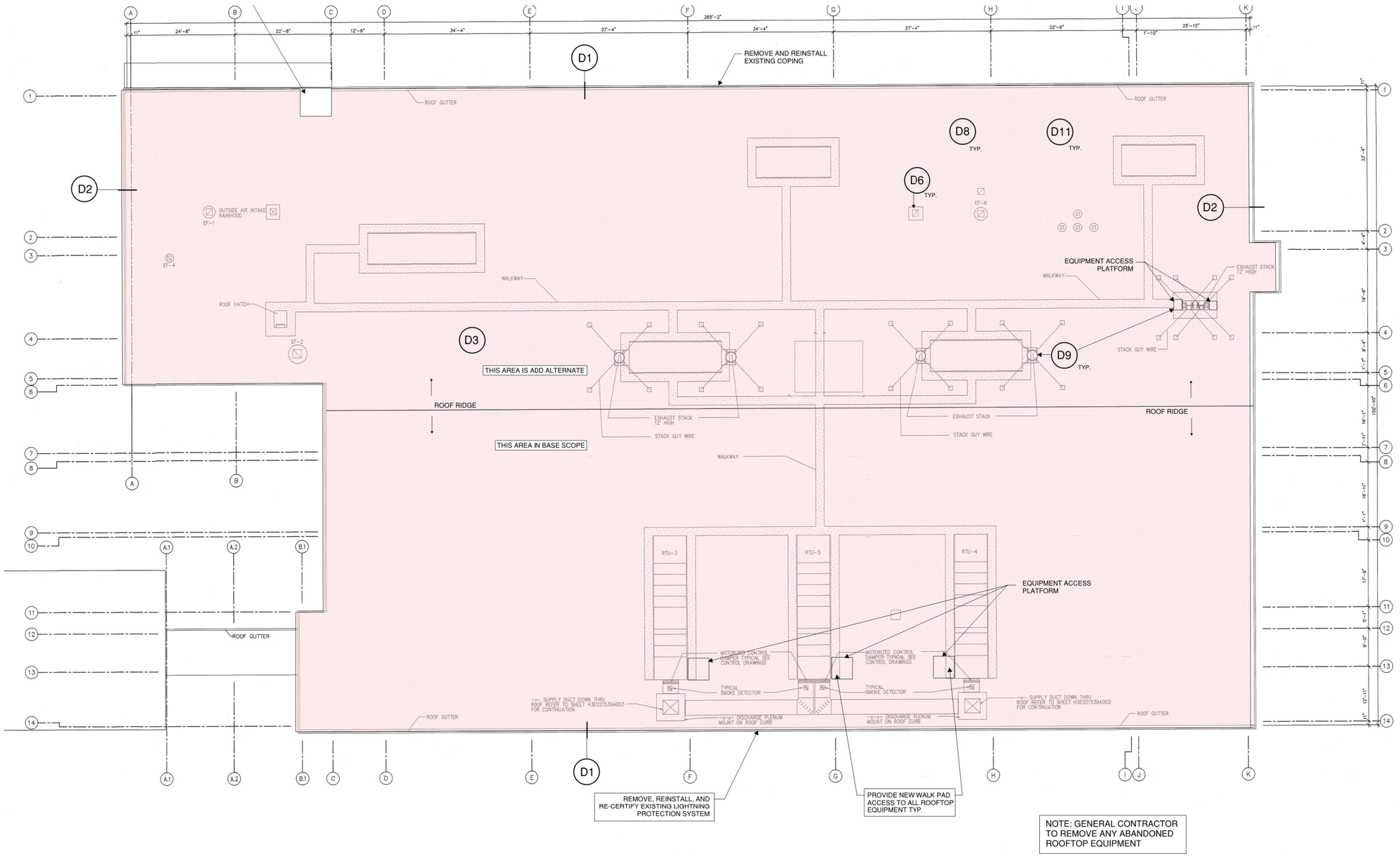

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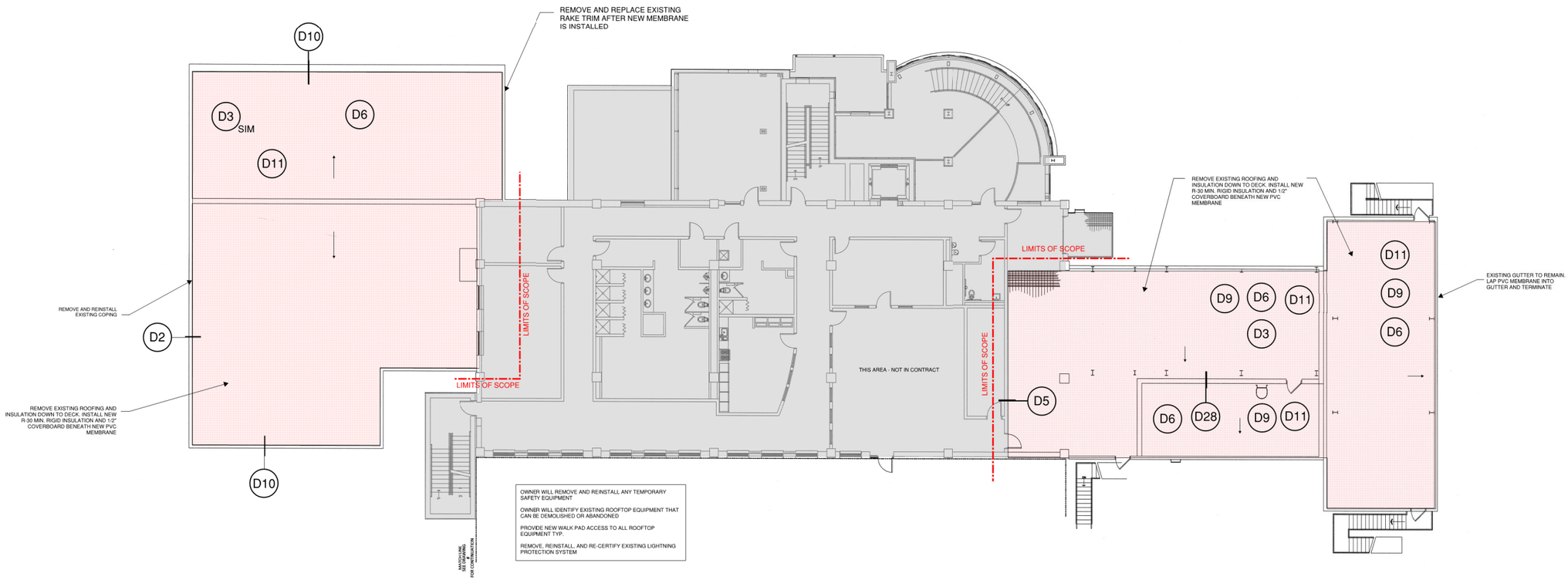

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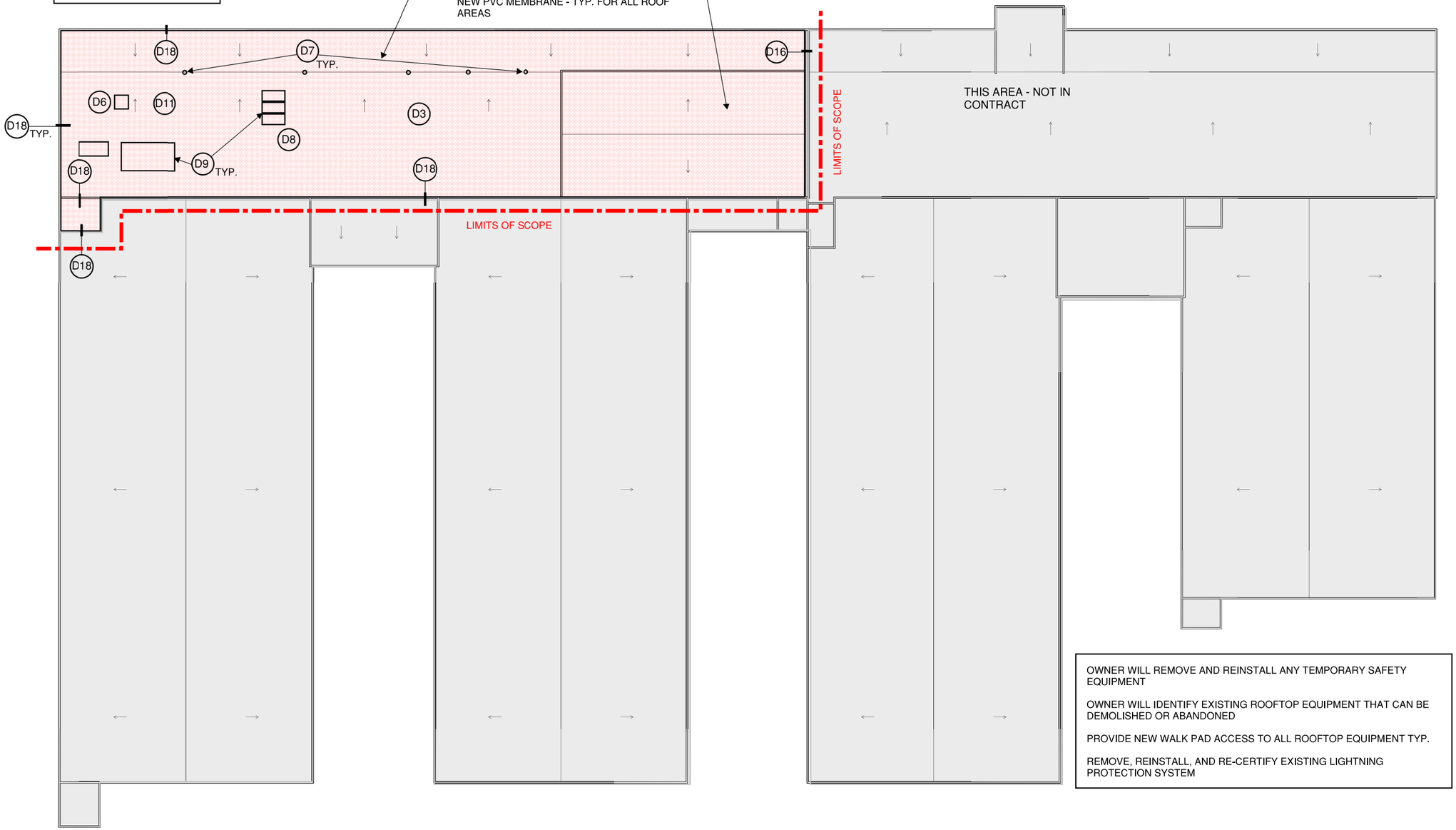
2519

NOTE: D18 TO BE USED IN BASE SCOPE. D18A TO BE USED AS ALTERNATE SCOPE

REMOVE EXISTING ROOF MEMBRANE AND INSULATION TO DECK - INSTALL NEW R-30 MIN. POLY ISO INSULATION, 1/2" COVERBOARD AND NEW PVC MEMBRANE - TYP. FOR ALL ROOF AREAS



OWNER WILL REMOVE AND REINSTALL ANY TEMPORARY SAFETY EQUIPMENT

OWNER WILL IDENTIFY EXISTING ROOFTOP EQUIPMENT THAT CAN BE DEMOLISHED OR ABANDONED

PROVIDE NEW WALK PAD ACCESS TO ALL ROOFTOP EQUIPMENT TYP.

