



Department of Public Works
City Engineering Division

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6/18/13

NOTICE OF ADDENDUM

ADDENDUM NO. 3

STREETS WEST COLD STORAGE ROOF REPLACEMENT

CONTRACT NO. 7025

Revise and amend the contract document(s) for the above project as stated in this addendum, otherwise, the original document shall remain in effect.

The original scope of this project included the removal of the existing exterior sprayed on foam insulation down to the top of the ribs of the existing metal roofing system. An excessive amount of moisture was found in this sprayed on insulation. Therefore, this addendum provides for the removal of all of the sprayed on foam insulation and necessary changes to the plans and specifications.

Omit page D-5 and replace with D-5, Revised.

Omit pages D-32 thru D-39 and replace with D-32, Revised thru D-39, Revised.

Omit page D-42 and replace with D-42, Revised

Omit page D-44 and replace with D-44, Revised

Omit page D-45 and replace with D-45, Revised

Omit page D-46 and replace with D-46, Revised

Omit page D-48 and replace with D-48, Revised

Please acknowledge this addendum on page E1 of the contract documents and/or in Section E: Bidder's Acknowledgement on Bid Express.

Electronic version of these documents can be found on Bid Express at <https://www.bidexpress.com/>.

If you are unable to download plan revisions associated with the addendum, please contact the Engineering office at 608-266-4751 receive the material by another route.

Robert F. Phillips, City Engineer

**SECTION 01 00 02
GENERAL REQUIREMENTS**

1. SCOPE OF WORK

Work for this contract shall consist of the following

- 1) Remove all of the existing spray foam insulation from the top of the existing metal roof. This includes removing the insulation between the roof's ribs down to the bottom of the pans.
- 2) Inspect for any deteriorated or damaged areas of the existing roof. Repair any damages that were caused by removal of foam insulation. Report any other deficiencies to the Project Manager.
- 3) Remove vents/penetrations from roof as indicated on plans. Fabricate replacement panels from 22 gauge galvanized sheet metal to cover openings. Extend the curb for remaining vent as to ensure there is a minimum of 8" of clearance from the final roof surface elevation and the top of the vent curb.
- 4) Infill polyisocyanurate foam insulation between existing metal roof's ribs .
- 5) Install TPO roofing system with 4 ½" of polyisocyanurate insulation as shown on plans & specifications
- 6) Install Alpine #115 snow guard per plans & specifications
- 7) Perform all other work as required to achieve the specified manufacturers 20 year non pro rate warranty utilizing 30 year warranty details from the manufacturer
- 8) Install new gutters and downspouts per plans.

2. PRE-BID INFORMATION

Site Visits may be arranged by making an appointment with the site contact or thru the City project manager.

3. COMMENCEMENT AND COMPLETION

Please refer to Section 105.15, 109.7, and 110.5 of the Standard Specifications, which can be found here: <http://www.cityofmadison.com/Business/PW/specs.cfm>.

The successful Bidder must agree to commence the work on or before a date to be specified in a written "Start work Letter" and to **fully complete all the work within 60 consecutive calendar days** thereafter.

4. CONTACTS

The City's designee for engineering is: Paul Stauffer
Company: City of Madison
Address: Room 115, 210 Martin Luther King Jr. Blvd.
Phone: 608-266-4366
Email: pstauffer@cityofmadison.com

The City's designee for project management: Paul Stauffer
Company: City of Madison
Address: Room 115, 210 Martin Luther King Jr. Blvd.
Phone: 608-266-4366
Email: pstauffer@cityofmadison.com

The City's designee for the site contact is: John Blotz
Company: City of Madison- Streets Division
Address: 1501 Badger Road Madison WI 53711
Phone: 608-515-6849, Email: jblotz@cityofmadison.com

5. QUALIFICATIONS OF BIDDER

By submitting the bid, the bidder certifies as to meeting the following requirements:

Has completed one or more projects of at least 50% of the size or value of the division of work being bid and the type of work completed is similar to that being bid. If a greater magnitude of experience is deemed necessary, other than size or value of the work, such requirements will be described in the appropriate technical section of these specifications.

Specification for Installation of TPO Membrane Roofing System

SECTION 07 5423

THERMOPLASTIC-POLYOLEFIN ROOFING (TPO)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fully adhered thermoplastic membrane roofing system, including all components specified.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at <http://manual.fsbp.com>.
- D. Commencement of work by Contractor shall constitute acknowledgement by Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood nailers associated with roofing and roof insulation.
- B. Section 07 6200 - Sheet Metal Flashing and Trim: Formed metal flashing and trim items associated with roofing.
- C. Section 07 7100 - Roof Specialties: Manufactured copings, fascias, gravel stops, and other flashing-related items.
- D. Section 07 7200 - Roof Accessories: Roof hatches, vents, and manufactured curbs.

