SECTION 03 05 59

PENETRATING COLLOIDAL CONCRETE TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Penetrating colloidal concrete treatment, spray applied to new concrete in a curing and sealing application.

B. The information herein is provided for information for Add Alternate No. 1.

1. Base Scope of Work shall include Concrete Sealers Types 1 and Type 3 as specified in Section 03 05 59 for all concrete slabs. Alternate shall include providing Penetrating Colloidal Concrete Treatment for floor slabs as scheduled, which will not require Type 1 or Type 3 Sealers if the Alternate is accepted.
2. Alternate No. 1 Penetrating colloidal concrete treatment, shall be spray applied to new concrete in a curing and sealing application to the point of refusal per the manufacturers installation instructions immediately following concrete placement.

1.2 ACTION SUBMITTALS

A. Product Data: Technical data for materials, components and systems; performance criteria; use limitations; preparation instructions and recommendations; storage and handling requirements and recommendations; and installation methods.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit data for manufacturer and Applicator.

B. Material Test Reports.

C. Field Quality Control Reports.

D. Manufacturer's Field Service inspection reports.

E. Operation and Maintenance Data: For penetrating colloidal concrete treatments to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Entity having minimum 5 years documented experience in the formulation and manufacture of colloidal silica concrete treatments.

B. Applicator Qualifications: Entity having minimum 5 years documented experience who is acceptable to manufacturer and employs applicators trained in the specified system.

C. Testing Agency Qualifications: Qualified according to ASTM E 699 or ASTM E 329 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC Standard 17025.

D. Source Limitations: Obtain penetrating colloidal concrete treatments through one source from a single manufacturer.

E. Manufacturer's Field Services: Engage a Manufacturer’s Authorized Representative to inspect preparation and installation of the penetrating colloidal concrete treatment. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."

F. Preinstallation Conference: Conduct conference at project site.
   1. Comply with provisions of Section 01 31 00 - Project Management and Coordination.
   2. Applicator and Product representative shall be present during meeting.
   3. Review all manufacturer recommended preparation and application instructions and other recommended items for the specific project conditions. Review issues that may result in unintended results and aesthetic anomalies.

G. Field Sample Panels: After approval of submittals and before casting concrete, produce field sample panels to demonstrate the approved range of selections made. Sample submittals and final finish conditions. Produce a minimum of three sets of full-scale panels, approximately 48 inches by 48 inches (1200 mm by 1200 mm) minimum, to demonstrate the expected range of finish, color, and appearance variations acceptable in floor finish.
   1. Locate panels as indicated or as directed by Architect.
   2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed work.
   3. If Architect determines that sample panels do not meet requirements, demolish and remove them from the site and cast others until mockups are approved.
   4. Apply curing compound and allow to dry completely. Perform peel test in presence of Architect and manufacturer’s representative to determine bond strength.
   5. If bond fails, determine cause of failure, correct deficiency, and repeat peel test until recommended bond is attained.
   6. Apply Sealing Agents and allow to dry completely exhibiting final concrete finish intended in the completed Work.
   7. Sample panels shall remain for finish and other reference for the duration of construction. Demolish and remove field sample panels when directed.

1.5 COORDINATION

A. Coordination: Coordinate sequence of activities to accommodate required testing, quality-assurance, and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Coordinate the Work of this Section with all related materials, installations, site activities and administrative requirements.

2. Schedule times for tests, inspections, obtaining samples, and similar activities.
3. The colloidal treatment specified in this Section shall be applied at the time of concrete placement and in accordance with the Manufacturer's recommendations for the conditions of this Project. Consult and coordinate with the Manufacturer's Authorized Representative.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with colloidal treatment manufacturer's written instructions for substrate temperature, ambient temperature, relative humidity, ventilation, and conditions affecting application.

1. Apply colloidal treatment when substrate temperature and surrounding air temperatures are between 36 degrees F and 95 degrees F (2 degrees F and 35 degrees C).
2. Do not apply colloidal treatment in snow, rain, fog, or mist, or high winds; when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces. Do not apply to frozen or icy surfaces or where there is standing or ponding water.
3. Allow surfaces and product to attain a temperature of 36 degrees F (2 degrees C) and rising before proceeding with product application.
4. Very Hot Weather and Direct Sunlight Conditions: Apply a fine mist spray of water on the surface after application of penetrating colloidal concrete treatments treatment to alleviate premature chemical reaction and/or drying from taking place prior to achieving maximum penetration. Do not allow the colloidal treatment to dry prematurely during application.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packages. Store materials in accordance with manufacturer's recommendations. Protect from freezing, direct sun exposure, and exposure to moisture.

