

SECTION 07 52 16.12**HOT-MOPPED STYRENE-BUTADIENE-STYRENE
MODIFIED BITUMINOUS MEMBRANE ROOFING****PART 1 - GENERAL****1.1 DESCRIPTION**

- A. Work Included: Supply and install modified bitumen membrane roofing with protective covering, base flashings, cant strips and counter flashings where indicated on Drawings, as specified herein, and as needed for a complete and proper installation.
 - 1. Modified Bitumen Roofing System: Four-ply hot mopped bitumen mineral surfaced roofing system.
- B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to the Owner's administrative requirements.
 - 1. Section 05 31 23: Steel Roof Decking.
 - 2. Section 06 10 00: Rough Carpentry.
 - 3. Section 07 21 16: Blanket Insulation.
 - 4. Section 07 61 13: Standing Seam Sheet Metal Roofing.
 - 5. Section 07 62 00: Sheet Metal Flashing and Trim.
 - 6. Section 07 72 33: Roof Hatches.
 - 7. Section 07 92 00: Joint Sealants.
 - 8. Section 22 00 00: Plumbing.

1.2 REFERENCES

- A. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
- B. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance near Ambient Temperature Using a Portable Solar Reflectometer.
- C. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- D. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing.
- E. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.

ADDENDUM 5

- F. ASTM D6083/D6083M - Standard Specification for Liquid-Applied Acrylic Coating Used in Roofing.
- G. ASTM D6162/D6162M - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- H. FM 1-28 - (Factory Mutual Insurance Company) Property Loss Prevention Data Sheet - Wind Design.
- I. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manuals.
- J. UL - (UL Solutions) Fire Hazard Classifications.

1.3 PERFORMANCE REQUIREMENTS

- A. Energy Performance: Provide roofing system with Solar Reflectance minimum of 0.70 when calculated according to ASTM C1549 and emissivity of at least 0.90 per ASTM C1371 based on testing identical products by a qualified testing agency.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced Installer ("Roofer") to perform modified bitumen roofing work who has specialized in the installation of work similar to that required for this Project and who is approved by system manufacturer.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with five (5) years documented experience.
- C. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.
- D. Perform work in accordance with NRCA Roofing Manual, NRCA Waterproofing Manual, and manufacturer's instructions. Maintain one copy of each document on Site.
- E. Mechanical and electrical subcontractors shall coordinate their work with roofing subcontractor. Flashing, counter-flashing and through-roof penetration flashing shall be performed by roofing subcontractor in accordance with manufacturer's recommendations.
- F. Workmanship Liability: Information or assistance provided by the Owner's Inspector does not relieve the roofing installer of strict compliance with Specifications, Drawings and roofing material manufacturer's requirements.
- G. Notify Owner's Inspector 72 hours prior to starting roofing installation and each time work is to be performed.

1.5 SUBMITTALS

- A. Comply with pertinent provisions of the Owner's administrative requirements.
- B. Shop Drawings: Indicate setting plan for layout of seams, direction of laps, base flashing details.
- C. Product Data:
 - 1. Membrane materials, base flashing materials, and protective coating.
 - 2. Cool Roof Rating Council rating stamp for the material of this Section.
 - 3. Product data highlighting the emissivity rating of the material of this Section when tested in accordance with ASTM C1371.
- D. Verification Samples: Provide for each product specified.
- E. Manufacturer's Installation Instructions.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Field Reports: Submit under provisions of the Owner's administrative requirements.
- H. Prior to roofing system installation, provide a copy of the Guarantee Application Confirmation document issued by roofing system manufacturer indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.
- I. Provide an Asphalt Confirmation Number (ACN) that indicates that the asphalt was registered with the approved asphalt source.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements.
- B. UL Listing: Class A Fire Hazard Classification.
- C. FM Listing: Roof Assembly Classification Class 1 Construction, wind uplift requirement of 1-90, in accordance with FM 1-28.

1.7 PRE-INSTALLATION CONFERENCE

- A. Approximately two weeks prior to scheduled commencement of modified bitumen roofing installation and associated work, meet at Project site to review Specifications and to walk deck.
- B. Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work

(including mechanical work if any), Architect, Owner's Inspector, Contractor and others directly concerned with performance of the work are to be in attendance.

