

ITEM 11615.8701 M - Steel Pipe Bollard - Fixed
ITEM 11615.8702 M - Steel Pipe Bollard - Removable

DESCRIPTION - Under this item, the Contractor shall furnish, powder coat, and erect Steel Pipe Bollard, Fixed or Removable, in accordance with the plans, specifications, and directions of the Engineer.

MATERIALS - Steel Pipe Bollard shall be as manufactured by All City Play Equipment, Brooklyn, N.Y. (718) 258-9600, Boundary Fence, Jamaica, N.Y. (718) 847-3400, or approved equal.

All fittings and hardware shall be of the materials listed in the following schedule:

<u>PART</u>	<u>MATERIAL</u>
Post Caps	Malleable Iron - 5 mm thick
Drive Pins and Set Screws	Stainless Steel, 18-8
Flange	Pressed Steel
"U" Bolts	Pressed Steel, Extra Heavy

Malleable iron castings shall be hot dipped galvanized in accordance with ASTM Serial Designation A-153 and powder coated per this specification.

Pressed steel fittings and appurtenances shall be powder coated and hot dipped galvanized in accordance with ASTM Serial Designation A-123.

Posts: Posts shall be extra heavy galvanized steel pipe, 100 mm O.D. and shall conform to ASTM Serial Designation A-120, Schedule 80, except that pipe shall be unthreaded and untested for water pressure.

Sleeves: Sleeves shall be extra heavy galvanized steel pipe, 125 mm O.D. and shall conform to ASTM Serial Designation A-120, Schedule 80, except that pipe shall be unthreaded and untested for water pressure.

Powder Coating: The galvanized steel pipe and fittings shall be powder coated with TGIC-Polyester.

Galvanizing shall provide an acceptable substrate for applied powder coatings. No lacquer, urethane or other coatings which would prevent proper adhesion of powder coating shall be applied to the pipe and fittings.

The powder coating shall be applied to the galvanized pipe and fittings in such a manner that the coating will not peel off. Insure surfaces to be coated are clean and dry and free of grease, dust, rust, etc. All coated parts shall first receive phosphating and chromating treatments to improve the adhesion of the surface coating.

Color to be black unless otherwise indicated on the plans.

The TGIC-Polyester shall be applied at a film thickness of 75 to 100 μ m 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.

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

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Padlocks: One padlock shall be furnished for each removable bollard. The padlocks shall be American No. 5571, as manufactured by American Lock Co. of Crete, Illinois, (718)361-1040, or approved equal. All padlocks for the same park facility shall be keyed alike, with fifty millimeter (50 mm) width by nineteen millimeter (19 mm) thick brass body, maximum security, five (5) pin tumblers with hardened alloy steel chrome plated shackle no less than eight millimeters (8 mm) diameter and fifty millimeter (50 mm) clearance (elongated shackle). The Contractor shall furnish two (2) keys for each padlock.

SHOP DRAWINGS: Before the work is started, the Contractor shall submit shop drawings for approval by the Engineer.

CONSTRUCTION DETAILS - The posts for fixed bollards shall be set in concrete footings with no flange as shown on the plans or as directed by the Engineer. Once erected, steel pipe of the fixed bollard shall be filled with Class A concrete. The sleeves for removable bollards shall be set in concrete footings, as shown on the plans or as directed by the Engineer.

All posts and sleeves shall be set plumb and true to line and grade. Any post and sleeve not set true to line and grade shall be removed and replaced at the Contractor's expense. Bending posts to make them plumb will not be permitted.

Touch-up & Repair of Powder Coating: For minor damaged caused by installation or transportation, clean damaged area, then;

1. On damaged galvanized surfaces, apply organic zinc repair paint complying with ASTM A780, then repair powder coating per number 2 below. Galvanizing repair paint shall have 65 percent zinc by weight. Thickness of repair paint shall be not less than that required by ASTM A123.

2. On damaged powder coated surfaces, touch-up finish in conformance with manufacturer's recommendations. Provide touch-up such that repair is not visible from a distance of two meters (2 m).

METHOD OF MEASUREMENT - The quantity of Steel Pipe Bollard-fixed and Steel Pipe Bollard-Removable to be paid for under these items will be the number furnished and installed in accordance with the plans, specifications, and directions of the Engineer.

BASIS OF PAYMENT - The price bid shall be for each Steel Pipe Bollard of whichever type furnished and erected, and shall include the cost for all labor, material, equipment, and incidental expenses necessary to complete the work, including excavation, concrete and powder coating, all in accordance with the plans and specifications, to the satisfaction of the Engineer.