

ITEM 16570.32 M - LOCALIZED PAINTING OF BARE STRUCTURAL STEEL

DESCRIPTION. The work shall consist of applying a three coat structural steel paint system to structural steel locations from which paint has previously been removed under a separate item.

The contractor is specifically forewarned that structural steel cleaning will also be required by this item.

The three coat paint system shall consist of the following components:

1. **EPOXY PRIMER**
2. **EPOXY INTERMEDIATE COAT**
3. **POLYURETHANE TOPCOAT**

All components shall be compatible and shall be supplied by a single manufacturer.

MATERIALS.

- A. Equipment.** Cleaning equipment shall consist of vacuum equipped blast cleaning equipment only. The contractor may supply any recyclable abrasive which contains less than one percent free silica, and is compatible with the requirements of the equipment.

Hand held abrasive paper shall be used to abrade existing paint, where required.

All equipment shall be acceptable to the Engineer both prior to, and during, cleaning operations.

- B. Paint.** All paint used on any one structure shall be produced by a single manufacturer. A list of approved paint types and their manufacturers appears on the Department's approved list.

All paint in storage shall be protected from damage and maintained between 5°C and 32°C.

Each single paint (epoxy primer, epoxy intermediate coat and POLYURETHANE topcoat) shall be of a different color from the others. The color of the primer and intermediate coat will be the Contractor's option. However, they shall contrast with the underlying substrate or previously applied paints. The intermediate coat color shall be such that it can be completely hidden by a single coat of topcoat applied at the minimum specified dry film thickness.

The color of the topcoat shall be as specified in the contract documents.

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All components of the system (primer, intermediate coat and topcoat) will be accepted on the basis of the manufacturer's written certification that the batch produced meets their product specification. Only paint arriving at the work site in new, unopened containers and labeled with the manufacturer's name, product name, component part, batch number and shelf life date shall be used. Paint in containers having expired shelf life dates shall be immediately removed from the work site and not used.

c. Paint Inspection Equipment.

Prior to the start of work and throughout the duration of the work, the Contractor shall ensure that the Engineer is supplied with the following equipment in good working order:

1. Air thermometer, pocket type, -20°C to 100°C. (2)*
2. Surface thermometer, -20°C to 150°C. (2)*
3. Sling Psychrometer (2)*
4. Weight per cubic meter cup (kg) (2)*
5. Wet film thickness gage, Prong type (3)*
6. Dry film thickness gage, magnetic pull-off type (1)*
7. Dry film thickness, Type 2 fixed probe magnetic gage (2)*

*numbers in parentheses denote minimum quantity required.

CONSTRUCTION DETAILS.

A. CLEANING. Vacuum blast cleaning is limited to areas where paint has been removed. 150 mm outside the paint removal location's perimeter the existing paint shall be abraded only.

1. Bare steel locations. All bare structural steel surfaces to be painted shall be cleaned in accordance with SSPC - SP-6; COMMERCIAL BLAST CLEANING.

Before cleaning begins, visible deposits of oil, grease, dirt, salt, or other contaminants shall be removed by the methods specified in SSPC - SP1, Solvent Cleaning.

No cleaning operations will be conducted under the following conditions:

1. The relative humidity exceeds 85%.
2. The surface temperature is less than 3°C above the dew point.

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The area cleaned shall be limited to that which can be cleaned and prime coated within a 16-hour period provided the condition known as flash rusting does not occur. The contractor shall make every effort to avoid removing any existing paint at, or near, the cleaning location. (Refer to Priming). Cleaned areas shall be approved by the Engineer prior to priming.

After cleaning is completed, cleaned surfaces shall be defined by SSPC - Visl.-89, Pictorial Standards B SP6, C SP6 and D SP6 as applicable. All surfaces shall be cleaned of blasting products and other residues by means of vacuum systems equipped with HEPA filters. No other means will be permitted. The contractor's attention is directed to subsection 107-05; SAFETY AND HEALTH REQUIREMENTS.

2. Perimeter surrounding cleaned locations. Cleaned locations will be partially, or completely surrounded by existing paint. The contractor shall hand abrade a 150 mm wide band of paint enclosing the cleaned perimeter. Prior to abrading, the perimeter shall be cleaned in accordance with SSPC - SP1; SOLVENT CLEANING. After solvent cleaning, the paint band shall be abraded by hand held abrasive papers. There shall be no attempt made to remove the existing paint.
3. Clean up. All removed material shall be collected by vacuum systems equipped with high efficiency particulate (HEPA) filters. No other method will be permitted. The collected material shall be disposed of as lead contaminated hazardous waste.

B. PAINTING.

1. **GENERAL.** At least five working days prior to the start of work the Contractor shall supply the Engineer with one copy of the paint manufacturer's current technical data for each paint furnished. Instructions, suggestions and precautions shall be followed to the extent they do not contradict the provisions of this specification.

All paint shall be thoroughly mixed in accordance with the manufacturer's instructions. Mechanical mixers shall be used.

Only properly sealed and unopened paint containers will be permitted for use. Containers opened prior to the Engineer's authorization, or containers indicating tampering, shall be rejected and removed from the work site. All such containers shall be replaced by properly sealed containers at no additional cost.

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Thinning of paint will be allowed only with the express permission of the Engineer. All thinning shall be done in strict accordance with manufacturer's instructions. Only the type and quantity of thinner recommended by the manufacturer shall be used. Unauthorized use of thinners will result in the recleaning and repainting of the affected surface in a manner satisfactory to the Engineer at no additional cost.

Paint may be applied by brush, roller or air-less spray methods unless otherwise recommended by the paint manufacturer or otherwise stated by the contract documents. The requirements and restrictions of Standard Specification §740-01 apply.

Complete protection from paint spatter, spillage, overspray, wind blown paint, or similar releases of paint shall be provided. Covers, tarps, mesh, and similar materials shall be placed around the work area to protect public and private property, pedestrian, vehicular, marine or other traffic, all portions of the bridge, highway appurtenances, waterways, and similar surrounding areas and property, upon, beneath, or adjacent to the structure.

Individual coats shall be applied in sufficient quantity so that the following minimum dry film thicknesses (DFT) result:

<u>Primer</u>	<u>Intermediate</u>	<u>Finish</u>
100 µm	100 µm	75 µm

DFT determinations will be made by the Engineer in accordance with SSPC - PA2, Paint Application Specification No. 2, Measurement of Dry Paint Thickness with Magnetic Gages. The Contractor shall supply the following equipment required by §740-01 as well as two, Type 2 fixed probe magnetic gages, or equal, as approved by the Director, Materials Bureau. No work shall be done until all the required equipment is supplied.

No paint shall be applied unless all of the following conditions are met:

1. The receiving surface shall be clean and absolutely dry.
2. The surface temperature and ambient air temperature are as recommended by the paint manufacturer except in no case shall painting work be performed when surface and ambient air temperatures are less than 5°C or greater 38°C.

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3. The receiving surface temperature shall be at least 3°C above the dew point.
4. The relative humidity shall not exceed 85%.
5. The Engineer determines no poor adhesion or other non-acceptable condition will result.

All paint applied in violation of these conditions shall be completely removed, and the affected surface cleaned and repainted in accordance with stated requirements at no additional costs.

All individual coats shall be applied as required by the manufacturer's instructions. No coat of paint shall be applied until the previous coat has cured in accordance with the manufacturer's instructions and has been approved by the Engineer.

All work is subject to inspection. The contractor shall provide adequate access and suitable lighting for such inspections to be made. Any work done while the Engineer has been refused, denied, or restricted from access, or work performed in a manner that in the Engineer's opinion prevents adequate inspection, will automatically be rejected. All such work shall be recleaned and repainted in accordance with these requirements at no additional cost.

The Engineer will take wet and dry film readings to ensure minimum coating thicknesses and evenness of application. Coatings shall also be monitored for the presence of holidays, pinholing, bubbling, cratering, frothing, lack of adhesion, and other defects. Coatings having less than the required dry film thickness, or other defects unacceptable to the Engineer, shall be corrected in a manner satisfactory to the Engineer at no additional cost.

2. **Priming.** The following shall not be painted:
 - a. Metal to metal contact surfaces
 - b. All metal surfaces to be in contact with concrete.

Priming shall begin only after all welding, fabrication, repair, and replacement work is completed and accepted.

Cleaned bare metal surfaces shall have all extraneous products removed in

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accordance with CONSTRUCTION DETAILS Part A 3, and shall have the primer applied within 16-hours after completion of the cleaning operations, and before the condition known as flash-rusting occurs. No bare steel surface prepared for priming shall be left uncoated long enough to allow the formation of rust. No rust formation of any nature will be permitted. Cleaned areas upon which rust has formed shall be re-cleaned in accordance with these cleaning requirements at no additional cost. The presence of rust shall be determined by the Engineer.

Surfaces receiving primer shall be absolutely clean and dry prior to primer application.

All welds, edges of plates, angles or other shapes, corners and crevices shall be striped before the full coat of primer is applied. All stripe painting shall be done by spray application only. The stripe shall extend a minimum of 25 mm from the edge or corner. The stripe coat shall be set (dried) in accordance with the manufacturer's recommendations before application of the full prime coat. The 150 mm band surrounding the cleaned perimeter shall be primed.

3. **Intermediate Coat.** The requirements given under Priming together with the following shall apply:

Prior to application, if detrimental material, surface contamination(s), etc. are present, the primed surface shall be cleaned in accordance with the paint manufacturer's recommendations or as directed by the Engineer. Stripe painting shall not be required.

The intermediate coat shall be painted within the time period recommended by the manufacturer for re-coating, except that in no case shall more than 30 days elapse between the time that primer is applied and the intermediate coat is painted. Steel not painted with the intermediate coat within the specified time period(s) shall be re-cleaned and repainted with another prime coat at the Contractor's expense.

4. **Finish Coat.** The requirements of Priming and Intermediate Coat (including the 30-day application requirements for re-coating) shall apply together with the following:

1. Stripe painting shall not be required.
2. Finish coat color shall be that required by the plans.

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METHOD OF MEASUREMENT. The work will be measured as the number of square meters of surface painted as required. Measurement will be taken as the plane projection of the painted surface. No allowances will be made for irregular, or non-planar, surfaces.

All projections will be taken perpendicular to the painted surface. Changes in direction of ten degrees, or more, will constitute the termination line of the surface being measured.

BASIS OF PAYMENT. The unit price bid per square meter shall include the cost of all labor, material and equipment necessary to complete the work.

DISAPPROVED BY
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