

**SECTION 07535  
ADHERED SINGLE PLY MEMBRANE ROOFING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Adhered EPDM elastic sheet single ply membrane roofing.
- B. Related Sections:
  - 1. Section 06100 - Carpentry: Wood deck and curbs.
  - 2. Section 06200 – Finish Carpentry: for synthetic decking
  - 3. Section 07210 - Building Insulation: Other rigid insulation.
  - 4. Section 07620 – Prefinished Flashing and Sheet Metal.

**1.2 DESCRIPTION**

- A. Single Ply Adhered on Metal Deck (SPA-1)
  - 1. Vapor retarder
  - 2. Insulation: Flat with tapered at crickets
  - 3. Elastomeric sheet membrane directly attached to metal deck through cover board and insulation.
  - 4. Rubber pads at mechanical equipment

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicating roof size, location and type of penetrations, perimeter and penetration details, roof insulation make-up and layout that have been accepted by authorized manufacturer's representative.
- B. Compliance: Submit compliance from insulation manufacturer that insulation furnished conforms to specified product.
- C. Warranty: Submit 2 copies of manufacturer's warranty for elastic sheet single ply roofing.

**1.4 QUALITY ASSURANCE**

- A. Roofing Applicator: Applicator shall have not less than 3 years of successful experience in installation of similar roofing systems and shall be certified in writing by manufacturer as a licensed or approved applicator.
- B. Pre-Roofing Conference: Prior to installation of roofing and associated work, meet at project site with installer, roofing manufacturer, installers of related work, and other entities concerned with roofing performance. Record discussions and agreements and furnish copy to each participant. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.
- C. Fire Classification Requirements: Underwriters Laboratories Class B approval as fire-retardant for membrane.

**1.5 PRODUCT HANDLING**

- A. Deliver material in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's instructions for storage and handling.
- B. Handle rolled goods to prevent damage.
- C. Store materials on clean raised platforms with weather protective covering.

## **1.6 PROJECT/SITE CONDITIONS**

- A. Weather Conditions: Proceed with elastic sheet single ply roofing work only when weather conditions comply with manufacturer's recommendations, and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer.
- B. Proceed with installation of elastic sheet single ply roofing only after substrate construction has been completed, and after penetrating components have been installed, so that membrane will not be penetrated or damaged by subsequent work.

## **1.7 WARRANTY**

- A. Completed elastic sheet single ply roofing installation shall be warranted by sheet roofing manufacturer, in accordance with manufacturer's standard warranty, for period of 15 years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

### **2.2 EPDM ROOFING MEMBRANE**

- A. EPDM Roofing Membrane: ASTM D 4637, Type I, nonreinforced uniform, flexible sheet made from EPDM, and as follows:
  - 1. Thickness: Minimum 0.060 inch thick
  - 2. Sheet Size: Largest sheet size possible as determined by membrane manufacturer.
  - 3. Manufacturers:
    - a. Carlisle SynTec Incorporated.
    - b. Firestone Building Products Company.
    - c. Johns Manville
    - d. GAF Materials Corp

### **2.3 VAPOR RETARDER**

- A. Vapor Retarder for Flame Resistant Roofing: Consisting of two layers of heavy duty kraft laminated with a unique flame-extinguishing adhesive. Glass reinforcing fibers placed along each edge for added strength.
  - 1. Perms per ASTM F 1249: 0.46
  - 2. Water Resistance per ASTM D 779: 48+ hr
  - 3. Dry Tensile Strength ASTM D-828 MD: 60
  - 4. Puncture Resistance per ASTM D-781: 15
  - 5. Burning Characteristics per ASTM E -84:
    - a. Flame Spread: 24 max
    - b. Smoke Development: 30 max.
  - 6. FM and UL Approved.
  - 7. Product:
    - a. Fortifiber Building Product Systems: Pyro-Kure 600
    - b. GAF: Permate

### **2.4 ROOF INSULATION**

- A. General

1. Multiple Layers: Furnish in not less than 2 layers.
  2. R-Value: Average of roof insulation not less than R-25.
  3. Where tapered insulation is indicated: Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Factory miter valleys and corners
- B. Polyisocyanurate Foam Board: Closed cell polyisocyanurate foam core with laminated black glass reinforced mat facer complying with ASTM C 1289.
1. Type: Type II
  2. Density: 2.0 pcf per ASTM D1622
  3. Compressive Strength: 25 psi minimum per ASTM D1621 Procedure A
  4. Moisture Vapor Transmission: 1.0 perms maximum.
  5. Dimensional Stability: 2 percent maximum linear change when conditioned at 158 degrees F and 97 percent relative humidity for seven days.
  6. Thickness: Provide total thickness and slope as indicated using multi-layer of 2 inch thick panels.
    - a. Provide minimum of 2 inches at roof drains and/or scuppers.
  7. R-Value: 5.6 per inch of thickness based on RIC/TIMA Roof Insulation Specimen Conditioning Procedure and in-service R-value according to ASTM C 1303.
  8. Available Manufacturers:
    - a. AlliedSignal Inc.; Commercial Roofing Systems.
    - b. Hunter Company.
    - c. Carlisle SynTec Incorporated.
    - d. Firestone Building Products Company.
    - e. GAF Materials Corp.
    - f. Johns Manville International, Inc.

