ULTRAPLY™ (SELF) ADHERED OR MECHANICALLY ATTACHED OR INDUCTION WELDED TPO MEMBRANE ROOFING SYSTEM

*This specification is provided as a courtesy on an as-is basis and is not intended to substitute for specific design services provided by an Architect, Engineer, roof Consultant, or other design professional. It is in the building Owner’s interest to consult with these professionals prior to executing the specified project. The building Owner will ultimately assume the entire risk as to results, quality and performance of the roofing system specified.*

*EDITOR NOTE: Text underlined and/or red in color must be addressed to complete a final specification document. It is the sole responsibility of the editor to exercise appropriate care and sound professional judgment in the execution of this task. Green and/or italicized text represents notes to the Specifier and should be removed prior to publication.*

# GENERAL

The project, Project Name located in City, ST, includes the provision of a complete Elevate UltraPly™ TPO membrane roofing system.

## Summary

### Furnish and install a complete TPO roofing system, including:

#### Roofing Manufacturer's requirements for the specified warranty

#### Preparation of roofing substrates

#### Wood nailers for roofing attachment

#### Vapor barrier *(optional)*

#### Insulation

#### Self-Adhered **or** Adhered **or** Mechanically Attached **or** Induction Welded TPO membrane

#### Metal roof edging and copings

#### Flashings

#### Walkway pads

#### Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system

## Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.

## Comply with the published recommendations and instructions of the roofing membrane Manufacturer, at <http://www.holcimelevate.com>.

## Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane Manufacturer. *Any modification of the Contract Sum will be made in accordance with the stipulations of the Contract Documents stated elsewhere.*

## Related Sections (as present or needed)

### Section 06 10 00 – Rough Carpentry

### Section 07 55 63 & 64 – Vegetated Protected Membrane Roofing & Green Roof Components

### Section 07 62 00 – Sheet Metal Flashing and Trim

### Section 07 71 00 – Roof Specialties

### Section 07 72 00 – Roof Accessories

### Section 08 60 00 – Roof Windows and Skylights

### Section 22 14 26.13 – Roof Drains

## Definitions

### Definitions in the current editions of ASTM D1079 and NRCA's “The NRCA Roofing Manual: Membrane Roof Systems” apply to work of this Section.

## Submittals

### Product Data

#### Provide membrane Manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane Manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.

#### 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.

### Installation Instructions

#### Provide Manufacturer's instructions to Installer, marked up to show exactly how all components will be installed.

#### Where instructions allow installation options, clearly indicate which option will be used.

### Shop Drawings

#### Provide roof plan indicating orientation of steel deck *(if applicable)*, and fastener and/or adhesive layouts.

#### Provide the 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.

### Provide copy of Pre-Installation Notice to show that Manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the Manufacturer.

### Submit samples of each product to be used. *(optional)*

### Specimen Warranty

### Closeout Submittals

#### Executed Warranty

#### Maintenance data

## Quality Assurance

### Applicator Qualifications

#### Current Elevate Master Contractor status

#### At least five years’ experience in installing specified system

#### Capability to provide payment and performance bond to building Owner

### Pre-Installation Conference

#### Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.

#### Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.

#### Review methods and procedures related to roofing installation, including Manufacturer's written instructions.

#### Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

#### Examine deck substrate conditions and finishes, including flatness and fastening.

#### Review structural loading limitations of roof deck during and after roofing.

#### Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.

#### Review governing regulations and requirements for insurance and certificates if applicable.

#### Review temporary protection requirements for roofing system during and after installation.

#### Review roof observation and repair procedures after roofing installation.

#### Notify Architect well in advance of meeting.

## Delivery, Storage and Handling

### Deliver products in Manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

### Discard and legally dispose of material that cannot be applied within its stated shelf life.

### Store materials clear of ground and moisture with weather protective covering.

### Keep combustible materials away from ignition sources.

### Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck and/or structural overloading.

## Field Conditions

### Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with Manufacturer's written instructions and warranty requirements.

