



5111 - SPECIFICATION FOR REPAINTING METAL STRUCTURES

5111 - 1 DESCRIPTION

- 1.01 The work shall consist of cleaning and sandblasting the steel surfaces, and applying, protecting and drying the paint coatings, and including protection of the public and compliance with environmental constraints. It shall include the supply of all materials, equipment, labour, scaffolding and tools necessary for completion of the work.

5111 - 2 MATERIALS

- 2.01 All paints, paint thinners, solvents and abrasives shall be supplied by the Contractor.
- 2.02 The abrasive used for blast cleaning shall be Kayway nickel slag, unless an alternative abrasive is approved by the Department.

5111 - 3 CONSTRUCTION

Traffic Control and Safety

- 3.01. Minimum traffic control requirements shall be identified in the special provisions. The Contractor shall be responsible for installation and maintenance of all necessary signing, flagging and such other warning or traffic control devices as may be required for the safety of the public, or as directed by the Department to protect the property of others, and to ensure the minimum interference with traffic. Signing shall be in place only during the time work is actually in progress and shall be removed or covered up at all other times. Equipment and materials shall be removed from the highway when work is not in progress.
- 3.02 Standard signs, sign posts, traffic cones, etc. shall be obtained from the Department's inventory. Non-standard signs, flashing light boards and other similar devices, if deemed by the Contractor to be required, shall be provided by the Contractor.
- 3.03 The Contractor shall not commence any work which may interfere with traffic until all signs and traffic control devices are in place.
- 3.04 The Department shall have full authority to restrict working hours, methods of cleaning and painting, and areas of the structure where work may proceed, so as to present the least possible hazard or inconvenience to the public.

Scaffolding and Work Platforms

- 3.05. The safety of the scaffolding, staging and work platforms shall be the responsibility of the Contractor. All requirements of the Occupational Health and Safety Act and the Workers' Compensation Board shall be met.
- 3.06 The Contractor shall have sufficient scaffolding, staging and work platforms to permit assessment of the cleaned and painted areas by the Department inspector while work is progressing on other spans.
- 3.07 Scaffolding, staging and work platforms shall not be suspended from the structural steel girders.

Protection of Concrete and Other Surfaces

- 3.08 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.

Protection of Property of Others

- 3.09 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.

Protection of Workers

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

Surface Preparation

- 3.11 Areas where oil, grease or smoke staining are present shall be cleaned in accordance with the requirements of Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP1) Solvent Cleaning. The extent of solvent cleaning will be identified in the special provisions. The solvent shall be water soluble, be effective in removing the contaminants, and when blast cleaning is not required, leave the surface suitable for overcoating after a thorough rinsing with water.
- 3.12 All steel surfaces which may have been subjected to salt action and salt accumulation shall be pressure washed at a minimum pressure of 20 MPa prior to blast cleaning. The extent of pressure washing, if required, will be identified in the special provisions.
- 3.13 The exterior corners of the bottom flanges and cover plates on the exterior girders shall be ground to provide a minimum 2 mm radius. This work shall be completed prior to the start of cleaning operations on the corresponding lengths of girder.
- 3.14 When blast cleaning to bare metal is required, the blast cleaning shall be done in accordance with the requirements of Steel Structures Painting Council Surface Preparation No. 6 (SSPC-SP6) Commercial Blast Cleaning. To facilitate the blasting operation, the Contractor shall use a compressor which has a minimum capacity of 350 cfm.
- 3.15 Hand cleaning with wire brushes, grinders and scraping tools shall be done on surfaces which cannot be effectively cleaned by blasting.
- 3.16 The abrasive used for blast cleaning shall be clean and dry, with a grading and hardness suitable to produce an anchor pattern acceptable to the paint supplier.
- 3.17 Compressed air, from which oil and water have been removed, shall be used to remove dust and all traces of blast products from the surfaces immediately prior to the application of each coat of paint. Where necessary, the surface shall also be wiped with a dry cloth.
- 3.18 Surface imperfections in the form of slivers or laminations which are raised by the blast cleaning operation shall be removed by grinding or another means acceptable to the Department.
- 3.19 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.

Priming and Painting

Primer and Finish Coats

- 3.20 The paint system, number of coats and required colors will be identified in the special provisions.

Film Thickness

- 3.21 The dry film thickness of each coat and of the entire system will be identified in the special provisions.

- 3.22 Wet film thickness shall be checked at the time the paint is being applied in order to ensure the proper dry film thickness is being obtained. Each painter shall be equipped with a wet film thickness gauge to enable frequent checks.

Thinners

- 3.23 Thinners shall not be used unless prior approval of the Department 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.

Weather Conditions

- 3.24 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.
- 3.25 Paint shall not be applied to damp surfaces, nor when the air is misty, windy or otherwise unsatisfactory for the work.

Application of Paint

- 3.26 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.
- 3.27 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.
- 3.28 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.
- 3.29 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.
- 3.30 All rivets, bolts, nuts and washers shall be initially coated by brush and followed immediately by sprayed application of paint. The brushed coating shall be allowed to dry completely if the sprayed coating cannot be applied before the brushed coating begins to dry.
- 3.31 The initial passes of the spray gun shall be directed at the outside corners of the steel members, followed by application to the entire member.
- 3.32 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.
- 3.33 "Dry overspray" shall be removed prior to application of the next coat of paint.
- 3.34 Blast cleaning shall be conducted and scheduled to avoid contamination of wet painted surfaces.
- 3.35 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.

Quality of Work

- 3.36 The Department shall provide an inspector to examine and approve the cleaning and painting work. The dry film paint thickness shall be measured by an Elcometer 345 Electronic Thickness Gauge, or equivalent.
- 3.37 The Department shall measure dry film thickness at a minimum of 5 random locations per 10 m² of painted surface area, and the thickness at each location shall be the average of 3 readings taken approximately 1 cm apart.
- 3.38 The Contractor shall provide and move scaffolding, staging or work platforms as required to facilitate inspection of the work.
- 3.39 Painted surfaces shall be considered to lack uniformity, continuity and soundness if any of the following defects are apparent to the Department's Inspector:
- (a) Runs, sags, holidays or shadowing caused by inefficient application methods.
 - (b) Evidence of poor coverage at bolts or rivets, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
 - (c) Surfaces which have been bashed, scraped, spotted by rain or otherwise damaged.
 - (d) "Orange peel" texture.
 - (e) Surfaces damaged by overspray.
- 3.40 Defects shall be repaired by the Contractor to the satisfaction of the Department. Where necessary, repairs may include paint removal, re-cleaning the steel and repainting. All repair work shall be the responsibility of the Contractor.

5111 - 4 MEASUREMENT

- 4.01 The areas to be cleaned and painted shall be identified in the special provisions.

5111 - 5 PAYMENT

- 5.01 Payment for REPAINTING METAL STRUCTURES shall be at the contract lump sum price. The lump sum price shall be full compensation for the provision of traffic control, the cleaning of steel surfaces, the supply and the application of paint, and includes all materials, equipment, tools and labour necessary to complete the work.