DS-23001
(New)

DEVELOPMENTAL SPECIFICATIONS
FOR
CONCRETE SURFACE PREPARATION AND TESTING PRIOR TO COATING APPLICATION

Effective Date
October 17, 2023

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

23001.01 DESCRIPTION.

Prepare concrete surfaces of bridge and test for readiness prior to application of concrete coatings (paints, stains, silicate coatings, sealers, cementitious plasters, etc.) as designated in plans.

23001.02 CONSTRUCTION.

A. Special Considerations During Concrete Construction.

1. On slip formed concrete barrier rails, use only curing compounds approved for over-coating by manufacturer of the concrete coating specified in the plans, or use only products that can be entirely removed by surface preparation techniques required by these specifications. Do not use curing compounds containing paraffin. Thoroughly remove curing compounds not approved by concrete coating manufacturer prior to coating application.

2. Ensure concrete form release compounds used are in accordance with the coating manufacturer's recommendations, or use only products that can be entirely removed by the surface preparation techniques required by these specifications.

B. Pre-application Surface Preparation.

1. For new concrete surfaces to receive coating, perform a Class 2 Strip Down Surface Finish according to Article 2403.03, P, 2, b, of the Standard Specifications.

2. After form removal, allow new concrete and surface repairs to cure for a minimum of 14 calendar days, or longer to remain in accordance with concrete coating manufacturer's recommendations.

3. Use combined sand and water blasting to prepare concrete surfaces in accordance with ASTM D 4259-88, "Standard Practice for Abrading Concrete", Section 8, "Abrasive Blast Cleaning Procedure". Surface roughness achieved shall be in accordance with the International Concrete Repair Institute (ICRI) Technical Guideline No. 310.2-1997 for Concrete Surface Profile Two (CSP 2) to Three (CSP 3) without exposure of coarse aggregate. Ensure that the finish is consistent across entire surface. Prepared surfaces shall have the texture of fine sand with no smooth, burnished or shiny areas of fine cement paste.

4. Wash concrete surfaces with clean water following combined sand and water blasting. Using lint-free towels, blot dry bug holes, voids, or depressions that contain moisture. Allow prepared concrete to dry for a minimum of 24 hours prior to coating application.

5. Protect the public, passing vehicles, the bridge, nearby waterways and vegetation, and all surfaces from harm during surface preparation. Do not blast galvanized or painted metal surfaces.

6. Ensure surfaces are clean, dry, and free of grease, oil, paint, curing compounds not approved for over-coating by concrete coating manufacturer, concrete sealers, or other material that prevents a stable bond between concrete coating and concrete surface.

7. Following surface preparation, ensure concrete to be coated passes the pH, water penetration, and moisture content tests described in these specifications.

C. Pre-application Surface Tests.

Prior to commencement of coating, check concrete surfaces for pH level. Check for presence of sealers, oils, curing compounds not approved for over-coating by concrete coating manufacturer, or other possible contaminants interfere with bond of coating to the concrete. Use the following methods and techniques:

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

2. **Water Penetration Test.**
   Test dry concrete surfaces for presence of sealers, oils, curing compounds not approved by concrete coating manufacturer, and other contaminants. 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 surface of sealing agents. This may require further combined sand and water blasting, or light sandblasting (brush blast). Test, in different locations, portions of all surfaces designated to receive concrete coating as directed by the Engineer.

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

4. **Report of Test Results.**
   Submit results of tests performed to the Engineer for review. Do not begin concrete coating application until Engineer issues approval to proceed.

D. Clean-up.

Remove abrasive blast residue and other related debris and leave work area broom clean.

23001.03 METHOD OF MEASUREMENT AND BASIS OF PAYMENT.

Concrete surface preparation and readiness testing prior to application of concrete coating will not be measured for payment. All labor, equipment, and materials required shall be considered incidental to the bid item that includes the costs associated with the concrete coating.