SECTION 03 0559

PENETRATING COLLOIDAL CONCRETE TREATMENT

CSI 3-PART **SHORT-FORM** GUIDE SPECIFICATION:
USE FOR OUTLINE OR DD SPECIFICATION ISSUES. EDIT TO SUIT PROJECT

PART 1 – GENERAL

1.1 SUMMARY

A. Work of this Section consists of spray-applied, penetrating, colloidal concrete treatments and includes, but is not limited to, the following:

1. SCP 327 – Time of Placement by SCP™ (Spray-Lock Concrete Protection, LLC)
2. SCP 578 – Premium Concrete Protection by SCP™
3. SCP 743 – Concrete Remediation by SCP™
4. Project Manager/Engineer Approved Equivalent
5. Substrate preparation

NOTE: SCP™ products are based on colloidal technology that penetrates into concrete capillaries and pores. SCP Technology then reacts with free alkali (i.e. – Na^{+}, K^{+}, and Ca^{++}) to form an insoluble gel within the capillaries and pores of the concrete, providing a waterproof seal, but uniquely leaving the concrete surface in a condition to receive adhesives, toppings, other finish systems, and/or coatings.

B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. Documents and Sections include, but are not limited to, the following:

1. Drawings and General Provisions of the Contract
2. General and Supplementary Conditions
3. DIVISION 01 General Requirements
4. Relevant Detailed Specification Sections

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordination per DIVISION 01
B. Concrete placement per DIVISION 03
C. Masonry maintenance and common work per DIVISION 04
D. Thermal and moisture protection per DIVISION 07
E. Installation and maintenance of floor and wall finishes per DIVISION 09
F. Installation and maintenance of high-performance and specialty coatings per DIVISION 09
G. Operation and maintenance of special construction per DIVISION 13
H. Operation and maintenance of concrete aboveground storage tanks per DIVISION 23
I. Cement and concrete for earthwork per DIVISION 31
J. Concrete special foundations and load-bearing elements per DIVISION 31
K. Tunneling and mining per DIVISION 31
L. Operation and maintenance of exterior improvements per DIVISION 32
M. Operation and maintenance of utilities per DIVISION 33
N. Operation and maintenance of transportation infrastructure per DIVISION 34
O. Operation and maintenance of waterway and marine construction per DIVISION 35
P. Operation and maintenance of refractory concrete per DIVISION 40
Q. Operation and maintenance of material storage per DIVISION 41

R. Operation and maintenance of gas and liquid storage per DIVISION 43
S. Preinstallation Meetings per DIVISION 01: Review requirements for application

RED NOTE: Specifier to closely coordinate applicable sections between concrete, SCP™, adhesive systems, subfloor substrate finish coatings, floor finish coverings, and/or other coatings.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's printed descriptions of materials, components and systems; performance criteria; use limitations; preparation instructions and recommendations; storage and handling requirements and recommendations; and installation methods.
B. Quality Assurance Submittals: Certificates, and Test and Evaluation Reports.
C. Sustainable Design (USGBC LEED™) Submittals:

NOTE: SCP™ can help to achieve up to **9 or more** USGBC LEED™ credits as follows:

1. LEED Credit SS, Sustainable Sites. Submit completed LEED 2009-NC v.3 Submittal Templates and other required paperwork as follows:
   a. SS 3 – Brownfield Redevelopment: Submit documentation proving site is contaminated
2. LEED Credit MR, Materials & Resources. Submit completed LEED 2009-NC v.3 Submittal Templates, and other required paperwork as follows:
   a. MR 1.1 – 75% Building Reuse: Submit documentation quantifying existing to remain
   b. MR 1.2 – 95% Building Reuse: Submit documentation quantifying existing to remain
   c. MR 2.1 – Construction Waste Management, Divert 50% from Disposal: Document
   d. MR 2.2 – Construction Waste Management, Divert 75% from Disposal: Document
   e. MR 5.1 – 10% Regional Materials: Submit corroborating data
   f. MR 5.2 – 20% Regional Materials: Submit corroborating data
3. LEED Credit IEQ, Indoor Environmental Quality. Submit completed LEED 2009-NC v.3 Submittal Templates and required paperwork as follows:
   a. IEQ 3.2 – Construction IAQ Management Plan – Before Occupancy: Option 2, Air Testing
   b. IEQ 4.1 – Low-Emitting Materials: Adhesives & Sealants: Submit VOC Data
   c. IEQ 4.2 – Low-Emitting Materials: Paints & Coatings: Submit VOC Data
   d. IEQ 4.3 – Low Emitting Materials: Carpet Systems: Submit VOC Data
4. LEED Credit ID, Innovation and Design Process. Submit completed LEED 2009-NC v.3 Submittal Templates and required paperwork as follows:
   a. ID 1.1 – Innovation in Design: Significant Construction Time Savings

NOTE: Coordinate and edit to the correct Section number below.

