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MODEL HD 300 EM

PHALANX™ TYPE BARRICADE SYSTEM

Electro-Mechanical Power System

Procurement Specification

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SYNOPSIS OF FULL SCALE CRASH CERTIFICATION

FULL SCALE CRASH TEST CERTIFICATION

- The HD 300 Barricade System has been tested and certified to the highest United States Vehicle Barricade Standard.
- This barricade exceeds ASTM F 2656-07 M50 P1. Testing by an independent testing laboratory confirms that it will stop and destroy a heavily loaded truck moving at high speeds and remain standing for a second attack.

1.0 SCOPE

- Full Scale Crash Test Certification
- This specification defines the procurement of a PHALANX™ SYSTEM, Model HD 300 EM, consisting of (one, two, three or four) vehicle Barricade(s) operating (independently or in sets of two, three or four) Barricade(s), An independent Electromechanical actuator and proprietary counterbalance system is installed in each barricade.
- POWER SYSTEM, the CONTROLS AND LOGIC CIRCUITS, FEATURES and OPTIONS as defined herein.
- SAFETY AND ENVIRONMENTAL OPTIONS include signal lights, gate arm barriers; safety loops; IR beams, heaters and sump pumps.
- TOUCH SCREEN CONTROL PANELS or PUSH BUTTON CONTROL PANELS. Remotes and Masters.

2.0 SITE SPECIFIC REQUIREMENTS

2.1 The Barrier plate when installed shall provide a level or co-planar surface relative to surrounding roadways. (Ref. Std. Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-96)

2.2 The Barricade plate within itself shall be continuous with no welded joints, removable sections or bolted-in place road panels with the exception of a small access portal.

2.3 The Barricade shall safely handle heavy truck traffic with loads up to 66,000 lbs. per axle.

2.4 SYSTEM CONFIGURATION

2.4.1 BARRICADE(S)

2.4.2 Barricade Construction. Barricade shall be a shallow frame below grade assembly that can be cast in a foundation of 24 inches [610 mm] in depth. The assembly shall have a heavy steel ramp weldment capable of being rotated 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 Ramp weldment and then transmitted to the foundation of the unit.

2.4.3 Barricade Height (Deployed). Height of the Barricade shall be 39 inches [1,0 M] inches as measured from the top of the foundation frame to the top of the barrier inclusive of the top road plate.

2.4.4 Barricade Ramp Length. Barricade ramp length shall be 109 inches [2,77 M] or a minimum length of 60 inches [1,52 M].).

2.4.5 Foundation Depth. The frame of the Barrier shall be 24 inches [610 mm].

2.4.6 Safety / Visibility Panel. Descending from the front edge of the Barrier Ramp shall be a rigid panel containing three or more red warning lights. The panel shall be continuous across the full width of the Barrier Ramp. The height of the panel shall be 22 inches (558 mm). The Safety Visibility Panel shall have red/white (alternately yellow/black) diagonal stripes.

2.4.7 Serviceability of Safety / Visibility Panel. The panel and side skirts, mounted on the ramp weldment shall be readily removable to facilitate Barrier Maintenance and Service using standard hand tools.

2.4.8 Finish. The roadway plates shall be painted white [specify optional color(s)]. Finish. Coatings shall be checked against ordering information and shall be workmanlike in appearance.

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2.5 Electrical Mechanical System (EMS)

The EMS shall include an electro-mechanical actuator, internal encoder, variable frequency drive, programmable logic controller, power cables and Delta counter balance system, command and control station(s), control logic, interconnecting elements and reservoir(s).

2.5.1 Main Power. The EMS shall be fed from _____ (specify actual site voltage, phase and frequency, i.e. 230/3/60 as an example).

2.5.2 Power Off Operation. Back up batteries and counter balance reservoir shall be sized to allow _____ operations of the barrier (s).

2.5.3 Hourly Throughput Rate, The actuator and accessories shall be sized to maintain a through put rate of _____ per hour of the Barrier(s).

2.5.4 Peak Operating Rate, The actuator and accessories shall be sized to maintain a through put rate of _____ per hour of the Barrier(s) for a period of _____minutes.

2.5.5 Construction. The electro-mechanical actuator and cables shall be rated IP-67. The actuator controls, system components, counter balance and power off equipment shall be mounted and wired on integral steel skid(s). Dimension to be defined for site specific applications. The controls shall be installed indoors or in an optional weather resistant enclosure see 3.6.

