

The Ross XT-1208 (K8) Retractable Bollards provide an ideal solution where the need to secure vehicular access competes with aesthetic considerations or the requirement for continuous pedestrian or bicycle traffic. Ross Bollards are built to withstand a violent impact, from any direction, and continue to operate. Extending a full 40" above grade, the bollards remained fully deployed following their crash testing certification. Yet despite their inherent strength, the variety of finishes available and the option for built-in illumination allows them to blend seamlessly with new or existing buildings and even become an architectural highlight. For more information, please call our toll-free number above or visit our website.

## SECTION 323916

### RETRACTABLE BOLLARDS

(ROSS XT-1208 – K8)

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
  - 1. Retractable bollards to prevent vehicular traffic, installed flush with road surface.

##### 1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of product.
- B. Shop Drawings: Submit shop drawings including the following:
  - 1. Complete list of equipment, materials, and manufacturer's descriptive and technical literature.
  - 2. Complete wiring and schematic diagrams, and details required to demonstrate that the system has been coordinated and will properly function as a unit.
  - 3. Proposed layout and anchorage of equipment and relationship to other parts of the work, including foundation and clearances for maintenance and operation.
- C. Reports and Certifications: Submit the following:
  - 1. Crash Test Report: Provide a copy of the crash test report summary showing that the barrier meets the penetration requirements for condition designation K8 per Department of State SD-STD-02.01, Revision A.
  - 2. Crash Test Certification: Provide a copy of the United States Department of State letter certifying the barrier with a K8 rating under the provisions of Department of State SD-STD-02.01, Rev A, "Test Method for Vehicle Crash Perimeter Barriers and Gates," (March 2003).
  - 3. Cycle Test Certification: Provide a summary of the test report showing that the bollards are capable of operating for 200,000 continuous cycles without failure of any component necessary for continued operation.
- D. Operations and Maintenance Manuals: Submit at least two copies of operating and maintenance instructions at least two weeks prior to installation.
  - 1. Operating Instructions: Include step by step procedures required for system startup, operation, and shut down. Also include the manufacturer's name, manufacturer's contact

information, model number, parts lists, and brief description of all equipment and their basic operating features.

2. Maintenance Instructions: Include maintenance schedule, routine maintenance procedures, troubleshooting and repair procedures, and spare parts list.

E. Welder's Certificates: Copy of current certificate for AWS D1.1/D1.1M.

F. Warranty: Submit executed copy of manufacturer's warranty.

### 1.3 QUALITY ASSURANCE

A. Installer: Minimum 2 year documented history of installing similar equipment, authorized and certified by the manufacturer. Installer shall accept responsibility for all field verifications, underground utility locations, and coordination of all controls and interfaces to the units. Installer shall be capable of bonding projects to relevant project amounts, and acceptable liability and vehicle insurance.

B. Manufacturer's Services: If requested by the Owner, provide services of a manufacturer's representative who is experienced in the installation, adjustment, and operation of the equipment. The representative shall inspect the final installation and supervise final hookup, adjustment, and final testing of the equipment.

### 1.4 DELIVERY, STORAGE AND HANDLING

A. Store equipment in a location protected from the weather, humidity, temperature variation, dirt and dust, or other contaminants. Store materials on sleepers or pallets and protect from rust and objectionable materials such as dirt, grease or oil.

### 1.5 WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty.

## PART 2 - PRODUCTS.

### 2.1 MANUFACTURER

A. Basis-of-Design Manufacturer: Ross Technology Corporation, 104 North Maple Avenue, Leola, PA 17540. Toll-free 800-345-8170. www.rosstechnology.com. No substitutions.

### 2.2 RETRACTABLE BOLLARDS

A. Retractable Bollards: Ross XT-1208 by Ross Technology Corporation complying with the following:

1. Crash Performance: Crash test rating K8 per DoS SD-STD-02.01 Rev. A (15,000 lb. truck at 40 mph with less than 1 m penetration).
2. Cycle Test Performance: Barrier shall be capable of operating for 200,000 continuous cycles without failure of any component necessary for the continued operation of the barrier.
3. Bollard System: Three structural steel housings below grade with three structural steel bollards that retract into the housings to allow passage of authorized vehicles; flush with roadway surface when installed, with no side pillars and/or buttresses attached to the hydraulic power unit or any above ground/grade assemblies.

