

SECTION 709 -- PAINTING

709.01 -- Description

The Contractor shall prepare the surfaces to be painted, furnish the paint, apply the paint, protect the paint, and dry the paint.

709.02 -- Material Requirements

1. Paint systems and paint materials shall be on the NDR Approved Products List or as specified in the special provisions.

2. The Contractor shall furnish the paint manufacturer's certification that the paint complies with the paint system specified.

709.03 -- Construction Methods

1. The Contractor shall paint structural steel as follows:

a. General:

(1) All painting shall be done in strict compliance with the paint manufacturer's specifications and the special provisions.

(2) All new structural steel work, unless otherwise specified, shall be painted with a prime coat and a final coat.

(3) Only the exposed surfaces of the steel bearing piles, steel sheet piles, steel pile shells, and steel pile enclosures above finished ground line or stream bed shall be cleaned and painted with a prime coat. The final coat is not required.

(4) All miscellaneous steel, tie rods, armor angles, nose angles, and extrusions for strip seals, except surfaces against which plastic concrete is to be placed, shall be cleaned and painted with a prime coat. The final coat is not required.

(5) Weathering steel shall not be painted.

(6) Galvanized surfaces shall not be painted.

b. Surface Preparation:

(1) All steel surfaces to be painted shall be blast-cleaned to a near-white condition in accordance with Steel Structures Painting Council Specifications (SSPC-SP10). The pictorial reference standards contained in SSPC-VIS 1, which correspond to specification SSPC-SP10, may be used to aid the evaluation of the surface cleaning.

(2) The abrasives used shall be clean, dry, sand; steel grit; or iron, steel, or synthetic shot and shall be of a gradation which produces acceptable results. When

shot is used for blasting, it must contain sufficient grit to produce a sharp, angular, anchor pattern. The normal profile height shall be 25 to 63 μm .

(3) The cleaned surface shall be one that is free of all rust, mill scale, and paint, with only slight shadows, streaks, or discolorations. At least 95 percent of the surface area shall be free of all visible residues, and the remainder shall be limited to the light discoloration mentioned above. Hammers, brushes, scrapers, and other hand or power tools shall be used to supplement blast cleaning, as necessary.

(4) Surfaces that will be inaccessible after fabrication shall be blast cleaned and painted before assembly.

(5) All blasted surfaces shall be brushed clean with bristle or wood fiber brushes, blown clean with compressed air which is free of oil or water, or cleaned by vacuum to remove any trace of blast products from the surface, pockets, or corners. All oil spots shall be cleaned with a solvent.

(6) The cleaning shall be approved by the Engineer before painting commences.

(7) Blast cleaned surfaces shall receive the prime coat of paint within 24 hours after cleaning unless otherwise authorized by the Engineer. Any rust or surface contamination occurring before painting will require recleaning.

(8) (i) Where touch-up of the prime coat is required, cleaning of small areas may be accomplished by the use of a needle gun or coarse sandpaper.

(ii) Larger areas shall be blast cleaned.

c. Mixing and Thinning Paint:

Mixing, thinning, pot life, and storage shall be in accordance with the paint manufacturer's specifications.

d. Application of Paint:

(1) Application of paint shall not be allowed until the certification stating that the paint complies with the paint system specified has been received by the Engineer.

(2) Painters and quality control personnel to be involved with the paint system shall have passed a training program given by the paint manufacturer's technical representative. The paint manufacturer shall issue a certificate for each individual who has been trained. The Contractor shall present copies of these current certificates to the Engineer prior to application of the paint system.

(3) All painting shall be done in a neat and professional manner in accordance with the paint manufacturer's specifications. Paint shall be applied to the structure to produce a smooth, uniform film without runs, sags, lap marks, or dry spray overspray. Paint shall be applied at temperatures and humidities specified by the paint manufacturer. Paint

shall not be applied upon damp surfaces or under any weather conditions that, in the opinion of the Engineer, are unsatisfactory for painting.

(4) (i) It shall be the responsibility of the Contractor to conduct and document quality control inspection of the painting, including measurements of temperature, dew point, surface profile, and paint thickness.

(ii) The measurements shall satisfy the recommendations of the paint manufacturer and shall meet the requirements of these *Specifications*.

(iii) Written documentation of measurements taken shall be provided to the Engineer.

(5) The Contractor shall thoroughly blast clean and repaint all metal coated with unacceptable paint at no additional cost to the Department.

(6) During fabrication and shop coating, scaffolding shall be furnished and erected so the Engineer can inspect the steel before and after coating.

(7) Rubber rollers or other protective devices used on scaffold fastenings shall be approved by the Engineer. Metal rollers or clamps and other types of fastenings which will mar or damage freshly coated surfaces shall not be used.

e. Shop Painting:

(1) When all fabrication work is completed and has been accepted, all surfaces not painting before assembling shall be painted with the first, or prime, coat.

