

**PROCUREMENT SPECIFICATION  
MODEL TW107 PHALANX® TYPE HYDRAULIC BARRICADE SYSTEM**

**1.0 SCOPE**

This specification defines the procurement of a PHALANX\* HYDRAULIC BARRICADE SYSTEM, Model TW107, consisting of (one, two, three or four) vehicle Barricade(s) operating (independently or in sets of two, three or four) Barricade(s), a HYDRAULIC POWER SYSTEM, the CONTROLS AND LOGIC CIRCUITS, FEATURES and OPTIONS as defined herein.

**2.0 SYSTEM CONFIGURATION**

**2.1 BARRICADE(S)**

2.1.1 Barricade Construction. Barricade shall be a below grade assembly containing a heavy steel weldment capable of being rotated into position above grade. The raised Barricade shall present a formidable obstacle to approaching vehicles. Upon impact, forces shall be absorbed by the Barricade assembly and transmitted to the foundation of the unit. The Barricade roadway plates shall be fabricated from checkered steel plates. Removable cover(s) on the roadway plates shall provide access to the Barricade internals and shall utilize fasteners with flush heads.

2.1.2 Barricade height. Height of the Barricade shall be 14 inches (355 mm) as measured from the top of the foundation frame to the top of the barrier inclusive of the top road plate.

2.1.3 Barricade Length. Barricade length (standard) shall be 79 inches (2,0 M). Barricade(s) can be optionally specified in 20 inch (0,5 M) increments from a minimum of 20 inches (0,5 M) to a maximum of 157 inches (4,0 M).

2.1.4 Finish. The foundation and underside of the Barricade shall be asbestos free asphalt water emulsion coated for corrosion protection. The exposed Barricade surfaces shall be painted with yellow/black or yellow/white diagonal stripes.

2.1.4.1 (Optional Corrosion Protection) The Barricade exterior and exposed portion of the Foundation frame shall be plasma jet coated with aluminum to a thickness of 0.003-0.005 inch (0.8 - 1.3 mm).

**2.2 HYDRAULIC POWER UNIT (HPU)**

2.2.1 Hydraulic Circuit. Circuit shall incorporate the design concepts as described by US Patent # 4,490,068. Unit shall consist of an electrically driven hydraulic pump which shall pressurize a high pressure manifold connected to a hydraulic accumulator. Electrically actuated valves shall be installed on the manifold to allow oil to be driven to the up and down side of a double acting hydraulic cylinder to raise and lower the Barricade. The hydraulic circuit shall include all necessary control logic devices, interconnect lines and valves.

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- 2.2.2 Main Power. The electric motor driving the hydraulic pump shall be fed from (specify actual sit voltage, phase and frequency, i.e. 230/3/60). Motor shall be sized for the expected number of Barricade operations.
- 2.2.3 Power Off Operation. The accumulator shall be sized to allow six half cycle operations of a single Barricade in the event of a power outage. Enhanced power off capability can be selected as an option. The bi-directional control valves shall also be manually operable in this case.
- 2.2.4 Manual Operation (optional). A hand pump shall be furnished to allow the Barricades to be raised manually in the event of a prolonged power interruption.
- 2.2.5 Construction. The hydraulic power unit and accessories shall be mounted and wired on an integral steel skid. The HPU shall fit in a envelope 36 inches W x 18 inches D x 48 inches H (914 mm W x 457 mm D x 1219 mm H). The HPU shall be mounted indoors or in an optional weather resistant enclosure.

## 2.3 CONTROL AND LOGIC CIRCUITS

The following circuits and control stations shall be furnished:

- 2.3.1 Control Circuit. A control circuit shall be provided to interface between all Barricade control stations and the hydraulic power unit. This circuit shall contain all relays, timers and other devices necessary for the Barricade operation.
    - 2.3.1.1 Voltage. The control circuit shall operate from a 120 volt, 50/60 Hz supply (optionally 240 volt, 50/60 Hz or 24 VDC). An internally mounted transformer shall reduce this to 24 VAC (24 VDC) for all external control stations.
    - 2.3.1.2 Power Consumption. The control circuit power consumption shall not exceed 250 watts basic load, plus 200 watts for each Barricade in the system.
    - 2.3.1.3 Construction. The control circuit shall be mounted in a general purpose enclosure. All device interconnect lines shall be run to terminal strips.
  - 2.3.2 Remote Control Station. A remote control station shall be supplied to control the Barricade operation. This station shall have a buttons to raise and lower the Barricade. Station construction shall be Nema Type 1 (IEC IP30). The remote control station shall operate on 24VAC.
- 3.0 Accessory Equipment (Any or all of the following may be selected):
- 3.1 Electro-Mechanical Signal Gate. A electrically operated wood arm signal gate shall be supplied to alert vehicle drivers of the Barricade position. The gate operate shall interface with the Barricade at the control circuit. The control circuit shall close the gate at the Barricade "up" command and remain closed until the Barricade is fully lowered. The wood arm shall be \_\_\_\_ foot ( 6, 8, 10 or 12 foot can be specified) long and be striped with

reflective yellow/black tape. The gate assembly shall be mountable directly to the roadway surface.

- 3.2 Stop/Go Traffic Lights. Red/Green 8 inch traffic lights shall be supplied to alert vehicle drivers of the Barricade position. The green light shall indicate that the Barricade is fully down. All other positions shall cause the light to show red. Brackets shall be supplied to allow light(s) to be located on a (3.5 inch OD post) (wall) (3.5 inch OD post - back to back). The light operating voltage shall be 120 Volt, power consumption 40 watts per light.
- 3.3 Sump Pump. A self priming sump pump shall be supplied to drain water collected in the Barricade foundation. The pump shall have the capacity to remove \_\_\_\_ inches per minute of rainfall a distance of \_\_\_\_\_ feet to customer supplied discharge drain. Pump operating voltage shall be 120/1/50-60 (alternately 240/1/50-60).
- 3.4 Safety Interlock Detector. A Barricade vehicle detector safety loop shall be supplied to prevent the Barricade from being accidentally raised under an authorized vehicle. The detector shall utilize digital logic have fully automatic tuning for stable and accurate long term reliability. The output of the detector shall delay any Barricade rise signal (except for EFO command) when a vehicle is over the loop.
- 3.5 Enhanced Power Off Capability. The hydraulic accumulator shall be sized to provide \_\_\_\_ half cycle operations of a single Barricade (or sets of Barricades).
- 3.6 Weather Resistant HPU Enclosure. A lockable weather resistant enclosure shall be provided for the HPU. The design shall provide for easy access to the HPU for maintenance and emergency operation of the hydraulic system. Enclosure shall be provided with a corrosion resistant coating and shall be 36 in W x 18 in D x 48 in H (91 cm W x 46 cm D x 122 cm H).

#### 4.0 PERFORMANCE

- 4.1 Experience. Barricade and auxiliaries shall be of proven design. Manufacturer shall have had 200 Phalanx type Barricades in field operation for a minimum of 5 years with documented field experience for all major components and design features.
- 4.2 Certifications. The manufacturer shall certify that a detailed finite element structural analysis has been conducted on each Barricade configuration and that the results of that analysis supports the specified stopping capacity of the system as defined in paragraphs 4.3.1 and 4.3.2. The analysis shall be based on underlying data gathered by the manufacturer from certified results of not less than ten successful full scale crash tests of similiar, but not necessarily identical Barricade systems.
- 4.3 Stopping Capacity. Barricade(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 Barricade system shall be designed to destroy the front suspension system, steering linkage, engine crank case and portions of the drive train. Some damage to the Barricade system is probable at these levels.

4.3.1 The Barricade shall be capable of stopping and destroying a vehicle(s) weighing:

5,000 pounds at 47 mph (22,2 kN @ 76 kph)  
10,000 pounds at 33 mph (44,4 kN @ 53 kph)

4.4 Speed of Operation. Each Barricade (or set) shall be capable of being raised or lowered in 3 to 15 seconds (customer adjustable) when operated at a repetition rate not greater than specified in paragraph 4.5. Barricade direction shall be instantly reversible at any point in its cycle from the control station.

4.5 Frequency of Operation. Barricade shall be capable of \_\_\_\_ (specify up to 200 cycles per hour) complete up/down cycles per hour.

## 5.0 ENVIRONMENTAL DATA

Barricade shall operate satisfactorily under the following environmental conditions (Please supply the following):

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 Barricade 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 Barricade 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 Barricade 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 Barricade 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 Barricade 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 vehicle as well as pedestrians are fully aware of the Barricades 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 & safety engineer be consulted prior to installation of a Barricade system. Delta will offer 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 TW107 Phalanx** Hydraulic Barricade System shall be purchased from:

### **DELTA SCIENTIFIC CORPORATION**

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