1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.
- B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

1.04 REFERENCE STANDARDS

- A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2010.
- B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012.
- C. ASTM C209 - Standard Test Methods for Cellulosic Fiber Insulating Board; 2007ae1.
- D. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- E. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2012.
- F. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer; 2009.
- G. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2010.
- H. ASTM D1004 - Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting; 2009.
- I. ASTM D1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials; 2010.
- J. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics; 2010.

- K. ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2008.
- L. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- M. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing; 2004 (Reapproved 2012)e1.
- N. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2011a.
- O. CAN-ULC-S770 - Standard Test Method Determination of L-Term Thermal Resistance Of Closed-Cell Thermal Insulating Foams; 2009.
- P. PS 1 - Structural Plywood; 2009.
- Q. PS 20 - American Softwood Lumber Standard; 2005.
- R. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; 2003. (ANSI/SPRI ES-1)

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Meeting: Before start of roofing work, Contractor shall attend a meeting to discuss the, scheduling, proper installation of materials and requirements to achieve the warranty.
 - 1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 - 2. The Project Manager for the City shall schedule the pre-construction meeting shortly after the contract has been signed by the Contractor and the City.

1.06 SUBMITTALS

- A. See Section 01 00 02, GENERAL REQUIREMENTS, Part 1-GENERAL Section 18, for submittal procedures.
- B. Product Data:
 - 1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
- C. Samples: Submit samples of each product to be used.
- D. Specimen Warranty: Submit prior to starting work.
- E. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.
- F. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.
- G. Executed Warranty.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: Roofing installer shall have the following:
 - 1. Current Manufacturer's Licensed Contractor status.
Firestone- Red Shield Licensed Contractor or Carlisle- Centurian Licensed Contractor
 - 2. Current approval, license, or authorization as applicator by the manufacturer.
 - 3. At least five years experience in installing specified system.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.

- C. Keep combustible materials away from ignition sources.

1.09 WARRANTY

- A. See Section 01 00 02, GENERAL REQUIREMENTS, Part 1-GENERAL Section 12. GUARANTEES, for additional warranty requirements.
- B. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- C. Warranty: Manufacture's 20 Year Limited Warranty covering membrane, roof insulation, and other indicated components of the system, for the term indicated.
 - 1. Limit of Liability: No dollar limitation.
 - 2. **Scope of Coverage: Repair leaks in the roofing system caused by:**
 - a. Ordinary wear and tear of the elements.
 - b. Manufacturing defect in Firestone brand materials.
 - c. Defective workmanship used to install these materials.
 - d. Damage due to winds up to 55 mph (88 km/h).
 - 3. Not Covered:
 - a. Damage due to winds in excess of 55 mph (88 km/h).
 - b. Damage due hurricanes or tornadoes.
 - c. Hail.
 - d. Intentional damage.
 - e. Unintentional damage due to normal rooftop inspections, maintenance, or service.
- D. Metal Roof Edging with Exposed Decorative Fascia: Provide 20 year warranty for painted finish covering color fade, chalk, and film integrity.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer - Roofing System: Firestone Building Products LLC, Carmel, IN: www.firestonebpco.com.
 - 1. Roofing systems manufactured by others are acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the manufacturer meets the following qualifications:
 - a. Specializing in manufacturing the roofing system to be provided.
 - b. Minimum ten years of experience manufacturing the roofing system to be provided.
 - c. Able to provide a no dollar limit, single source roof system warranty that is backed by corporate assets in excess of one billion dollars.
 - d. ISO 9002 certified.
 - e. Able to provide isocyanurate insulation that is produced in own facilities.
 - f. Roofing systems manufactured by the companies listed below are acceptable provided they are completely equivalent in materials and warranty conditions:
 - 1) Carlisle.
- B. Manufacturer of Insulation and Cover Boards: Same manufacturer as roof membrane.
- C. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
 - 1. Metal roof edging products by other manufacturers are not acceptable.
 - 2. Field- or shop-fabricated metal roof edgings are acceptable.

