

**PROCUREMENT SPECIFICATION
MODEL TT210M BOLLARD (MANUAL) BARRICADE SYSTEM**

1.0 SCOPE

The specification defines the procurement of a MANUAL BOLLARD BARRICADE SYSTEM, Model TT210M, consisting of (specify the quantity required) manual vertical lift Bollards.

2.0 SYSTEM CONFIGURATION

2.1 BOLLARD(S)

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 10.75 inches (273 mm) in diameter.

2.1.4 Finish. The foundation and underside of the Bollard shall be asphalt emulsion coated for corrosion protection. 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.

3.0 PERFORMANCE

3.1 EXPERIENCE. Bollard and auxiliary equipment shall be of proven design. Manufacturer shall have over 1000 Bollard type vehicle barriers in field operation for a minimum of 10 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 a performance evaluation per D.O.S. Specification SD-SDT-02.01 (Dated April 1985) of 4K/L2.0.

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. The Bollard system shall be designed to stop a vehicle attacking from either direction and continue to operate when the vehicle is within the weight and velocity characteristics as defined in paragraph 3.3.1.1, minor repairs excepted.

3.3.1.1 Bollard shall be fully operational after successfully stopping vehicle(s), in the priority direction, weighing:

10,000 pounds at 65 mph (44,4 kN @ 104 kph)
20,000 pounds at 46 mph (88,9 kN @ 74 kph)
50,000 pounds at 30 mph (222 kN @ 48 kph)

3.3.2 High Energy Attack. Bollard(s) shall be designed to stop and immobilize non-armored or non-tracked vehicles with weight and velocity characteristics as defined in paragraph 3.3.2.1. The Bollard system shall be designed to destroy the front suspension system, steering linkage, engine crank case and portions of the drive train. Significant damage to the Bollard system is probable at these levels.

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.

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9.0 PROCUREMENT SOURCE

The **Model TT210M** Bollard (Manual) Barricade System shall be purchased from:

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