## 2.5 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

## 2.6 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate, 1/2 inch (13 mm) thick.

## 2.7 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil thick EPDM, partially cured or cured, according to application.
- C. Seaming Material: Manufacturer's standard synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.
- D. Lap Sealant: Manufacturer's standard single-component sealant, color to match roofing membrane.
- E. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

## **2.8 MEMBRANE FASTENERS**

- A. Fasteners: Corrosion-resistant, as recommended by manufacturer, of type, length and strength required for intended use.
- B. Insulation Plates: Corrosion-resistant AZ55 Galvalume steel, as recommended by manufacturer.
- C. Coated screws of sufficient length to penetrate minimum one inch into wood or masonry substrate.
- D. Termination Bar: 1.3 inch by 0.10 inch thick aluminum bar with integral caulk ledge.

## **2.9 MISCELLANEOUS MATERIALS**

- A. Refer to Section 06100 for wood curbs, blocking, nailers.
- B. Rubber Walkway Pads: Constructed from recycled rubber tires
  - 1. Size: 24 inch by 24 inch
  - 2. Thickness: 1-1/2"
  - 3. Manufacturer: Versico

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrate and conditions under which elastic sheet roofing work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Verify that penetrations, expansion joints, and blocking are in place and secured and that roof drains are properly clamped into position.

### **3.2 SUBSTRATE PREPARATION**

- A. Comply with sheet membrane manufacturer's instructions for preparation of substrate to receive elastic sheet roofing. Clean substrate of dust, debris and other substances detrimental to elastic sheet roofing work.

### **3.3 WOOD NAILERS**

- A. Wood nailer height shall match total thickness height of insulation being used and shall be installed with 1/8 inch gap between each length of wood nailer.
- B. Fasten wood nailers to deck or wall at maximum 16 inches on center to resist force of 200 pounds per foot in any direction.
- C. Where nailers are required to be flush at point of contact with roofing membrane taper wood nailers.

### **3.4 VAPOR RETARDER INSTALLATION**

- A. Install vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively. Bond vapor retarder to deck as follows:
  - 1. Apply adhesive at rate recommended by vapor-retarder manufacturer. Seal laps with adhesive approved by FMG's Approval Guide.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

### 3.5 ROOF INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is **2 inches** or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of **6 inches** in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding **1/4 inch** with insulation.
  - 1. Cut and fit insulation within **1/4 inch** of nailers, projections, and penetrations.
- G. Install substrate board over insulation.
  - 1. Install each layer of insulation, cover board, and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
- H. Mechanically Fastened Insulation:
  - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

### 3.6 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
  - 1. Fasten substrate board to top flanges of deck to resist uplift pressure at corners, perimeter, and field of roof according to membrane roofing system manufacturers' written instructions.

### 3.7 MEMBRANE INSTALLATION

- A. Loosely lay field membrane sheets over substrate without stretching and allow to relax 30 minutes before bonding, splicing or attachment. Lap sides and ends of adjoining sheets minimum of 3 inches.
- B. Evenly fold each sheet back on itself so as to expose underside. Apply bonding adhesive evenly to both substrate and membrane. Apply in sequence to allow equal drying time for both exposed membrane and substrate. Allow to dry until such time when adhesive will not stick or string when touched by dry finger. Starting at fold of sheet, slowly roll coated membrane onto coated substrate evenly in order to prevent wrinkles. Compress with stiff push broom to assure full contact.

### 3.8 LAP SPLICE

- A. After membrane sheet has been positioned to provide minimum overlaps as specified, top sheet at overlap shall be folded back approximately 10 to 12 inches to allow for cleaning of membrane surfaces to be spliced. Clean mating surfaces with clear splice wash or splice primer wash and allow to dry.
- B. Apply seam tape per manufacturers' recommendations.

- C. Roll top sheet towards lap area until two surfaces begin to meet, and then allow top sheet to fall freely onto bottom sheet so that stretching or wrinkling of membrane is prevented. Apply hand pressure along entire length of splice. Roll entire lap with hard rubber roller, applying firm and even pressure.
- D. Prime edge of completed seam with brush application of splice adhesive, and apply continuous bead of lap sealant along edge.

### **3.9 FLASHING**

- A. Install flashing at roof interruptions (walls and curbs), roof penetrations and roof perimeters, using longest flashing pieces possible. Flashing shall extend vertically up and over parapets. Where flashing terminates at metal through-wall flashing extend flashing a minimum of 8 inches above highest point of insulation
- B. Complete splice between flashing and roof membrane before bonding or attaching flashing to vertical surfaces.
  - 1. Install flashing at round penetrations, pipes, and conduits.

### **3.10 MISCELLANEOUS**

- A. Roof Scuppers: Comply with membrane manufacturers and sheet metal manufacturer's recommended installation procedures.
- B. Install roof pads at mechanical equipment. Provide additional pads for service walk ways from roof hatch to roof top equipment.

### **3.11 PROTECTION OF ROOFING**

- A. Upon completion of roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. Maintain roof free of nails, screws, scrap and other foreign objects. At end of construction period, or at time when remaining construction will in no way affect or endanger roofing, make final inspection of roofing and prepare written report to Owner, describing nature and extent of deterioration or damage found.
- B. Repair or replace (as required) deteriorated or defective work found at time of final inspection to condition free of damage and deterioration at time of Substantial Completion and in accordance with requirements of specified warranty.

**END OF SECTION 07535**