

SECTION 07141
Lava-Liner, Ltd.
COLD FLUID-APPLIED WATERPROOFING
SLAB-ON-GRADE WATERPROOFING UNDER SLAB

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LAVA-LINER, LTD.
SECTION 07141

COLD FLUID-APPLIED WATERPROOFING
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PART 1 GENERAL

1.1 SECTION INCLUDES

- 1.1.a Waterproofing membrane, sheet flashing and accessories, including:
- 1.1.b Geomembrane protection course.
- 1.1.c Drainage panels.
- 1.1.d Substrate preparation.

1.2 RELATED SECTIONS

- 1.2.a Section 02620 - Sub drainage: Foundation drainage piping, filter fabric, and drainage fill.
- 1.2.b Section 03300 - Cast-In-Place Concrete: Concrete placement, curing, and finishing.
- 1.2.c Section 03371 - Shotcrete.
- 1.2.d Section 03411 - Structural Precast Concrete: Precast concrete members and placement.
- 1.2.e Section 05810 - Expansion Joint Cover Assemblies.
- 1.2.f Section 06150 - Wood Decking: Plywood decks.
- 1.2.g Section 07900 - Joint Sealers.

1.3 REFERENCES

- 1.3.a ASTM C 836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2000.
- 1.3.b ASTM C 898 - Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Separate Wearing Course; 2001.
- 1.3.c ASTM D 543 - Standard Test Methods for Resistance of Plastics to Chemical Reagents.
- 1.3.d ASTM D 751 - Standard Test Methods for Coated Fabrics; 2000.
- 1.3.e ASTM D 3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method; 1987.
- 1.3.f ASTM D 4258 - Standard Practice for Surface Cleaning Concrete for Coating; 1983 (Reapproved 1999).
- 1.3.g ASTM E 96 Test Method for Water Vapor Transmission of Materials. (Permeability) May be substituted by WSDOT Test Method No. 411 Method of Test for Water Absorption and Moisture Vapor Transmission.
- 1.3.h ASTM D412-98a(2002)e1 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

- 1.3.i ASTM D4541-93, “Pull-Off Strength of Coatings Using Portable Adhesion Testers

1.4 SUBMITTALS

- 1.4.a Product Data: For each type of waterproofing specified submit manufacturer’s printed technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.
- 1.4.b Shop Drawings: Drawings prepared for this project, showing locations and extent of waterproofing, details for substrate joints and cracks, sheet flashing, penetrations, and termination conditions.
- 1.4.c As-Build-Drawings: Where shop drawings are not provided, the installer shall provide pre-installation drawings indicating locations and extent of waterproofing, details for substrate joints and cracks, sheet flashing, penetrations, and termination conditions and shall provide final drawings indicating the true extent of finished work prior to acceptance by the general contractor..
- 1.4.d Samples: Submit two samples of each of the following:
 - 1.4.d.i Waterproof membrane material.
 - 1.4.d.ii Geomembrane material (reinforcing fabric imbedded in waterproof membrane).
 - 1.4.d.iii Joint reinforcing strip.
 - 1.4.d.iv Installer Certification: Certificate signed by manufacturer certifying installer qualifications.

1.5 QUALITY ASSURANCE

- 1.5.a Installer Qualifications: Engage an experienced Installer who is certified in writing and approved by waterproofing manufacturer for the installation of the specified waterproofing system.
- 1.5.b Mock-Up: (If Required.)
 - 1.5.b.i Apply waterproofing system to 100 square feet (9.3 sq m) of surface to demonstrate surface preparation, joint and crack treatment, thickness, texture, and standard of workmanship.
 - 1.5.b.ii Notify Architect one week in advance of the dates and times when mock-up will be prepared. If Architect determines that mock-up does not meet requirements, reapply waterproofing until mock-up is approved.
 - 1.5.b.iii Retain and maintain approved mock-up during construction in undisturbed condition as standard for judging completed waterproofing. Undamaged mock-up may become part of the completed work.
- 1.5.c Pre-installation Meeting: Hold a pre-installation meeting prior to application of waterproofing system to ensure proper substrate and installation conditions; require attendance of contractor and applicator; invite Architect and special inspector, if any.

1.6 DELIVERY, STORAGE, AND HANDLING

- 1.6.a Deliver materials to site labeled with manufacturer's name, product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components.
- 1.6.b Store materials as required by waterproofing manufacturer in clean, dry, protected location and within temperature range required by waterproofing manufacturer. Protect stored materials from direct sunlight.
- 1.6.c Remove and replace material that cannot be applied within its stated shelf life.

1.7 PROJECT CONDITIONS

- 1.7.a Protect adjacent areas not to be waterproofed. Where necessary, apply masking to prevent staining of surfaces to remain exposed wherever membrane abuts to other finish surfaces.
- 1.7.b Perform work only when existing and forecast weather conditions are within manufacturer's recommendations for material and application method used; minimum ambient temperature is 45°F (7°C).

1.8 WARRANTY

- 1.8.a Provide written limited warranty signed by waterproofing manufacturer and installer agreeing to repair or replace waterproofing that does not meet requirements or that does not remain watertight within the specified warranty period.
- 1.8.b Warranty Period: 10 years after date of Substantial Completion.
- 1.8.c Warranty does not include failure of waterproofing due to failure of substrate or formation of new joints and cracks in substrate that exceed 1/8 inch (3.2 mm) in width.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- 2.1.a Waterproof Membrane: ULTRA-FLEX ECO 5000, Lava-Liner, Ltd. located at 98 Main Street, PMB 418, Tiburon, CA 94920 Ph. 415-829-9114, Fax 415-829-9203 Email info@lava-liner.com ; Web: www.Lava-Liner.com .
- 2.1.b Reinforcing Fabric: May be obtained from either of the following manufacturers:
 - 2.1.b.i Article 27417, Jaeger (Gebruder Jaeger GmbH), Lahsienstrassa 51a. D42369, Wuppertal Germany; Phone: 0114920224656049-0-202-246-560; Fax 011492022465639; Email Sales@jaeger-ttc.de; Web: www.jaeger-ttc.de
 - 2.1.b.ii Tietex T272, Tietex International, Ltd., 3010 N. Blackstock Rd., Spartanburg, SC 29301, USA, +1-800-843-8390, info@tietex.com ; Web: www.tietex.com;
- 2.1.c Drainage Protection Board: Enkadrain 3811R, Colbond, Inc. P. O. Box 1057, 1301 Sand Hill Rd., Enka, NC 28728 Web: www.colbond-usa.com;
- 2.1.d Requests for substitutions will be considered in accordance with provisions of Section 01600

2.2 WATERPROOFING SYSTEMS

- 2.2.a General: Lava-Liner, LTD.'s ULTRA-FLEX ECO 5000, 2 component liquid applied impermeable waterproofing system that prevents the

passage of liquid water under hydrostatic pressure and that comply with specified physical requirements as demonstrated by testing performed by independent testing agency on manufacturer's current waterproofing formulations and system design; use materials specified below.

- 2.2.b Slab-On-Grade Waterproofing Under Slab: Use specified materials as assembled below:
- 2.2.c Sub base: Sand over rough grade to smooth surface with no penetrations.
- 2.2.d First Course: Tack coat of ULTRA-FLEX ECO 5000 into which a reinforcing fabric shall be laid over lapping edges by at least 6" with the following properties:
 - 2.2.d.i Burst Strength >21 psi
 - 2.2.d.ii Tensile of Coated Material >3,000 psi
- 2.2.e Second Course: ULTRA-FLEX ECO 5000 – a Type 1, cold applied elastomeric membrane (ASTM D 6153-93) more particularly described as a plural component, asphalt extended polyurethane composed of a prepolymer, Part A and an activator, Part B. ULTRA-FLEX ECO 5000 is a cold applied, liquid urethane. It cures to form a tough, durable, seamless, water impermeable barrier with the following properties:
 - 2.2.e.i Spray, roller, brush or squeegee applied.
 - 2.2.e.ii Applied dry thickness: 80 mils min
 - 2.2.e.iii Tensile Strength: > 1,320 psi
 - 2.2.e.iv Water vapor transmission rate: 0.020
 - 2.2.e.v Hydrostatic pressure: 64 psi
 - 2.2.e.vi Adhesion to concrete: > 350 psi or greater.
 - 2.2.e.vii Temperature Flexibility: maintains flexibility to -10 °F and operating temperatures up to 150°F.
 - 2.2.e.viii Hardness – shore A: 70-75
 - 2.2.e.ix Softening Point >300°F
- 2.2.f Drainage Course: Install Enkadrain 3811R in accordance with manufacturer's specifications over cured membrane.
- 2.2.g Finish Course: Concrete slab as indicated in drawings.