## Warranty

### Provide Elevate 15-year **or** 20-year **or** 25-year Red Shield™ Roofing System Limited Warranty covering membrane, roof insulation, and system accessories. Comply with all warranty procedures required by Manufacturer, including notifications, scheduling, and inspections. *Systems specified with a warranty duration of 20 years or greater or a wind speed coverage above 55 mph require additional attachment and detail considerations. Consult the Manufacturer’s design guidelines for further information. See Platinum TPO specification for 30-year systems.*

### Limit of Liability: No dollar limitation (NDL)

### Scope of Coverage: Repair leaks in the roofing system caused by

#### Ordinary wear and tear

#### Normal exposure to the elements

#### Manufacturing defect in Elevate materials

#### Defective workmanship used to install these materials

#### Damage due to winds up to 55 **or** 72 **or** 80 **or** 90 **or** 100 mph

#### Not Covered:

##### Damage due to winds in excess of 55 **or** 72 **or** 80 **or** 90 **or** 100 mph

##### Damage due to hurricanes or tornadoes

##### Hail

##### Intentional damage

##### Unintentional damage due to normal rooftop inspections, maintenance, or service

# PRODUCTS

## Manufacturers

### Acceptable Manufacturer – Roofing System: Elevate roofing, lining, and wall systems, Nashville, TN, <http://www.holcimelevate.com>

#### Roofing systems manufactured by others may be acceptable provided the roofing system is completely equivalent in materials and warranty conditions and the Manufacturer meets the following qualifications:

##### Specializing in manufacturing the roofing system to be provided

##### Minimum ten years of experience manufacturing the roofing system to be provided

##### Able to provide a no dollar limit, single source roof system warranty backed by corporate assets in excess of one billion dollars

##### ISO 9001 certified

##### Able to provide polyisocyanurate insulation produced in own facilities

### Manufacturer of Insulation and Cover Board: Same Manufacturer as roof membrane

### Manufacturer of Metal Roof Edging: Same Manufacturer as roof membrane

#### Metal roof edging products by other Manufacturers are not acceptable.

#### Field- or shop-fabricated metal roof edgings are not acceptable **or** only acceptable if using Elevate metal.

### Substitution Procedures: See Instructions to Bidders

#### Submit evidence that the proposed substitution complies with the specified requirements.

## Roofing System Description

### Roofing System

#### Membrane: Thermoplastic polyolefin (TPO)

##### Thickness: As specified elsewhere

##### Membrane Attachment: Self-Adhered **or** Adhered **or** Mechanically Attached **or** Induction Welded

#### Slope: ¼:12 (2%) by means of tapered insulation *(optional if adequate structural slope is present)*

#### Comply with applicable local building code requirements.

#### Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification

#### Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29, and meeting minimum requirements of FM 1-60 **or** 75 **or** 90 wind uplift rating. *(optional)*

### Vapor Barrier over deck/deck cover: *(optional: the use of a vapor barrier within the roofing system is strictly the decision of the design professional)*

#### Membrane: High density polyethylene sheet with SBS modified bitumen adhesive

#### Attachment: Self-adhering

### Choose one insulation assembly, a) **or** b):

#### Insulation *(non-composite)*:

##### Total System R-Value: 25 or greater

###### Maximum Board Thickness: 3″ (76.2 mm)

###### Use as many layers as necessary to achieve required R-value

###### Stagger joints in adjacent layers

##### Base Layer: Polyisocyanurate foam board, non-composite

###### Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

##### Fill Layers: Polyisocyanurate foam board, non-composite *(optional)*

###### Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

##### Top Layer: Polyisocyanurate foam board, non-composite

###### Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

##### Choose one of the following cover boards, a) **or** b):

###### High Density Polyisocyanurate Cover Board

Thickness: ½″ (12.7 mm)

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

Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

###### Gypsum-Based Cover Board

Thickness: 0.25″ (6.4 mm) **or** 0.5″ (12.7 mm) **or** 0.625″ (15.9 mm)

Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

#### Insulation *(composite)*:

##### Total System R-Value: 25 or greater

##### Maximum Board Thickness: 4″ (101 mm)

###### Use as many layers as necessary to achieve required R-value

###### Stagger joints in adjacent layers

##### Base Layer *(optional)*: Polyisocyanurate foam board, non-composite

###### Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

##### Top Layer: Polyisocyanurate foam board, composite

###### Attachment: Mechanical fastening **or** Low-rise polyurethane adhesive

## TPO Membrane Materials

### Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D 6878, with polyester weft inserted reinforcement and the following additional characteristics:

#### Thickness: 0.045ʺ (1.14 mm) **or** 0.060″ (1.52 mm) or 0.080″ (2.03 mm)

#### Color: White **or** Tan **or** Grey

#### Reinforcement: Polyester, weft-inserted scrim

#### Sheet Width: *(if self-adhered, adhered, or induction welded)* Use widest sheet practical for jobsite conditions to minimize field seams **or** *(if mechanically fastened)* Use sheet width required to meet wind uplift and/or fastener spacing requirements

#### Acceptable Product: UltraPly™ TPO Membrane **or** UltraPly™ TPO SA *(self-adhered)* by Elevate

### Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane Manufacturer.

### Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18″ (457 mm) wide; UltraPly™ TPO 18″ Curb Flashing.

### Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane; UltraPly™ TPO Unsupported Flashing by Elevate

### Factory-formed Weldable Flashing Accessories: UltraPly™ TPO Flashing (various) by Elevate

### Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane factory laminated to white seam tape; UltraPly™ TPO QuickSeam™ Flashing by Elevate

### Factory-formed Self-Adhering Flashing Accessories: UltraPly™ TPO QuickSeam™ Flashing (various) by Elevate

### Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials; UltraPly™ Bonding Adhesive **or** Water-Based Bonding Adhesive – P *(15-yr max warranty)* **or** Single Ply LVOC Bonding Adhesive **or** Jet Bond Spray Adhesive by Elevate

### Seam Edge Treatment: Clear polymer-based sealant, formulated for sealing exposed edges of membrane; UltraPly™ TPO Cut Edge Sealant **or** UltraPly™ TPO Cut Edge Sealant LVOC by Elevate

### Pourable Sealer: One part polyurethane; White One-Part Pourable Sealer by Elevate.

### Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal S-20 by Elevate

### Metal Plates and Strips used for Fastening Membrane and Insulation: Steel with Galvalume coating; corrosion-resistance meeting FM 4470 criteria

### Coated Metal Plates for Induction Welding *(if applicable)*: UltraPly™ TPO InvisiWeld™ Plate **or** UltraPly™ TPO InvisiWeld™-S Plate by Elevate

### Termination Bars: Aluminum bars with integral caulk ledge; 1.3″ (33 mm) wide by 0.10″ (2.5 mm) thick; Termination Bar by Elevate

### Roof Walkway Pads: TPO pad designed to provide protection from essential rooftop services and traffic and maintain the integrity of the existing roof surface; UltraPly™ TPO Walkway Pad **or** X-Tred™ Walkway Pad (White **or** Grey **or** Yellow) by Elevate

### Yellow Safety Strip: A 5.5″ (140 mm) by 100′ long (30 m) strip and nominal 30 mil (0.76 mm) thick yellow TPO membrane laminated to a white, cured, seam tape, compatible with TPO and EPDM; QuickSeam™ Yellow Safety Strip by Elevate

## Roof Insulation and Cover Boards

### Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with glass reinforced mat laminated to facers, complying with ASTM C 1289 Type II Class 1 **or** 2 *(match with options below)*, with the following additional characteristics:

#### Thickness: As indicated elsewhere

#### Size: 48″ (1.22 m) by 96″ (2.44 m), nominal (if mechanically fastened) or 48″ (1.22 m) by 48″ (1.22 m), nominal (if adhered)

#### R-Value (LTTR) per inch (25 mm): min. 6.2R at 40 °F (4.4 °C) and min. 5.7R at 75 °F (23.9 °C)

#### Compressive Strength: 20 psi (138 kPa)

#### Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents

#### Acceptable Product: *(class 1)* ISOGARD GL polyiso board insulation **or** *(class 2 - mold resistant facer)* ISOGARD CG polyiso board insulation by Elevate

### Composite Insulation *(optional)*: closed cell polyiso foam core laminated to ½ʺ (13 mm) high density ISOGARD HD board:

#### Thickness: As indicated elsewhere

#### Size: 48″ (1.22 m) by 96″ (2.44 m), nominal (if mechanically fastened) or 48″ (1.22 m) by 48″ (1.22 m), nominal (if adhered)

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

#### Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents

### Acceptable Product: ISOGARD™ HD Composite by Elevate

### Choose one of the following a) **or** b): *(omit if specifying composite insulation)*

#### High Density Polyisocyanurate Cover Board: Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D 1623, and with the following additional characteristics:

##### Size: 48″ (1.22 m) by 96″ (2.44 m), nominal (if mechanically fastened) or 48″ (1.22 m) by 48″ (1.22 m), nominal (if adhered)

##### Thickness: 0.5″ (12.7 mm)

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

##### Surface Water Absorption: <3%, maximum, when tested in accordance with ASTM C 209

##### Compressive Strength: 120 psi (827 kPa), when tested in accordance with ASTM 1621

##### Density: 5 pcf (80 kg/m3), when tested in accordance with ASTM 1622

##### Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies

##### Mold Growth Resistance: Passed, when tested in accordance with ASTM D 3273

##### Acceptable Product: ISOGARD HD Cover Board by Elevate

#### Gypsum-Based Cover Board: Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C 1177/C 1177M, and with the following additional characteristics:

##### Size: 48″ (1.22 m) by 96″ (2.44 m), nominal (if mechanically fastened) or 48″ (1.22 m) by 48″ (1.22 m), nominal (if adhered)

##### Thickness: 0.25″ (6.4 mm) **or** 0.5″ (12.7 mm) **or** 0.625″ (15.9 mm)

##### Surface Water Absorption: 2.5 g max., when tested in accordance with ASTM C 473

##### Surface Burning Characteristics: Flame spread of 0, smoke developed of 0, when tested in accordance with ASTM E 84

##### Combustibility: Non-combustible, when tested in accordance with ASTM E 136

##### Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies

##### Mold Growth Resistance: Zero growth, when tested in accordance with ASTM D 3273 for minimum of 4 weeks

### Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane Manufacturer.

