SECTION 071323

Pre-applied sheet membrane waterproofing

Preprufe 200

PART 1 — GENERAL

1.01 SUMMARY

A. The Work of this Section includes, but is not limited to, pre-applied sheet membrane waterproofing that forms an integral bond to poured concrete for the following applications:

1. Vertical Applications: Membrane applied against soil retention system prior to placement of concrete foundation walls;

2. Horizontal Applications: Membrane applied on prepared subbase prior to placement of concrete slabs.

B. Related sections include, but are not limited to, the following:

1. Section 031000 - Concrete Forming
2. Section 032000 - Concrete Reinforcing
3. Section 033000 – Cast-In-Place Concrete
4. Section 312000 – Earth Moving
5. Section 316200 - Driven Piles
6. Section 316400 - Caissons

NOTE TO SPECIFIER: *For vertical applications, coordinate with concrete formwork section to require one-sided wall forming system to minimize punctures to the sheet membrane waterproofing during formwork installation.*

1.02 SUBMITTALS

A. Submit manufacturer’s product data, installation instructions and membrane samples for approval.

1.03 REFERENCE STANDARDS

A. The following standards and publications are applicable to the extent referenced in the text.

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

C 836 Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course

D 412 Standard Test Methods for Rubber Properties in Tension

D 570 Standard Test Method for Water Absorption of Plastics

D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting

D 1876 Standard Test Method for Peel Release of Adhesives (T-Peel)

D 1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

D 3767 Standard Practice for Rubber - Measurements of Dimensions

D 5385 Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes

E 96 Standard Test Methods for Water Vapor Transmission of Materials

E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

1.04 QUALITY ASSURANCE

A. Manufacturer: Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.

B. Installer: A firm which has at least 3 years experience in work of the type required by this section.

C. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

E. Schedule Coordination: Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer’s instructions. Protect from damage from weather, excessive temperature and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

1.06 PROJECT CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.07 WARRANTY

A. Sheet Membrane Waterproofing: Provide written five year material warranty issued by the membrane manufacturer upon completion of work.

PART 2 — PRODUCTS

2.01 MATERIALS

A. Pre-applied Integrally Bonded Sheet Waterproofing Membrane: Preprufe® 200 Membrane by GCP Advanced Technologies Construction Products, a composite sheet membrane comprising 0.5 mm (0.020 in.) of high density polyethylene film, and layers of specially formulated synthetic adhesive layers. The membrane shall form an integral and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete. Provide membrane with the following physical properties:

PHYSICAL PROPERTIES FOR PREPRUFE 200 MEMBRANE:

|  |  |  |
| --- | --- | --- |
| Property | Test Method | Typical Value |
| Color |  | White |
| Film Thickness | ASTM D 3767 Method A | 0.5 mm (0.020 in.) nominal |
| Low Temperature Flexibility | ASTM D 1970 | Unaffected at -23°C (-10°F) |
| Elongation | ASTM D 412 Modified1 | >300% |
| Crack Cycling at -23°C (-10°F), 100 Cycles | ASTM C 836 | Unaffected |
| Tensile Strength, Film | ASTM D 412 | 27.6 MPa (4,000 lbs/in.2) minimum |
| Peel Adhesion to Concrete | ASTM D 903 Modified2 | 880 N/m (5.0 lbs/in.) |
| Resistance to Hydrostatic Head | ASTM D 5385 Modified3 | 10 m (30 ft) minimum |
| Puncture Resistance | ASTM E 154 | 600 N (135 lbs) minimum |
| Permeance | ASTM E 96 Method B | <0.6 ng/m2sPa (0.01 perms) |
| Water Absorption | ASTM D 570 | <0.5% |

**Footnotes:**

Elongation of membrane is run at a rate of 50 mm (2 in.) per minute.

Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 50 mm (2 in.) per minute at room temperature.

Hydrostatic head tests are performed by casting concrete against the membrane with a lap across a 1mm (0.040 in) crack.

B. Waterstop: AdcorTM ES hydrophilic non-bentonite waterstop by GCP Advanced Technologies Construction Products for non-moving concrete construction joints.

C. Miscellaneous Materials: Tape and other accessories specified or acceptable to manufacturer of pre-applied waterproofing membrane.

PART 3 — EXECUTION

3.01 EXECUTION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION, VERTICAL APPLICATIONS

A. Substrates shall be smooth and sound. Suitable substrates include Hydroduct® Drainage Composites by GCP Advanced Technologies Construction Products or plywood.

B. Strictly comply with installation instructions in manufacturer’s published literature, including but not limited to, the following:

1. Apply membrane with the HDPE film facing the prepared soil retention system (wood lagging, sheet piling, gunite, shotcrete, etc.). - Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the printed coated side facing towards the concrete pour. The membrane may be installed in any convenient length.
2. Secure the top of the membrane using a batten such as a termination bar or fixing 50mm (2 in.) below the top edge. Working downwards, fastenings should be made through the overlap area at maximum 0.5m (20 in) on center so that the membrane lays flat without openings. Immediately remove the plastic release liner.

3.03 INSTALLATION, HORIZONTAL APPLICATIONS

A. Earth and stone substrates shall be well compacted to produce an even, solid substrate. Remove loose aggregate or sharp protrusions. Concrete substrates shall be smooth or broom finished and monolithic. Fill gaps or voids greater than 13 mm (0.5 in.). Remove standing water prior to membrane applications.

B. Strictly comply with installation instructions in manufacturer’s published literature, including but not limited to, the following:

1. Apply membrane with the HDPE film facing the prepared substrate. Remove the release liner during application.
2. Accurately position succeeding sheets to overlap the previous sheet 75mm (3 in.) along the marked lap line. Ensure the membrane lays flat without any openings. End laps should be staggered to avoid a build up of layers.
3. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.
4. To prevent the membrane from moving and fishmouths opening, the laps should be fastened together at maximum 1.0m (39 in) on center. Fix through the center of the lap area using 12mm (0.5 in) long washer-head self-tapping screws or similar allowing the head of the screw to bed into the adhesive compound to self seal. It is not necessary to fix the membrane to the substrate, only to itself.
5. Ensure the membrane lays flat and no openings occur. Additional fastening may be required at corners, details etc.

3.04 PROTECTION

A. Protect membrane in accordance with manufacturer’s recommendations until placement of concrete. Inspect for damage just prior to placement of concrete and make repairs in accordance with manufacturer’s recommendations.