

SECTION 07 53 23

FULLFORCE™ EPDM SELF ADHERING MEMBRANE WITH SECURE BOND™ TECHNOLOGY ROOFING SYSTEM ELEVATE™ ROOFING, WALL, AND LINING SYSTEMS

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.

PART 1 GENERAL

The project, Project Name located in City, ST, includes the provision of a complete Elevate roofing, wall, and lining systems FullForce EPDM with Secure Bond technology Roofing System.

1.01 SUMMARY

- A. Furnish and install elastomeric sheet roofing system, including:
 - 1. Roofing manufacturer's requirements for the specified warranty.
 - 2. Preparation of roofing substrates.
 - 3. Wood nailers for roofing attachment.
 - 4. Insulation.
 - 5. Cover boards.
 - 6. Self-Adhering elastomeric membrane roofing.
 - 7. Metal roof edging and copings.
 - 8. Flashings.
 - 9. Walkway pads.
 - 10. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at www.holcimelevate.com
- D. 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. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 RELATED SECTIONS [as present or needed]

- A. Section 06 10 00 – Rough Carpentry: Wood nailers associated with roofing and roof insulation.
- B. Section 07 62 00 – Sheet Metal Flashing and Trim: Formed metal flashing and trim items associated with roofing.
- C. Section 07 72 00 – Roof Accessories: Roof hatches, vents, and manufactured curbs.
- D. Section 08 62 00 – Unit Skylights.
- E. Section 22 10 00 – Plumbing Piping and Roof Drains.

1.03 REFERENCES

Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.

1. ASTM C 1177/C 1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2006.
2. ASTM C 1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2013.
3. ASTM D 3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
4. ASTM D 4637 – Standard Specification for EPDM Sheet used in Single-Ply Roof Membrane; 2004.
5. ASTM D 4811 – Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing; 2004.
6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
7. ASTM E 136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
8. FM 1-28 – Design Wind Loads; Factory Mutual System; 2007.
9. FM 1-29 – Roof Deck Securement and Above Deck Roof Components; Factory Mutual System; 2006.
10. FM 4470 – Approval Standard - Class I Roof Covers; current version.
11. PS 1 – Construction and Industrial Plywood; 2009.
12. PS 20 – American Softwood Lumber Standard; 2010.
13. SPRI ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; 2007. (ANSI/SPRI ES-1).

1.04 SUBMITTALS

- A. Product Data:
 1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.
 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: 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.
- B. Shop Drawings:

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.
- C. Pre-Installation Notice: Copy to show that manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the manufacturer.
- D. Executed Warranty.
- E. Specimen Warranty: Submit prior to starting work.
- F. Samples: Submit samples of each product to be used.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: Roofing installer shall have the following:
 - 1. Current Elevate Master Contractor status.
 - 2. At least five years' experience in installing specified system.
 - 3. Capability to provide payment and performance bond to building owner.
- B. 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.
 - 1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 - 2. Notify Architect well in advance of meeting.

1.06 DELIVERY, STORAGE AND HANDLING

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

1.07 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.
- B. Warranty: Elevate 20-year Red Shield™ Limited Warranty covering membrane, roof insulation, and membrane accessories.

Warranty	Membrane Thickness,
<u>Duration</u>	<u>required minimums</u>
20 year	.060 FullForce EPDM with Secure Bond Technology

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 found at www.holcimelevate.com.

