

5110.1 TABLE OF CONTENTS

5110.1	TABLE OF CONTENTS	1
5110.2	DESCRIPTION.....	1
5110.3	MATERIALS	2
5110.4	CONSTRUCTION	2
5110.5	PAYMENT.....	9

5110.2 DESCRIPTION

- 5110.2.1 The work shall consist of the preparation of the structural steel surfaces, the application, protection and drying of the paint coatings in accordance with this specification, and the supplying of all tools, tackles, scaffolding, labour and materials necessary in order to complete the work.
- 5110.2.2 The steel surfaces that are designated on the plans to be painted will receive one shop coat of primer and mid-coat prior to shipment, except that splices and connections will be left unpainted. The Contractor shall complete the painting of these areas.
- 5110.2.3 The work shall include the cleaning of bare steel and painted surfaces after the superstructure concrete has been placed.

5110.3 MATERIALS

- 5110.3.1 The Contractor shall supply all paint, primers, paint thinners, solvents and abrasives.
- 5110.3.2 The paint system and thickness requirements will be identified in the Special Provisions.

5110.4 CONSTRUCTION

5110.4.1 Scaffolding and Work Platforms

- 5110.4.1.1 The safety of the scaffolding, staging and work platforms shall be the responsibility of the Contractor. All requirements of the Saskatchewan Employment Act and The Occupational Health and Safety Regulations, 1996, shall be met.
- 5110.4.1.2 All scaffolding shall be designed and stamped by a Professional Engineer registered in the Province of Saskatchewan.
- 5110.4.1.3 The Contractor shall have sufficient scaffolding, staging and work platforms to permit assessment of the cleaned and painted areas by the Ministry inspector while work is progressing on other spans.

5110.4.2 Protection of Concrete and Other Surfaces

- 5110.4.2.1 The Contractor shall take necessary precautions against damaging or disfiguring any portion of the structure. Masking, covering or other suitable means shall be used to protect the piers, abutments, concrete slope protection and other portions of the structure from being painted, from damage due to the cleaning operations or paint overspray, or from paint spillage. Overspray onto the underside of

the concrete deck shall not extend more than 50 mm from the edge of the steel girders.

5110.4.3 Protection of Workers

5110.4.3.1 The Contractor shall be responsible for the supply and use of appropriate safety equipment for all the workers employed on site.

5110.4.4 Protection of Property of Others

5110.4.4.1 The Contractor shall take whatever steps are necessary to protect the property of others and the environment from damage caused by the cleaning and painting operations. This may include rescheduling these operations to periods of light traffic volumes and/or light wind, the use of protection devices such as tarps or spray sheets, or whatever other arrangements may be necessary.

5110.4.5 Surface Preparation and Coating

5110.4.5.1 For weathering steel bridges, all structural steel shall be painted for the larger of the following distances from deck joint locations:

- 3 000 mm.
- 1.5 times the superstructure depth (including girder, haunch and slab thickness).

5110.4.5.2 For overpasses, the entire exterior face of the exterior girder including the bottom of the bottom flange shall be painted.

5110.4.5.3 Areas where oil or grease are present shall be cleaned in accordance with the requirements of The Society For Protective Coatings (SSPC) Surface Preparation Specification No. 1 (SSPC-SP1) Solvent Cleaning. The type of solvent used shall first be approved by the Engineer.

5110.4.5.4 Areas covered by wet concrete may be cleaned by washing with water.

5110.4.5.5 Unpainted steel surfaces stained by dry concrete, and steel surfaces to be painted, shall be cleaned in accordance with the requirements of The Society For Protective Coatings Surface

Preparation Specification No. 7 (SSPC-SP7) Brush-off Blast Cleaning.

- 5110.4.5.6 Concrete splash and staining on painted surfaces shall be cleaned in accordance with the requirements of The Society For Protective Coatings Surface Preparation Specification No. 2 (SSPC-SP2), Hand Tool Cleaning and Surface Preparation Specification No. 3 (SSPC-SP3), Power Tool Cleaning.
- 5110.4.5.7 All steel surfaces which may have been subjected to dirt, mud, road salts, slush or other contaminants during transport shall be pressure washed using a minimum pressure of 20 MPa prior to any abrasive blast cleaning.
- 5110.4.5.8 Non-visible salts shall meet The Society For Protective Coatings/National Association of Corrosion Engineers SSPC-SP12 / NACE No. 5 NV-2 levels. Bare, rusty or damaged areas shall be cleaned to SSPC-SP11, Power Tool Cleaning to Bare Metal.
- 5110.4.5.9 Clean water, or compressed air from which oil and water have been removed, shall be used to remove dust and blasting abrasive from the cleaned bare steel or painted surfaces. Where necessary, the surface shall also be wiped with dry cloths.
- 5110.4.5.10 The abrasive used for blast cleaning shall be clean and dry, with a grading and hardness suitable to produce an anchor pattern specified by the manufacturer of the coating system.
- 5110.4.5.11 Blast cleaned surfaces shall be painted as soon as possible following completion of the cleaning operations. If unusual circumstances occur which prevent all repaired surfaces from being primed the same day, or if significant rusting forms, a light

sandblast will be required over all unprimed surfaces prior to recommencement of priming.

5110.4.6 **Application of Paint**

- 5110.4.6.1 All steelwork which is to be painted shall be given three shop coats of paint – primer, stripe coat and midcoat.
- 5110.4.6.2 Paint shall be chosen from the Ministry's Approved Product List for 3 coat systems.
- 5110.4.6.3 Surfaces surrounding bolt holes at connection locations shall receive the prime coat only and shall be masked off so that no stripe coat, midcoat or topcoat paint will be under the bolt heads, washers or nuts.
- 5110.4.6.4 These masked off areas shall have the stripe coat, midcoat and topcoat paint applied in the field after installation of the bolts.
- 5110.4.6.5 All faying surfaces of steelwork shall be cleaned by sand blasting in the shop. Faying surfaces of steelwork to be painted shall be painted only with 1 coat of inorganic zinc primer. Primer coatings shall meet the Class B coating requirements as specified in CSA S6, Canadian Highway Bridge Design Code. The class of coating shall be determined based on testing in accordance with the "Specification for Structural Joints Using ASTM A325 or A490 Bolts" issued by the Research Council on Structural Connections. Primers shall be supplied with a Class B certificate and be applied and cured at the conditions specified on the certificate. Over thickness will not be accepted.
- 5110.4.6.6 Paint shall be applied in a covered area in accordance with the manufacturer's specification. Paint shall not be exposed to the air until it is required for immediate use. Any paint which has become oxidized, thickened, ropy, lumpy or dirty shall be discarded.
- 5110.4.6.7 Paint shall be applied by brush, roller or spray, or a combination of these methods. On all surfaces which are inaccessible for brushes or rollers, and where spraying is not being employed, the paint shall

be applied with sheepskin daubers specially constructed for the purpose.

- 5110.4.6.8 “Dry overspray” shall be removed prior to application of the next coat of paint.
- 5110.4.6.9 Spray equipment shall be of ample capacity for the work and shall at all times be kept clean and in good working order. Spray guns shall be suited to the kind of paint being used, and shall be operated with orifices, nozzles and pressure suited to the kind of paint and its consistency. Air lines shall be equipped with water traps to positively remove condensed moisture.
- 5110.4.6.10 Brushes shall be in good condition, with uniform hair length and free of loose hairs. Brushes shall generally be moved in a series of part circles to thoroughly fill all irregularities after which the coating shall be smoothed by a series of parallel strokes. All areas showing excessive brush marks will be rejected.
- 5110.4.6.11 For each application of field paint, all bolts, nuts and washers, and all edges of plates and rolled shapes shall be pre-painted. This pre-paint shall be allowed to dry completely if general painting of the entire surface, including the pre-painted areas, cannot be done before the pre-paint begins to dry.
- 5110.4.6.12 All coats of paint shall be allowed to dry thoroughly prior to application of subsequent coats. In general, at least 24 hours of favourable drying weather will be required before a mid-coat may be applied over the primer, or before the finish coat may be applied over the primer or mid-coat.
- 5110.4.6.13 All edges, corners, crevices, bolts, nuts, protrusions and welds (unless ground flush) shall be stripe painted by brush for a width of 50 mm with the midcoat paint before the midcoat coat is applied. Stripe coating paint shall be applied as per SSPC-PA1 and may be

applied by spray, but shall be brushed in. Stripe painting shall be cured before the midcoat coat is applied.

5110.4.6.14 Blast cleaning shall be conducted and scheduled to avoid contamination of wet painted surfaces. Surfaces shall be cleaned to SSPC SP6 – Commercial Blast Clean.

5110.4.6.15 The Contractor shall measure the wet film thickness at sufficient locations to substantiate that proper technique is being used to apply the paint, and to confirm that paint thickness will meet these specifications without resulting in runs or sags.

5110.4.6.16 Thinners shall not be used unless prior approval of the Engineer has been obtained. When approved, only thinners meeting the requirements of the paint manufacturer and added in accordance with the manufacturer's directions shall be used.

5110.4.6.17 The midcoat shall be applied to all surfaces including tops and sides of the top flanges, except faying surfaces and surfaces surrounding bolt holes. The midcoat shall not be applied until the primer and stripe coat are accepted by the Engineer to be sufficiently cured.

5110.4.6.18 Any surfaces inaccessible after erection, except faying surfaces and tops and sides of top flanges, shall be given in addition to the 3 shop coats, 1 coat of the topcoat paint appropriate for the paint system being used.

5110.4.6.19 The topcoat shall be applied in the field.

5110.4.6.20 The topcoat shall be chosen from the Ministry's Approved Product List for 3 coat systems.

5110.4.6.21 The topcoat shall be applied in accordance with the manufacturer's specifications.

5110.4.6.22 For weathering steel, unless noted otherwise, the topcoat colour shall match the expected colour of the oxidized surfaces.

5110.4.7 **Quality of Work**

5110.4.7.1 The Ministry will provide an inspector to examine and approve the cleaning and painting work. The dry film paint thickness will be measured by an Elcometer 456 Electronic Thickness Gauge, or equivalent.

5110.4.7.2 The Contractor shall provide and move scaffolding, staging or work platforms as required to facilitate inspection of the work.

5110.4.7.3 Painted surfaces will be considered to lack uniformity, continuity and soundness if any of the following defects are apparent to the Engineer:

- Runs, sags, holidays or shadowing caused by inefficient application methods.
- Evidence of poor coverage at bolts or rivets, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
- Surfaces which have been bashed, scraped, spotted by rain or otherwise damaged.
- “Orange peel” texture.
- Surfaces damaged by overspray.

5110.4.7.4 Defects shall be repaired by the Contractor to the satisfaction of the Engineer. Where necessary, repairs may include paint removal, recleaning the steel and repainting. All repair work shall be the responsibility of the Contractor.

5110.4.8 **Weather Conditions**

5110.4.8.1 Paint shall not be applied when air temperature or the steel temperature are below 10°C, nor when the steel has absorbed sufficient heat (above 50°C) to cause the paint to blister or produce a porous paint film, nor when it is possible the air temperature may drop below 2°C before the paint is dry. No painting shall be done

when relative humidity meets or exceeds 85% or when the substrate temperature is within 3°C of the dew point.

5110.4.8.2 Paint shall not be applied to damp surfaces, nor when the air is misty, windy or otherwise unsatisfactory for the work.

5110.5 PAYMENT

5110.5.1 Payment for FIELD SURFACE PREPARATION AND PAINTING OF STRUCTURAL STEEL will be included in the contract lump sum price for FIELD SURFACE PREPARATION AND PAINTING OF STRUCTURAL STEEL.

5110.5.2 The contract price for FIELD SURFACE PREPARATION AND PAINTING OF STRUCTURAL STEEL shall include all labour, materials, equipment, tools, unloading, hauling, shop painting and field painting necessary for the completion of the work in accordance with the contract.