

SECTION 09972

PAINTING FOR STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prepare and paint all surfaces except where indicated otherwise.

1.2 REFERENCES

- A. ASTM E 11: Wire Cloth and Sieves for Testing Purposes.
- B. Federal Standard No. 595: Color.
- C. SSPC-SP 6: Commercial Grade Blast Cleaning.
- D. SSPC-SP 10.
- E. SSPC-PA1.
- F. SSPC Paint Application Guide No. 3: "A Guide to Safety in Paint Application."

1.3 SUBMITTALS

- A. Detailed plan for approval for protection methods that includes Environmental Protection.
- B. Source and gradation of the sandblast abrasive.
- C. Type and source of solvent, if required.
- D. Manufacturer's information regarding the specified coating materials, including:
 - 1. Required wet- and dry-film thickness
 - 2. Project safety data
 - 3. Thinning recommendations
 - 4. Temperature requirements
 - 5. Profile recommendations
 - 6. Mixing and application procedures
 - 7. Required equipment

- E. Test samples as required.

1.4 SAMPLES

- A. Department tests samples from each batch or lot of paint using infrared and gas chromatography techniques prior to use.
 - 1. Submit samples to UDOT's Central Chemistry Lab.
 - 2. Paints must match the spectrum samples on file in the UDOT Central Laboratory.
- B. Reject paint that does not match the standard.

1.5 PAINTER AND SANDBLASTER QUALIFICATIONS

- A. Department must approve individuals who perform painting and sandblasting, except for shop painting or sandblasting.
- B. Coating application evaluation:
 - 1. Establish a test area about 12 yd² as determined by the Department.
 - 2. Obtain surface preparation approval from the inspector before applying paint.
 - 3. Apply the coating using technique and application equipment consistent with the specified coating materials and with the paint manufacturer's recommendations.
 - 4. Prepare the surfaces of the test area according to the project specifications.
 - 5. Treat primer, intermediate, and finish coats as separate applications, waiting the specified drying time before inspecting each completed coat.
 - 6. Painter, sandblaster, or both should consult with the manufacturer for answers to technical questions relating to the application of specified coating materials.
 - 7. Take dry-film thickness readings on all portions of the test area including nuts and bolts.
- C. Evaluation Criteria:
 - 1. Ability to prepare the surface and to apply specified coatings with the proper tools and equipment.
 - 2. Familiarity with specified coating material and acceptance criteria, and awareness of any difficulties in applying the coating to any specified surface.
- D. Disqualification:
 - 1. Lack of proper tools or equipment.

2. Inadequate surface preparation, improper profile, runs, sags, overspray, thin film thickness, excessive film build, uneven coating, nonuniform color, improper curing, or any other defect in the coating system.
 3. Qualification may be withdrawn any time the qualifying inspector has reasons to question the performance of the painter, sandblaster, or the equipment.
 4. The disqualified person or equipment may be required to re-qualify or be removed from the project site at the option of the Engineer.
 5. To requalify:
 - a. Engineer may accept the qualifications of a sandblaster or painter who has been qualified on a previous Department project within one year.
 - b. The sandblaster, painter, or both must re-qualify if any material or equipment changes are made from the original qualification.
- E. Painter provides:
1. Coating materials properly mixed meeting the manufacturer's recommendations and project specification.
 2. Necessary equipment for properly applying the specified coating.
 3. Practice area outside the project limits to adjust and test the equipment before performing the test.
 4. Safety and equipment as specified in SSPC Paint Application Guide.
 5. Wet- and dry- film thickness gauges for testing the coating thickness during and after application.

1.6 PAYMENT PROCEDURES

- A. Surface Preparation, or Painting, or both, are included in the contract lump sum price for structural steel.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Select a complete 3-part coating system consisting of a Zinc primer, Epoxy or Urethane intermediate coat and aliphatic Urethane top coat as approved by the New England Protective Coating Specification Criteria (NEPCOAT). This list may be found at <http://www.state.me.us/mdot/planning/products/nepcoat.htm>.
- B. Use paint color No. 26293 for the first field coat and No. 26306 for the top coat following Federal Standard 595.

PART 3 EXECUTION

3.1 INSPECTION

- A. Engineer examines surfaces prior to surface preparation and prior to application of each succeeding coating. Correct any condition that may potentially affect proper surface cleaning or coating application.
- B. Provide safe access to permit inspection of the steel before and after painting. Use rubber rollers or other approved protective devices for scaffold fastenings. Do not mar or damage freshly coated surfaces.

