

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 35 20 16 - Hydraulic Gates.
- .3 Section 41 22 23 - Hoists.
- .4 Section 43 26 00 - Stop Logs.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA G164-2003 - Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM D6386 - 10 Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
 - .2 ASTM A123/A123M - 12 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A653M - 11 Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
- .3 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual.
 - .2 Maintenance Repainting Manual.
 - .3 Exterior Structural Steel and Metal Fabrications, 07.
- .4 Federal Standard (FS)
 - .1 FED-STD-595B-89, Colours Used in Government Procurement.
- .5 The Society for Protective Coatings (SSPC)
 - .1 SSPC-SP 1-2004, Solvent Cleaning.
 - .2 SSPC-SP 2-R2004, Hand Tool Cleaning.
 - .3 SSPC-SP 3-R2004, Power Tool Cleaning.
 - .4 SSPC-SP 6/NACE No. 3-2007, Commercial Blast Cleaning.
 - .5 SSPC-SP 7/NACE No. 4-2007, Brush-off Blast Cleaning.
 - .6 SSPC-Vis-1-1989, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Specs).
 - .7 SSPC-SP 10/NACE No. 2-2007, Near-White Blast Cleaning.
 - .8 SSPC-PA 1-2004, Shop, Field, and Maintenance Painting of Steel.
 - .9 SSPC-PA 2-2004, Measurement of Dry Coat Thickness with Magnetic Gauges.
 - .10 SSPC Good Painting Practices, Volume 1, 4th Edition.

- .6 The Environmental Choice Program
 - .1 CCD-047, Architectural Surface Coatings.
 - .2 CCD-048, Surface Coatings - Recycled Water-borne.
- .7 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for painting exterior metal surfaces, and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of Workplace Hazardous Materials Information System (WHMIS) material safety data sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures.
- .3 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Paints that do not appear on MPI Approved Products List must be approved by Departmental Representative before use on project.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports:
 - .1 Showing compliance of a product with specified performance characteristics and physical properties, and in accordance with Section 01 45 00 - Quality Control.
 - .2 Dry film thickness tests.
- .6 Galvanizing of all metal surfaces for structural and miscellaneous metalwork will be in the shop prior to shipment to the Site, unless accepted by the Departmental Representative.

Part 2 Products

2.1 GENERAL

- .1 Supply paint materials for paint systems from single manufacturer.
- .2 Conform to latest MPI requirements for painting work including preparation and priming.

- .3 Colours:
 - .1 Submit proposed colour schedule to Departmental Representative for review.
- .4 Mixing and Tinting:
 - .1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Obtain written approval from Departmental Representative for tinting of painting materials.
 - .2 Use and add thinner in accordance with paint manufacturer's recommendations.
 - .1 Do not use kerosene or similar organic solvents to thin water-based paints.
 - .3 Thin paint for spraying in accordance with paint manufacturer's written recommendations.
 - .4 Remix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.2 MECHANICAL EQUIPMENT

- .1 Unless otherwise specified, mechanical equipment such as pumps and fans procured by the Contractor will be coated by the manufacturer with their factory standard coating system; additional site painting is not required except that the Contractor will touch-up paint any equipment coating that is damaged during shipping, handling, storage, installation and/or testing.
- .2 Unless otherwise specified, gates, stop logs, hoist, machinery bridge and machinery enclosures will be coated and painted as follows:
 - .1 Coat all surfaces which are to be painted with two coats of high-built epoxy, having a minimum dry film thickness of 0.1524 mm (6 mils) per coat. The colour will be specified by the Departmental Representative.
 - .2 Do not coat the following surfaces:
 - .1 Areas in contact with concrete.
 - .2 Stainless steel or aluminum surfaces.
 - .3 Do not paint at temperatures lower than 5°C, or in a damp condition.
 - .4 Apply coating in accordance with SSPC-PA 1 and the manufacturer's specifications.

2.3 STRUCTURAL STEEL AND MISCELLANEOUS METALWORK

- .1 All structural steel and miscellaneous metalwork such as hatch covers, grating, handrails, exterior steel doors and fall arrest system will be hot-dip galvanized after fabrication unless stated otherwise on the Drawings.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections are acceptable for painting in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 New Metal Surfaces:
 - .1 Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances.
 - .2 Prior to painting, grind to rounded contours all rough welds which do not have a smooth ripple finish. Grind all sharp edges to form a rounded contour of minimum edge radius of 2 mm to prevent pull back when the paint cures. Steel will be shot blasted to SSPC-SP10 "Near White Blast". Apply the first coat of paint within 8 hours of completing the above surface preparation.
 - .3 Brush stripe coat all edges, corners and welds prior to the application of each specified full coat.
 - .4 Degrease the exterior surfaces that will not be embedded in concrete, in accordance with SSPC-SP1. Employ solvent cleaning and grit blast cleaning in accordance with SSPC-SP10. Near White Finish, for steel surfaces to be painted. The blast cleaning process will produce surface profile 2 mils in depth and of a jagged nature. Remove oil, paraffin and grease with suitable solvents.
 - .5 After dry-blast cleaning, employ compressed air free of detrimental oil and water to remove dust from the surface.
 - .6 Thoroughly clean exterior surfaces that will be embedded in concrete by power tool cleaning in accordance with SSPC-SP3, free of all loose rust, mill scale and foreign substances. Remove oil, paraffin and grease with suitable solvents.
 - .7 Ensure surfaces to be painted are completely dry, clean and free from moisture at the time of coating.
 - .8 Apply paint after prepared surfaces have been accepted by Departmental Representative.
 - .9 Prior to starting paint application ensure degree of cleanliness of surfaces is to SSPC-Vis1.
 - .10 Apply primer, paint, or pretreatment after surface has been cleaned and before deterioration of surface occurs.
 - .11 Clean surfaces again if rusting occurs after completion of surface preparation.
- .2 Mixing Paint:
 - .1 Do not dilute or thin paint for brush application.
 - .2 Mix ingredients in container before and during use, and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.
 - .3 Do not mix or keep paint in suspension by means of air bubbling through paint.

- .4 Thin paint for spraying according to manufacturer's written instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.
- .3 Preparation of Surfaces to be Galvanized:
 - .1 Preparation for galvanizing to meet the requirements of CSA G164 Appendix B and ASTM A123.
 - .2 Prior to galvanizing, all material to be galvanized will be cleaned carefully of rust, loose scale, dirt, oil, grease and other foreign substances. Weld spatter, rough welds or sharp protrusions will be removed by chipping and grinding.
 - .3 Vent holes will be provided where required for galvanizing.
 - .4 Hot-dip galvanizing will be in accordance with the relevant sections of CSA G164, ASTM A123, and ASTM A653.
 - .5 The galvanizing of bolts, nuts and washers will conform to and be carried out in accordance with the requirements of CSA G164 and ASTM A153. Nuts will be tapped after being galvanized and the threads of nuts left bare.
 - .6 Materials will be galvanized after fabrication, machining and shop work is completed unless accepted by the Departmental Representative.
 - .7 The Contractor will be responsible to take necessary means to ensure that materials are not distorted during the galvanizing process.
 - .8 Clean damaged surfaces with wire brush removing loose and cracked spelter coatings. Apply two coats of approved zinc-rich paint to damaged areas.
- .4 Preparation of Galvanized Surfaces to be Painted (Exterior Doors and Frames):
 - .1 Prepare galvanized surfaces to be painted according to ASTM D6386.
 - .2 Paint exterior doors to match siding.

3.3 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Apply paint by spraying, brushing, or combination of both. Use sheepskins or daubers when no other method is practical in places of difficult access.
- .3 Use dipping or roller coating method of application when specifically authorized by Departmental Representative in writing.
- .4 Caulk open seams at contact surfaces of built up members with material approved by Departmental Representative, before second undercoat of primer is applied.
- .5 Where surface to be painted is not under cover, do not apply paint when:
 - .1 Air temperature is below 5°C or when temperature is expected to drop to 0°C before paint has dried.
 - .2 Temperature of surface is over 50°C unless paint is specifically formulated for application at high temperatures.
 - .3 Fog or mist occur at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.

- .4 Surface to be painted is wet, damp or frosted.
- .5 Previous coat is not dry.
- .6 Supply cover when paint must be applied in damp or cold weather. Supply, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified. Protect until paint is dry or until weather conditions are suitable.
- .7 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .8 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .9 Brush Application:
 - .1 Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
 - .2 Brush out runs and sags.
 - .3 Remove runs, sags and brush marks from finished work and repaint.
- .10 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
 - .3 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .4 Apply paint in uniform layer, with overlapping at edges of spray pattern.
 - .5 Brush out immediately runs and sags.
 - .6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
 - .7 Remove runs, sags and brush marks from finished work and repaint.
- .11 Shop Painting:
 - .1 Do shop painting after fabrication and before damage to surface occurs from weather or other exposure.
 - .2 Spray paint contact surfaces of field-assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.
 - .3 Do not paint metal surfaces which are to be embedded in concrete.
 - .4 Paint metal surfaces to be in contact with wood with either full paint coats specified or three shop coats of specified primer.
 - .5 Do not paint metal within 50 mm of edge to be welded. Give unprotected steel one coat of approved primer/protective coating after shop fabrication is completed.
 - .6 Remove weld spatter before painting.

- .7 Protect machine finished or similar surfaces that are not to be painted but that do require protection with coating of rust-inhibitive petroleum, molybdenum disulphide, or other coating approved by Departmental Representative.
- .8 Copy previous erection marks and weight marks on areas that have been shop painted.
- .12 Field Protective Coating Application:
 - .1 Unless otherwise specified, prepare weld sites to conditions specified for shop coating, and apply finish coats in accordance with the following:
 - .1 At welds: two coats of high-solids epoxy coating.
 - .2 Areas of coating damaged in shipment or during erection: clean in an appropriate manner and recoat to the standards specified for shop coating.
 - .3 Surfaces and other appurtenances not shop coated which are rendered inaccessible after completion of erection: intermediate and finish coat before erection.
 - .4 The final colours of the various items will conform to Departmental Representative's requirements. Exposed surfaces will have a light colour for the final coat.
 - .5 Supply 25 litres of each type of coating for Departmental Representative's subsequent use.
- .13 Field Painting:
 - .1 Paint steel structures as soon as practical after erection.
 - .2 Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
 - .3 Field paint surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.
 - .4 Apply final coat of paint after concrete work is completed or as directed by Departmental Representative. If concreting or other operations damage paint, clean and repaint damaged area. Remove concrete spatter and droppings before paint is applied.
 - .5 Where painting does not meet with requirements of specifications, and when so directed by Departmental Representative, remove defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.
- .14 Handling Painted Metal:
 - .1 Handle painted metal after paint has dried, or when necessary for handling for painting or stacking for drying.
 - .2 Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

3.4 FIELD QUALITY CONTROL

- .1 Site Tests, Inspections:
 - .1 On completion of initial surface cleaning, an inspection will be carried out. If oxidation occurs between cleaning and coating application, the affected area will be re-cleaned to the specified standard. Any areas subjected to contamination after cleaning will be cleaned/degreased in accordance with SSPC-SP1. The inspector will certify, record, and verify that the surface has been prepared in accordance with this specification.
 - .2 Advise Departmental Representative when each applied coating is ready for inspection. Inspection of painted product by a NACE International Certified Coating Inspector. Do not proceed with subsequent coats until previous coat has been approved. The following testing must be completed and recorded by the on-site inspector:
 - .1 Results of surface salt testing.
 - .2 Dry film thickness (DFT) reading and evaluate the results as per SSPC-PA 2.
 - .3 Wet film thickness (WFT).
 - .4 Surface temperature at time of painting.
 - .5 Temperature.
 - .6 Relative humidity.
 - .7 Viscosity of paint.
 - .8 Lot codes of paint being applied.
 - .3 Verify the continuity of paint film on metal surface. Inadequate coated areas must be identified and repaired. If five or more such deficiencies are found in 10 m², the area will be considered defective.
 - .4 On-site periodical and final inspection of product by Departmental Representative will verify the following:
 - .1 Dry Film Thickness: a mikotest gauge, or equivalent thickness gauge, will be used for nonmagnetic coatings on magnetic bases.
 - .2 Wet Film Thickness: may be determined by use of wet.
 - .5 Departmental Representative may perform tests to determine if coatings meet requirements of specification. Testing by Departmental Representative and repairs necessitated by destructive testing of coating film, which meets specifications, will be at the expense of Departmental Representative. Areas tested by Departmental Representative that do not meet specification requirements will be repaired by the vendor at his/her own expense.
 - .6 Submit test reports to Departmental Representative.

3.5 PROTECTION

- .1 Protect painted surfaces from damage during construction.
- .2 Protection of Surfaces:
 - .1 Protect surfaces not to receive paint.

- .2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.
- .3 Protect cleaned and freshly painted surfaces from dust to approval of Departmental Representative.
- .3 Repair damage to adjacent materials caused by painting exterior metal surface application installation.

END OF SECTION