- C. Review installation procedures and coordination required with related work.

1.8 PRODUCT HANDLING

- A. Comply with pertinent provisions of the Owner's administrative requirements.
- B. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- C. Store products in weather protected environment, clear of ground and moisture.
- D. Stand roll materials on end.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Asphalt temperature should be at the Equiviscous Temperature of $\pm 25^{\circ}$ F, at the point of application.
- B. Do not apply roofing membrane to damp or frozen deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- D. Temporary Roofing: When adverse job conditions or weather conditions prevent permanent roofing and associated work from being installed in accordance with requirements, and Contractor determines that roofing cannot be delayed because of need for job progress or protection of other work, proceed with installation of temporary roofing. Engage roofing Installer to provide temporary roofing and to remove it prior to proceeding with permanent roofing work.

1.10 WARRANTY

- A. Manufacturer's Warranty: Submit executed copy of roofing manufacturer's No Dollar Limit Roofing System Guarantee, signed by an authorized representative of the modified bitumen roofing system manufacturer, on a form that is acceptable to the Owner, for not less than twenty (20) years after date of Substantial Completion.
 - 1. Single-source special guarantee includes roofing plies, base flashings, liquid applied flashing, roofing membrane accessories, and other approved single-source components of roofing system marketed by the manufacturer.
- B. Installer's Warranty: Submit two (2) executed copies of the Installer's two (2)-year warranty on a form acceptable to the Owner, covering work of this Section, including all components of roofing system, signed and countersigned by Installer (Roofer) and Contractor.

1.11 EXTRA MATERIALS

- A. Provide an additional 20 lineal feet of installed roof walkway for Owner's use in roof maintenance.
- B. Furnish extra materials packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Johns Manville.
- B. GAF Materials Corporation.

2.2 MATERIALS

- A. Membrane Roofing System: Johns Manville 4CND-HA-CR or equal by GAF.
- B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft.
- C. Base Felt: ASTM D4601, Type II, asphalt-impregnated and coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides, Johns Manville PermaPly 28 or equal by GAF, 1 layer.
- D. Intermediate Felts: Asphalt-coated fiberglass ply felt, Johns Manville GlasPly Premier or equal by GAF, 2 layers.
- E. Cap Sheet: Johns Manville DynaKap FR T1 CR G or equal by GAF, bearing a Cool Roof Rating Council rating label and achieving an emissivity of at least 0.9 per ASTM C1371 testing procedure. Fire-resistant, premium, fiberglass/polyester composite reinforced, SBS (Styrene-Butadiene-Styrene) modified bitumen cool roof cap sheet, 1 layer, conforming to ASTM D6162, Type I, Grade G.
- F. Asphalt: Trumbull asphalt or another manufacturer approved asphalt.
 - 1. Up to 1/2" incline per foot, 190° F, Type III, Steep, 69 pounds total weight, conforming to ASTM D312.
 - 2. 1/2" to 3" incline per foot, 220° F, Type IV, Special Steep, 69 pounds total weight, conforming to ASTM D312.
- G. Asphalt Primer: ASTM D41, Type II. JM Asphalt Primer or equal by GAF.
- H. Base Flashings: Elastomeric, modified bitumen flashing sheet incorporating a flexible fiber glass and polyester composite mat in a blend of SBS (Styrene-Butadiene-Styrene) rubber and asphalt. DynaFlex CR G by Johns Manville, or equal by GAF.

- I. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitch bonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. PermaFlash System by Johns Manville, or equal by GAF.
- J. Sealants: Refer to Section 07 92 00.
- K. Traffic Pads: Bituminous composition type, Johns Manville DynaTred Roof Walkway or equal by GAF, 32" x 32" size, color as selected by Architect.
- L. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.3 REFLECTIVE COATING

- A. Elastomeric Coating: ASTM D6083. A multipurpose, acrylic elastomeric coating. TopGard 4000 or equal by GAF.
- B. Base Coat: One-part acrylic elastomeric with bleed-blocking properties for coating over asphalt surfaces. TopGard Base Coat or equal by GAF.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secured, and verify adjacent roof members do not vary more than 1/4 inch in height.
- C. Verify deck surfaces are dry and free of snow or ice.
- D. Confirm dry deck by moisture meter with 12 percent moisture maximum.
- E. Verify roof openings, curbs, pipes, conduit, sleeves, ducts, and vents through roof are solidly set, and wood cant strips, wood nailing strips and reglets are in place.