- 1. Limit of Liability: No dollar limitation.
- 2. Scope of Coverage: Repair leaks in the roofing system caused by:
 - a. Ordinary wear and tear of the elements.
 - b. Manufacturing defect in Elevate roofing, wall, and lining systems materials.
 - c. Defective workmanship used to install these materials.
 - d. Damage due to winds up to 55 or 72, 80, 90 mph.
- 3. Not Covered
 - a. Materials made entities other than Elevate roofing, wall, and lining systems
 - b. Damage due to winds in excess of 55 or 72, 80, 90 mph.
 - c. Damage due to hurricanes or tornadoes.
 - d. Hail.
 - e. Intentional damage.
 - f. Unintentional damage due to normal rooftop inspections, maintenance, or service.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer - Roofing System: Elevate roofing, wall, and lining systems. www.holcimelevate.com.
- B. 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:
 - 1. Specializing in manufacturing the roofing system to be provided.
 - 2. Minimum ten years of experience manufacturing the roofing system to be provided.
 - 3. Able to provide a no dollar limit, single source roof system warranty that is backed by corporate assets in excess of one billion dollars.
 - 4. ISO 9001 certified.
 - 5. Able to provide polyisocyanurate insulation that is produced in own facilities.
- C. Manufacturer of Insulation and Cover Board: Same manufacturer as roof membrane.
- D. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.
 - 1. Metal roof edging products by other manufacturers are not acceptable.
 - 2. Field- or shop-fabricated metal roof edgings are not acceptable.

2.02 ROOFING SYSTEM DESCRIPTION

- A. Roofing System
 - 1. Membrane: Ethylene propylene diene monomer (EPDM).
 - 2. Thickness: As specified elsewhere.
 - 3. Membrane Attachment: Adhered.
 - 4. Slope: If deck is sloped, but not enough to provide positive drainage to meet local building codes, provide additional slope to achieve ¼"/ft (1:48) by means of tapered insulation.
 - 5. Comply with applicable local building code requirements.
 - 6. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A, B, C, Fire Hazard Classification.
 - 7. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28 and 1-29, and meeting minimum requirements of FM 1- [60, 90, 120, 150] wind uplift rating.
- B. Deck Board: Gypsum-Based Deck Board:
 - 1. Thickness: 0.25" (6.4 mm).
 - 2. R-Value: negligible.
 - Attachment: Mechanical fastening, Contact adhesive or Low-rise polyurethane adhesive.
- C. Vapor Barrier over deck/deck cover: (Optional, not required. The use of a vapor barrier within the roofing system is strictly the decision of the design professional.)
 - 1. Membrane: High density polyethylene sheet with SBS modified bitumen adhesive.
 - 2. Attachment: Self-adhering
- D. Insulation
 - 1. Total System R Value: 25 or greater
 - 2. Maximum Board Thickness: 3" (50 mm); use as many layers as necessary; stagger joints in adjacent layers.

System R Value*	Total Iso Insulation Thickness, nominal	
	20 R	3.5"
	25 R	4.5"
	30 R	5.25"
	35 R	6.25"

Use of **Elevate ISOGARD™ HD cover board** can provide an additional 2.5 R vs. gypsum-based cover boards. [Example: 1.66" (42.2 mm) ISO (9.45 R) + 1.66" (42.2 mm) ISO (9.45 R) + .5" (13 mm) HD Iso cover board (2.5 R) = 21.4 R]

3. Base Layer: Polyisocyanurate foam board, non-composite.
 - Attachment: Mechanical fastening, or Low-rise polyurethane adhesive.
4. Top Layer: Polyisocyanurate foam board, non-composite.
 - Attachment: Mechanical fastening, or Low-rise polyurethane adhesive.

Choose one / eliminate one:

E. Cover Board: High Density Polyisocyanurate Cover Board

1. Thickness: 0.5" (13 mm)
2. R-Value: 2.5 based on ASTM tests C158 and C177
 - Attachment: Mechanical fastening, or Low-rise polyurethane adhesive.

OR

F. Cover Board: Gypsum-Based Cover Board

1. Thickness: **0.25" (6.4 mm).**
2. R-Value: negligible.
 - Attachment: Mechanical fastening, Contact adhesive or Low-rise polyurethane adhesive.

