

METAL HAND RAILING

****From Statewide STP SDWK(11)**

- xx. DESCRIPTION. This work shall consist of furnishing and erecting metal hand railing at the locations indicated in the Plans and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Section 525 of the Standard Specifications.

- xx. MATERIALS. Materials for Metal Hand Railing shall meet the requirements specified in the Plans and the following:

(a) Handrail. Handrail shall be steel pipe of the diameter shown in the Plans. All surfaces shall be free of burrs and sharp edges and be hand safe. All welds shall be ground smooth.

(b) Finish. Finish shall be hot-dipped galvanized with a shop applied color coating.

(1) Surface Preparation Prior to Galvanizing. Pickle steel prior to galvanizing in conformance with SSPC-SP8. Remove all rust, dirt, weld flux, weld spatter, and other foreign matter.

(2) Hot-dip Galvanizing. Provide an approved coating for iron and steel fabrication applied by the hot-dip process. Comply with ASTM A 123 for fabricated products and ASTM A 153 for bolts, nuts, washers, and other rough hardware. Provide thickness of galvanizing specified in referenced standards.

Wherever possible, perform galvanizing after assembly of items.

Galvanized items shall be straightened to remove all warpage and distortion caused by the galvanization process.

Touch-up breaks on hot-dip surfaces caused by cutting, welding, drilling, or undue abrasion with liquid zinc coating as specified herein. Apply liquid zinc by brush or spray on all damaged areas in two coats to a total dry film thickness of not less than 3 mils. Apply first coat within two hours after damage to hot-dip film to prevent undue oxidation of exposed surface. On all welds remove weld spatter by power wire brushing or equivalent before applying liquid zinc coating. Repair material should extend as possible at least 3 inches beyond all edges of the damaged galvanized area to assure continuity of galvanic protection.

Touch-up of galvanized surfaces with aerosol spray, silver paint, bridge paint, brite paint, or aluminum paints is not acceptable.

- (3) Shop Applied Coatings. Provide factory-applied polyurethane color coating, 2.5 mils dry film thickness minimum. Apply coating within 12 hours after galvanizing at the galvanizer's plant in a controlled environment meeting applicable environmental regulations, and as recommended by the coating manufacturer. Engage the services of a galvanizing facility which will assume single-source responsibility for galvanizing and finish coating.

- xx. FABRICATION. Metal handrail fabrication shall be performed by a fabricator with a minimum of five (5) years of experience in similar metal fabrication. The fabricator shall provide documentation of previous successful projects of similar scope.

The galvanizer shall provide a clearly visible stamp or tag indicating the name of the galvanizer, the weight of the zinc coating, and the applicable ASTM specifications number(s).

- xx. CONSTRUCTION REQUIREMENTS.

- (a) General. Metal Hand Railing shall be installed to the configuration detailed in the Plans and as directed by the Engineer.

Construct and install railings in strict accordance with the details in the Contract Documents, approved Fabrication Drawings, and requirements of all codes, laws, and ordinances bearing on the work.

Set pipe rails in non-shrinking hydraulic cement. Hole to receive pipe shall be core drilled and shall provide at least ½ inch clearance around entire perimeter. Hold expanding grout back ½ inch from finish surface and fill void with Portland cement grout to match color and texture of railing.

- (b) Field Welding. Field weld components indicated on Fabrication Drawings in accordance with AWS D1.1.

Immediately after welding, touch-up welds, burned areas, and damaged surface coatings.

Thoroughly remove all spatter by power wire-brushing (or if inaccessible, by wire brushing) per SSPC, surface preparation specification SP2 or SP3. Allow surface to cool to ambient temperature. Clean surface with solvent wipe to remove oils, grease, and dirt in accordance with SPC surface preparation specification SP1.

Apply one coat of liquid zinc to attain a minimum of 1.5 mils dry film thickness. Coating should extend at least

two inches beyond either side of weldment to ensure complete coverage of welded area.

- (c) Touch Up. Touch-up all welds, burned areas, scratches, and abrasions on galvanized metals using specified liquid zinc coating.

Touch-up all welds, scratches, abrasions, and other surface damaged on shop-painted metals using the same coatings as specified under MATERIALS (c) Shop Applied Coatings of this Section.

Touch-up blemishes to powder coated panels using air-dry touch up paint.

- xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Metal Hand Railing) to be measured for payment will be the number of meters (linear feet) of railing placed in the complete and accepted work, measured within the pay limits designated in the Plans.

- xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Metal Hand Railing) will be paid for at the Contract unit price per meter (linear foot). Payment will be full compensation for detailing, furnishing, handling, and placing the materials specified; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.640 Special Provision (Metal Hand Railing)	Meter (Linear Foot)