



Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS FOR COLORED SEALER COATING FOR STRUCTURAL CONCRETE

Effective Date
October 20, 2009

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

09002.01 DESCRIPTION.

Finish the concrete surfaces of the bridge as designated in the plans using a colored high silicone-content acrylic concrete sealer coating.

09002.02 MATERIALS.

- A. Use one of the following products, or an approved equal:

Sherwin-Williams SWD DOT Bridge and Highway Sealer B-97 Series
The Sherwin-Williams Company
10132 Buxton
Houston, TX 77017
281-615-7571

Anvil Siliconized Acrylic Concrete Opaque Sealer
Anvil Paints and Coatings
1255 Starkey Road
Largo, FL 33771
800-822-6776

Advanced Concrete Stain Pigmented Sealer
Advanced Surfaces Inc.
2000 Banks Road
Margate, FL 33063
954-973-4528

- B. Submit alternate products and suppliers to the Engineer for approval prior to material acquisition and application.
- C. Refer to the bridge plans for specified coating colors and locations. Submit product specification sheets and coated concrete samples to the Iowa Department of Transportation, Office of Bridges and Structures, for approval prior to application. Submit samples for each coating color:
- Made from concrete of the same mix design to be used for actual construction,

- 1 foot square by 2 inches thick (300 mm square by 50 mm thick),
- Prepared according to the guidelines described in this specification, and
- Coated on the formed face only.

- D. The following guidelines are in addition to the manufacturer's product recommendations. Do not violate the manufacturer's recommendations.

An applicator with three or more years of experience applying similar coatings to concrete surfaces is to apply the product. The product manufacturer's representative is to be on site during initial surface preparation and product application. The Engineer's review and approval of a 3 foot by 3 foot (1 m by 1 m) test section is required prior to continuing with final product application.

09002.03 CONSTRUCTION.

A. Pre-application surface preparation.

1. To all new concrete surfaces to receive the colored sealer coating, perform a Class 2 Strip Down Surface Finish according to Article 2403.03, S, 2, b, of the Standard Specifications.
2. Allow new concrete to cure for a minimum of 14 days. Ensure it passes the pH, water penetration, and moisture content tests described in this Developmental Specification.
3. On slip formed concrete barrier rails, use curing compounds approved by the concrete sealer manufacturer for over-coating with the concrete sealer. Do not use curing compounds containing paraffin. Thoroughly remove curing compounds not approved by the concrete sealer manufacturer prior to final coating application.
4. Use a concrete etching solution complying with the concrete sealer manufacturer's recommendations on surfaces of slip formed barrier rails less than 3 months old. The etching solution application is to yield an open, porous surface for proper adhesion of the concrete sealer coating.
5. Ensure all surfaces are clean, dry, and free of grease, oil, paint, curing compounds not approved for overcoating by the sealer coating manufacturer, concrete sealers, or any other material that would prevent a stable bond between the concrete sealer coating and the concrete surface.
 - a. Surface cleaning, at a minimum, requires the use of 3000 psi (20 MPa) high-pressure washing at a flow rate of 3 to 14 gallons (11 to 53 L) per minute. Allow to dry for a minimum of 24 hours prior to coating application.
 - b. If the concrete cannot be cleaned adequately with a water wash, use combined sand-and-water-blasting or light sandblasting (brush blast).
 - c. Protect the public, the bridge, and all surfaces from harm during the cleaning process.

B. Pre-application surface tests.

Prior to the commencement of any coating, check concrete surfaces for pH level. Also check for the presence of sealers, oils, curing compounds not approved by the concrete sealer manufacturer, or other possible bond breakers. Use the following methods and techniques:

1. pH test.

The prepared concrete is to have a pH level between 6 and 10. Perform pH testing according to ASTM D 4262 prior to coating the surface. An acid-etch complying with the coating product manufacturer's recommendations may be added to the water wash to reduce the pH. If acid-etch is used, rinse surfaces prior to re-testing the pH level.

2. Water penetration test.

Test dry concrete surfaces for the presence of sealers, oils, curing compounds not approved by the concrete sealer manufacturer, and so forth. Perform testing by visual inspection and by wetting with fine mist water spray. Properly prepared, porous surfaces show no water beading after 1 minute. If beading of water is apparent after 1 minute, clean the surface of sealing agents. This may require further high-pressure washing, combined sand-and-water-blasting, or light sandblasting (brush blast). Test, in different locations, portions of all surfaces designated to receive colored sealer coating as directed by and to the satisfaction of the Engineer.

3. Moisture content test.

Follow the requirements of ASTM E 1907 to test for moisture content and readiness of the concrete surface to receive the coating. Acceptable test methods include electrical resistance or electrical impedance testing.

C. Product application.

1. Apply a minimum of two coats.
2. Apply under dry conditions only. Do not apply if rain is expected within 12 hours following application.
3. Air and surface temperature should be between 50°F and 90°F (10°C and 32°C) during and for 24 hours following application.
4. Do not over apply. Follow manufacturer's recommendations for coating thickness. No drips, runs, or sags will be allowed during the application or in the final results.
5. Stir product thoroughly before and during application.
6. The following application methods are allowed:
 - a. Brush: Use a natural bristle brush.
 - b. Roller: Use a 3/8 to 1/2 inch (9 to 13 mm) nap lambswool or other solvent-resistant cover.
 - c. Spray: Airless sprayer with a pressure of 1500 psi (10 MPa) and a 0.013 to 0.017 inch (0.3 to 0.4 mm) tip opening.
7. First coat: Apply first coat evenly, working in one direction. Allow at least 12 hours before applying the second coat. Do not overwork, as brushing or rolling back over partially dried material may cause lifting of the coating from the surface.
8. Second coat: For best coverage apply the second coat perpendicular to the first coat.
9. Third coat: Apply if needed to eliminate brush or roller marks that are evident in the finish. Apply in the same direction as the first coat.
10. Protect concrete areas adjacent to surfaces to receive the colored sealer coating from splash, staining, dripping, or over-rolling of the coating during application. To prevent staining, immediately and thoroughly remove coating material applied to surfaces not intended to receive the coating.

09002.04 METHOD OF MEASUREMENT.

Square yards (square meters) shown in the contract.

09002.05 BASIS OF PAYMENT.

- A. Payment will be the contract unit price per square yards (square meters) for the Colored Sealer Coating for Structural Concrete.
- B. Payment is full compensation for furnishing all labor, equipment, and materials used to prepare, test, and apply all three coats, if needed, of the paint.