4. Concrete Foundation: 6000 psi (41.4 MPa) Portland Type 1 concrete with an industry standard cure time of 28 days. Foundation shall have approximately 13 cubic yards (10 cubic meters) of concrete. Normal maximum aggregate size shall be 1.5 inches (38 mm). Vibrate concrete to fill all voids. Rebar shall comply with ASTM A615 grade 60 and factory-attached to the front, rear and side plates of the bollard housing.
5. Raised Height: 40 inches (1015 mm).
6. Repair: Capability of removing the bollard element and hydraulic cylinder for replacement or repair, without replacement of the entire bollard assembly.
7. Bollard Capabilities: 180 complete up/down cycles per hour during continuous normal operation.
8. Bollard Motion: Instantly reversible in either direction. Bollard shall rise from lowered to fully raised position in 4 to 5 seconds.
9. [Optional] Emergency Fast Operation (EFO): Capable of raising the bollard to full guard position in approximately 2 seconds. Normal operation of bollard shall not resume until EFO reset button has been pushed. Operating times may vary if system has been turned off; system exhausted from continual EFO operation, or is being operated in manual mode.
10. Failure Mode of Operation: Include integrated manual hand pump and manual down valve to raise or lower the barrier in the event of control or pump malfunction.
11. [Optional] Accessories:
  - a. Heater: For areas of extreme conditions such as blowing snow or icing conditions with ambient temps of below 40 degrees Fahrenheit.
  - b. Traffic Control Lights: Alerts drivers to the position of the bollard. Includes LED lights with pole and stand for mounting.
  - c. Signal Gate Arm: Alerts drivers of the bollard position. The gate operation shall be interfaced with the bollard at the control circuit. The control circuit shall close the gate on the bollard "up" command and open the gate on the bollard "down" command.
  - d. Vehicle Loop Detector: Prevents the bollard accidentally rising under an authorized vehicle. When a vehicle is over the detector loop (wire supplied by installer) the bollard "up" signal is interrupted except when the EFO mode is engaged. The EFO mode can be programmed to be safe/non-safe depending on the needs of the customer.
  - e. Sump Pump: Supplied to prevent accumulation of water inside each bollard assembly. The water will be pumped to either the storm drain or sump pit.
  - f. Decorative Cover: Supplied to allow hydraulic bollards to fit in with the architectural design of the site. The covers must fit over the bollard and raise/lower with the bollard.

B. Electro-Hydraulic Power Unit (HPU):

1. Remotely located HPU at a distance not greater than 30 ft. (9.1 m) from the vehicle bollard. Shield HPU from the elements. Placement in a utility room or covering with an environmental enclosure is required. Environmental enclosure shall have locking doors, with removable top and all four sides that are accessible for service.
2. Main power supply, Main power supply, 240/480 volts AC, 3 phase, 60 Hz.
3. Locate main power disconnect inside the main locked door. Main power disconnect must be disengaged to open main control panel.
4. Conduit for hydraulic lines shall be electrical conduit with wide sweeps. No conduit with 90 degree elbows shall be used. All hydraulic conduits shall be sized to accommodate two lines. Hydraulic lines may change in diameter due to distance the lines are run.
5. Motor: 5 HP direct drive AC motor to operate gear pump.
6. Tank: 5 gallon (19 l) tank for storage of hydraulic fluid for normal operation of the bollard system.
7. Hydraulic fluid: Chevron Clarity® synthetic hydraulic fluid.

8. Manual operation: Provide manual hand pump with handle to raise barrier and manually operated down valve to lower barrier in emergency situations.
9. [If EFO Option is selected] Accumulator: Provide accumulator to store fluid for EFO operation and for 3 cycles of backup operation.
10. [Optional] Accessories:
  - a. Heaters: Hydraulic oil heaters may be required to ensure satisfactory operation in temperatures below -22 degrees Fahrenheit (-30 degrees Celsius). Install if required.
  - b. Coolers: Hydraulic oil coolers are required to insure satisfactory operation in temperatures above 150 degrees Fahrenheit (66 degrees Celsius). Install if required.
11. [Optional] DC-powered HPU with 5 HP direct-drive motor, 5 gallon (19 l) fluid tank, manual back-up hand pump and lowering valve, and fully integrated, battery-powered uninterruptible power supply (UPS) to provide 160+ cycles without local power. Contact manufacturer for additional information.