REMOVE, REINSTALL, AND RE-CERTIFY EXISTING LIGHTNING PROTECTION SYSTEM

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FY 21 Re Roofs

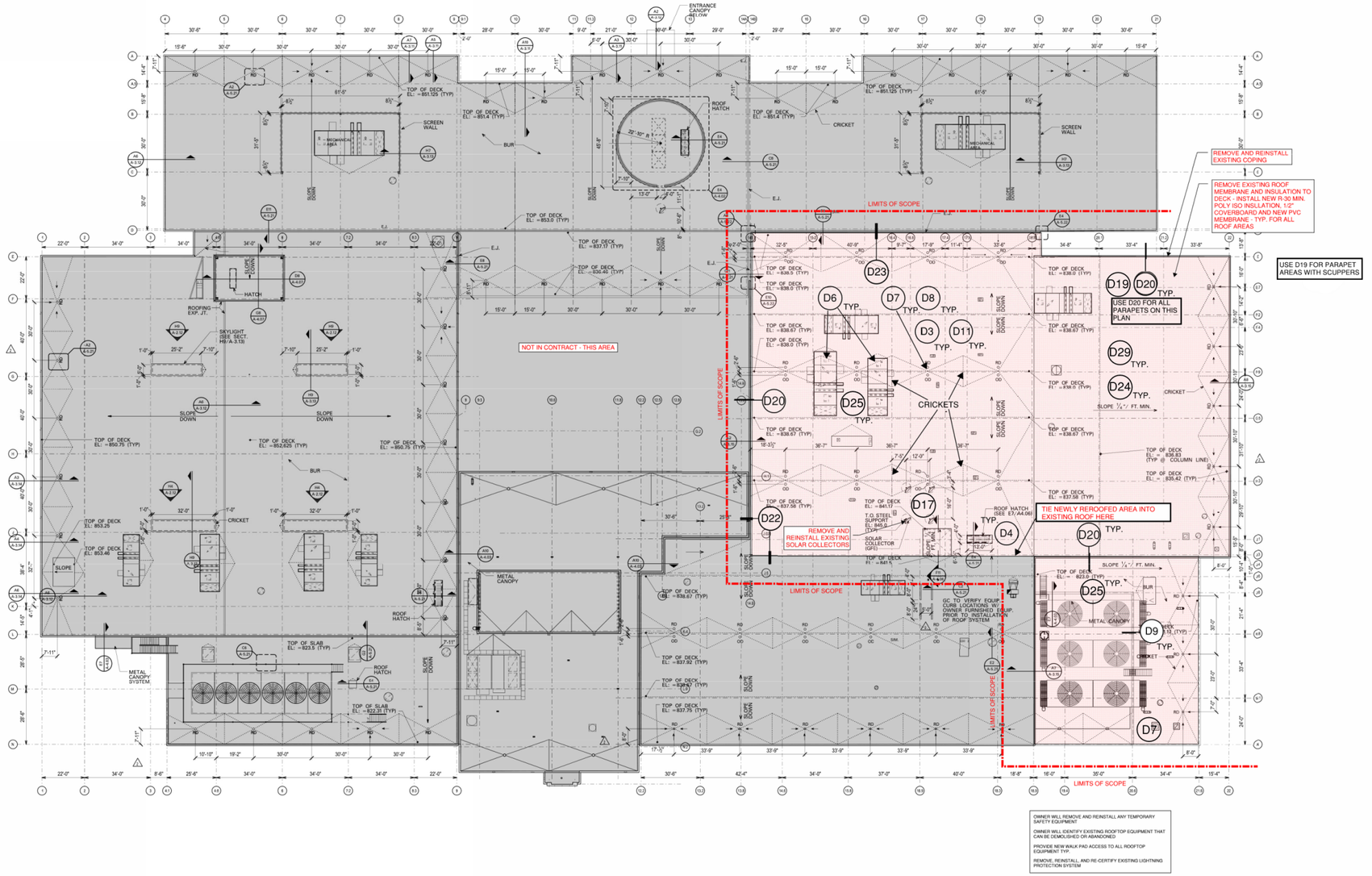
1 Bethel Valley Rd, Oak Ridge
TN 37830

ISSUE DATE

12-23-2020

BUILDING NUMBER

4500N



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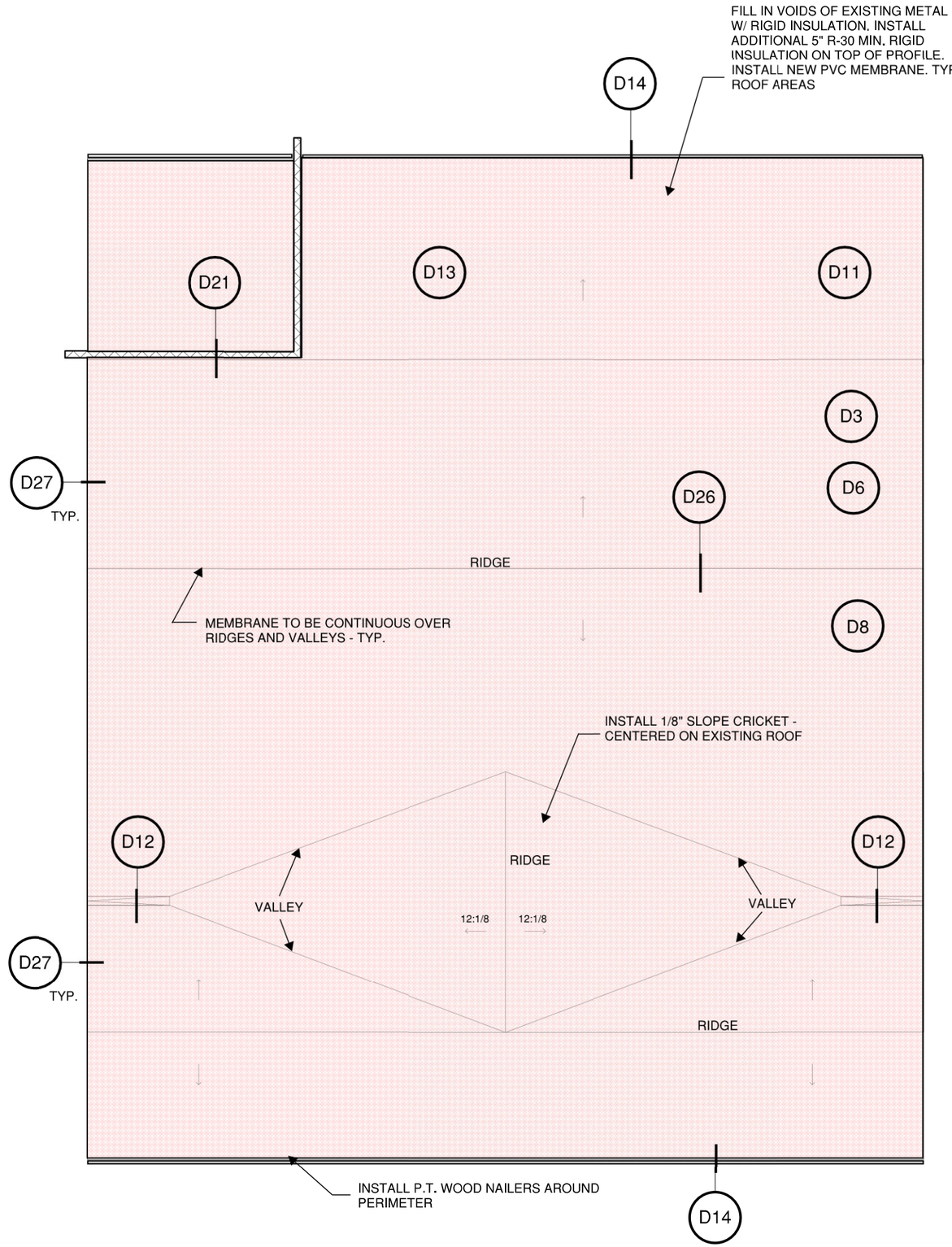
ISSUE DATE

12-23-2020

BUILDING NUMBER

5800



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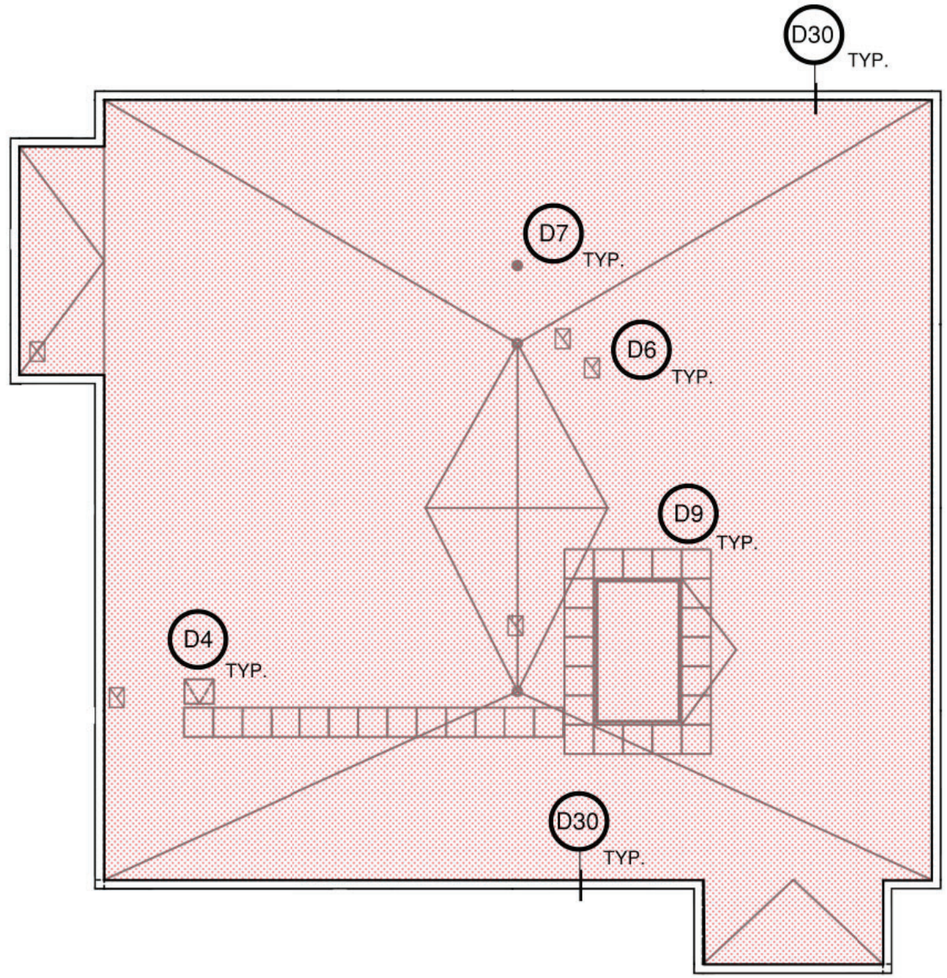
ISSUE DATE
12-23-2020

BUILDING NUMBER
7009



OWNER WILL REMOVE AND REINSTALL ANY TEMPORARY SAFETY EQUIPMENT

OWNER WILL IDENTIFY EXISTING ROOFTOP EQUIPMENT THAT CAN BE DEMOLISHED OR ABANDONED

PROVIDE NEW WALKPAD ACESS TO ALL ROOFTOP EQUIPMENT TYP.

REMOVE, REINSTALL, AND RECERTIFY EXISTING LIGHTNING PROTECTION SYSTEM

REMOVE AND REINSTALL EXISTING HANDRAILS

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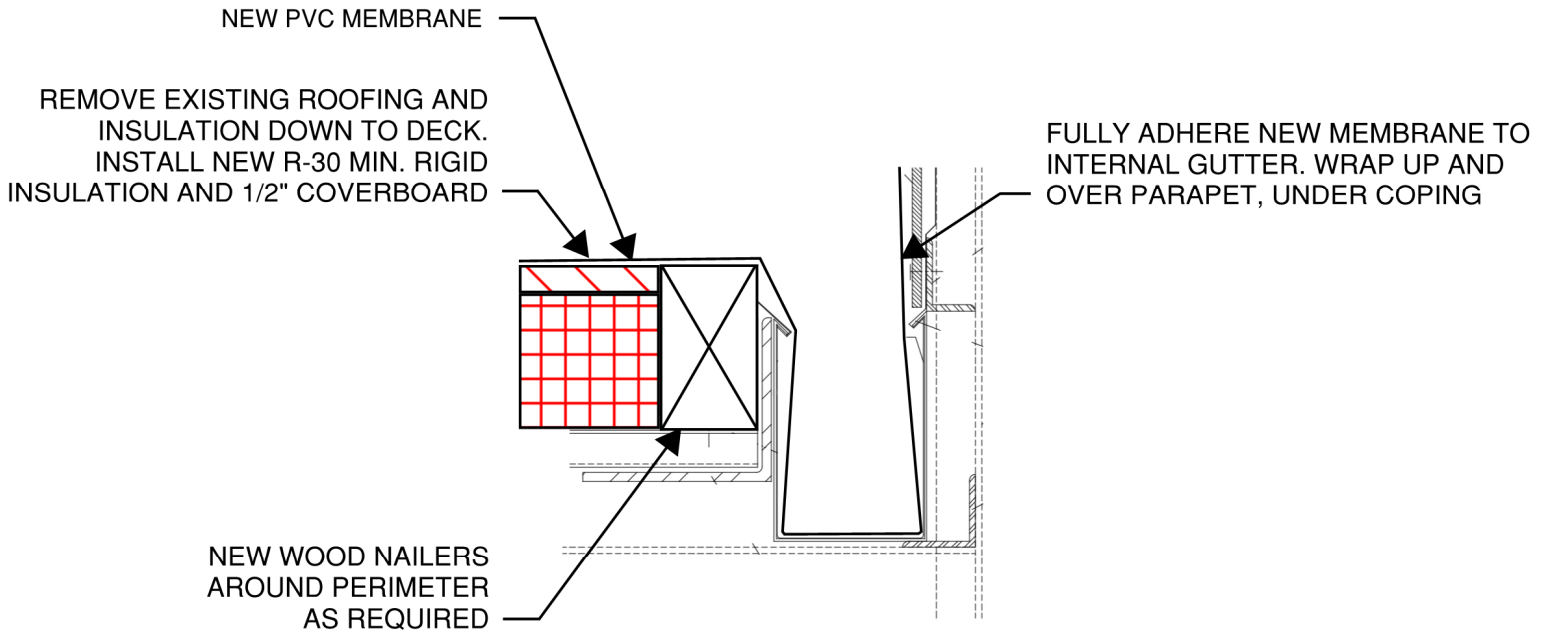
BUILDING NUMBER

7917



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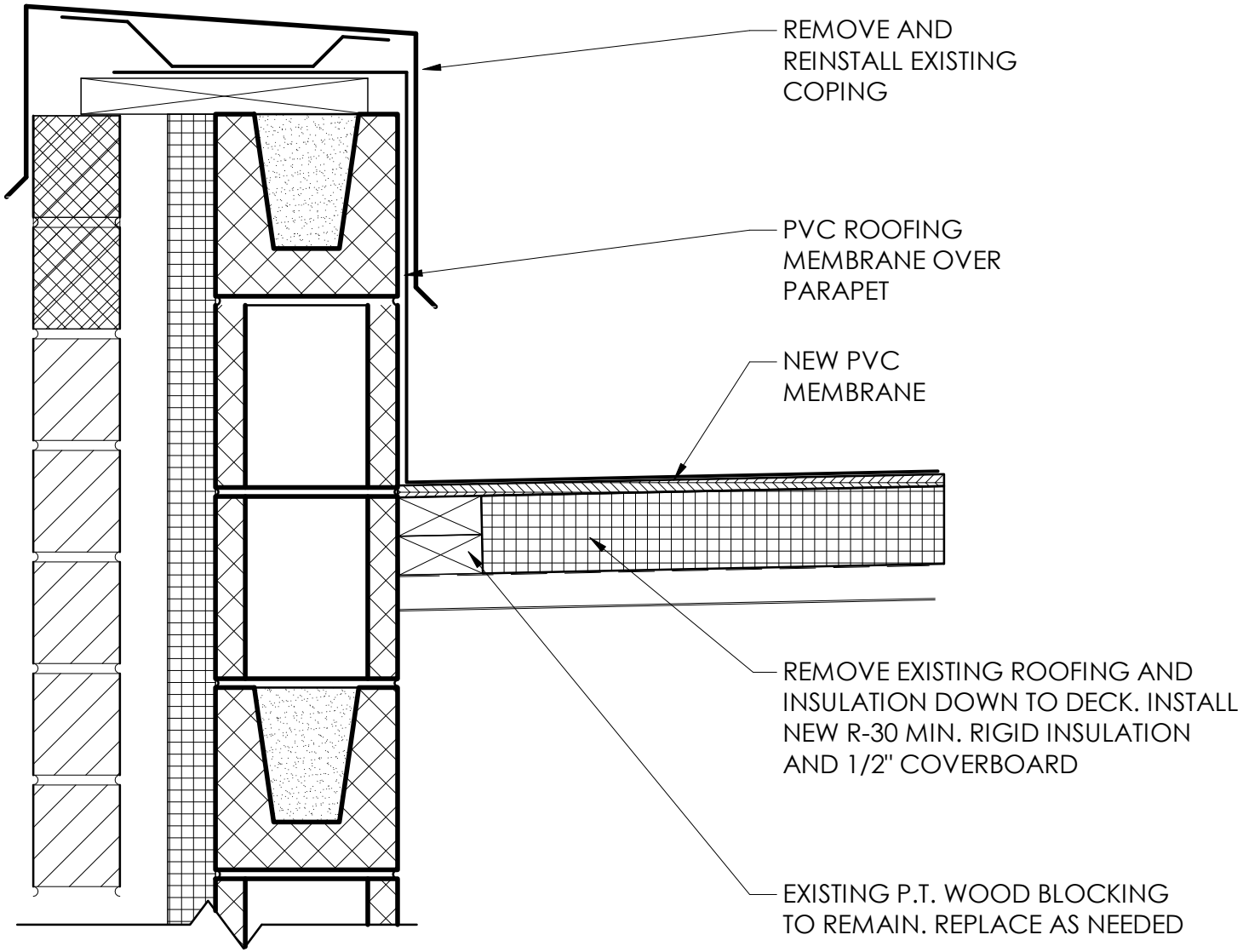
ISSUE DATE
12-23-2020

BUILDING NUMBER
D1



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ISSUE DATE
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BUILDING NUMBER
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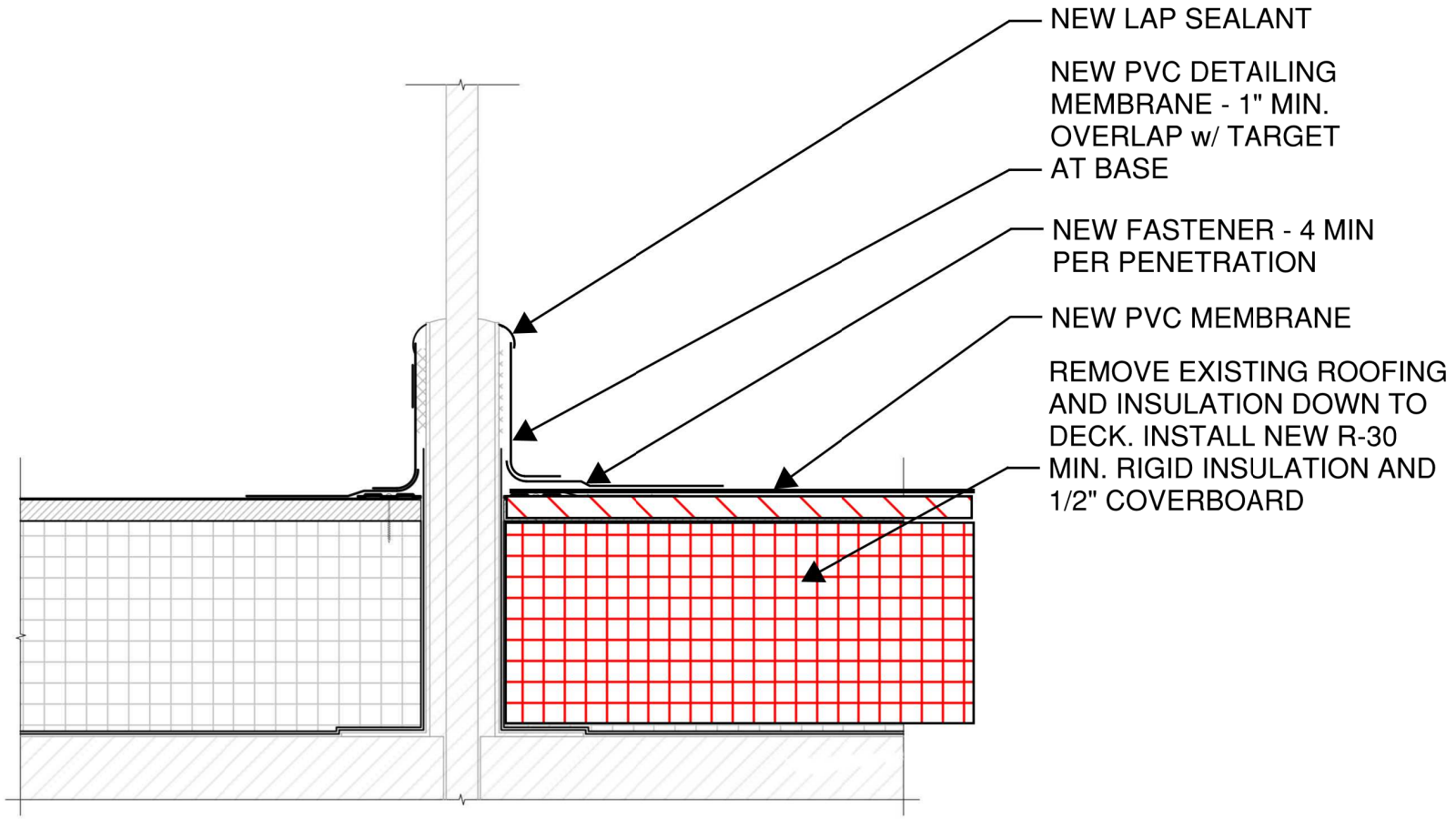

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ISSUE DATE
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BUILDING NUMBER
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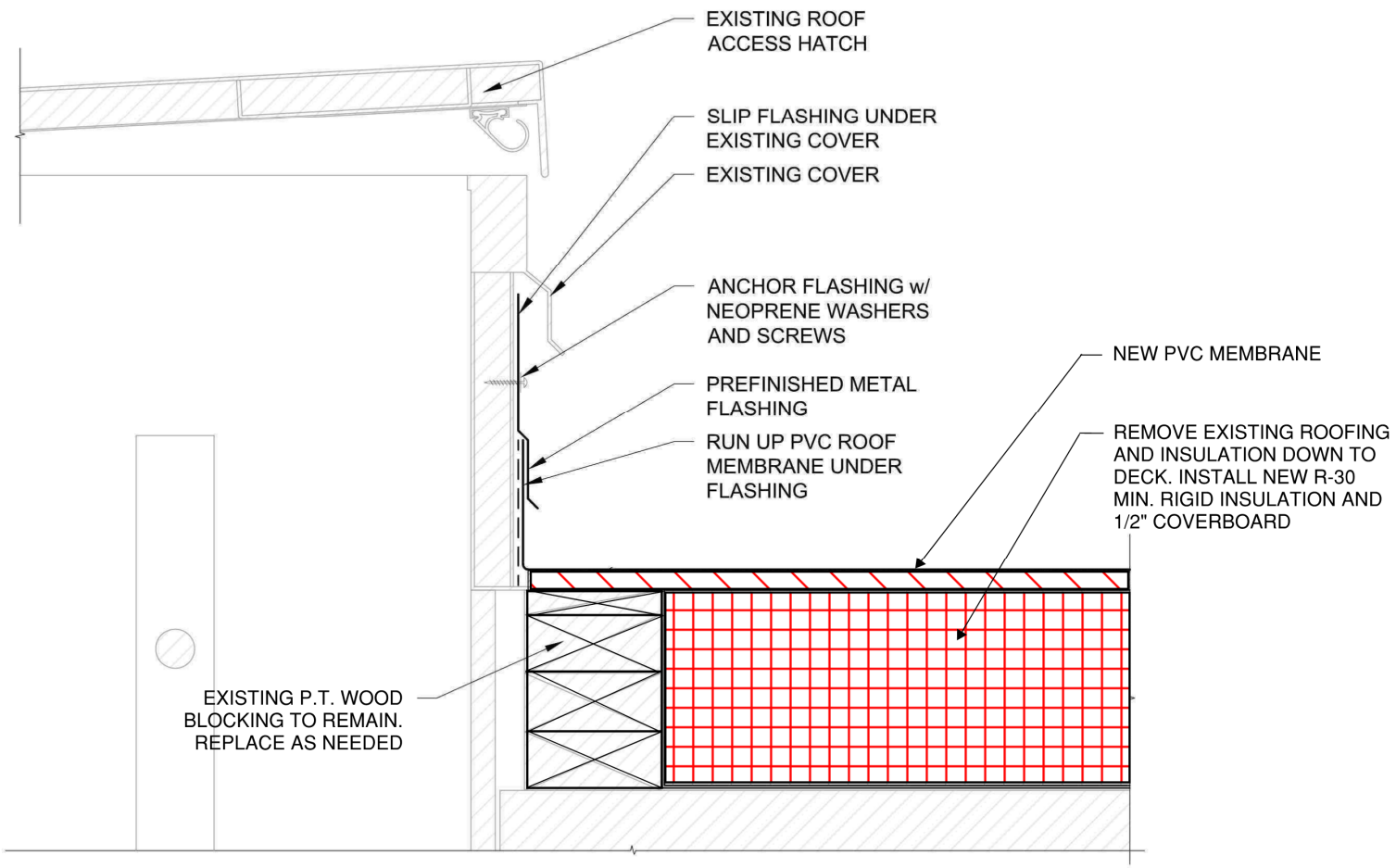

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BUILDING NUMBER
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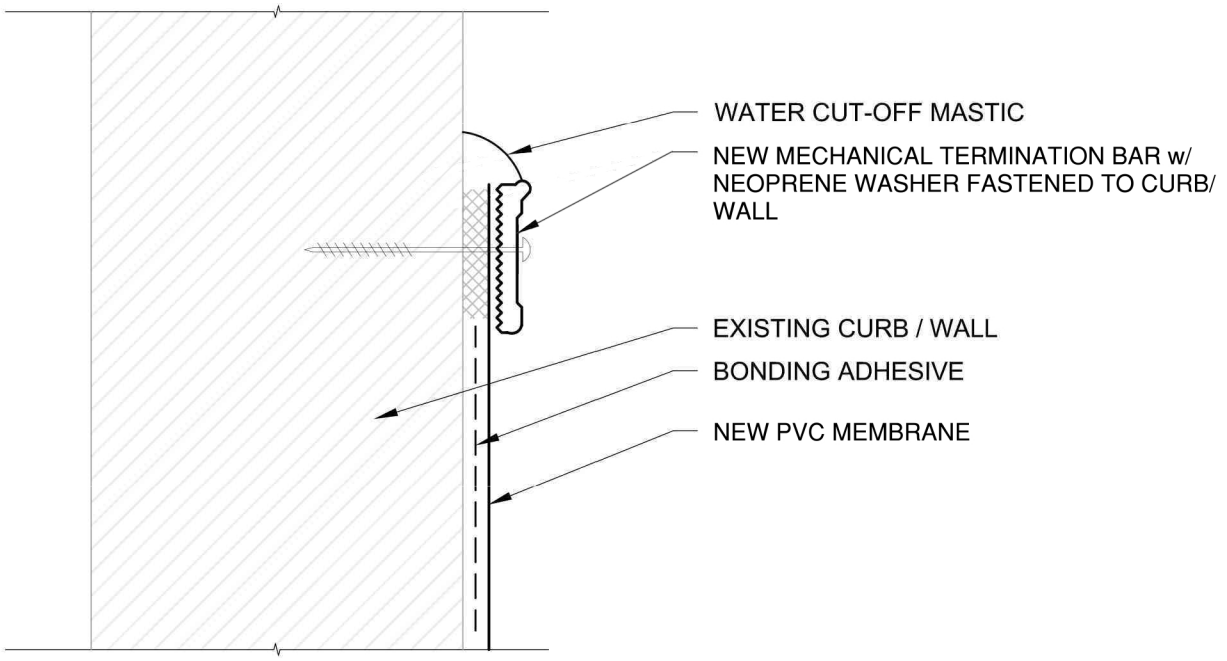

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ISSUE DATE
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BUILDING NUMBER
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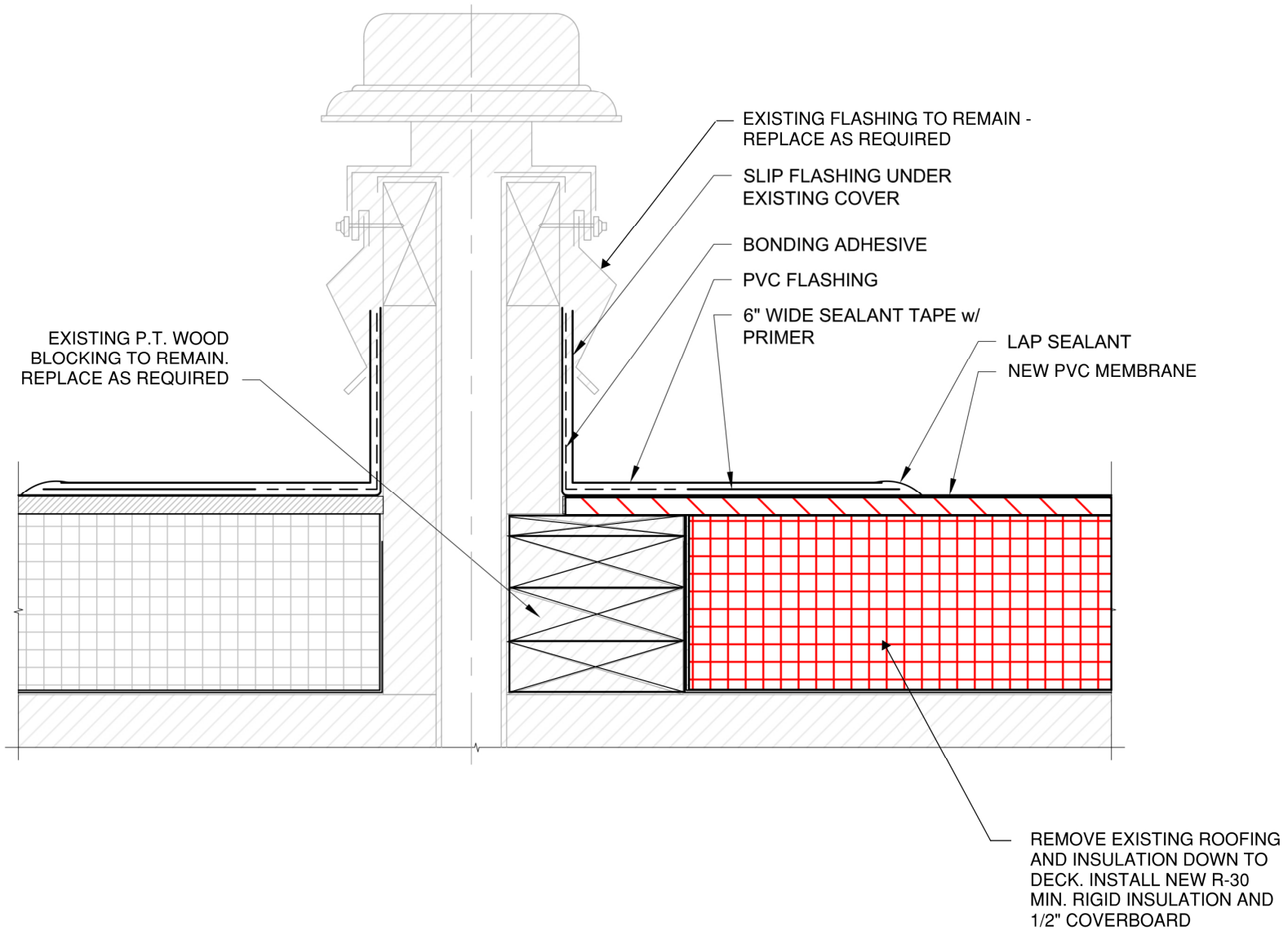

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ISSUE DATE
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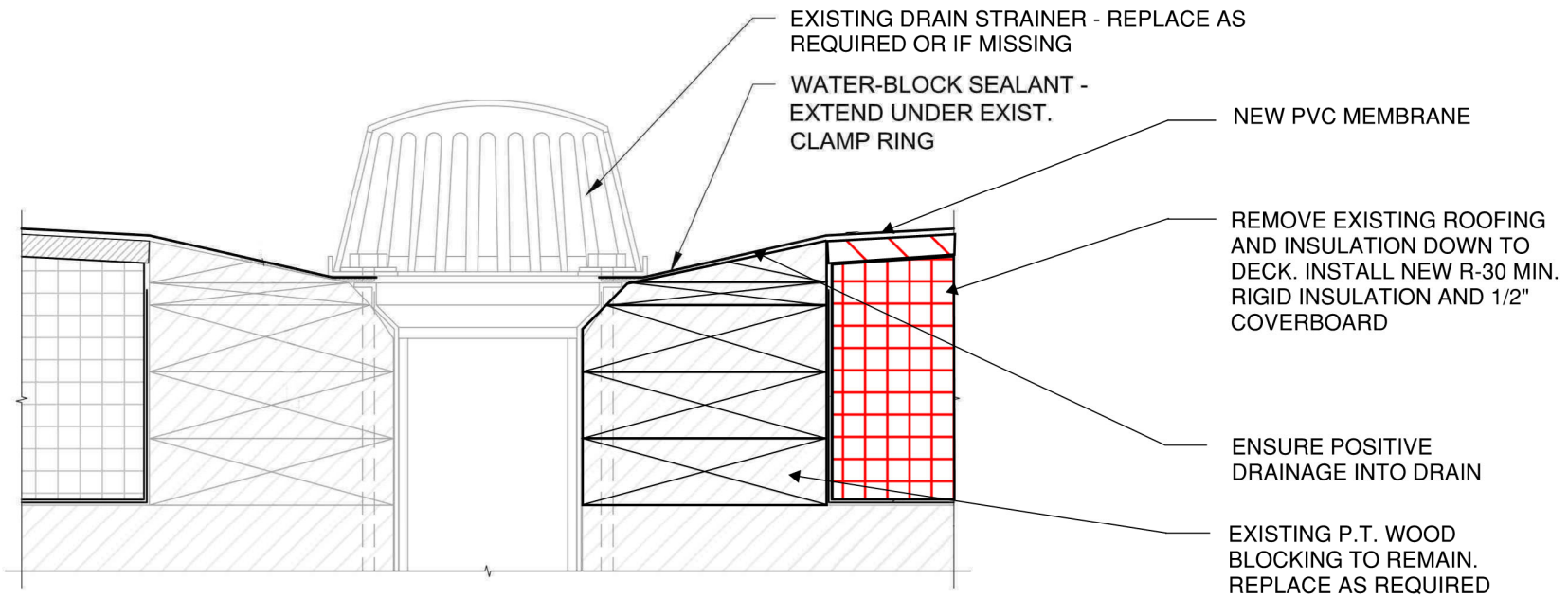
BUILDING NUMBER
D6



