SECTION 07 54 23

THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

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\*\* NOTE TO SPECIFIER \*\* Elevate Commercial Roofing Systems; Roofing, Wall Panels, Rubber Linings.  
This section is based on the products of Elevate Commercial Roofing Systems, which is located at:26 Century Blvd., Suite 205Nashville, TN 37214Toll Free Tel: 800-428-4442Email: [request info (emma.nealy@amrize.com)](https://arcat.com/rfi?action=email&company=Elevate%252BCommercial%252BRoofing%252BSystems&message=RE%253A%2520Spec%2520Question%2520(07542evt)%253A%2520&coid=53946&spec=07542evt&rep=&fax=)  
Web: <https://www.holcimelevate.com/us-en>   
 [ [Click Here](https://arcat.com/company/elevate-commercial-roofing-systems-53946) ] for additional information.  
A Legacy Made to Last  
Elevate is built on 40 years of history - proof that a commitment to the highest quality materials and trusted partnerships withstand the test of time. While our focus continues to be on smart safe and sustainable solutions for our customers, there's so much more on the horizon. We're raising our sights and are ready to help you achieve whatever you can imagine - the sky's the limit.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Thermoplastic-polyolefin (TPO) membrane roofing systems. (UltraPly) (UltraPly with Secure Bond) (UltraPly Platinum) (UltraPly XR and XR Platinum) (UltraPly SA)
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06 10 00 - Rough Carpentry.
    2. Section 07 55 63 - Vegetated Protected Membrane Roofing and Green Roof Components.
    3. Section 07 62 00 - Sheet Metal Flashing and Trim.
    4. Section 07 71 00 - Roof Specialties.
    5. Section 07 72 00 - Roof Accessories.
    6. Section 08 60 00 - Roof Windows and Skylights.
    7. Section 22 14 26.13 - Roof Drains.
  1. DEFINITIONS
     1. Definitions in the current editions of ASTM D1079 and NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.
  2. SUBMITTALS
     1. Submit under the provisions of Section 01 30 00.
     2. Product Data:
        1. Membrane Manufacturer's printed data sufficient to show that components of the 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.
        2. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable. Include data itemizing the components of the classified or approved system.
     3. Installation Instructions:
        1. Manufacturer's instructions to Installer, marked up to show exactly how components will be installed.
        2. Where instructions allow installation options, clearly indicate which option will be used.
     4. Shop Drawings:
        1. Roof plan indicating orientation of steel deck (if applicable), and fastener and/or adhesive layouts.
        2. Roof membrane Manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
     5. A copy of Pre-Installation Notice to show that Manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the Manufacturer.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + 1. Submit samples of each product to be used.
    2. Specimen Warranty.
    3. Closeout Submittals:
       1. Executed Warranty.
       2. Maintenance data.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years' documented experience.
     2. Applicator Qualifications: Company specializing in performing Work of this section with minimum five years documented experience with projects of similar scope and complexity.
        1. Current Elevate Master Contractor status.
        2. Capability to provide payment and performance bond to the building Owner.
     3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
       1. The intent of a mock-up is to demonstrate quality of workmanship and visual appearance.
       2. If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
       3. Retain mock-up during construction as a standard for comparison with completed work.
       4. Do not alter or remove mock-up until work is completed or removal is authorized.
  1. PRE-INSTALLATION CONFERENCE
     1. Before start of roofing work, Contractor will hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
        1. Require attendance by parties directly influencing the quality of roofing work or affected by the performance of roofing work.
        2. Review the Following:
           1. Methods and procedures related to roofing installation, including Manufacturer's written instructions.
           2. Construction schedule. Verify materials availability, Installer's personnel, equipment, and facilities needed to progress and avoid delays.
           3. Deck substrate examination conditions and finishes, including flatness and fastening.
           4. Structural loading limitations of roof deck during and after roofing.
           5. Base flashings, roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction affecting roofing system.
           6. Governing regulations and requirements for insurance and certificates.
           7. Temporary protection for roofing system during and after installation.
           8. Roof observation and repair procedures after roofing installation.
        3. Notify Architect well in advance of meeting.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Deliver products in Manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
     2. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
        1. Until ready for use, keep materials in their original containers as labeled by the Manufacturer.
        2. Consult membrane Manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers, and cleaning materials away from all sources of ignition.
     3. Protect from damage due to weather, excessive temperature, and construction operations.
        1. Store materials clear of ground and moisture with weather protective covering.
     4. Discard and legally dispose of material that cannot be applied within its stated shelf life.
     5. Keep combustible materials away from ignition sources.
     6. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck and/or structural overloading.
  3. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.
        1. Do not install under environmental conditions outside manufacturer's recommended limits.
        2. Install when existing and forecasted weather permits roofing system installation in accordance with Manufacturer's written instructions and warranty requirements.
  4. WARRANTY
     1. Elevate Red Shield Roofing System Limited Warranty covering membrane, roof insulation, and system accessories. Comply with warranty procedures required by Manufacturer, including notifications, scheduling, and inspections.
        1. Warranty durations of 20 years or greater or a wind speed coverage above 55 mph require additional attachment and detail considerations. Consult Manufacturer's design guidelines for further information.

\*\* NOTE TO SPECIFIER \*\* Delete warranty duration options not required. See the Platinum product for 30 year warranty.

* + - 1. Warranty Duration: 15-year.
      2. Warranty Duration: 20-year.
      3. Warranty Duration: 25-year.
      4. Warranty Duration: 30-year.
    1. Limit of Liability: No dollar limitation (NDL).
    2. Scope of Coverage; Repair leaks in the roofing system caused by:
       1. Ordinary wear and tear.
       2. Normal exposure to the elements.
       3. Manufacturing defect in Elevate materials.
       4. Defective workmanship used to install these materials.

\*\* NOTE TO SPECIFIER \*\* Delete wind speed options not required.

* + - 1. Damage Due to Winds Up To: 55 mph.
      2. Damage Due to Winds Up To: 72 mph.
      3. Damage Due to Winds Up To: 80 mph.
      4. Damage Due to Winds Up To: 90 mph.
      5. Damage Due to Winds Up To: 100 mph.
      6. Not Covered:

\*\* NOTE TO SPECIFIER \*\* Delete wind speed options not required.

* + - * 1. Damage Due to Winds in Excess of 55 mph.
        2. Damage Due to Winds in Excess of 72 mph.
        3. Damage Due to Winds in Excess of 80 mph.
        4. Damage Due to Winds in Excess of 90 mph.
        5. Damage Due to Winds in Excess of 100 mph.
        6. Damage due to hurricanes or tornadoes.
        7. Hail.
        8. Intentional damage.
        9. Unintentional damage due to normal rooftop inspections, maintenance, or service.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Elevate Commercial Roofing Systems, which is located at:26 Century Blvd., Suite 205Nashville, TN 37214Toll Free Tel: 800-428-4442Email: [request info (emma.nealy@amrize.com)](https://arcat.com/rfi?action=email&company=Elevate%252BCommercial%252BRoofing%252BSystems&message=RE%253A%2520Spec%2520Question%2520(07542evt)%253A%2520&coid=53946&spec=07542evt&rep=&fax=);Web: <https://www.holcimelevate.com/us-en>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs: coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs: coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

\*\* NOTE TO SPECIFIER \*\* Delete article not required.

* 1. THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING SYSTEMS (ULTRAPLY)
     1. Basis of Design: Ultraply Thermoplastic Polyolefin (TPO) Roofing System as manufactured by Elevate.
        1. Membrane: Thermoplastic polyolefin (TPO).
           1. Thickness: As specified elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete attachment options not required.

* + - * 1. Membrane Attachment: Adhered.
        2. Membrane Attachment: Mechanically Attached.
        3. Membrane Attachment: Induction Welded.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is optional if adequate structural slope is present.

* + - 1. Slope: 2 percent by means of tapered insulation.
      2. Comply with applicable local building code requirements.

\*\* NOTE TO SPECIFIER \*\* Delete whichever of the two following options is not required.

* + - 1. Assembly to have Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
      2. Assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29.

