

SECTION 07 13 26 - SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Sheet waterproofing systems and supplementary items necessary for installation at the following applications.
 - 1. Horizontal pre-applied (blindsided) sheet waterproofing **WPS-02** below slabs-on-grade over mud slab or prepared subgrade.
- B. Related Sections:
 - 1. Refer to Owner Building Enclosure Commissioning Plan for Field Observations and Performance Testing Activities.
 - 2. Refer to Division 07 Section 07 21 00 "Thermal Insulation" for board insulation requirements.
 - 3. Refer to Division 07 Section 07 14 16 "Cold Fluid Applied Waterproofing" for vertical waterproofing requirements.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include construction details, material descriptions, tested physical and performance properties, and installation instructions for waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of installation, including plans, elevations, sections, details of components and attachments to other work.
 - 1. Include details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
 - 2. Show transitions to cold fluid applied waterproofing membrane and detail requirements for warranty of waterproofed structures.
 - 3. Include manufacturer's written approval of shop drawings prior to submission.
- C. Samples: For each exposed product and for each color and texture specified, including the following products:
 - 1. 8-by-8-inch (200-by-200-mm) square of waterproofing and flashing sheet.
 - 2. 4-by-4-inch (100-by-100-mm) square of drainage panels.
- D. Sustainable Design Submittals:
 - 1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

- a. Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
- b. Bio-based Materials: For bio-based products and materials other than wood, submit documentation of product data and testing results in compliance with LEED requirements.
- c. Wood Products: Submit documentation of Forest Stewardship Council or USGBC equivalent certification.
- d. Materials Reuse: For products that are salvaged, refurbished, or reused, include a statement indicating costs for each product.
- e. Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
 - 1) Include statement indicating costs for each product having recycled content.
- f. Regional Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - 1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required, and that a warranty will be issued.
 - 1. Provide written confirmation by the manufacturer that Geotechnical Report has been reviewed and that manufacturer takes no exception to the design of the below grade waterproofing system.
- B. Field quality-control reports: Written report of testing and inspection required by "Field Quality Control".
- C. Warranties:
 - 1. Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations, and exclusions.
- D. Sustainable Design Submittals:
 - 1. Building Product Disclosure and Optimization - Environmental Product Declarations
 - a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.
 - 2. Building Product Disclosure and Optimization - Material Ingredients
 - a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

- 1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
 - 2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
 - 3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
 - 4) Living Product Challenge
 - 5) Product Lens Certification
 - 6) USGBC approved program.
- b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100ppm) and/or that has a compliant material ingredient optimization report with at least one of the following:
- 1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
 - 2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
 - 3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
 - 4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
 - 5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
 - 6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with not less than 10 years of experience in the successful production and in-service performance of products and systems similar to scope of this Project.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
 2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.
 3. Manufacturer Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer to install products.
- C. Pre-Construction Subsoil Water Testing: Provide subsoil water testing as recommended or required by waterproofing manufacturer.
1. General Requirements: Test subsoil water for compatibility with waterproofing materials.
 2. Test Method: Use manufacturer's standard test method to test for acids, alkalis, brine, or other contaminants that may inhibit performance of waterproofing materials.
 3. Specimen Quantity: Obtain and submit as many subsoil water samples required from Project at approximate locations where waterproofing will be installed.
 4. Reports: Interpret test results and certify reports indicating requirements for use of waterproofing materials and for corrective measures necessary.

- D. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
 - 1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, sealing at penetrations, crack and joint treatments, inside and outside corner treatments, and protection.
 - a. Size: One (1) elevator pit.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - a. If Architect determines mock-up does not comply with requirements, reconstruct mock-ups until accepted.
 - 3. Accepted mock-ups may become part of completed Work if undisturbed at time of Substantial Completion.