2.03 EPDM MEMBRANE MATERIALS

- A. Roofing and Flashing Membrane: Black cured synthetic single-ply membrane composed of ethylene propylene diene terpolymer (EPDM) with the following properties:
 1. Thickness: 0.060" (1.5 mm)
 2. Reinforcement: Non-reinforced
 3. Nominal Thickness Tolerance: Plus/minus 10 percent.
 4. Sheet Width: Provide the widest available sheets to minimize field seaming.
 5. Adhesive: Self-Adhered
 - Factory applied across full sheet, from edge to edge
 6. Acceptable Product: FullForce EPDM Membrane with Secure Bond Technology by Elevate.
- B. Flashing Membrane: Self-curing, non-reinforced membrane composed of nonvulcanized EPDM rubber, complying with ASTM D 4811 Type II, and with the following properties:
 1. Thickness: 0.055" (1.4 mm)
 2. Color: Same as field membrane
 3. Acceptable Product: RubberGard EPDM FormFlash by Elevate
- C. Self-Adhesive Flashing Membrane: Semi-cured 45 mil EPDM membrane laminated to 35 mil (0.9 mm) EPDM tape adhesive; QuickSeam Flashing by Elevate.
- D. Pre-Molded Pipe Flashings: EPDM, molded for quick adaptation to different sized pipes; Elevate EPDM Pipe Flashing.
- E. Adhesive Primer: Synthetic rubber-based primer formulated for compatibility with EPDM membrane and tape adhesive, with VOC content less than 2.1 lb/gal (250 g/L); QuickPrime Plus or QuickPrime Plus LVOC by Elevate.
- F. Seam Edge Treatment: EPDM rubber-based sealant, formulated for sealing exposed edges of membrane at seams; FullForce Sealant by Elevate.
- G. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Elevate.
- H. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal by Elevate.
- I. Metal Plates and Strips Used for Fastening Membrane and Insulation: Steel with Galvalume coating; corrosion-resistance meeting FM 4470 criteria.
 - Termination Bars: Aluminum bars with integral caulk ledge; 1.3" (33 mm) wide by 0.10" (2.5 mm) thick; Termination Bar by Elevate.
- J. Roof Walkway Pads: EPDM, 0.30" (7.6 mm) thick by 30" x 30" (760 mm x 760 mm) with EPDM tape adhesive strips laminated to the bottom; QuickSeam Walkway Pads by Elevate.
- K. Yellow Safety Strip: To designate areas of caution on the roof or around rooftop objects. 5.5" (140 mm) wide x 100' (30 m) long 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.

2.04 ROOF INSULATION AND COVER BOARDS

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:
1. Thickness: As indicated elsewhere.
 2. Size: 48" (1.22 m) by 96" (2.44 m), nominal.
 3. Exception: Insulation to be attached using adhesive or asphalt may be no larger than 48" (1.22 m) by 48" (1.22 m), nominal.
 4. R-Value (LTTR): 1" (25 mm) Thickness: 5.7 R, minimum.
 5. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C 1289.
 6. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 7. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 8. Acceptable Product: ISO 95+™ GL / ISOGARD GL polyiso board insulation by Elevate **or**
 9. Acceptable Product: RESISTA™ / ISOGARD CG polyiso board insulation by Elevate **(optional, mold resistant material per ASTM D3273)**
- Choose one / eliminate one. Match with ROOFING SYSTEM DESCRIPTION choice above.
- B. 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:
1. Size: 48" (1.22 m) by 96" (2.44 m), nominal.
 - Exception: Board to be attached using adhesive may be no larger than 48" (1.22 m) by 48" (1.22 m), nominal.
 2. Thickness: 0.5" (13 mm).
 3. R-Value: 2.5 R based on ASTM tests C158 and C177.
 4. Surface Water Absorption: <3%, maximum, when tested in accordance with ASTM C 209.
 5. Compressive Strength: 120psi, when tested in accordance with ASTM 1621.
 6. Density: 5pcf, when tested in accordance with ASTM 1622.
 7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
 8. Mold Growth Resistance: Passed, when tested in accordance with ASTM D 3273.
 9. Acceptable Product: ISOGARD HD Cover Board by Elevate.
- B. Gypsum-Based Cover Board: Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C 1177/C 1177M, or C 1278 and with the following additional characteristics:
1. Size: 48" (1.22 m) by 96" (2.44 m), nominal.
 - Exception: Board to be attached using adhesive or asphalt may be no larger than 48" (1.22 m) by 48" (1.22 m), nominal.
 2. Thickness: **0.25" (6.4 mm).**
 3. Surface Water Absorption: 2.5 g, maximum, when tested in accordance with ASTM C 473.
 4. Spanning Capability: As recommended by manufacturer for maximum flute spans.
 5. Surface Burning Characteristics: Flame spread of 0, smoke developed of 0, when tested in accordance with ASTM E 84.
 6. Combustibility: Non-combustible, when tested in accordance with ASTM E 136.
 7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
 8. Mold Growth Resistance: Zero growth, when tested in accordance with ASTM D 3273 for minimum of 4 weeks.
- Retain following elements as applicable to your project, eliminate others:
- C. 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.
- D. Insulation Adhesive: Type as required by roof membrane manufacturer for roofing system and warranty to be provided; use only adhesive furnished by roof membrane manufacturer.

