SECTION  – crystalline waterproofing

1. General
   1. SUMMARY
      1. Section Includes:
         1. Crystalline waterproofing.
      2. Related Requirements:
         1. Section 03 35 00 – Concrete Finishing.
         2. Section 05 50 00 – Metal Fabrications.
         3. Section 07 92 00 – Joint Sealants.
         4. Section 14 21 00 – Electric Traction Elevators.
         5. Section 14 24 23 – Hydraulic Passenger Elevators.
   2. pre-installation meetings
      1. Preinstallation Conference: Conduct conference at Project site.
   3. action SUBMITTALS
      1. Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
      2. Product Data: Submit manufacturer's product data, with complete general and specific installation instructions, recommendations, and limitations affecting installation.
      3. Provide representative samples of the following for review by Consultant: Crystalline waterproofing.
      4. Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical requirements; and that waterproofing system and components; materials are supplied by a single source manufacturer.
      5. Provide written certification that installer has current approved applicator status with waterproofing material manufacturer when requested by Consultant.
      6. Provide written report summarizing manufacturer's observations and indicating results of final inspection and any corrective action required for changes arising from deficiencies or site conditions.
   4. INFORMATIONAL SUBMITTALS
      1. Product certificates.
      2. Product test reports.
   5. QUALITY ASSURANCE
      1. Manufacturer Qualifications: A firm with not less than ten (10) years experience manufacturing crystalline waterproofing of the type specified, able to provide test reports showing compliance with specified performance characteristics, and able to provide on-site technical representation to advise on installation.
      2. Applicator Qualifications: A firm experienced in applying crystalline waterproofing similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
      3. Pre-installation Meeting: Before installation, conduct meeting with waterproofing installer, installers of adjacent work and work penetrating waterproofing, and waterproofing manufacturer's representative to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements; notify Owner and Consultant at least one (1) week in advance of meeting.
   6. DELIVERY, STORAGE, HANDLING and protection
      1. Deliver materials in factory sealed and labelled packaging, and handle and store as per the manufacturer's instructions, recommendations, and material safety data sheets.
      2. Store materials in accordance with manufacturer's instructions, and as follows:
         1. Do not double stack pallets during shipping or storage.
         2. Protect waterproofing materials from moisture, excessive temperatures and sources of ignition.
         3. Provide cover to top, bottom and sides for materials stored on site, allowing for adequate ventilation.
      3. Handle materials in accordance with manufacturer's instructions, and as follows:
         1. Protect from construction operation related damage, damage from weather, excessive temperatures, and prolonged sunlight.
         2. Remove damaged material from site and dispose of in accordance with applicable regulations.
   7. field conditions
      1. Proceed with waterproofing work only after pipe sleeves, vents, curbs, inserts, drains, and other projections through the substrate to be waterproofed have been completed. Proceed only after substrate defects, including honeycombs, voids, and cracks, have been repaired to provide a sound substrate free of forming materials, including reveal inserts.
      2. Ambient Conditions: Proceed with waterproofing work only if temperature is maintained at 40 deg F (4.4 deg C) or above during work and cure period, and space is well ventilated and kept free of water.
   8. WARRANTY
      1. Provide manufacturer's written system warranty for a period of five (5) years starting from substantial performance of the Project, covering materials and labour.
      2. Installer's Warranty: Provide warranty signed by installer that reads as follows:
         1. Installer warrants that, upon completion of the work, surfaces treated with crystalline waterproofing will be and will remain free of water leakage resulting from defective workmanship or materials for a period of ten (10) years from Date of Substantial Performance.
         2. In the event that water leakage occurs within the warranty period from such causes, the installer shall, at his own expense, repair, replace, or otherwise correct such defective workmanship and materials.
         3. Installer shall not be liable for consequential damages.
         4. Installer's liability shall be limited to repair, replacement, or correction of defective workmanship and materials.
         5. This warranty excludes leaks or other defects due to causes beyond the installer's control, including but not limited to structural failure, movement of the structure, fire, earthquakes, tornadoes, and hurricanes.
2. Products

Manufacturers and Products listed are neither recommended nor endorsed by the AIA or Avitru.. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 01 61 00 – Common Product Requirements.

* 1. waterproofing materials

Before retaining "white" option in "Crystalline Waterproofing" Paragraph below, verify availability of white for products retained.

* + 1. Crystalline Waterproofing: Prepackaged, proprietary blend of portland cement, specially treated sand, and active chemicals that, when mixed with water and applied, penetrates into concrete and concrete unit masonry, and reacts chemically with the byproducts of cement hydration in the presence of water to develop crystalline growth within substrate capillaries to produce an impervious, dense, waterproof substrate; with properties complying with or exceeding the criteria specified below.
       1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
          1. Euclid Chemical Company (The); an RPM company.
          2. Kryton International Inc.
          3. Xypex Chemical Corporation.
          4. BASF Corp. - Construction Chemicals.

Retain "Water Permeability" and "Compressive Strength" subparagraphs below to suit Project and according to properties of products selected. Not all manufacturers report properties, use the same test methods, or test products for every property.