1.5 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.
 - 1. Participants:
 - a. Architect.
 - b. Contractor, including superintendent.
 - c. Installer, including project manager and supervisor.
 - d. If requested, Manufacturer's qualified technical representative.
 - e. Installers of other construction interfaced with Work.
 - 2. Minimum Agenda: Installer shall demonstrate understanding of the Work required by describing detailed procedures for preparing, installing, and cleaning the Work. Demonstration shall include, but not be limited to, following topics:
 - a. Tour representative areas of Work, inspect and discuss condition of substrate, and other preparatory work performed by other trades.
 - b. Review Contract Document requirements.
 - c. Review approved submittals.
 - d. Review inspection and testing requirements.
 - e. Review environmental conditions and procedures for coping with unfavorable conditions.
 - f. Resolve deviations or differences between Contract Documents and the manufacturer's specifications.
- B. Record discussions, including decisions and agreements, and prepare report.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

- B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions.
- E. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

1.9 WARRANTY

- A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design and installation of product. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
 - 1. Warranty Period: Manufacturer shall warrant the products to be free from material and labor Defects for a period of 10 years from date of Substantial Completion.
 - a. Warranty includes waterproofing, flashings, counter-flashings, insulation, below grade expansion joints and other components of waterproofing system necessary to provide a complete installation.
 - b. Warranty includes interfacing with integral with waterproofing system specified in Division 07 Section 07 14 16 "Cold Fluid Applied Waterproofing".
- B. Installer's Warranty: Furnish installer's written workmanship warranty signed by an authorized representative using installer's standard form agreeing to provide labor required to repair or replace work which exhibits workmanship defects. "Defects" is defined to include but not limited to deterioration or failure to perform as required.
 - 1. Warranty Period: Installer shall warrant the installation to be free from workmanship Defects for a period of 2 years from date of Substantial Completion.
 - a. Warranty includes interfacing with integral with waterproofing system specified in Division 07 Section 07 14 16 "Cold Fluid Applied Waterproofing".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, manufacturers offering products that may be incorporated into the Work include, but are not limited to, those listed.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.
1. Provide waterproofing materials, protection course, and molded-sheet drainage panels from single source from single manufacturer.
 2. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

2.3 PERFORMANCE REQUIREMENTS

- A. General: Provide sheet waterproofing systems that prevent the passage of liquid water.
- B. Material Compatibility: Provide waterproofing materials that are compatible with one another under conditions of service and application required, as demonstrated by manufacturer based on testing and field experience.

2.4 PRE-APPLIED (BLINDSIDE) SHEET WATERPROOFING

- A. Pre-Applied (Blindside) Sheet Waterproofing for Horizontal Applications **WPS-02**: waterproofing assembly.
1. Description:
 - a. Uniform, flexible, multilayered-composite sheet membrane that forms a permanent bond with fresh concrete placed against it; complete with accessories and preformed shapes for an unbroken waterproofing assembly.
 - b. Minimum 32-mils (0.8 mm) thick, uniform, flexible sheets consisting of 0.020 inch (0.5 mm) thick high density polyethylene film with pressure-sensitive adhesive and release liner with the following physical properties.

Property	Test Method	Typical Value
Solids Content	ASTM D1644	100 percent
Flexibility (Pliability), 180 degree bend over 1 inch mandrel at -23°F	ASTM D1970	Unaffected
Elongation	ASTM D412	500 percent minimum
Peel Adhesion to Concrete	ASTM D903 Modified*	Approximately 880 N/m (5 lbs./in.) plus or minus 5%

2. Manufacturer and Product:
 - a. Carlisle Coatings & Waterproofing MiraPLY-H.
 - b. GCP Applied Technologies; Preprufe 200.
 - c. Henry Blueskin Preseal 320.
 - d. W.R. Meadows Inc. Precon.
 - e. Or approved equal.

2.5 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
 1. When required by waterproofing manufacturer, obtain Engineer of Record's approval to use manufacturer's recommended waterstops to meet warranty requirements.
- B. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity, provided by waterproofing manufacturer.
- C. Mastic and Adhesives: Liquid mastic and adhesives, and adhesive tapes provided by waterproofing manufacturer.
- D. Detail Tape: Two-sided, pressure-sensitive, self-adhering reinforced tape, 4-1/2 in (112 mm) wide, with tack-free protective adhesive coating on one side and release film on self-adhering side; provided by waterproofing manufacturer.
- E. Termination Bars: Aluminum bars or stainless steel bars ASTM A 666, Type 304; 2 types, one flat and one flat with upper flange shaped to receive sealant, locations as indicated; 1 in by 1/8 in (25 mm by 3 mm) thick; predrilled at 8 in (200 mm) centers; with stainless steel fasteners.
- F. Injectable Waterstop: As required by waterproofing manufacturer to ensure watertight installation.
- G. Waterstop: Polymer/butyl rubber waterstop strip that expands when in contact with water.
 1. Basis of Design: GCP Applied Technologies; Adcor ES.
 - a. Locations: All typical concrete to concrete cold joints.

