

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precautions
- .2 Section 05 12 33 – Structural Steel for Bridges

1.2 GENERAL

- .1 Coating work is one of the following types, which are different in terms of surface preparation and coating systems as specified in this specification:
 - .1 Coating of new steel.
 - .2 Coating of existing steel.
 - .3 Touch-up of coatings damaged during construction.

1.3 INCLUSIONS

- .1 The work under this Section will not be measured and is deemed to be included in the cost for the work associated to Section 05 12 33 – Structural Steel for Bridges pertaining to the repair details in question.
- .2 Costs associated with the work described in this section that does not pertain to a repair detail associated to Section 05 12 33 – Structural Steel for Bridges, will not be measured and is deemed to be included in the lump sum portion of the contract. All work included in the lump sum portion of the contract must be incorporated and detailed in the cost breakdown submitted by the Contractor after contract award as per Section 01 00 10 – General Instructions.
- .3 Progress payments will only be made after:
 - .1 Completion of work in conformance with the contract documents.
 - .2 Completion of required Quality Control Inspections by the Contractor associated to the work being paid;
 - .3 Submission and acceptance of all documentation required in this specification associated to the work being paid; and,
 - .4 Completion of required Quality Assurance Inspection by the Department Representative associated to the work being paid.

1.4 REFERENCES

- .1 The Society for Protective Coatings (SSPC)
 - .1 SSPC-SP 1-82(R2004), Solvent Cleaning.
 - .2 SSPC-SP 2-82(R2004), Hand Tool Cleaning.
 - .3 SSPC-SP 10/NACE No. 2-07, Near White Blast Cleaning.
 - .4 SSPC SP 11 Power Tool Cleaning to Bare Metal.
 - .5 SSPC-Vis-1-89, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Specs.).

- .6 SSPC VIS 3 Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning.
- .7 SSPC PA 1 Shop, Field, and Maintenance Painting of Steel.
- .8 SSPC-PA 2-04, Measurement of Dry Coat Thickness with Magnetic Gauges.
- .9 SSPC-Paint 20, Zinc-Rich Coating (Type I Inorganic and Type II Organic)
- .10 SSPC Painting Manual
- .6 CSA International
 - .1 CAN/CSA S6-14 Canadian Highway Bridge Design Code.
- .7 ASTM International
 - .1 ASTM D4940 Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blast Cleaning Abrasives.
 - .2 ASTM C566 Standard Method for Total Evaporable Moisture Content of Aggregate by Drying.
 - .3 ASTM D4285 Standard Test Method for Indicating Oil or Water in Compressed Air.
 - .4 ASTM D4417 Standard test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
- .8 Ontario Provincial Standards for Roads & Public Works
 - .1 OPSS 1704 Material Specification for Paint Coating Systems for Structural Steel.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Coating Contractor Qualifications:
 - .1 Provide information on a minimum of two (2) similar projects completed in the last five (5) years, including project name, client name and contact information, and detailed scope of work.
- .3 Written Notice:
 - .1 Submit a written notice to the Departmental Representative at least four (4) weeks before work begins. This notice must include the following information:
 - .1 Details of the methods, procedures and sequence of operations to be implemented in order to complete the work, including the Working Drawings and schedules.
 - .2 Details pertaining to surface preparation and coating of restricted areas and areas difficult to access, as well as application method used.
 - .3 Details of the proposed method for management of excess materials including collection, containment and disposal of all solid and liquid wastes.
- .4 Working Drawings:
 - .1 Environmental Protection:

- .1 The Working Drawings shall include a detailed description of the environmental protection employed, including details of enclosures, erection of enclosures, and relocation procedure for enclosure equipment.
 - .2 Restriction on Construction Loads:
 - .1 The Working Drawings shall show the location and magnitude of all applied construction loads.
 - .2 The Working Drawings shall state that the bridge, including all components that the Contractor requires to support the enclosure system, can safely support all loads, including construction loads according to the CAN/CSA-S6 and the Ontario Structural Manual, and bear the seals and signatures of two qualified Professional Engineers registered or licensed in both Provinces of Ontario and Quebec. The Engineer shall verify the actual field condition of the structure and carry out a structural evaluation prior to certifying the Working Drawings. The evaluation shall ensure that the bridge can safely support all loads according to CAN/CSA-S6 and the Structural Manual, including construction loads imposed on the bridge based on the Contractor's method of construction. A synopsis of the evaluation, including detailed calculations and notes, shall be prepared and, when requested, be made available to the Departmental Representative. The documents shall bear the seals and signatures of both Engineers.
- .5 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for painting exterior metal surfaces and include:
 - .1 Recommended maximum dry film thickness.
 - .2 The mixing and thinning directions.
 - .3 The recommended spray nozzles and pressures.
 - .4 The recommended temperature range and acceptable humidity levels for application.
 - .5 The minimum acceptable recoat time period for temperatures in the intervals of 5 °C from 0 to 30 °C.
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .6 Material Certification:
 - .1 Coating Manufacturer's Certification:
 - .1 Before commencement of coating application, submit product certificates signed by the coating manufacturer certifying and demonstrating in writing that materials comply with performance characteristics, criteria and physical requirements specified in this specification, and that the new coating system is compatible with the existing coating system.
- .7 Test Reports:
 - .1 Submit test reports showing compliance with specified performance characteristics and physical properties and in accordance with Section 01 45 00 - Quality Control.

- .8 Samples:
 - .1 Submit samples measuring 75mm by 125mm on metal sheets with the same surface preparation as specified in this document for review and acceptance of the finish coat colour.
 - .2 Enable Departmental Representative to take 2 L samples of each paint lot to site, one sample from manufacturer's containers and one sample from painters' pot.

1.6 QUALITY ASSURANCE

- .1 Quality Assurance Inspections of the surface preparation and each subsequent phase of work of coating application will be conducted by the Departmental Representative.
- .2 Supply power, scaffolding, weather protection and access required for the inspections and testing procedures.
- .3 Access for inspection to all portions of the work including cleaning and painting shops where components of the new steel are being cleaned and coated, shall be provided and maintained by the Contractor during all hours of work.
- .4 Provide a 72 hour notice of commencement of cleaning and recoating operations.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.8 WARRANTY

- .1 For the work of this Section 09 97 19 – Painting Exterior Metal Surfaces, the 12 month warranty period prescribed in Subsection GC 3.13 of General Conditions “C” is extended to 24 months, against peeling and/or the appearance of rust.

Part 2 Products

2.1 MATERIALS

- .1 General:
 - .1 Meet or exceed specified provincial standards using only materials that are approved for use in Ministry of Transportation of Ontario (MTO) or Ministère des Transports du Québec (MTQ) construction projects, and that meet the requirements of this specification. Demonstrate in writing that each product meets or exceeds provincial requirements, and the requirements of this specification.
 - .2 Only coatings contained in the original containers sealed by the manufacturer shall be used.
 - .3 All coating materials to be compatible with the surface to which it is being applied.

- .4 Obtain the coating system for new structural steel and the coating system for existing structural steel from the same manufacturer.
- .2 Coating system for new structural steel:
 - .1 Low VOC Epoxy-Zinc / Epoxy / Polyurethane Coating System:
 - .1 Base coat: Low VOC Epoxy Zinc Rich Primer.
 - .2 Mid coat: Epoxy.
 - .3 Top coat: Polyurethane.
 - .2 Materials must meet the requirements of OPSS 1704.
 - .3 Low VOC Epoxy Zinc Rich Primer must meet the SSPC-paint 20 requirements for the zinc rich primers.
 - .4 Each coat must be obtained from a single manufacturer.
 - .5 Each coat shall be formulated to show a distinct colour difference.
 - .6 The colour of the finish coat shall match the existing truss paint colour. Conduct the required testing or mock-ups to confirm the colour code for the existing paint (The 1995 recoating contract called for a grey 501-105 gloss to CGSB standard 1-GP-12C). Submit samples measuring 75mm by 125mm on metal sheets for approval, prior to purchasing the paint.
- .3 Coating system for existing structural steel:
 - .1 Surface Tolerant Coating System ST2:
 - .1 Base coat: Aluminum and micaceous iron oxide filled surface tolerant two component epoxy mastic Primer.
 - .2 Mid coat: The above primer or an epoxy mid-coat.
 - .3 Top coat: Aliphatic polyurethane.
 - .2 Materials must meet the requirements of OPSS 1704.
 - .3 The base coat must be compatible for application on to surfaces power tool cleaned to SSPC-SP11.
 - .4 Each coat must be obtained from a single manufacturer.
 - .5 Each coat shall be formulated to show a distinct colour difference.
 - .6 The colour of the finish coat shall match the existing truss paint colour. Conduct the required testing or mock-ups to confirm the colour code for the existing paint (The 1995 recoating contract called for a grey 501-105 gloss to CGSB standard 1-GP-12C). Submit samples measuring 75mm by 125mm on metal sheets for approval, prior to purchasing the paint.
- .4 Slip Critical Connections:
 - .1 Faying surfaces of all bolted connections shall be blast or mechanically cleaned and coated with a class B primer as defined by CAN/CSA S6-14 Chapter 10. The mean slip coefficient for class B shall be 0.5 minimum. Contractor must provide test results demonstrating that the chosen coating respects the minimum slip coefficient.

Part 3 Execution

3.1 GENERAL

- .1 Where there is a conflict between the manufacturer's recommendations and the Contract Documents, the more stringent requirements shall apply as determined by the Departmental Representative.
- .2 All components coated off-site shall be protected from handling or shipping damage by using padded slings, separators, and tie downs or other similar devices. Loading procedures shall be designed to protect coated surfaces from any possible damage to the coating.
- .3 Restricted areas and areas difficult to access:
 - .1 The structure has many restricted areas and areas difficult to access. Adjust working methods accordingly. No additional payment will be made for costs associated with these access constraints.

3.2 OPERATIONAL CONSTRAINTS

- .1 For each phase of work, the Departmental Representative shall be informed when the surface preparation and each subsequent phase of work of coating application are completed and ready for Quality Assurance Inspection.

Subsequent work shall not commence until the Departmental Representative has completed the Quality Assurance Inspection of the work completed and given permission in writing to proceed.

The Departmental Representative will conduct Quality Assurance Inspections only after the work is inspected and approved by the Quality Control NACE Inspector, and after receipt of the Quality Control NACE Inspector's Sign-Off Form.

All Quality Control Inspection Reports shall be made available for review by the Departmental Representative upon request.

The Contractor's request for the Quality Assurance Inspection and permission to proceed to the next phase of work shall be submitted 72 hours in advance of requested date for Quality Assurance Inspection.

Not limited to, the phases of work for which Quality Control and Quality Assurance approval are required are as follows:

 - .1 Surface Preparation
 - .2 SSP1 Cleaning
 - .3 Base coat application, including stripe coats and touch ups
 - .4 Mid coat application, including stripe coats and touch ups
 - .5 Top coat application, including stripe coats and touch ups
 - .6 Repairs to deficient work
 - .7 Final Cleanup
- .2 Do not release steel components from the fabrication shop prior to Quality Control and Quality Assurance approval from the completed phases of work.

- .3 Welding, cutting, or drilling of existing structural steel shall not be done unless approved by the Departmental Representative.
- .4 Surfaces adjacent to areas to be cleaned and coated shall be protected from damage during surface preparation and coating application.
- .5 When there is partially completed coating work at shutdowns, the following operations shall be carried out immediately prior to commencement of coating application in the next construction season:
 - .1 Areas that have been coated but have not received the finish coat shall be power washed using potable water and allowed to dry thoroughly.
 - .2 Partially completed coating exhibiting rust or rust stains shall be removed, and the surface shall be cleaned to the original surface preparation standard specified in the Contract Documents and recoated with the specified coating system or an alternative coating system acceptable to the Departmental Representative.

3.3 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for painting exterior metal surfaces installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Carry out tests to determine existence of lead base paint on existing exterior metal surfaces.
 - .3 If lead exists stop work and report findings to Departmental Representative.
 - .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- .2 The structural steel was last re-coated in 1995. The 1995 coating contract specified the following coating system:
 - .1 Base coat: Zinc-rich epoxy.
 - .2 Mid Coat: High build epoxy polyamide.
 - .3 Top coat: Aliphatic polyurethane.
- .3 The coating previous to that of the 1995 contract contained concentrations of lead. As such, it is expected that coatings on the contact surfaces that will be exposed during repairs contain lead. Traces of lead from the coating previous to that of the 1995 contract may still be found in the re-coated areas. For all surface preparation activities on the structure, sufficient containment will be required to protect the environment, as well as workers, from the hazards of lead.

3.4 PREPARATION

- .1 Fins, slivers, burred, or sharp edges; weld spatter; slag or any other surface defect shall be removed by power grinding prior to the surface preparation and coating application.

- .2 Final surface preparation for coating application shall only be carried out when the temperature, moisture, and humidity satisfy the criteria specified in SSPC-PA 1 for coating application.
- .3 The temperature, moisture, and humidity limitations do not apply to interim surface preparation. The Departmental Representative shall be notified of the Contractor's intention to do interim surface preparation work prior to commencement of the work.
- .4 Remove existing loose and rusted paint from exterior metal surfaces.
- .5 Preparation for coating of new structural steel:
 - .1 Sharp edges of structural steel specified to be cleaned and coated shall be ground to a smooth radius of at least 3 mm by power tools prior to abrasive blast cleaning.
 - .2 Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances in accordance with the following:
 - .1 Near White Blast Cleaning: to SSPC-SP 10/NACE No. 2.
 - .3 The abrasive blast cleaning shall provide a surface profile height of a minimum of 40 μ m and a maximum of 75 μ m, or as specified by the prime coat.
- .6 Preparation for coating of existing structural steel:
 - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following.
 - .1 Power tool cleaning to bare metal on all steel repair faying surfaces, and for a distance of 75 mm beyond the faying surfaces: to SSPC-SP11; and,
 - .2 Solvent cleaning of all surfaces power tool cleaned: to SSPC-SP1
- .7 Preparation for coating of bolts:
 - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following.
 - .1 Hand tool cleaning of exposed surfaces of bolts, nuts and washers after installation: to SSPC-SP2; and,
 - .2 Solvent cleaning of exposed surfaces of bolts, nuts and washers: to SSPC-SP1
- .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.
 - .1 Apply primer, paint, or pretreatment after surface has been cleaned and before deterioration of surface occurs.
 - .2 Clean surfaces again if rusting occurs after completion of surface preparation.
 - .3 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 without delay.

3.5 APPLICATION

- .1 Notify the Departmental Representative 72 hours in advance of mixing and applying a paint coating or coating system.
- .2 All new A 325 bolts to be used on coated areas of structural steel after the application of coating shall be galvanized.
- .3 Prepared surfaces shall have no dust prior to the application of coating.
- .4 Paint coating shall be smooth, continuous and free of runs and sags. No pinholes or holidays of the paint coating on galvanized components shall be allowed.
- .5 All paint coating systems shall be stored, thinned, handled, mixed, and applied according to SSPC-PA 1 and the recommendations on the manufacturer's product data sheets.
- .6 When there is a drop in temperature after the coating has been applied, the recoat time period shall be according to the manufacturer's product data sheets for the lower temperature.
- .7 Exterior surfaces of the bolted connections within a distance of 25 mm around the edge of the bolt holes and against which the bolt head or washer is going to be bearing shall receive only the prime coat. Any exposed areas of primer not covered by the bolt head or washer after the installation of the bolts, shall be touched up with the second and third coats of the specified coating system.
- .8 All new bolts shall receive the mid coat and top coat of the specified coating system after installation and surface preparation.
- .9 Stripe coats:
 - .1 If a bolted component is assembled before spray application of the base coat, all rivets, bolts, nuts, washers, and pitted areas shall be given a base coat, by brush in addition to the spray application. The base coat shall be brush applied after the spray application of the base coat.
 - .2 If a bolted component is assembled before spray application of the mid coat, all rivets, bolts, nuts, washers, and pitted areas shall be given a mid coat, by brush in addition to the spray application. The mid coat shall be brush applied prior to the spray application of the mid coat.
 - .3 If a bolted component is assembled before spray application of the top coat, all rivets, bolts, nuts, washers, and pitted areas shall be given a top coat, by brush in addition to the spray application. The top coat shall be brush applied after the spray application of the top coat.
- .10 Only paint products in their original, sealed containers must be used.
- .11 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 partially used containers.
 - .4 Do not mix or keep paint in suspension by means of air bubbling through paint.

- .5 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.
- .12 Apply paint by spraying, brushing, or combination of both. Use sheepskins or daubers when no other method is practical in places of difficult access.
- .13 Where surface to be painted is not under cover, do not apply paint when:
 - .1 Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.
 - .2 Temperature of surface is over 50 degrees 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 as per Government Canada Weather forecast; relative humidity is above 85%.
 - .4 Surface to be painted is wet, damp or frosted.
 - .5 Previous coat is not dry.
- .14 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.
- .15 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .16 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .17 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.
- .18 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 For each coat of paint the initial pass of the spray gun shall be directed at the outside edges of the steelwork prior to completely coating all surfaces.
 - .5 Apply paint in uniform layer, with overlapping at edges of spray pattern.
 - .6 Brush out immediately runs and sags.
 - .7 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.

- .8 Remove runs, sags and brush marks from finished work and repaint.
- .9 All dry spray shall be removed by sanding and the coating reapplied as specified in the Contract Documents.
- .19 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 after shop fabrication is completed.
 - .6 Remove weld spatter before painting. Remove weld slag and flux.
 - .7 Copy previous erection marks and weight marks on areas that have been shop painted.
- .20 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.
- .21 Application related failures in coatings, as described in the Coating Failures chapter of the SSPC Painting Manual, shall be corrected prior to application of a subsequent coat and, in the case of the top coat, after the application of the top coat.
- .22 Where excessive coating thickness produces "mud cracking" in zinc rich coating materials, the coating shall be scraped back and sanded to a soundly bonded coating and the area recoated to the required thickness.
- .23 New Structural Steel:
 - .1 All new structural steel must be prime coated before being delivered to site.
 - .2 The maximum time between final surface preparation and prime coat application inside the shop shall be 24 hours. Structural steel subjected to outdoor exposure after final surface preparation shall be prime coated within 10 hours.

- .3 All new structural steel excluding surfaces in contact with concrete and the faying surfaces of bolted joints, shall be coated to the extent specified in this specification. Faying surfaces of bolted joints shall have only the prime coat applied. Prime coated surfaces that are exposed after assembly shall receive the second and third coats of the paint system after cleaning of the surfaces according to manufacturer's recommendations.
- .4 Prior to assembly, surfaces not in contact with other steel surfaces, but that are inaccessible after assembly shall have all coats applied.
- .5 Surfaces inaccessible for coating after erection shall be coated prior to erection.
- .6 At least 100 mm of bare metal and 100 mm of each coat of the new system shall be left exposed for lapping of subsequent coats where the continuous application of paint or final surface preparation is interrupted in a section.
- .24 Existing Structural Steel:
 - .1 The maximum time between final surface preparation and the prime coat application shall be 10 hours.
 - .2 When work operations require bolt connections of structural steel components, faying surfaces of exiting structural steel shall have only the prime coat applied, prior to assembly. Prime coated surfaces that are exposed after assembly shall receive the second and third coats of the paint system after cleaning of the surfaces according to manufacturer's recommendations.
 - .3 When tying into existing coatings, the edges of the existing coating shall be feathered into areas cleaned to bare steel so that at least 100mm of each coat of the existing coating is exposed.
- .25 Slip Critical Connections:
 - .1 At slip critical components on paint coated components, the surface within the bolt pattern and for a distance of 50 mm beyond the contact surface shall receive only the prime coat of paint prior to assembly. Prime coated surfaces that are exposed after assembly shall receive the second and third coats of the paint system after cleaning of the surfaces according to manufacturer's recommendations.
- .26 Dry Film Thickness
 - .1 Shall be compliant with manufacturer's recommendations.
- .27 Handling painted metal:
 - .1 Handle painted metal after paint has dried, or when necessary for handling for painting or stacking for drying.
 - .2 Damaged areas of paint coated surfaces shall be prepared to the original surface preparation standard specified and by feathering the edges of sound coatings. For damaged areas of less than 100 cm², power tool cleaning to SSPC-SP 11 may be used for surface preparation. The prepared surfaces shall be recoated with the originally applied materials. The dry film thickness of all the three coats in the repair area shall be as specified for the initial application.

3.6 QUALITY CONTROL

- .1 Execute ongoing Quality Control of the cleaning and coating application operations, including measurements of temperature, humidity, dew point, surface profile, and coating thickness. Written documentation of inspections conducted and measurements taken shall be provided to the Departmental Representative on a weekly basis, minimally, or more often as requested by the Departmental Representative.
- .2 NACE Inspector:
 - .1 Retain a qualified inspector to control the quality of shop and field paint work.
 - .2 The inspector must hold a NACE certification – Level 1 with the bridges painting specialty, and experience on two bridge projects minimum over the last five years.
 - .3 The inspector's certification must be valid for the duration of the work in accordance with Section 01 45 00 – Quality Control.
 - .4 The inspector's qualifications and work experience must be submitted for review and approval.
- .3 Inspection:
 - .1 Each phase of the work shall be inspected by the NACE Inspector.
 - .2 Access to installations and supply of equipment for inspection to all portions of the work shall be supplied, properly installed, and operated by the Contractor.
- .4 Surface Preparation:
 - .1 Acceptability of the surface preparation by the NACE Inspector shall be based on the applicable SSPC surface preparation specifications and pictorial standards given in SSPC-VIS 1 and SSPC-VIS 3.
- .5 Measurement of Surface Profile:
 - .1 Surface profile measurements shall be made by the NACE Inspector on a random basis using a spring micrometer and an extra coarse pressure sensitive replica tape according to ASTM D 4417, Method C.
- .6 Testing Cleanliness:
 - .1 The work shall be randomly tested by the NACE Inspector for cleanliness to determine contamination of surfaces by the presence of visible dust, oils, grease, or other foreign matter.
- .7 Measurement of Temperature, Humidity, and Dew Point:
 - .1 Random testing of ambient and surface temperature, relative humidity, and dew point by the NACE Inspector shall be done by means of a thermometer, surface thermometer, or recording hygrothermograph and digital or sling psychrometer with recognized psychrometric tables.
- .8 Measurement of Coating Thickness:
 - .1 Measurement of the coating thickness shall be made by the NACE Inspector. The dry film thickness shall be measured by Type 2 constant pressure probe magnetic gauges according to SSPC-PA 2.

- .2 Determination of the acceptability of the dry film thickness of each coat shall be made according to SSPC-PA 2.
- .3 The specified maximum dry film thickness used to determine acceptability of coating thickness according to SSPC-PA 2 shall be the manufacturer's recommended maximum, as shown in the submitted product data sheets.
- .4 The Departmental Representative shall be present when the NACE Inspector's magnetic gauges are being calibrated. The magnetic gauge shall be calibrated according to the procedures in SSPC-PA 2. To facilitate the calibration procedure, mask off a 75 x 75 mm area of the prepared steel at a location selected by the Departmental Representative. After all tests are completed, this area shall be coated as specified in the Contract Documents.
- .9 Testing Adhesion of Paint Coatings:
 - .1 Paint coatings shall be tested for adhesion by the NACE Inspector at the discretion of the Departmental Representative.
- .10 Inspection of Environmental Protection Installations:
 - .1 Performance and condition of the environmental protection installations shall be inspected regularly.
- .11 Frequency of Tests and Inspection:
 - .1 Except as specified above, the frequency of tests shall vary as instructed by the Departmental Representative as conditions require.
 - .2 Each phase of work must be inspected and approved by the NACE Inspector.
- .12 Inspection Reports:
 - .1 All Inspection Reports prepared by the NACE Inspector shall be made available for review by the Departmental Representative upon request, within 24 hours after the inspections described in the reports.
- .13 Sign-Off Forms:
 - .1 For each phase of work, after the work is inspected and approved by the NACE Inspector, submit a Sign-Off Form and include:
 - .1 Identification of areas applicable to the sign-off form.
 - .2 List of Inspections performed, time, and date.
 - .3 List of remedial work performed.
 - .4 Statement that work is found to be acceptable. No conditions or limitations can form part of the Sign-Off Form.
 - .5 Signature of NACE Inspector.
 - .2 All Sign-Off Forms prepared by the NACE Inspector must be submitted within 24 hours of completing the work described in the Sign-Off Forms.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.8 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. If necessary, remove contaminants from surface and apply paint immediately.
- .3 Repair damage to adjacent materials caused by painting exterior metal surface application installation.

3.9 ENVIRONMENTAL PROTECTION

- .1 All work including containment of debris and cleaning activities shall be done in accordance with the requirements of Section 01 35 43 – Environmental Procedures.

3.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Separate and dispose of hazardous waste (spent material that is tested to be leachate toxic) in accordance with Section 01 14 25 – Designated Substances, and Section 02 83 10 – Lead-Base Abatement – Minimum Precautions.

END OF SECTION