(2) Before the material may be moved, the first, or prime, coat shall be allowed to cure for a minimum of 24 hours or the time that the manufacturer recommends. The minimum dry-film thickness of the prime coat, measured over the peaks of any blast profile or surface projections, shall be 75 μm . The maximum dry-film thickness shall not exceed 150 μm .

(3) The dry-film thickness of the prime coat shall be 25 to 100 μm for surfaces held in contact with high strength steel bolts (in lieu of the thickness specified for the regular paint system).

(4) Surfaces against which plastic concrete is to be placed need not be painted. Bolts, nuts, and washers installed in the field shall not be painted in the shop.

(5) Surfaces which are not to be in contact but which will be inaccessible after erection shall be painted in the shop with the full paint system required on the completed structure.

(6) If the proper dry-film thickness of the prime coat is not obtained with 1 coat, the cured film shall be cleaned of all contaminants and blasted to slightly etch the existing film. Since the adhesion problems may occur between coats of zinc primer specifically

recommended for this procedure by the manufacturer of the cured primer. In no case shall the total dry-film thickness of the prime coats exceed 150 µm.

(7) The prime coat shall be allowed to stand a sufficient length of time to allow the film to cure thoroughly throughout its entire thickness before the final, or finish, coat is applied. This time will vary with weather conditions, but in no case should the drying time be less than that specified by the paint manufacturer. The prime coat shall be thoroughly cured before the painted steel is loaded for shipment.

(8) Erection marks for field identification of members and mass marks shall be painted on the top flange of girders or upon the prime coat applied in the shop.

f. Field Painting:

(1) Before applying the final or finish coat, the first, or prime, coat shall be cleaned in accordance with the paint manufacturer's recommendation and the surfaces allowed to dry. The cleaning shall be approved by the paint manufacturer and the Engineer before application of the final coat commences.

(2) Before application of the final coat, all areas where the prime coat has been damaged during shipping, handling, and erection shall be cleaned as specified under "Surface Preparation" and painted with the primer to a condition equal to that required for the prime coat applied in the shop.

(3) Unless otherwise specified, all structural steel that has received the first, or prime, coat, except contact surfaces, shall be field painted after erection with the final, or finish, coat. The minimum dry-film thickness of the final, or finish, coat shall be 75 µm.

(4) When the erection work is complete and before the coat is applied, all bolts, nuts, and washers shall be cleaned of all adhering rust, scale, dirt, grease, or other foreign matter in an applicable manner as described in Paragraph 1.b. of this Subsection and painted with primer to a condition equal to that required for the first, or prime, coat applied in the shop.

(5) If, in the judgement of the Engineer, traffic produces an objectionable quantity of dust, the Contractor shall, at no additional cost to the Department, allay the dust for the necessary distance on each side of the structure and take any other precautions necessary to prevent dust and dirt from coming in contact with freshly painted surfaces or with surfaces to be painted.

g. Protection of Property:

(1) The Contractor shall take all necessary precautions during cleaning, surface preparation, and painting to protect people, vehicles, and all property in the vicinity from damage or disfigurement by paint or paint materials.

(2) Any damage or injury to people, vehicles, or property, public or private, and all damage claims which arise shall be the sole responsibility of the Contractor.

2. The Contractor shall overcoat existing structural steel as follows:

a. General:

(1) All painting shall be done in strict compliance with the paint manufacturer's specifications and the special provisions.

(2) All existing steel structures, unless otherwise specified, shall be painted with a three coat system.

(3) Only the exposed surfaces of the steel bearing piles, steel sheet piles, steel pile shells, and steel pile enclosures above finished ground line or stream bed shall be cleaned and painted with a prime coat and a mid coat. The final coat is not required.

(4) All miscellaneous steel, armor angles, nose angles, and extrusions for strip seals, shall be cleaned and painted with a prime coat and a mid coat. The final coat is not required.

(5) Paint on existing structural steel which contains lead in excess of State or Federal limits shall be treated as a hazardous material and shall be subject to the appropriate governing regulations and laws.

b. Surface Preparation:

(1) All steel surfaces shall be cleaned and prepared; and all debris or waste shall be contained, collected, and disposed of in accordance with the special provisions for "Environmental Protection".

(2) Cleaned surfaces shall receive the first coat of paint within 24 hours after cleaning, unless otherwise authorized by the Engineer. Any rust or surface contamination occurring before painting will require recleaning.

(3) Where touch-up is required, cleaning of small areas may be accomplished by the use of a needle gun or coarse sandpaper. Larger areas shall be cleaned using the methods specified in the special provisions for "Environmental Protection".

c. Mixing and Thinning Paint:

Mixing, thinning, pot life, and storage shall be in accordance with the manufacturer's recommendations.

d. Application of Paint:

(1) Application of paint will not be allowed until the certification stating that the paint complies with the paint system specified has been received by the Engineer.

(2) Painters and quality control personnel to be involved with the paint system shall have passed a training program given by the paint manufacturer's technical representative. The paint manufacturer shall issue a certificate for each individual who has

been trained. The Contractor shall present copies of these current certificates to the Engineer prior to application of the paint system.

(3) All painting shall be done in a neat and professional manner in accordance with the paint manufacturer's specifications. Paint shall be applied to the structure to produce a smooth, uniform film without runs, sags, lap marks, or dry spray overspray. Paint shall be applied at temperatures and humidities specified by the paint manufacturer. Paint shall not be applied upon damp surfaces or under any weather conditions that, in the opinion of the Engineer, are unsatisfactory for painting.

(4) (i) It shall be the responsibility of the Contractor to conduct quality control inspection of the painting, including measurements of temperature, dew point, surface profile, and paint thickness.

(ii) The measurements shall satisfy the recommendations of the paint manufacturer and shall meet the requirements of these *Specifications*.

(iii) Written documentation of measurements taken shall be provided to the Engineer.

(5) Paint which is not acceptable shall be thoroughly removed and the surface recoated by the Contractor to the satisfaction of the Engineer. Additional compensation will not be allowed for this cleaning or recoating.

(6) Concrete at all junction points of concrete and steel shall be adequately shielded or otherwise protected so that the application of paint on the steel is full and complete without spraying on the concrete.

(7) If, in the judgement of the Engineer, traffic produces an objectionable quantity of dust, the Contractor shall allay the dust for the necessary distance on each side of the structure and take any other precautions necessary to prevent dust and dirt from coming in contact with freshly painted surfaces or with surfaces to be painted.

e. Protection of Property:

(1) The Contractor shall take all necessary precautions during cleaning, surface preparation, and painting to protect pedestrians, vehicles, and structures in the vicinity from damage or disfigurement by paint or paint materials.

(2) Any damage or injury to people, vehicles, or property, public or private, and all damage claims which arise shall be the sole responsibility of the Contractor.

3. Handling Coated Steel:

a. Extreme care shall be exercised in handling the steel in the shop, during shipping, during assembly, and during subsequent construction of the structure. Painted steel shall not be moved or handled until sufficient cure time has elapsed to insure no damage is done to the fresh coating.

- b. The steel shall be insulated from binding chains by softeners.
- c. Hooks and slings used to hoist steel shall be padded.
- d. Diaphragms and similar pieces shall be spaced to minimize rubbing during shipment.
- e. The steel shall be stored on wooden pallets or battens at the job site, or by other means approved by the Engineer, so that it does not rest on the ground and so that components do not fall or rest on each other.
- f. All shipping and job site storage and handling details shall be presented to the Engineer and must be approved before shipping any steel.

4. Cleaning Weathering Steel:

- a. All surfaces of the girders, including all splice plates and the contact surfaces of all bolted splices, shall be blast cleaned by the Contractor in accordance with Steel Structures Painting Council Specification SSPC-SP6, Commercial Blast Cleaning. The cleaning shall remove all rust, mill scale, paint, markings, dirt, and all other foreign material. The metal shall be uniformly cleaned, with only slight shadows, streaks, or discolorations from rust and mill scale oxides remaining. Grease, oil, and paint shall first be removed by suitable solvents.
- b. All other steel surfaces (except those specified to be metallized or galvanized) shall be cleaned only to the extent necessary to remove oil, grease, and dirt.
- c. All blast cleaned surfaces shall be protected against contamination by oil, grease, paint, or other markings during transportation, storage, and assembly, and against form marks and mortar leaks and spatters during decking and concrete placement.

709.04 -- Method of Measurement

"Painting Structure at ____" and "Painting Piles and Miscellaneous Steel" are not measured but are lump sum bid items.

709.05 -- Basis of Payment

- | | | |
|----|--|-----------------|
| 1. | <u>Pay Item</u> | <u>Pay Unit</u> |
| | Painting Structure at _____ | Lump Sum (LS) |
| | Painting Piles and Miscellaneous Steel | Lump Sum (LS) |
- 2. The painting of new structures and piling will not be paid for directly, but shall be considered subsidiary to the relevant structure pay item.
 - 3. Cleaning weathering steel is subsidiary to the relevant structure pay item that contains the weathering steel.

4. The Contractor shall provide all necessary dust and dirt control measures at no additional cost to the Department.

5. Payment is full compensation for all work prescribed in this Section.