

## 615 MEMBRANE WATERPROOFING

### 615.01 DESCRIPTION

Membrane waterproofing shall consist of furnishing all materials, labor, tools, and equipment necessary to apply two-ply or three-ply membrane waterproofing at the locations and to the areas shown in the contract documents and/or as specified herein.

### 615.02 MATERIALS

Materials for this work shall conform to [802.05](#). Asphalt materials, including primers, fabrics, and mop coats shall not be used in conjunction with coal tar materials.

### 615.03 CONSTRUCTION REQUIREMENTS.

(A) **GENERAL.** Membrane waterproofing shall not be applied until all provisions for curing concrete have been complied with and the surfaces have thoroughly dried, reasonably smooth and are free from projections or holes that might puncture the membrane.

The concrete surfaces shall be cleaned of all loose and foreign materials, concrete fins, and dirt, and shall be dry. The Chief Engineer may require the surfaces to be scrubbed with water and a stiff brush, after which the surfaces shall be allowed to become thoroughly dry before application of materials.

Membrane waterproofing shall not be done when the temperature is 35° F or lower, or in damp or wet weather.

The surfaces shall first be painted with a primer, either by spraying or brushing. The amount of the primer coat shall be not less than 1/8 gallon for each square yard of surface. The primer shall be applied so as to give a uniform coating. The primer coat shall be applied 24 hours in advance of applying any mop coats, and shall be allowed to become thoroughly dry before the first mopping is applied. The primer shall not be heated.

Asphalt shall be heated to a temperature between 300°F and 350°F and tar shall be heated to a temperature between 200°F and 250°F, with frequent stirring to avoid local overheating. The heating kettle shall be equipped with thermometers.

Mopping on concrete shall cover the surface so that no gray spots appear. Mopping on fabric shall be sufficiently heavy to completely conceal the weave.

On both vertical and horizontal surfaces, not less than 15 gallons of hot asphalt or hot tar shall be used for each 100 square feet of finished work. The work shall be so regulated that at the end of the day's work, all fabric that is laid shall have received the final mopping of asphalt or tar. Special care shall be taken at all laps to assure a thorough seal.

Strips of fabric of the width required shall be used to eliminate lapping of piles. All end laps shall be at least 12 inches.

Care shall be taken to confine all bituminous materials to the areas to be covered and special care shall be taken to prevent disfigurement of any other parts of the structure by dripping or spreading of the materials.

At the ends of the membrane and at any points where it is punctuated by such appurtenances as drains or pipes, suitable provisions shall be made to prevent water from getting between the waterproofing and the waterproofed surface.

- (B) JOINTS.** Membrane waterproofing shall be three-ply. The first layer or fabric shall be 1 foot wide, the second layer shall be 2 feet wide, and the third layer shall be 3 feet wide. All layers shall be placed symmetrically about the joint.

The surface shall be mopped for the entire width of strip and the first layer of fabric, placed immediately following the mopping, shall be carefully pressed into place to eliminate all air bubbles and obtain close conformity with the surface. The surface of the fabric shall be mopped and, in the same manner, the second and third layers of fabric shall be placed. The entire surface shall then be given a final mopping.

- (C) SURFACES.** In all cases, the waterproofing shall start at the low point on the surface to be waterproofed and proceed upward so that the water will run over and not against or along the laps.

Beginning at the low point on the surface, a section 2 inches wider than half the width of the cotton fabric being used, and for the full length of the surface, shall be mopped with hot asphalt or hot tar. Upon this hot mopping, a half-width of cotton fabric shall be placed and pressed into it to eliminate all air bubbles and obtain close conformity with the surface. The half width of cotton fabric and an adjacent section of the surface 2 inches wider than half the width of the fabric being used shall then be mopped. On this mopping shall be placed a full width of cotton fabric, completely covering the first or half-width strip and pressed into place as before. The second full width strip shall be placed on hot mopping in such a manner that it will lap the second previous or half-width strip by at least 2 inches. Thereafter, full widths of cotton fabric shall be placed on hot mopping in such a manner that each strip shall lap the second previous strip at least 2 inches until the entire surface is covered. All end laps shall be at least 12 inches. The entire surface shall then be given a final mopping of hot asphalt or hot tar.

There shall be no break in the membrane waterproofing at expansion joints. The waterproofing fabric shall be given a slight roll and pressed down in order to allow a small amount of movement.

The completed waterproofing shall be a firmly bonded membrane composed of 2 layers of fabric and 3 moppings of asphalt or tar. Under no circumstances shall 1 layer of fabric touch another layer at any point or touch the surface being waterproofed as each layer of fabric must be covered with a complete mopping of asphalt or tar. Backfilling shall not begin until the final mop coat is thoroughly hardened as directed by the Chief Engineer.

Care shall be taken to prevent injury to the finished membrane. Any damage that may occur shall be repaired by patching as approved by the Chief Engineer. Patches shall extend at least 12 inches beyond the outermost damaged portion and the second ply shall extend at least 3 inches beyond the first.

#### **615.04 MEASURE AND PAYMENT.**

The unit of measure of Membrane Waterproofing will be the square yard. The actual number of square yards of surface area of the concrete, steel, or masonry which is covered by the membrane waterproofing will be paid for at the contract unit price per square yard, which payment will include all labor, materials, tools, equipment and incidentals necessary to complete the work