

SECTION 07130

SHEET MEMBRANE WATERPROOFING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the sheet membrane waterproofing as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:
 - 1. Continuous system: Sheet membrane waterproofing as shown on the drawings for underslab conditions tie into the vertical system to provide a “bathtub” effect”.
 - 2. Sheet membrane waterproofing, for foundation vertical surfaces.

1.3 RELATED SECTIONS

- A. Earthwork - Section 02300.
- B. Concrete - Section 03300.

1.4 SUBMITTALS

- A. Shop Drawings: Submit project specific typical installation details, showing details at flashings, at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in membrane system.
- B. Samples - Submit
 - 1. Membrane, 150 mm x 150 mm samples.
 - 2. 150 mm x 150 mm sample of flashing.
 - 3. 150 mm x 150 mm sample of protection board.
 - 4. 150 mm x 150 mm sample of drainage board.
- C. Manufacturer's literature: Submit manufacturer's technical, safety data sheets, and installation literature for all materials of this Section. Submit Independent Test data indicating that membrane meets properties specified herein.
- D. General Contractor's Certification: Submit per Article 1.7.

1.5 STORAGE OF MATERIALS

- A. All materials shall be stored in their original tightly sealed containers or unopened packages; shall be clearly labeled with the manufacturer's name, brand name and number, and batch number of the material with expiration date where appropriate.
- B. Materials shall be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.
- C. Material shall be stored out of the weather in a clean, dry area.
- D. Liquid materials, such as adhesives, thinners and primers, shall be stored in areas away from sparks, open flames and excessive heat.

1.6 JOB CONDITIONS

- A. No application of liquid applied urethane flashing shall commence or proceed during inclement weather, or the threat of imminent precipitation.
- B. All surfaces to receive the system shall be thoroughly dry and free of sand or foreign material including moisture.
- C. Prior to and during application, all dirt and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air, or similar methods.
- D. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

1.7 WARRANTY

- A. The General Contractor shall jointly warrant with the manufacturer the waterproofing system executed under this Section to be watertight and free from defects in materials and workmanship for a period of ten (10) years from date of acceptance of this Contract, and that he, at his own expense, repair and/or replace all other work which may be damaged as a result of such defective work, and which becomes defective during the warranty period.

1.8 QUALITY ASSURANCE

- A. Preinstallation Conference: Approximately 2 weeks prior to scheduled commencement of waterproofing installation, meet at Project site with Waterproofing Installer; preparer of substrate to receive waterproofing; installers of other work in and around waterproofing that must precede, follow, or penetrate waterproofing (including Structural pertaining to rebars and related structural work, Mechanical and Electrical Installers as applicable); Architect, Project Manager, Owner, and waterproofing manufacturer's representative to review materials, procedures, schedules, and other requirements and conditions related to installing waterproofing.
- B. Qualifications of Subcontractors
 - 1. Subcontractors: All work of this Section shall be performed by a subcontractor who is approved by the manufacturer of the waterproofing material.

2. Qualifications of Subcontractors: Subcontractors shall submit evidence of being bona fide waterproofing subcontractors, and that they are approved by the manufacturer of the waterproofing material for the installation of the manufacturer's material in accordance with the requirements of this Section.
 - a. Subcontractor shall submit a letter from manufacturer of waterproofing material stating that subcontractor is approved by the manufacturer for the application of the waterproofing systems specified and accepted for use on the Project.
 - b. Letter shall certify that the subcontractor has previously and satisfactorily applied the waterproofing systems specified herein, under manufacture's supervision.
 - c. Letter shall be on manufacturer's letterhead and shall be signed by an officer of the company, not by a local sales representative.

C. Manufacturers Representative/Contractors Certification

1. Representative of the waterproofing material manufacturer shall be required to provide field instructions and supervision for the installation of the waterproofing systems at the start of the work of this Section.
2. The manufacturer's representative shall be required to make sure that the workmen for waterproofing systems on the site of the Project are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.
3. Upon completion of the Installation, submit to the Architect written certification that the representative of the manufacturer of the waterproofing material has supervised the work of this Section and that all materials were correctly installed.

