

SECTION 07540

THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Adhered system with thermoplastic roofing membrane.
- B. Insulation, flat and tapered.
- C. Flashings.
- D. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

- A. Section 07620 - Sheet Metal Flashing and Trim: Counterflashings, reglets,.
- B. Section 08620 - Unit Skylights: Skylight frame, integral curb, and counterflashing.

1.03 REFERENCE STANDARDS

- A. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2008.
- B. ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2008.
- C. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- D. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.
- E. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
 - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Specimen Warranty: For approval.
- D. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Tri-State Metals Company's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section:
 - 1. Approved by membrane manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

1.08 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 15 years after installation.
- C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1. Warranty Term: 15 years.
 - 2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Thermoplastic Polyolefin Membrane Materials:
 - 1. Carlisle SynTec: www.carlisle-syntec.com.
 - 2. Firestone Building Products Co: www.firestonebpc.com.
 - 3. GenFlex Roofing Systems: www.genflex.com.
- B. Insulation:
 - 1. Atlas Roofing Corporation: www.atlasroofing.com. ACFOAM roof insulation.
 - a. Flame Spread ASTM E84 (Full 10 min. Test) 40-60*
 - b. Smoke Developed ASTM E84 (Full 10 min test) 50-170*
 - c. *(Flame spread index 75 or less, smoke developed 450 or less meet code) Smoke development does not apply to roofing codes exempt foam, plastic insulation when used in roof deck constructions that comply as an assembly with FM4450, or UL 1256.
 - 2. Substitutions: See Section 01600 - Product Requirements.

2.02 ROOFING - UNBALLASTED APPLICATIONS

- A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered.
- B. Roofing Assembly Requirements:
 - 1. Roof Covering External Fire-Resistance Classification: UL Class A.
 - 2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.
 - 3. Insulation Thermal Value (R), minimum: R28; provide insulation of thickness required.
- C. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
 - 1. Minimum 2 layers of polyisocyanurate board.

2. Insulation must comply with ASTM C1289 STD. SPEC for faced rigid cellular Polyisocyanurate thermalInsulation Board 2001.
- D. Acceptable Insulation Types - Tapered Application: Any of the types specified.
1. Tapered extruded polystyrene board.
 2. Atlas roofing Corp Tapered foam ACFOAM II.
 3. Tapered closed cell HCFC free "Green" polyisocyanurate foam core manufacturing, using HCFC ACULTA HYDROCARBON blowing agent and integrally laminated to heavy asphaltic fiber-reinforced felt facers;FM I-90 wind uplift classification; compressive strength - 20 psi.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane:
 - 1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D6878.
 - 2. Reinforcing: Internal fabric.
 - 3. Thickness: 0.045 inch, minimum.
 - 4. Thickness: .060 inch, minimum.
 - 5. Sheet Width: Factory fabricated into largest sheets possible.
 - 6. Color: White.
 - 7. Roof Covering Class:
 - a. Membrane must comply with ASTM 6878 STD SPEC for Thermoplastic Polyolefin based sheet roofing. 2006a (TPO)
 - b. .60 TPO Membrane
 - c. Fully Adheared
 - d. Max slope 1/4"
 - e. CLASS A (Includes roof covering which are effective against SEVERE FIRE EXPOSURES).
 - f. Per UL Item: A.FA.#158
 - g.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane.

2.04 INSULATION

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type I, aluminum foil both faces; Class 1, non-reinforced foam core and with the following characteristics:
 - 1. Thermal Resistance: R-value of 12.1 each 2" thick layer.
 - 2. Manufacturers:
 - a. Atlas Roofing Corporation: www.atlasroofing.com. or architect approved equal product.

2.05 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: As specified in Section 07710.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- C. Membrane Adhesive: As recommended by membrane manufacturer.
- D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- E. Sealants: As recommended by membrane manufacturer.
- F. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Asphaltic with mineral granule surface.
 - 2. Surface Color: White or yellow.

PART 3 EXECUTION

3.01 INSTALLATION- GENERAL

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Do not apply roofing membrane during unsuitable weather.

- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.02 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.03 METAL DECK PREPARATION

- A. Install deck sheathing on metal deck:
 - 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.
 - a. Over entire roof area, fasten sheathing using 6 fasteners with washers per sheathing board.
 - b. At roof perimeter to a distance of 4 ft in from edges, fasten sheathing using 6 fasteners with washers per board.

3.04 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate at rate of ____ gal/square. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Install roofing expansion joints where indicated. Make joints watertight.
 - 1. Install prefabricated joint components in accordance with manufacturer's instructions.
- H. Coordinate installation of roof drains and sumps and related flashings.

3.05 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for field quality control and inspection.
- B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.06 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION