

SECTION 07 14 16
COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Cold fluid-applied waterproofing, vertical and horizontal deck applications.
 - 2. Protection course, drainage panels, insulation, and insulation drainage panels.

1.02 RELATED REQUIREMENTS

- A. Section 07 21 00 - Thermal Insulation: Insulation used for protective cover.

1.03 REFERENCES

- A. ASTM C 836 - Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2012.
- B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM D 4258 - Standard Practice for Surface Cleaning Concrete for Coating.
- D. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- E. ASTM D 4716 - Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- F. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials.
- H. U.S. Environmental Protection Agency (EPA): 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
- I. ICC-ES AC29 - Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials; 2011.
- J. NRCA (WM) - The NRCA Waterproofing Manual.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Conference: Conduct conference at Project Site.
 - 1. Review requirements for waterproofing products and installation, including surface preparation, substrate conditions, project and manufacturer's details, installation procedures, mockups, testing and inspection requirements, protection and repairs, and coordination and sequencing of waterproofing work with work of other Sections.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of waterproofing product specified, including:
 - 1. Technical data indicating compliance with requirements.
 - 2. Substrate preparation instructions and recommendations.
- C. Shop Drawings: Show locations for waterproofing system components. Show details for each type of substrate, joints, corners, and edge conditions, including flashings, counterflashings, penetrations, transitions, and terminations.
- D. Qualification Data: For Installer, manufacturer and waterproofing Inspector.
 - 1. Certification of manufacturer's approval of Installer.
- E. Product Test Reports: Test data for waterproofing products and waterproofing system, by qualified testing agency, indicating proposed waterproofing meets performance requirements, when requested by Architect.
- F. Warranty: Sample of unexecuted manufacturer and installer special warranties.

- G. Field quality control reports.

1.06 QUALITY ASSURANCE

- A. Source Limitations: All weather barrier products and waterproofing products by the same manufacturer to form complete system and warranty.
- B. Installer Qualifications: A manufacturer-approved firm with minimum 5 years of experience in installation of specified products in successful use on similar projects, employing workers trained by manufacturer, including a full-time on-site supervisor with a minimum of 5 years of experience installing similar work, and able to communicate verbally with Contractor, Architect, and employees.
- C. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum five years of experience in manufacture of waterproofing as one of its principal products.
1. Manufacturer's product submitted has been in satisfactory operation on five similar installations for at least five years.
 2. Approval of Manufacturers and Comparable Products: Prime bidder must submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Completed and signed Substitution Request form.
 - b. Product data, including certified independent test data indicating compliance with requirements.
 - c. Sample shop drawings from similar project.
 - d. Project references: Minimum of five installations of similar system not less than five years old, with Owner and Architect contact information.
 - e. Name and resume of proposed qualified Inspector.
 - f. Sample warranty.
- D. Waterproofing Inspector Qualifications: An independent party certified as a waterproofing inspector by the SWRI or other certifying organization acceptable to Architect, retained by the Contractor and experienced in the installation and maintenance of the specified waterproofing system, qualified to perform observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification.
- E. Testing Agency Qualifications: Qualified independent agency experienced in the installation of the specified waterproofing system, and qualified to perform observation and inspection specified in Field Quality Control Article to determine Installer's compliance with the requirements of this Project, acceptable to Architect, retained by the Contractor.

1.07 MOCK-UP

- A. Provide waterproofing mockup application in an area of not less than 150 sq. ft. of surface where directed by Architect for each type of substrate condition. Include examples of surface preparation, crack and joint treatment, waterproofing application, and flashing, transition, and termination conditions, to set quality standards for execution.
1. Include intersection of waterproofing with adjacent vertical waterproofing and moisture control system.
- B. Approved mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Accept materials on site in manufacturer's unopened original packaging.
- B. Store products in weather protected environment, clear of ground and moisture, within temperature ranges recommended by waterproofing manufacturer.
- C. Protect materials during handling and application to prevent damage or contamination.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer.
 - 1. Protect substrates from environmental conditions that affect waterproofing performance.
 - 2. Do not apply waterproofing during snow, rain, fog, or mist.

1.10 SCHEDULING

- A. Coordinate installation of waterproofing with completion of roofing and other work requiring interface with waterproofing.
- B. Schedule work so waterproofing applications may be inspected prior to concealment.
- C. Ensure waterproofing materials are cured before covering with other materials.

1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. General: Waterproofing system shall be capable of performing as a continuous watertight installation and as a moisture drainage plane transitioned to adjacent flashings and discharging water to the building exterior. Waterproofing shall accommodate normal substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without resultant moisture deterioration.
- B. VOC Content: 250 g/L maximum per 40 CFR 59, Subpart D (EPA Method 24) and complying with requirements of authorities having jurisdiction.
- C. Compatibility: Provide waterproofing system materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by waterproofing manufacturer based on testing and field experience.
- D. Source Limitations: Provide waterproofing system materials and accessory products from single source from single manufacturer.

2.02 WATERPROOFING MEMBRANE

- A. Cold Fluid-Applied Waterproofing: Single component, reinforced, high solids, modified aliphatic polyurethane, ASTM C 836/C 836M and coal-tar free, formulated for application to damp and green concrete.
 - 1. VOC Content: Less than 100 g/L, roller and self-leveling grades.
 - 2. VOC Content: Less than 160 g/L, trowel detailing grade.
 - 3. Hardness, ASTM D 2240: 70-80.
 - 4. Low Temperature Flexibility and Crack Bridging, ASTM C 1305: Pass.
 - 5. Adhesion in Peel, ASTM C 794: 26 lbf/in. (4553 N/m).
 - 6. Products:
 - a. Tremco, Inc.; TREMproof 250GC: www.tremcosealants.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

- A. **REQUIREMENT:** Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by waterproofing membrane manufacturer to produce a complete waterproofing system and that are compatible with waterproofing material and adjacent construction to which they may seal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Surface Condition: Before applying waterproofing materials, examine substrate and conditions to ensure substrates are fully cured, smooth, clean, dry, and free from high spots, depressions, loose and foreign particles and other deterrents to adhesion, and conditions comply with manufacturer's written recommendations.
 - 1. Verify concrete and masonry surfaces are free from release agents, curing agents, laitance, and other contaminants. Test for waterproofing adhesion per manufacturer's recommended method. Notify Architect of unsatisfactory conditions.
 - 2. Verify masonry joints are filled with mortar and struck flush.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INTERFACE WITH OTHER WORK

- A. Sequencing of Work: Coordinate sequencing of waterproofing work with work of other sections that form portions of building envelope moisture control to ensure that flashings and transition materials can be properly installed and inspected.
- B. Subsequent Work: Coordinate waterproofing work with work of other sections installed subsequent to waterproofing to ensure complete inspection of installed waterproofing and sealing of waterproofing penetrations necessitated by subsequent work.

3.03 PREPARATION

- A. Clean, prepare, and treat substrates in accordance with waterproofing manufacturer's written instructions.
 - 1. Mask adjacent finished surfaces.
 - 2. Remove contaminants and film-forming coatings from substrates.
 - 3. Remove projections and excess materials and fill voids with substrate patching material.
 - 4. Prepare and treat joints and cracks in substrate per ASTM D 4258 and waterproofing manufacturer's written instructions.
- B. Detail Preparation: Prepare non-moving shrinkage cracks, large cracks, construction joints, expansion joints, projections and protrusions, penetrations, drains, and changes in plane in accordance with waterproofing manufacturer's written instructions and details, using accessory materials specified. The following are two acceptable options for detail preparation:
 - 1. Adhere strips of elastomeric sheet to moving expansion joints on both sides in conjunction with a metal termination bar embedded in a layer of cold fluid-applied waterproofing and overlay with coat of cold fluid-applied waterproofing.
 - 2. Apply single-component urethane within moving expansion joints and overlay with a coat of cold fluid-applied waterproofing.
- C. Transitions to Adjacent Materials: Apply Tremco Approved Primer to transition cold fluid-applied waterproofing membrane to adjacent components of the building envelope.