D. Closeout Submittals: Operation and Maintenance Data, and Record Documents.

1. Operation and Maintenance Data: Including, but not limited to, methods for maintaining installed products and precautions against cleaning materials with methods detrimental to finishes and performance.
2. Record Documents: Drawings, Specifications, and Product Data.

NOTE: Edit LEED Requirements below to suit project.

3. Sustainable Design Closeout Documentation: Submit completed USGBC LEED™ Submittal Worksheet Templates for the following credits:
   a. SS 3, MR 1.1, MR 1.2, MR 2.1, MR 2.2, MR 5.1, MR 5.2, IEQ 3.2, IEQ 4.2, IEQ 4.3, ID 1.1, and ID 1.2

1.4 QUALITY ASSURANCE

A. Material Requirements: Concrete mixes shall be designed in accordance with ACI 211 Standard Recommended Practice for Selecting Proportions for Concrete.
B. Structural Requirements: Concrete shall be "fit for use" per the applicable Guides, Manuals, Specifications, and/or Standards of the following ACI Manual of Concrete Practice series:
   1. ACI 300 Series (Design & Construction Practices)
   2. ACI 500 Series (Special Products & Processes)
C. Qualifications: ISO 9001 Certified Manufacturer with a minimum 15 years experience and capable of providing field service representation; Applicator to have a minimum three (3) years successful experience and/or SCP confirmation of successful application training; and a Testing Agency per ISO/IEC Standard 17025 or ASTM E699 and ASTM E329.
D. Source Limitations: Obtain penetrating colloidal concrete treatment through one source from a single manufacturer.
E. Sustainability Standards and Certifications:
   1. VOC Limits: As tested using a Gas Chromatograph/Mass Spectroscopy as defined by South Coast Air Quality Management District Rules: In areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur.
      a. SCAQMD Rule 1113, Architectural Coatings
F. Mockups: Provide full-scale three-dimensional concrete slab, wall assembly, and/or other mockup(s) utilizing final specified materials, approved mix design, and final production techniques.
   1. Fully test constructed mockup(s), either in the field or off-site, verifying that the product application meets the performance requirements of this Specification.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery, storage, and handling shall be according to the manufacturer's written recommendations, industry guidelines, and/or DIVISION 01 requirements whichever is more stringent.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers List: Subject to compliance with requirements, provide spray-applied products by one of the following:
   1. Spray-Lock Concrete Protection, LLC, 5959 Shallowford Road, Suite 405, Chattanooga, TN 37421; (office) 423.305.6151 / (fax) 423.305.6150; www.spraylockcp.com
   2. Substitution Limitations: Manufacturers of equivalent products beyond those listed above shall be considered when submitted per DIVISION 01, using CSI Substitution Request Form 1.5C (During the Bidding Phase) or Form 13.1 (After the Bidding Phase). Project Engineer/Manager shall assess the equivalency of the submitted product(s).
B. Product Options:
   1. Acceptable hydraulic cement leveling underlayments: Refer to SECTION 03 5416
   2. Acceptable Primers / Paint Systems: Acrylic-based or equivalent approved by the Project Manager/Engineer
   3. Acceptable Coatings: As approved by the Project Manager/Engineer
   4. Acceptable Adhesives: Spray-Lock™ Premium Eco Adhesives or equivalent approved by the Project Manager/Engineer

2.2 DESCRIPTION

A. NEW CONCRETE: SCP 327 – Time of Placement is a green-tinted (dries clear), odorless, non-toxic, and non-flammable penetrant in a colloidal liquid base. SCP 327 penetrates concrete and masonry substrates to chemically react with free alkali components in the concrete resulting in:
   1. Superior cure at time of placement
   2. A 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. Minimizes scaling and spalling
   5. Enhanced durability

