

SECTION 07530 – SINGLE-PLY MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fully adhered systems.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Wood nailers, blocking, and other related items.
- B. Section 07600 - Flashing and Sheet Metal: Metal roof flashing and accessories.

1.3 REFERENCES

- A. ASTM C177-85 - Test Method for Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate.
- B. ASTM D412-87 - Rubber Properties in Tension.
- C. ASTM D471-79 - Standard Test Method for Rubber Property - Effect of Liquids.
- D. ASTM D624-86 - Rubber Property - Tear Resistance.
- E. ASTM D746-79 - Brittleness Temperature of Plastics and Elastomeric by Impact.
- F. ASTM D822-89 - Practice for Operating Light and Water-Exposure Apparatus (Carbon-Arc) Type for Testing Paint, Varnish, Lacquer, and Related Products.
- G. ASTM D1004-66 - Initial Tear Resistance of Plastic Film and Sheeting.
- H. ASTM E96-90 - Water Vapor Transmission of Materials.
- I. FM 4470 (Factory Mutual Engineering Corporation) - Roof Assembly Classifications.
- J. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual.
- K. UL 790 - Fire Hazard Classifications.

1.4 DESIGN REQUIREMENTS

- A. Roof system shall be designed to meet FM Class 1, and I-90 requirements.
- B. Roof flashing details shall be consistent with those shown on the drawings. Where cap flashing is shown, a standard manufacturer-s bar anchor only detail is not acceptable. Membrane manufacturer's recommended flashing detail may be considered by the Architect when no detail is provided.

1.5 SUBMITTALS

- A. General: Submit in accordance with Section 01300.
- B. Product Data: Installation instructions, and general recommendations from manufacturer of single-ply membrane system for types of roofing materials required. Include data substantiating that materials comply with requirements.
- C. Samples: Submit finished roofing sheets, including T-shaped side/end-lap seam. Also include the following:
 - 1. Warranty certificate.

- D. Shop Drawings: Submit shop drawings approved by the manufacturer showing roof configuration, sheet layout, seam locations, colors (as applicable), details at perimeter, penetration and flashing details and special conditions.
- E. Test data for pullout resistance of fastening systems.
- F. Certification that materials comply with local VOC limitations.
- G. Manufacturer's installation rating of the roofing contractor.
- H. Submit copy of shop drawings to manufacturer of existing roofing for review and approval to maintain existing warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Obtain primary single-ply membrane roofing from a single manufacturer. Provide secondary materials by same manufacturer or as recommended in writing by manufacturer of primary materials.
- B. Installer: The complete roofing system shall be installed by a roofing Contractor licensed, factory trained and approved by the roofing system manufacturer and employing personnel experienced and skilled in the application of the manufacturer's roofing system. The Contractor shall have a minimum of 3 years experience installing the system, have installed a minimum of 500,000 square feet and shall have a manufacturer's installation rating of 9.0 or better.
 - 1. Work associated with single-ply membrane roofing, including (but not limited to) insulation, flashing, and membrane sheet joint sealers, shall be performed by Installer of this Work.
- C. Roofing work shall be applied in strict accordance with the provisions of the specification criteria. No deviations shall be permitted without written consent from the Architect. Should a conflict between this specification and the manufacturer's requirements arise, the most restrictive provision as determined by the Architect shall govern.
- D. Upon completion of the installation, an inspection shall be made by the system manufacturer to ascertain that the roofing system has been installed according to the applicable manufacturer's specifications and details. No "early bird" warranty will be accepted. The results of the warranty inspection shall be submitted in writing to Owner for their review and records.
- E. Pre-Roofing Conference: Before installing roofing and associated Work, meet at mutually agreed location with Installer, roofing manufacturer, installers of related work, and other entities concerned with roofing performance, Architect, and Owner. 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.
- F. UL Listing: Provide labeled materials that have been tested and listed by UL in "Building Materials Directory" or by other nationally recognized testing laboratory for Class A rated materials/system.
- G. Coordinate alterations to existing roofing with original manufacturer to maintain warranty. The results of the warranty inspection shall be submitted in writing to Owner for their review and records.

1.7 PROJECT CONDITIONS

- A. Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.
- B. Substrate Conditions: Do not begin roofing installation until substrates have been inspected and are determined to be in satisfactory condition. All surfaces shall be smooth, dry, clean, free of fins or sharp edges, loose or foreign materials, oil or grease. No work shall proceed when moisture is present on the roof or in the materials.
- C. Temporary waterstops shall be installed at the end of each work day and shall be removed before proceeding with the next day's work.

1.8 WARRANTY

- A. The Roofing Contractor shall furnish the Owner a manufacturer's minimum 10-year written warranty covering labor and materials, and a minimum 20-year written guarantee covering materials only. Such warranty shall cover defects in workmanship and ensure watertightness for 10 years and defects in materials for twenty years. Warrantor shall be the manufacturer of the membrane. Warranty shall be "No Dollar Limit" (NDL). The warranty shall be written to the building Owner.
- B. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- C. Notify manufacturer of existing roofing and assist Owner in applying for continuation of original warranty.
- D. No AEarly Bird® warranties shall be issued.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Performance: Provide roofing materials identified to be of generic type indicated and tested to show compliance with required performances.
- B. Compatibility: Provide products recommended by manufacturers to be fully compatible with indicated substrates. Provide separation materials as required to eliminate contact between incompatible materials.

2.2 FULLY ADHERED EPDM MEMBRANE

- A. Manufacturer's standard installation.
- B. General: Ethylene propylene diene monomers formed into uniform, flexible sheets, complying with ASTM D 4637, Type 1.
 - 1. Class U: Unreinforced.
 - 2. Thickness: 60 mils, nominal.
 - 3. Exposed Face Color: Black.
- C. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Carlisle Syntec Systems.
 - 2. Firestone Building Products Co.
 - 3. Versico Inc.

2.3 AUXILIARY MATERIALS

- A. Sheet Seaming System: Manufacturer's standard splice tape for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by membrane manufacturer.
- B. Cant Strips, Tapered Edge Strips, and Flashing Accessories: Types recommended by membrane manufacturer, including adhesive tapes, flashing cements, and sealants.
 - 1. Crickets: Johns-Manville tapered factory pre-cut crickets, extending to roof drain sumps.
- C. Membrane Flashing Material: Manufacturer's standard system compatible with single-ply membrane.
- D. Slip Sheet: Type recommended by membrane manufacturer for protecting membrane from incompatible substrates.
- E. Protective Coating: Liquid-applied Hypalon finish coat to apply to exposed membrane in color selected by Architect from manufacturer's standard colors.

- F. Mechanical Fasteners: Metal or plastic plates, caps, battens, accessory components, and fastening devices to suit substrate and as recommended by membrane manufacturer.
- G. Membrane Adhesive: As recommended by membrane manufacturer for particular substrate and project conditions, formulated to withstand minimum 90-psf uplift force.
 - 1. Provide adhesives that comply with local requirements limiting amounts of volatile organic compounds.

PART 3 - EXECUTION

3.1 PREPARING SUBSTRATE

- A. General: Comply with manufacturers' instructions to prepare substrate to receive single-ply membrane system.
 - 1. Verify that penetrations, expansion joints, and blocking are in place and secured and that roof drains are properly clamped into position.
- B. Clean substrate of dust, debris, and other substances detrimental to single-ply system installation. Remove sharp projections.
- C. Install cant strips, flashings, and accessory items as shown and as recommended by manufacturer.
- D. Prime substrate where recommended by manufacturer of materials being installed.
- E. On wood board decks to receive bituminous materials, install nailed course of paper slip sheet.
- F. Prevent materials from entering and clogging drains and conductors and from spilling or migrating onto surfaces of other work.

3.2 INSTALLING INSULATION

- A. General: Extend insulation full thickness in two layers, or in multiple layers over entire surface to be insulated, cutting and fitting tightly around obstructions. Form cant strips, crickets, saddles, and tapered areas with additional material as shown and as required for proper drainage of membrane.
 - 1. Stagger joints in one direction for each course. For multiple layers, stagger joints in both directions between courses with no gaps, to form a complete thermal envelope.
 - 2. Provide tapered units to suit drainage pattern indicated.
- B. Do not install more insulation in a day than can be covered with membrane before end of day or before start of inclement weather.
- C. Secure roof insulation to substrate with mechanical anchors of type and spacing required by the system manufacturer but in no case provide less than one anchor per 4 sq. ft. of surface area or less anchorage than required by FM Loss Prevention Data Sheet 1-28.
- D. Set insulation units on substrate with mechanical fasteners or spot adhesives and cover immediately with loose membrane for ballasted installation.
- E. Provide protection sheet between insulation and membrane when recommended by membrane manufacturer.

3.3 INSTALLING MEMBRANE

- A. General: Start installation only in presence of manufacturer's technical representative.
 - 1. Cut out and repair membrane defects at the end of each day's work.
- B. Fully Adhered Membrane: Install membrane by unrolling over prepared substrate, lapping adjoining sheets as recommended by manufacturer. Apply adhesive to surfaces to be bonded and roll into place when adhesive has properly cured. Adhere seams with splicing tape and apply sealant to exposed sheet edges, tapering application as recommended by manufacturer. Install mechanical fasteners, flashings and counterflashings, and accessories at locations and as recommended by manufacturer.

1. Flashing details shall be done in accordance with the approved shop drawings. Base flashing shall be properly terminated and covered with counterflashing, providing not less than a 4 inch overlap.
2. Apply 6" wide strip of uncured EPDM to all field sheet seams which will underlie walkway.
3. Provide 6" x 6" patch strip over each metal edge strip joint, running strip up to top of cant.

C. Walkway Protection: Provide roof walkways at locations indicated, attaching and spacing according to roof membrane manufacturer's requirements.

D. Walkway Protection: Install paver units at locations shown and where required for access to roof-mounted equipment. Place protection boards carefully to avoid damage to membrane, laying over an additional layer of roof membrane material, loosely applied, for additional protection. Separate pavers by 50 mm (2 inch) to allow for flow of water.

3.4 PROTECTING ROOFING

A. After completing roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage found.

B. Repair or replace as required by the architect, deteriorated or defective work found at the time of final inspection to a condition free of damage and deterioration at the time of Substantial Completion and according to the requirements of the specified warranty.

END OF SECTION 07530