2.05 VAPOR BARRIER (Optional, its retention here is strictly the decision of the design professional.)

- A. 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.
1. Intended for use as a direct to deck air/vapor barrier in roofing systems and may be used as a

- temporary roof membrane for up to ninety (90) days.
 - 2. Thickness: 0.0325" (0.83 mm) minimum, when tested in accordance with ASTM D 5147.
 - 3. 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.
 - 4. Low Temperature Flexibility: -30 °F (-34 °C) when tested in accordance with ASTM D 5147.
 - 5. Moisture Vapor Permeance, 0.02 Perms (0.92 Ng/Pa•s•m²) maximum, when tested in accordance with ASTM E 96.
 - 6. Air Permeability: 0.00114 ft³/min•ft² (0.007 L/sec•m²) maximum, when tested in accordance with ASTM E 2178.
- B. Acceptable Product: V-Force™ Vapor Barrier Membrane by Elevate.

2.06 METAL ACCESSORIES

Include following elements as applicable to your project, eliminate others:

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
- 1. Wind Performance:
 - a. Membrane Pull-Off Resistance: 100 lb/ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition.
 - b. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-2, current edition.
 - c. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-270 wind uplift rating.
 - 2. Description: Two-piece; 45 degree sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia; Elevate EdgeGard™.
 - 3. Fascia Face Height: 5" (127 mm)
 - 4. Edge Member Height Above Nailer: 1¼" (31 mm)
 - 5. Length: 144" (3.66 m)
 - 6. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
 - 7. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
 - 8. Anchor Bar Cleat: 20 gage, 0.036" (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
 - 9. Curved Applications: Factory modified.
 - 10. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
 - 11. 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.
 - 12. Scuppers: Welded watertight.
 - 13. Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings.
- B. 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; Elevate Coping.
- 1. Wind Performance:
 - a. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
 - b. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.
 - 2. 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.
 - 3. 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.

4. Dimensions:
 - a. Wall Width: As indicated on the drawings
 - b. Piece Length: Minimum 144" (3.66 m)
 - c. Curved Application: Factory fabricated in true radius.
5. 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" (1.83 m) on center.
6. 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.
7. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lb (109 kg) for actual substrate used; no exposed fasteners.

2.07 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.

1. Width: 3½" (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
2. Thickness: Same as thickness of roof insulation

PART 3 INSTALLATION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install self-adhering 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 60-80 °F (16-27 °C).
- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 1. Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.
 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers, and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate

before commencing with roofing work.

- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.03 PREPARATION

- A. 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.
- B. Fill all surface voids in the immediate substrate that are greater than ¼" (6 mm) wide with fill material acceptable insulation to membrane manufacturer.

3.04 VAPOR BARRIER INSTALLATION (optional, retain only if included in PART 2)

- A. All deck/deck cover substrates (except metal decks) must be primed prior to application. Use only primer supplied by membrane manufacturer.
- B. Expanded Polystyrene, Extruded Polystyrene, Common Polyisocyanurate, Fiberglass, Wood Fiber, Perlite, and existing single-ply roofs are not acceptable substrates for SBS bitumen adhesive.
- C. 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.
- D. Install with minimum 3" (76.2 mm) side laps and 6" (152.4 mm) end laps.
- E. Roll in with a 75 lb (34 kg) roller to fully mate each roll to substrate, including all lap areas.

3.05 DECK BOARD INSTALLATION

- A. Lay roof insulation in courses parallel to roof edges.
- B. 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).

Retain following elements as applicable to your project, eliminate others:

- C. Mechanical Fastening: Using specified fasteners and insulation plates, engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.

3.06 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. 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.
- C. Lay roof insulation in courses parallel to roof edges.
- D. 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).

Retain following elements as applicable to your project, eliminate others:

- E. Mechanical Fastening: Using specified fasteners and insulation plates, engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.
- F. Adhesive Attachment: Using specified adhesive, engage deck to pattern and extent required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.

3.07 SELF ADHERING SINGLE-PLY MEMBRANE INSTALLATION

- A. Substrates must be clean, dry, and free of foreign material which could inhibit adhesion.
Install Elevate FullForce EPDM membrane with Secure Bond technology only when ambient and substrate temperatures are 20 °F (-7 °C) minimum and rising. Do not install Elevate

FullForce EPDM below this minimum temperature.

- B. 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; bond and test seams and laps in accordance with membrane manufacturer's instructions and details. **NOTE:** All seams must be primed for proper adhesion and finished using FullForce Lap Sealant as required by the manufacturer's application guide and details.
 1. Once the membrane has relaxed in place a minimum of 30 minutes (longer in colder weather), and the seam positions are aligned, carefully fold back the leading edge of the FullForce EPDM membrane at one end to expose the release liner. Do not fold the length of the roll in half to remove the liner.
 2. Starting from the center split of the exposed release liner, remove both halves of the liner at 45° angles from the center of the sheet back beyond the membrane edge. Be sure to pull enough of the release liner to hold below the membrane. Remove at least 5' (1.5 m) of release liner from one end of the sheet and adhere it to the substrate. The removed liner should extend at a 45° angle beyond the edges of the membrane. Do not remove the 4" (102 mm) strip or release liner along the seam edge at this time.
 3. Keeping the membrane flat and secured, and the seam overlap aligned, continue removing the release liner at a 45° angle along the entire length of the sheet: up to 100' (30 m). Pulling the release liner at an alternate angle can cause the sheet to move and may trap air. The two halves of the release liner should be pulled out at the same time by two people. Keep the release liner as close to the roof surface as possible during removal. **NOTE:** Removal of the liner and any handling of the exposed SA adhesive should be completed by two persons minimum.
 4. To initiate adhesion, use a stiff bristled broom and apply downward pressure across the installed membrane. Broom the membrane from the center of the sheet working toward the edge. Repeat the process on the other half of the sheet.
 5. Remove the 4" (102 mm strip of release liner from the edge overlapping the lower sheet of EPDM. Peel the liner at a 45° angle to the seam edge and then along the length of the seam, making sure there is sufficient contact between the two membranes layers.
 6. Use a 1½" to 2" (38 mm to 51 mm) wide silicone roller to roll the entire seam at a right angle toward the outer seam and then along the length of the seam.
 7. Roll the installed membrane with a weighted roller (5 lb per lineal inch) across the width of the sheet to ensure full contact with the substrate. **NOTE:** Do not roll membrane in place with a weighted roller if installed over ISOGARD HD or RESISTA / ISOGARD CG
- C. Fold back the remaining half of membrane and repeat the preceding steps.
- D. Edge Securement
 1. Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12" (1:6) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
 - a. Exceptions: Round pipe penetrations less than 18" (460 mm) in diameter and square penetrations less than 4" (200 mm) square.
 - b. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.07 FLASHING AND ACCESSORIES INSTALLATION

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

- piece of flashing to cover the metal edge.
6. 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.
 7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.
- C. Scuppers: Set in sealant and secure to structure; flash as recommended by manufacturer.
- D. Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing manufacturer.
- E. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8" (200 mm) high above membrane surface.
1. Use the longest practical flashing pieces.
 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- F. 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 ½ to ¾" (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.
 3. Make round holes in 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.
- G. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
 2. 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.
 3. 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.
 4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

3.08 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
- B. 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.
1. 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.
 2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.09 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for

warranty purposes (i.e., not a salesperson).

- B. Perform all corrections necessary for issuance of warranty.

3.10 CLEANING

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

3.11 PROTECTION

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

END OF SECTION