C. Controls:

1. Provide a control panel and control circuit to interface between all bollard control stations and the power unit, UL 508 listed.
2. Control stations are defined as the master control panel and the slave control panel, NEMA 12.
3. Control circuit shall be separate from the control stations but mounted integrally with the power unit.
4. Control circuit shall function through the use of industrial Programmable Control Logic (PLC). The PLC must be off the shelf item available through world wide distribution, and not a proprietary item.
5. Direct Interface with Auxiliary Equipment: Card readers, remote switches, loop detectors, traffic lights, proximity readers, numerical pads, etc., made possible through connection to a main terminal strip.
6. Additional control options are available. Contact manufacturer to discuss other options.

D. Master Control Panel:

1. Supply a 19 inch rack mount or standard desk mount main control panel to control barrier functions. Provide buttons to raise and lower each barrier. Include barrier "UP" and "DOWN" indicator lights for each barrier or barrier array. The main control panel shall have a switch to arm or disable the remote control station if a remote slave control panel is required. [Optional if EFO is selected] An emergency fast operate (EFO) circuit shall be operated by depressing a designated, shielded push-button. Furnish the EFO with an EFO "ACTIVE" light and a reset button with annunciator.
2. [Optional] Supply touch-screen control panel that integrates all barrier controls on a single screen.
3. Additional buttons and controls are available based on site operation needs.

E. Remote Slave Control Panels:

1. Remote control panels shall have a panel "ON" light that is lit when enabled from the main control panel. Provide buttons to raise and lower the barrier. Include barrier "UP" and "DOWN" indicator lights for each barrier or barrier array. [Optional if EFO is selected] An emergency fast operate (EFO) circuit shall be operated by depressing a designated, shielded push-button. Furnish the EFO with an EFO "ACTIVE" light and a reset button with enunciator. When the remote control panel EFO is pushed, further barrier operation

- from that panel will not be possible until the EFO condition is reset on the master control panel.
2. Additional buttons and controls are available based on site operation needs.

F. Finish:

1. Hot-dip galvanized per ASTM A123.
2. [Optional] Wash primer after hot-dip galvanizing per ASTM A123.
3. [Optional] Factory wash primer and finish after hot-dip galvanizing per ASTM A123; polyurethane top coat. Select colors from manufacturer's color range.
4. [Optional] Slip-resistant Algrip™ surfaces for the top plates of the bollard housing.
5. [Optional] Reflective strip placed on the top section of the bollard pipe to be visible to vehicular traffic when in the raised position.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and site conditions for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work. Use concealed anchorages where possible.
  1. Protect adjacent areas against damage; repair or patch damaged areas. Restore damaged finishes so no evidence remains of corrective work.
- B. Foundation: Excavate to required depth and place concrete in accordance with ACI standards. Perform backfilling by layering and tamping into place crushed limestone base material to 95 percent compaction.
- C. Pavement: After level placement of the vehicle bollard, place pavement sections to match the section and depth of the surrounding pavement. New pavement shall match the elevations of existing pavement and retractable bollards. Slope pavement to provide positive drainage.
- D. Pit Drainage: Provide drain connections in each bollard. Make hookups to approved storm drains. If no storm drains exist for connection, or if a gravity drain cannot be utilized, then two self-priming sump pumps shall be sized sufficiently to keep the pit area free from water build-up and shall have the minimum capacity to remove water at a rate suitable for local conditions.

#### 3.3 FIELD TESTING AND TRAINING

- A. Notify Owner's representative at least 7 days prior to beginning of the field test.
- B. Upon completion of construction, perform a field test for each vehicle bollard. The test shall include raising and lowering the bollard through its complete range of operation.
- C. Continuously cycle each vehicle bollard for not less than 30 minutes to test for heat build-up in the hydraulic system.

- D. Installer shall furnish equipment and make necessary corrections and adjustments prior to test witnessed by the Owner's representative. Changes to site conditions and adjustments and repairs to bollard system shall be performed at no additional cost to the Owner or manufacturer. If adjustments are made to ensure correct functioning of components, complete field tests and cycle tests shall be performed after adjustments are made.
- E. Provide a field-training course for designated operating staff members by the installer. Field training shall cover all of the items contained in the operating and maintenance instructions.

#### 3.4 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION

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