
SPECIFICATION FOR MODEL 303 HIGH IMPACT BOLLARD SYSTEM

PART I - GENERAL

1.1 WORK INCLUDED IN THIS SECTION

- A. Furnish labor, materials, inspections, supervision, etc., necessary for the complete installation and operation of hydraulic bollard system(s) as shown on the plans and specified herein. Work includes furnishing all items and accessories required or necessary for the correct operation of the hydraulic bollard system (s) as shown on plans and/or specified herein.

1.2 QUALITY ASSURANCE

- A. The Company shall specialize in manufacturing of the type hydraulic bollards specified, with a minimum fifteen (15) years experience.
- B. The installer shall have a minimum three (3) years installation experience of similar equipment.

1.3 SUBMITTALS

- A. Submittals shall contain sufficient plans, elevations, sections, and schematics to clearly describe the apparatus. All conduit runs, controls and similar drawings shall be included.
- B. Submittals shall include (but not necessarily limited to) the following:
 - 1. All high and low voltage conduit runs.
 - 2. Mounting dimensions and locations.
 - 3. Details of electronic equipment, electrical equipment or any other apparatus deemed necessary by the Owner or Owners representative.
- C. Installer shall provide two (2) copies of submittal packages.

1.4 INSPECTIONS

- A. Procure all the necessary and usual inspections and certificates for all work to be installed. Deliver same to the Owner/Owners representative before final acceptance.

PART II - PRODUCTS

2.1 HYDRAULIC BOLLARD SYSTEM

A. Application

- 1. The bollard shall be a below grade assembly containing a heavy steel cylindrical weldment capable of being raised hydraulically above grade. The raised position shall block

approaching vehicles. Upon impact, forces shall be first absorbed by the weldment and then transferred to the foundation of the unit.

B. Features

1. Height of the bollard shall be no less than 40-inches (1016 mm) as measured from the top of the foundation to the top of the bollard.
2. Bollard tube structure shall be 8-inches (203 mm) in diameter.
3. Each set of bollards shall be operated independently from one another. Each set of bollards shall be provided with its own controls.

Or

Each bollard shall be operated independently from each other set within the system. Each bollard shall have its own controls.

4. The roadway cover plates shall have a non-skid surface. The above grade portion of the bollard shall be yellow with a black top plate (colors and surface may vary per application).
5. A manufacturer supplied bollard casing shall be cast in place prior to the bollard cylinder installation for ease of installation, maintenance, or replacement. Bollards which require structural components cast in concrete shall not be acceptable.

C. Functional Specifications

1. The Hydraulic Power Unit shall consist of an electrically driven hydraulic pump which shall pressurize a high-pressure manifold connected to a hydraulic type accumulator. Electrically actuated valves shall be installed on the manifold to allow oil to be driven to the deploy side of a hydraulic cylinder to raise and lower the bollard. Double acting hydraulic cylinders shall not be acceptable. The hydraulic circuit shall include all necessary control logic, interconnect lines and valves to override and lock out the normal speed control valve(s) for emergency fast operation of the bollard(s).
 - a. The accumulator shall be sized to allow operation of the bollards in the event of a HPU supply power outage. The bi-directional control valves shall be manually operable in the event the bollards require to be deployed or stowed without control singles.
 - b. A hand pump shall be furnished to allow the bollards to be raised manually in the event of a sustained power failure.
 - c. The hydraulic power unit and accessories shall be mounted and wired in a weather resistant cabinet.
 - d. Electrical components associated with the controller shall be mounted in a separate, hinged cabinet located within the weather resistant steel cabinet.
2. Power System
 - a. The electric motor, hydraulic pump and accumulator configuration shall be capable of producing a minimum of 2 cycles (deploy/stow) in 60 seconds.

- b. The HPU shall be made available with factory optional 208/230 single phase or 208/230/460 three-phase AC main supply voltage. The motor shall be of the high starting torque, continuous duty, and industrial type, protected against overload.

3. Control Circuitry

- a. Internal to the HPU control area a built-in PLC controller shall interface between the external bollard control stations and the hydraulic power unit. The PLC shall include all necessary inputs, outputs, timers and logic necessary for bollard application. Relays or proprietary control boards shall not be acceptable.
- b. The control circuit shall be powered from the HPU electronics and operate from 24-volt command signals.
- c. The control circuit shall be mounted in an enclosure with the hydraulic pumping unit. The enclosure shall be of sufficient size and rating to accommodate accessory devices. All accessory device wiring shall connect to included terminal strips.

2.2 CONTROL PANELS

(Any or all of the following control panels may be specified)

A. Remote Control Panel

1. A remote control panel shall be supplied to control the bollard operation. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise or lower each bollard (or bollard set) shall be provided. "Up" and "down" indicator lights shall be included for each bollard (or bollard set). The emergency fast operate (EFO) feature (if ordered) shall be operated from a push button designated as EFO. EFO shall also be furnished with EFO active light and reset switch.
 - a. The remote control panel shall operate on 24 volts.
 - b. The remote control station shall be a standard 19 inch electronics rack type surface mount panel or desktop console type with all devices wired to a terminal strip on the back.

