

## SECTION 07 14 00 – FLUID APPLIED WATERPROOFING SYSTEM

### PART 1: GENERAL

#### 1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 01 General Requirements, apply to the work of this section.

#### 1.2 SUMMARY

- A. The work of this section includes, but is not limited to, the following:
  - 1. Fluid applied waterproofing system.
- B. Composite membrane.
- C. Prefabricated drainage composite.
- D. Protection board.
- E. Insulation.
- F. System Description: The fluid applied composite sheet membrane waterproofing system shall consist of the following:
  - 1. Fluid Applied Membrane: A minimum thickness as per section 3.03 of a 2-component self-curing synthetic rubber waterproofing membrane.
  - 2. Composite Membrane: 3-layer reinforced composite membrane fully embedded into fluid-applied membrane with end laps and side laps taped with self-adhering waterproofing membrane.
  - 3. Accessories and Materials for complete waterproofing application.
- G. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
  - 1. Section 03 30 00 –Concrete Sidewalks.
  - 2. Section 04 20 00 – Unit Masonry.
  - 3. Section 07 62 00 – Sheet Metal Flashing and Trim.
  - 4. Section 07 92 00 – Joint Sealants.

#### 1.3 REFERENCE STANDARDS

- A. The following standards and publications are applicable to the extent referenced in the text. The most recent version of these standards is implied unless otherwise stated.
- B. American Society for Testing and Materials (ASTM).
  - 1. C 836 - Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
  - 2. C 898 - Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Separate Wearing Course.
  - 3. D 412 - Standard Test Methods for Rubber Properties in Tension.
  - 4. D 903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.

5. D 1644 - Test Methods for Nonvolatile Content of Varnishes.
6. D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
7. D 3767 - Standard Practice for Rubber - Measurements of Dimensions.
8. D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geo-membranes, and Related Products.
9. D 1709 - Standard Test Methods for Impact Resistance of Plastic Films by the Free Falling Dart Method.
10. D 882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
11. E 96 - Standard Test Method for Water Vapor Transmission of Materials.

#### 1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations.
- B. Shop drawings showing locations and extent of waterproofing including details for terminations and flashings, projections, penetrations, drains and treatment of substrate joints and cracks.
- C. Written documentation demonstrating the installer's qualifications under the "Quality Assurance" article including reference projects of a similar scope.
- D. Samples: Submit representative samples of the following for approval:
  1. Fluid applied membrane.
  2. Composite Membrane.
  3. Protection board.
  4. Prefabricated drainage composite.
  5. Insulation board.
- E. Warranty: Submit a sample warranty identifying the terms and conditions stated in Section 1.7.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer: Waterproofing systems shall be manufactured and marketed by a firm with a minimum of 20 years' experience in the production and sales of waterproofing. The fluid applied composite sheet membrane waterproofing system must be supplied by single manufacturer. 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 five years.
- B. Installer: The installer shall demonstrate qualifications to perform the work of this Section by submitting the following:
  1. Certification or written license from the Waterproofing Manufacturer that the Installer is a trained applicator.
  2. List of at least 3 projects contracted within the past 5 years of similar scope and complexity to this project.
  3. Installer must show evidence of adequate equipment and trained field personnel to successfully complete the project in a timely manner.

4. Installer's credentials must be approved by both the Architect and the Waterproofing Materials Manufacturer.
- C. Materials: Fluid applied composite sheet membrane waterproofing system shall be by single source manufacturer and shall consist of fluid applied waterproofing material, a 2-part synthetic rubber based system free of isocyanates and bitumen and a composite sheet, a 3-layer co-extruded bi-axially oriented HDPE integrally bonded to a non-woven geotextile. For each type of material required for the work of this section, provide primary materials that 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 the meeting shall include review of surface preparation, minimum curing period, installation procedures, special details and flashings, inspection, testing, protection and repair procedures.
- E. Inspection and Testing: All areas shall be water tested following application and be inspected an individual trained and approved by the waterproofing systems manufacturer.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in the original, unopened containers with seals unbroken, labeled with the manufacturer's name, product brand name and type, date of manufacture and directions for storage and use.
- B. Store and handle materials 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. Do not double-stack pallets of waterproofing on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
  2. Store drainage composite or protection board flat and off the ground. Provide cover on top and all sides.
  3. Protect waterproofing materials from freezing.
  4. Store composite membrane. The composite membrane should be stored off the ground and not stacked more than 12 rolls high. Provide cover for material to protect top and sides.
- C. Sequence deliveries to avoid delays, but minimize on-site storage.

