

SECTION 07105

WATERPROOFING MEMBRANE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prepare an entire concrete deck and the approach slabs, or specified structure joint areas for waterproofing membrane.
- B. Place waterproofing membrane.

1.2 REFERENCES

- A. ASTM C 578: Rigid, Cellular Polystyrene Thermal Insulation.
- B. ASTM D 5: Penetration of Bituminous Materials.
- C. ASTM D 36: Softening Point of Bitumen (Ring-and-Ball Apparatus).
- D. ASTM D 146: Sampling and Testing Bitumen - Saturated Felts and Woven Fabrics for Roofing and Waterproofing.
- E. ASTM D 882: Tensile Properties of Thin Plastic Sheeting.
- F. ASTM D 3236: Apparent Viscosity of Hot Melt Adhesives and Coating Materials.
- G. ASTM E 96: Water Vapor Transmission of Materials.
- H. ASTM E 154: Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
- I. Vermont DOT: Low Temperature Flexibility Test.

1.3 WEATHER LIMITATIONS

- A. Do not work during wet conditions or when the deck or ambient air temperatures are below 50 degrees F.

- B. Do not apply the membrane unless the deck is surface dry.

1.4 SCHEDULING

- A. Notify the Engineer at least 1 week before installing the membrane.

PART 2 PRODUCTS

2.1 HOT POURED POLYMER MEMBRANE

- A. Characteristics:
 - 1. Single Component Elastomeric Material
 - 2. Applied hot
 - 3. Spreadable to uniform thickness after cooling
 - 4. ASTM C 578
- B. Mechanical Properties:
 - 1. Penetration, Max: 100
 - 2. Pliability, at 10 degrees F: No cracks when bent 180 degrees over a 1 inch mandrel.

2.2 RUBBERIZED ASPHALT MEMBRANE

- A. Characteristics:
 - 1. Laminate Form
 - 2. Heat Resistant
 - 3. Self-adhesive surface protected by special release paper

B. Mechanical Properties:

Property	Method	Value
Thickness, inch min.		0.065
Permeance-Perms, grains/sq ft-hr-inhg	ASTM E 96, Method B	0.10
Tensile Strength, psi	ASTM D 882, (modified for 1 inch opening)	50
Elongation, percent	ASTM D 882, (modified for 1 inch opening)	75
Puncture Resistance (Mesh), lb	ASTM E 154	200
Pliability, at -15 degrees F	ASTM D 146	No cracks in mesh or rubberized asphalt when bent 180 degrees over a 1/4 inch mandrel

2.3 PATCHING CONCRETE

- A. Approved patching concrete from the Accepted Products Listing at <http://www.dot.utah.gov/res>.

2.4 FIBERGLASS MATTING

- A. Weight = 1.5 lbs/yd²

2.5 BINDER

- A. Compatible with the matting material and conforming to the following requirements:

Property	Method	Value
Penetration, 0.1 mm	ASTM D 5	40-82
Softening point, min.	ASTM D 36	155 degrees F
380 degrees F. viscosity, cps	ASTM D 3236	1000 - 1800
Low temperature flexibility, max.	Vermont DOT (modified)	0 degrees F

PART 3 EXECUTION

3.1 PREPARATION

- A. Concrete deck:
 - 1. Sandblast to remove asphalt and all other foreign material from the entire deck, approach slabs and sides of the parapet for a height of 4 inches above the concrete deck.
 - 2. Vacuum or use compressed air to remove all dust and loose material from the deck.
 - 3. Remove all sharp ridges and projections that could puncture the membrane.
 - 4. Patch holes or spalled areas in the concrete deck with patching concrete to provide a flat deck surface.

- B. Asphalt Surface: When membrane will be placed on an asphalt surface, apply a 1/2 inch layer of Hot Mix Asphalt as shown on the plans to provide a flat deck surface.

- C. Joints and Cracks: Bond a 12 inch wide strip of woven fiberglass reinforcing to the deck over cracks and joints greater than 3/16 inch wide using a compatible binder.

3.2 APPLY MEMBRANE

- A. Use either hot poured polymer membrane or rubberized asphalt membrane.

- B. Hot pour polymer membrane: Follow manufacturer's recommendations for application temperatures, equipment, and procedures.
 - 1. Primer: Apply primer according to the instructions of the membrane manufacturer, if required.
 - 2. Application Rate: Apply at a uniform rate to yield a minimum membrane thickness of 3/32 inch.
 - 3. Vertical Surfaces: Apply the membrane on existing vertical surfaces and curb faces to a height 1 inch above that required for the asphalt surfacing overlay without splattering.
 - 4. Defects: Repair membrane that exhibits pin holes surface blisters, crazing or cracking after cooling.

5. Protection: Protect the membrane from damage by using asphalt roofing felt (30 lbs/200 sq ft) when asphalt surfacing is not placed within 4 hours of placing waterproofing membrane. Observe the following characteristics and procedures when using the asphalt roofing felt:
 - a. Cover entire surface and lay dust side up.
 - b. Lay parallel to the centerline of the roadway with a minimum overlap of 4 inches between adjoining sections.
 - c. Bond overlap with suitable mastic or cement.
 - d. Place free of wrinkles, bubbles or other defects. Repair any placement defects.
 6. Traffic: Allow only necessary rubber tire vehicles on the membrane system.
 - a. Do not allow public traffic.
 - b. Maintain the roofing material in good condition until covered with pavement.
 7. Preparation for overlaying: Do not use a tack or prime coat on the top surface of the asphalt rolled roofing.
- C. Rubberized Asphalt Membrane: Follow membrane manufacturer's recommendations for application temperatures, equipment, and procedures.
1. Primer: Use primer furnished by the manufacturer of membrane material. Apply primer to all surfaces to be covered by the membrane according to the manufacturer's recommended procedure and application rate.
 2. Placement: Overlap prefabricated membrane strips a minimum of 4 inches. Place joints such that a shingling effect will be achieved in which water will drain effectively.
 3. Bonding: Use hand rollers or other satisfactory pressure apparatus on the membrane to assure firm and uniform contact with the primed surfaces. If necessary to assure a good seal at joints, an adhesive may be required or use a wide tipped torch to cause tackiness.
 4. Placement: Place the membrane on the vertical face of the concrete curb to the height of the finished overlay surfacing.
 5. Defects: Protect the entire membrane from developing wrinkles, air bubbles, or other placement defects. Patch any torn or cut areas and narrow overlaps using a satisfactory adhesive and a piece of membrane. Extend the patch at least 4 inches beyond any defect. Bond the patch firmly to the surface.
 6. Traffic: Allow only necessary rubber tire vehicles on the membrane. Do not allow public traffic. Maintain the membrane in good condition until covered with pavement.

7. Preparation for Overlaying: If required by the membrane manufacturer, apply a bond coat of an acceptable adhesive to the surface of the membrane.

3.3 ASPHALT SURFACING OVERLAY

- A. Place required surfacing after the membrane has cured according to manufacturer's recommendations. Deposit, spread, and roll asphalt material so the membrane will not be damaged.

END OF SECTION