## ITEM F-170 STEEL BOLLARD

DESCRIPTION

170-1.1 This item consists of replacing and/or installing new steel bollards as shown on the plans or as directed by the Engineer.

MATERIALS

170-2.1 Use materials that conform to the following:

**a. Steel Pipe.** Use standard weight, Grade B, galvanized, welded, or seamless pipe meeting ASTM A53.

**b. Concrete.** Use commercial grade concrete with a minimum 28-day compressive strength of 2,500 pounds per square inch (psi) or an approved, pre-mixed, sacked concrete.

**c. Paint.** Use single component, moisture cure, polyurethane (SC-MC-U) zinc primer. Use single component, moisture cure, aliphatic polyurethane (SC-MC-ALIP-U) safety yellow paint for the top coats.

**d. Retroreflective Bands.** Use flexible high intensity sheeting, pressure sensitive type, cut to form 6-inch wide reflector bands meeting ASTM D4956, Type III. Use sheeting with a smooth sealed outer surface.

CONSTRUCTION REQUIREMENTS

170-3.1 Install bollards plumb, in hand or mechanically dug holes, backfilled with the specified material, and thoroughly compacted to the satisfaction of the Engineer.

170-3.2 Painting. Paint bollards with one coat of primer and two top coats of safety yellow. Ensure that the surfaces are free of all oil, grease, dirt, abrasive residues, and all other foreign substances prior to application of coatings. Maintain the surface to be coated at a minimum temperature of 5  ̊F above the dew point for the duration of coating application. Adhere to these preparation requirements in addition to any requirements by the coating manufacturer. Repair any nicks, scratches or other paint damage resulting from shipping and handling at the site.

170-3.3 Reflective Bands. Apply a minimum of two white retroreflective bands placed 3-4 inches from the top with a maximum of 6 inches between the bands.

METHOD OF MEASUREMENT

170-4.1

**a. Lump Sum.** No measurement of quantities will be made.

**b. Unit Prices.** By the number of bollards specified, installed and accepted as completed units in place. Where replacement is specified, each unit shall include removal and installation.

BASIS OF PAYMENT

170-5.1Payment will include all labor, equipment, materials, and personnel to complete the work described in the plans.

Payment will be made under:

Item F170.010.0000 Steel Bollard – per each

Item F170.020.0000 Steel Bollards – per lump sum