### Low Rise Foam Adhesive: Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates; Twin Jet **or** I.S.O.Stick™ **or** I.S.O. Twin Pack™ **or** I.S.O.Spray™ R by Elevate

## Vapor Barrier *(optional: the use of a vapor barrier within the roofing system is strictly the decision of the design professional)*

### Vapor Barrier Membrane: Comprised of 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.

#### Thickness: 0.0325" (0.826 mm) minimum, when tested in accordance with ASTM D 5147

#### Max Load at Break at 73 °F (23 °C): 64 lbf/in, MD (11 kN/m) 88 lbf/in, XMD (15 kN/m) when tested in accordance with ASTM D 5147

#### Low Temperature Flexibility: -30 °F (-34 °C) when tested in accordance with ASTM D 5147

#### Moisture Vapor Permeance, 0.02 Perms (0.92 Ng/Pa•s•m2) maximum, when tested in accordance with ASTM E 96

#### Air Permeability: 0.00114 ft3/min•ft2 (0.007 L/sec•m2) maximum, when tested in accordance with ASTM E 2178

#### Acceptable Product: V-Force Vapor Barrier Membrane by Elevate.

## Metal Accessories *(include following elements as applicable to your project, eliminate others)*

### 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

#### Wind Performance:

##### Membrane Pull-Off Resistance: 100 lbs./ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition

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

##### Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-270 rating

#### Description: Two-piece, 45° sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia

##### Fascia Face Height: 5″ (127 mm)

##### Edge Member Height Above Nailer: 1 ¼″ (31 mm)

##### Fascia Material and Finish: 24-gage, 0.024″ (0.06 mm) galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film

##### Length: minimum of 120″ (3.048 m)

##### Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia

##### Acceptable Product: Appropriate Elevate pre-manufactured fascia system

### Weldable Metal: Flexible non-reinforced thermoplastic polyolefin membrane factory laminated to hot-dipped galvanized steel, color to match roof membrane; UltraPly™ TPO Coated Metal

### Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion

### Anchor Bar Cleat: 20-gage, 0.036″ (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes

### Curved Applications: Factory modified

### Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted

### Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14″ (355 mm) long legs on corner pieces

### Scuppers: Welded watertight

### Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings

### Parapet Copings: Formed metal coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated

#### Wind Performance:

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

##### Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

#### Description: Coping sections 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″ (200 mm) wide splice plates with factory applied dual non-Curing sealant strips capable of providing watertight seal.

#### Material and Finish: 24-gage, 0.024″ (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.

#### Dimensions:

##### Wall Width: As indicated on the drawings.

##### Piece Length: Minimum 144″ (3.65 m).

#### Curved Application: Factory fabricated in true radius.

#### Anchor/Support Cleats: 20-gage, 0.036″ (0.9 mm) thick pre-punched galvanized cleat with 12″ (305 mm) wide stainless-steel spring mechanically locked to cleat at 72″ (1.82 m) on center.

#### Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14″ (355 mm) long legs on corner, intersection, and end pieces.

#### Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs. (109 kg) for actual substrate used; no exposed fasteners.

#### Acceptable Product: Appropriate Elevate pre-manufactured coping system

## Accessory Materials

### Wood Nailers: PS 20-dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.

#### Width: 3 ½″ inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it

#### Thickness: Same as thickness of roof insulation

# INSTALLATION

## General

### Install roofing, insulation, flashings, and accessories in accordance with roofing Manufacturer's published instructions and recommendations for the specified roofing system. Where Manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

### Obtain all relevant instructions and maintain copies at project site for duration of installation period.

### Do not start work until Pre-Installation Notice has been approved by Manufacturer as confirmation that this project qualifies for a Manufacturer's warranty.

### Perform work using competent and properly equipped personnel.

### 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.

### Install roofing membrane only when surfaces are clean, dry, smooth, and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult Manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 °F (15 to 25 °C).

### Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.

### Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.

### Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.

### Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

### Until ready for use, keep materials in their original containers as labeled by the Manufacturer.

### 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.

## Examination

### 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.

### Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.

### Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

### Examine roof substrate to verify that it is properly sloped to drains.

### 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.

## Preparation

### Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease, and other materials that may damage the membrane.

### Fill all surface voids in the immediate substrate that are greater than 1/4″ (6 mm) wide with fill material acceptable to membrane Manufacturer.

### Seal, grout, or tape deck joints, where needed, to prevent seepage into building.

## Vapor Barrier Installation *(optional, retain only if included in PART 2)*

### All substrates (except metal decks) must be primed prior to application. Use only primer supplied by membrane Manufacturer.

### Expanded Polystyrene, Extruded Polystyrene, Common Polyisocyanurate, Fiberglass, Wood Fiber, Perlite, and existing single-ply roofs are not acceptable substrates for SBS bitumen adhesive.

### Application can be made at ambient temperatures as low as 25 °F (-4 °C) as long as membrane has been stored in a heated area so that it will be between 50 °F (10 °C) and 100 °F (38 °C) at the time of application.

### Install with minimum 3" (76.2 mm) side laps and 6" (152.4 mm) end laps.

### Roll in with a 75 lb. (34 kg) roller to fully mate each roll to substrate, including all lap areas.

## Insulation and Cover Board Installation

### Install insulation in configuration and with attachment method(s) specified in PART 2, under Insulation.

### 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.

### Lay roof insulation in courses parallel to roof edges.

### Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than ¼″ (6 mm). Fill gaps greater than ¼″ (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than ¼″ (6 mm).

### 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 *(if applicable)*.

### Adhesive Attachment: Apply in accordance with membrane Manufacturer's instructions and recommendations; "walk-in" individual roof insulation boards to obtain maximum adhesive contact *(if applicable)*.

## Single-Ply Membrane Installation

### 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.

### Lay out the membrane pieces so that field and flashing splices are installed to shed water.

### 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.

### Choose one of the following: a) **or** b) **or** c) **or** d)

#### Self-Adhered Membrane: Place membrane over substrate and broom over using membrane Manufacturer's recommended procedures.

#### Adhered Membrane: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, and procedures.

#### Mechanically Attached Membrane: Fasten membrane using membrane Manufacturer's recommended fasteners and plates, fastener spacing, and procedures.

#### Induction Welded Membrane: Fasten membrane using membrane Manufacturer's recommended induction plates, fasteners, fastener spacing, and procedures.

### Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 1:12 inches (8.3%) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing Manufacturer. Exceptions: Round pipe penetrations less than 18″ (460 mm) in diameter and square penetrations less than 4″ (200 mm) square.

#### Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing Manufacturer and compliant with IBC.

## FLASHING AND ACCESSORIES INSTALLATION

### Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane Manufacturer's recommendations and details.

### 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.

#### Follow roofing Manufacturer's instructions.

#### Use weldable TPO-coated metal where membrane-to-metal connections occur.

#### Remove protective plastic surface film immediately before installation.

#### Install water block sealant under the membrane anchorage leg.

#### Flash with Manufacturer's recommended flashing sheet unless otherwise indicated.

#### Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.

#### 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.

#### When the roof slope is greater than 1:12 (8.3%), apply seam edge treatment along the back edge of the flashing.

### Scuppers: Set TPO-coated metal scuppers in sealant and weld to membrane as recommended by Manufacturer.

### Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing Manufacturer.

### Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces:

#### 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″ (200 mm) above membrane surface.

#### Use the longest practical flashing pieces.

#### Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane Manufacturer's recommendations.

#### Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.

#### Provide termination directly to the vertical substrate as shown on roof drawings.

### Roof Drains:

#### 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.

#### Position membrane, then cut a hole for roof drain to allow ½″ to ¾″ (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.

#### Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.

#### Apply sealant on top of drain bowl where clamping ring seats below the membrane

#### Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.

### Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.

### Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.

### Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2″ (50 mm) deep, with at least 1″ (25 mm) clearance from penetration, sloped to shed water.

### Structural Steel Tubing: If corner radii are greater than ¼″ (6 mm) and longest side of tube does not exceed 12″ (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.

### Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by Manufacturer.

## Walkway Installation

### Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.

#### Use specified walkway pads unless otherwise indicated.

#### Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1″ (25 mm) and maximum of 3″ (75 mm) from each other to allow for drainage.

#### If installation of walkway pads over field fabricated splices or within 6″ (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″ (150 mm) on either side.

#### Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

## Field Quality Control

### 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).

### Perform all corrections necessary for issuance of warranty.

## Cleaning

### Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

### 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.

### Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

## Protection

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

END OF SECTION