2.6 MOLDED-SHEET DRAINAGE PANELS

- A. High-Capacity, Molded-Sheet Collector-Panel System Wrapped with Geotextile: Composite subsurface collector-panel system by same manufacturer as primary molded-sheet drainage panels; consisting of a high-profile, studded, nonbiodegradable, molded-plastic-sheet drainage core; wrapped with a nonwoven-geotextile facing. Provide system with manufacturer's outlets, connectors, tapes, and other accessories to connect primary molded-sheet drainage panels with piped sub-drainage system.
 1. Compressive Strength per ASTM D1621: 9000 psf (431 kPa) minimum.
 2. Flow Rate per ASTM D4716: 17 to 80 gpm per ft. (211 to 994 L/min. per m) minimum.
 3. Manufacturers and Products:

- a. CETCO Building Materials Group; Aquadrain 100BD.
- b. GCP Applied Technologies; Hydroduct Coil 600.
- c. Carlisle Coatings & Waterproofings; CCW MiraDRAIN HC.
- d. Polyguard Products Inc.; Totalflow.
- e. Or approved equal in accordance with the following salient characteristics as listed in this specification.

B. Drainage Panel Auxiliary Materials.

1. Miscellaneous Accessories: As required by manufacturer for complete installation assembly, including flanges around piping penetrations and expanded base and tie-in fittings as necessary to coordination with foundation drainage system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.
- B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.
 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D4263.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 1. ASTM D 6135.
 2. Respective manufacturer's written installation instructions.
 3. Accepted submittals.
 4. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

- B. Excavation Dewatering: Verify that the waterproofing application area is dry and free of standing and uncontrolled water. Should the dewatering system fail at any time during application of waterproofing system, the materials shall be completely removed and work shall start over with new materials once the area is dry and free of water.
- C. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

3.4 INSTALLATION OF PRE-APPLIED SHEET WATERPROOFING

- A. Install pre-applied waterproofing sheets according to waterproofing manufacturer's written instructions.
- B. Apply continuous sheets over prepare substrate.
- C. Waterproofing Tie-Ins: Install waterproofing and accessories to tie into adjacent waterproofing to ensure watertight installation.
- D. Damaged Waterproofing: Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Tape perimeter of damaged or nonconforming area extending 6 inches (150 mm) beyond repaired areas in all directions. Apply a patch of sheet waterproofing and firmly secure with detail tape.
 - 1. Patch tears, voids, misaligned or inadequately lapped seams.
 - 2. Slit fishmouths and blisters, overlap flaps, and patch.

3.5 INSTALLATION OF MOLDED-SHEET DRAINAGE PANEL

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions.. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Manufacturer's qualified technical representative shall periodically inspect Work to ensure installation is proceeding in accordance with manufacturer's designs, recommendations, instructions, and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings, and conclusions of inspection.
 - 1. Manufacturer's Technical Representative Qualifications: Direct employee of technical services department of manufacturer with experience in providing recommendations, observations, evaluations, and problem diagnostics.
- B. Testing Agency: The Owner may employ and pay a qualified independent testing agency to perform field quality control.
 - 1. Agency shall be certified by waterproofing manufacturer to provide observations and inspections required to provide warranty indicated.

- a. Agency shall prepare reports and digital photographs documenting observations. Reports shall be made available to the Contractor, waterproofing installer, waterproofing manufacturer, and Architect.
- C. Correction of Deficiencies: Waterproofing will be considered defective if it does not pass tests and inspections.
 - 1. Correct deficiencies in or remove waterproofing that does not comply with requirements: repair substrates, reapply waterproofing, and repair flashing until waterproofing installation is watertight.
 - 2. Materials and installation failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be performed at Contractor's expense.
- D. Final Inspection: Arrange for waterproofing system manufacturer's qualified technical representative to inspect waterproofing installation on completion of waterproofing membrane and flashing. Notify Architect and Owner 48 hours in advance of date and time of final inspection.
- E. Prepare test and inspection reports.

3.7 PROTECTION, REPAIR, AND CLEANING

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION