

**PROCUREMENT SPECIFICATION
MODEL DSC720M 1M MANUAL BOLLARD BARRICADE SYSTEM**

SYNOPSIS

This specification defines a CRASH TESTED - CRASH CERTIFIED - HIGH SECURITY – BOLLARD BARRICADE SYSTEM – DELTA Model DSC720M.

- The basic system can consists of one or more manually operated vertical lift BOLLARDS together with SAFETY AND ENVIRONMENTAL OPTIONS.
- The BOLLARD(S) may be specified with Standard or Custom Cast Outer Shells to match existing ARCHITECTURAL TREATMENTS or STYLES.

1.0 PATENT LICENSE

The CRASH CERTIFIED HYDRAULIC BOLLARD SYSTEM shall be fully licensed for manufacture under U.S. Patent Numbers: 4,576,508 and 4,715,742.

2.0 BOLLARD CONFIGURATION

- 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 Bollard Height. Height of the Bollard shall be 39.3 inches (1000 mm) as measured from the top of the foundation frame to the top of the Bollard assembly.
- 2.3 Bollard Dimensions. Bollard shall be 12 ¾” inches in diameter (w/o decorative casting or sleeve).
- 2.4 Finish. The foundation and underside of the Bollard shall be finished with an industrial enamel primer for corrosion protection. The above grade portion of the Bollard shall be white and have yellow/black diagonal stripes (other paint schemes alternately available).
- 2.5 Bollards(s) with Architectural Enhancements
 - 2.5.1 Architectural Enhanced Outer Shells shall be cast from a free machining aluminum alloy and be free of cracks, uneven surface texture, and excessive parting line offset or particle inclusions. Optionally they shall be supplied in fiberglass.
 - 2.5.2 Bollard Diameter, with Architectural Enhancement in place shall not be greater than 15.25 inches (387 mm) in diameter. (Refer to DELTA drawing 08475 for design envelope for enhancement).

2.5.3 Finish of Architectural Enhancement. Standard Aluminum Cast Outer Shells shall first be primed with an industrial enamel primer then finished with industrial grade enamel. Highlight colors shall be of equivalent quality.

2.5.4 Custom Architectural Enhancement Outer Shells shall be finished in accordance with customer instructions.

3.0 COUNTERBALANCE SYSTEM

3.1 Operation. The Bollard shall be counterbalanced to require a minimal pull (approximately 45 pounds) to raise it to the guard position.

3.2 Locking arrangement. A locking pin shall be provided to lock the Bollard in either the fully up or fully down position.

3.3 Padlock Capability. The Bollard access cover over the locking pin shall have a padlock hasp to secure the locking pin (padlock by others).

4.0 PERFORMANCE

4.1 EXPERIENCE. Bollard and auxiliary equipment shall be of proven design. Manufacturer shall have over 2000 Bollard type vehicle barriers in field operation for a minimum of 20 years with documented field experience for all major components and design features.

4.2 QUALIFICATION TESTS. Bollard design shall have successfully passed actual full scale crash tests conducted by a qualified independent agency.

4.2.1 Performance Evaluation. The Bollard shall have been successfully tested to ASTM 2656-07 P1 M50 test. Zero penetration.

4.2.2 United Kingdom Crash Test The DSC720 has been tested to the United Kingdom BSI Standard PAS:68 2007 Crash Test. 7.5 Tonne EU truck at 80 kph. Three tests were conducted: three bollard array, Two bollard array. Stop and destroy vehicle with penetration. Second attack readiness demonstrated. Passed Test.

4.3 STOPPING CAPACITY.

4.3.1 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.

4.3.1.1 The Bollard system shall be designed to stop a vehicle attacking from either direction.

4.3.2 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.

4.3.2.1 The Bollard shall be capable of stopping and destroying a vehicle(s) weighing:
15,000 pounds at 81 mph (3.280E6 LB-FT)
30,000 pounds at 68 mph (4.623E6 LB-FT)

5.0 ENVIRONMENTAL DATA (Please supply the following):

Bollard shall operate satisfactorily under the following environmental conditions:

5.1 Extremes in temperature

Yearly maximum drybulb temp _____ f/c

Yearly minimum drybulb temp _____ f/c

5.2 Rainfall

Yearly average _____ inches

Maximum expected hourly rate _____ inches/hour

5.3 Snowfall

Maximum expected hourly rate _____ inches/hour

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

6.0 QUALITY ASSURANCE PROVISIONS

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

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

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

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

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

7.0 PREPARATION FOR SHIPMENT

- 7.1 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.

8.0 MANUFACTURER'S DATA

- 8.1 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).

9.0 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.

10.0 PROCUREMENT SOURCE

The **Model DSC720M** Bollard Barricade System shall be purchased from:

DELTA SCIENTIFIC CORPORATION

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