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ISSUE DATE
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BUILDING NUMBER
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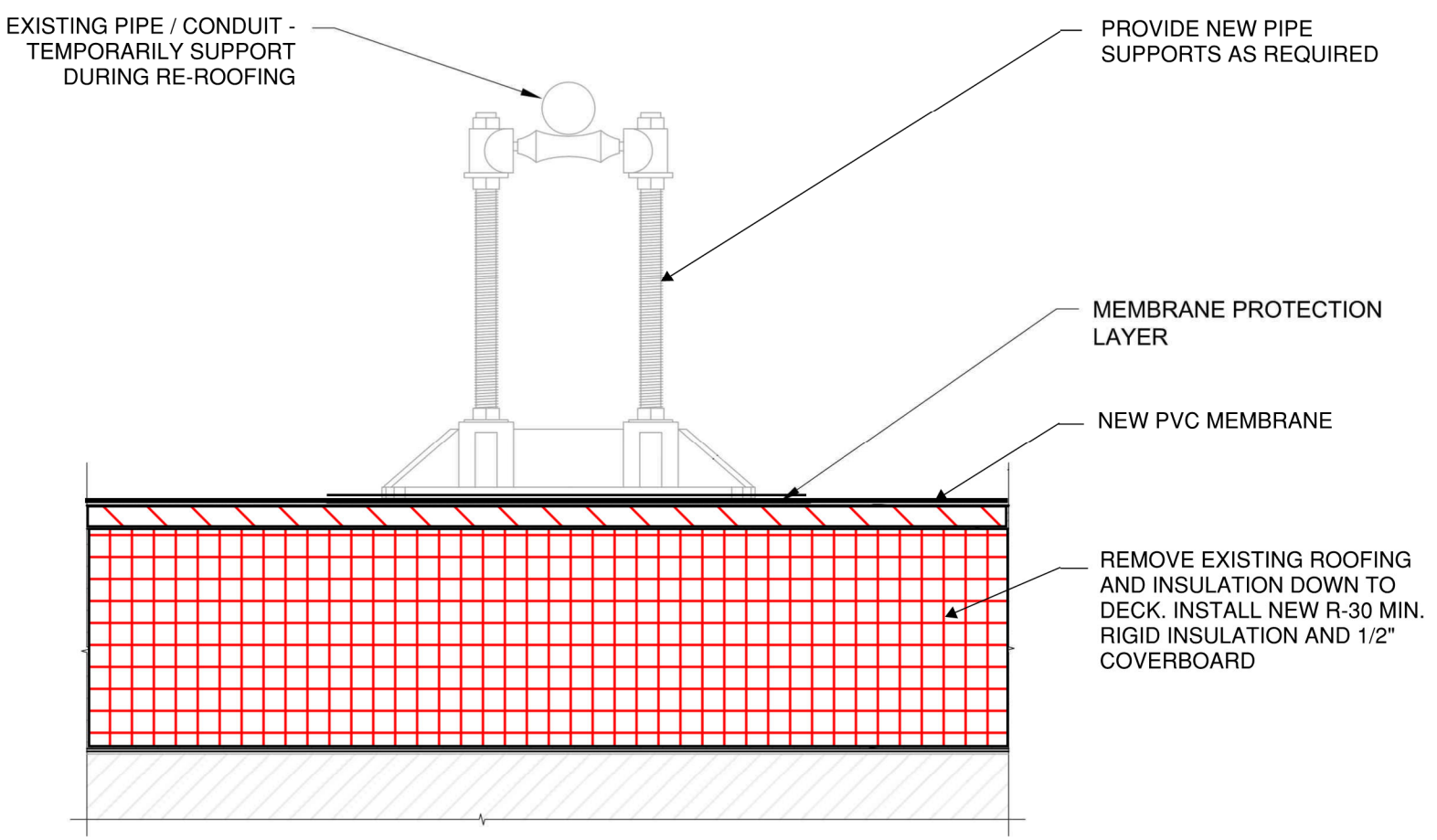

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ISSUE DATE
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BUILDING NUMBER
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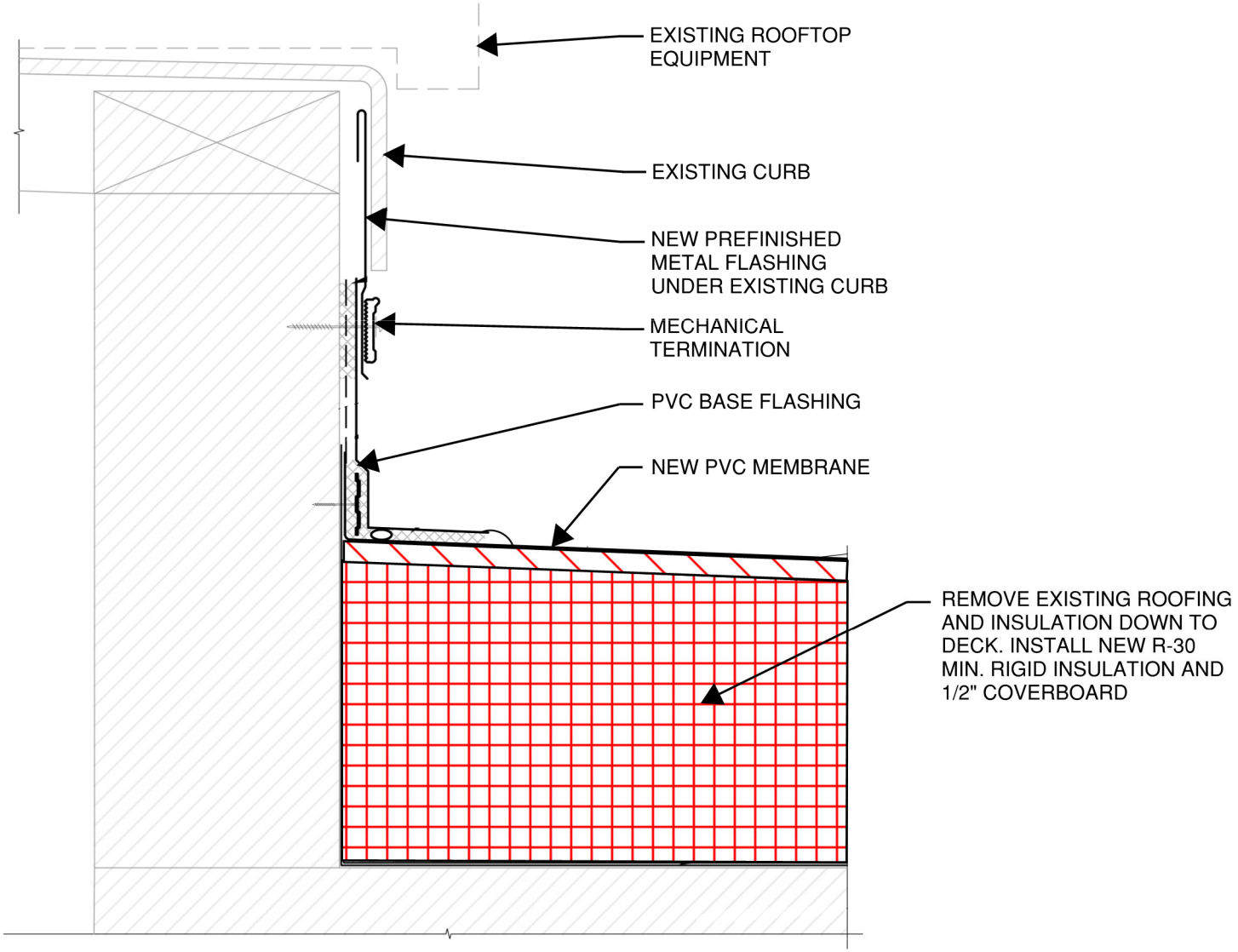

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ISSUE DATE
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BUILDING NUMBER
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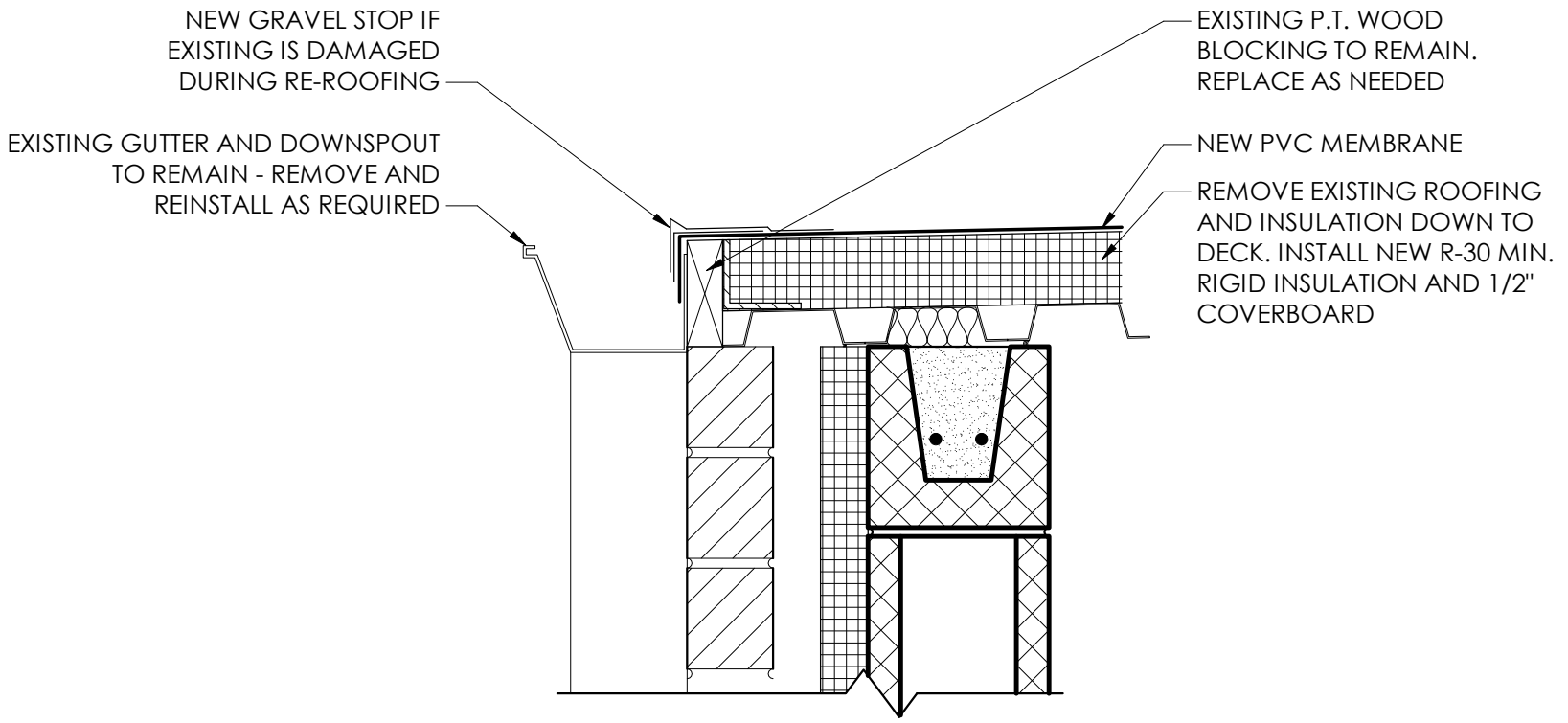

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ISSUE DATE
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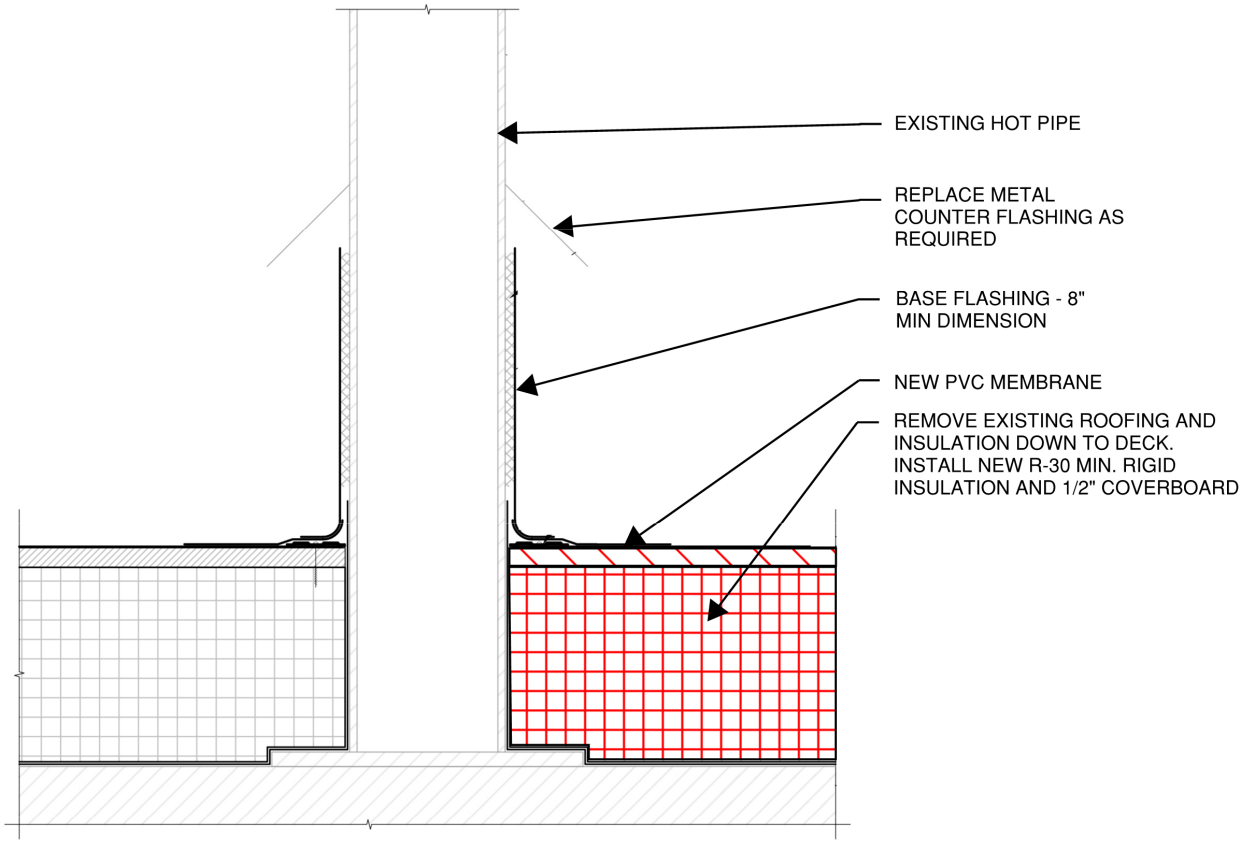
BUILDING NUMBER
D10



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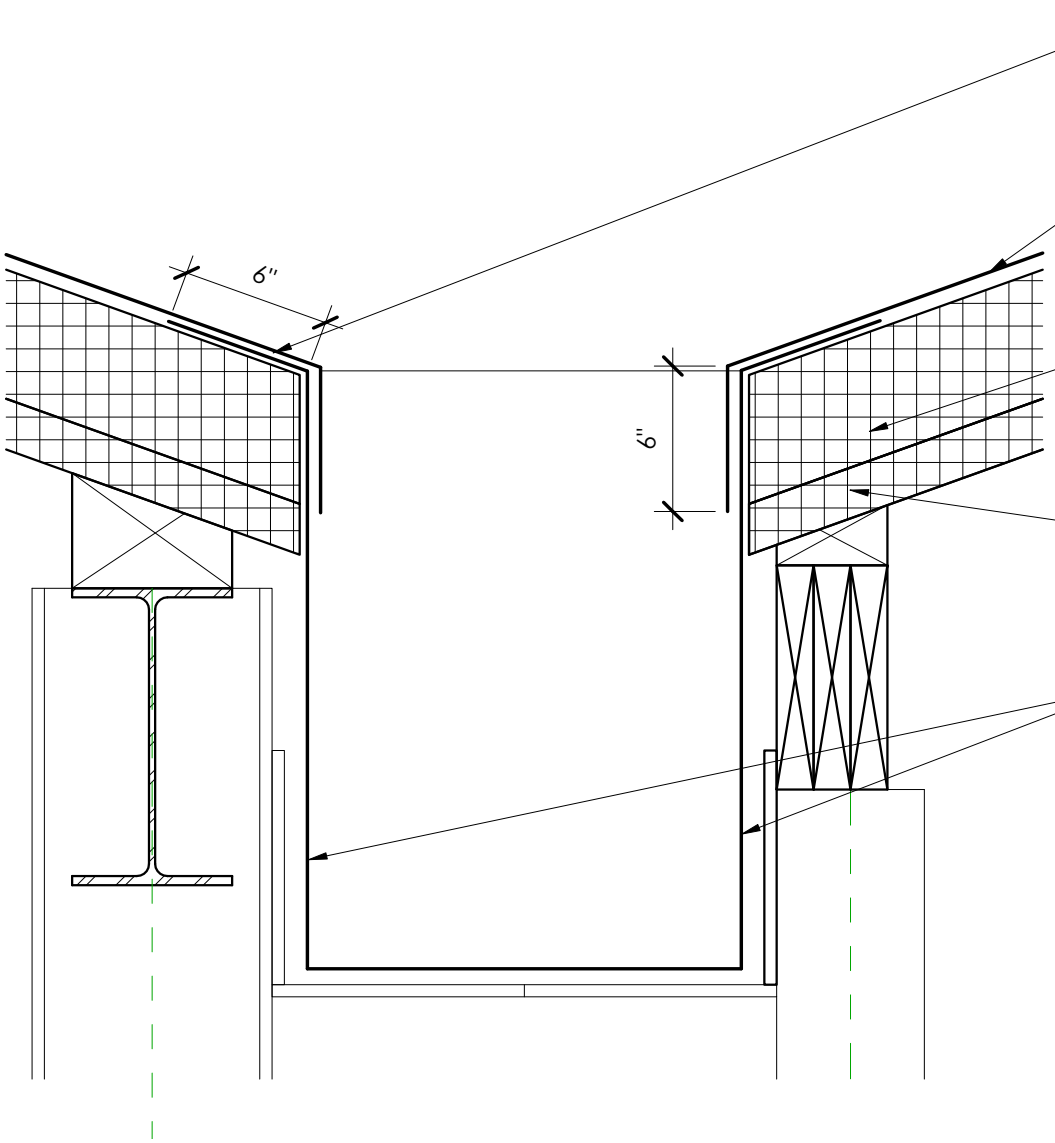
BUILDING NUMBER
D11



LAP ROOF MEMBRANE OVER GUTTER LINER AND INTO GUTTER 6" MIN. RUN GUTTER LINER UNDER ROOF MEMBRANE 6" MIN

NEW PVC MEMBRANE - ADHERED TIGHT TO INSIDE OF GUTTER

R-30 MIN. RIGID INSULATION - APPLIED ON TOP OF EXISTING METAL ROOF PROFILE

FILL IN EXISTING METAL ROOF VOIDS W/ RIGID INSULATION

MEMBRANE LINING GUTTER

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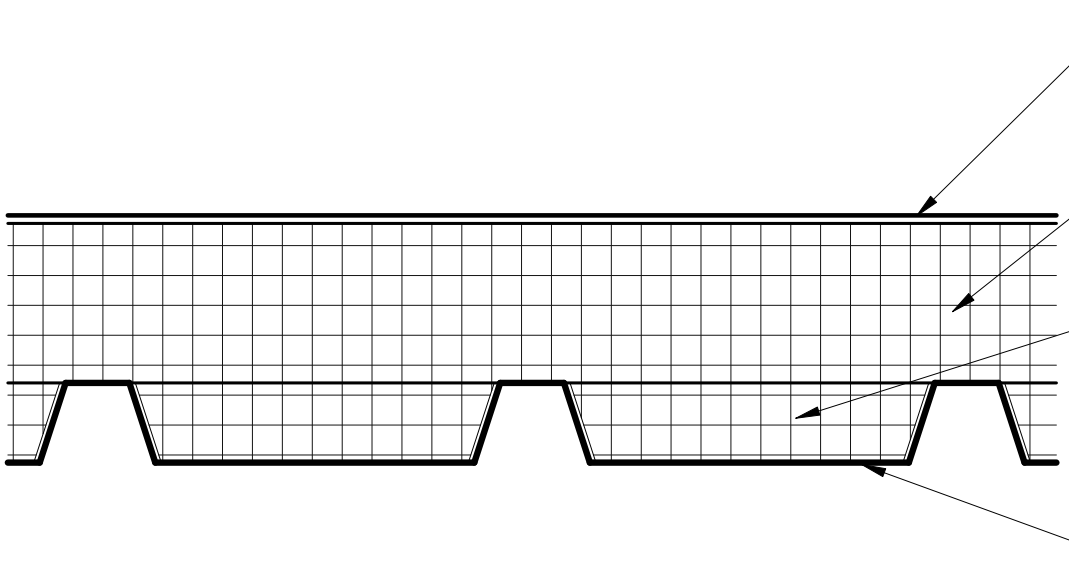
D12



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ISSUE DATE
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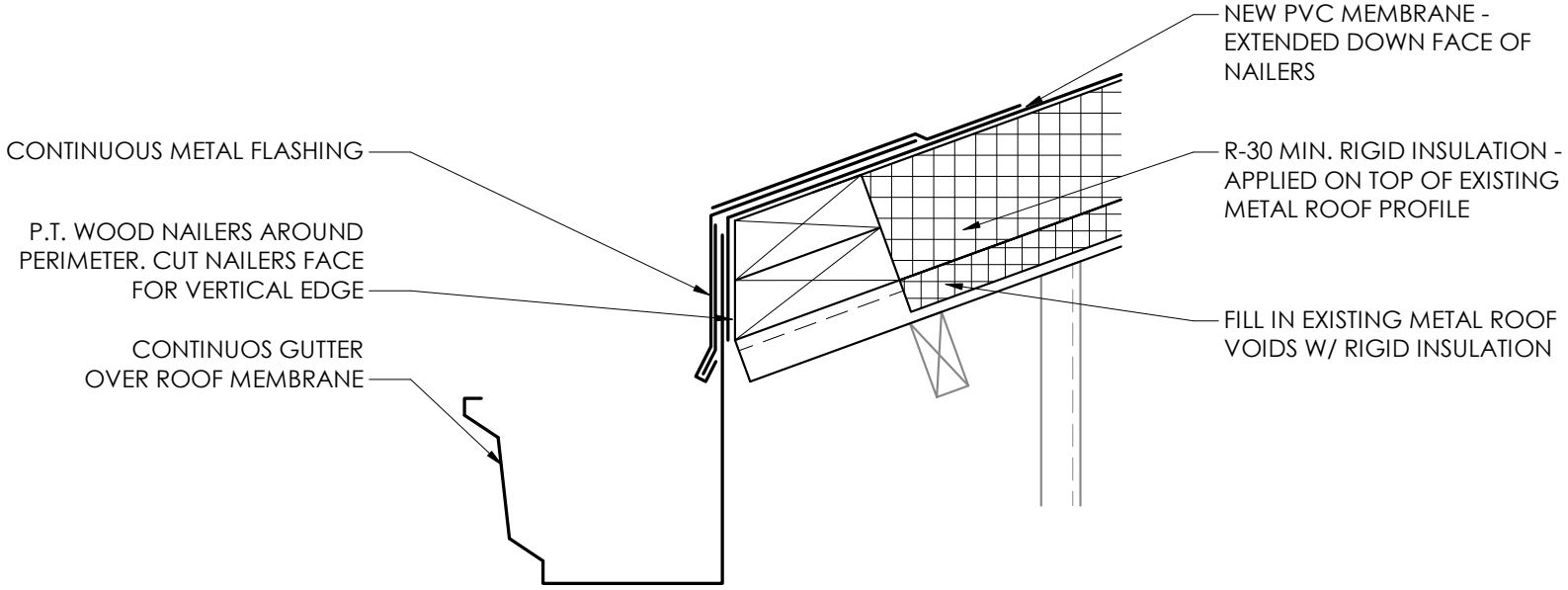
BUILDING NUMBER
D13



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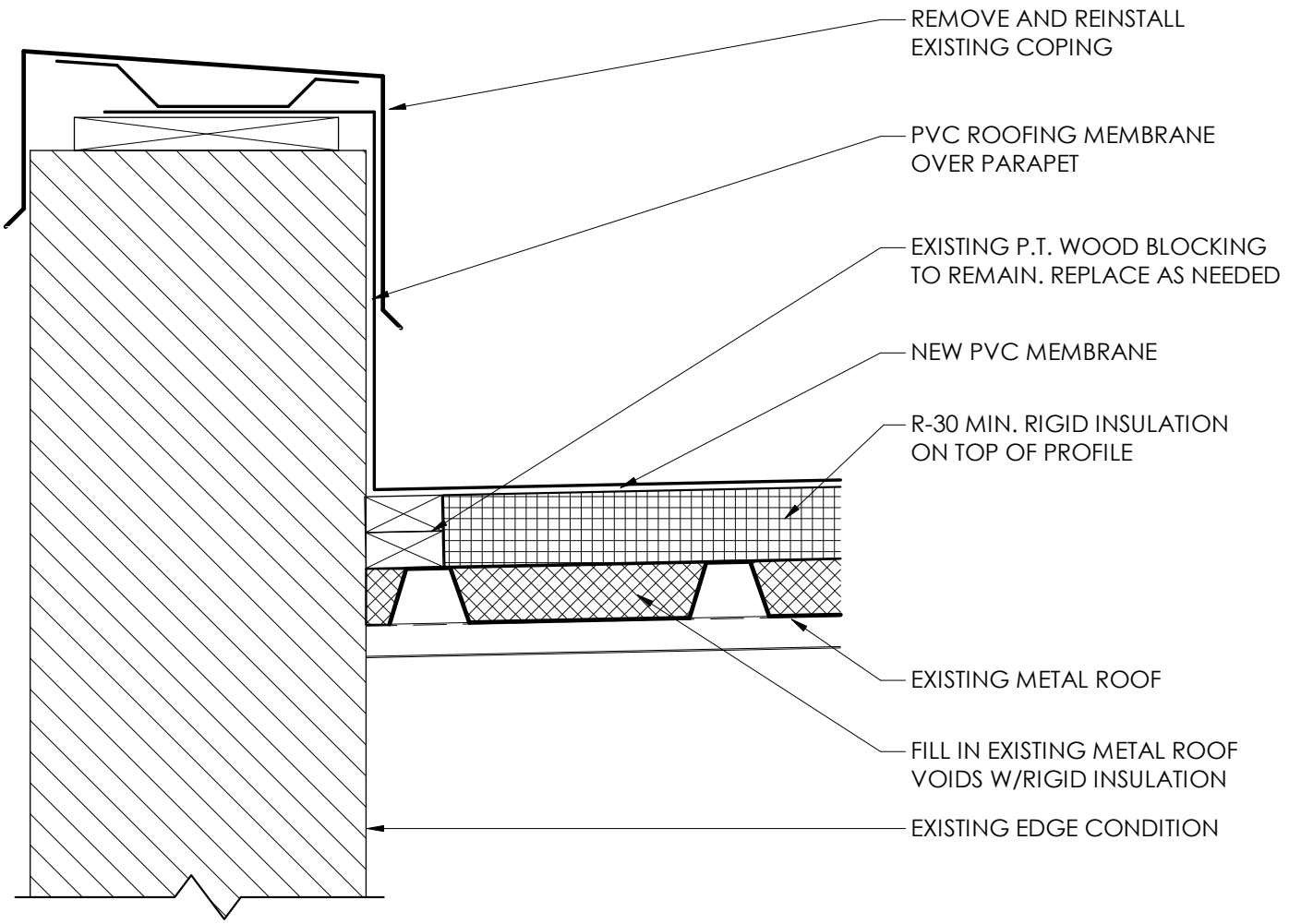
BUILDING NUMBER
D14



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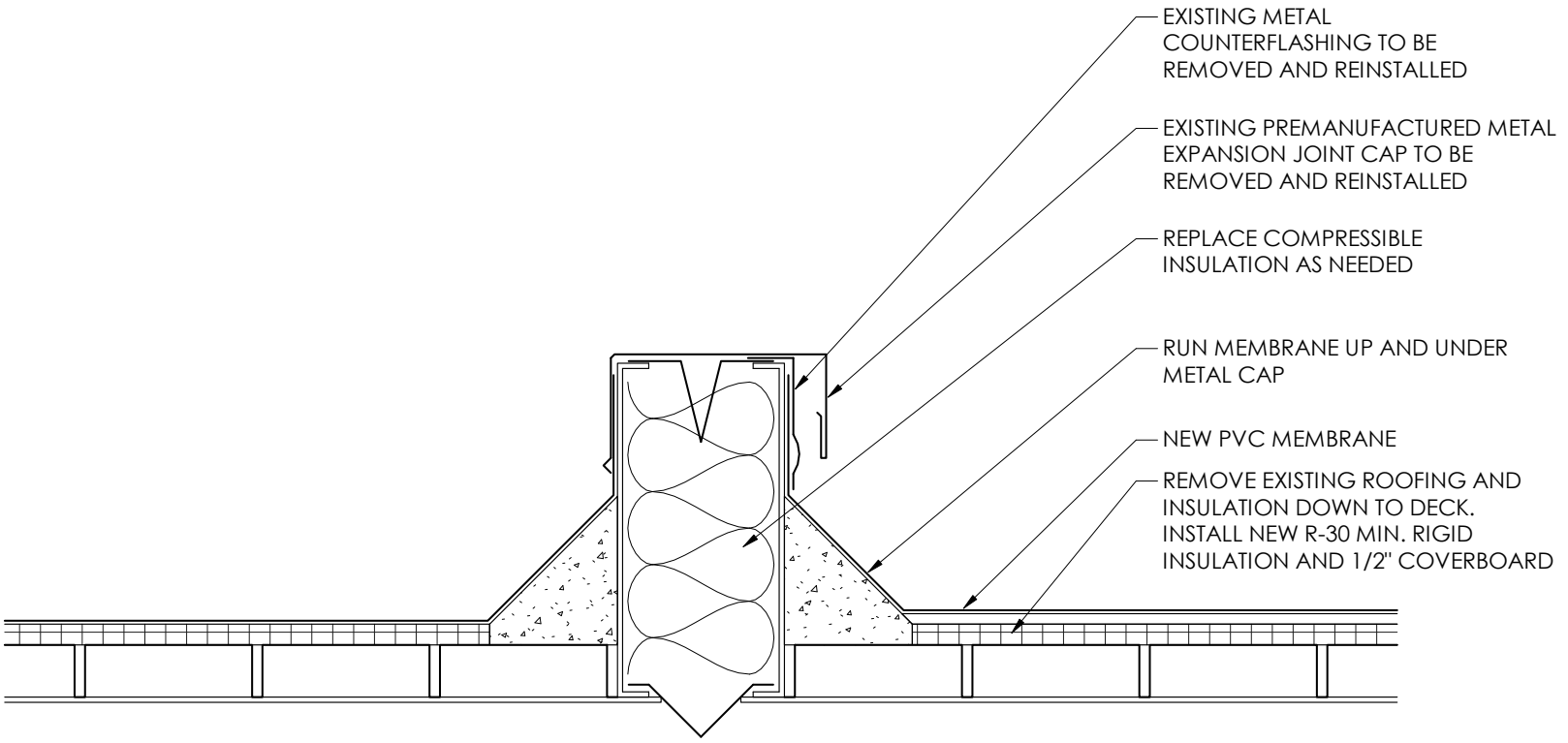
BUILDING NUMBER
D15