2.02 ROOFING SYSTEM DESCRIPTION

- A. Roofing System: Thermoplastic olefin (TPO) single-ply membrane.
 - 1. Membrane Attachment: Fully adhered.
 - 2. Warranty: Full system warranty; Firestone 20 year Red Shield Limited Warranty or a Carlisle 20 year Total System Gold Star Warranty covering membrane, roof insulation, and membrane accessories. **It is the intention of this contract to provide a 20 year limited warranty while using the Manufacturer's details from drawings for a 30 year warranty.**
 - 3. Comply with applicable local building code requirements.

- B. Roofing System Components: Listed in order from the top of the roof down:
1. Membrane: Thickness as 60 Mil.
 2. Insulation polyisocyanurate; mechanically attached
 - a. The Maximum Board Thickness: 1.5 inches (75 mm); the intent is to provide a total thickness of new polyisocyanurate 4.5 inches thick; stagger joints in adjacent layers.
 3. Vapor Retarder: Existing metal roof. Additional vapor retarder not required.
 4. Substrate: Existing structural metal roofing system.
 5. Preparation of Insulation at Substrate: Flute Fill: Infill polyisocyanurate foam insulation between ribs on existing metal structural roof.
 6. Install blocking around the perimeter of the roof to the same elevation as the new polyisocyanurate foam insulation as show on the plans. Where different roofing systems meet, between roofs B & C, the resultant raised elevations shall be the same.
 7. Additional Work.
 1. Remove roof penetrations as indicated on the plans. Fabricate replacement panels from 22 gauge galvanized sheet metal to fill in open area.
 2. Raise the remaining roof vent as indicated on the plans.
 3. Install the #115 Alpine 2-Pipe Show Guard system as indicated on plans and specifications.

2.03 MEMBRANE MATERIALS

- A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement and the following additional characteristics:
1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent, with coating thickness over reinforcement of 0.024 inch (0.61 mm) plus/minus 10 percent.
 2. Puncture Resistance: 265 lbf (1174 N), minimum, when tested in accordance FTM 101C Method 2031.
 3. Solar Reflectance: 0.79, minimum, when tested in accordance with ASTM C1549.
 4. Color: White.
 5. Acceptable Product: UltraPly TPO by Firestone or SureWeld TPO by Carlisle.
- B. Membrane Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
- C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide.
- D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
 2. Tensile Strength: 1550 psi (10.7 MPa), minimum, when tested in accordance with ASTM D638 after heat aging.
 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
 4. Tearing Strength: 12 lbf (53 N), minimum, when tested in accordance with ASTM D1004 after heat aging.
 5. Color: White.
 6. Acceptable Product: UltraPly TPO Flashing by Firestone or SureWeld TPO Flashing by Carlisle.
- E. Tape Flashing: 5-1/2 inch (140 mm) nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch (1.6 mm) nominal; TPO QuickSeam Flashing by Firestone or TPO Pressure Sensitive Cover Strip by Carlisle.
- F. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone or SureWeld Pourable Sealer by Carlisle.

- G. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
- H. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches (33 mm) wide by 0.10 inch (2.5 mm) thick; Firestone Termination Bar by Firestone or Carlisle Termination Bar by Carlisle.
- I. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant by Firestone or SureWeld Cut Edge Sealant by Carlisle.
- J. General Purpose Sealant: EPDM-based, one part, white general purpose sealant; UltraPly TPO General Purpose Sealant by Firestone or SureWeld TPO Sealant by Carlisle.
- K. Coated Metal Flashing and Edgings: Galvanized steel with roofing manufacturer's bonded TPO coating; UltraPly TPO Coated Metal by Firestone or SureWeld Coated Metal by Carlisle.
- L. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; UltraPly TPO Small and Large Pipe Flashing by Firestone or SureWeld PreMolded Pipe Flashings by Carlisle.
- M. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal by Firestone or Water-Cut-Off Mastic by Carlisle.

2.04 VAPOR RETARDER MATERIALS

Not applicable, existing metal roof.

2.05 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C1289 Type II Class 1, with the following additional characteristics:
 - 1. Thickness: As indicated elsewhere.
 - 2. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
 - 3. R-Value (LTTR):
 - a. 1.0 inch (25 mm) Thickness: 6.0, minimum.
 - b. 1.25 inch (32 mm) Thickness: 7.5, minimum.
 - c. 1.5 inch (38 mm) Thickness: 9.0, minimum.
 - d. 1.75 inch (44 mm) Thickness: 10.5, minimum.
 - e. 2.0 inch (51 mm) Thickness: 12.1, minimum.
 - f. 3.0 inch (76 mm) Thickness: 18.5, minimum.
 - g. 4.0 inch (102 mm) Thickness: 25.0, minimum.
 - 4. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C1289.
 - 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - 6. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 - 7. Acceptable Product: ISO 95+ GL Polyisocyanurate Insulation by Firestone or HP Polyisocyanurate by Carlisle.
- B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

2.06 METAL ACCESSORIES

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
 - 1. Wind Performance:
 - a. Membrane Pull-Off Resistance: 100 lbs/ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition.
 - b. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-2, current edition.

