SECTION 07135

SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install modified bituminous sheet waterproofing system where shown on the drawings, as specified herein, and as needed for a complete and proper installation.
   1. Waterproofing system installation shall provide leak free below-grade walls.

1.2 RELATED REQUIREMENTS

A. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Section 02620 “Subdrainage;” for drain mat and foundation drainage in non-hydrostatic installations.

C. Section 07215 “Thermal Insulation;” for protection board.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling: Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer but in no case left unprotected for more than 30 days.

B. Preinstallation Meetings: Coordinate preinstallation meeting prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this Work with related and adjacent Work. Verify that final waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations. Preinstallation meeting attendees shall include representatives for Stanford University and the Architect, inspection firm, Contractor, waterproofing contractor, concrete contractor, excavating/backfill contractor, and mechanical and electrical contractors if Work penetrates the waterproofing.

1.4 SUBMITTALS

A. Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section;
2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements;
3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
4. Manufacturer’s recommended installation procedures which, when approved by the Architect and Stanford University, will become the basis for accepting or rejecting actual installation procedures used on the Work.

B. Product Data: For each product indicated.

C. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

D. Samples: Submit representative samples of the following for approval:
   1. 12 inch x 12 inch minimum size sheet membrane

E. Certificates: Submit certificate(s) signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements. Submit certification that waterproofing system and components, drainage and protection materials are supplied by a single-source manufacturer.

F. Certificate: Submit written certification that installer has current Approved Applicator status with waterproofing material manufacturer

G. Sample Warranty: Submit project specific sample warranty by manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall meet or exceed the qualifications listed below and indicated elsewhere in the Contract Documents.
   1. 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.
2. Manufacturer shall be capable of providing field service representation during construction, approving an acceptable installer, recommending appropriate installation methods, and conducting a final inspection of the bentonite waterproofing and drainage system applied.

3. 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 20 projects of similar design and complexity completed within the past 5 years.

B. Installer Qualifications: Installer shall meet or exceed the qualifications listed below and indicated elsewhere in the Contract Documents.
   1. A firm which has at least (10) years experience in work of the type required by this Section, who can comply with manufacturer's warranty requirements.
   2. Installer must have been an authorized applicator of the specified materials for a minimum of 5 years.
   3. Installer shall adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section

C. Materials: For each type of material required for the Work of this Section, provide materials which are the products of one manufacturer. For products indicated that are not manufactured by the sheet waterproofing manufacturer, provide products approved by the sheet waterproofing manufacturer.

D. Mockups: Before beginning installation, install waterproofing to 100 square feet of wall to demonstrate surface preparation, crack and joint treatment, corner treatment, and execution quality.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver the materials to the job site in the manufacturer’s unopened containers with all labels intact and legible at time of use.

B. Store and handle in strict compliance with manufacturer’s instructions, recommendations and material safety data sheets.

C. Maintain the products in a dry condition during delivery, storage, handling, installation, and concealment.

D. Protect from damage from sunlight, weather, excessive temperatures and construction operations.
E. Remove damaged material from the site and dispose of in accordance with applicable regulations.

F. 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 waterproofing.

1.8 WARRANTY

A. Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of membrane roofing system including components that fail in materials within specified warranty period.

1. Provide written 10 year material, labor, and leak repair warranty issued by the membrane manufacturer upon completion of work.

B. Installer's Warranty: Installer's warranty against all leaks in the waterproofing system in which Installer agrees to repair or replace waterproofing system that does not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

   a. Warranty shall provide for crack injection repairs for leakage that occurs during the warranty period at no additional cost to the Owner.

   b. Warranty includes removing and reinstalling protection board, drainage panels, and other overburden at no additional cost to the Owner.

   c. Warranty shall state that the waterproofing system shall remain watertight for the entire warranty period and that the contractor will make timely leak repairs upon notification.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Basis-of-Design: Subject to compliance with requirements, provide Bituthene System 4000 Membrane by Grace Construction Products or one of the products listed below.
   2. Pecora Corporation; Duramon 700-SM.
   3. American Hydrotech, Inc; VM 75.

B. Self-adhering Sheet Waterproofing: Self-adhesive, cold-applied composite sheet consisting of a thickness of 0.056 inch of rubberized asphalt and 0.004 inch of cross-laminated, high density polyethylene film specially formulated for use with surface treatment.
   1. Provide rubberized asphalt membrane covered with a release sheet which is removed during installation. No special adhesive or heat shall be required to form laps.