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BUILDING NUMBER
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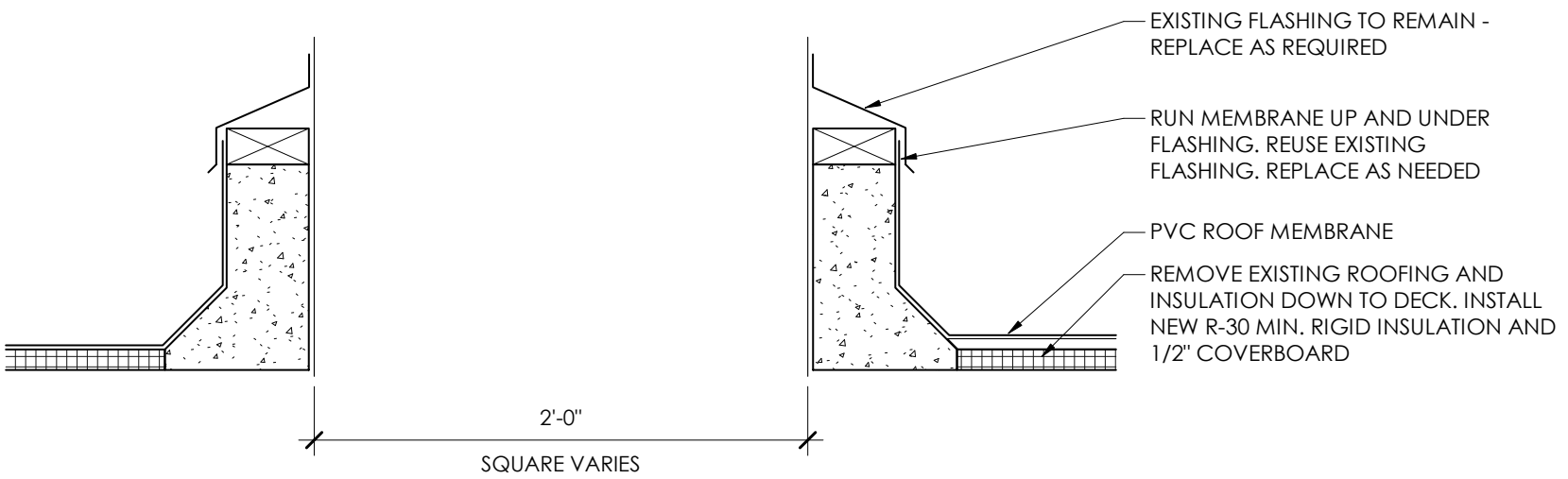

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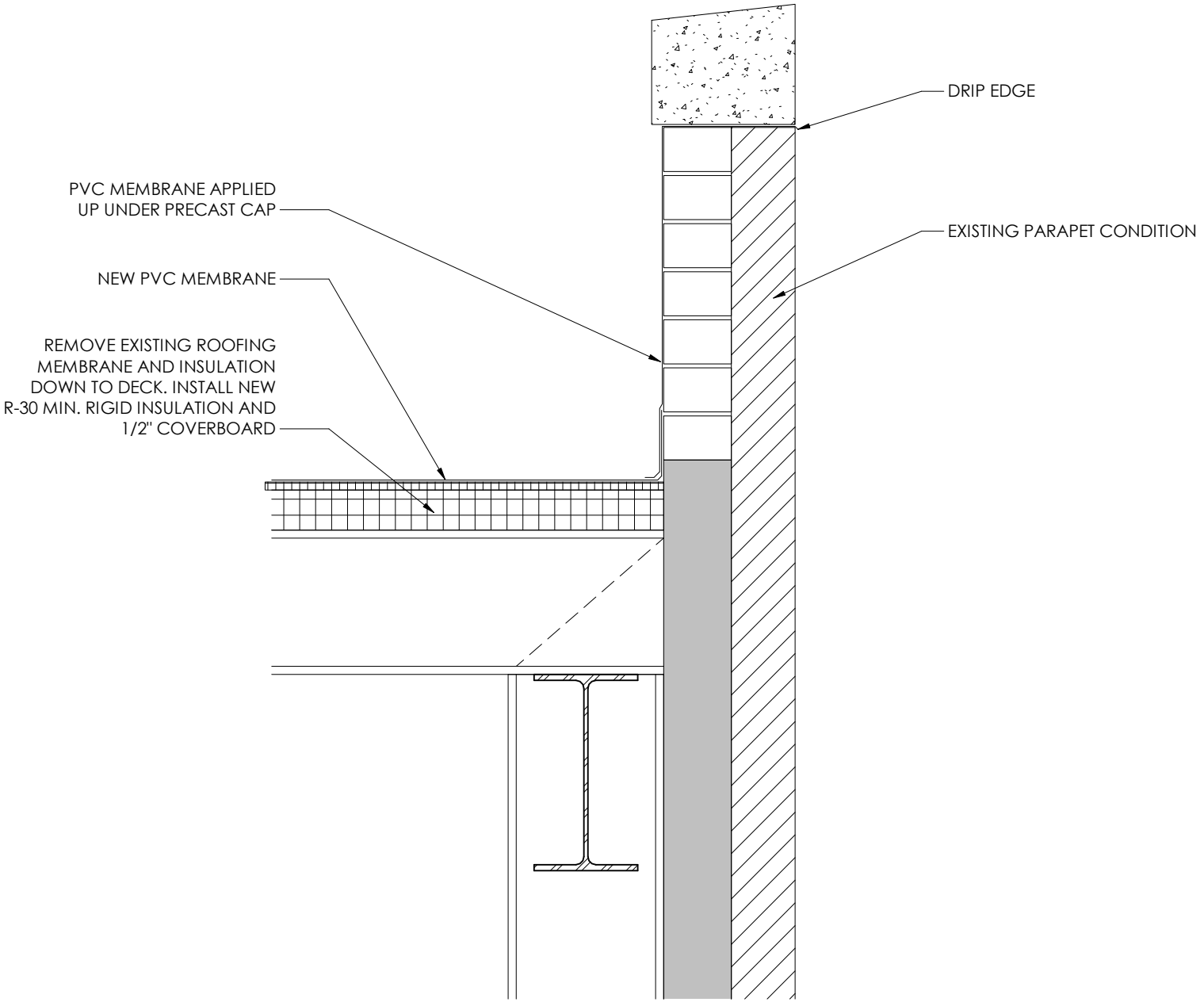
BUILDING NUMBER
D17



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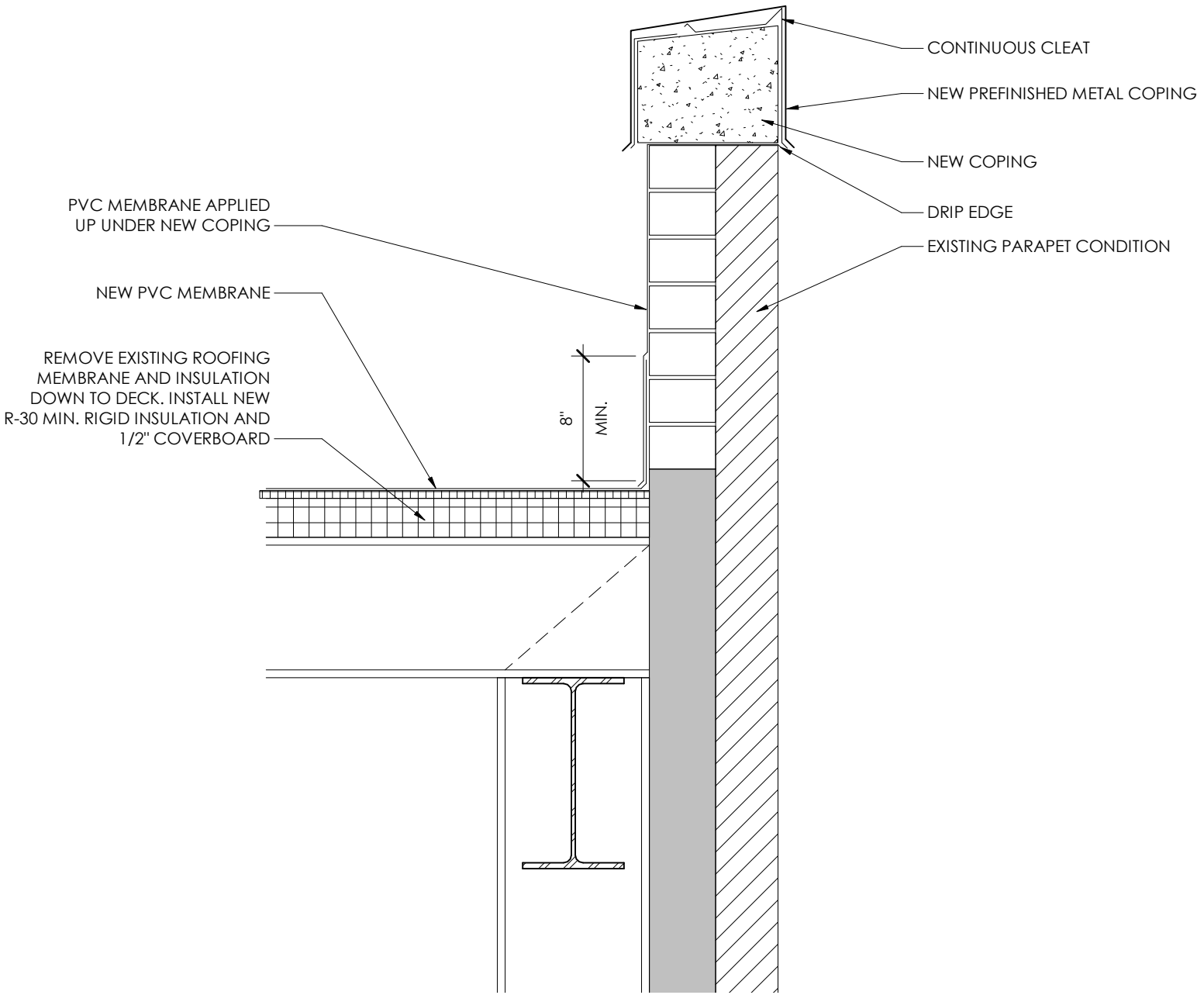

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BUILDING NUMBER
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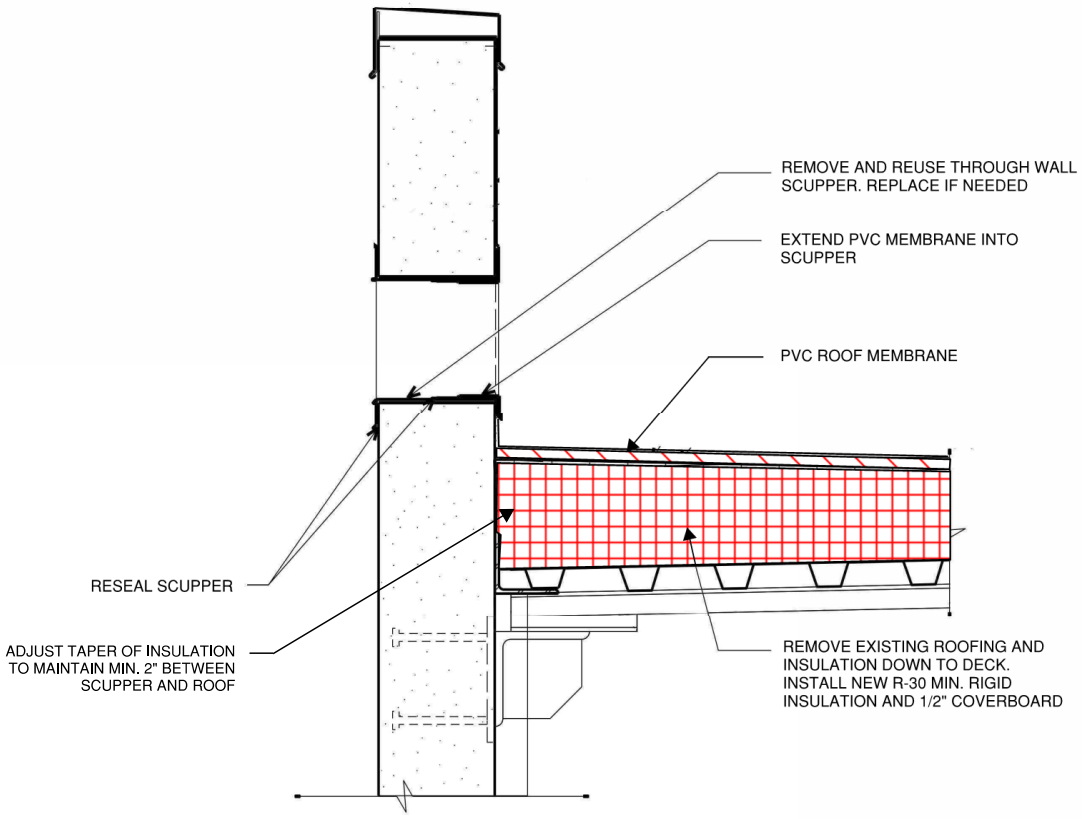

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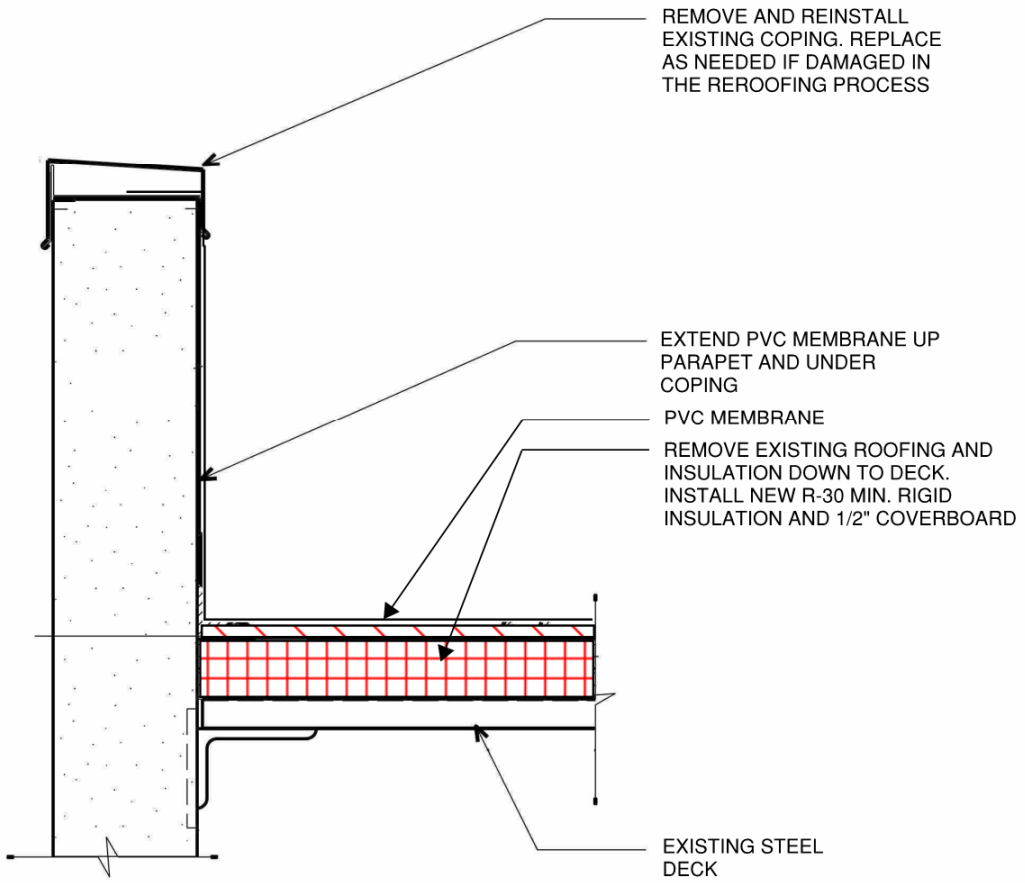
D19