2.5 DELTA PROPRIETARY COUNTERBALANCE

2.6.1 The Delta Proprietary Counterbalance shall serve multiple purposes; first to eliminate tension or compression springs in counter balancing the barrier plate, and second to reduce the load and wear on the electro-mechanical actuator.

2.6.2 The Delta Proprietary Counterbalance shall, during normal operation provide a constant assist to deploy and retract the barrier.

2.6.3 Delta Proprietary Counterbalance shall be a self-contained and sealed device.

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2.7 CONTROL AND LOGIC CIRCUITS

The following circuits and control stations shall be furnished:

2.7.1 Control Circuit. A control circuit shall be provided to interface between all Barricade control stations and the electromechanical actuator(s). This circuit shall contain all relays, timers and other devices necessary for the Barricade operation.

2.7.2 Voltage. The control circuit shall operate from a 120/240 volt, 50/60 Hz supply (optionally 24 VDC). An internally mounted transformer shall reduce this to 24 VDC for all external control stations.

2.7.3 Power Consumption. The control circuit power consumption shall not exceed 30 amps.

2.7.4 Construction. The control circuit shall be mounted in a general purpose enclosure. All device interconnect lines shall be run to terminal strips.

2.8 Touch Screen Control Panels (Optional Alternative to Push Button Controls, Select Type)

Touch Screen Panels. Touch Panel controls can be provided as an option. Touch Screens are available in standard sizes from 8 to 15 inches in a rack mount or table top console.

2.8.1 Configurations. The master and slave Touch Screens have all the standard functionality of the Remote Control panels in sections 2.9 and these additional features:

2.8.2 Data Logging – Records and maintains a time stamped record of all command signals issued from the Touch Panel and any Auxiliary Controls. This record log can be easily exported into a spreadsheet on computers.

2.8.3 Layering – Locations with multiple barriers can be presented in a layered fashion allowing control from one convenient panel opposed to multiple panels or one large pushbutton panel.

2.8.4 Customizable – Each location allows the end user to change the name of the location and barrier to correspond with the site's naming.

2.8.5 Cycle Count and Alarms – The Touch Screens monitor the number of cycles a barrier completes and will alert the operator when maintenance is due (based on cycles or days depending on site).

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2.8.6 Passwords – The Touch Screens offer passwords that can be set up at different operating levels allowing access to differing functional configurations per user

2.8.7 Video – Video Touch Screen models are available for control. This option displays the vehicle barricade directly above the control “buttons” which operate the barricade. Having a live feed of the barriers allows the operator to more safely monitor and control the area from a distant remote location.

2.8.8 Ethernet and Fiber Optic communications shall be specified if required.

2.9 Push Button Control Panels (Optional Alternative to Touch Screen Select Type)

Push Button. Specify Remote Control Master and the number of slave control panels or EFO push buttons required.

2.9.1 Remote Control Master Panel. A remote control master panel shall be supplied to control Barrier function. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower each Barrier (or set) shall be provided. Barrier "up" and "down" indicator lights shall be included for each Barrier (or set). The emergency fast operate circuit (EFO) feature shall be operated from a covered toggle switch (optionally a push button larger than the normal controls). The EFO shall be furnished with EFO active light and reset button. The remote control master panel shall have a key lockable switch to arm or disarm the remote slave panel(s). An indicator light shall show if the slave panel is armed.

2.9.2 Remote Control Slave Panel. A remote control slave panel shall also be supplied to control the Barrier operation. This panel shall have a "panel on" light that is lit when enabled by a switch on the remote control master panel. Buttons to raise or lower each Barrier (or set) shall be provided. Barrier "up" and "down" indicator lights shall be included for each Barrier (or set). The emergency fast operate (EFO) feature shall be operated from a push button larger than the normal controls (optionally a covered toggle switch). When the slave panel EFO is pushed, an EFO "active" lamp will light and operation of the Barrier(s) will not be possible until reset at the master panel.

2.9.3 Voltage. The remote control panel(s) shall operate on 24 VDC.

2.9.4 Construction. The remote control panel(s) shall be a standard 19 inch electronics rack type surface mount panel with all devices wired to a terminal strip on the back.