\*\* NOTE TO SPECIFIER \*\* The following paragraph options not required.

* + - * 1. Meet minimum requirements of FM 1-60 wind uplift rating.
        2. Meet minimum requirements of FM 1-75 wind uplift rating.
        3. Meet minimum requirements of FM 1-90 wind uplift rating.

\*\* NOTE TO SPECIFIER \*\* The use of a vapor barrier within the roofing system is strictly the decision of the design professional. Delete if not required.

* + - 1. Vapor Barrier Over Deck/Deck Cover:
         1. Membrane: High density polyethylene sheet with SBS modified bitumen adhesive.
         2. Attachment: Self-adhering.
      2. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required. Keep either non-composite or composite. Do not specify both. You just need one.

* + - 1. Insulation Type: Non-composite.
         1. Total System R-Value: 25 or greater.

Maximum Board Thickness: 3 inches (76.2 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* Fill Layers are optional. Delete if not required. Then delete the attachment options not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Fill Layers: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Top Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Insulation Type: Composite:

Total System R-Value: 25 or greater.

Maximum Board Thickness: 4 inches (101 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* Base layer is optional. Delete if not required. Then delete attachment option not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Top Layer: Polyisocyanurate foam board, composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - 1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board type not required. Then delete attachment and thickness options not required. The high density polyisocyanurate board is for non-composite insulation assemblies. The gypsum-base boards are for composite insulation assemblies.

* + - * 1. Cover Board Type: High density polyisocyanurate.

Thickness: 1/2 inches (13 mm).

R-Value based on tests per ASTM C158 and ASTM C177: 2.5.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Cover Board Type: Gypsum-based cover board.

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + 1. TPO Membrane Materials:

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + - 1. Product: UltraPly TPO Membrane by Elevate.
      2. Product: UltraPly TPO SA (self-adhered) by Elevate.
      3. Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement.

\*\* NOTE TO SPECIFIER \*\* Delete thickness and color options not required.

* + - * 1. Thickness: 0.045 inch (1.14 mm).
        2. Thickness: 0.060 inch (1.52 mm).
        3. Thickness: 0.080 inch (2.03 mm).
        4. Color: White.
        5. Color: Tan.
        6. Color: Gray.
        7. Reinforcement: Polyester, weft-inserted scrim.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width option not required.

* + - * 1. Sheet Width, Self-Adhered, Adhered, Induction Welded: Use widest sheet practical for jobsite conditions to minimize field seams.
        2. Sheet Width, Mechanically Fastened: Use sheet width required to meet wind uplift and/or fastener spacing requirements.
      1. Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by membrane Manufacturer.
      2. Curb and Parapet Flashing: Same material as membrane. Encapsulated edge eliminates the need for seam sealing the flashing-to-roof splice. Precut: 18 inches (457 mm) wide.
         1. Product: UltraPly TPO 18 inch (457 mm) Curb Flashing by Elevate.
      3. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane.
         1. Product: UltraPly TPO Unsupported Flashing by Elevate.
      4. Factory-Formed Weldable Flashing Accessories:
         1. UltraPly TPO Flashing (various) by Elevate.
      5. Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane.
         1. Factory laminated to white seam tape.
         2. Product: UltraPly TPO QuickSeam Flashing by Elevate
      6. Factory-formed Self-Adhering Flashing Accessories:
         1. Product: UltraPly TPO QuickSeam Flashing (various) by Elevate
      7. Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials.
         1. Product: UltraPly Bonding Adhesive.
         2. Water-Based Bonding Adhesive - P (15 year max warranty).
         3. Single Ply LVOC Bonding Adhesive.
         4. Jet Bond Spray Adhesive by Elevate.
      8. Seam Edge Treatment Sealant: Clear polymer-based, for sealing exposed membrane edges.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

* + - * 1. Product: UltraPly TPO Cut Edge Sealant by Elevate.
        2. Product: UltraPly TPO Cut Edge Sealant LVOC by Elevate.
      1. Pourable Sealer: One part polyurethane.
         1. Product: White One-Part Pourable Sealer by Elevate.
      2. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed.
         1. Product: Water Block Seal S-20 by Elevate.
      3. Metal Plates and Strips used for Fastening Membrane and Insulation:
         1. Corrosion-resistance meeting FM 4470 criteria.
         2. Steel with Galvalume coating.

\*\* NOTE TO SPECIFIER \*\* Delete the following if not required or delete product not required.

* + - 1. Coated Metal Plates for Induction Welding:
         1. Product: UltraPly TPO InvisiWeld Plate by Elevate.
         2. Product: UltraPly TPO InvisiWeld-S Plate by Elevate.
      2. Termination Bars: Aluminum bars with integral caulk ledge (WxT). 1.3 x 0.10 inch (33 x 2.5 mm). Product: Termination Bar by Elevate.
      3. Roof Walkway Pads:
         1. TPO pad providing protection from essential rooftop services and traffic and maintains the integrity of the existing roof surface.

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

Product: UltraPly TPO Walkway Pad by Elevate.

Product: X-Tred Walkway Pad by Elevate. Color: White.

Product: X-Tred Walkway Pad by Elevate. Color: Gray.

Product: X-Tred Walkway Pad by Elevate. Color: Yellow.

* + - 1. Yellow Safety Strip: Compatible with TPO and EPDM.
         1. Width: 5.5 inch (140 mm), Length: 100 ft (30 m). Thick: 30 mil (0.76 mm) thick.
         2. TPO membrane laminated to white, cured, seam tape.

Product: QuickSeam, Yellow Safety Strip by Elevate.

* + 1. Roof Insulation and Cover Boards:
       1. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required. Keep either non-composite or composite. Do not specify both. Just pick one.

* + - * 1. Insulation Type: Non-Composite.

Polyisocyanurate Board Complying with ASTM C 1289 Type II:

Closed cell polyisocyanurate foam with glass reinforced mat laminated to facers.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

Product: Class 1: ISOGARD GL polyiso board insulation by Elevate.

Product: Class 2: ISOGARD CG polyiso board insulation by Elevate.

Mold resistant facer.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required, and R-value option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

R-Value (LTTR) per Inch (25 mm): 6.2, at 40 degrees F (4.4 degrees C) minimum.

R-Value (LTTR) per Inch (25 mm): 5.7, at 75 degrees F (23.9 degrees C) minimum.

Compressive Strength: 20 psi (138 kPa).

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

* + - * 1. Insulation Type: Composite.

Closed cell polyisocyanurate foam core laminated to 1/2 inch (13 mm) high density board.

Product: ISOGARD HD Composite by Elevate.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Compressive Strength: 20 psi (138 kPa) core with 80 psi (552 kPa) board.

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

* + - 1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board type not required. Then delete attachment and thickness options not required. Do not specify both. Just pick one. The high density polyisocyanurate board is for non-composite insulation assemblies. The gypsum-base boards are for composite insulation assemblies.

* + - * 1. Cover Board Type:

High Density Polyisocyanurate: Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D1623, and with the following:

Product: ISOGARD HD Cover Board by Elevate.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 0.5 inch (13 mm).

R-Value Based on Testing per ASTM C158 and ASTM C177: 2.5.

Surface Water Absorption Tested per ASTM C 209: Less than 3 percent, maximum.

Compressive Strength Tested per ASTM 1621: 120 psi (827 kPa).

Density Tested per ASTM 1622: 5 pcf (80 kg/m3).

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed.

* + - * 1. Cover Board Type:

Gypsum-Based: Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and the following:

\*\* NOTE TO SPECIFIER \*\* Delete size and thickness options not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Surface Water Absorption, Maximum: 2.5 grams. Tested in accordance with ASTM C473.

Surface Burning Characteristics, tested per ASTM E84:

Flame Spread: 0. Smoke Developed: 0.

Combustibility, tested per ASTM E136: Non-combustible.

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed. For a minimum of 4 weeks.

* + - 1. Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by roof membrane Manufacturer.
      2. Low Rise Foam Adhesive:
         1. Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates.

I.S.O. Stick.

I.S.O. Twin Pack.

I.S.O. Spray R by Elevate.

Twin Jet.

