

SECTION 07540 - THERMOPLASTIC MEMBRANE ROOFING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Mechanically attached 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 06 1000 (06100) - Rough Carpentry: Wood nailers and curbs.
- B. Section 07 6200 (07620) - Sheet Metal Flashing and Trim: Counterflashings.
- C. Section 07 7200 (07720) - Roof Accessories: Roof-mounted units; prefabricated curbs.
- D. Section 22 1006 (15146) - Plumbing Piping Specialties: Roof drains.
- E. Section 26 4113 (13100) - Lightning Protection for Structures.

1.03 REFERENCE STANDARDS

- A. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2004.
- B. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2006.
- C. ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2003.
- D. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

1.04 SUBMITTALS

- A. See Section 01 3000 (01300) - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, 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. Warranty: Submit manufacturer warranty and ensure forms have been completed in Columbia Housing Authority Development's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section:
 1. Approved by membrane manufacturer.

1.06 PRE-INSTALLATION MEETING

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

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 01 7800 (01780) - Closeout Submittals, for additional warranty requirements.
- B. 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 Incorporated: www.carlisle-syntec.com.
 - 2. Firestone Building Products Co: www.firestonebpc.com.
 - 3. GenFlex Roofing Systems: www.genflex.com.
 - 4. Substitutions: See Section 01 6000 (01600) - Product Requirements.
- B. Insulation:
 - 1. Atlas Roofing Corporation: www.atlasroofing.com.
 - 2. GAF Materials Corporation: www.gaf.com.
 - 3. Dow Chemical Co: www.dow.com.
 - 4. Owens Corning Corp: www.owenscorning.com.
 - 5. Substitutions: See Section 01 6000 (01600) - Product Requirements.

2.02 ROOFING - UNBALLASTED APPLICATIONS

- A. Thermoplastic Membrane Roofing: One ply membrane, mechanically fastened, over insulation.
- B. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
 - 1. Minimum 2 layers of polyisocyanurate board.
 - 2. Bottom layer of polyisocyanurate board covered with single layer of polyisocyanurate board.
- C. Acceptable Insulation Types - Tapered Application: Any of the types specified.
 - 1. Tapered perlite or extruded polystyrene board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane:
 - 1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D 6878.
 - 2. Reinforcing: Internal fabric.
 - 3. Thickness: 0.045 inch (1.1 mm), minimum.
 - 4. Sheet Width: Factory fabricated into largest sheets possible.
 - 5. Color: White.

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- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Fasteners:
- D. Flexible Flashing Material: Same material as membrane.

2.04 INSULATION

- A. Perlite Board Insulation: Expanded perlite mineral aggregate, ASTM C 728, with the following characteristics:
 1. Tapered Board: Slope as indicated; minimum thickness 1/2 inch (13 mm); fabricate of fewest layers possible.
 2. Board Edges: Square.
 3. Thermal Resistance at 1/2 inch (13 mm) thickness: 1.4 (0.25).
 4. Substitutions: See Section 01 6000 (01600) - Product Requirements.
- B. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C 1289, Type I, aluminum foil both faces; Class 1, non-reinforced foam core and with the following characteristics:
 1. Compressive Strength: 16 psi (110 kPa)
 2. Board Size: 48 x 96 inch (1220 x 2440 mm).
 3. Board Thickness: 3 inch (76 mm).
 4. Board Edges: Square.
- C. Extruded Polystyrene Board Insulation: ASTM C 578, Type X; Extruded expanded polystyrene board with natural skin surfaces, with drainage channels one face; with the following characteristics:
 1. Tapered Board: Slope as indicated; minimum thickness 1/2 in (13 mm); fabricate of fewest layers possible.
 2. Board Edges: Square.
 3. Thermal Conductivity (k factor) at 25 degrees F (-3.9 degrees C): 0.18 (0.31) as determined by ASTM C 177.
 4. Compressive Resistance: 15 psi (104 kPa).
 5. Board Density: 1.3 lb/cu ft (21 kg/cu m).
 6. Water Absorption, maximum: 0.3 percent, volume.

2.05 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
 1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
- C. Membrane Adhesive: As recommended by membrane manufacturer.
- D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- E. Roofing Nails: Galvanized, hot dipped type, size and configuration as required to suit application.
- F. Sealants: As recommended by membrane manufacturer.
- G. Walkway Pads: Type as recommended by membrane manufacturer; 24" x 24" in size.

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 nailing strips are in place.

3.03 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. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- D. Mechanical Attachment: Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.
- E. At intersections with vertical surfaces:
 1. Extend membrane over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.
 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. At rake flashing and copings, extend membrane under flashing and to the outside face of the wall.
- G. Around roof penetrations, seal flanges and flashings with flexible flashing.
- H. Coordinate installation of roof drains and sumps and related flashings.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 (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.

3.05 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.

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- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 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

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