1.9 PROTECTION

- A. Against Loads: Protect work of this Section against concentrated loads and any other loads or equipment that would damage the materials or work.
- B. Against Traffic: Do not permit traffic on horizontally installed work of this Section, except for workmen doing the work, during the installation, and after the installation until membrane systems are covered with protective boards or with the specified finishing materials.
- C. Against Damage: Protect vertically installed work of this section from damage by reinforcing and placement.
 1. Take and maintain necessary preventative measures to protect work of this Section from damage until Project is accepted.
 2. Rejection of Damaged Work
 - a. Damaged materials or work will be rejected.
 - b. Rejected materials or work must be immediately removed and replaced with new materials.

1.10 FIELD QUALITY CONTROL

- A. Construction Traffic:
 - 1. Limit construction traffic over completed membrane.
 - 2. General Contractor shall provide 12mm plywood protection layer, where construction traffic is unavoidable.
- B. Inform Architect in writing on a daily basis of any of the following events. State specific location of each occurrence.
 - 1. Buckling to the Waterproofing and other deformations as a result of ground water events.
 - 2. Leakage through the finished waterproofing installation.
 - 3. Damage by other trades.
- C. Provide Manufacturer Representative report (prior to backfill) stating that the waterproofing has been inspected and is acceptable.

PART 2 PRODUCTS

2.1 WATERPROOFING MEMBRANE

- A. At underslab conditions, provide adhesive coated HDPE Composite Sheet "Bituthene Preprufe 300R" system by W.R. Grace & Co. or approved equal.
- B. Provide if needed to suit construction sequence vertical waterproofing "Bituthene 8000" sheet waterproofing membrane, 1.5mm thick, and "Bituthene Liquid Membrane", 1.5mm, thick, for flashing, as manufactured by W.R. Grace or equal made by Mirafi.
- C. At blind side waterproof condition, provide adhesive coated HDPE Composite Sheet "Bituthene Preprufe 160R" system by W.R. Grace & Co. or approved equal.
- D. Bituthene Surface Conditioner: Latex/water based primer specifically formulated to provide adhesion of Bituthene Waterproofing Membranes.
- E. Bituthene Elastomeric Mastic: Rubberized asphalt base mastic.
- F. Bitustik Tape: Double sided synthetic adhesive tape.
- G. Bituthene Liquid Membrane: Two-component 100% solids trowel grade asphalt modified urethane.
- H. Drainage Mat: Preformed polystyrene dimpled drainage composite with integral woven polypropylene geotextile medium equal to "Hydroduct 650" by W.R. Grace. Provide vertical and horizontal system depending on loading requirements.
- I. Protection Board: 3mm thick asphaltic board equal to Servipak 3 by W.R. Grace.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where membrane waterproofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 PREPARATION OF SURFACES TO RECEIVE WATERPROOFING

- A. Conform to the requirements of Technical letters published by W.R. Grace.
- B. Mud slab shall be a even and sound substrate.

3.3 INSTALLATION

- A. General: Conform to recommendations and published specifications of the manufacturer' including environmental requirements.
- B. Foundation Walls (accessible depending on construction sequence)
 - 1. General: The membrane, when in place must withstand a minimum static ground water pressure of 45 m.
 - 2. Priming: Application of primer shall be limited to what can be covered with Bituthene Waterproofing Membrane in a given work day. Primed areas not covered by membrane during the work day will be reprimed. Apply primer by spray, roller or brush. Roller shall be natural material such as lamb's wool, having a nap of approximately one inch. Primer shall be applied to a clean, dry, dust-free surface. Sufficient primer must be used on the day surface to condition it to a dust-free state suitable for the application of Bituthene Waterproofing Membranes.
 - 3. Membrane Installation: Apply Bituthene Waterproofing Membrane vertically in sections of 2.5m in length or less. On higher walls apply two or more sections with the upper overlapping the lower by a least 60mm. Press all membrane in place with heavy hand pressure or rollers during application.
 - 4. Sealing Edges: Bituthene Waterproofing Membrane shall be applied over the edge of the slab or over the top of the foundation wall. If the membranes are terminated on the vertical surface, a reglet or counter flashing may be used or the membrane may be terminated directly on the vertical surface by pressing very firmly to the wall. Press edges with a metal or hardwood tool such as a hammer or knife handle. Apply a troweled bead of Bituthene Mastic to all vertical and horizontal terminations. Bituthene Liquid Membrane can be used as an alternative method at the General Contractor's option.
 - 5. Sealing Seams: All edges and end seams must be overlapped at least 60mm. Apply succeeding sheets with a minimum 60mm overlap and stagger end laps. Roll or press the entire membrane firmly and completely as soon as possible. Patch misaligned or inadequately lapped seams with Bituthene Membrane. Slit any fish mouths, overlap the flaps, and repair with a patch of Bituthene and press or roll in place. The edges of the patch shall be sealed with a troweling of

mastic. Laps within 300mm of all corners shall be sealed with a troweling of mastic.

6. Corner Forming: Outside corners must be free of sharp edges. Inside corners shall receive a fillet formed with Liquid Membrane, latex modified cement mortar equal to Daraweld C made by Grace mixed with cement mortar or epoxy mortar. Do not use fiber or wood cants. One of two methods may be used for treating corners at the General Contractor's option:
 - a. Apply Bituthene Liquid Membrane 150mm in each direction from the corner and form a fillet with a minimum 19mm face.
 - b. Install an 280mm minimum strip of Bituthene Membrane centered on the corner. Install Bituthene Membrane over the treated inside and outside corners.
7. Apply protection boards and drainage mat to all surfaces.

3.4 INSTALLATION OF BLINDSIDE AND UNDERSLAB WATERPROOFING

A. Wall Applications

1. Refer to manufacturer's literature for complete installation instructions but not limited to the following:
 - a. Apply Hydroduct Drainage Composite to a point 150mm below grade line. Fasten Hydroduct to the sheet piling system.
 - b. Apply membrane with the HDPE film facing the sheet piling. Remove the release liner and fasten membrane to Hydroduct drainage composite with large head nails or staples.
 - c. Apply succeeding sheets by overlapping the previous sheet 75mm along the uncoated edge of the membrane.
 - d. Overlap the ends of the membrane 75mm. Apply Preprufe Tape centered over the end lap and roll firmly. Remove release liner.
 - e. Concrete must be poured within 30 days of membrane application. Protect membrane until concrete pour.
 - f. If membrane ties into a vertical membrane, leave an additional 300mm flap of Preprufe membrane to tie into Bituthene membrane.

B. Horizontal Applications

1. Apply the membrane with the HDPE side facing the properly prepared substrate and the treated white coating surface facing the concrete to be poured. The membrane maybe installed at any convenient length. Apply succeeding sheets by overlapping previous sheets 75mm along the self adhesive edge of the membrane. Remove the silicone coated release liner covering the membrane and roll the side lap to assure a tight seal.

3.5 SEAM REINFORCEMENT

- A. Provide a 150mm strip of modified bituminous sheet membrane (Bituthene 8000) centered behind all laps.

- B. At locations where a selvage edge is not present and at end laps, lap sheets 150mm, apply a 3mm. thick by 150mm wide application of liquid membrane between sheets, to provide a 150mm wide seal.
- C. Integration of old onto new pre-applied sheet membrane.
 - 1. Integration of Sheet Membrane onto Sheet Membrane that has been installed in excess of 30 days prior
 - a. Lap sheets 300mm, apply a 3mm thick by 300mm wide application of fluid membrane between sheets, to provide a 300mm wide seal at this location.
 - b. Install Waterproofing Tape centered at edge of lap and roll firmly into place with an approved roller.
 - c. Install additional Waterproofing Tape to cover white film that has been installed over 30 days prior.
 - 2. Repair of pre-applied sheet membrane
 - a. Scratch on white coating exposing underlying black surfing of Sheet Membrane: Install Waterproofing Tape at areas where the white coating of the membrane is damaged, including boot scuff marks and abrasions by rebar.
 - b. Damage or Puncture of Sheet Membrane: Install Patch of short Membrane set in Liquid Membrane. Patch must extend 75mm in every direction around extent of damaged area. Install Waterproofing Tape centered over the edge of the patch. If the damaged area does not have 125mm of sound material around it, inject Liquid Membrane into puncture until Liquid Membrane backs out, and proceed with patch as space allows.

3.6 CLEAN-UP

- A. Upon completion of the waterproofing system, the General Contractor shall remove all equipment, material and debris from the work and storage area, and leave those areas in an undamaged and acceptable condition.

END OF SECTION