SP- 151045
(New)

SPECIAL PROVISIONS

FOR

HIGH PERFORMANCE COATINGS

Polk County
STP-U-6102(613)--70-77

Effective Date
October 16, 2018

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDE D BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation, shop-application, and field touch-up of high-performance coating (HPC) systems for the following:
   1. All steel components of the MASONRY PIER cage (tubes, plates, fasteners, etc.)

1.2 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing method indicated. High performance coatings product shall meet or exceed the following requirements:
   1. Abrasion:
      a. Method: ASTM D 4060, (CS-17 Wheel, 1,000 gram load).
         1) Requirement: No more than 134 mg loss after 1,000 cycles, average of three tests.
   2. Adhesion:
      a. Method: ASTM D 4541 (Method B, Type II Tester).
         1) Requirement: No less than 950 psi pull-off strength, average of three tests.
      b. Method: ASTM D 4541 (Method E, Type V Tester).
         1) Requirement: No less than 1,733 psi pull-off strength, average of three tests.
   3. Exterior Exposure:
      a. Method: ASTM D 4141, Method C (EMMAQUA).
         1) Requirement: No blistering, cracking or chalking. No less than 80% gloss retention (8.2 units gloss change) and 0.29 DED Hunter Lab Scale color change after 1260 MJ/m2
         2) EMMAQUA exposure, average of five tests in five colors.
   4. Flexibility:
      a. Method: ASTM D 522 (Method A - Conical Mandrel).
         1) Requirement: No less than 11.61% elongation average of three tests. (TR5333)
   5. Hardness:
      a. Method: ASTM D 3363
         1) Requirement: No gouging with an 8H or less pencil. (TR5334A)
   6. Humidity:
      a. Method: ASTM D 4585
         1) Requirement: No blistering, cracking, checking, rusting or delamination of film after 2,000 hours exposure. (TR5415)
   7. Impact:
      a. Method: ASTM D 2794
         1) Requirement: No visible cracking or delamination of film after 28 inch-pounds or less direct impact, average of three tests. (TR5398)
   8. QUV Exposure:
      a. Method: ASTM D 4587 (UVA-340 bulbs, Cycle 4: 8 hours UV/4 hours condensation).
         1) System: Series 66 Hi-Build Epoxoline/Series 1071 Fluoronar applied to SSPC-SP1 Solvent Cleaned aluminum panels and cured 30 days at 75°F.
         2) Requirement: No blistering, cracking or chalking. No less than 83% gloss retention (8.8 units gloss change), and 2.65 DE_{FMCII} color change after 10,000 hours QUV exposure, average of five colors. (TR5785)

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of coating system and in each color and gloss of finish coat indicated.
   1. Submit Samples on rigid backing, 8 inches square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

C. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Plans and in schedules.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for high performance coatings, indicating compliance with performance requirements.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience and receiving approval prior to bidding.
   1. Approved High Performance Coating Applicators:
      a. Abstract Painting, Council Bluffs, IA: 712-328-3231
      b. W.S. Bunch, Omaha, NE: 402-558-4242
      c. Allen Blasting & Coating, New London, IA: 319-367-5500
      d. Mongan Painting, Cherokee, IA: 712-225-0626
      e. HEG Painting, Cherokee, Iowa 712-225-4513
      f. Wes Jarnagin Painting Inc. 515-276-8532
      g. Or approved equal.

B. Mockups: Apply benchmark samples of each coating system indicated to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Contacting Authority will select one surface to represent surfaces and conditions for application of each type of coating and substrate.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45°F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Shop Conditions:
   1. All coatings shall be shop applied in controlled environment; comply with manufacturer's requirements for air and surface temperature and relative humidity during application and curing period. Allow finishes to adequately cure prior to transporting to site for installation.

B. Field Touch-Up:
   1. Touch-up coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50°F and 95°F.
   2. Do not touch-up coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5°F above the dew point; or to damp or wet surfaces.

1.7 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair or replace finish that shows evidence of deterioration of finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 DE Hunter units when tested according to ASTM D 2244 by comparing the affected exposed coating claeaned with water and soft cloth with unexposed color standards maintained by coatings manufacturer and Owner.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214, Method A.
      c. Exhibit loss of gloss in excess of 24 units as measured by a gloss meter in accordance with ASTM D523-89 with 60 degreegeometry.
      d. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 15 years from date of substantial completion.
   3. Coatings applicator shall prepare and field apply the complete specified coating system to a minimum of six sample panels, 3 inches x 6 inches or larger of each finish color. The six field applied sample panels of each finish color shall be air dried for a minimum of 7 days prior to transmitting to coatings manufacturer for verification and distribution.

PART 2 - PRODUCTS

2.1 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:
   1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. Provide products of same manufacturer for each coat in a coating system.

B. Colors:
   1. MASONRY PIER cage: Match RAL 5011 (Steel Blue).
   2. STEEL PIPE PEDESTRIAN HAND RAILING: Black.

2.2 HIGH-PERFORMANCE COATINGS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thickness indicated; number of coats specified does not include primer or filler coat unless specifically noted.

B. Coating systems, including primers, intermediate and top coats, to be provided by a single manufacturer. The same manufacturer and applicator shall be used for all parts and assemblies covered by this Special Provision.

C. Basis of Design Products: High performance coatings are based on products manufactured by Tnemec Company Inc. Subject to compliance with requirements, provide the named product or an equivalent product, approved prior to bidding, by one to the following:
   1. Carboline Company.
   2. PPG Architectural Finishes, Inc.
   3. Sherwin Williams
   4. Or approved equal.

D. High Performance Coating –Galvanized Steel: Fluoropolymer
   1. Surface Preparation: SSPC SP-1 Remove all soluble and insoluble contaminants and corrosion. Sweep (Abrasive). Blasting per ASTM D 6386 to achieve a uniform anchor profile (1.0 - 2.0 mils).

2. Primer: Tnemec Series 66 or 161 (Hi-Bond Epoxoline); 3.0 to 4.0 mils DFT.
3. Intermediate: Tnemec Series 73 (Endura-Shield); 2.5 to 3.0 mils DFT.
4. Finish: Semi-Gloss, Tnemec Series 1071 (Fluoronar); 2.5 to 3.0 mils DFT.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
   1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   2. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   3. Coating application indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
   1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.

C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.

D. Galvanized-Metal Substrates: Remove all soluble and insoluble contaminants and corrosion. Sweep (Abrasive) Blasting per ASTM D 6386 to achieve a uniform anchor profile (1.0 - 2.0 mils).

3.3 APPLICATION

A. Apply high-performance coatings to specified items in shop following fabrication of units. Limit field application of high performance coatings to touch-up of finished coating.

B. Apply high-performance coatings according to manufacturer's written instructions.
   1. Use applicators and techniques suited for coating and substrate indicated.
   2. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

E. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp lines and color breaks.

F. Mechanically abrade applied finish coats that have cured for 30 days or longer prior to applying additional layers of finish coats or field applied touch-up coats.

G. Protect coating from deformation or imprinting by packaging material or other objects until coating system has fully cured.

3.4 FIELD QUALITY CONTROL

A. Contacting Authority reserves the right to invoke the following procedure at any time and as often as Contacting Authority deems necessary during the period when coatings are being applied:
   1. Contacting Authority will engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
   2. Testing agency will perform tests for compliance with specified requirements.
   3. Contacting Authority may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

3.5 CLEANING AND PROTECTION FOR FIELD TOUCH-UP

A. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

B. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

C. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

D. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Contacting Authority, and leave in an undamaged condition.

PART 4 - MEASUREMENT

4.1 MEASUREMENT

A. Basis of Measurement: As described, all Items are incidental to the MASONRY PIER bid item.

PART 5 - PAYMENT

5.1 PAYMENT

A. Basis of Payment: Payment for all items will be included in payment for related MASONRY PIER bid item.