

SECTION 07 12 00

BUILT-UP BITUMINOUS WATERPROOFING
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C208	(2012) Cellulosic Fiber Insulating Board
ASTM C726	(2012) Mineral Fiber Roof Insulation Board
ASTM D1327/D1327M	(2004e1; R 2012) Standard Specification for Bitumen-Saturated Woven Burlap Fabrics Used in Roofing and Waterproofing
ASTM D1668/D1668M	(1997a; R 2014; E 2014) Glass Fabrics (Woven and Treated) for Roofing and Waterproofing
ASTM D173/D173M	(2003; R 2011; E 2012) Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing
ASTM D2178/D2178M	(2014) Asphalt Glass Felt Used in Roofing and Waterproofing
ASTM D41/D41M	(2011) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D449/D449M	(2003; R 2014; E 2014) Asphalt Used in Dampproofing and Waterproofing
ASTM D4586/D4586M	(2007; E 2012; R 2012) Asphalt Roof Cement, Asbestos-Free
ASTM D517	(1998; R 2008) Asphalt Plank

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Protection board

Membrane fabric

Reinforcing Fabric

SD-06 Test Reports

Liquid asphalt

Submit certified laboratory reports on the results of tests performed on asphalt delivered to the construction site by bulk liquid asphalt tankers.

SD-08 Manufacturer's Instructions

Application

SD-11 Closeout Submittals

Asphalt shipment records

1.3 ENVIRONMENTAL CONDITIONS

Apply the primers and waterproofing specified herein when the ambient temperature is above 40 degrees F.

1.4 DELIVERY AND STORAGE

1.4.1 Packaged Materials

Deliver materials in bundles, rolls, and sealed containers bearing the manufacturer's original labels. Asphalt shall be protected from freezing in a weathertight enclosure. Store materials in an enclosed area free from contact with soil and weather, and maintain at not less than 50 degrees F for at least 24 hours before use. Reinforcement fabrics shall be protected from moisture damage and moisture absorption in a weathertight enclosure or shall be stored off the ground on pallets, and covered on top and all sides with breathable-type canvas tarpaulins. Plastic sheets cause condensation buildup and therefore shall not be used to cover waterproofing materials. If material is dated for use or shelf life is indicated on the labels, remove outdated material from the jobsite. Damaged or deteriorated materials shall be removed from project site.

PART 2 PRODUCTS

2.1 BITUMEN

Asphalt; ASTM D449/D449M, Type I.

2.2 BITUMINOUS PLASTIC CEMENT

ASTM D4586/D4586M, Type I for asphalt.

2.3 MEMBRANE FABRIC

The following requirements shall apply:

<u>Felt or Fabric Material</u>	<u>Saturant or Impregnant</u>	<u>Specification</u>
Glass (felt) mat	Asphalt	ASTM D2178/D2178M, Type III
Reinforcing glass fabric	Asphalt	ASTM D1668/D1668M, Type I
Reinforcing cotton fabric	Asphalt	ASTM D173/D173M
Reinforcing woven burlap fabric	Asphalt	ASTM D1327/D1327M

2.3.1 Cotton Fabrics

Cotton fabrics shall be woven entirely of cotton conforming with ASTM D173/D173M, thoroughly and uniformly saturated with asphalt.

2.3.2 Woven Burlap Fabrics

Woven burlap fabrics shall be composed of 100 percent jute fiber and two cotton threads at each selvage conforming with ASTM D1327/D1327M, thoroughly and uniformly saturated with asphalt. The fabric mesh shall not be completely closed or sealed by the process of saturation. Sufficient porosity shall be maintained to allow successive moppings of the plying asphalt to seep through. The surface shall not be coated or covered with talc or any other substances that will interfere with the adhesion between fabric and plying asphalt. The fabric surface shall be uniformly smooth and free of irregularities, folds and knots. The finished woven burlap fabrics shall be free of ragged edges, untrue edges, breaks or cracks, and other visible external defects.

2.4 NAILS

Galvanized roofing nails.

2.5 PRIMER

ASTM D41/D41M for asphalt.

2.6 PROTECTION BOARD

ASTM D517, plain, asphalt plank; ASTM C208, construction grade building board, 1/2 inch thick, asphalt saturated or coated; ASTM C726, 7/16 inch thick, covered on one side with waterproof paper or asphalt-saturated felt.

2.7 WOOD NAILERS

Specified in Section 06 10 00 ROUGH CARPENTRY.

PART 3 EXECUTION

3.1 INSPECTION OF SURFACES

Before starting the work, inspect all surfaces to be waterproofed to determine if in satisfactory condition. Check the location and setting of all embedded items. Place backing and blocking and perimeter framing for recessed items as required by the various trades on the project. Complete conduit, piping, and other required rough-in. Notify the Contracting Officer of serious defects or conditions that will prevent satisfactory

application. Start application after such defects and conditions have been corrected.

3.2 PREPARATION OF SURFACES

Surfaces to be treated shall be clean and dry, smooth and free from deleterious and excess materials and projections. Cut off or grind smooth high spots. Give surfaces to receive asphalt membrane waterproofing a priming coat of asphalt primer. Apply priming coat at a rate not less than **one gallon per 100 square feet**, covering the entire surface to be waterproofed. Allow primer to dry before applying waterproofing.

3.3 APPLICATION

Install waterproofing where indicated. Provide ventilation for enclosed spaces when using bituminous membrane waterproofing.

3.3.1 Protection of Surrounding Areas

Before starting the waterproofing work, the surrounding areas and surfaces shall be protected from spillage and migration of asphalt onto other work. Drains and conductors shall be protected from clogging with asphalt.

3.3.1.1 Fired Kettles

Melt kettles for bitumen shall not be closer than **25 feet** to buildings or combustible materials. Provide minimum of two **20 pound** ABC all-purpose type extinguishers at melting kettle and area of hot material application. Equip kettles with automatic thermostatic control capable of maintaining asphalt temperature. Controls shall be calibrated and maintained in working order for duration of work. Equip kettles with means of agitation to ensure controlled uniform temperature throughout contents to prevent spot heating. Do not heat contents above flash point.ext

3.3.1.2 Heating and Application of Bitumen Coatings

Heat solid bitumen in kettle, equipped with an automatic heating device or control unit for positive control of the specified temperature. Provide an accurate and clearly readable thermometer on all kettles. Bulk liquid asphalt may be heated using the heating equipment in the transport tanker vehicle or transferred to kettles and heated as specified for solid bitumen. Heat bitumen to flow freely but not above **375 degrees F**. Apply bitumen over the primer, between each ply and as a top coating at the rate of not less than **20 pounds** of asphalt per **100 square feet** of surface.

3.3.2 Membrane Waterproofing

3.3.2.1 Below-Grade Wall Waterproofing

Waterproofing for foundation walls shall consist of a 1-ply hot-applied asphalt membrane system. Fabrics shall be installed using the "shingle" method. Joints shall be caulked prior to primer applications. Primer shall be applied at a rate of **1/2 gallon per 100 square feet**. Fabrics shall be overlapped at ends and staggered a minimum **10 inch** for 1-ply system. End-to-end taping is not acceptable. Each fabric shall be firmly embedded into a solid uniform coating of hot asphalt at a rate of **20 lbs. per 100 square feet** lbs. per 100 square feet by pressing with broom. Fabrics shall not touch fabrics. Hot asphalt shall penetrate each fabric to provide the required adhesion. Asphalt between fabrics shall not be

excessive to prevent slippage. Waterproofing system consisting of two or more fabrics shall be provided with fabric reinforcement at corners, angles, over construction joints, and in locations where waterproofing fabrics are subject to unusual stress.

3.3.3 Fabric Membrane Reinforcement

Provide fabric membranes to reinforce felts at intersections. Provide reinforcement consisting of two plies of fabric membrane cemented in place and to each other with bituminous plastic cement not less than $1/16$ inch thick for each coating. At the intersection of slabs and vertical surfaces, extend the first ply at least 6 inches on the slab and 4 inches up the vertical surface. At intersections of two vertical surfaces, extend the first ply at least 10 inches on each side of the intersection. Place second ply to lap the first by not less than 2 inches.

3.3.4 Keyed Joint Footings

Provide membrane flashing, neatly formed, to the contours of keyed joints in foundation wall footings. Extend flashing to the outside edge of the footing, and turn the flashing down 4 inches. Continue the flashing through the joint to the inside of the walls and lap the flashing into the waterproofing membrane under the slab. Protect the flashing until it is lapped by the waterproofing membranes for the subsurface floor slabs and foundation walls. The flashing membrane shall be made up of the same number and type materials as the waterproofing membrane or a thermoplastic material compatible with the waterproofing materials, as recommended by the manufacturer.

3.3.5 Flashing Flanges

Prime flashing flanges of the sleeves of pipes and ducts penetrating the waterproofing membrane. Allow primer to dry. Strip flanges in with two fabric membrane collars cemented in place and to each other with bituminous plastic cement. Extend collars 4 and 6 inches, respectively, beyond the edge of the flanges, cover the flanges, and fit the flanges tight against the sleeve. Extend waterproofing connecting with work exposed to the weather back of same, or counter flash to form a watertight connection.

3.3.6 Clamping Devices

At floor drains and elsewhere, as indicated, extend membrane into clamping device set in heavy coating of bituminous plastic cement, and clamp securely.

3.3.7 Reglets

Install continuous reglets to receive the exposed edges of membrane waterproofing. After placement of waterproofing, completely fill reglets with bitumen.

3.4 FIELD TEST

3.4.1 Sampling and Testing of Bulk Liquid Asphalt

Notify the Contracting Officer one working day prior to the delivery date of asphalt. Take a minimum of one quart sample of each shipment of bulk liquid asphalt when the shipment arrives at the construction site. Obtain samples in the presence of the Contracting Officer using clean one-quart,

friction-lid cans. Label samples to indicate project contract number, location where used on project, and date and time of arrival of shipment from which sample is taken. Give samples to the Contracting Officer for safekeeping until picked up by the testing laboratory. The Contractor shall pay for the testing of the bulk liquid asphalt. Samples tested which are found not to be in conformance with specification requirements will constitute grounds for rejection. Remove and replace with new materials all waterproofing installed with asphalt from which the nonconforming samples were taken.

3.5 PROTECTIVE COVERING

3.5.1 Vertical Surfaces

Protect membrane waterproofing against which backfill is to be placed by providing protective covering pressed into the final mopping while the mopping of bitumen is still hot. Butt edges of protection board against adjacent edges of protection boards. Cover exposed surfaces with a coating of bitumen. Where surfaced fiberboard or mineral fiberboard is used, place surface side facing outward. Fit board around pipes and projections so as to cover the entire surface of the membrane waterproofing.

3.5.2 Horizontal Surfaces

Place protective covering over membrane immediately after application has thoroughly dried. Remove protective covering immediately before proceeding with work which will conceal the membrane waterproofing.

3.6 CLEAN-UP

Surfaces of other work which are stained with waterproofing materials shall be cleaned with a cleaner recommended by waterproofing manufacturer.

-- End of Section --