Twin Jet Y.

\*\* NOTE TO SPECIFIER \*\* Delete vapor barrier not required. The use of a vapor barrier within the roofing system is strictly the decision of the design professional.

* + 1. Vapor Barrier Membrane: SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface. Release liner protecting adhesive. May be used as a temporary roof membrane for up to ninety (90) days.
       1. Product: V-Force Vapor Barrier Membrane by Elevate.
       2. Thickness tested per ASTM D5147: 0.0325 inches (0.826 mm) minimum.
       3. Max Load at Break at 73 degrees F (23 degrees C) Tested per ASTM D 5147:
          1. Machine Direction: 64 lbf per inch(11 kN/m).
          2. Cross Machine Direction: 88 lbf/in (15 kN/m).
       4. Low Temperature Flexibility tested per ASTM D5147: Minus 30 degrees F (Minus 34 degrees C).
       5. Moisture Vapor Permeance Tested per ASTM E96: 0.02 Perms (0.92 Ng per Pa-s-m2) maximum.
       6. Air Permeability Tested per ASTM E2178: 0.00114 cfm per sq ft (0.007 Liter per sec per sq m) maximum.
    2. Metal Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories options not required.

* + - 1. 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. Product: Appropriate Elevate pre-manufactured fascia system
         2. Two-piece, 450 sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia.
         3. Wind Performance:

Membrane Pull-Off Resistance: 100 lbs per ft (1460 N per m) minimum. Tested per ANSI/SPRI ES-1 Test Method RE-1, current edition.

Fascia Pull-Off Resistance: At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-2, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least an FM 1-270 rating.

* + - * 1. Fascia Face Height: 5 inches (127 mm).
        2. Edge Member Height Above Nailer: 1-1/4 inches (31 mm).
        3. Fascia: With factory-installed protective plastic film.

Material: 24 gage, 0.024 inches (0.06 mm) galvanized steel.

Finish: Kynar 500 finish in Manufacturer's standard color, matching concealed joint splice plates.

* + - * 1. Length: minimum of 120 inches (3048 mm).
        2. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
      1. Weldable Metal: Flexible non-reinforced thermoplastic polyolefin membrane, factory laminated to hot-dipped galvanized stee. Colo: To match roof membrane.
         1. Product: UltraPly TPO Coated Metal by Elevate.
      2. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes, miters welded, injection molded EPDM splices to allow thermal expansion.
      3. Anchor Bar Cleat: 20 gage, 0.036 inches (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
      4. Curved Applications: Factory modified.
      5. Fasteners: Factory-provided corrosion resistant fasteners, with drivers.
         1. Not Acceptable: No exposed fasteners.
      6. Special Shaped Components: Factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps.
         1. Legs on Corner Pieces: Minimum 14 inches.
      7. Scuppers: Welded watertight.
      8. Accessories: Special fabrications as shown on the drawings, i.e., matching brick wall caps, downspouts, extenders, etc.
      9. Parapet Copings: Formed metal, galvanized steel anchor/support cleats for capping any parapet wall. Coping sections are to be allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened. stainless steel springs factory attached to anchor cleats. 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips providing a watertight seal.
         1. Product: Appropriate Elevate pre-manufactured coping system
         2. Watertight, maintenance free, without exposed fasteners.
         3. Butt type joints with concealed splice plates.
         4. Mechanically fastened as indicated.
         5. Wind Performance:

At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-3, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

* + - * 1. Material and Finish: 24 gage, 0.024 inch (0.06 mm) thick galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
        2. Dimensions:

Wall Width: As indicated on the drawings.

Piece Length: Minimum 144 inches (3.65 m).

* + - * 1. Curved Application: Factory fabricated in true radius.
        2. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick pre-punched galvanized cleat with 12 inch (305 mm) wide stainless-steel spring mechanically locked to cleat at 72 inch (1.82 m) on center.
        3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.
        4. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs (109 kg) for actual substrate used; no exposed fasteners.
    1. Wood Nailers:
       1. PS 20-dimension lumber, Structural Grade No. 2 better; Southern Pine or Douglas Fir.
       2. PS 1, APA Exterior Grade plywood; pressure preservative treated.
       3. Width: 3.54 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
       4. Thickness: Same as thickness of roof insulation.
  1. THERMOPLASTIC POLYOLEFIN MEMBRANE ROOFING SYSTEMS (ULTRAPLY SA WITH SECURE BOND)
     1. Basis of Design: Ultraply TPO Self Adhering Membrane with Secure Bond Technology Roofing System as manufactured by Elevate.
        1. Membrane: Thermoplastic polyolefin (TPO).
           1. Thickness: As specified elsewhere.
           2. Membrane Attachment: Fully Adhered.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is optional if adequate structural slope is present.

* + - 1. Slope: Provide, if necessary, by means of tapered insulation, additional slope to achieve 1/4 inch per foot (1:48).
      2. Comply with applicable local building code requirements.

\*\* NOTE TO SPECIFIER \*\* Delete whichever of the two following options is not required.

* + - 1. Assembly to have Underwriters Laboratories, Inc. (UL) Class A,B, and C Fire Hazard Classification.
      2. Assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29 .

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraph options not required.

* + - * 1. Meet minimum requirements of FM 1-60, 90, 120 or 160 wind uplift rating.
        2. Meet minimum requirements of FM 1-60, 90, 120 or 160 wind uplift rating.
        3. Meet minimum requirements of FM 1-60, 90, 120 or 160 wind uplift rating.
        4. Meet minimum requirements of FM 1-60, 90, 120 or 160 wind uplift rating.
      1. Insulation:
         1. Total System R-Value: 20 or greater.

Maximum Board Thickness: 2 inches (50 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* Delete attachment options for the base and top layer not required.

* + - * 1. Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Contact adhesive.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Top Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Contact adhesive.

Attachment: Low-rise polyurethane adhesive.

\*\* NOTE TO SPECIFIER \*\* Delete cover board option not required. Then delete attachment and thickness options not required.

* + - * 1. Cover Board: High density polyisocyanurate.

Thickness: 1/2 inches (13 mm).

R-Value based on tests per ASTM C158 and ASTM C177: 2.5.

Attachment: Mechanical fastening.

Attachment: Contact adhesive.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Cover Board: Gypsum-based cover board.

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Attachment: Mechanical fastening.

Attachment: Contact adhesive.

Attachment: Low-rise polyurethane adhesive.

* + 1. TPO Membrane Materials:
       1. Acceptable Product: UltraPly TPO SA (self-adhered) with Secure Bond Technology by Elevate.
       2. Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement.
          1. Thickness: 0.060 inch (1.15 mm) plus/minus 10 percent, with coating thickness over reinforcement of 0.021 inch (0.54 mm) plus/minus 10 percent.
          2. Puncture Resistance, Tested per FTM 101C Method 2031: 300 lbf (1,334 N), minimum,
          3. Solar Reflectance: 0.74, minimum, when tested in accordance with ASTM C1549. Color: White.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required. Tan and Gray are by special order only.

* + - * 1. Color: White.
        2. Color: Tan.
        3. Color: Gray.
      1. Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by membrane Manufacturer.
      2. Curb and Parapet Flashing: Same material as membrane. Encapsulated edge eliminates the need for seam sealing the flashing-to-roof splice. Precut: 18 inches (457 mm) wide.
      3. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane.
         1. Product: UltraPly TPO Flashing by Elevate.
         2. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
         3. Tensile Strength, Tested per ASTM D638 After Heat Aging: 1550 psi (10.7 MPa), minimum.
         4. Elongation at Break, Tested per ASTM D638 After Heat Aging: 650 percent, minimum.
         5. Tearing Strength, Tested per ASTM D1004 After Heat Aging: 12 lbf (53 N), minimum.
      4. Tape Flashing: 5-1/2-inch (140 mm) wide TPO membrane laminated to cured rubber polymer seaming tape. Overall Thickness: 0.065-inch (1.6 mm).
         1. Product: TPO QuickSeam Flashing by Elevate.
      5. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing.
         1. Product: Pourable Sealer by Elevate.
      6. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
      7. Termination Bars: Aluminum bars with integral caulk ledge (WxT). 1.3 x 0.10 inch (33 x 2.5 mm). Product: Termination Bar by Elevate.
      8. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed.
         1. Product: UltraPly TPO Cut Edge Sealant by Elevate.
      9. General Purpose Sealant: EPDM-based, one-part, white general-purpose sealant.
         1. Product: UltraPly TPO General Purpose Sealant by Elevate.
      10. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.
          1. Product: UltraPly TPO Small and Large Pipe Flashing by Elevate.
      11. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch (3 mm) by 30 inches (760 mm) by 40 feet (12.19 m) long with patterned traffic bearing surface.
          1. Product: UltraPly TPO Walkway Pads by Elevate.
      12. Yellow Safety Strip: Compatible with TPO and EPDM.
          1. Width: 5.5 inch (140 mm), Length: 100 ft (30 m). Thick: 30 mil (0.76 mm) thick.
          2. TPO membrane laminated to white, cured, seam tape.

