

**SECTION 32 31 36
FIXED BOLLARDS**

PART 1 GENERAL

1.01 1.01 SECTION INCLUDES

- A. Fixed bollards and requirements
- B. Heavy-duty fixed bollards and requirements

1.02 1.02 RELATED REQUIREMENTS

- A. Section 32 12 16 - Asphalt Paving: Installation of adjacent paved surfaces.
- B. Section 03 30 00 – Cast-in-Place Concrete for Concrete Paving: Installation of adjacent paved surfaces.
- C. Section 09 91 13 – Exterior Painting

1.03 1.03 REFERENCE STANDARDS

- A. ASTM F2656 - Standard Test Method for Vehicle Crash Testing of Perimeter Barriers; 2007.

1.04 1.04 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.
- B. Shop Drawings: Provide detailed drawings showing:
 - 1. Foundation and anchoring requirements of the barrier equipment.

PART 2 PRODUCTS (MATERIALS)

2.01 2.01 FOR FIXED BOLLARDS:

- A. Fixed Bollards shall be constructed of nominal five (5") inch diameter schedule 80 pipe with an actual outside diameter of 5.563 inches and a wall thickness of .3750 inches.
- B. Bollards shall be filled with approved concrete. Concrete for bollards or new footings shall conform to the Concrete Section of these Specifications.
- C. After filling with concrete, a malleable or cast iron screw cap shall installed. Caps shall be drilled and pinned to prevent removal.
- D. All fabricated fixed bollards shall be painted as per the Specification, Exterior Painting 09 91 13. The color shall be Safety Yellow, unless otherwise noted. All surfaces must be clean and free of dust or loose rust. All greasy and oily residue must be removed from new metal with appropriate solvent.

2.02 2.02 FOR HEAVY-DUTY FIXED BOLLARDS:

- A. Heavy Duty Fixed Bollards shall be constructed of nominal eight (8") inch diameter schedule 80 pipe with an actual outside diameter of 8.625 inches and a wall thickness of .500 inches.
- B. Bollards shall be filled with approved concrete. Concrete for bollards or new footings shall conform to the Concrete Section of these Specifications.
- C. After filling with concrete, a malleable or cast iron screw cap shall installed. Caps shall be drilled and pinned to prevent removal.
- D. All fabricated heavy duty fixed bollards shall be painted as per the Specification, Exterior Painting 09 91 13. The color shall be Safety Yellow, unless otherwise noted. All surfaces must be clean and free of dust or loose rust. All greasy and oily residues must be removed from new metal with appropriate solvent.

PART 3 EXECUTION

3.01 3.01 INSTALLATION

- A. Bollards shall be placed vertically to line and grade and held securely in place during the pouring of concrete footings. Footings shall be of concrete and shall conform to the dimensions shown on the Drawings.

- B. After installation all chips, scrapes, and blemishes on the bollards shall be touched up with a final field coat of approved paint. No paint shall be applied during damp weather or when the temperature is below freezing. During painting, all concrete work, paving, etc. shall be fully protected from stains. Any paint spots that may occur shall be removed immediately with an approved paint or stain remover.
- C. If bollards are to be installed in existing pavement;
1. 1. For existing concrete pavement: remove flag(s) of concrete pavement up to nearest expansion joint or by neatly saw-cutting at the nearest control joints.
 2. 2. For existing asphalt pavement: neatly saw cut perpendicular to the adjacent curbs and remove a strip (minimum 24" width) or preferred up to adjacent perimeter walkway.
 3. 3. For existing bricks or pavers: carefully remove bricks or pavers as necessary and safely stockpile for reinstallation.
 4. Then, install bollard top plate at finished height of pavement and the concrete footing up to the bottom of proposed pavement. Install finished pavement over concrete footing and flush to top plate. Pitch pavement away from top plate in all directions to reduce water penetration.

END OF SECTION 32 31 36