

SECTION 075423 - TPO ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Adhered thermoplastic polyolefin (TPO) roofing system.
 - 2. Roof insulation.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 4. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 - 5. Review temporary protection requirements for roofing system during and after installation.
 - 6. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For the following products:
 - 1. Sheet roofing, of color required.
 - 2. Walkway pads, of color required.

1.5 INFORMATIONAL SUBMITTALS

- A. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building Products; UltraPly™ or the following:
 - 1. Carlisle SynTec Incorporated; SureWeld.
- B. Source Limitations: Obtain components including roof insulation and fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- C. **Roofing System Design**: Tested by a qualified testing agency to resist the following uplift pressures:
 - 1. Corner Uplift Pressure: <Insert lbf/sq. ft. (kPa/sq. m)>.
 - 2. Perimeter Uplift Pressure: <Insert lbf/sq. ft. (kPa/sq. m)>.
 - 3. Field-of-Roof Uplift Pressure: <Insert lbf/sq. ft. (kPa/sq. m)>.
- D. **FM Global Listing**: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a built-up roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 1. **Fire/Windstorm Classification**: [Class 1A-60] [Class 1A-75] [Class 1A-90].
 - 2. Hail-Resistance Rating: MH.
- E. **Exterior Fire-Test Exposure**: ASTM E 108 or UL 790, [Class A] [Class B] [Class C]; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 TPO ROOFING

- A. Fabric-Reinforced TPO Sheet: ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible TPO sheet.
 - 1. Thickness: 80 mils (2.0 mm), nominal.
 - 2. Exposed Face Color: White.

2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils (1.4 mm) thick, minimum, of same color as TPO sheet.
- C. Bonding Adhesive: Manufacturer's standard.
- D. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- E. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 VAPOR RETARDER

- A. Self-Adhering-Sheet Vapor Retarder: ASTM D 1970, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil- (1.0-mm-) total thickness; maximum permeance rating of 0.02 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building Products; V-Force.

2.6 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
- B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (13 mm) thick, factory primed.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Corporation; Dens Deck Prime.

2.8 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.

PART 3 - EXECUTION

3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.2 VAPOR-RETARDER INSTALLATION

- A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 inches (90 mm) and 6 inches (150 mm), respectively. Seal laps by rolling.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.3 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- D. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Set each layer of insulation in insulation adhesive, firmly pressing and maintaining insulation in place.
- E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction.
 - 1. Adhere cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.4 ADHERED ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
- B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.
- E. Apply roofing with side laps shingled with slope of roof deck where possible.
- F. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- G. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.5 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars, unless otherwise indicated.

3.6 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.

- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.8 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION