

SECTION 071416 – COLD FLUID-APPLIED WATERPROOFING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes but is not limited to the installation of a reinforced (2-ply) cold fluid-applied polymer modified waterproofing with all the materials, labor and supervision necessary to provide a continuous waterproofing system below grade.

1.2 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. 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.
- C. Product test reports shall yield the following results:
 - 1. Liquid Adhesive applied at the rate of two gallons per square (100 sq. ft.) yields the following test results.
 - a. ASTM D-529-82, Weathering Daily Cycle B. No cracking or crazing. No slump. Turns a slight gray color.
 - b. Hardness: Attains a Shore Hardness of 60 max.
 - c. Ductility; ASTM D-113-79; at 1 cm per minute (39.2oF=4oC) 125% elongation min.
 - d. Wind up-lift pull=150 lbs. using test apparatus.
 - e. Water permeability; ASTM E-96-80; 0.005 perms/hr/sq.ft.
 - f. Dry Film Thickness: 9 mils per gallon per 100 sq.ft. min.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's products. Installer is responsible for inspecting project for all relevant field conditions prior to installation. Conditions noted by installer are to be corrected prior to installation of the waterproofing system. Commencement of installation indicates acceptance of substrate conditions by the contractor.
- B. Preinstallation Conference: Conduct conference at Project site.



1. Preinstallation conference shall include but not be limited to the following attendees.
 - a. Building Owner or Owner's authorized representative
 - b. Architect / Engineer / Consultant
 - c. Waterproofing Contractor
 - d. Manufacturer's authorized technical representative
 - e. General Contractor, and any other trades having impact on the waterproofing system.

1.4 STORAGE

- A. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life. Protect stored materials from direct sunlight.
- C. Boxes containing the Waterproofing Sheet must be stored flat at all times, approximately 5 boxes high, on pallets or other means to keep off the ground.
- D. If indoor or trailer storage is not available, tarp in with canvas tarpaulins only.
- E. DO NOT USE POLYETHYLENE OR OTHER NON-BREATHING FILMS TO COVER THE BOXES.
- F. Remove rolls of Waterproofing Sheet from boxes when ready to use. Do not discard boxes for restoring of any unused or partial rolls.
- G. Store in cool places only. If trailer storage is used, it should be well ventilated for summer storage and 600F (maximum) or winter storage.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a contaminated, soiled and unclean surface or a substrate with standing water, frost or ice. Surface dampness is acceptable provided no standing water is present.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer and installer, and agreeing to repair or replace waterproofing that does not comply with requirements or that does not remain watertight for a period of **XX** years after date of Substantial Completion.



PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Single-Component, reinforced cold fluid applied rubber modified asphalt waterproofing:
 - a. Laureco Waterproofing System, as manufactured by FBC Chemical Corp.

2.2 WATERPROOFING MATERIALS

- A. Cold Fluid-Applied Waterproofing: Comply with ASTM C 836.
- B. Primer: NA
- C. Adhesive: Specially formulated Asphalt modified with compatible polymers using long fibers and clean aliphatic solvent.
 - 1. Compatible polymers are combinations of Neoprene, Butyl and/or N.B.R.
 - 2. Solid Content 55% min.
 - 3. Meets or exceeds ASTM D-2823, Type 1 and Federal Specification SS-A-694D.
 - 4. Using ASTM Test Method D-1004-70, Tensile Strength shall be 1070 p.s.i. average; using Tear Die C 77lbs. per inch average of sheets and adhesive.
- D. Sheet Flashing and Reinforcing Sheet: 50-mil-(1.3 mm) minimum, proprietary chloroprene rubber.
 - 1. Specially formulated Asphalt modified with Chloroprene Rubber (Neoprene*) plus appropriate fillers, curing agents and plasticizer.
 - 2. Thickness of waterproofing sheet is 50 mils. plus or minus 5%.
 - 3. Tensile strength of waterproofing sheet = 75 lbf/in. Min. (ASTM D 146-90, section 13) and (ASTM E 154-99, section 9). Two Ply Waterproofing System > 180 lbf/in.
 - 4. Puncture resistance of waterproofing sheet = 215 lbs. (ASTM E 154-99, section 10). Two Ply Waterproofing System > 450 lbs.
 - 5. Ductility of Modified Asphalt for use on waterproofing sheet: (ASTM D-113-69) at 39.2 degree F. using 1cm. per min. pull-10% to 12.5% plus, at 75 degree F. using 5 cm. per min. pull = 100% to 125% plus.
 - 6. Softening point of modified asphalt used on waterproofing sheet: (ASTM D 36-70 using distilled water) = 160° degree F. min.
 - 7. Penetration of Modified Asphalt used on waterproofing sheet: (ASTM D 5-73) = 30 max. at 77 degree F. using 3 oz. seamless metal container.



8. Ductility of Sheet: 1.360 degree bend on 1" O.D. bar at 39.2° degree F. at 5cm. per min. flex. Minimum. Mesh or polyester fabric.

E. Performance Criteria or Sheet and Adhesive:

1. Water Permeability-Inverted cup @ 75° degrees F. 25 day duration (ASTM. E96-95 Procedure BW) using Manufacturer's sheet and adhesive in System form 0.005grams/hr./sq.ft.
2. Weather test on waterproofing sheet and adhesive in System form (ASTM Test Method D 529-73, Daily Cycle B) 25 days. Hardness range of 60 plus or minus 5 pt. variation of a range of 0-99 Shore A hardness and no further changes after 10 cycles- Materials stable with no cracking or crazing. Cycles continued for 25 days.
3. Pull Test: Using 1" thick concrete slab and waterproofing system (2 plies Sheet and Adhesive) pull at rate of 2 inches per minimum. Results = 26.39 lbs. plus p.s.i. or 3800 lbs plus per minimum. (slabs all broke under pull test-1" thick were used to accommodate machine) See Tensile Strength.
4. Waterhead Test: Results incomplete as 210 foot limit of machine was reached at end of 28 days with no leakage.
5. Mullen Burst Test: (Membrane Sheets and Adhesive) shall attain 160 p.s.i. minimum.

F. Protection Course:

1. Smooth surfaced, premium polymer modified reinforced asphaltic protection sheet complying with ASTM D5147 with minimum thickness of 94 or 120 mils.
 - a. Laureco SPC
 - b. Laureco PPC
2. Unfaced extruded polystyrene board insulation; ASTM C 578, Type X, 1 inch thick minimum. (Vertical application only)

G. Molded-Sheet Drainage Panels

1. Composite drainage panels, 3 dimensional, non-biodegradable, manufactured with a permeable geotextile bonded to molded plastic-sheet drainage core and designed to effectively convey water.
2. Geotextile: Nonwoven geotextile fabric of polypropylene or polyester fibers or combination of both.
3. Film Backing Plastic: Plastic, protective film backing sheet attached to surface facing waterproofing.
4. Compressive Strength core: 15,000 psf when tested according to ASTM D 1621 for use on pedestrian areas.
5. Compressive Strength core and root inhibitor: 15,000 psf when tested according to ASTM D 1621 for use in planter areas.
6. Compressive Strength core: 30,000 psf when tested according to ASTM D 1621 for use on vehicular traffic areas.
7. Available Products: Subject to compliance with requirements, products that may be incorporated into the work include but are not limited to:



- a. Waterproofing Manufacturer's proprietary drainage panel
- b. Waterproofing Manufacturer Approved drainage panel.

H. Root Barrier

1. High density polyethylene sheet manufactured for use as a mechanical barrier and root deflector to prevent tree roots from damaging waterproofing of planters and installed directly over protection board.
2. Available products: Subject to compliance with requirements, products that may be incorporated into the work include but are not limited to;
 - a. Waterproofing manufacturers proprietary root barrier.
 - b. Waterproofing manufacturers Approved root barrier.

