

**SECTION 075323 EPDM MEMBRANE ROOFING AND ROOF INSULATION**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the membrane roofing, roof insulation and sheet metal work as shown on the drawings and/or specified herein, including, but not limited to, the following:
  - 1. EPDM sheet membrane roofing.
  - 2. Rigid roof insulation below roof membrane.
  - 3. Sheet flashing.
  - 4. Cover board over insulation at paver and pedestal areas.

1.3 RELATED SECTIONS

- A. Steel Deck - Section 053100
- B. Carpentry - Section 062000.
- C. Sheet Metal Flashing - Section 076200.
- D. Pavers - Section 077600.
- E. Drains and vents - Division 22.

1.4 DESCRIPTION OF THE SYSTEM

- A. The membrane roofing system specified herein shall consist of factory fabricated large sections of sheet membrane fully adhered over the rigid roof insulation. Provide flashing at roof penetrations and vertical surfaces.

1.5 QUALITY ASSURANCES

- A. Qualifications
  - 1. The membrane roofing system specified herein shall be the product of a manufacturer who can furnish supporting evidence of experience in the manufacture of the membrane roofing system and of having been regularly engaged in this business for not less than five (5) years. Such experience shall be in projects similar to the requirements and scope for this project.
  - 2. The details and specifications are based on a particular manufacturer. It is not the intention of this specification to restrict competition. If a manufacturer other than the one specified is selected, it shall be his obligation and responsibility to modify and adjust his materials to suit the encountered conditions and to consult and coordinate his work with

other trade Contractors to assure that the installation will be watertight and function for use intended and that the guarantee will be issued to the Owner.

3. Acceptable Manufacturers:

- a. Carlisle Syntec Incorporated ("Sure-White," basis of design).
- b. Firestone Building Products Company.
- c. Genflex.
- d. or an equal acceptable to the Architect.

- B. Installer: A firm with not less than 5 years of successful experience in installation of roofing systems similar to those required for this project and which is acceptable to or licensed by the manufacturer of the primary roofing materials.
- C. UL Listing: Provide system which has been tested and listed by UL for application indicated and which has a "Class A" rating.
- D. The specified roofing assembly must have been successfully tested by a qualified testing agency following ANSI/FM 4474 to resist the design uplift pressures calculated according to American Society of Civil Engineers (ASCE) 7 and after multiplying the results with a safety factor of 3, but assembly uplift pressures shall be not less than 60 lbs./sq. ft.
- E. Solar Reflectance: Roof system shall have a minimum initial solar reflectance of 0.7 in accordance with ASTM C1549 or ASTM E1918 and minimum thermal emittance of 0.75 as determined in accordance with ASTM C1371 or ASTM E408 or a minimum SRI of 78 as determined in accordance with ASTM E1980.

1.6 SUBMITTALS

- A. The samples and certificates listed below are required to be submitted by the Contractor to the Architect, for review. An omission of an item or items does not relieve the Contractor from this responsibility and for compliance with the Contract Documents, of which this is a part.

1. Samples
2. 

Item No.	Size	Description
a. S1	6" x 6"	Membrane w/ splice
b. S2	6" x 6"	Rigid Insulation
c. S3	6" x 6"	Flashing materials

3. Notarized Certificates of Compliance

4. 

Item No.	Description	Standard
a. C1	Sheet membrane - As specified	
b. C2	Submit manufacturer's published specifications that completely describe the preparation of surfaces and application of roofing systems.	
c. C3	Submit a letter from membrane manufacturer issuing sample guarantee and approving the applicator prior to pre-application conference.	

- B. Submit complete shop drawings showing details, dimensions, fabrication and fastening elements for each condition encountered, layout of each sheet noting seam locations, perimeter and penetration flashing, and other details where roofing abuts other materials and/or conditions.
- C. Submit copies of pre-roofing conference records.

- D. Submit a letter signed by the manufacturer and Contractor acknowledging that the submitted roofing system complies with ASCE-7 and FM I-90 for wind speed code requirements based on height and geographic location of project.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type and brand. Delivered materials shall match approved samples. Fire classification labels shall be intact and visible.
- B. Store materials under cover in a dry and clean location, off the ground and remove materials which are damaged, torn or otherwise not suitable for installation and replace with acceptable materials.
- C. Keep insulation and membrane dry before and during installation. Remove wet materials from project site.
- D. Store roofing materials on platforms or pallets, above ground, on roof level and cover with tarpaulins or on other suitable watertight covering. Store membrane and handle, in such a way as to prevent damage to edges or ends.

1.8 PREROOFING CONFERENCE

- A. Prior to ordering of materials, a pre-roofing conference will be held to discuss the specified roofing system and its proper application. Conference shall include installer, roofing manufacturer, installers of related work, Architect and representatives of Owner. Record discussions and agreements and furnish copy to each participant. Provide at least 72 hours' advance notice to participants prior to convening conference.
- B. Coordinate application of the roofing system in such a manner that the complete installation is weather-tight and in accordance with guarantee requirements.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Work shall not be installed when the roof deck is damp, wet or spotted with frost or if the ambient temperature is 35 deg. F. and falling or if there is a forecast for inclement weather that may adversely affect the proper installation of the roofing system.

1.10 WARRANTY

- A. Provide warranty for the roofing work as specified in this section. Warranty shall state that installed work shall be free from defects of materials and workmanship for fifteen (15) years from date of Substantial Completion.
- B. Warranty shall be in a form acceptable to the Architect and shall be duly executed by officers or principals of the manufacturer.
- C. Contractor shall inform the Architect if conditions exist which will interfere with issuance of the specified warranty. Start of work shall imply that the warranty as specified above will be issued.
- D. In addition to manufacturer's warranty, provide roofing Installer's warranty effective for a period of two (2) years from date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. General: The materials provided shall be part of a roofing system developed by the approved manufacturer and shall in every respect be compatible with each other and with the substrates and conditions encountered in the field.
- B. Membrane Sheets: 0.060" thick, white-on-black, non-reinforced EPDM (Ethylene Propylene Diene Monomer) compounded elastomer, conforming to ASTM D 4637, Type II, Class A. Membrane shall be fully adhered; refer to Part 3.2,C of this specification section.
- C. Membrane Flashing: 0.060" thick cured EPDM; or as recommended by roofing manufacturer.
- D. Bonding Adhesives, Mastics and Splicing Cement: Compatible with the materials with which they will come in contact.
- E. Lap Sealant: For sealing the exposed edge of the splices and as otherwise required shall be of a consistency recommended by the manufacturer.
- F. Prefabricated Pipe Seal Assemblies: Provide assemblies to accommodate vents, pipe penetrations and other similar roof penetrations.
- G. Sealers: Provide sealers and other similar accessory materials as recommended by the manufacturer.
- H. Cant Strips, Tapered Edge Strips, and Flashing Accessories: Types recommended by membrane manufacturer, including adhesive tapes, flashing cements, and sealants.
- I. Membrane Adhesive: As recommended by membrane manufacturer for particular substrate and project conditions, formulated to withstand ASCE 7-02 wind uplift force requirements of the geographic area of the building.
  - 1. Provide adhesives that comply with local requirements limiting amounts of volatile organic compounds.
- J. Roof Insulation: Minimum 2" thick flat and tapered (1/4" per foot) polyisocyanurate board roof insulation conforming to ASTM C 1289, faced with proper facing to allow membrane to be adhered to it without delamination. Roof insulation must have an LTTR R-Value of 6.0/inch at 75 deg. F. when tested in accordance with ASTM C 1303.
  - 1. Manufacturer of roofing system must approve use of insulation in writing in advance.
  - 2. Provide high-density insulation, minimum 60 psi compressive strength, at areas where paver and pedestal systems are to be installed.
- K. Cover Board (at paver area): Provide "Dens-Deck Roof Boards" by Georgia-Pacific Corporation ASTM C 1177, glass-mat, water-resistant gypsum substrate, thickness as indicated on drawings.
- L. Walkway Pads: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads, approximately 3/16-inch thick, and acceptable to membrane roofing system manufacturer.

- M. Concrete Pavers on Pedestals: Refer to Section 077600.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Examine the areas and conditions where roofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

#### 3.2 INSTALLATION

##### A. Nailers

1. Continuous pressure-treated nailers shall be firmly anchored to resist a force of 75 pounds per lineal foot in any direction. The thickness of the nailer shall be such that the top of the nailer is flush with the surface to which the membrane is attached at the horizontal plane.
2. Nailers shall be installed continuous at perimeters and around all roof penetrations unless otherwise noted.

##### B. Insulation

1. Clean the deck prior to installation of the insulation. Mechanically attach insulation to deck using F.M. approved fasteners in pattern to meet F.M. I-90 minimum and ASCE 7-02 wind uplift requirements, including greater requirements for corners and perimeters as required. For tapered insulation, follow pattern of taper to insure correct pitch.
2. Moderately butt end joints over flutes, stagger joints in adjacent boards. Do not install more insulation in any one day than can be covered by the membrane roof sheets.
3. Where two layers of insulation or coverboards are required, stagger joints two (2) feet in length and width in both directions.
4. Neatly cut around all projections encountered and at abutting vertical surfaces. Where large gaps occur fill with a urethane foam pack.
5. At paved area, provide cover board over top of insulation.

- C. Sheet Membrane Application (Fully Adhered): Where required by manufacturer, install membrane by unrolling over prepared substrate, lapping adjoining sheets. Apply adhesive to surfaces to be bonded and roll into place when adhesive has properly cured. Treat seams with cleaner and prime finish with 4" seam tape and apply sealant to exposed sheet edges, tapering application as recommended by manufacturer. Install mechanical fasteners, flashings and counterflashings, and accessories at locations indicated and as recommended by manufacturer.