2. Description: Two-piece; 45 degree sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia; Firestone EdgeGard or SecureEdge by Carlisle .
3. Fascia Face Height: approximately 8 ½" inches (127 mm). or greater as determined by existing field conditions or in order to cover additional blocking heights requirements.
4. Edge Member Height Above Nailer: Flush with nailer.
5. Fascia Material and Finish: 24 gage, 0.024 inch (0.06 mm) galvanized steel with Kynar 500 finish in manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
6. Length: 144 inches (3650 mm).
7. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
8. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
9. Anchor Bar Cleat: 20 gage, 0.036 inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
10. Curved Applications: Factory modified.
11. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
12. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14 inch (355 mm) long legs on corner pieces.
13. Accessories: Provide downspout, and other special fabrications as shown on the drawings.

2.07 ACCESSORY MATERIALS

- A. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
 1. Width: 5-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
 2. Thickness: Build up to same thickness as roof insulation, 4 ½".

PART 3 INSTALLATION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 45 degrees F (85 degrees C).

- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.
- E. Verify that wood nailers have been properly installed.

3.03 PREPARATION

- A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

3.04 VAPOR RETARDER

Not Applicable

3.05 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. Install insulation in a manner that will not compromise the vapor retarder integrity.
- C. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
- E. Loose Laid Installation: Install insulation by laying loose over substrate without mechanical securement of any kind.
- F. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through insulation into deck (existing metal roof) to depth and in pattern required by membrane manufacturer.

3.06 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
 - 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
 - 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.07 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
 - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
 - 6. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.

3.08 FINISHING AND WALKWAY INSTALLATION

- A. Not Applicable.

3.09 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
- B. Perform all corrections necessary for issuance of warranty.

3.10 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.11 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION

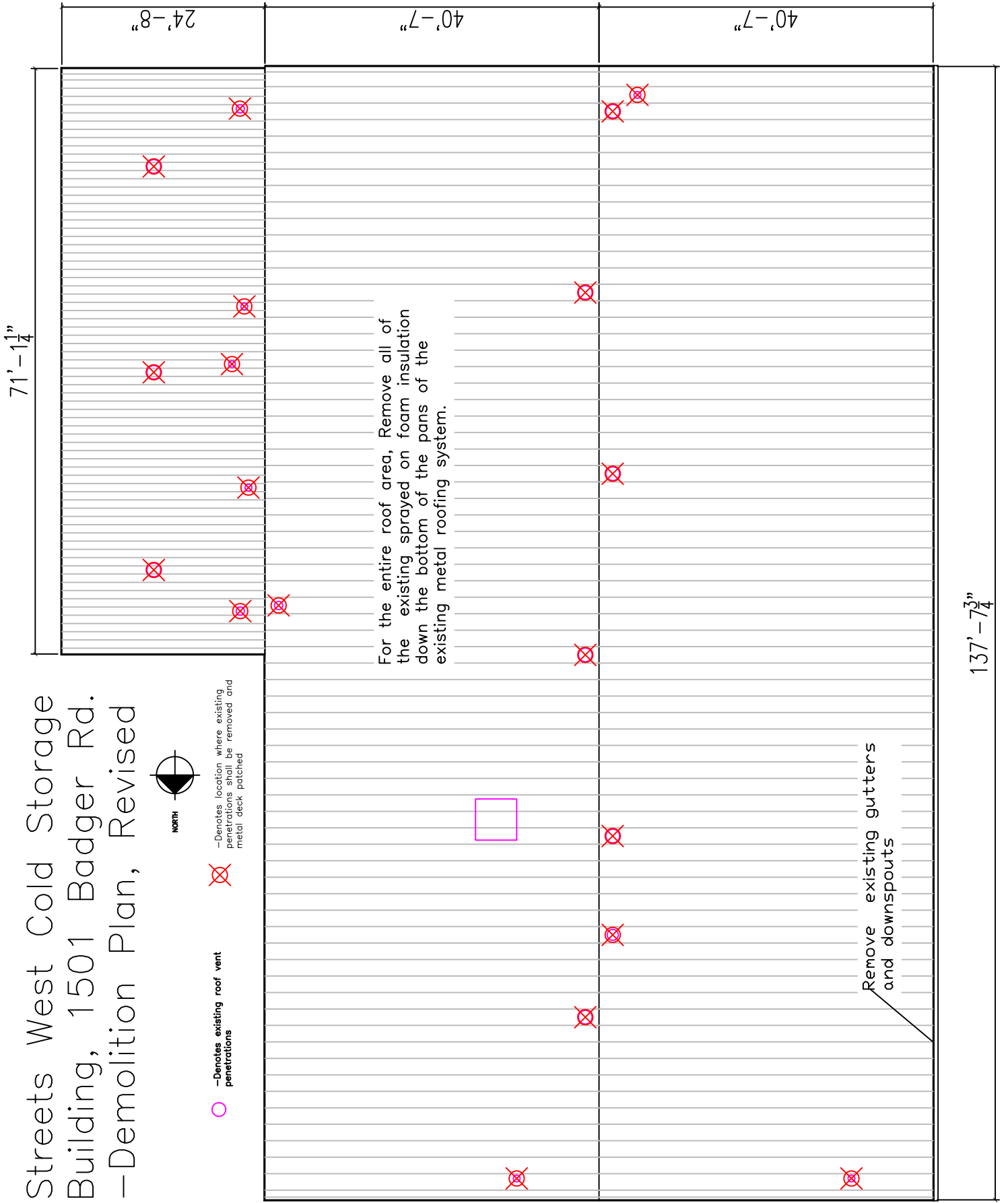
Streets West Cold Storage Building, 1501 Badger Rd. -Demolition Plan, Revised

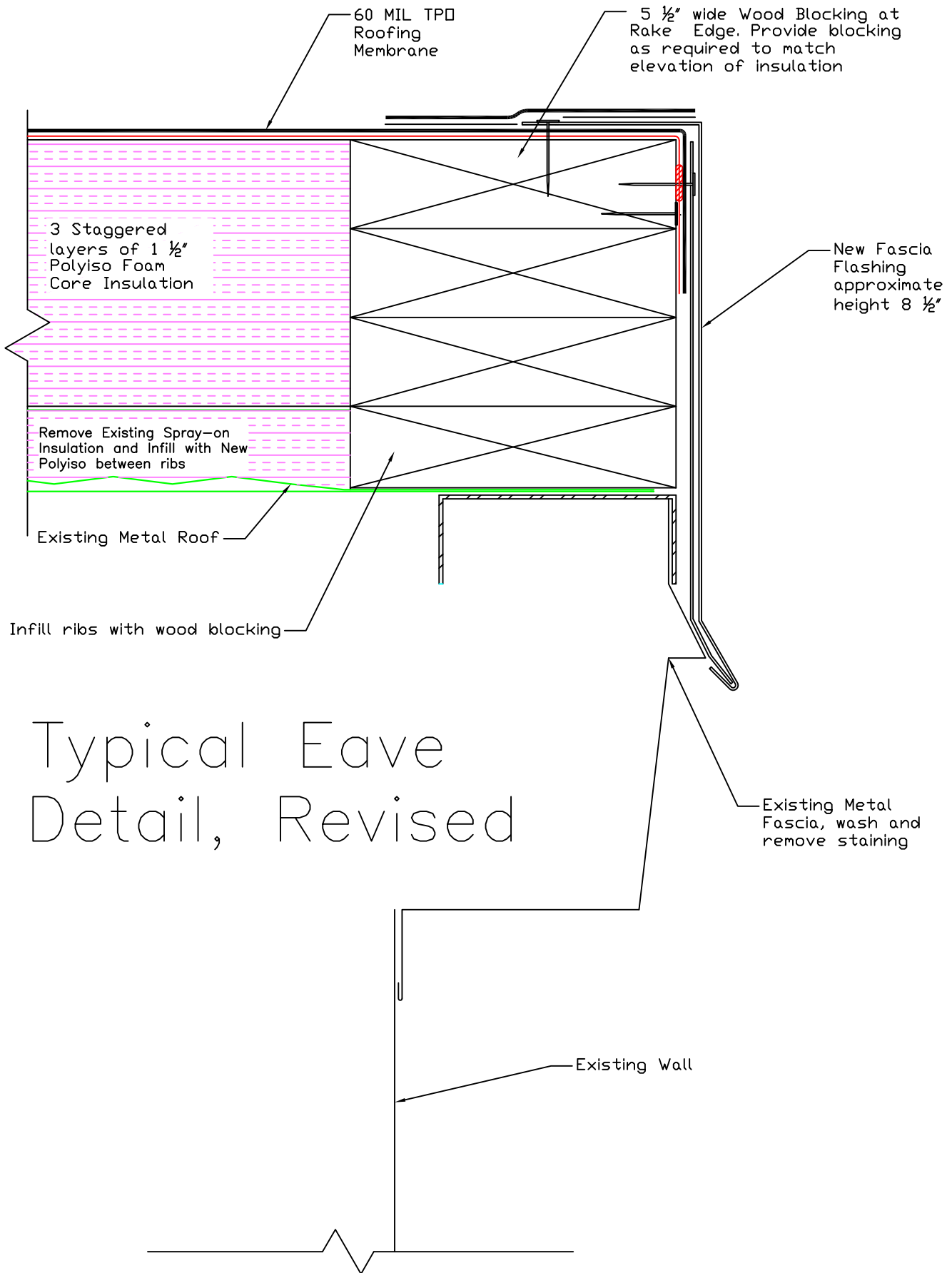


○ -Denotes existing roof vent penetrations

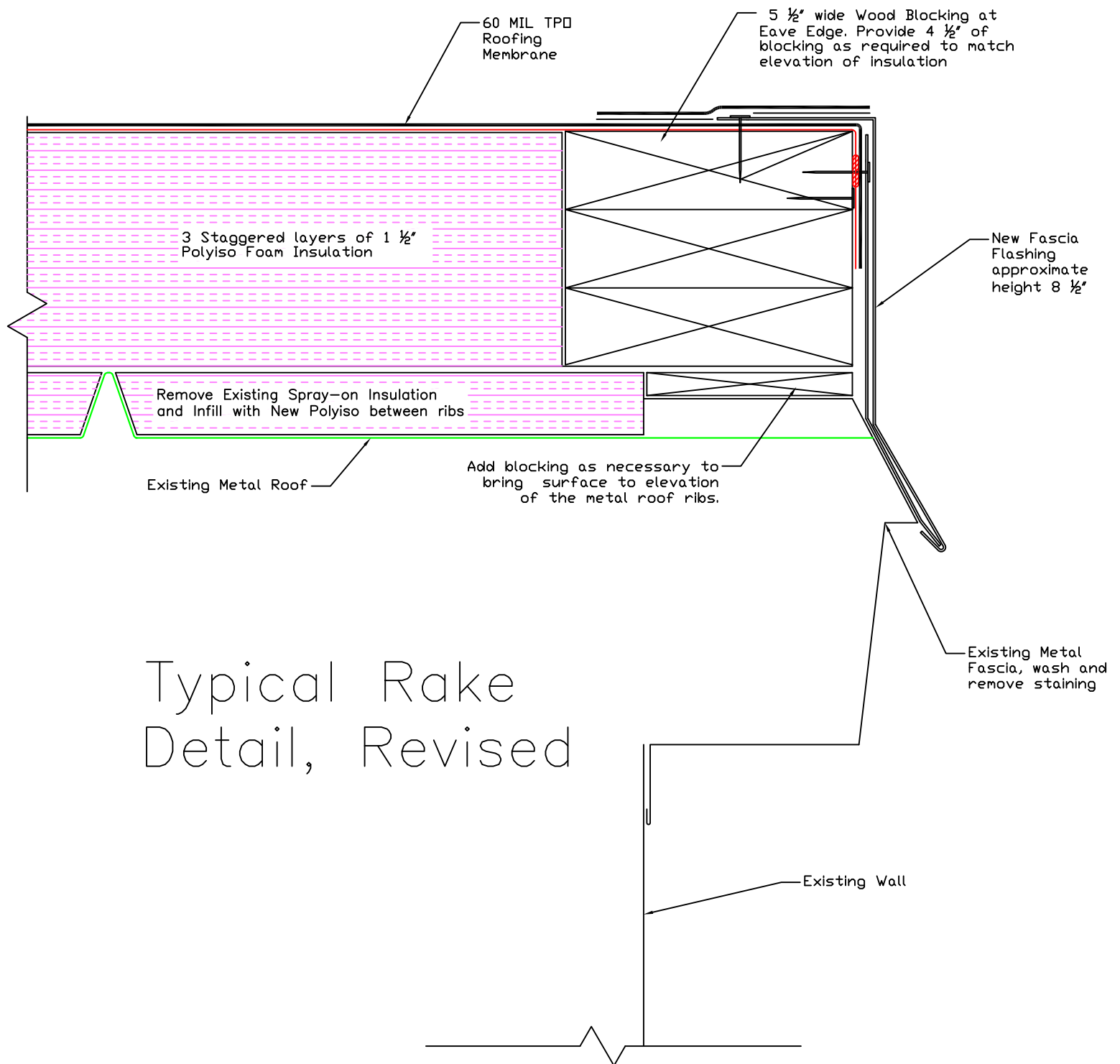


-Denotes location where existing penetrations shall be removed and metal deck patched



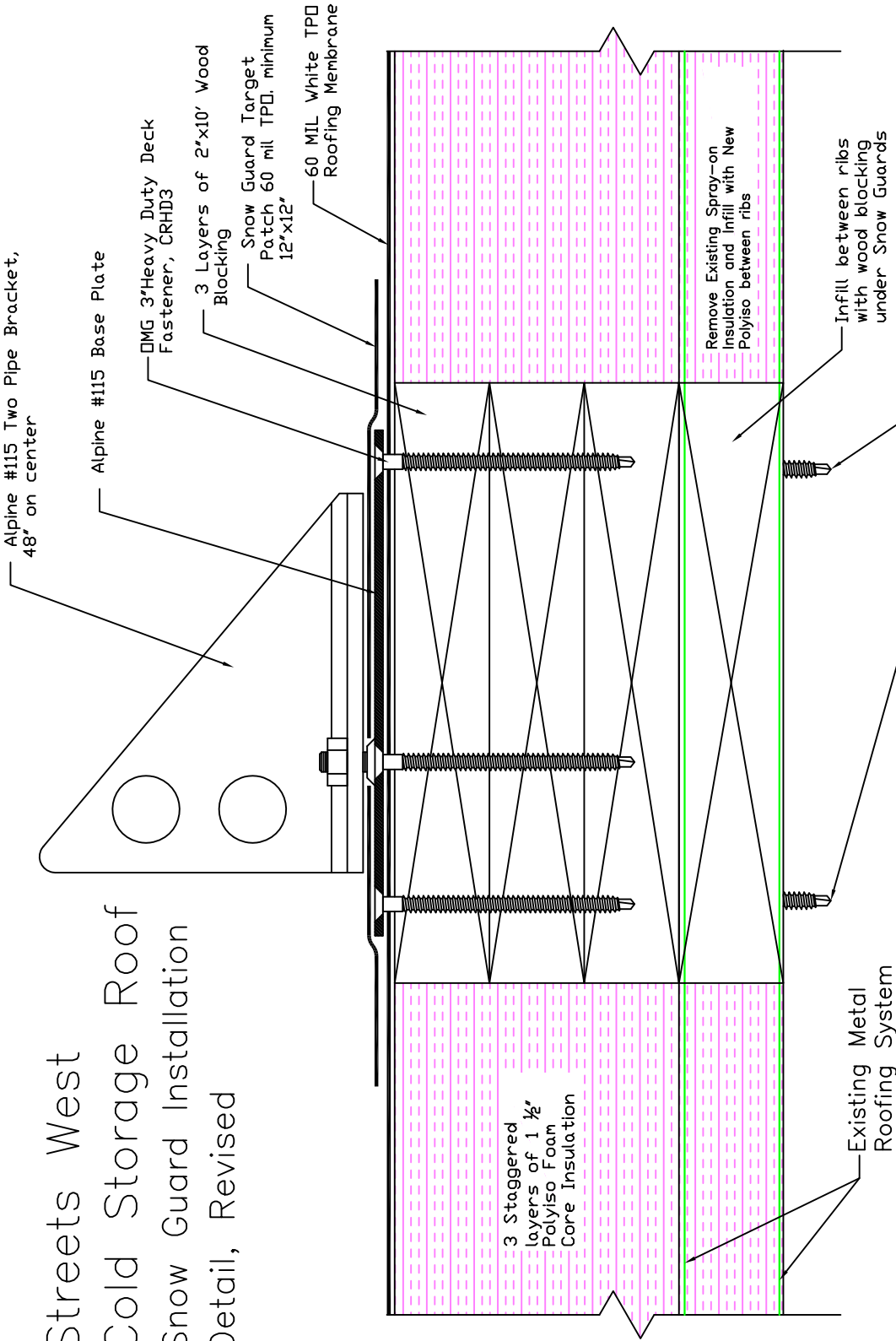


Typical Eave Detail, Revised

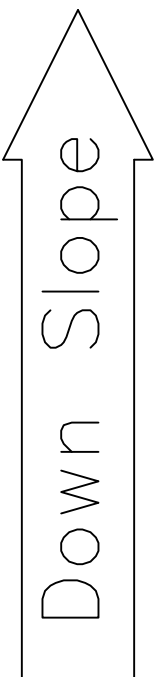


D-45, Revised

Streets West Cold Storage Roof Snow Guard Installation Detail, Revised

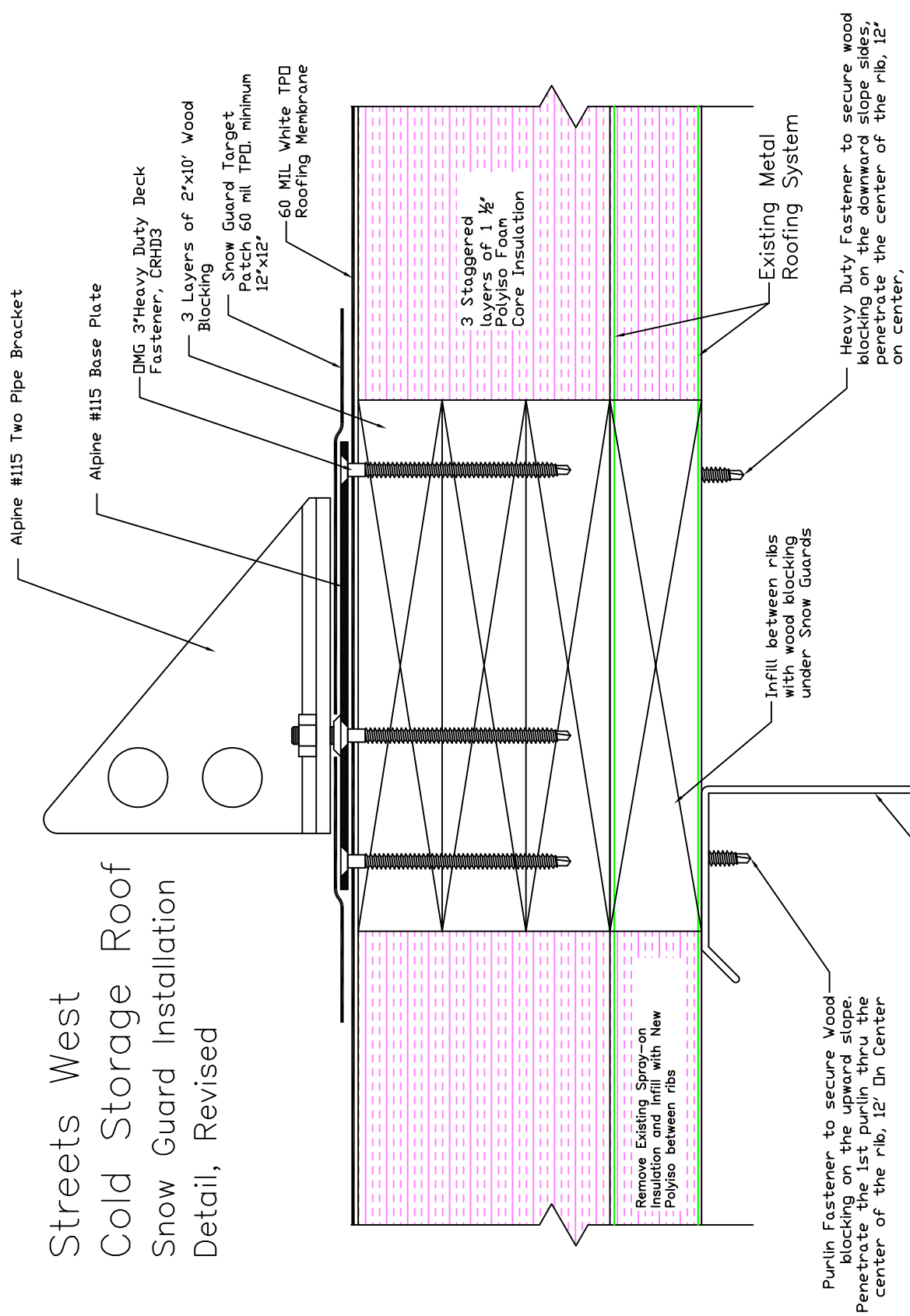


Snow Guard and Blocking for Roofs A & B Revised



Streets West
Cold Storage Roof
Snow Guard Installation
Detail, Revised

D-48, Revised



Snow Guard and
Blocking for Roof C,
Revised