Product: QuickSeam, Yellow Safety Strip by Elevate.

* + 1. Roof Insulation and Cover Boards:
       1. Insulation Type:
          1. Polyisocyanurate Board Complying with ASTM C 1289 Type II Class 1: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

* + - * 1. Product: ISO 95+ GL / ISOGARD GL polyiso board insulation by Elevate.
        2. Product: RESISTA / ISOGARD CG polyiso board insulation by Elevate.

Mold resistant facer.

* + - * 1. Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

* + - * 1. Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).
        2. Size: Adhered. 48 x 48 inches (1.22 x 1.22 m). Adhere using adhesive or asphalt.
        3. R-Value (LTTR) per Inch (25 mm): 5.7, at 75 degrees F (23.9 degrees C) minimum.
        4. Compressive Strength, Tested per ASTM C1289: 20 psi (138 kPa).
        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.
      1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board and size options not required. The polyisocyanurate board is for non-composite assemblies. The gypsum-base boards are for composite.

* + - * 1. Cover Board Type:

High Density Polyisocyanurate: Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D1623, and with the following:

Product: ISOGARD HD Cover Board by Elevate.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 0.5 inch (13 mm).

R-Value Based on Testing per ASTM C158 and ASTM C177: 2.5.

Surface Water Absorption Tested per ASTM C 209: Less than 3 percent, maximum.

Compressive Strength Tested per ASTM 1621: 120 psi (827 kPa).

Density Tested per ASTM 1622: 5 pcf (80 kg/m3).

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed.

* + - * 1. Cover Board Type:

Gypsum-Based: Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and the following:

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 1/4 inches (6 mm).

Surface Water Absorption, Tested per ASTM C473: 2.5 grams maximum.

Spanning Capability: As recommended by manufacturer for maximum flute spans.

Surface Burning Characteristics, tested per ASTM E84:

Flame Spread: 0. Smoke Developed: 0.

Combustibility, tested per ASTM E136: Non-combustible.

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed. Zero growth for a minimum of 4 weeks.

* + - 1. Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by roof membrane Manufacturer.
      2. Insulation Adhesive: Type as required by roof membrane manufacturer for roofing system and warranty to be provided. Use adhesive furnished by roof membrane manufacturer.
    1. Metal Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories options not required.

* + - 1. 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. Product: EdgeGard by Elevate.
         2. Two-piece, 450 sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia.
         3. Wind Performance:

Membrane Pull-Off Resistance: 100 lbs per ft (1460 N per m) minimum. Tested per ANSI/SPRI ES-1 Test Method RE-1, current edition.

Fascia Pull-Off Resistance: At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-2, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least an FM 1-270 rating.

* + - * 1. Fascia Face Height: 5 inches (127 mm).
        2. Edge Member Height Above Nailer: 1-1/4 inches (31 mm).
        3. Length: 144 inches (3650 mm).
        4. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
      1. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes, miters welded, injection molded EPDM splices to allow thermal expansion.
      2. Anchor Bar Cleat: 20 gage, 0.036 inches (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
      3. Curved Applications: Factory modified.
      4. Fasteners: Factory-provided corrosion resistant fasteners, with drivers.
         1. Not Acceptable: No exposed fasteners.
      5. Special Shaped Components: Factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps.
         1. Legs on Corner Pieces: Minimum 14 inches.
      6. Scuppers: Welded watertight.
      7. Accessories: Special fabrications as shown on the drawings, i.e., matching brick wall caps, downspouts, extenders, etc.
      8. Parapet Copings: Formed metal, galvanized steel anchor/support cleats for capping any parapet wall. Coping sections are to be allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats. 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips providing a watertight seal.
         1. Product: Appropriate Elevate pre-manufactured coping system.
         2. Watertight, maintenance free, without exposed fasteners.
         3. Butt type joints with concealed splice plates.
         4. Mechanically fastened as indicated.
         5. Wind Performance:

At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-3, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

* + - * 1. Material and Finish: 24 gage, 0.024 inch (0.06 mm) thick galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
        2. Dimensions:

Wall Width: As indicated on the drawings.

Piece Length: Minimum 144 inches (3.65 m).

* + - * 1. Curved Application: Factory fabricated in true radius.
        2. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick pre-punched galvanized cleat with 12 inch (305 mm) wide stainless-steel spring mechanically locked to cleat at 72 inch (1.82 m) on center.
        3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.
        4. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs (109 kg) for actual substrate used; no exposed fasteners.
    1. Wood Nailers:
       1. PS 20-dimension lumber, Structural Grade No. 2 better; Southern Pine or Douglas Fir.
       2. PS 1, APA Exterior Grade plywood; pressure preservative treated.
       3. Width: 3.54 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
       4. Thickness: Same as thickness of roof insulation.
  1. THERMOPLASTIC POLYOLEFIN MEMBRANE ROOFING SYSTEMS (ULTRAPLY PLATINUM)
     1. Basis of Design: Ultraply Platinum Thermoplastic Polyolefin (TPO) Roofing System as manufactured by Elevate.
        1. Membrane: Thermoplastic polyolefin (TPO).
           1. Thickness: As specified elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete attachment options not required.

* + - 1. Membrane Attachment: Adhered.
      2. Membrane Attachment: Mechanically Attached.
      3. Membrane Attachment: Induction Welded.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is optional if adequate structural slope is present.

* + - 1. Slope: 2 percent by means of tapered insulation.
      2. Comply with applicable local building code requirements.

\*\* NOTE TO SPECIFIER \*\* Delete whichever of the two following options is not required.

* + - 1. Assembly to have Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
      2. Assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29.

\*\* NOTE TO SPECIFIER \*\* The following paragraph options not required.

* + - * 1. Meet minimum requirements of FM 1-60 wind uplift rating.
        2. Meet minimum requirements of FM 1-75 wind uplift rating.
        3. Meet minimum requirements of FM 1-90 wind uplift rating.

\*\* NOTE TO SPECIFIER \*\* The use of a vapor barrier within the roofing system is strictly the decision of the design professional. Delete if not required.

* + - 1. Vapor Barrier Over Deck/Deck Cover:
         1. Membrane: High density polyethylene sheet with SBS modified bitumen adhesive.
         2. Attachment: Self-adhering.
      2. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required, either non-composite or composite. Just choose one. You do not need both.

* + - * 1. Insulation Type: Non-composite.

Total System R-Value: 25 or greater.

Maximum Board Thickness: 3 inches (76 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* Fill Layers are optional. Delete if not required. Delete attachment options not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Fill Layers: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Top Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Insulation Type: Composite:

Total System R-Value: 25 or greater.

Maximum Board Thickness: 4 inches (101 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* ' Base layer is optional. Delete if not required. Delete attachment options not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Top Layer: Polyisocyanurate foam board, composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - 1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board option not required. Then delete attachment and thickness options not required. The high density polyisocyanurate board is for non-composite insulation assemblies. The gypsum-base boards are for composite insulation assemblies.

* + - * 1. Cover Board Type: High density polyisocyanurate.

Thickness: 1/2 inches (13 mm).

