

## SECTION 07 53 00

### THERMOSET, EPDM, MEMBRANE ROOFING

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Thermoset Membrane Roofing.
- B. Membrane Flashings.
- C. Metal Flashings.
- D. Roof Insulation.

##### 1.2 RELATED SECTIONS

- A. Section 07 62 00 - Sheet Metal Flashing and Trim.

##### 1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE) - ASCE 7-5 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
- B. ASTM International (ASTM):
  - 1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
  - 2. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - 3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - 4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - 5. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
  - 6. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
  - 7. ASTM D 816 - Standard Test Methods for Rubber Cements.
  - 8. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
  - 9. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
  - 10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- C. International Code Council (ICC):
  - 1. International Building Code (IBC).
- D. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
- E. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

- F. Underwriters Laboratories (UL):
  - 1. TGFU R1306 - "Roofing Systems and Materials Guide".
  - 2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.

#### 1.4 DESIGN CRITERIA

- A. Wind Uplift Performance:
  - 1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7. Refer to Drawing S-102.
- B. Fire Resistance Performance:
  - 1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
- C. Thermal Performance: Roof system will achieve a minimum R value not less than 30.
- D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
- E. Building Codes:
  - 1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

#### 1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- B. Detail Drawings:
  - 1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
  - 2. Coordinate approved drawings with locations found on the Contract Drawings.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of fifteen (15) years experience.
- B. Installer Qualifications:
  - 1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
  - 2. Installer shall be capable of extending the Manufacturer's Labor and Materials guarantee.
  - 3. Installer shall be capable of extending the Manufacturer's No Dollar Limit guarantee.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## 1.9 WARRANTY

- A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.
  - 1. Duration: Twenty (20) years.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Versico Roofing Systems, which is located at: P. O. Box 1289; Carlisle, PA 17013; Toll Free Tel: 800-992-7663; Fax: 717-960-4036; Email [request info \(vince@ebsreps.com\)](mailto:request_info@vince@ebsreps.com); Web:[www.versico.com](http://www.versico.com)
- B. Substitutions: Approved equal.

### 2.2 SCOPE / APPLICATION

- A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in this section.
  - 1. Membrane Attachment: Fully Adhered.
- B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.
- C. Insulation: Provide a roof insulation system beneath the finish membrane.

### 2.3 INSULATION

- A. Polyisocyanurate MP-H: Rigid board with fiber reinforced facers on both sides, meeting or exceeding the requirements of ASTM C 1289. Versicore MPH
  - 1. Compressive Strength: 20 psi (138 kPa).
  - 2. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
  - 3. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
  - 4. Tapered.
- B. Secureshield HD Coverbarod
  - 1. Compressive Strength 100 PSI

### 2.4 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

- A. VersiGard 60 mil Non-Reinforced Membrane: Cured, non-reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type I.
  - 1. Color: Black.
  - 2. Membrane Thickness: 60 mil nominal.
  - 3. Sheet Dimensions: 10 feet (3.1 m) by 100 feet (30.5 m).
  - 4. Performance:

- a. Tensile Strength: 1550 psi (10.7 MPa) minimum.
- b. Tear Resistance: 200 lbf/in (35 kN/m) minimum.
- c. Elongation: 480 percent.

## 2.5 FLASHING ACCESSORIES

- A. Versico Black QA Molded Pipe Seals: Factory applied QA tape on the deck flange, for use with VersiGard Black Roofing Systems.
- B. VersiGard Pourable Sealer Pocket: Pre-fabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with pre-applied, adhesive backed uncured EPDM Flashing.
- C. VersiGard QA Inside/Outside Corner: A 7 inch by 9 inch (178 x 229 mm) precut 60-mil thick Uncured EPDM Flashing with a 30-mil pre-applied adhesive tape. Available in black only.
- D. VersiGard QA Coverstrip: A nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 30-mil cured, pre-applied adhesive tape for flashing gravel stops, metal edgings and Seam Fastening Plates.
- E. VersiGard QA "T" Joint Covers: A factory cut 6 inch by 6 inch (152mm x 152mm) uncured 40-mil thick EPDM flashing laminated to a nominal 30-mil pre-applied adhesive tape, used to overlay field splice intersections and to cover field splices at angle changes.
- F. VersiGard Clean Cured Flashing: A cleaned, cured .060 inch (1.5mm) thick non-reinforced (seamless) black EPDM membrane used to flash gravel stops, metal edgings, walls/curbs and Seam Fastening Plates used for additional membrane securement when the use of RTS is not feasible.
- G. White Cured Flashing: A cured .060 inch (1.5 mm) thick non-reinforced (seamless) white-on-black EPDM membrane used to flash gravel stops, metal edgings, walls/curbs and Seam Fastening Plates used for additional membrane securement when the use of RTS is not feasible.
- H. VersiGard Uncured EPDM Flashing: Formable 60-mil thick VersiGard uncured EPDM flashing.
- I. VersiGard QA Uncured EPDM Flashing: 60-mil thick uncured EPDM Flashing laminated to a 30-mil pre-applied adhesive tape used in conjunction with VersiGard Primer as an option to VersiGard Uncured EPDM Flashing.

## 2.6 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

- A. Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to the application of Seam Adhesive or EPDM Primer.
- B. Lap Sealant: A black, heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice. A pre-formed Lap Sealant tool is included in each carton of Lap Sealant.
  1. Versico Lap Sealant: Black sealant for use with VersiGard Roofing Systems.
  2. White Lap Sealant: White sealant for use with White Roofing Systems.

- C. Versico QA Seam Tape: 3 inch (76mm) or 6 inch (152mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane. Complies with the South Coast Air Quality Management District Rule 1168.
- D. Low VOC EPDM Primer: a solvent based primer designed for one-step cleaning and priming of EPDM surfaces prior to installation of quick-applied products. This product complies with the < 250 gpl VOC content requirements for the OTC Model Rule for Single-Ply Roofing Adhesives.
- E. Low-VOC Bonding Adhesive: a solvent-based contact adhesive that allows bonding to EPDM to various porous and non-porous substrates. This product complies with the < 250 gpl VOC content requirements for the OTC Model Rule for Single-Ply Roofing Adhesives. This product does not comply with the following California counties' VOC regulations: Alameda, Contra Costa, El Dorado, Los Angeles, Marin, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Solano, Sonoma and Tehema.
- F. Water Cut-Off Mastic: A one-component, low viscosity, self-wetting, Butyl blend mastic used as a compression sealing agent between EPDM membranes or uncured flashing and applicable substrates.
- G. Versico One-Part Pourable Sealer: A black, one-component, moisture curing, elastomeric polyether sealant used for attaching lightning rod bases and ground cable clips to the membrane surface and as a sealant around hard-to-flash penetrations such as clusters of pipes.
- H. Universal Single-Ply Sealant: A 100 percent solids, solvent free, one-part, polyether sealant that provides a weather tight sealant to a variety of building substrates; used as a termination bar sealant. Available in white only.

## 2.7 FASTENING COMPONENTS

- A. VersiGard QA RTS (Reinforced Termination Strip): 6 or 9 inch wide, nominal 45-mil thick clean, cured, reinforced EPDM black membrane with 3 inch wide pre-applied adhesive tape laminated along one edge for the 6 inch wide RTS and along both edges for the 9 inch wide RTS. 9-inch wide QA RTS is utilized for perimeter membrane securement on VersiGard Mechanically Attached Roofing Systems.
  - 1. 6" RTS: 6 inch (305 mm) wide, 100 foot long (30.5 M), strip of VersiGard (black) reinforced EPDM membrane for additional membrane securement on Adhered, Ballasted, and Mechanically Attached Roofing Systems.
- B. Polymer Seam Plate: 2-inch (51mm) diameter plastic barbed fastening plate used for membrane and RTS securement for Mechanically Attached Roofing Systems over steel roof decks.
- C. Insulation Fastening Plate: Nominal 3-inch (76 mm) diameter FM approved metal plate used for insulation attachment.
- D. Versico Fasteners:
  - 1. InsulTite Insulation Fasteners: A threaded, #12 fastener with #3 Phillips head fastener used with 3-inch (76mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.
  - 2. Term Bar Nail-In: A 1 1/4 inch (32mm) long expansion anchor with threaded drive

pin used for fastening VersiGard Termination Bar or Seam Fastening Plates to concrete, brick, or block walls.