##### D. Splicing

1. Fold the top sheet back about twelve (12) inches and clean both mating surfaces at the splice area using clean rags with membrane manufacturer's recommended cleaner.
2. Apply the in-seam tape primer with a synthetic scrub pad at a rate of 375 lineal feet of five (5) inch splice per gallon. Allow tape primer to dry to the touch.
3. Roll the top sheet toward the splice area until the cemented area is nearly touching the cement on the bottom sheet along the entire length of the splice. Allow the top sheet to fall freely into place avoiding stretching and wrinkling. Roll the splice with a two (2) inch wide steel roller, using positive pressure, toward the outer edge of the splice.

4. Solvent clean the splice edge, extending at least one (1) inch onto the top and bottom membranes. Apply a bead of lap sealant completely covering the splice edge, feathering the lap sealant with a preformed putty knife or trowel.
5. Lap sealant application shall be completed on all splices by the end of each working day.

**E. Membrane Flashing**

1. Perimeter flashing and flashing around vents and other roof penetrations shall be preformed using the recommended flashing, compatible with the approved roofing system and utilizing the longest pieces practicable.
2. The splice between the flashing and the main roof sheet should be completed before bonding the flashing to the vertical surface. Seal this splice at least three (3) inches beyond the fasteners which attach the membrane to the horizontal nailer.
3. Bonding adhesive shall be applied to both the flashing and the surface to which it is being bonded. After the adhesive has dried to the point where it does not string or stick to a dry finger touch, roll the flashing into the adhesive. Take care to assure that the flashing is not bridging where there is any change of direction of the flashing (e.g., where the parapet meets the roof deck).
4. Nail the flashing at the top every 12 inches on center maximum under metal counterflashing or cap. Metal counterflashing is specified under Section 076200.

**F. Pipe Flashing**

1. Flashing for pipes, conduits and other similar items which are scheduled to penetrate (pass through) the membrane shall be provided with factory prefabricated elements when such use is possible. When prefabricated devices are not possible, field fabricated seals shall be used.
2. Bases of the pipe seals shall be spliced to the membrane roofing sheet as specified above for sheet laps and the top portion shall be secured to the pipe with a stainless steel clamping ring and continuously sealed with sealant in a watertight manner.
3. Field fabricated pipe seals shall be fabricated with base and cap membrane flashing which shall be spliced to the membrane and to itself and continuously sealed with sealant in a watertight manner.

- G. Drains:** At drain locations, where the insulation is tapered to form a smooth transition from roof surface to membrane, the membrane sheet shall be accurately cut-out so as to fit the encountered clamping ring, and shall be secured to the ring with the addition of the approved mastic in a secure, neat and watertight manner.

**H. Curbs, Corners**

1. Field fabricated outside corners shall consist of approved membrane flashing which shall have not less than 6" horizontal legs which shall be spliced to the roof membrane, and vertical legs as required which shall be nailed at 12" o.c. maximum. Corners shall be lapped a minimum of 3" and be secured by splicing to each flashing section
2. Field fabricated inside corners shall consist of approved membrane flashing with 6" horizontal legs which shall be spliced to the roof membrane, and vertical legs as required which shall be nailed at 12" o.c. maximum. Corners shall be lapped a minimum 6" and secured by splicing to each flashing section.
3. Install lap type sealant along all seams to insure a watertight installation.

- I. Daily Seal: Care should be exercised to ensure that the water does not flow beneath any completed sections of roof. Temporarily seal loose edge of membrane with sealant when weather is threatening.
  - 1. Mix the two components thoroughly according to the instructions on the label.
  - 2. Apply the sealant at a rate of 100 lineal feet per gallon, on smooth surface, 12" back from edge of sheet onto exposed substrate surface. If necessary, use a trowel to spread material in order to achieve complete seal.
  - 3. After embedding membrane in sealant, check for continuous contact. Then weight the edge, providing continuous pressure over the length of the cutoff. The recommended weight for the continuous pressure is a ten (10) foot length of 2-1/2" tubing filled with dry sand.
  - 4. When work is resumed, pull sheet free before continuing installation.
- J. Walkway Pads: Install walkway pads in locations indicated; adhere to substrate with compatible adhesive according to roofing system manufacturer's written instructions.
- K. Ballasting: Where indicated, set pavers on pedestals following manufacturer's instructions; provide 3/16" open joint between pavers and support each corner of paver on a pedestal. Adjust paver height to proper elevation using accessories that come with paver pedestal system.
- L. Apply a 2" thick layer of 100 psi extruded polystyrene board insulation over finished membrane under and 6" from all sides of loose planters.

### 3.3 CLEANING AND PROTECTION

- A. From time to time during the progress of the work and at the completion of the work, remove all rubbish, debris, dirt, equipment and unused materials from the site. Clean adjoining surfaces which may have been soiled by roofing work.
- B. Protect installed roofing from damage and abuse by other trades. Repair damages to watertight conditions at no additional cost to the Owner.
- C. Exercise care to protect installed work. Work which does become damaged in any way or is not watertight, shall be repaired and/or replaced as directed to the satisfaction of Architect and/or Owner at no additional cost or time.

END OF SECTION 075323