* + 1. Waterproofing Products: Provide installed products that comply with following, when tested using cured concrete samples made without admixtures, with two 1.27mm (0.05 inches) thick coats of waterproofing:
       1. Penetration: At least 50 mm (2 inches) penetration of crystal-forming material, evidenced by scanning electron microscope photographs.
       2. Permeability: No measurable leakage through waterproofed concrete, when tested in accordance with COE CRD-C 48 at 123.4 m (405 feet) of head or 1200 kPa (175 psi) using 50 mm (2 inshes) thick, 13.8 MPa (2000 psi) compressive strength concrete.
       3. Chemical Resistance: No detrimental effects when tested using (27.6 MPa) compressive strength concrete in accordance with ASTM C 267-01 (2006) using hydrochloric acid (pH of 3.5), brake fluid, transformer oil, ethylene glycol, toluene, and caustic soda as test mediums for duration of 84 days each; minimum of 14 percent increase in concrete compressive strength when tested in accordance with ASTM C39.
       4. Potable Water Contact Approval: NSF certification for use on structures holding potable water, based on testing in accordance with NSF 61.
       5. Water Permeability: Maximum [**zero for water at 30 feet (9 m)**] <**Insert requirement**> when tested according to COE CRD-C 48.
       6. Compressive Strength: Minimum [**4000 psi (27.6 MPa)**] <**Insert value**> at 28 days when tested according to ASTM C109/C109M.
  1. accessory materials
     1. Patching Compound: Factory-premixed cementitious repair mortar, crack filler, or sealant recommended by waterproofing manufacturer for filling and patching tie holes, honeycombs, reveals, and other imperfections; and compatible with substrate and other materials indicated.
     2. Plugging Compound: Factory-premixed cementitious compound with hydrophobic properties and recommended by waterproofing manufacturer; resistant to water and moisture but vapor permeable for all standard applications (vertical, overhead, and horizontal surfaces not exposed to vehicular traffic); and compatible with substrate and other materials indicated.
     3. Water: Potable.
  2. MIXES
     1. Crystalline Waterproofing: Add prepackaged dry ingredients to water according to manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency.

1. Execution
   1. PREPARATION
      1. Comply with manufacturer's written instructions.

Retain option in first paragraph below if spray application may be used.

* + 1. Protect other work from damage caused by cleaning, preparation, and application of waterproofing. Provide temporary enclosure to confine spraying operation and to ensure adequate ambient temperatures and ventilation conditions for application.
    2. Do not allow waterproofing, patching, and plugging materials to enter reveals or annular spaces intended for resilient sealants or gaskets, such as joint spaces between pipes and pipe sleeves.
    3. Stop active water leaks with plugging compound.
    4. Repair damaged or unsatisfactory substrate with patching compound.
       1. At holes and cracks 1/16 inch (1.6 mm) wide or larger in substrate, remove loosened chips and cut reveal with sides perpendicular to surface, not tapered, and minimum 1 inch (25 mm) deep. Fill reveal with patching compound flush with surface.

Retain "Surface Preparation" Paragraph below for surface preparation of substrate. Include special procedures required by manufacturers or to suit Project.

* + 1. Surface Preparation: Remove efflorescence, chalk, dust, dirt, mortar spatter, grease, oils, paint, curing compounds, and form-release agents to ensure that waterproofing bonds to surfaces.
  1. INSTALLATION
     1. Comply with waterproofing manufacturer's written instructions for application and curing.
        1. Saturate surface with water for several hours and maintain damp condition until applying waterproofing. Remove standing water.
        2. Apply waterproofing to surfaces, and extend waterproofing onto adjacent surfaces as follows:
           1. Onto columns integral with treated walls.
           2. Onto interior nontreated walls intersecting exterior treated walls, for a distance of 24 inches (600 mm) for cast-in-place concrete and 48 inches (1200 mm) for masonry.
           3. Onto exterior walls and onto both exterior and interior columns, for a height of 12 inches (300 mm), where floors, but not walls, are treated.
           4. Onto every substrate in areas indicated for treatment, including pipe trenches, pipe chases, pits, sumps, and similar offsets and features.
        3. Number of Coats: Number required for specified water permeability, but not less then two (2) coats**. <Insert Number>**
        4. Application Method: Apply to ensure that each coat fills voids and is in full contact with substrate or previous coat.
        5. Dampen surface between coats.
     2. Final Coat Finish: **[Smooth] [Brushed]** Spray textured, unless otherwise indicated on the Drawings.

Revise "Curing" Paragraph below according to manufacturer's recommendations and to suit Project.

* + 1. Curing: Moist-cure waterproofing for three (3) days immediately after final coat has set, followed by air drying, unless otherwise recommended in writing by manufacturer.
       1. During curing period, protect treated surfaces from rainfall, ambient temperature below freezing, and puddling of water.
       2. Provide supplementary air circulation as recommended by waterproofing manufacturer.
  1. CLEANING AND PROTECTION
     1. Clean spillage and overspray from adjacent surfaces using appropriate cleaning agents and procedures.
     2. Protect installed product from damage during construction; do not allow traffic on unprotected waterproofed surfaces.
     3. Do not backfill against waterproofed surfaces for at least thirty-six (36) hours after installation; use moist backfill material when backfilling occurs less than seven (7) days after installation.

END OF SECTION