SECTION 071616 - CRYSTALLINE WATERPROOFING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY

Clay masonry is not a suitable substrate for crystalline waterproofing.

* + - * 1. Section Includes:

Crystalline waterproofing.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include construction details, material descriptions, and installation instructions.

* + - * 1. Quality Control Submittals:

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers.

Product Certificates: For each type of waterproofing, patching, and plugging material.

Product Test Reports: For each product formulation, for tests performed by manufacturer and witnessed by a qualified testing agency.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

Field quality-control reports.

* + - 1. QUALITY ASSURANCE

Before retaining option in "Applicator Qualifications" paragraph below, verify with manufacturers that this requirement is available for Project location.

* + - * 1. 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 **[, and that employs workers trained and approved by manufacturer]**.
				2. Benchmark: Build Benchmark to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Build mockup of typical [**vertical**] [**and**] [**horizontal**] surfaces [**as shown on Drawings**] [**10 sq. ft. in size**] <**Insert description**>.

Approval of Benchmark does not constitute approval of deviations from the Contract Documents contained in Benchmark unless Director’s Representative specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement for demolishing and removing Benchmark.

Subject to compliance with requirements, approved Benchmark may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. FIELD CONDITIONS
				1. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit crystalline waterproofing to be performed according to manufacturer's written instructions.
				2. 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.
				3. Ambient Conditions: Proceed with waterproofing work only if temperature is maintained at 40 deg F or above during work and cure period, and space is well ventilated and kept free of water.
1. PRODUCTS
	* + 1. WATERPROOFING MATERIALS

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

Review products listed below and revise as necessary per project. Ensure products are current and are comparable to one another in regards to required properties.

* + - * 1. Crystalline Waterproofing: Prepackaged, **[gray] [white]**-colored 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.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Anti-Hydro International, Inc

A-H Hydrocap.

Conproco Corporation; Conpro Super Seal.

IPA Systems, Inc.; Drycon.

Penetron USA;

Penetron.

Xypex Chemical Corporation; **[Xypex Concentrate][Xypex Modified]**.

Or equal

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. Insert requirement for vapor permeance or water-vapor-transmission rate according to ASTM E96 if required because of having waterproof barriers on both sides of a wall or slab; verify availability with manufacturers and revise list of products above accordingly.

Water Permeability: Maximum **[zero for water at 30 feet] <Insert requirement>** when tested according to COE CRD-C 48.

Compressive Strength: Minimum **[4000 psi] <Insert value>** at 28 days when tested according to ASTM C109.

* + - 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.

Insert patching-compound manufacturers and products and tested product properties here to suit Project if required; verify availability of tested performance with manufacturers.

* + - * 1. 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.

Insert plugging-compound manufacturers and products and tested product properties here to suit Project if required; verify availability of tested performance with manufacturers.

* + - * 1. Water: Potable.
			1. 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. EXAMINATION

Revise this article to suit Project. Existing substrates may require specific repair to correct unsatisfactory conditions.

* + - * 1. Examine substrates, areas, and conditions, with Applicator present, for suitable conditions where waterproofing is to be applied.
				2. Proceed with application only after unsatisfactory conditions have been corrected.
				3. Notify Director’s Representative in writing of active leaks or defects that would affect system performance.
			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.

Retain subparagraph below for repair work. Do not permit conical or tapered joints in repairs.

At holes and cracks 1/16 inch wide or larger in substrate, remove loosened chips and cut reveal with sides perpendicular to surface, not tapered, and minimum 1 inch 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.

Clean concrete surfaces according to ASTM D4258.

Retain one of or both "Scratch- and Float-Finished Concrete" and "Smooth-Formed and Trowel-Finished Concrete" subparagraphs below for type of surface preparation required. Revise to suit Project.

Scratch- and Float-Finished Concrete: Etch with 10 percent muriatic acid solution according to ASTM D4260.

Smooth-Formed and Trowel-Finished Concrete: Prepare by mechanical abrading or abrasive-blast cleaning according to ASTM D4259.

Clean concrete unit masonry surfaces according to ASTM D4261.

Retain one of or both "Lightweight Concrete Unit Masonry" and "Medium- and Normal-Weight Concrete Unit Masonry" subparagraphs below for type of surface preparation required. Revise to suit Project.

Lightweight Concrete Unit Masonry: Etch with 10 percent muriatic acid solution or abrade surface by wire brushing. Remove acid residue until pH readings of water after rinse are not more than 1.0 pH lower or 2.0 pH higher than pH of water before rinse.

Medium- and Normal-Weight Concrete Unit Masonry: Sandblast or bushhammer to a depth of 1/16 inch.

Concrete Joints: Clean reveals.

* + - 1. INSTALLATION
				1. Comply with waterproofing manufacturer's written instructions for application and curing.

Saturate surface with water for several hours and maintain damp condition until applying waterproofing. Remove standing water.

Apply waterproofing to surfaces, and extend waterproofing onto adjacent surfaces as follows:

Revise subparagraphs below to suit Project.

Onto columns integral with treated walls.

Onto interior nontreated walls intersecting exterior treated walls, for a distance of [**24 inches for cast-in-place concrete**] [**and**] [**48 inches for masonry**].

Onto exterior walls and onto both exterior and interior columns, for a height of 12 inches, where floors, but not walls, are treated.

Onto every substrate in areas indicated for treatment, including [**pipe trenches**] [**pipe chases**] [**pits**] [**sumps**] <**Insert area**> [**and**] [**similar offsets and features**].

Revise "Number of Coats" Subparagraph below if a different number of coats on horizontal and vertical surfaces is required.

Number of Coats: [**Number required for specified water permeability**] [**Two**] [**Three**] <**Insert number**>.

Application Method: Apply to ensure that each coat fills voids and is in full contact with substrate or previous coat.

Dampen surface between coats.

Retain one or more options in "Final Coat Finish" paragraph below for an exposed finish or as substrate for a finish specified elsewhere.

* + - * 1. Final Coat Finish: [**Smooth**] [**Brushed**] [**Spray textured**].

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

* + - * 1. Curing: Moist-cure waterproofing for [**three**] <**Insert number**> days immediately after final coat has set, followed by air drying, unless otherwise recommended in writing by manufacturer.
			1. FIELD QUALITY CONTROL

Retain "Manufacturer's Field Service" paragraph below to require a company field advisor per Section 014216 to perform tests and inspections.

* + - * 1. Manufacturer's Field Service: Engage a company field advisor per Section 014216 to test and inspect completed application of waterproofing.
				2. Prepare test and inspection reports.

END OF SECTION 071616