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2.9.5 (Option) Panel(s) shall be equipped with a timer circuit to notify the operator via an annunciator "squealer" that the Barrier has been left in the down position for too long a time period. The time interval shall be customer selectable.

3.0 ACCESSORY EQUIPMENT (Any or all of the following may be selected):

3.1 Enhanced Power Off Capability. An optional redundant pneumatic power system is available to cycle the barricade in the case of extended power outages.

3.2 Electro-Mechanical Signal Gate. An 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 to 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.

3.3 Stop/Go Traffic Lights. Red/Green 8 inch stand alone 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 (alternately 240 Volt), power consumption 40 watts per light.

3.4 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).

3.5 Safety Interlock Detector. A 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.

3.6 Heavy Duty Weather Resistant EMS Enclosure. A lockable weather resistant enclosure shall be provided for the EMS fabricated from not less than 0.25 inch [6,35mm] steel plate. The design shall provide for easy access to the EMS for maintenance and emergency operation of the power system. Enclosure shall be provided with a corrosion resistant coating and shall be 36 inches W x 18 inches D x 58 inches H [914 mm W x 457 mm D x 1476 mm H].

4.0 PERFORMANCE

4.1 Experience. Barricade and auxiliaries shall be of proven design. Manufacturer shall have 17,000 Phalanx™ type Barricades in field operation for a minimum of 20 years with Documented field experience for all major components and design features.

4.2 Qualification Tests. Barricade design shall have successfully passed full scale crash test conducted by qualified independent agencies.

4.3 Performance Evaluation. The Barricade shall have successful performance evaluations based on full scale testing of vehicles as either defined by the agency or as set forth in the specifications noted in 4.4

4.4 ASTM F 2656-07 M50

4.5 Second Strike Capability. After the full scale test the barricade and foundation remained in place and ready for a second attack.

4.6 Barricade(s) shall be designed to destroy a non-armored or non-tracked vehicle at energy levels of up to 5,400,000 foot –pounds (7,340,000 Joules) , i.e. -

65,000 pounds at 50 mph (29,500 kg at 80 Kph)
50,000 pounds at 67 mph (22,680 kg at 108 Kph]

5.0 SPEED OF OPERATION.

5.1 Normal Operation. Each Barricade (or set) shall be capable of being raised or lowered in 3 to 5 seconds (adjustable) when operated at a repetition rate not greater than specified in paragraph 5.3. Barricade direction shall be instantly reversible at any point in its cycle from the control stations.

5.2 Emergency Fast Operation. Barricade shall rise to the guard position from fully down in 1.5 seconds when the emergency fast operate button is pushed. Barricade shall remain in the up and locked position (normal up/down buttons inoperable) until the EFO condition is reset.

5.3 FREQUENCY OF OPERATION. Barricade shall be capable of ____ (specify up to 120 cycles per hour) complete up/down cycles per hour.

6.0 ENVIRONMENTAL DATA (Please supply the following):

Barricade shall operate satisfactorily under the following environmental conditions:

6.1 Extremes in temperature

Yearly maximum drybulb temp _____f/c
Yearly minimum drybulb temp _____f/c

6.2 Rainfall

Yearly average _____inches
Maximum expected hourly rate_____inches/hour

6.3 Snowfall

Maximum expected hourly rate_____ inches/hour
Roadway will be (mechanically/manually/chemically) cleared _____.

7.0 QUALITY ASSURANCE PROVISIONS

7.1 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:

7.2 Identification. A nameplate with manufacturer's name, model number, serial number and year built shall be located on the control circuit.

7.3 Workmanship. The Barricade and subsystems shall have a neat and workmanlike appearance.

7.4 Dimensions. Shall be checked against drawings and ordering information.

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

8.0 PREPARATION FOR SHIPMENT

8.1 The Barricade system shall be crated or mounted on skids as necessary to prevent damage from handling. Lifting points shall be of sufficient structural integrity to enable the assembly to be lifted and transported by overhead crane or forklift without failure.

9.0 MANUFACTURER'S DATA

9.1 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).

10.0 DISCLAIMER

10.1 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 and or safety engineer be consulted prior to installation of a Barricade 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.

11.0 PROCUREMENT SOURCE

11.1 The **Model HD 300 EM** Phalanx™ Barricade System shall be purchased from:

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