

SECTION 411 BRIDGE PAINTING

411.1 DESCRIPTION

This work consists of cleaning metal surfaces and application of the specified coating system.

411.2 MATERIALS

Coatings, including primer, finish and field repair coats shall all be from the same supplier and shall be one of the systems from the approved products list.

411.3 CONSTRUCTION REQUIREMENTS

- a. **General:** The coatings shall be applied in accordance with the manufacturer's recommendations. A written copy of these recommendations, including product data sheet, shall be furnished to the Department. The recommendations shall indicate the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum drying time, and the recommended procedures for coating galvanized bearings, bolts, nuts and washers.

Whenever the manufacturer's recommendations are more stringent than the provisions of this Section, the manufacturer's recommendations shall apply. Coatings shall not be applied when the air temperature is below 40EF (4EC). Or above 90EF (32EC), when the air is misty, when the humidity exceeds 85 percent, when the steel temperature is less than 5EF (3EC) above the dew point, or when conditions are otherwise unsatisfactory.

Coatings shall not be applied on damp or frosted surfaces. Coatings applied under cover in damp or cold weather shall remain under cover until dry or until weather conditions are suitable. Coatings shall not be applied when the metal is hot enough to cause the paint to blister or produce a porous paint film.

Coatings shall be applied in a uniform, even coat and shall be worked into all corners and crevices. Coatings shall be applied with approved equipment. On surfaces which are otherwise inaccessible the coating may be applied with sheepskin daubers.

Unsatisfactory coatings shall be removed, the metal reblasted, cleaned and recoated at no expense to the Department.

During coating application scaffolding or other safe devices shall be provided to permit inspection of the steel.

The Contractor shall provide protective devices as necessary to prevent damage to the work and to other property or persons from all cleaning and painting operations.

Paint or paint stains that result in an unsightly appearance on surfaces not designated to be painted shall be removed or obliterated by the Contractor at his expense.

B. Coating New Structures:

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- 1. Surface Preparation:** Surfaces to be coated shall be blast cleaned to a near white finish, in accordance with SSPC SP 10. Abrasives used for blast cleaning shall be either clean dry sand, steel shot, mineral grit or manufactured grit and shall have a gradation that provides a uniform steel surface profile of one to three mils (0.254 to 0.762 mm).

Fins, tears, slivers, and burred or sharp edges shall be removed by grinding and the area reblasted to provide the profile specified.

Blast residue shall be removed from steel surfaces with a commercial grade vacuum cleaner equipped with a brush type cleaning tool, or by double blowing. Steel shall be kept dust free, dry and primed within 24 hours after cleaning.

- 2. Mixing and Thinning Paint:** The coating shall be thoroughly mixed so the pigment is completely in suspension and the consistency in uniform. The coating shall be strained over a sieve having openings no larger than a No. 50 sieve (300 F m). After straining, the mixed primer shall be kept under continuous agitation until application is completed.

When thinning is necessary for proper application, it shall be accomplished in accordance with the manufacturer's recommendations.

- 3. Coating Application:** Both the inorganic zinc prime coat and the high build polyurethane finish coat shall be applied in the shop.

After the surface has been satisfactorily cleaned, the primer shall be applied producing a uniform even coating bonded with the metal. The finish coat shall not be applied until the prime coat has been determined acceptable by the Department. The minimum curing time between coats shall be as recommended by the manufacturer. Coatings shall be applied in accordance with SSPC PA1.

Surfaces to be coated include contact surfaces of bolted field splices. The dry film thickness (DFT) of the primer coat on the bolted friction splices on the main members shall not be less than one mil or greater than 2.5 mils. The contact or faying surfaces of bolted field splices, bolted shop splices and any other bolted faying surface, shall be masked during subsequent coating operations. In areas of field bolted connections, including the outside surface of splice plates, the outside surface shall be primed [2.5 mils (0.0635 mm) DFT] only. The DFT for the primer coat on all other surfaces shall be from three to six mils (0.0762 to 0.1524 mm) and for the polyurethane finish coat three to five mils (0.0762 to 0.127 mm). DFT shall be measured in accordance with SSPC PA 2. When measuring DFT in accordance with SSPC PA 2, the areas to be measured shall be set up to ensure that the total DFT (primer plus top coat) is not less than six mils (0.1524 mm) on the following surfaces: top of the bottom flange, top of horizontal stiffeners, and top surfaces of diaphragms.

Bolted shop connections and bolted cross frames or diaphragms shall be removed and disassembled prior to the sand blasting and coating of the girders. The removed parts shall be sand blasted and primed separately, allowed to dry, reassembled and the bolts fully tightened.

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Galvanized components, including nuts, bolts and washers shall be cleaned, after assembly, with a mineral spirit solvent followed by a hot water rinse and thorough drying, given a coat of aluminum filled epoxy mastic prime coat, and then coated with the polyurethane finish coat.

To avoid runs, bubbles and sags, the coating shall be applied in multiple passes of the spray gun, (mist coat) with each pass separated by several minutes. When applying the polyurethane top coat over an inorganic zinc primer, a mist coat is required. Where excessive coating thickness produces “mud cracking”, the coating shall be scraped back to soundly bonded coating and the area recoated.

Areas of deficient primer thickness shall be thoroughly cleaned with power washing equipment to remove all dirt. The area shall then be wire brushed, vacuumed and recoated. Each member shall have an erection mark for field identification. A diagram shall be furnished showing the erection marks. The mark shall not be visible after erection.

- 4. Handling and Shipping:** Material shall not be loaded for shipment until the shop coating has been determined acceptable by the Department. Extreme care shall be exercised in handling the steel in the shop, during shipment, during erection and during subsequent construction of the bridge, to prevent damage to the coating. Overhang brackets shall be padded where they bear on the web. Deck form work shall be mortar tight to prevent leakage onto the girders. The coating shall be protected from all chains, slings, hooks and other apparatus used to lift or turn the coated steel. During shipment, padding shall be used to prevent damage from rubbing and other causes. Diaphragms and other parts shall be padded and packed to prevent damage. The steel shall be stored off the ground on padded supports to prevent damage. Girders shall be stored so they cannot fall on, or touch one another. The steel shall not be shipped until the contractor has the necessary equipment for handling and storing the steel. The Contractor's proposed methods for handling and storing the steel will be discussed at the preconstruction meeting.
- 5. Field Repair:** All field repairs shall be made in accordance with the manufacturer's recommendations. Field repairs shall consist of application of an Aluminum Filled Epoxy Mastic primer with a finish coat of high build aliphatic polyurethane in accordance with Section 411.3C below. Field Repair shall be accomplished after the deck is poured and falsework removed and includes painting galvanized bolts, primed areas of splice plates, diaphragm connections and other areas requiring touch up or finish painting. Faying surfaces of bolted connections, including splice plates shall be coated only with the shop applied inorganic zinc primer.

C. Repainting Existing Structures: Repainting existing structures shall conform to Section 412.

411.4 METHOD OF MEASUREMENT

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Measurement for the item Bridge Painting will not be made.

411.5 BASIS OF PAYMENT

Bridge Painting will be paid for at contract price bid per lump sum. Payment will be full compensation for surface preparation, furnishing and applying the coating, field repair of damaged or uncoated areas and other incidentals required.