B. Master Control Panel

1. An external control master panel shall be supplied to control bollard operation. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Weather resistant buttons to raise and lower each bollard (or bollard set) shall be provided. "OPEN LANE" and "CLOSE LANE" indicator lights shall be included for each bollard (or bollard set). The emergency fast operation circuit (EFO) feature (if ordered) shall be operated from a push button designated as EFO. The EFO shall be furnished with an active light and reset switch. The external control master panel shall have a key lockable switch to arm or disarm a remote panel (if ordered). An indicator light shall show if the remote panel is armed.
 - a. The remote control panel shall operate on 24 volts available from the HPU.
 - b. The remote control station shall be a standard 19 inch electronics rack type surface mount panel or desktop console type with all control signals wired to terminal strips.

C. Remote Control Panel

1. A remote control panel shall also be supplied to control bollard 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 "OPEN LANE" or "CLOSE LANE" for each bollard (or set) shall be provided. Bollard "OPEN LANE" and "CLOSE LANE" indicator lights shall be included for each bollard (or set). The emergency fast operate (EFO) feature (if ordered) shall be operated from a push button designated as EFO. When the panel EFO is pushed, an EFO "active" lamp shall light and operation of the bollard(s) shall not be possible until reset at the master panel.
 - a. The remote control panel shall operate on 24 volts available from the HPU.
 - b. The remote control station shall be a standard 19 inch electronics rack type surface mount panel or desktop console type with all devices wired to a terminal strip on the back.

2.3 ACCESSORY DEVICES

(Any or all of the following may be specified)

A. Electro-Mechanical Barrier Gate

1. An electrically operated wood or aluminum arm barrier gate shall be supplied to alert vehicles of the bollard position. The gate operator shall interface with the bollard control circuitry. The barrier gate shall close the lane when the bollard "CLOSE LANE" command is engaged and remain closed until the bollards are fully lowered. The gate assembly shall be mounted directly to the roadway surface.

B. Traffic Signals

1. 8 inch traffic lights shall be supplied to alert vehicles of the bollard position. The amber/green (*specify color*) light shall indicate that the lane is fully open. 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. The operating voltage shall be 120 volts

C. Sump Pump

1. A self priming sump pump shall be supplied to drain water collected in the bollard foundation. The pump shall feed to customer supplied discharge drain and operate automatically. Pump operating voltage shall be 120 volts.

D. Vehicle Detection Loop

1. A vehicle loop detector shall be supplied to prevent the bollards from being raised under an authorized vehicle. The detector shall utilize digital logic have fully automatic tuning for stable and accurate long-term reliability. The detector shall prevent any bollard rise signal (except for EFO command) when a vehicle is over the loop.

2.4 PERFORMANCE

A. Testing

1. Bollard design shall have successfully passed actual full-scale crash tests conducted by a qualified independent agency.

B. Evaluation

1. The Bollard shall have been certified to meet ASTM F2656-18a and have a performance evaluation of M30/P1.

C. Stopping Capacity

1. The bollard system shall be designed to impede a vehicle approaching from either direction after installation.
 - a. The Bollard shall be capable of stopping a vehicle weighing 15,000 pounds traveling at 30 mph with less than 3-feet of penetration.

D. Normal Operating Speed

1. Bollard(s) shall be capable of being raised or lowered in 3 to 15 seconds under normal operating conditions. Bollard direction shall be instantly reversible at any point in its cycle from the control stations.

E. Emergency Fast Operation

1. Bollard shall rise to the full up position from fully down position in 1.5 seconds when the emergency fast operate button is depressed, provided the system has not previously been exhausted by manual operation or high-speed cycle rates. Bollard shall remain in the up and locked position. Normal up/down buttons shall remain inoperable until the EFO has been reset.

2.5 QUALITY ASSURANCE

A. Factory Testing

1. Upon completion, the bollard system will be fully tested for proper operation by manufacturer prior to shipment. A nameplate with manufacturer's name, model number, project number and serial number shall be located within the hydraulic pumping unit.
2. All critical dimensions shall be checked for accuracy against customer approved shop drawings.

2.6 PROCUREMENT SOURCE

The hydraulic bollard system shall be Model 303 as manufactured by **B&B ARMOR (800-367-0387), 5900 South Lake Forest Drive, Suite 230, McKinney, TX 75070.**



PART III - EXECUTION

3.1 INSTALLATION

- A. Installation shall be performed according to the manufacturer's instructions. Verify all component locations with contract drawings and shop drawings.
- B. Any disagreement between the Plans, Specifications, and Ordinances, must be called to same before signing of the shop drawings. After the shop drawings have been signed, the Contractor is responsible for having all work meet requirements of the governing ordinances.