B. EXISTING CONCRETE: SCP 578 – Premium Concrete Protection is a cloudy white (dries clear), odorless, non-toxic, and non-flammable penetrant in a colloidal liquid base. SCP 578 penetrates concrete and masonry substrates to chemically react with free alkali components in the concrete. In addition to the benefits of SCP 327, SCP 578 also provides:
   1. Permanent waterproofing and sealing
   2. Hardening and densifying up to 8 inches (200mm) in depth
   3. Reduced or eliminated surface dusting (i.e. – concrete carbonation)
   4. Enhanced resistance to chemical and environmental attack
   5. Access to floors, slabs, and other treated areas in as little as 1 hour
   6. Minimizes mold and mildew

C. CONCRETE REMEDIATION: SCP 743 – Concrete Remediation is a blue-tinted (dries clear), odorless, non-toxic, and non-flammable penetrant in a colloidal liquid base. SCP 743 deeply penetrates concrete and masonry substrates to chemically react with free alkali components in the concrete. In addition to the benefits of SCP 327 and SCP 578, SCP 743 also provides:
   1. Protection of reinforcing steel
   2. Rejuvenation of concrete capillary and pore structure
   3. Stabilizes concrete chemistry

D. Product Requirements – All penetrating colloidal concrete treatments shall conform to the information provided in the most current product data sheet supplied by Spray-Lock Protection or product manufacturer approved by the Project Engineer/Manager.

E. Sustainability Characteristics

NOTE: SCP™ can help to achieve up to **9 or more** USGBC LEED™ credits as follows:

   1. SS 3, Brownfield Redevelopment: SCP™ can help to achieve this credit when used to **remediate** existing concrete slabs and/or walls.
   2. MR 1.1, MR 1.2, Building Reuse: SCP™ can help to achieve these credits when used to **remediate** existing concrete slabs and/or walls.
   3. MR 2.1, MR 2.2, Construction Waste Management, Divert from Disposal: SCP™ can help to achieve these credits when used to **remediate** existing concrete slabs and/or walls.
   4. MR 5.1, 5.2, Regional Materials, Regionally Extracted: SCP™ can help to achieve these credits when project is located **within 500 miles of** the Caddo Mills, TX 75135 manufacturing plant.
   5. IEQ 3.2, Construction IAQ Management Plan: Before Occupancy: SCP™ concrete and masonry treatments minimize the concrete surface area where dust, pollutants, and other VOCs can be trapped, facilitating the building flush-out process. In addition, SCP™ **contributes 0.0 VOCs**, making it easier to meet the requirements for Option 2: Air Testing.
   6. IEQ Credit 4.1 / 4.2 / 4.3, Low Emitting Materials: SCP™ treatments for all architectural and structural concrete elements **contributes 0.0 VOC**
      a. Waterproofing Concrete / Masonry Sealers VOC limited to 100 g / liter per SCAQMD Rule 1113.
   7. Possible Innovation Design ID Credits: SCP™ concrete and masonry treatments have several advantages that may be included in an application for Innovation Credits:

a. ID 1.1 - Radical Construction Time Savings: Very significant time savings occurs when 5 to 14 day-old concrete can have the final finished system installed in as little as 24 hours after product application, and eliminates or significantly reduces concrete moisture issues, and therefore promotes good indoor environmental quality.

NOTE: LEED Innovation Design credits for air quality mitigation have previously been awarded by USGBC on projects.

2.3 ACCESSORIES

A. Large Surface Areas and/or Volumes: Low to medium pressure (i.e. – ≤ 1,500 psi) airless sprayer
B. Small to Medium Surface Areas and/or Volumes: Pump or backpack sprayer

PART 3 – EXECUTION

3.1 FIELD CONDITIONS

A. Environmental Requirements per manufacturer's written recommendations, DIVISION 01, and as follows:
1. Allow surfaces and product to attain a temperature of 36 deg F (2 deg C) and rising before proceeding with product application.
2. Do not apply unprotected 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 SCP™ treatment to help alleviate premature chemical reaction and/or drying from taking place prior to achieving maximum penetration.