3.2 SHEATHING PAPER INSTALLATION

- A. Over wood board decks, one ply of sheathing paper must be used under the base felt, next to the deck.
- B. Loosely lay sheathing paper in a single layer over all wood deck areas, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively.
- C. Seal side and end laps with tape.

ADDENDUM 5

3.3 MEMBRANE APPLICATION

- A. Apply base felt, intermediate felts and cap sheet in accordance with manufacturer's instructions.
- B. On roof decks with slopes up to 1/2" per foot, the roofing felts and modified bitumen sheets may be installed either perpendicular or parallel to the roof incline.
- C. Apply all felts so that they are firmly and uniformly set, without voids, into the hot asphalt. All felt edges shall be well sealed. The asphalt shall be applied just before the felt, at a nominal rate of 23 pounds per square. Asphalt temperature should be at the Equiviscous Temperature (EVT) of $\pm 25^{\circ}$ F at the point of application.
- D. For modified bitumen sheets, the asphalt temperature shall be at a minimum of 400°F when the sheet is set into it for maximizing the bonding of the modified bitumen sheet.
- E. Cap sheets must be allowed to relax in an unrolled position prior to installation.

3.4 FLASHINGS AND ACCESSORIES

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions.
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
- B. Secure to nailing strips and reglets at 4 inches oc.
- C. Seal flashings and flanges of items penetrating or protruding through the membrane.
- D. Coordinate installation of roof drains, curbs, and related flashings.
 - 1. Roof Drains: Flash drain using liquid applied flashing system. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.
 - a. Install stripping according to roofing system manufacturer's written instructions.
 - 2. Flash all penetrations using liquid applied flashing system.

3.5 COATING INSTALLATION

- A. Ensure that all surfaces are clean, dry and free of any dirt, grease, oil or other debris that may interfere with proper adhesion.

- B. Apply coating to roofing membrane and base flashings as recommended by the manufacturer. Apply in two coats allowing the first coat to completely dry before applying the second coat.

3.6 ROOF WALKWAY INSTALLATION

- A. Use same asphalt recommended for use with membrane application.
- B. Leave a minimum of 1" open spaces in all directions between walkway boards to provide for drainage of the roofing system.
- C. Ensure that all four corners of each piece are fully and firmly set prior to walking on the board.

3.7 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of the Owner's administrative requirements.
- B. Correct identified defects or irregularities.
- C. Upon completion of work, test for leaks by plugging the drains or damming areas and filling with three inches of water. Allow water to stand for 24 hours and inspect for leakage. Make necessary adjustments to stop leakage and retest until watertight.

3.8 CLEANING

- A. In areas where finished surfaces are soiled by work of this Section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- B. Repair or replace defaced or disfigured finishes caused by work of this Section.
- C. Waste Management: Refer to Owner's administrative requirements for recycling requirements.

3.9 PROTECTION

- A. Upon completion of roofing, institute appropriate procedures for surveillance and protection of roofing during remainder of construction period.
- B. Where traffic must continue over finished roof membrane, protect surfaces.
- C. Protect exposed roof terminations at parapets or other walls and curbs until permanent flashing is applied.
- D. At end of construction period, or at a time when remaining construction will in no way affect or endanger roofing, inspect roofing and prepare a written report, with a copy to the Architect, describing nature and extent of damage found.

ADDENDUM 5

- E. Repair or replace (as required) deteriorated or defective work found at time of above inspection to a condition free of damage and deterioration at time of Substantial Completion and in accordance with requirements of specified warranties.

3.10 FINAL INSPECTION

- A. Final inspection will be performed by the Owner's Inspector.

END OF SECTION

ADDENDUM 5

ADDENDUM 5