2.3 INSULATION BOARD: (Where Required)

A. Extruded Polystyrene

1. Minimum 40 psi compressive strength extruded polystyrene (XPS) with integrated drainage channels. (unless separate drainage mat installed.)
2. Comply with ASTM C 578

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.
 1. Verify that substrate is visibly dry and free of excessive moisture.
- B. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- C. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.
- D. Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves according to ASTM C 898 and manufacturer's written instructions.
 1. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat when recommended by waterproofing manufacturer.
- E. Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 898 and waterproofing manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
- F. Repair damaged or spalling substrates for roughness with repair mortar patches or one component cementitious parge coatings rated for vertical and overhead use that have high



early strengths and are resistant to freeze thaw. Provide a finish suitable for waterproofing installation; broom finish minimum.

G. Install Proprietary LW PMMA liquid flashing and bond to deck and wall substrates where indicated or required according to waterproofing manufacturer's written instructions.

1. Extend sheet flashings onto perpendicular surfaces and other work penetrating substrate according to ASTM C 898.

H. Surface Preparation:

1. Remove or grout projections higher than $\frac{1}{16}$ inch. i.e., fins.
2. Grout all tie-wire holes.
3. Grout all honeycombs and voids larger than a U.S. 25 cent coin and deeper than $\frac{1}{4}$ inch.
4. Remove all latices, spatters, dirt, etc., by scraping surfaces to be waterproofed. Do not grind.
5. Scrape off knife-like edges of exterior corners and grout to a continuous smooth surface all exterior and interior corners. Good wood float finish is preferred; good wood screed is acceptable.
6. Remove all dirt and debris. Use A.C.I. 515, 1R-79, Chapter 3, and A.C.I. 301-72 (revised 1975), Chapters 9, 10, 11 (11.8.2 Finished Surfaces) as reference information guide. Water cure only if surface cannot be waterproofed immediately. Propane weed burners or hot air torches may be carefully used to surface dry. Surface dry only.

3.2 WATERPROOFING APPLICATION

A. GENERAL

1. Install fully adhered sheets over entire area to receive waterproofing according to manufacturer's written instructions.
2. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps of each ply.
3. Uniformly distribute bonding adhesive. Warning, excessive adhesive will interfere with installation and coring of waterproofing membrane.
4. Roll waterproofing sheet into adhesive. Work sheet into adhesive with wood head squeegee following waterproofing manufacturers written installation instructions.
5. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit, flatten and adhere fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.

B. FIRST PLY INSTALLATION:

1. Apply adhesive to prepared substrate at rate of 1.5 to 1.75 gallons maximum per 100 square feet. Do not exceed amount of specified adhesive.



- a. Roll first ply of waterproofing sheets into adhesive after “tack” develops. Use push broom or water filled lawn roller to alleviate trapped air by working air pockets from center outward toward sheet edges.

C. SECOND PLY INSTALLATION:

1. Apply adhesive at rate of 1.0 to 1.25 gallons maximum per 100 square feet. Do not exceed amount of adhesive specified.
2. Install second ply of waterproofing sheets using “cap sheet” application method only. Side and end laps of 1st ply must be offset a minimum of 8 inches.
3. Roll second ply of waterproofing sheets with side laps offset a minimum of 8 inches from first ply of rolls after tack develops.

D. CURING AND SETTING

1. Allow completed waterproofing to cure for 12 to 48 hours prior to water testing or application of protection board.
2. Verify proper curing and setting of waterproofing in accordance with manufacturers written instructions before proceeding.
3. Where water testing is required, it is recommended to perform testing prior to the installation of the protection course.

3.3 PROTECTION COURSE INSTALLATION

- A. Install protection course over waterproofing membrane according to manufacturer’s written instructions and before beginning subsequent construction operations.
- B. Clean and dry membrane before applying adhesive and setting protection course in adhesive.
- C. Apply adhesive at a rate of 2.0 to 2.5 gallons per 100 square feet.
- D. Set protection board course into adhesive after tack occurs. Apply sheets with 3” side and end-laps adhesively sealed.

3.4 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels to substrate according to manufacturer's written instructions. Protect installed molded-sheet drainage panels during subsequent construction.

3.5 CURING, PROTECTING, AND CLEANING

- A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.



- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END