## 2.8 EDGINGS AND TERMINATIONS

- A. Metal Era AnchorTite Fascia: An anchor bar roof edge fascia system consisting of 0.100 inch (2.5 mm) thick extruded aluminum bar, corrosion resistant stainless-steel fasteners and snap-on fascia cover.
- B. Metal Era Perma Tite Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10- or 12-foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.
- C. Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
- D. A vapor retarder / temporary roof (Versico 725 TR Air & Vapor Barrier/Temporary Roof) may be applied to protect the inside of the structure prior to the roof system installation.

### 3.3 SUBSTRATE PREPARATION

- A. Steel Deck:
  - 1. Metal decks shall be a minimum uncoated thickness of 22 gauge and have a G-90 galvanized finish on all panels.
  - 2. Decks shall comply with the gauge and span requirements in the current Factory Mutual Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
  - 3. Remove any surface corrosion and repair severely corroded areas. Properly fasten loose or inadequately secured decking.

### 3.4 INSULATION - SYSTEM DESIGN

- A. Base Layer:
  - 1. Type:MPH 20 PSi
  - 2. Thickness: R30.

3. Attachment Method: Mechanically Attached.
- B. Top Layer:
1. Type: Secureshield HD Coverboard.
  2. Thickness: .5 inches.
  3. Attachment Method: Mechanically Attached.
- C. Tapered System:
1. Type: MPH Crickets.
  2. Cricket Slope: ¼" inch per foot.
  3. Attachment Method: Mechanically Attached.

### 3.5 INSULATION PLACEMENT

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically if multiple layers are provided.
- B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
- C. Do not install wet, damaged, or warped insulation boards.
- D. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.
- E. Wood nailers shall be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness shall equal that of insulation but not less than 1 inch (25 mm) thickness.
- F. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
- G. Do not install any more insulation than will be completely waterproofed each day.

### 3.6 INSULATION ATTACHMENT

- A. Securely attach insulation to the roof deck for Adhered Roofing Systems. Attachment shall have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.
- B. Enhance the perimeter and corner areas in accordance with FM Loss Prevention Data Sheet 1-29.

### 3.7 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)

- A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is

tacky but will not string or stick to a dry finger touch.

- C. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
- D. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.
- E. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

### 3.8 MEMBRANE SPLICING (Tape Splice)

- A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
- B. Fold the top sheet back and clean the dry splice area a minimum of 3 inches (76 mm) on both membrane sheets.
- C. Apply Primer to the mating surfaces with a scrub pad, at a rate of approximately 450 square feet per gallon for a 3-inch wide seam, and allow to dry.
- D. Apply 3-inch wide Seam Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13mm).
- E. Remove the release film and press the top sheet onto the tape using hand pressure.
- F. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.
- G. Install QA "T" Joint Cover, a 6 inch wide (152 mm) section of VersiGard QA Flashing or VersiGard Non-QA Flashing over all field splice intersections. When using Non-QA Flashing, seal edges of flashing with Lap Sealant.
- H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

### 3.9 FLASHING

- A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.
- C. RP-4 guidelines (dated November 19, 2002) concerning applicable coverage rates.

### 3.10 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.
- B. Adhere walkway pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.

### 3.11 DAILY SEALS

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the workday, a daily seal shall be performed to temporarily close the membrane to prevent water infiltration.
- B. Use Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

### 3.12 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris shall be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator shall perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

### 3.13 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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