

**PROCUREMENT SPECIFICATION
MODEL DSC800M BOLLARD (MANUAL) BARRICADE SYSTEM**

1.0 SCOPE

The specification defines the procurement of a MANUAL BOLLARD BARRICADE SYSTEM, Model DSC800M, consisting of (specify the quantity required) manual vertical lift Bollards.

2.0 SYSTEM CONFIGURATION

2.1 BOLLARD(S) STANDARD CONFIGURATION

2.1 BOLLARD ARRANGEMENT. The system shall have a total of ____ Bollards (specify the total number of Bollards in the system).

2.1.1 Bollard Construction. Bollard shall be a below grade assembly containing a heavy steel cylindrical weldment capable of being raised to an above grade position. The guard position shall present a formidable obstacle to approaching vehicles. Upon impact, forces shall be first absorbed by the weldment and then transmitted to the foundation of the unit.

2.1.2 Bollard Height. Height of the Bollard shall be 30 inches (762 mm) as measured from the top of the foundation frame to the top of the Bollard assembly.

2.1.3 Bollard Dimensions. Bollard shall be 6.63 inches (168 mm) in diameter.

2.1.4 The foundation and underside of the Bollard shall be coated with an industrial grade primer for corrosion protection. The roadway plates shall have a non skid surface. Bollard shall be white and have yellow/black diagonal stripes (or alternately Bollard shall be yellow with black vertical stripes).

2.1.5 Operation. The Bollard shall be counterbalanced to require a minimal pull to raise it to the guard position. A locking pin shall be provided to lock the Bollard in either the fully up or fully down position.

2.2 BOLLARDS(S) WITH ARCHITECTURAL ENHANCEMENTS

2.2.1 Construction. Bollard shall be a below grade assembly containing a heavy steel cylindrical weldment capable of being raised to an above grade position. The guard position shall present a formidable obstacle to approaching vehicles. Upon impact, forces shall be first absorbed by the weldment and then transmitted to the foundation of the unit.

2.2.2 Architectural Enhanced Outer Shells shall be cast from a free machining aluminum alloy and be free of cracks, uneven surface texture, excessive parting line offset or particle inclusions.

2.2.3 Bollard Diameter, with Architectural Enhancement in place shall not be greater than 10.22 inches (260 mm) in diameter. (Refer to DELTA Drawing 8473 for design envelope for enhancement).

- 2.2.4 Bollard Height: shall be 30 inches (762mm) as measured from the top of the foundation frame to the top of the Bollard assembly.
- 2.2.5 Operation. The Bollard shall be counterbalanced to require a minimal pull to raise it to the guard position. A locking pin shall be provided to lock the Bollard in either the fully up or fully down position.
- 2.2.6 Finish:
 - 2.2.6.1 Steel Structure. The foundation and underside of the Bollard shall be coated with an industrial grade primer for corrosion protection. The roadway plates shall have a non-skid surface. The above grade portion of the Bollard shall be finished with an industrial enamel primer.
 - 2.2.6.2 Architectural Enhancement. Standard Aluminum Cast Outer Shells shall first be primed with an industrial enamel primer then finished with an industrial grade enamel. Highlight colors shall be of equivalent quality.
 - 2.2.6.2 Custom Architectural Enhancement Outer Shells shall be finished in accordance with customer instructions.

3.0 PERFORMANCE

- 3.1 EXPERIENCE. Bollard and auxiliary equipment shall be of proven design. Manufacturer shall have over 1700 Bollard type vehicle barriers in field operation for a minimum of 5 years with documented field experience for all major components and design features.
- 3.2 QUALIFICATION TESTS. Bollard design shall have successfully passed actual full scale crash tests conducted by a qualified independent agency.
 - 3.2.1 Performance Evaluation. The Bollard shall have been certified by the United States Department of State to have a performance evaluation per DOS Specification SD-SDT-0201 (Dated April 1985) of K4/L2.0.
- 3.3 STOPPING CAPACITY.
 - 3.3.1 Normal Operation. Bollard(s) shall provide excellent security and positive control of normal traffic in both directions by providing an almost insurmountable obstacle to non-armored or non-tracked vehicles.
 - 3.3.1.1 The Bollard system shall be designed to stop a vehicle attacking from either direction.
 - 3.3.2 High Energy Attack. Bollard(s) shall have been shown by certified dynamic non linear analysis to be capable of stopping and immobilizing non-armored or non-tracked vehicles with weight and velocity characteristics as defined in paragraph 4.3.2.1. The Bollard system shall be designed to destroy the front suspension system, steering linkage, engine crankcase and portions of the drive train.

3.3.2.1 The Bollard shall be capable of stopping and destroying a vehicle(s) weighing:

15,000 pounds at 62 mph (66,7 kn. at 100 Kph)
30,000 pounds at 44 mph (133 kn. at 71 Kph)

4.0 ENVIRONMENTAL DATA (Please supply the following):

Bollard shall operate satisfactorily under the following environmental conditions:

4.1 Extremes in temperature

Yearly maximum drybulb temp _____ f/c

Yearly minimum drybulb temp _____ f/c

4.2 Rainfall

Yearly average _____ inches

Maximum expected hourly rate _____ inches/hour

4.3 Snowfall

Maximum expected hourly rate _____ inches/hour

Roadway will be (mechanically/manually/chemically) cleared _____.

5.0 QUALITY ASSURANCE PROVISIONS

5.1 Testing. Upon completion, the Bollard system will be fully tested in the manufacturer's shop. In addition to complete testing to verify function, the following checks shall be made:

5.1.1 Identification. A nameplate with manufacturer's name, model number, serial number and year built shall be located within the maintenance access area.

5.1.2 Workmanship. The Bollard and subsystems shall have a neat and workmanlike appearance.

5.1.3 Dimensions. Principal dimensions shall be checked against drawings and ordering information.

5.1.4 Finish. Coatings shall be checked against ordering information and shall be workmanlike in appearance.

6.0 PREPARATION FOR SHIPMENT

6.1 The Bollard system shall be crated or mounted on skids as necessary to prevent damage from handling. The shipping container(s) shall be of sufficient structural integrity to enable the assembly to be lifted and transported by overhead crane or forklift without failure.

7.0 MANUFACTURER'S DATA

7.1 Drawings and installation data. The Bollard system drawings and installation, maintenance and operating manuals shall be sent to purchaser within 4 weeks of order. ____ additional copies shall be supplied (1 copy supplied at no cost).

8.0 DISCLAIMER

Please note - careful consideration must be devoted to the selection, placement and design of a Bollard installation. Just as in the case of any Barricade system, perimeter security device or security gate that blocks a roadway or drive, care must be taken to ensure that approaching vehicles well as pedestrians are fully aware of the Bollards and their operation. Proper illumination, clearly worded warning signs, auxiliary devices such as semaphore gates, stop-go signal lights, audible warning devices, speed bumps, flashing lights, beacons, etc. should be considered. Delta has information available on many such auxiliary safety equipment not specifically listed herein. It is strongly recommended that an architect and or a traffic and or safety engineer be consulted prior to installation of a Bollard system. Delta will offer all possible assistance in designing the operating equipment, controls and the overall system but we are not qualified nor do we purport to offer either traffic or safety engineering information.

9.0 PROCUREMENT SOURCE

The **Model DSC800M** Bollard (Manual) Barricade System shall be purchased from:

DELTA SCIENTIFIC CORPORATION

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