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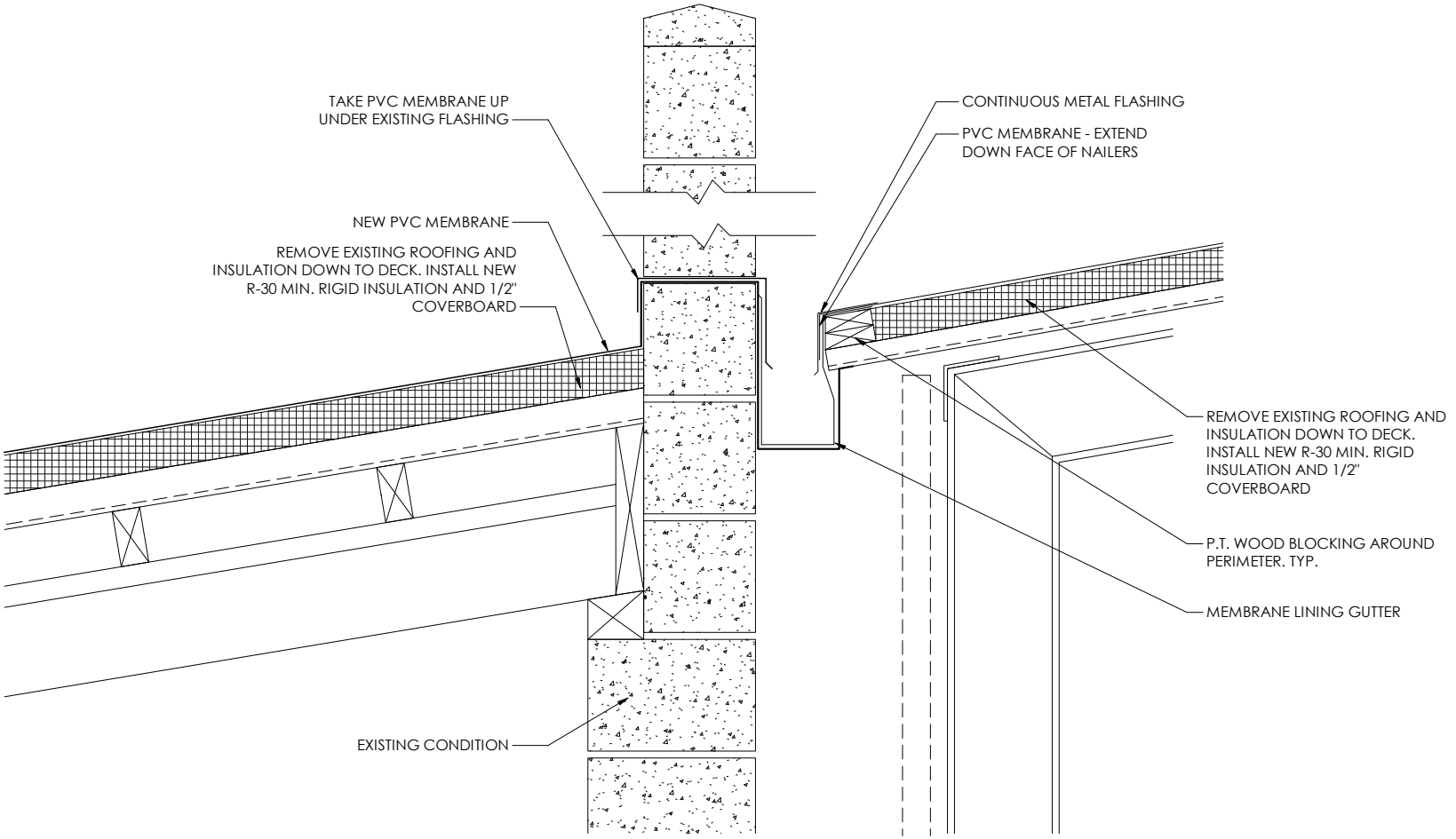

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BUILDING NUMBER
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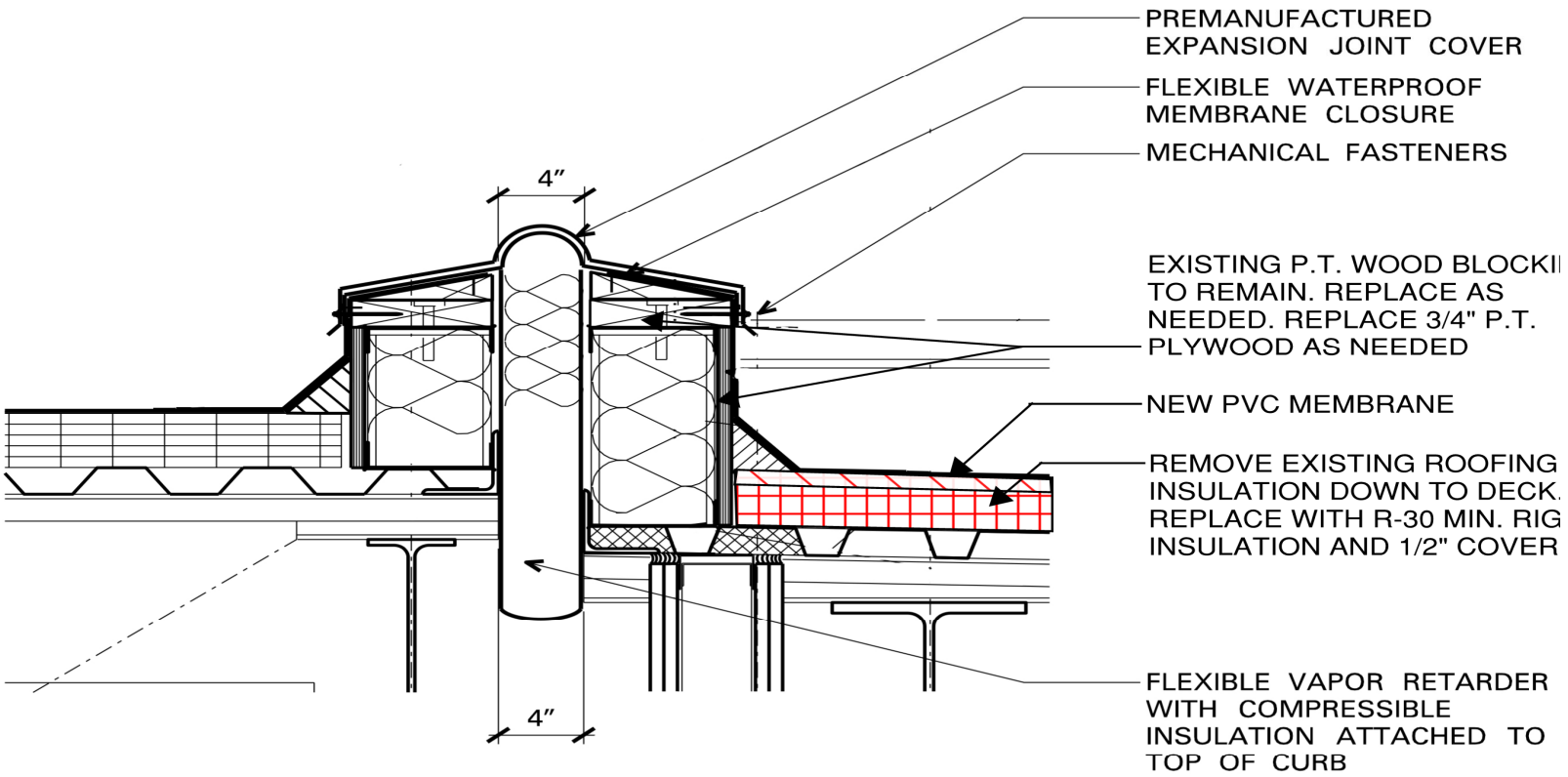

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BUILDING NUMBER
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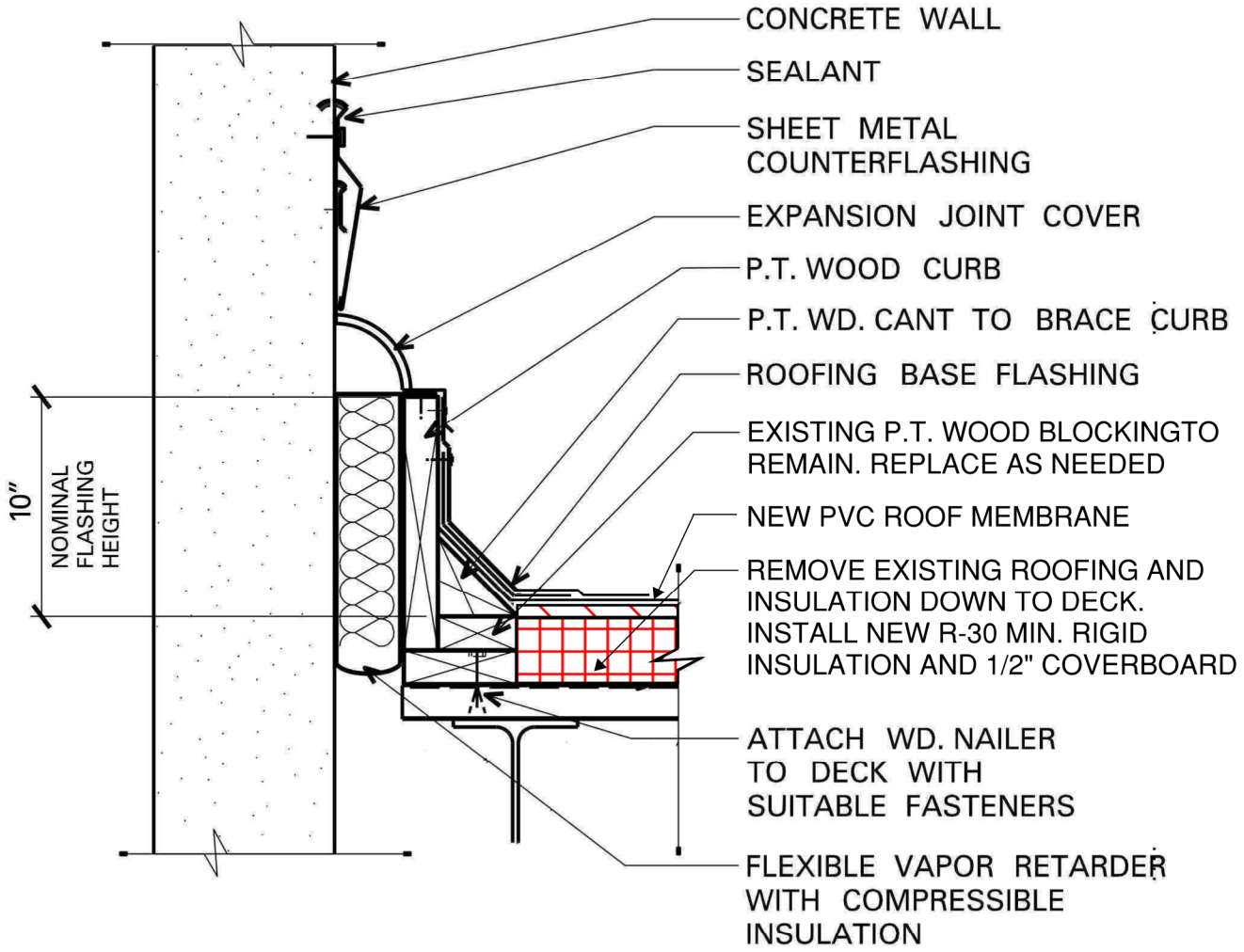

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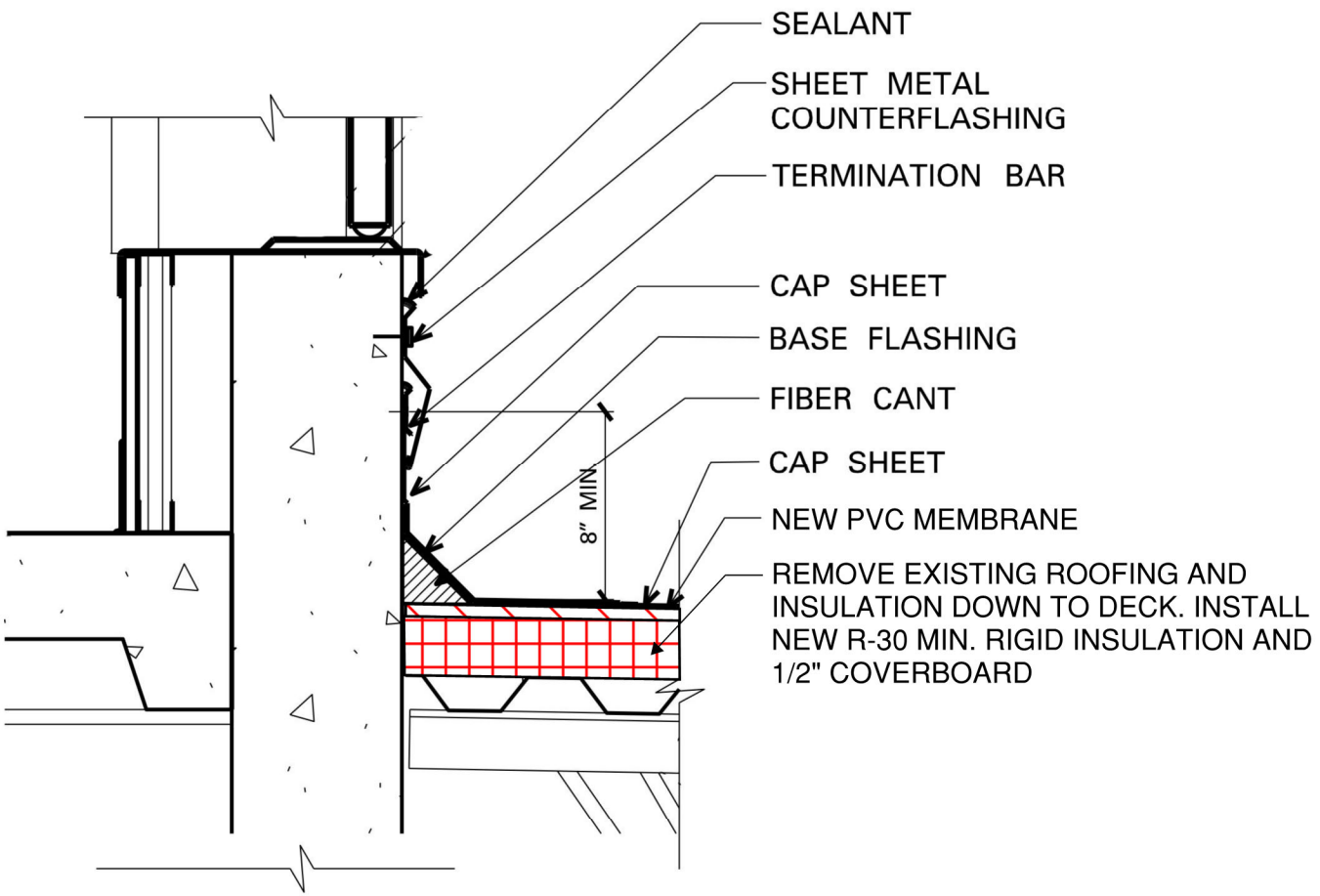

