BOLLARDS

1. GENERAL
   * + 1. SUMMARY
          1. The General Conditions and Division - 1 Specification sections apply to the work of this section.
          2. The following documents form part of the Specifications to the extent stated. Where differences exist between Codes, Standards, and the Documents, the one affording the greatest protection shall apply.
          3. Sustainable Design Requirements: Provide the Work and submit documentation necessary for compliance with specified sustainable requirements. Manufacturer must provide material test reports for LEED credit eligibility. All material must be 100% recyclable or reusable
          4. This Section includes the following:

Fixed Shallow Mount Bollards

* + - 1. SUBMITTALS
         1. Product Data: For each type of product indicated.
         2. Samples for Initial Selection: For units with factory-applied color finishes.
         3. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

Size: Not less than 6-inch- long linear components and 4-inch- square sheet components.

* + - * 1. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
        2. Maintenance Data: For site furnishings to include in maintenance manuals.
      1. PROJECT CONDITIONS
         1. Site and Drawing Examination:

Any contractor submitting a proposal for this work shall first examine the site of the proposed work and all conditions at the site that he may fully understand any facilities, difficulties, and restrictions attending the execution of the contract. No subsequent allowances shall be made because of omission, error, or negligence, in connection with this provision.

* + - 1. QUALITY ASSURANCE
         1. Source Limitations: Obtain site furnishing(s) through one source from a single manufacturer.
         2. Contractor’s Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.
         3. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.
      2. WARRANTY
         1. Special Warranty:

Warranty Period: One year from date of Substantial Completion.

1. PRODUCTS
   * + 1. MATERIALS
          1. Carbon Steel

Pipe: Schedule 80 ASTM A53 Grade B

1” Stiffener Plate ASTM A36 Insert

I-Beam: W6X25 ASTM A36

* + - 1. BOLLARDS
         1. Basis-of-Design Product: Subject to compliance with requirements, provide Calpipe Security Bollards’ Calpipe Security Bollards’ M50 PDT Series Fixed Shallow Mount Security Bollards,

Calpipe Industries, 877-283-8518

Or Approved Equal

* + - Bollards must be manufactured by Calpipe Security Bollards of Dominguez Hills California
    - Bollards must be manufactured by an American company in an American facility
    - Bollards must be manufactured in a UL-listed facility
    - Bollards must comply with ASTM and DOD / DOS standards for crash-tested and crash-rated products
    - Bollard manufacturer must have documentation of crash test results and engineering specifications for crash-rated products
    - Bollard manufacturer must offer shallow mount version of the crash rated product
    - Bollard manufacturer must offer deep mount version of the crash rated product.
    - Bollard manufacturer must offer lighted version of the crash rated product
    - Bollard manufacturer must offer removable version of the crash rated product
    - Bollard manufacturer must have engineering department on premises
    - Type 304 Type 316 stainless steel must be polished and passivated by an American company in an American facility
      * 1. Site Requirement: Site must maintain M50 Security Standard

Per manufacturer recommended spacing: “As Tested”

* + - 1. BOLLARD SCHEDULE
         1. Bollard Type A – Calpipe Security Bollards K12 Fixed Shallow Mount Bollard

Carbon Steel Bollard 10-3/4” in diameter

Finish: Zinc Rich Primer

Style: Flat Cap, Dome Cap, Knight Cap

Overall Height: 36” above finished grade for flat cap. 36” is minimum height for bollard post not including cap style.

Bollard Depth: 12”

Footing Width: As Indicated in Drawings

Footing Depth: As Indicated in Drawings

Installation Method: Cast in Reinforced Concrete

* + - 1. PERFORMANCE
         1. Experience

Bollard shall be of proven design utilizing proven components

Manufacturer shall have used similar bollard and sub-grade assembly structure for a minimum of 2 years with documented field experience.

* + - * 1. Evaluation

Bollards, equipment and workmanship shall be warranted by manufacturer for one year.

The manufacturer must provide detailed drawings (including foundations and sub-frames) to demonstrate that the barrier will meet the specified design criteria and to facilitate installation.

The manufacturer must provide detailed drawings for the placement, specifications, and electrical requirements for all controls and equipment.

* + - * 1. Qualification:

Bollard design shall have successfully passed in-field crash test certified by a qualified independent agency

Bollard shall be certified to be in compliance with ASTM standard F2656 Standard Test Method for Crash Testing of Vehicle Security Barriers specifically to meet or exceed a 15,000 lb. (6810 kg) test vehicle’s impact on a barrier in a horizontal direction at a rate of 50 mph (80 kph)

* + - * 1. Requirements

PDT10080SMF must be installed in a minimum array of (3) fixed bollards with a center on center spacing of no more than 60” to maintain as-tested certification to ASTM: F2656.

* + - 1. FABRICATION
         1. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
         2. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
         3. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
         4. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
         5. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.
      2. FINISHES, GENERAL
         1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
         2. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
      3. STEEL AND GALVANIZED STEEL FINISHES
         1. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
         2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

Proceed with installation only after unsatisfactory conditions have been corrected.

* + - 1. INSTALLATION, GENERAL
         1. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated.
         2. Contractor shall be responsible for providing all necessary connections, supports, brackets, hardware, and anchors, whether shown or not shown on the drawings, as required for a full and complete installation and execution of the Bollard scope of work.
         3. Install bollards level, plumb, true, and at position locations indicated on Drawings.
         4. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
      2. CLEANING AND PROTECTION
         1. Provide cardboard protection over and around bollards until substantial completion. Utilize Sonotube or equivalent.
         2. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.