

ITEM 11615.8081 M - POWDER COATED PIPE HANDRAIL - 2 RAIL
ITEM 11615.8082 M - POWDER COATED PIPE HANDRAIL - 3 RAIL

DESCRIPTION This work includes furnishing and erecting powder coated galvanized steel pipe handrails along walkways, steps, or ramps where shown in the contract documents or where directed by the Engineer.

MATERIALS Materials for this work shall meet the requirements of the New York State Steel Construction Manual and the following subsections of NYSDOT Standard Specification Section 700- Materials:

701-05 Concrete Grouting Material.

721-03 Epoxy Polysulfide Grout. Color of grout shall match surrounding pavement, curb, or wall.

Galvanized steel pipe shall meet the requirements of ASTM Designation F-1083 and ASTM-53 schedule 40. All galvanized surfaces shall provide an acceptable substrate for applied powder coatings. No laquer, urethane or other coatings which would prevent proper adhesion of powder coating shall be applied to the pipe.

18-8 Stainless Steel Dowels.

Powder Coating shall be one of the following:

1. Polyvinyl Chloride Powder Coating shall be applied to the galvanized steel by the fluid bed method to a preheated base which has been cleaned and primed prior to submersion in the vinyl, resulting in a firm bond between the PVC and the metal. PVC shall be applied to film thickness of 0.25mm to 0.375mm without voids, tears, or cuts that reveal the substrate and shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

2. TGIC -Polyester Powder Coating shall be applied to the galvanized steel in such a manner that the coating will not peel off. The TGIC-Polyester shall be applied at a film thickness of 0.075mm to 0.15mm by electrostatic spray process and bake finished per manufacturer's directions. The TGIC-Polyester shall be applied without voids, tears or cuts that reveal the substrate and shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

Color shall be black unless specified otherwise or directed otherwise by the Regional Landscape Architect.

ITEM 11615.8081 M - POWDER COATED PIPE HANDRAIL - 2 RAIL
ITEM 11615.8082 M - POWDER COATED PIPE HANDRAIL - 3 RAIL

Organic zinc repair paint shall be 65% zinc by weight and meet the requirements of ASTM A780.

CONSTRUCTION DETAILS

Shop Drawings. The Contractor shall submit duplicate shop drawings to the Regional Landscape Architect for approval. Shop drawings shall include complete details of handrail construction including dimensions, layout, height, post spacing, and connections between rails, posts, and footings.

Samples. The Contractor shall submit one 30 millimeter long section of powder coated, galvanized pipe of each specified color to the Regional Landscape Architect for approval.

Certification. The Contractor shall submit certification that the materials used comply with this specification.

Fabrication. Pipe handrail shall be completely shop fabricated prior to delivery to the site. Pipe handrail shall be fabricated in strict accordance with the plans, details, and approved shop drawings. All welding shall be in conformance with New York City Parks and Recreation Standard Specification, "Materials and Methods of Construction," Section B. All welds shall be ground smooth and spot primed immediately after welding in the shop with a protective zinc-rich metal primer. After welding is completed, all pipe handrail components, except stainless steel dowels, shall receive phosphating and chromating treatments to improve the adhesion of the powder coating. All pipe handrail components, except stainless steel dowels, shall then be powder coated on all surfaces. Powder coatings shall be applied to the galvanized surfaces in such a manner that the coating will not peel off. Surfaces to be coated shall be clean, dry, free of grease, dust, rust, etc.

Laboratory Test for TGIC - Powder Coating. At the discretion of the Engineer, a sample of the TGIC - Polyester powder coated handrail shall be laboratory tested for bonding of the powder coating to the metal. The test shall be the Cross Hatch test per ASTM D3359, method B. Failure to satisfactorily pass this test will be a basis for rejection.

Field Test For PVC Powder Coating. As per ASTM F668, three sample sections of PVC powder coating handrail shall be tested for bonding of the powder coating to the metal. Each test will consist of making two cuts through the coating approximately 2 millimeters apart and at least 13 millimeters long and parallel to the axis of the pipe or rail. With a knife peel back one end of each 2 millimeter wide strip of coating to produce a tab between 3 millimeters and 7 millimeters long. Attempt to remove the rest of the strip of coating by pulling on the tab of coating. If the coating separates from the metal on any sample, the handrail will be rejected.

ITEM 11615.8081 M - POWDER COATED PIPE HANDRAIL - 2 RAIL
ITEM 11615.8082 M - POWDER COATED PIPE HANDRAIL - 3 RAIL

Installation. No pipe shall be cut on site. Posts shall be set as shown in the contract documents or as directed by the Engineer. Posts shall be properly supported in their holes to hold them plumb and to the intended line and grade prior to neatly filling the remaining space with grout. Connections shall be as shown in the contract documents or the approved shop drawings.

Touch-up & Repair will be required for minor damage at field welds, bolted connections, and at abrasions sustained during transportation and installation.

The Contractor shall apply organic zinc repair paint to damaged galvanized surfaces. Thickness of repair paint shall be not less than that required by ASTM A123.

The Contractor shall repair damaged powder coated surfaces in accordance with the manufacturer's recommendations. The repair shall not visible from a distance of 1.8 meters.

METHOD OF MEASUREMENT: Powder coated pipe handrail will be measured as the number of linear meters installed in accordance with the plans, specifications and directions of the Engineer.

BASIS OF PAYMENT: The unit price bid shall include the cost of furnishing all labor, materials, equipment and incidentals necessary to complete the work, including powder coating touch-up, in accordance with the contract documents and to the satisfaction of the Engineer.

Excavation and concrete footings will be paid for separately under their respective items.