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BUILDING NUMBER
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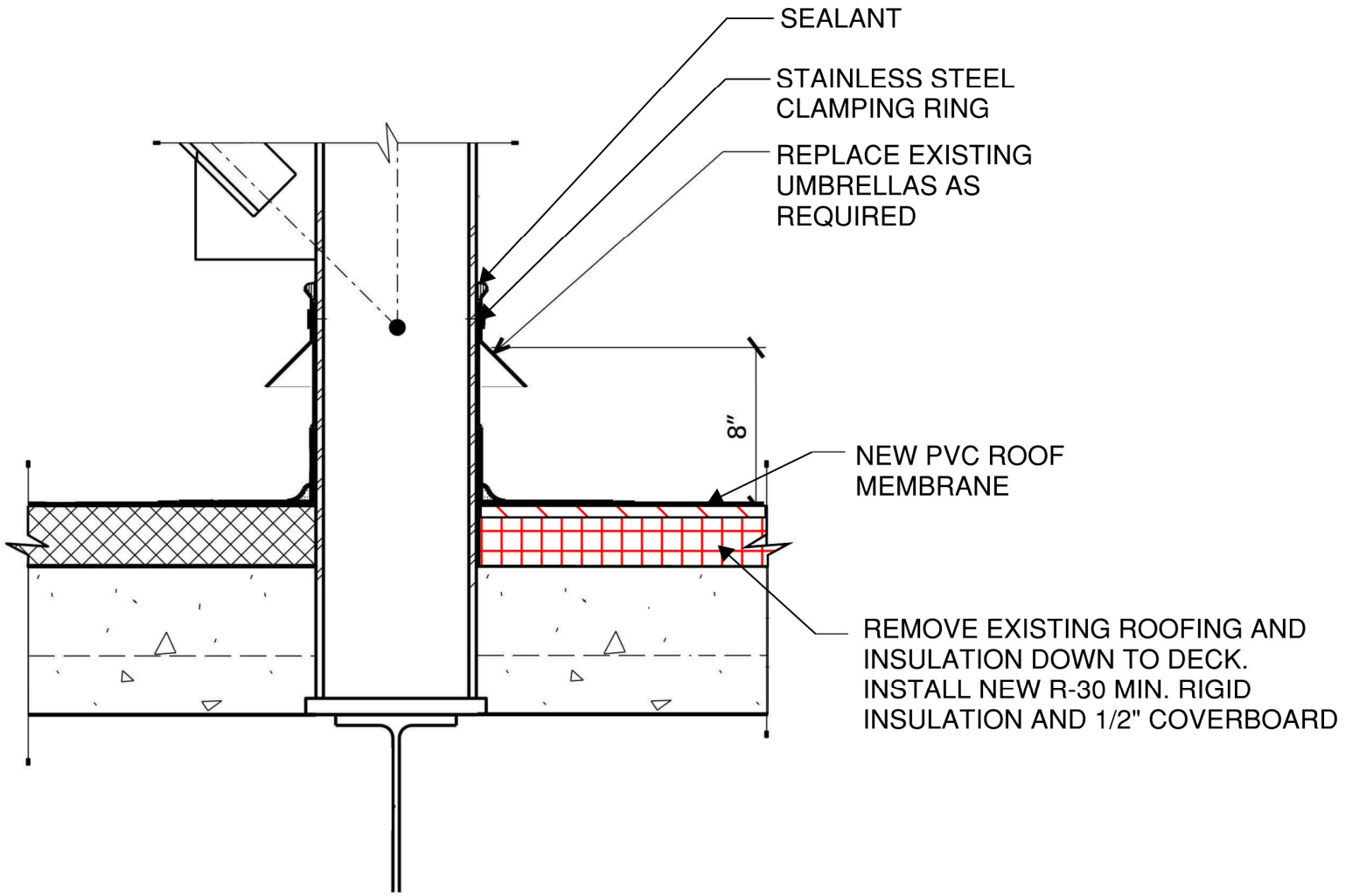

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BUILDING NUMBER
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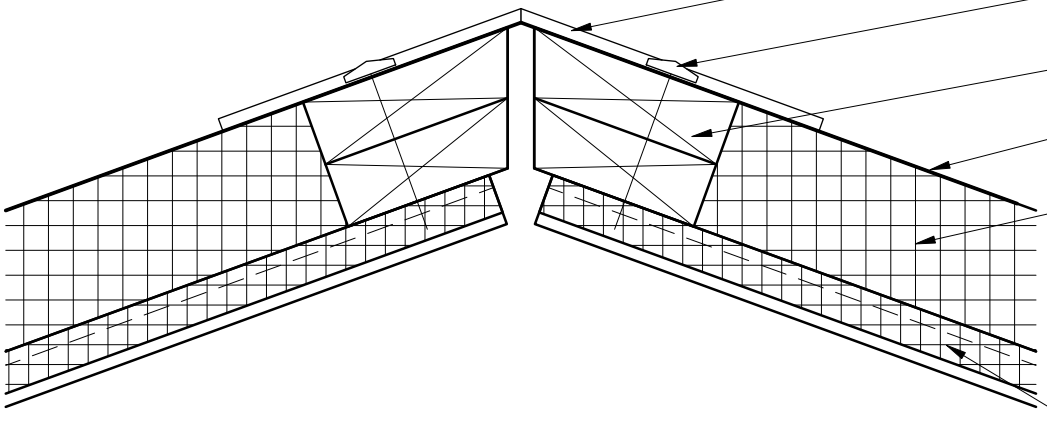

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BUILDING NUMBER
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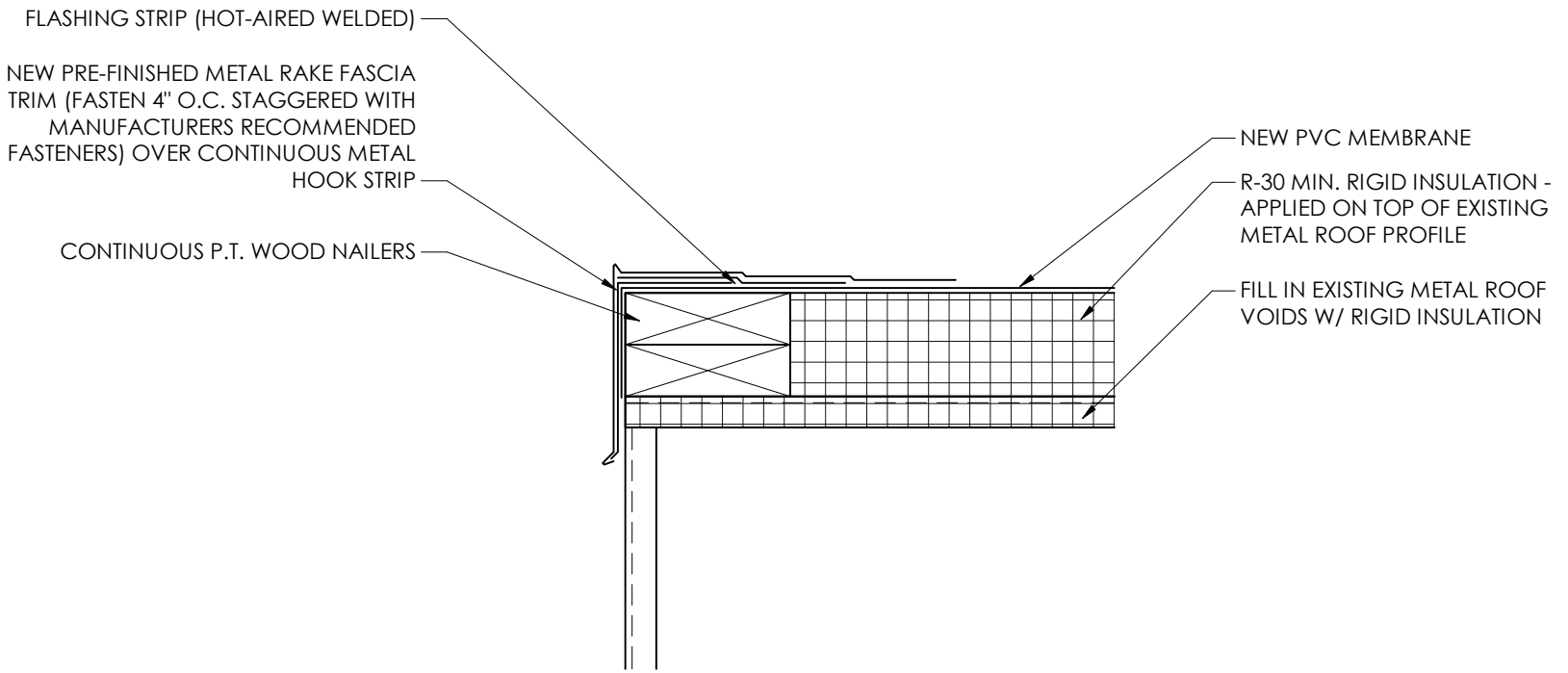

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BUILDING NUMBER
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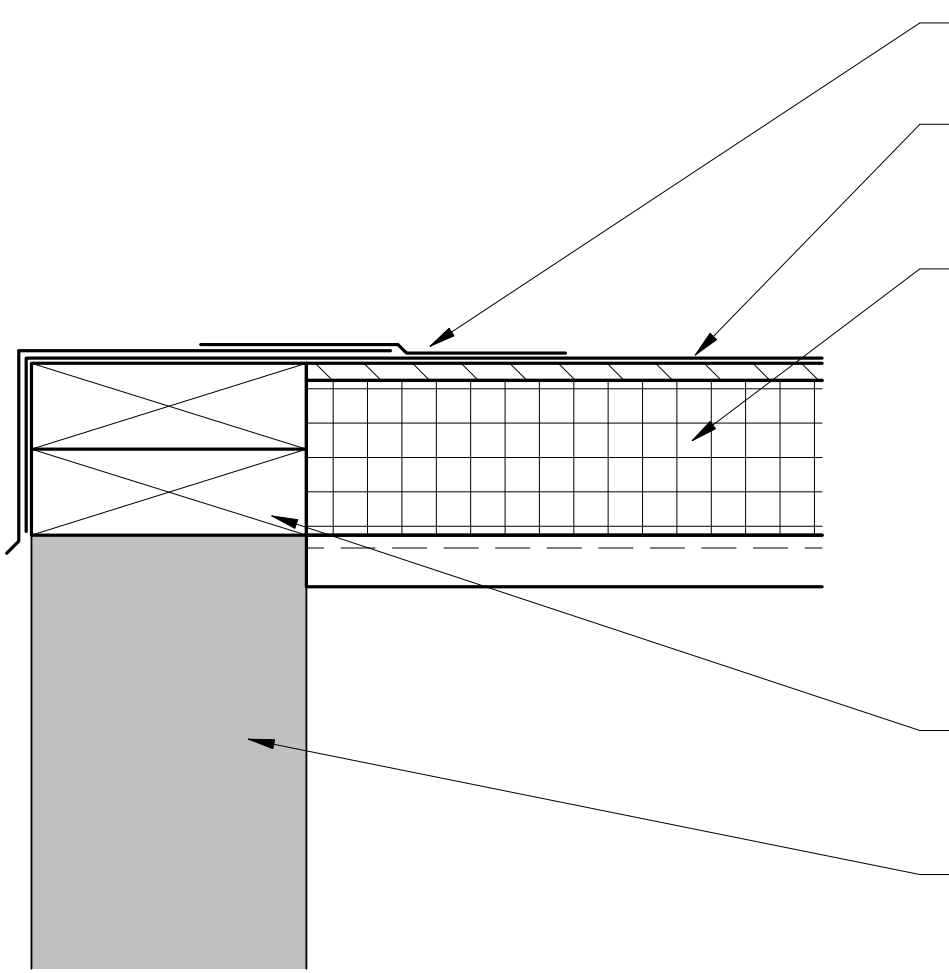

FLASHING STRIP (HOT-AIRED WELDED)

NEW PVC MEMBRANE. EXTEND MEMBRANE DOWN FACE OF NAILERS

REMOVE EXISTING ROOFING AND INSULATION DOWN TO DECK. INSTALL NEW R-30 MIN. RIGID INSULATION AND 1/2" COVERBOARD

P.T. WOOD NAILERS ALONG PERIMETER

EXISTING CONDITIONS

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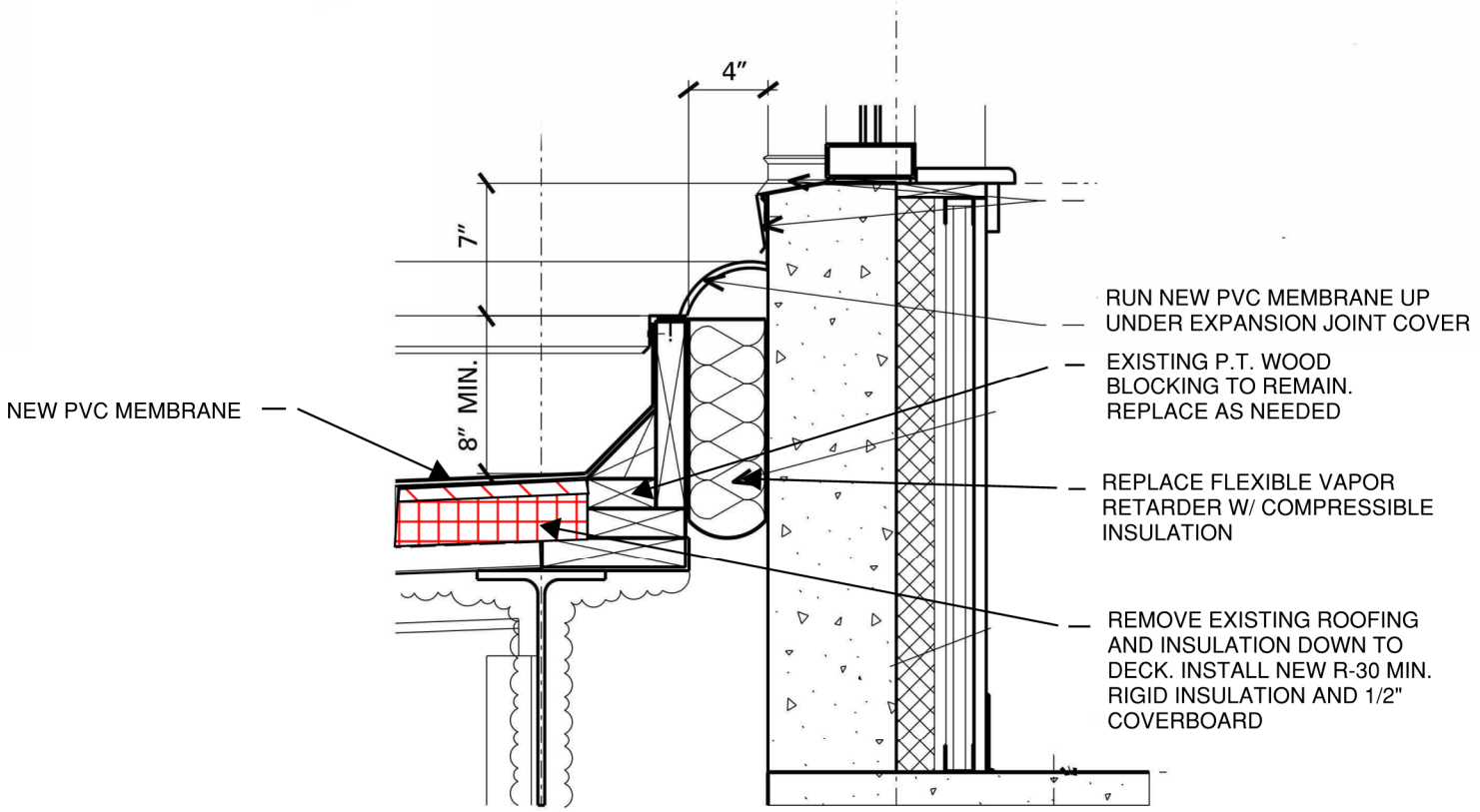
BUILDING NUMBER
D28



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D29