C. Self-Adhering Sheet Waterproofing Criteria:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Typical Value</th>
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<tbody>
<tr>
<td>Color</td>
<td></td>
<td>Dark gray-black</td>
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<tr>
<td>Thickness</td>
<td>ASTM D 3767 Method A</td>
<td>1.5 mm (0.060 in.) nominal</td>
</tr>
<tr>
<td>Flexibility, 180° bend over 25 mm (1 in.) mandrel at -43°C (-45°F)</td>
<td>ASTM D 1970</td>
<td>Unaffected</td>
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<tr>
<td>Tensile Strength, Membrane Die C</td>
<td>ASTM D 412 Modified¹</td>
<td>2240 kPa (325 lbs/in.²)</td>
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<tr>
<td>Tensile Strength, Film</td>
<td>ASTM D 882 Modified¹</td>
<td>34.5 MPa (5,000 lbs/in.²)</td>
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<tr>
<td>Elongation, Ultimate Failure of Rubberized Asphalt</td>
<td>ASTM D 412 Modified¹</td>
<td>300% minimum</td>
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<tr>
<td>Crack Cycling at -32°C (-25°F), 100 Cycles</td>
<td>ASTM C 836</td>
<td>Unaffected</td>
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<tr>
<td>Lap Adhesion at Minimum Application Temperature</td>
<td>ASTM D 1876 Modified²</td>
<td>880 N/m (5 lbs/in.)</td>
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<tr>
<td>Peel Strength</td>
<td>ASTM D 903 Modified¹</td>
<td>1576 N/m (9 lbs/in.)</td>
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<tr>
<td>Puncture Resistance, Membrane</td>
<td>ASTM E 154</td>
<td>222 N (50 lbs) minimum</td>
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<tr>
<td>Resistance to Hydrostatic Head</td>
<td>ASTM D 5385</td>
<td>70 m (231 ft) of water</td>
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Permeance

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<tr>
<th>Permeance</th>
<th>ASTM E 96, Section 12 – Water Method</th>
<th>2.9 ng/m²sPa (0.05 perms) maximum</th>
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<tr>
<td>Water Absorption</td>
<td>ASTM D 570</td>
<td>0.1% maximum</td>
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1. The test is run at a rate of 50 mm (2 in.) per minute.
2. The test is conducted 15 minutes after the lap is formed and run at a rate of 50 mm (2 in.) per minute at -4°C (25°F).
3. The 180° peel strength is run at a rate of 300 mm (12 in.) per minute.

D. Primer: Liquid [waterborne] [solvent-borne] primer recommended for substrate by sheet-waterproofing material manufacturer.

E. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.

F. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
   1. Compatibility: Bituthene; cured silicone and polyurethane sealants.

G. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

H. Termination Bar: Minimum 1 inch wide by 1/8 inch thick stainless steel bar with holes pre-punched at 3-inches on center for fastening.

I. Fasteners:
   1. Drive Pin Fasteners: Stainless steel drive pin fasteners with threaded pins. Subject to compliance with requirements, provide Zamac Hammer Screw by Powers Fasteners or approved equal.
   2. All other miscellaneous fasteners shall be stainless steel.

J. Miscellaneous Materials: Surface conditioner, mastic, tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing. Provide accessory products indicated in the Contract Documents and as required by the manufacturer for a complete and watertight installation.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed 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, 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 which are acceptable to manufacturer of sheet membrane waterproofing.

B. Cast-In-Place Concrete Substrates:
   1. Do not proceed with installation until concrete has properly cured and dried (minimum 7 days for normal structural concrete and minimum 14 days for lightweight structural concrete).
   2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
   3. Repair "bugholes" over 1/2-inch length and 1/4-inch 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.

C. Treat joints and install flashing as recommended by waterproofing manufacturer.

D. Changes in Plane: Treat all changes in plane with a 2-inch wide cant of Liquid Membrane. The membrane may not be wrapped around 90 degree inside corners.

3.3 SELF-ADHERING SHEET WATERPROOFING INSTALLATION

A. Comply with Contract Documents and manufacturer's written instructions and recommendations.

B. Apply surface treatment at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.
C. Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.

D. Seal daily terminations with troweled bead of mastic.

E. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 4-inch minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

F. Apply self-adhering sheet waterproofing in two layers, with staggered laps. Install first layer with running length oriented horizontally, and second layer with running length oriented vertically.

G. Seal exposed edges of sheets at terminations not concealed by metal counter flashings or ending in reglets with mastic.

H. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.

I. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing where applicable.

J. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6-inches beyond repaired areas in all directions.

K. At the end of work each day, cover all exposed membrane laps with liquid membrane. Cover all exposed laps in the outer membrane surface with liquid membrane.

L. Install drainage mat over waterproofing membrane immediately.

M. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

3.4 AT GRADE TERMINATIONS

A. All at-grade terminations shall be terminated using a stainless steel termination bar secured at 6-inches on center with drive pin fasteners.

B. Cover and encase the termination bar and exposed membrane edge in liquid membrane then cover with a 9-inch wide strip of self-adhering sheet waterproofing.
3.5 CLEANING AND PROTECTION

A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.

B. Protect completed membrane waterproofing and accessory products from subsequent construction activities as recommended by manufacturer.

C. Provide third party observation and documentation of backfill operations to confirm the waterproofing system is not damaged during concealment.

D. Protect from rain, strong winds, high temperatures and freezing for 48 hours minimum after application.

END OF SECTION