1.8 FIELD CONDITIONS

A. Environmental Requirements per manufacturer's written recommendations and as follows:

1. Allow surfaces and product to attain a temperature of 36 degrees F (2 degrees C) and rising before proceeding with product application.
2. Do not apply product during periods of exposure to high winds.
3. Ensure that frost or frozen surfaces are thawed with no standing water.
4. Very Hot Weather and Direct Sunlight Conditions: Apply a fine mist spray of water on the surface after application of penetrating colloidal concrete treatments treatment to alleviate premature chemical reaction and/or drying from taking place prior to achieving maximum penetration.

1.9 WARRANTY

A. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace finished flooring products that fail as a result of failure(s) in materials or workmanship of penetrating colloidal concrete treatments within specified warranty period.
   1. Warranty Period: Twenty year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Requirements: Comply with ACI Manual of Concrete Practices:
   1. ACI 300 Series (Design & Construction Practices).
   2. ACI 500 Series (Special Products & Processes).

2.2 MATERIALS

A. Products: Subject to compliance with requirements, provide the following:
   1. Spray-Lock Concrete Protection, LLC; SCP 327.
   2. Substitutions NOT PERMITTED.
   3. No substitutions shall be considered nor permitted for the Penetrating Colloidal Concrete Treatment as specified in this Section. The Architect has determined that no equivalent product exists for this treatment and the end resulting technical properties of concrete to combat site water conditions.
   4. The Contractor is responsible for the proper application of this treatment and all appropriate handling to result in the design intent. Any reparations necessary as a result of mishandling or improper application of this treatment shall rest solely with the Contractor.

B. Penetrating colloidal concrete treatment is a green tinted (dries clear), odorless, nontoxic, and nonflammable penetrant in a colloidal liquid base applied at time of concrete placement. Penetrating colloidal concrete treatment penetrates concrete substrates to chemically react with free alkali components in the concrete resulting in:
   1. Superior concrete curing at time of placement.
   2. Concrete surface ready to accept adhesives, coatings, and/or underlayments when applied according to the respective manufacturer’s recommendations.
   3. Reduced or eliminated shrinkage cracking and slab curl.
   4. Minimized scaling and spalling.
   5. Enhanced durability.

2.3 ACCESSORIES

A. Large Surface Areas: Low to medium pressure (≤ 1,500 psi) airless sprayer.

B. Small to Medium Surface Areas: Pump or backpack sprayer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination, preparation, and application per manufacturer's written instructions, industry guidelines:

1. Acceptance of Conditions: Carefully examine installation areas with Applicator present for compliance with requirements affecting Work performance.
    a. Verify that surfaces, substrates, tolerances, levelness, plumbness, temperature, humidity, cleanliness, and other applicable conditions are as required by product manufacturer and are ready to receive work.
    b. Test substrates as required by manufacturer to verify proper conditions.
    c. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates to ensure proper application of penetrating colloidal concrete treatment.

1. Protect in place assets from overspray.
2. Concrete is ready for application of product as soon as concrete placement, floating, and/or troweling is completed and is hard enough for foot traffic or other surface loading without causing damage to the surface.
    a. Concrete mixes shall not use internal curing compounds or other membrane forming chemical additives, such as crystalline silicate sealers (i.e. – sodium, potassium, lithium, etc. silicate sealers) that can inhibit penetration of colloidal concrete treatment.
    b. Remove standing water.
    c. Do not hard trowel or over-float the surface.

3.3 INSTALLATION

A. Apply penetrating colloidal concrete treatment as soon as the concrete is hard enough for foot traffic or other surface loading without damage to the surface. Use a low to medium pressure air less sprayer (≤ 1,500 psi). Set pressure between 300 – 600 psi to prevent damaging concrete slab surface. Apply at a rate of approximately one gallon per 140-180 sq. ft.

B. If product is immediately absorbed into porous concrete, spray a second application of penetrating colloidal concrete treatment at the same rate of approximately one gallon per 140-180 sq. ft. penetrating colloidal concrete treatment has been applied to new concrete.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory authorized service representative to inspect all applications of Penetrating Colloidal Concrete Treatment.

1. Manufacturer’s representative shall view all preparations made for concrete placement and application of colloidal treatment at the time of concrete placement. The Contractor shall provide sufficient advanced notice to the manufacturer’s representative prior to concrete placement to afford on site representation.
2. Provide reports of all inspections for conditions and observations made, recommendations made and other information to Architect for record within 48 hours of completed inspection.

B. Perform Site Tests and Inspections as follows:

1. Inspect substrate for nonconforming work including, but not limited to:
   a. Curing compounds.
   b. Other barrier forming compounds (i.e. – crystalline silicates, epoxies, urethanes, etc.)
   c. Excessive hard troweling (i.e. – burnished surface).
   d. Dried penetrating colloidal concrete treatment material on the concrete substrate due to slab not being wetted during very hot, direct sunlight, and/or windy conditions.

3.5 CLEANING

A. Immediately clean overspray or splash from glass and metal surfaces with soap and water then towel dry.

END OF SECTION