R-Value based on tests per ASTM C158 and ASTM C177: 2.5.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + - * 1. Cover Board Type: Gypsum-based cover board.

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

* + 1. TPO Membrane Materials:
       1. Acceptable Product: UltraPly TPO Platinum Membrane by Elevate.
       2. Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement.
          1. Thickness: 0.080 inch (2.03 mm).

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - * 1. Color: White.
        2. Color: Tan.
        3. Color: Gray.
        4. Reinforcement: Polyester, weft-inserted scrim.

\*\* NOTE TO SPECIFIER \*\* Delete sheet width option not required.

* + - * 1. Sheet Width, Adhered or Induction Welded: Use widest sheet practical for jobsite conditions to minimize field seams.
        2. Sheet Width, Mechanically Fastened: Use sheet width required to meet wind uplift and/or fastener spacing requirements.
      1. Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by membrane Manufacturer.
      2. Curb and Parapet Flashing: Same material as membrane. Encapsulated edge eliminates the need for seam sealing the flashing-to-roof splice. Precut: 18 inches (457 mm) wide.
         1. Product: UltraPly TPO 18 inch (457 mm) Curb Flashing by Elevate.
      3. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane.
         1. Product: UltraPly TPO Unsupported Flashing by Elevate.
      4. Factory-Formed Weldable Flashing Accessories:
         1. UltraPly TPO Flashing (various) by Elevate.
      5. Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane.
         1. Factory laminated to white seam tape.
         2. Product: UltraPly TPO QuickSeam Flashing by Elevate
      6. Factory-formed Self-Adhering Flashing Accessories:
         1. Product: UltraPly TPO QuickSeam Flashing (various) by Elevate
      7. Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials.

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + - * 1. Product: UltraPly Bonding Adhesive.
        2. Product: Single Ply LVOC Bonding Adhesive.
        3. Product: Jet Bond Spray Adhesive by Elevate.
      1. Seam Edge Treatment Sealant: Clear polymer-based, for sealing exposed membrane edges.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

* + - * 1. Product: UltraPly TPO Cut Edge Sealant by Elevate.
        2. Product: UltraPly TPO Cut Edge Sealant LVOC by Elevate.
      1. Pourable Sealer: One part polyurethane.
         1. Product: White One-Part Pourable Sealer by Elevate.
      2. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed.
         1. Product: Water Block Seal S-20 by Elevate.
      3. Metal Plates and Strips used for Fastening Membrane and Insulation:
         1. Corrosion-resistance meeting FM 4470 criteria.
         2. Steel with Galvalume coating.

\*\* NOTE TO SPECIFIER \*\* Delete the following if not required or delete product not required.

* + - 1. Coated Metal Plates for Induction Welding:
         1. Product: UltraPly TPO InvisiWeld Plate by Elevate.
         2. Product: UltraPly TPO InvisiWeld-S Plate by Elevate.
      2. Termination Bars: Aluminum bars with integral caulk ledge (WxT). 1.3 x 0.10 inch (33 x 2.5 mm). Product: Termination Bar by Elevate.
      3. Roof Walkway Pads:
         1. TPO pad providing protection from essential rooftop services and traffic and maintains the integrity of the existing roof surface.

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

Product: UltraPly TPO Walkway Pad by Elevate.

Product: X-Tred Walkway Pad by Elevate. Color: White.

Product: X-Tred Walkway Pad by Elevate. Color: Gray.

Product: X-Tred Walkway Pad by Elevate. Color: Yellow.

* + - 1. Yellow Safety Strip: Compatible with TPO and EPDM.
         1. Width: 5.5 inch (140 mm), Length: 100 ft (30 m). Thick: 30 mil (0.76 mm) thick.
         2. TPO membrane laminated to white, cured, seam tape.

Product: QuickSeam, Yellow Safety Strip by Elevate.

* + 1. Roof Insulation and Cover Boards:
       1. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required, either non-composite or composite. Just choose one. You do not need both.

* + - * 1. Insulation Type: Non-Composite.

Polyisocyanurate Board Complying with ASTM C 1289 Type II:

Closed cell polyisocyanurate foam with glass reinforced mat laminated to facers.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

Product: Class 1. ISOGARD GL polyiso board insulation by Elevate.

Product: Class 2. ISOGARD CG polyiso board insulation by Elevate.

Mold resistant facer.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option and R-value options not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

R-Value (LTTR) per Inch (25 mm): 6.2, at 40 degrees F (4.4 degrees C) minimum.

R-Value (LTTR) per Inch (25 mm): 5.7, at 75 degrees F (23.9 degrees C) minimum.

Compressive Strength: 20 psi (138 kPa).

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

* + - * 1. Insulation Type: Composite.

Closed cell polyisocyanurate foam core laminated to 1/2 inch (13 mm) high density board.

Product: ISOGARD HD Composite by Elevate.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Compressive Strength: 20 psi (138 kPa) core with 80 psi (552 kPa) board.

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

\*\* NOTE TO SPECIFIER \*\* Delete cover board type, size, and thickness options not required. The polyisocyanurate board is for non-composite assemblies. The gypsum-base boards are for composite.

* + - 1. Cover Boards:
         1. Cover Board Type: High Density Polyisocyanurate:

Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D1623, and with the following:

Product: ISOGARD HD Cover Board by Elevate.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 0.5 inch (13 mm).

R-Value Based on Testing per ASTM C158 and ASTM C177: 2.5.

Surface Water Absorption Tested per ASTM C 209: Less than 3 percent, maximum.

Compressive Strength Tested per ASTM 1621: 120 psi (827 kPa).

Density Tested per ASTM 1622: 5 pcf (80 kg/m3).

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed.

* + - * 1. Cover Board Type: Gypsum-Based:

Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and the following:

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Surface Water Absorption, Maximum: 2.5 grams. Tested in accordance with ASTM C473.

Surface Burning Characteristics, tested per ASTM E84:

Flame Spread: 0. Smoke Developed: 0.

Combustibility, tested per ASTM E136: Non-combustible.

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed. For a minimum of 4 weeks.

* + - 1. Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by roof membrane Manufacturer.
      2. Low Rise Foam Adhesive:
         1. Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates.

I.S.O. Stick.

I.S.O. Twin Pack.

I.S.O. Spray R by Elevate.

Twin Jet.

Twin Jet Y.

\*\* NOTE TO SPECIFIER \*\* Delete vapor barrier not required. The use of a vapor barrier within the roofing system is strictly the decision of the design professional.

* + 1. Vapor Barrier Membrane: SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface. Release liner protecting adhesive. May be used as a temporary roof membrane for up to ninety (90) days.
       1. Product: V-Force Vapor Barrier Membrane by Elevate.
       2. Thickness tested per ASTM D5147: 0.0325 inches (0.826 mm) minimum.
       3. Max Load at Break at 73 degrees F (23 degrees C) Tested per ASTM D 5147:
          1. Machine Direction: 64 lbf per inch(11 kN/m).
          2. Cross Machine Direction: 88 lbf/in (15 kN/m).
       4. Low Temperature Flexibility tested per ASTM D5147: Minus 30 degrees F (Minus 34 degrees C).
       5. Moisture Vapor Permeance Tested per ASTM E96: 0.02 Perms (0.92 Ng per Pa-s-m2) maximum.
       6. Air Permeability Tested per ASTM E2178: 0.00114 cfm per sq ft (0.007 Liter per sec per sq m) maximum.
    2. Metal Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories options not required.

* + - 1. 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. Product: Appropriate Elevate pre-manufactured fascia system.
         2. Two-piece, 450 sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia.
         3. Wind Performance:

Membrane Pull-Off Resistance: 100 lbs per ft (1460 N per m) minimum. Tested per ANSI/SPRI ES-1 Test Method RE-1, current edition.

Fascia Pull-Off Resistance: At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-2, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least an FM 1-270 rating.

* + - * 1. Fascia Face Height: 5 inches (127 mm).
        2. Edge Member Height Above Nailer: 1-1/4 inches (31 mm).
        3. Fascia: With factory-installed protective plastic film.

Material: 24 gage, 0.024 inches (0.06 mm) galvanized steel.

Finish: Kynar 500 finish in Manufacturer's standard color, matching concealed joint splice plates.

* + - * 1. Length: minimum of 120 inches (3048 mm).
      1. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
      2. Weldable Metal: Flexible non-reinforced thermoplastic polyolefin membrane, factory laminated to hot-dipped galvanized stee. Colo: To match roof membrane.
         1. Product: UltraPly TPO Coated Metal by Elevate.
      3. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes, miters welded, injection molded EPDM splices to allow thermal expansion.
      4. Anchor Bar Cleat: 20 gage, 0.036 inches (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
      5. Curved Applications: Factory modified.
      6. Fasteners: Factory-provided corrosion resistant fasteners, with drivers.
         1. Not Acceptable: No exposed fasteners.
      7. Special Shaped Components: Factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps.
         1. Legs on Corner Pieces: Minimum 14 inches.
      8. Scuppers: Welded watertight.
      9. Accessories: Special fabrications as shown on the drawings, i.e., matching brick wall caps, downspouts, extenders, etc.
      10. Parapet Copings: Formed metal, galvanized steel anchor/support cleats for capping any parapet wall. Coping sections are to be allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats. 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips providing a watertight seal.
          1. Product: Appropriate Elevate pre-manufactured coping system.
          2. Watertight, maintenance free, without exposed fasteners.
          3. Butt type joints with concealed splice plates.
          4. Mechanically fastened as indicated.
          5. Wind Performance:

At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-3, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

* + - * 1. Material and Finish: 24 gage, 0.024 inch (0.06 mm) thick galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
        2. Dimensions:

Wall Width: As indicated on the drawings.

Piece Length: Minimum 144 inches (3.65 m).

* + - * 1. Curved Application: Factory fabricated in true radius.
        2. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick pre-punched galvanized cleat with 12 inch (305 mm) wide stainless-steel springmechanically locked to cleat at 72 inch (1.82 m) on center.
        3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.
        4. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs (109 kg) for actual substrate used; no exposed fasteners.
    1. Wood Nailers:
       1. PS 20-dimension lumber, Structural Grade No. 2 better; Southern Pine or Douglas Fir.
       2. PS 1, APA Exterior Grade plywood; pressure preservative treated.
       3. Width: 3.54 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
       4. Thickness: Same as thickness of roof insulation.
  1. THERMOPLASTIC POLYOLEFIN MEMBRANE ROOFING SYSTEMS (ULTRAPLY XR AND XR PLATINUM)
     1. Basis of Design:

\*\* NOTE TO SPECIFIER \*\* Delete roofing system option not required.

* + - 1. Roofing System: UltraPly TPO XR Roofing System by Elevate.
      2. Roofing System: UltraPly TPO XR Platinum Roofing System by Elevate.
      3. Membrane: Thermoplastic polyolefin (TPO).
         1. Thickness: As specified elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete attachment options not required.

* + - 1. Membrane Attachment: Adhered.
      2. Membrane Attachment: Bead Adhered.
      3. Membrane Attachment: Mechanically Fastened.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is optional if adequate structural slope is present.

* + - 1. Slope: 2 percent by means of tapered insulation.
      2. Comply with applicable local building code requirements.

\*\* NOTE TO SPECIFIER \*\* Delete whichever of the two following options is not required.

* + - 1. Assembly to have Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
      2. Assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29.

\*\* NOTE TO SPECIFIER \*\* The following paragraph options not required.

* + - * 1. Meet minimum requirements of FM 1-60 wind uplift rating.
        2. Meet minimum requirements of FM 1-75 wind uplift rating.
        3. Meet minimum requirements of FM 1-90 wind uplift rating.

\*\* NOTE TO SPECIFIER \*\* The use of a vapor barrier within the roofing system is strictly the decision of the design professional. Delete if not required.

* + - 1. Vapor Barrier Over Deck/Deck Cover:
         1. Membrane: High density polyethylene sheet with SBS modified bitumen adhesive.
         2. Attachment: Self-adhering.
      2. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required, either non-composite or composite. Do not specify both. Just pick one.

* + - * 1. Insulation Type: Non-composite.

Total System R-Value: 25 or greater.

Maximum Board Thickness: 3 inches (76.2 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* Fill Layers are optional. Delete if not required. Delete the following attachment options not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

Fill Layers: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

Top Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

\*\* NOTE TO SPECIFIER \*\* The following insulation is a suitable substrate for XR Bonding Adhesive or hot asphalt-applied membranes.

* + - * 1. Insulation Type: Composite.

Total System R-Value: 25 or greater.

Maximum Board Thickness: 4 inches (101 mm).

Use as many layers as necessary to achieve the required R-value.

Stagger joints in adjacent layers.

\*\* NOTE TO SPECIFIER \*\* ' Base layer is optional. Delete if not required. Then delete attachment options not required.

Base Layer: Polyisocyanurate foam board, non-composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

Top Layer: Polyisocyanurate foam board, composite.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

* + - 1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board type option not required. Then delete attachment and thickness options not required. High density polyisocyanurate board is not a suitable substrate for XR Bonding Adhesive or hot asphalt-applied membranes.

* + - * 1. Cover Board Type: High density polyisocyanurate.

Thickness: 1/2 inches (13 mm).

R-Value based on tests per ASTM C158 and ASTM C177: 2.5.

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

* + - * 1. Cover Board Type: Gypsum-based cover board.

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Attachment: Mechanical fastening.

Attachment: Low-rise polyurethane adhesive.

Attachment: Hot asphalt.

* + 1. TPO Membrane Materials:

\*\* NOTE TO SPECIFIER \*\* Delete product options not required. The 135 membrane is required for the Platinum warranty.

* + - 1. Product: UltraPly TPO XR Membrane by Elevate.
      2. Product: UltraPly TPO XR 135 Membrane by Elevate.
      3. Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement.

\*\* NOTE TO SPECIFIER \*\* Delete thickness and color options not required. 80 mill is required for Platinum warranty. Delete color options not required.

* + - * 1. Thickness: 0.045 inch (1.14 mm).
        2. Thickness: 0.060 inch (1.52 mm).
        3. Thickness: 0.080 inch (2.03 mm).
        4. Color: White.
        5. Color: Tan.
        6. Color: Gray.
        7. Reinforcement: Polyester, weft-inserted scrim.
        8. Backing: 8 ounce Polyester fleece.
        9. Sheet Width, Adhered: Use widest sheet practical for jobsite conditions to minimize field seams.
        10. Sheet Width, Mechanically Fastened: Use sheet width required to meet wind uplift and/or fastener spacing requirements.
      1. Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by membrane Manufacturer.
      2. Curb and Parapet Flashing: Same material as membrane. Encapsulated edge eliminates the need for seam sealing the flashing-to-roof splice. Precut: 18 inches (457 mm) wide.
         1. Product: UltraPly TPO 18 inch (457 mm) Curb Flashing by Elevate.
      3. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane.
         1. Product: UltraPly TPO Unsupported Flashing by Elevate.
      4. Factory-Formed Weldable Flashing Accessories:
         1. UltraPly TPO Flashing (various) by Elevate.
      5. Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane.
         1. Factory laminated to white seam tape.
         2. Product: UltraPly TPO QuickSeam Flashing by Elevate.
      6. Factory-formed Self-Adhering Flashing Accessories:
         1. Product: UltraPly TPO QuickSeam Flashing (various) by Elevate.
      7. Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials. Full coverage XR bonding adhesive.
         1. Product: Jet Bond Spray Adhesive.
         2. Product: I.S.O. Spray R. Full coverage bead attachment.
         3. Product: XR Stick. Bead attachment.
         4. Product: Twin Jet by Elevate. Bead spatter attachment.
         5. Product: Twin Jet Y by Elevate. Bead spatter attachment.

\*\* NOTE TO SPECIFIER \*\* Delete hot asphalt if not required or delete product options not required.

* + - 1. Hot Asphalt: SEBS (styrene-ethylene-butadiene-styrene) modified asphalt.
         1. Product: SEBS Mopping Asphalt by Elevate.
         2. Product: ASTM D312 Type IV asphalt.
      2. Seam Edge Treatment Sealant: Clear polymer-based, for sealing exposed membrane edges.

\*\* NOTE TO SPECIFIER \*\* Delete product option not required.

* + - * 1. Product: UltraPly TPO Cut Edge Sealant by Elevate.
        2. Product: UltraPly TPO Cut Edge Sealant LVOC by Elevate.
      1. Pourable Sealer: One part polyurethane.
         1. Product: White One-Part Pourable Sealer by Elevate.
      2. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed.
         1. Product: Water Block Seal S-20 by Elevate.
      3. Metal Plates and Strips used for Fastening Membrane and Insulation:
         1. Corrosion-resistance meeting FM 4470 criteria.
         2. Steel with Galvalume coating.
      4. Termination Bars: Aluminum bars with integral caulk ledge (WxT). 1.3 x 0.10 inch (33 x 2.5 mm). Product: Termination Bar by Elevate.
      5. Roof Walkway Pads:
         1. TPO pad providing protection from essential rooftop services and traffic and maintains the integrity of the existing roof surface.

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

Product: UltraPly TPO Walkway Pad by Elevate.

Product: X-Tred Walkway Pad by Elevate. Color: White.

Product: X-Tred Walkway Pad by Elevate. Color: Gray.

Product: X-Tred Walkway Pad by Elevate. Color: Yellow.

* + - 1. Yellow Safety Strip: Compatible with TPO and EPDM.
         1. Width: 5.5 inch (140 mm), Length: 100 ft (30 m). Thick: 30 mil (0.76 mm) thick.
         2. TPO membrane laminated to white, cured, seam tape.

Product: QuickSeam, Yellow Safety Strip by Elevate.

* + 1. Roof Insulation and Cover Boards:
       1. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete insulation type not required, either non-composite or composite. Do not specify both. Just pick one.

* + - * 1. Insulation Type: Non-composite.

Polyisocyanurate Board Complying with ASTM C 1289 Type II.

Closed cell polyisocyanurate foam with glass reinforced mat laminated to facers.

\*\* NOTE TO SPECIFIER \*\* Delete product options not required. Class 2 ISOGARD GL is not a suitable substrate for XR Bonding Adhesive hot asphalt-applied membranes.

Product: Class 1: ISOGARD GL polyiso board insulation by Elevate.

Product: Class 2: ISOGARD GL polyiso board insulation by Elevate.

Mold resistant facer.

Product: ISOGARD CG polyiso board insulation by Elevate.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size and R-value options not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

R-Value (LTTR) per Inch (25 mm): 6.2, at 40 degrees F (4.4 degrees C) minimum.

R-Value (LTTR) per Inch (25 mm): 5.7, at 75 degrees F (23.9 degrees C) minimum.

Compressive Strength: 20 psi (138 kPa).

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

* + - * 1. Insulation Type: Composite.

Closed cell polyisocyanurate foam core laminated to 1/2 inch (13 mm) high density board.

Product: ISOGARD HD Composite by Elevate.

Thickness: As indicated elsewhere.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Compressive Strength: 20 psi (138 kPa) core with 80 psi (552 kPa) board.

Ozone Depletion Potential: Zero. Made without CFC or HCFC blowing agents.

* + - 1. Cover Boards:

\*\* NOTE TO SPECIFIER \*\* Delete cover board type option not required. The polyisocyanurate board is for non-composite assemblies. The gypsum-base boards are for composite.

* + - * 1. Cover Board Type: High Density Polyisocyanurate.

Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D1623, and with the following:

Product: ISOGARD HD Cover Board by Elevate.

\*\* NOTE TO SPECIFIER \*\* Delete size option not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 0.5 inch (13 mm).

R-Value Based on Testing per ASTM C158 and ASTM C177: 2.5.

Surface Water Absorption Tested per ASTM C 209: Less than 3 percent, maximum.

Compressive Strength Tested per ASTM 1621: 120 psi (827 kPa).

Density Tested per ASTM 1622: 5 pcf (80 kg/m3).

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed.

* + - * 1. Cover Board Type: Gypsum-Based:

Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and the following:

\*\* NOTE TO SPECIFIER \*\* Delete size and thickness options not required.

Size: Mechanically Fastened. 48 x 96 inches (1.22 x 2.44 m).

Size: Adhered. 48 x 48 inches (1.22 x 1.22 m).

Thickness: 1/4 inches (6 mm).

Thickness: 1/2 inches (13 mm).

Thickness: 5/8 inches (16 mm).

Surface Water Absorption, Maximum: 2.5 grams. Tested in accordance with ASTM C473.

Surface Burning Characteristics, tested per ASTM E84:

Flame Spread: 0. Smoke Developed: 0.

Combustibility, tested per ASTM E136: Non-combustible.

Factory Mutual Approved: For use with FM 1-60 and 1-90 rated roofing assemblies.

Mold Growth Resistance Tested per ASTM D3273: Passed. For a minimum of 4 weeks.

* + - 1. Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty. Use fasteners furnished by roof membrane Manufacturer.
      2. Low Rise Foam Adhesive:
         1. Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates.

Product: I.S.O. Stick.

Product: I.S.O. Twin Pack.

Product: I.S.O. Spray R by Elevate.

Product: Twin Jet.

Product: Twin Jet Y.

\*\* NOTE TO SPECIFIER \*\* Delete vapor barrier not required. The use of a vapor barrier within the roofing system is strictly the decision of the design professional.

* + 1. Vapor Barrier Membrane: SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface. Release liner protecting adhesive. May be used as a temporary roof membrane for up to ninety (90) days.
       1. Product: V-Force Vapor Barrier Membrane by Elevate.
       2. Thickness tested per ASTM D5147: 0.0325 inches (0.826 mm) minimum.
       3. Max Load at Break at 73 degrees F (23 degrees C) Tested per ASTM D 5147:
          1. Machine Direction: 64 lbf per inch(11 kN/m).
          2. Cross Machine Direction: 88 lbf/in (15 kN/m).
       4. Low Temperature Flexibility tested per ASTM D5147: Minus 30 degrees F (Minus 34 degrees C).
       5. Moisture Vapor Permeance Tested per ASTM E96: 0.02 Perms (0.92 Ng per Pa-s-m2) maximum.
       6. Air Permeability Tested per ASTM E2178: 0.00114 cfm per sq ft (0.007 Liter per sec per sq m) maximum.
    2. Metal Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories options not required.

* + - 1. 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. Product: Appropriate Elevate pre-manufactured fascia system.
         2. Two-piece, 450 sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia.
         3. Wind Performance:

Membrane Pull-Off Resistance: 100 lbs per ft (1460 N per m) minimum. Tested per ANSI/SPRI ES-1 Test Method RE-1, current edition.

Fascia Pull-Off Resistance: At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-2, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least an FM 1-270 rating.

* + - * 1. Fascia Face Height: 5 inches (127 mm).
        2. Edge Member Height Above Nailer: 1-1/4 inches (31 mm).
        3. Fascia: With factory-installed protective plastic film.

Material: 24 gage, 0.024 inches (0.06 mm) galvanized steel.

Finish: Kynar 500 finish in Manufacturer's standard color, matching concealed joint splice plates.

* + - * 1. Length: minimum of 120 inches (3048 mm).
        2. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
      1. Weldable Metal: Flexible non-reinforced thermoplastic polyolefin membrane, factory laminated to hot-dipped galvanized stee. Colo: To match roof membrane.
         1. Product: UltraPly TPO Coated Metal by Elevate.
      2. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes, miters welded, injection molded EPDM splices to allow thermal expansion.
      3. Anchor Bar Cleat: 20 gage, 0.036 inches (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
      4. Curved Applications: Factory modified.
      5. Fasteners: Factory-provided corrosion resistant fasteners, with drivers.
         1. Not Acceptable: No exposed fasteners.
      6. Special Shaped Components: Factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps.
         1. Legs on Corner Pieces: Minimum 14 inches.
      7. Scuppers: Welded watertight.
      8. Accessories: Special fabrications as shown on the drawings, i.e., matching brick wall caps, downspouts, extenders, etc.
      9. Parapet Copings: Formed metal, galvanized steel anchor/support cleats for capping any parapet wall. Coping sections are to be allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats. 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips providing a watertight seal.
         1. Product: Appropriate Elevate pre-manufactured coping system.
         2. Watertight, maintenance free, without exposed fasteners.
         3. Butt type joints with concealed splice plates.
         4. Mechanically fastened as indicated.
         5. Wind Performance:

At least the minimum required when tested per ANSI/SPRI ES-1 Test Method RE-3, current edition.

Product to be listed in the current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

* + - * 1. Material and Finish: 24 gage, 0.024 inch (0.06 mm) thick galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
        2. Dimensions:

Wall Width: As indicated on the drawings.

Piece Length: Minimum 144 inches (3.65 m).

* + - * 1. Curved Application: Factory fabricated in true radius.
        2. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick pre-punched galvanized cleat with 12 inch (305 mm) wide stainless-steel spring mechanically locked to cleat at 72 inch (1.82 m) on center.
        3. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.
        4. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs (109 kg) for actual substrate used; no exposed fasteners.
    1. Wood Nailers:
       1. PS 20-dimension lumber, Structural Grade No. 2 better; Southern Pine or Douglas Fir.
       2. PS 1, APA Exterior Grade plywood; pressure preservative treated.
       3. Width: 3.54 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
       4. Thickness: Same as thickness of roof insulation.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until the substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
         1. 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.
         2. Verify that surfaces and site conditions are ready to receive work.
         3. Correct defects in the substrate before commencing with roofing work.
         4. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
      3. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
      4. Examine the roof substrate to verify that it is properly sloped to drains.
      5. 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 acceptance of project conditions and requirements.
   2. PREPARATION
      1. Prior to proceeding, prepare the 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.
         1. Install roofing membrane when surfaces are clean, dry, smooth, and free of snow or ice.
         2. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application.
         3. Consult Manufacturer for recommended procedures during cold weather.
         4. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
      2. Fill all surface voids in the immediate substrate that are greater than 1/4" (6 mm) wide with fill material acceptable to membrane Manufacturer.
      3. Seal, grout, or tape deck joints, where needed, to prevent seepage into building.
      4. Do not start work until Pre-Installation Notice has been approved by Manufacturer as confirmation that this project qualifies for a Manufacturer's warranty.
      5. Perform work using competent and properly equipped personnel.
   3. INSTALLATION
      1. Install roofing, insulation, flashings, and accessories in accordance with roofing Manufacturer's published instructions, recommendations, approved submittals, and in proper relationship with adjacent construction, for the specified roofing system.
         1. Obtain all relevant instructions and maintain copies at the project site for duration of installation period.
         2. Where Manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

\*\* NOTE TO SPECIFIER \*\* Delete vapor barrier paragraph if not required.

* + 1. Vapor Barrier:
       1. Prime substrates prior to application, except metal decks.
          1. Use primer supplied by membrane Manufacturer.
       2. Not Acceptable Substrates for SBS Bitumen Adhesive:
          1. Expanded Polystyrene, Extruded Polystyrene, Common Polyisocyanurate, Fiberglass, Wood Fiber, Perlite, and existing single-ply roofs.
       3. Application can be made at ambient temperatures as low as 25 degrees F (-4 degrees C) as long as membrane has been stored in a heated area that is between 50 and 100 degrees F (10 and 38 degrees C) at the time of application.
       4. Install with minimum 3 inch (76 mm) side laps and 6 inch (152 mm) end laps.
       5. Roll in with a 75 lb. (34 kg) roller to fully mate each roll to substrate, including all lap areas.
    2. Insulation and Cover Board:
       1. Install insulation in configuration and with attachment methods specified in PART 2, under Insulation.
       2. 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.
       3. Lay roof insulation in courses parallel to roof edges.
       4. 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).

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + - 1. Mechanical Fastening: Using specified fasteners and insulation plates. Engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for specified FM Class and membrane Manufacturer, whichever is more stringent.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required.

* + - 1. Adhesive Attachment: Apply in accordance with membrane Manufacturer's instructions and recommendations; "walk-in" individual roof insulation boards to obtain maximum adhesive contact.
    1. Single-Ply Membrane:
       1. 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.
       2. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
       3. Install membrane without wrinkles and without gaps or fishmouths in seams, and bond and test seams and laps in accordance with membrane Manufacturer's instructions and details.

\*\* NOTE TO SPECIFIER \*\* Delete Roof System Type options not required.

* + - 1. Roof System Type: Fully Adhered Membrane; Bonding Adhesive: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, and procedures.
      2. Roof System Type: Fully Adhered Membrane; Hot Asphalt:
         1. Follow all industry and manufacturer requirements for heating, storage, and handling of asphalt. Do not apply asphalt or membrane if temperature is above or below that recommended.
         2. Bond membrane sheet to substrate using membrane Manufacturer's recommended asphalt, application rate, and procedures.
      3. Roof System Type: Bead- or Spatter-Attached Membrane: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, pattern/spacing, and procedures.
      4. Roof System Type: Mechanically Attached Membrane: Fasten membrane using membrane Manufacturer's recommended fasteners and plates, fastener spacing, and procedures.
      5. Edge Securement of Membrane:
         1. At locations where the membrane terminates.
         2. At locations where membrane goes through an angle change greater than 1:12 inches (8.3 percent) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated.
         3. As recommended by roofing Manufacturer.
         4. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inch (200 mm) square.
         5. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing Manufacturer and compliant with IBC.
    1. Flashing and Accessories:
       1. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane Manufacturer's recommendations and details.
       2. 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. Use weldable TPO-coated metal where membrane-to-metal connections occur.
          3. Remove protective plastic surface film immediately before installation.
          4. Install water block sealant under the membrane anchorage leg.
          5. Flash with Manufacturer's recommended flashing sheet unless otherwise indicated.
          6. Where a single flashing application will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
          7. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
          8. When the roof slope is greater than 1:12 (8.3 percent), apply seam edge treatment along the back edge of the flashing.
       3. Scuppers: Set TPO-coated metal scuppers in sealant and weld to membrane as recommended by Manufacturer.
       4. Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing Manufacturer.
       5. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces:
          1. Use bareback TPO membrane flashings on vertical surfaces. Do not use fleece-backed membrane.
          2. Install weathertight flashing at all walls, curbs, parapets, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inch (200 mm) above membrane surface.
          3. Use the longest practical flashing pieces.
          4. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane Manufacturer's recommendations.
          5. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
          6. Provide termination directly to the vertical substrate as shown on roof drawings.
       6. Roof Drains:
          1. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed Manufacturer's recommendations.
          2. Position membrane, then cut a hole for roof drain to allow 1/2 to 3/4 inch (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.
          3. Make round holes in the membrane to align with clamping bolts; do not cut membrane back to bolt holes.
          4. Apply sealant on top of drain bowl where clamping ring seats below the membrane.
          5. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.
       7. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
       8. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
       9. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches (50 mm) deep, with at least 1 inch (25 mm) clearance from penetration, sloped to shed water.
       10. Structural Steel Tubing: If corner radii are greater than 1/4 inch (6 mm) and the longest side of tube does not exceed 12 inches (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.
       11. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by Manufacturer.
    2. 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.
    3. Walkway Installation:
       1. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
          1. Use specified walkway pads unless otherwise indicated.
          2. Walkway Pads: Adhere to the roofing membrane, spacing each pad at a minimum of 1 inch (25 mm) and maximum of 3 inches (75 mm) from each other to allow for drainage.
          3. If the installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inch (150 mm) on either side.
          4. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.
  1. FIELD QUALITY CONTROL
     1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
       1. 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 (e.g., not a sales representative).
       2. Perform corrections necessary for issuance of warranty.
  1. PROTECTION
     1. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work.
     2. Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.
     3. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
     4. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
  2. CLEANING
     1. Clean contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
     2. 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.
     3. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.
     4. Where construction traffic must continue over finished roof membrane, provide durable protection, and replace or repair damaged roofing to original condition.

END OF SECTION