

## ITEM SS-281 STEEL SAFETY BOLLARDS DESCRIPTION

**281-1.1** This item shall consist of furnishing and installing steel bollards to the tolerances specified and to the lines, locations and grades directed by the Engineer.

### MATERIAL REQUIREMENTS

**281-2.1** Assure that bollards meet retroreflectivity requirements as shown on the plans and specified by the Texas MUTCD and the ATSSA (American Traffic Safety Services Association) Brochure on Retroreflectivity.

**281-2.2 Fixed bollards.** Provide fixed bollards consisting of 6 in. diameter galvanized Schedule 80 steel pipe filled with concrete and with form domed cap. Provide steel such as pipe, plates, and other required parts in accordance with TxDOT Item 442, "Metal for Structures." Paint or galvanize pipe, plates, and other required steel parts in accordance with the plans and meeting the requirements of TxDOT Item 441, "Steel Structures" and TxDOT Item 445, "Galvanizing." Provide foundation concrete meeting the requirements of TxDOT Item 421, "Hydraulic Cement Concrete." Perform welding in accordance with TxDOT Item 448, "Structural Field Welding."

**281-2.3 Removable Bollards.** Provide removable bollards consisting of 6 in. diameter galvanized Schedule 80 steel pipe with form domed cap. Provide steel such as pipe, plates, and other required parts in accordance with TxDOT Item 442, "Metal for Structures." Paint or galvanize pipe, plates, and other required steel parts in accordance with the plans and meeting the requirements of TxDOT Item 441, "Steel Structures" and Item 445, "Galvanizing." Provide foundation concrete meeting the requirements of TxDOT Item 421, "Hydraulic Cement Concrete." Perform welding in accordance with TxDOT Item 448, "Structural Field Welding."

### CONSTRUCTION REQUIREMENTS

**281-3.1** The steel bollards shall be installed in the ramp at the locations and in accordance with the details shown in plans and in accordance with the manufactures directions.

Install bollards to the depth as shown on the plans or as directed. Clean bollard holes free of loose dirt and debris, and thoroughly compact bottom of hole to the correct elevation for placement of the bollards. Place bollards to the correct alignment, elevation, and plumb. Backfill around fixed and timber bollards and thoroughly tamp in 4 in. layers.

Remove and replace existing bollards of the type shown on the plans or as directed. Remove and dispose of existing bollards as shown on the plans or as directed. Install bollard foundation of the size and depth as shown on the plans.

### METHOD OF MEASUREMENT

**END OF ITEM SS-281**