3.2 EXAMINATION, PREPARATION, AND APPLICATION

A. Examination, preparation, and application per SCP's™ written instructions, industry guidelines, DIVISION 01, and as follows:
1. Acceptance of Conditions: Carefully examine installation areas with Installer/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 manufacturers, and are ready to receive Work.
b. Test substrates as required by SCP™ to verify proper conditions.

NOTE: Penetrating colloidal technology is dependent upon water penetration/absorption into the concrete. If water does not penetrate the concrete, then treatment will also not penetrate.

c. Proceed with installation only after unsatisfactory conditions have been corrected.
2. Provide or prepare substrates to ensure proper application of SCP™ treatment.
a. Protect in-place assets from overspray.
b. NEW CONCRETE: As soon after concrete placement, floating, and/or trowelling so that it is hard enough for foot traffic or other surface loading without causing damage to the surface.
1). 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.
2). Remove standing water.
3). Do not hard trowel or over-float the surface.
c. EXISTING CONCRETE & CONCRETE REMEDIATION: Physically remove curing membranes, laitance, plaster, oil, adhesive residue, crystalline silicate hardeners, or other contaminants from the substrate surface (i.e. – sand or shot blast, high-pressure wash, etc.) then vacuum and/or pressure wash surface clean, removing all standing water prior to application.

RED NOTE: Please refer to the blast media manufacturer for proper shot media selection.

3. SCP™ Application to NEW CONCRETE:

a. Apply SCP™ 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 [i.e. - ≤ 1,500 psi (10 MPa)] set to a pressure that will not damage the surface [i.e. – approximately 300 to 600 psi (2.1 to 4.1 MPa)]. Apply at a rate of approximately 140-180 ft^2 per gallon.
b. If necessary, spray a second application of SCP™ for porous concrete at a rate of approximately 140-180 ft^2 per gallon.
c. After 24 to 48 hours, apply leveling cements, acrylic primers, applicable Spray-Lock™ adhesive, and/or the final surface finish materials according to the respective manufacturer recommendations.

4. SCP™ Application to EXISTING CONCRETE and for CONCRETE REMEDIATION:
   a. Apply SCP™ using a low to medium pressure air less sprayer [i.e. - ≤ 1,500 psi (10 MPa)] onto existing concrete as soon as the application surface has been properly prepared. Apply at a rate of approximately 70-180 ft^2 per gallon depending on the product and application.
   b. If necessary, spray a second application of SCP™ for porous concrete at a rate of approximately 140-180 ft^2 per gallon.
   c. After a minimum of 24 hrs, lightly sand & vacuum, or pressure wash, to remove any left over contaminants and excess materials.
   d. After 24 to 48 hours, apply leveling cements, acrylic primers, applicable Spray-Lock™ adhesive, and/or the final surface finish materials according to the respective manufacturer published recommendations.

3.3 FIELD QUALITY CONTROL

A. Site Tests and Inspections per DIVISION 01, and as follows:
   1. Inspect substrate for non-conforming work including, but not limited to:
      a. Curing compounds
      b. Other barrier forming compounds (i.e. – crystalline silicates, epoxies, urethanes, etc.)
      c. Excessive or hard troweling (i.e. – burnished surface)
      d. Dried SCP™ treatment material on the concrete substrate due to slab not being wetted during very hot, direct sunlight, and/or windy conditions.

3.4 CLEANING

A. Immediately clean overspray or splash off glass and metal with soap and water, and dry.
B. Waste Management per DIVISION 01, and as follows: Store and recycle shipping cartons and empty bucket containers.

3.5 CLOSEOUT ACTIVITIES

A. Substantial Completion Requirements per DIVISION 01 and as follows:
   1. Perform Closeout Procedures
   2. Perform Demonstration and Training with Owner's designated staff
   3. Sustainable Design Closeout Documentation: LEED credit worksheet paperwork
B. Correct Non-Conforming Work per General Conditions, and the acceptance of the A/E

END OF SECTION

RED NOTE: Be sure to obtain the latest version of this Guide Specification.
This Guide Specification is not a completed document ready for use. It must be edited (i.e. - deleting, adding, or modifying text) as required to suit project requirements.
The registered professional and the contracting parties of the Contract Documents are responsible for the accuracy of issued project specifications, including any use of this SCP™ Guide Specification.
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