

SECTION 07 13 52
MODIFIED BITUMINOUS SHEET WATERPROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies modified bituminous sheet material used for exterior below grade waterproofing and split slab waterproofing.

1.2 MANUFACTURER AND INSTALLER QUALIFICATIONS

- A. Approval by Contracting Officer is required of products and services of proposed manufacturers, and installers, and will be based upon submission by Contractor that:
1. Manufacturer regularly and presently manufactures bituminous sheet waterproofing as one of its principal products.
 2. Installer has technical qualifications, experience, trained personnel and facilities to install specified items.
 3. Manufacturer's product submitted has been in satisfactory and efficient operation on three similar installations for at least three years.
 4. Primary components of system must be products of single source manufacturer, including primers, flashing, and mastics.
- B. Installer Qualifications: Must be a firm with at least three (3) years' experience in installing products required by this Section and approved by product manufacturer; submit list of installations, include name and location of project and name of owner.

1.3 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIREMENTS, for project requirements.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data: Include certification of data indicating VOC content of all components of waterproofing system.
1. Bituminous sheet.
 2. Primer.
 3. Mastic and detailing liquid membrane.
 4. Patching compound.
 5. Protection material, temporary and permanent.

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6. Printed installation instructions for conditions specified.

C. Certificates:

1. Indicating bituminous sheet waterproofing manufacturer's qualifications as specified.
2. Approval of installer by bituminous sheet manufacturers.
3. Water test report.

D. Samples: Provide two samples of sheet membrane waterproofing, minimum size 12" x 12", and two samples of protection board, minimum size 12" x 12". Provide any additional samples as requested by Architect/Engineer.

E. Project List: Installer shall provide list of completed waterproofing projects, complete with completion date and name and phone number for Senior Resident Engineer (SRE) and Architect/Engineer for each project.

1.5 PRE-INSTALLATION CONFERENCE

A. Convene a meeting on site, after submittals are received and approved but before any work, to review drawings and specifications, submittals, schedule, manufacturer instructions, site logistics and pertinent matters of coordination, temporary protection, governing regulations, tests and inspections; participants to include RE/COR and all parties whose work is effected or related to the work of this section.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job in manufacturer's original unopened container.
- B. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Ambient Surface and Material Temperature: Not less than 4 degrees C (40 degrees F), during application of waterproofing.

1.8 WARRANTY

A. Warrant bituminous sheet waterproofing installation against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period is two years.

1.9 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

B. American Society for Testing and Materials (ASTM):

C578-12b	Rigid, Cellular Polystyrene Thermal Insulation
C836/C836M-12	High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
D412-06a(2013)	Vulcanized Rubber and Thermoplastic Elastomers - Tension
D570-98(2010)e1	Water Absorption of Plastics
D882-12	Tensile Properties of Thin Plastic Sheeting
D903-98(2010)	Peel or Stripping Strength of Adhesive Bonds
D1876-08	Peel Resistance of Adhesives (T-Peel Test)
D1970/D1970M-11	Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
D3767-03(2008)	Rubber - Measurements of Dimensions
D5385-93(2006)	Hydrostatic Pressure Resistance of Waterproofing Membranes
D5957-98(2013)	Flood Testing Horizontal Waterproofing Installations
E96/E96M-12	Water Vapor Transmission of Materials
E154/E154M-08a(2013)e1	Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

C. American Hardboard Association (AHA):

A135.4-2012	Basic Hardboard
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1.10 QUALITY ASSURANCE

- A. Manufacturer: Obtain waterproofing materials and accessories required for installation from single manufacturer. Items not provided by manufacturer shall be approved for use with waterproofing installation by manufacturer of primary materials.
- B. Installer: Firm shall have minimum of five waterproofing projects with requirements similar to those of this project. Waterproofing projects shall have satisfactory in-service performance.

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1.11 PROJECT CONDITIONS

- A. Substrate: Proceed with work after substrate construction has been completed.
- B. Weather: Proceed with waterproofing and associated work only when existing and forecasted weather conditions permit work performance in accord with manufacturer's recommendations and warranty requirements.

PART 2 - PRODUCTS

2.1 BITUMINOUS SHEET

- A. A self-adhesive, cold-applied composite sheet consisting of a minimum thickness of 1.4 mm (0.056 in.) of rubberized asphalt and 0.1 mm (0.004 in.) of cross-laminated, high density polyethylene file. Provide rubberized asphalt membrane covered with a release sheet, which is removed during installation; no special adhesive or heat required to form laps.
- B. Physical Properties for Membrane:

Property	Test Method	Typical Value
Color		Dark gray-black
Thickness	ASTM D3767 Method A	1.5 mm (0.060 in.) nominal
Flexibility, 180° bend over 25 mm (1 in.) mandrel at - 43°C (-45°F)	ASTM D1970/D1970M	Unaffected
Tensile Strength, Membrane Die C	ASTM D412 Modified ¹	2240 kPa (325 lbs/in. ²) minimum
Tensile Strength, Film	ASTM D882 Modified ¹	34.5 MPa (5,000 lbs/in. ²) minimum
Elongation, Ultimate Failure of Rubberized Asphalt	ASTM D412 Modified ¹	300% minimum
Crack Cycling at - 32°C (-25°F), 100 Cycles	ASTM C836/C836M	Unaffected
Lap Adhesion at Minimum Application Temperature	ASTM D1876 Modified ²	700 N/m (4 lbs/in.) - Bituthene 3000 880 N/m (5 lbs/in.) - Low Temp
Peel Strength	ASTM D903 Modified ³	1576 N/m (9 lbs/in.)
Puncture Resistance, Membrane	ASTM E154/E154M	222 N (50 lbs) minimum
Resistance to	ASTM D5385	60 m (200 ft) of