PART 3 EXECUTION

3.1 EXAMINATION

- 3.1.a Examine substrates, areas, and conditions under which waterproofing systems will be applied, with Installer present, for compliance with requirements. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- 3.2.a Clean and prepare substrate according to manufacturer's recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.
- 3.2.b Mask off adjoining surfaces not receiving waterproofing to prevent spillage or over spray affecting other construction.
- 3.2.c Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.

- 3.2.d Remove grease, oil, form release agents, paints, and other penetrating contaminants from concrete.
- 3.2.e Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, grout joints, tie holes, and other voids with joint detailing mastic, hydraulic cement, or rapid-set grout.
- 3.2.f Prepare and treat vertical and horizontal 90 degree terminations, edge terminations, penetrations through waterproofing material, expansion joints, cracks, drains, and sleeves and manufacturer's recommendations.
- 3.2.g At each area to be treated, apply a tack coat of ULTRA-FLEX ECO 5000 at least 3 inches to each side of the joint. Embed joint reinforcing strip into the tack coat and apply second coat entirely covering the embedded joint reinforcing strip ensuring complete saturation.
- 3.2.h 90 Degree Terminations, Vertical and Horizontal: apply a tack coat at least 6 inches (150 mm) on each surface horizontal as well as vertical. Embed a 9 or 12 inch reinforcing strip into the tack coat and apply second coat entirely covering the embedded joint reinforcing strip ensuring complete saturation. Fabric shall extend up vertical surfaces for at least 6 inches and 3 inches on horizontal surfaces.
- 3.2.i Penetrations, Drains, Sleeves: 3 inches (75 mm) radius around penetration and 3 inches (75 mm) onto penetrating object.
- 3.2.j Joints and Cracks: 6 inches (150 mm) wide on each side of joint/crack. Remove dust and dirt from joints and cracks in accordance with ASTM D 4258 prior to coating surfaces. Joints and Cracks Greater Than 1/16 inch (1.5 mm) In Width: Prior to applying joint detailing mastic, rout out joint/crack, install backer-rod and sealant to bring flush to surface.
- 3.2.k Secure and protect plumbing, electrical, mechanical and structural items to be under or passing through waterproof membrane prior to membrane application.
- 3.2.l When it is not possible to install waterproofing before placement of reinforcing steel, exposed reinforcing steel shall be masked by General Contractor prior to membrane application.

3.3 WATERPROOFING APPLICATION

- 3.3.a Mix and apply materials in accordance with manufacturer's instructions.
- 3.3.b Do not start waterproofing installation until manufacturer's technical representative is present.
- 3.3.c Apply waterproofing to surfaces according to manufacturer's recommendations and details and as indicated in Contract Documents and manufacturer's industrial applications manual. .
- 3.3.d Apply waterproofing by spray, unless otherwise indicated, achieving a seamless membrane free of entrapped gases.
- 3.3.e If clearance from surfaces is less than 24 inches (610 mm), making spray application difficult, roller application is acceptable.
- 3.3.f Spray Application: Apply one spray coat to achieve full specified thickness.

- 3.3.g Brush, Squeegee or Roller Application: Apply minimum of two coats to achieve full specified thickness.
 - 3.3.h Overlap geomembrane course seams and treat over lap as recommended by manufacturer and secure with specified tape; attach geomembrane to sheet flashing as recommended by manufacturer.
 - 3.3.i Verify thickness of membrane using a lightly oiled, needle nose depth gauge, taking two readings every 100 square feet (25 mm square area in every meter square area). Record the minimum reading. Mark test areas for repair if minimum reading is below minimum specified thickness.
 - 3.3.j Patch deficient test areas with additional waterproofing to achieve specified minimum dry thickness, extending minimum of 1 inch (25 mm) beyond the test perimeter.
- 3.4 CURING, PROTECTING, AND CLEANING
- 3.4.a Cure waterproofing according to manufacturer's recommendations, taking care to prevent contamination and damage during application stages and curing.
 - 3.4.b Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION