SECTION– 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:

Internal Locking Removable 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.
				3. Submittals shall contain sufficient plans, elevations, sections and schematics to clearly describe the apparatus. All conduit runs, controls, and similar drawings shall be included.
				4. Submittals shall include (but not necessarily limited to) the following:

All high and low voltage conduit runs

Mounting dimensions and locations

Details of electronic equipment, electrical equipment or any other apparatus deemed necessary by the Owner or Owners Representative.

* + - 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. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
				2. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of bollard security systems that are similar to those indicated for this Project in material, design, and extent.
				3. Source Limitations: Obtain site furnishing(s) through one source from a single manufacturer.
				4. Contractor’s Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.
				5. 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. Stainless Steel: Free of surface blemishes and complying with the following:

Rolled Sheet: 12 Ga. ASTM A-240

Sheet: 10 Ga. ASTM A-240

Plate: ¼” ASTM A-240

Type 304

* + - * 1. Carbon Steel

Pipe: Sch.80 Nominal Pipe, ASTM A-53 Grade B

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

Calpipe Industries, 877-283-8518

* + - 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 ETL-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. BOLLARD SCHEDULE
				1. Internal Locking Bollard Basis of Design (Bollard Type A) – Calpipe Security Bollards’ PDT06080R-S20, S20 Rated Removable Bollard

Carbon Steel Bollard: 6.625” in diameter; .432” in wall thickness; Schedule 80

Finish: Electrostatic Powdercoat

Cap Style: Flat or Dome or Knight or Viking Reveal

Overall Height: 36” above finished grade

Overall Depth: 18” below finished grade

Footing Width: As Indicated in Drawings

Footing Depth: As Indicated in Drawings

* + - * 1. Internal Locking Removable Bollard Receiver Basis Of Design (Receiver Type A)- Calpipe Security Bollards’ Embedment Sleeve: PDT060-S20-ESR

Grade Finish: #4 Brushed

Hinging Lid: ¼” Thick T304 Plate

Grade Flange: ¼” Thick T304 Plate

Drain Plate: 10 Ga. T304 Sheet

Overall Length: 18”

I.D. of Receiver: 6.750”

Overall Diameter of Flange: 11.250”

Embedment Depth: Match Bollard embedment depth

Hinging Lid will be secured with 3/8” Tamper Proof Screw when in closed position

* + - * 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.
			1. PERFORMANCE
				1. Experience

Bollard shall be of proven design utilizing proven components

Manufacturer shall have used similar bollard 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) 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 F3016 Standard Test Method for Surrogate Testing of Vehicle Impact Protective Devises at Low Speeds specifically to meet or exceed a 5,000 lb. (2268 kg) test vehicle’s impact on a barrier in a horizontal direction at a rate of 10, 20, or 30 mph (16, 32, 48 kph respectively)

* + - * 1. Requirements

PDT06080R-S20 must be installed in a minimum array of (1) removable bollards with no requirement for center on center spacing to maintain as-tested certification to ASTM: F3016 standard.

* + - 1. 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.
			2. 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.