3.2 PREPARING SURFACES

- A. Painted steel: Clean surfaces with clean petroleum solvents and then blast clean to a near-white following SSPC-SP 10. Use clean oil-free air.
 - 1. Grind off all fins, tears, slivers, and burred or sharp edges present on any steel member, or those that result from the blasting operation.
 - a. Reblast where needed.
 - b. Remove heavy scale.
 - c. Do not scar metal.
 - d. Produce a 2 mils uniform profile.
 - 2. Remove all abrasive and paint residue using either a commercial vacuum cleaner or by double blowing.
 - a. Equip commercial vacuum cleaner with a brush-type cleaning tool.
 - b. Double blowing: vacuum the top surfaces of all structural steel, including top and bottom flanges, longitudinal stiffeners, splice plates, hangers, etc., after the double-blowing operations are completed.
 - 3. Keep the steel dust-free and prime within 24 hours after cleaning. Reblast to a near-white condition if any rust is visible before priming.
 - 4. Protect freshly coated surfaces from subsequent blast-cleaning operations.
 - a. Repair surface if damaged.
 - b. Mask all areas requiring field welding before shop painting.
 - 5. Have the surfaces inspected and approved by Engineer or Construction and Materials Division representative of Department before applying shop coat.
 - 6. Apply the shop coat at the fabrication site.
- B. Field painting:
 - 1. Repair all damage to shop coat that occurs during shipping, handling, and erection.

2. Power wash steel without the field coat to remove contaminants or other foreign matter from the primed surface.
 3. Blast clean any rusted areas to a near-white finish. Thoroughly clean the coating surrounding the blasted area and re-prime using the same paint and the same dry-film thickness specified for the shop coat. (SSPC-SP 10)
 4. Remove all concrete drippings, abrasive and paint residue. If using double blowing, vacuum the top and bottom flanges, splice plates, longitudinal stiffeners, hangers, etc., after completing double-blowing operations.
 5. Allow the touch-up coat to dry at least 2 days before applying the field coats.
- C. Weathering steel:
1. Construct so that erection marks on the steel are not visible after the structure is completed.
 2. Commercially sandblast all faying surfaces according to the specification standards. Meet SSPC-SP6.
 3. Blast clean the following surfaces after the deck concrete is placed to specified surface finish:
 - a. Underside of the exterior portion of the top flange, and underside of all bottom flanges.
 - b. The exterior portion of web.
 - c. Top side and outside edge of the exterior portion of the bottom flange.

3.3 PREPARING PAINT MATERIALS

- A. Mix and thin paint materials per manufacturer's product data sheets for both shop and field painting. If weather conditions require paint thinning, follow manufacturer's recommendations.
- B. Mix the paint to a lump-free consistency with a high shear mixer (such as a Jiffy mixer), according to the producer's directions.
 1. Do not use paddle mixers or paint shakers.
 2. Keep paint in the original containers
 3. Mix until all the metallic powder or pigment is suspended, and until all paint solids that may have settled to the bottom of the container are thoroughly dispersed.
- C. Strain the paint through a screen having openings no larger than those specified for a No 50 sieve per the material standard. ASTM E 11.
- D. After straining, continuously agitate the mixed material up to and during the time of application.

3.4 APPLYING PAINT

- A. Apply each coat at proper consistency and thickness, and in accordance with the manufacturer's recommendations, including field coating. When using spray nozzles, use pressures recommended by the producer of the coating system.
- B. Produce a uniform, even coating that bonds to the underlying surface. Follow SSPC-PA1.
- C. Apply field coats at the construction site after steel erection work is completed.
 - 1. Do not apply field coats until Engineer approves the surface.
 - 2. Dry-film thickness of the first field coat should be greater than 4 mils.
 - 3. Keep the dry-film thickness of the top coat greater than 2 mils.
- D. Weather:
 - 1. If weather conditions require paint thinning, follow the manufacturer's recommendations.
 - 2. Temperature of the air and the steel must be above 40 degrees F, but not so hot as to cause the paint to blister.
 - 3. Relative humidity must be less than 85 percent or the combination of temperature, and humidity conditions must inhibit surface condensation.
 - 4. Test humidity by applying a thin film of water to a small area. If the film evaporates with 15 minutes, the surface may be painted.
- E. Scrape any shop coat that produces "mud-cracking" or adds more than 7 mils to a soundly bonded coating or bare steel.
- F. Thoroughly clean areas having deficient primer thickness to remove all dirt.
- G. Apply a top coat to any surface at the fabrication site that will be inaccessible for painting after field erection.
- H. Do not load material for shipment until shop paint is dry to the touch, and until the UDOT inspection sticker is placed on the member by the inspector. Remove sticker before final inspection.

3.5 PROTECTION

- A. Suspend work if protection is unsatisfactory.
- B. Protect pedestrian and vehicular traffic.

- C. Protect from splatter, splashes and overspray all portions of the structures that are not to be painted including superstructure, substructure, slope, and highway appurtenances. Protect where other damage during painting and blast cleaning operations could occur.
- D. Use barriers during any blast-cleaning operations to protect pedestrians and vehicles, and to prevent spreading or falling of abrasive materials and debris on the traveled portions of the pavement. Remove any abrasive materials and debris on pavement, shoulders, or slope paving before reopening work areas to traffic.
- E. Provide employees performing the blast-cleaning operations air-supplied sandblasting hoods approved by the US Bureau of Mines.
- F. Minimum requirements for the air supply system:
 - 1. Airline filter, pressure-reducing valve with gauge, and pressure release valve.
 - 2. Do not allow the air supply to be contaminated with harmful materials or elements.

3.6 FIELD QUALITY ASSURANCE

- A. Minimum Coating Thickness: Apply two or more coats if the required film thickness cannot be obtained by one coat without producing runs, bubbles, or sags.

END OF SECTION