#### 1.7 PROJECT CONDITIONS

- A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
- B. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive membrane waterproofing.
- C. Do not allow waste products (i.e. petroleum, grease, oil, solvents, vegetable or mineral oil, animal fat, acids, etc.) to come into contact with the waterproofing membrane. Any exposure to foreign materials or chemical discharges must be presented to the Membrane Manufacturer to determine the impact on the waterproofing assembly performance.
- D. Horizontal Application - Concrete Deck Surface condition:
  1. A minimum slope to drain of 11 mm/m (1/8"/ft.) shall be used on all concrete decks. This is best achieved with a monolithic structural slab and not with a separate concrete fill layer.

2. Ensure no excessive deflection or movement of the deck or other structural problems.
  3. The deck shall provide for support of the maximum anticipated dead and environmental loads and for expansion and contraction suitable for the roof system structure.
  4. All projections, penetrations and openings in the deck should be completed before the waterproofing application begins.
  5. Joints in pre-cast/pre-stressed concrete decks are to be grouted so that the top surface is level and smooth before membrane application.
- E. Deck/Wall Preparation: refer to Section 3.2 Substrate Preparation.
- F. General contractor shall assure adequate protection and ventilation during the application of the Waterproofing assembly.
- 1.8 WARRANTY
- A. Upon Project completion the contractor must submit a written warranty for the waterproofing materials signed by the Waterproofing Manufacturer.
  - B. Warranties available from the manufacturer. Please see manufacturer specific written warranty documents for specifics (Choose one):
    1. Material Warranty: Manufacturer's standard 10-year material warranty.
    2. Watertightness Warranty: Manufacturer's standard 15-year watertightness warranty.

## **PART 2: PRODUCTS**

### 2.1 MANUFACTURERS

#### **A. Grace Construction Products or approved equivalent.**

### 2.2 MATERIALS

- A. Fluid Applied Waterproofing Membranes: Procor® 75 fluid applied membrane by Grace Construction Products; a 2-part, self-curing, synthetic rubber based material.
- B. Composite Sheet Membrane: Procor Composite Membrane as supplied by Grace Construction Products, a 16-mil, cross-laminated, high-density polyethylene membrane.
- C. Prefabricated Drainage Composite [Edit to project requirements]: Hydroduct® 660 Drainage Composite by Grace Construction Products for horizontal surfaces. Hydroduct 220 Drainage Composite by Grace Construction Products for all vertical surfaces. Drainage composite shall be designed to promote positive drainage while serving as a protection course.
- D. Concrete Sealer (optional depending on substrate conditions): Procor Concrete Sealer by Grace Construction Products for concrete surfaces likely to produce outgassing during drying process.
- E. Composite Sheet Lap Sealing: Bituthene Low Temperature Membrane by Grace Construction Products, a 60 mil self-adhering waterproofing comprising 56 mils of rubberized asphalt integrally bonded to a 4 mil high density cross-laminated polyethylene film.
- F. Waterstop: Adcor™ ES hydrophilic non-bentonite waterstop by Grace Construction Products for non-moving concrete construction joints.
- G. Insulation [Edit to project requirements]: An extruded polystyrene rigid board insulation meeting the following requirements:

1. Minimum compressive strength, ASTM D1621, 40 or 60 psi (variance by product type).
  2. Maximum water absorption by volume per ASTM C272, 0.1%.
  3. Insulation shall have an R-value of 5.0 F.ft<sup>2</sup>.h/Btu/in. (0.88 K.m<sup>2</sup>/W) of thickness when tested at 75°F (23.9°C) mean temperature in accordance with ASTM C518.
  4. Product shall be free of CFCs.
- H. Miscellaneous Materials: Tape and other accessories specified or acceptable to manufacturer of fluid applied waterproofing membrane.

### **PART 3: EXECUTION**

#### **3.1 EXAMINATION**

- 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.

#### **3.2 PREPARATION OF SUBSTRATES**

- A. Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, and loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid applied waterproofing.
- B. Tie-holes and "bugholes" larger than 13 mm (½") in diameter or deeper than 3 mm (⅛"), or both, should be either pretreated with Procor or repaired with a lean concrete mix or with a lean concrete mix or grout. See ASTM D 5295, Preparation of Concrete Surfaces for Adhered Membrane Waterproofing Systems, for further details on substrate preparation.
- C. Cracked, pitted, honeycombed or heavily bugholed surfaces can be filled by spraying from close in (10" to 12") but high material usage with result. Under these circumstances it may be more efficient to fill the surface with a parge coat of lean mortar mix before application of the Procor. It is also acceptable to fill in gaps with a compatible sealant or caulk.
- D. Cast-In-Place Concrete Substrates:
1. For horizontal applications, poured in-place concrete must be cast with a minimum slope to drain of 11 mm/m (⅛"/ft.) and must be monolithic, smooth, and free of unapproved curing compounds, form release agents and other surface contaminants.
  2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
  3. Repair bugholes over 13 mm (0.5") in length and 6 mm (0.25") deep and finish flush with surrounding surface.
  4. Remove scaling to sound, unaffected concrete and repair exposed area.
  5. Grind irregular construction joints to suitable flush surface.
- E. Pre-cast Concrete Decks: All pre-cast units shall be mechanically fixed to minimize the potential for differential movement and all joints shall be grouted.
- F. Masonry Substrates: Apply waterproofing over concrete block and brick with smooth trowel-cut mortar joints or parge coat.

G. Substrate Cleaning:

1. Thoroughly sweep the substrate that is to receive the waterproofing membrane.
2. Substrate must also be blown using oil free air to remove any remaining loose debris.
3. A final check to determine if the substrate is sufficiently clean is to apply a test patch of membrane and check its adhesion.

3.3 INSTALLATION

A. Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:

1. Vertical Application Fluid Applied Membrane (Material Warranty Only):
  - a. Detailing: Apply a minimum thickness of 1.5 mm (60 mils) over all detail areas (including inside corners, outside corners, pipe penetrations, cracks, construction joints, etc) prior to application of the field of the membrane.
  - b. Apply a minimum thickness of 1.5 mm (60 mils) over all vertical areas to be waterproofed and lapping a minimum of 100mm (4") onto pre-treated detail areas. Perform wet film thickness tests as work progresses to confirm thickness.
2. Vertical Application Fluid Applied Membrane (Watertightness Warranty):
  - a. Detailing: Apply a minimum thickness of 1.5 mm (60 mils) over all detail areas (including inside corners, outside corners, pipe penetrations, cracks, construction joints, etc) prior to application of the field of the membrane.
  - b. Apply a minimum thickness of 2.3 mm (90 mils) over all vertical areas to be waterproofed and lapping a minimum of 100mm (4") onto pre-treated detail areas. Perform wet film thickness tests as work progresses to confirm thickness.
3. Horizontal Application Fluid Applied Membrane (Material Warranty Only):
  - a. Detailing: Apply a minimum thickness of 1.5 mm (60 mils), or as per manufacturer's drawings and written application instructions, over all detail areas (including inside corners, outside corners, pipe penetrations, cracks, construction joints, etc) prior to application of the field of the membrane
  - b. Apply a minimum thickness of 1.5 mm (60 mils) over all horizontal areas to be waterproofed and lapping a minimum of 100mm (4") onto detail areas. Perform wet film thickness tests as work progresses to confirm thickness.
4. Horizontal Application Fluid Applied Membrane (15 year Watertightness Warranty):
  - a. Detailing: Apply a minimum thickness of 1.5 mm (60 mils), or as per manufacturer's drawings and written application instructions, over all detail areas (including inside corners, outside corners, pipe penetrations, cracks, construction joints, etc) prior to application of the field of the membrane.
  - b. Apply a minimum thickness of 1.5 mm (60 mils) over all horizontal areas to be waterproofed and lapping a minimum of 100mm (4") onto detail areas. Perform wet film thickness tests as work progresses to confirm thickness.
  - c. Apply a second coat at a minimum thickness of 1.5 mm (60 mils) over first coat and completely covering all detail areas to give a minimum total thickness of 3.0 mm (120 mils) in the field and

4.5mm (180 mils) at detail areas. Perform wet film thickness tests as work progresses to confirm thickness.

5. Composite Sheet Membrane Application:

- a. Cut Procor Composite Sheet Membrane into manageable widths and lengths to achieve full horizontal coverage. Apply Procor Composite Sheet Membrane into wet or tacky Procor, geotextile side embedded into Procor. Apply pressure using a hand roller or broom to fully adhere Procor Composite Sheet Membrane for full contact into the Procor.
- b. Join adjacent sheets of Procor Composite Sheet Membrane by “butting” side laps.
- c. At side laps and end laps, adhere a 12” wide strip of Bituthene Low Temperature Membrane, using a roller to provide fully contact to Procor Composite Sheet Membrane. Overlap Bituthene strips minimum 2”; apply in manner to provide watershedding effect.
- d. Treat all edges of Bituthene Membrane with Liquid Membrane.

3.4 WATER TEST

- A. All areas of the deck must be water tested by means of electronic testing or ponding to a minimum depth of 50mm (2”) for a period of 24 hours to confirm the integrity of the membrane.
- B. Allow the membrane to cure for a minimum period of 48 hours before starting water tests.
- C. Before flood testing, be sure the structure will withstand the dead load of the water.
- D. For well-sloped decks, segment the flood test to avoid deep water near drains.
- E. Mark any leaks and repair according to manufacturers repair procedures when the membrane is dry.

3.5 CLEANING AND PROTECTION

1. Remove any masking materials after installation. Clean any stains on materials that would be exposed in the completed work.
2. A protection course should always be installed as soon as possible after completion of the waterproofing installation and flood testing to protect the membrane from mechanical damage and UV.
3. Install any protection, drainage and insulation courses according to the manufacturer's instructions.

END OF SECTION 07 14 00