Property	Test Method	Typical Value
Hydrostatic Head		water
Permeance	ASTM E96/E96M, Section 12 - Water Method	2.9 ng/m ² sPa (0.05 perms) maximum
Water Absorption	ASTM D570	0.1% maximum

2.2 PRIMER

- A. Furnished by manufacturer of bituminous sheet as required for particular application in accordance with sheet manufacturer's instructions.

2.3 PROTECTION MATERIAL

- A. Prefabricated Drainage Composite: Drainage composite furnished by manufacturer of bituminous sheet as required for particular application in accordance with sheet manufacturer's instructions. Select composite design that promotes positive drainage while serving as a protection course.

2.4 PATCHING COMPOUND

- A. Waterstop for non-moving concrete construction joints and applicable penetration details as indicated by the manufacturer of sheet membrane waterproofing.

2.5 MISCELLANEOUS MATERIALS

- A. Mastic, liquid membrane, tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Condition:
1. Before applying waterproofing materials, ensure concrete and masonry surfaces are fully cured, smooth, clean, dry, and free from high spots, depressions, loose and foreign particles and other deterrents to adhesion.
 2. Masonry Substrates: Apply waterproofing over concrete block and brick with smooth trowel-cut mortar joints or parge coat.
 3. Fill voids, joints, and cracks with patching compound.
- B. Concrete surfaces cured a minimum of seven days, free from release agents, concrete curing agents, and other contaminants.

3.2 APPLICATION

- A. Priming:
1. Prime concrete and masonry surfaces.

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2. Application method, amount of primer and condition or primer before installation of bituminous sheet as recommended by primer manufacturer.
3. Reprime when required in accordance with manufacturer's instructions.

B. Bituminous Sheet Installation:

1. Remove release sheet prior to application.
2. Lay bituminous sheet from low point to high point so that laps shed water.
3. Treat expansion, construction and control joints and evident working cracks as expansion joints. Apply bituminous sheet in double thickness over joint by first applying a strip of bituminous sheet not less than 229 mm (9 inches) wide, centered over joint.
4. Lap seams not less than 63.5 mm (2-1/2 inches).
5. Lay succeeding sheet with laps, and roll into place.
6. Repair misaligned or inadequately lapped seams in accordance with manufacturer's instructions.
7. Seal seams and terminations in accordance with sheet manufacturer's instructions.

C. Corner Treatment:

1. At inside and outside corners apply double cover using an initial strip not less than 280 mm (11 inches) wide, centered along axis of corner.
2. Cover each strip completely by the regular application of bituminous sheet.
3. Provide a fillet or cant of detailing liquid membrane on inside corners; vertical and horizontal.
4. Do not use wood, fiber, patching compound, and insulating materials for cants.

D. Projection Treatment:

1. Refer to manufacturer's literature for recommendations on detailing projections, penetrations and drains.

3.3 PROTECTION

- A. Protect bituminous sheet before backfill or wearing courses are placed.
- B. Install protection material and hold in place in accordance with instructions of manufacturer of waterproofing materials.
- C. Permanent Protection:
 1. Vertical Surfaces:

- a. Install prefabricated drainage composite.
 - b. Extend protection full height from footing to top of backfill covering all exposed waterproofing.
- D. Horizontal Surfaces:
- 1. Install prefabricated drainage composite under earth backfill.
 - 2. Where no concrete wearing course occurs or when surfaces will bear heavy traffic and will not immediately be covered with a wearing course, use protection specified for vertical surfaces.
- E. Temporary Protection:
- 1. When waterproofing materials are subjected to damage by sunlight and cannot be immediately protected as specified, protect waterproofing materials by waterproof building paper or suitable coating approved by manufacturer of waterproofing system used.

3.4 PATCHING

- A. Repair tears, punctures, air blisters, and inadequately lapped seams, in accordance with manufacturer's instructions before protection course is applied.

3.5 TESTING HORIZONTAL APPLICATIONS

- A. Before any protection or wearing course is applied, test all horizontal applications of waterproofing with a minimum of 50 mm (2 inch) head of water above highest point and leave for a minimum of 24 hours and a maximum of 72 hours. Flood test to be conducted as per ASTM D5957.
- B. Mark leaks and repair when waterproofing is dry.
- C. Certify, to RE/COR, that water tests have been made and that areas tested were found watertight.

3.6 INSPECTION

- A. Do not cover waterproofed surfaces by other materials or backfill until work is approved by RE/COR.

3.7 CLEANING AND PROTECTION

- A. After completion, remove any masking materials and stains from exposed surfaces caused by waterproofing installation.
- B. Provide for protection of completed membrane during installation of other materials or processes over membrane and throughout remainder of construction period. Do not allow material of any type on and/or against unprotected membrane.

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