3.04 WATERPROOFING INSTALLATION

- A. General: Apply waterproofing material to form a seal with strips and transition strips and to achieve a continuous waterproofing according to waterproofing manufacturer's written instructions. Apply waterproofing material within manufacturer's recommended application temperature ranges.
- B. Primer: Apply primer to substrates at required rate, using roller, brush, or airless spray. Allow to dry. Reprime areas not covered within 24 hours.
- C. Start application with manufacturer's authorized representative present.
- D. Cold Fluid-Applied Waterproofing: Apply waterproofing in total wet film thickness and with methods recommended in writing by waterproofing manufacturer.
- E. Standard Application: Vertical or Horizontal:
 - 1. Apply using roller or squeegee.

2. Apply in single pass at minimum thickness of 60 mils (1.5 mm) wet.
- F. High-Build Application: Horizontal:
 1. Apply using roller or squeegee.
 2. Apply in single pass at minimum thickness of 120 mils (3.1 mm) wet.
- G. High-Build Application: Vertical:
 1. Apply using roller.
 2. Apply in single pass at minimum thickness of 90 mils (2.3 mm) wet.
- H. Multi-Lift Application:
 1. Apply using roller or squeegee.
 2. Apply first coat at minimum 60 mils (1.5 mm) wet.
 3. Allow first coat to cure to firm rubber. Apply Vulkem 191 QD primer and allow to dry to a tack before applying second coat.
 4. Apply second coat of minimum 60 mils (1.5 mm) wet, for minimum total thickness of 120 mils (3.1 mm) wet.
- I. Multi-Lift Application, High-Build:
 1. Apply using roller or squeegee.
 2. Apply first coat at minimum 90 mils (2.3 mm) wet.
 3. Allow first coat to cure to firm rubber. Apply Vulkem 191 QD primer and allow to dry to a tack before applying second coat.
 4. Apply second coat of minimum 125 mils (3.18 mm) wet, for minimum total thickness of 215 mils (5.46 mm) wet.
- J. Terminations: Install terminations of waterproofing membrane in accordance with ASTM C 898 Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Separate Wearing Course and ASTM C 1471 Standard Guide for Use of High Solids Content Cold Liquid-Applied Elastomeric Waterproofing Membrane on Vertical Surfaces, as applicable to application, at not less than minimum height recommended by waterproofing manufacturer.
- K. Coordination of Testing:
 1. Coordinate application of waterproofing membrane with installation of membrane leak detection system specified in Section 07 72 73 "Membrane Leak Detection System."
 2. Do not cover waterproofing until it has been tested and inspected by Owner's testing agency.
- L. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates and reapply waterproofing components.

3.05 PROTECTION INSTALLATION

- A. Protection Course: Cover waterproofing with protection course following curing of waterproofing and prior to backfilling or subjecting installation to traffic. Overlap protection course joints.
- B. Drainage Panel: Place and secure drainage panels using methods that do not penetrate waterproofing. Face geotextile away from deck substrate. Lap edges or abut ends of geotextile.
- C. Insulation: Install one or more layers of board insulation as required, staggering joints. Fit within 1/2 inch (12 mm) of projections and penetrations.
 1. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.06 FIELD QUALITY CONTROL

- A. Contractor's Inspector: Contractor shall engage manufacturer's qualified Inspector full-time during the Work to perform tests and inspections, including documenting of waterproofing prior to concealment.
 1. Contractor's Inspector shall measure membrane thickness with a wet film gauge during the application process at least once for every 100 sq. ft. (10 sq. m).
 2. Provide written report of tests and inspections.

- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Coordination of Inspection: Cooperate with testing agency. Allow access to work areas and staging. Notify testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection.
 - 1. Do not cover Work until testing and inspection is completed and accepted.
- D. Reporting: Forward written inspection reports to the Architect within 10 working days of the inspection and test being performed.
- E. Correction of Work: Correct deficient applications not passing tests and inspections, make necessary repairs, and retest as required to demonstrate compliance with requirements.

3.07 CLEANING AND PROTECTING

- A. Clean spills, stains, and overspray resulting from application utilizing cleaning agents recommended by manufacturers of affected construction. Remove masking materials.
- B. Protect waterproofing from damage from subsequent work. Protect waterproofing materials from exposure to UV light for period in excess of that acceptable to waterproofing manufacturer; replace overexposed materials and retest.

END OF SECTION