

**ITEM 606.1001 03 - POWDER COATING BOX BEAM GUIDE RAILING**  
**ITEM 606.12020103 - POWDER COATING BOX BEAM GUIDE RAILING TYPE**  
**II END SECTION**

**DESCRIPTION**

This work shall consist of powder coating new box beam guide rail and box beam guide rail type II end sections (including all posts and above ground hardware) in powder coating shop facilities and delivering the rail and end sections to the work location(s).

**MATERIALS**

**Galvanizing:**

Guide Rail and Guide Rail Type II End Sections shall be galvanized in accordance with the provisions of Section 719-01 Galvanized Coatings and Repair Methods, and meet the following additional requirements.

- Hot-dipped galvanized components to be powder-coated shall not receive a water quench or chromate quench.
- All drainage spikes and surface defects shall be removed.
- Galvanized components shall not be left outside or allowed to get wet.
- Galvanized components shall not be transported uncovered

**Surface Preparation:**

- If contamination of the galvanizing has occurred or is suspected, the galvanizing shall be cleaned with a solvent/detergent designed for pre-cleaning and completely rinsed off prior to powder-coating. Solvents should only be applied with lint-free rags or soft bristled nylon brushes. Once rinsed, the components must be allowed to completely air dry.
- If ash residue from galvanizing is present, it should be removed using a solution of one to two percent ammonia. Apply the ammonia solution with a nylon brush, rinse thoroughly with hot water and allow the galvanizing to dry completely.
- All surfaces to be painted shall be pressure washed, using equipment operating at a minimum pressure of 21 MPa, and a minimum flow of 15 L/minute. The nozzle shall be held at a distance of 150 to 300 mm from the surface.
- When the washing is completed, the cleaned surfaces shall be free of dust, dirt, oil and grease, animal waste, salts, and other debris. Oil and grease shall be removed by solvent cleaning as described in SSPC SP1 Solvent Cleaning. The areas shall be pressure washed again following this cleaning.
- Once cleaned, all galvanized surfaces shall receive a light sweep blast using abrasive blasting equipment. All compressed air used to satisfy the requirements of this specification shall be clean. The cleanliness shall be verified with a white blotter test according to ASTM D4285 at least once per shift. The light blast shall remove zinc oxides from the galvanizing and etch the surface. The sweep blast shall impart to the galvanized surface an anchor profile of 25 to 40  $\mu\text{m}$  (micron) as measured using profile tape and a spring loaded micrometer in accordance with ASTM D4417.
- The initial thickness of the galvanizing prior to sweep blasting shall be established using a magnetic thickness gage, in a manner as described under ASTM A123. If the sweep blast results in a 15% or greater loss of galvanized coating, the article shall be rejected.

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ITEM 606.12020103 - POWDER COATING BOX BEAM GUIDE RAILING TYPE  
II END SECTION

The sweep blast shall be performed in a manner that does not result in disbondment or flaking of the galvanizing. After sweep blasting, the galvanized surfaces shall be thoroughly blown down with clean compressed air to remove all blast residues. Any sharp, protruding defects in the galvanized surface, such as that commonly found on edges and holes, shall be removed by hand tools.

Powder Coating:

The Box Beam Guide Railing and Box Beam Guide Rail Type II End Section shall be powder coated in a powder coating facility ("shop").

Application of the powder coating shall be performed within 12 hours of sweep blasting the galvanized surface. If more than 12 hours elapse prior to coating, the galvanized surfaces shall be re-blasted. If re-blasted, the item shall not have lost 15% or more of its original galvanized coating thickness.

Exterior surfaces of the railing shall be coated with a urethane or triglycidyl Isocyanurate (TGIC) polyester powder of a degassing grade only to a minimum dry film thickness of 50 µm.

All galvanized components to be powder coated shall be preheated in an oven to the temperature recommended by the manufacturer of the powder coat to avoid pinholing during powder cure.

The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the coated components to a specified temperature, and holding that temperature for a duration of time as recommended by the manufacturer of the powder coat (see Product Data Sheet for powder coat) to ensure sufficient storing time to meet curing specifications of the powder. Adjust pre-heating and line speed to ensure full cure.

The manufacturer's inspector shall check for correct cure by solvent testing. The powder coating shall achieve a minimum hardness of 2H as per ASTM D3363. It shall be capable of withstanding an impact test of 18 kg-m as per ASTM D2794 without any sign of cracking or lack of adhesion.

The powder coating for exterior surfaces shall be colored emerald green and semi-gloss and shall match RAL 6001. A color chip of 75 mm x 75 mm or greater shall be provided to the EIC no less than 2 wks prior to coating for approval.

**ITEM 606.1001 03 - POWDER COATING BOX BEAM GUIDE RAILING**  
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**Damaged Coating**

Powder coated articles shall be carefully transported to the work site in such a manner as to prevent any damage to the coating. Woven straps shall be used to unload the articles and they shall be carefully placed on timber donnage while awaiting installation. Powder coated articles that arrive at the worksite with damage to the coating greater than 25 mm (in any dimension) and/or extending to the galvanized coating will be rejected. Powder coated articles that are damaged while awaiting installation or are damaged during installation shall be subject to the same restrictions/requirements. The Contractor shall return to the shop such articles for cleaning and powder coating at no additional cost to the State. The cleaning procedure shall not remove galvanizing excessively as noted in this specification. Damage to the coating that is 25mm or smaller shall be repaired in the field using surface preparation techniques and repair material recommended by the powder coating manufacturer. The manufacturer's recommendations shall be followed in the application and curing of the repair material.

If the damage to the coating is smaller than 25 mm but has occurred at numerous locations on an article such that the Engineer believes the aesthetic value of the coating has been compromised, then this article will be rejected and returned by the Contractor to the shop for powder coating (as described earlier) at no cost to the State.

**METHOD OF MEASUREMENT**

The quantity to be measured for payment will be the linear meters of box beam guide railing or number of end sections that are powder coated.

**BASIS OF PAYMENT**

The unit price bid will include all labor, material and equipment necessary to satisfactorily complete the work.

Payment will be made under:

<b>ITEM NO.</b>	<b>ITEM PAY</b>	<b>UNIT</b>
606.10010003	Powder Coating Box Beam Guide Railing	Meter
606.12020103	Powder Coating Box Beam Type II End Assembly	Each