



Upswung Bollard Systems Corp.

**Upswung Bollard Systems
Installation Instructions and Scheduled
Maintenance
Semi-Automatic
ver.0609**



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WARNING

Improper use of this equipment constitutes negligence and may result in serious injury or death.

CAUTION

Warranty requires that the operation and maintenance requirements and instructions described in this manual be followed and records of all maintenance activities be kept. Records should be available upon request and may be required for warranty claims.

Failure to operate and maintain the equipment constitutes improper use and may void the warranty. Failed components and/or damaged parts requiring warranty service must be returned to Upswung Bollard Systems as requested.

1.0 Introduction:

- 1.1 Bollards shall generally be spaced at approximately 3.5 to 4.5 feet) center to center. Operation will be by a pneumatic system in which compressed air will be used to power the bollards movements

2.0 Site Planning Considerations:

2.1 Water Drainage

Retractable Bollards can be erected in vehicular laneways and access points supplied mechanically via pneumatic force retract below finished pavement level to allow vehicular traffic to pass over unobstructed.

In any installation water drainage is very important.

First, the bollards must be located in a raised area where water drains away from the bollards. This can be created by placing bollards in a slightly raised concrete pad which directs water away from the bollards.

Second, the bollards must be drained at the bottom of the bollard casing into a drain pipe which can direct water into a storm drain or into a French Drain/ leach field which is located a least 10 feet away from the bollard(s). The soil for the leach field must be able to percolate the volume of water that may fall into the bollard.

2.2 Excavation

All drainage and foundations for bollards must be BELOW the published frost line for the region where they are to be installed to avoid freeze lifting of the bollard foundation and freezing the drainage system below the bollard.

2.3 Cold Climates

All in-ground mechanical devices including bollards are subject to freezing of the interior components by water falling into the bollard as a liquid by day and freezing to a solid by night when it is colder. The accumulated ice will interfere with the operation of the bollard's retraction. Heating of the bollard(s) may be accomplished by using a commonly available heating tape normally used for roof ice damming and roof downspouts. Heating tape can be installed inside the bollard and to any drain pipe exiting the bollard if the drain outlet is above the frost line.

3.0 SAFETY WARNINGS AND CAUTIONS:

3.1 SAFETY WARNING AND CAUTION OVERVIEW

Recognize safety precautions at all times, including during operation, servicing and/or repairing bollard equipment. Warnings will be provided in this manual and will precede the text that is applicable. Failure to comply to these safety precautions can result in injury and/or damage to bollard equipment.

Comprehension of safety precautions is to be considered **mandatory**. Personnel associated with operation and/or maintenance of equipment must be familiar with the **system**. For safety, and damage protection on bollard equipment, all of the safety devices must be properly maintained.

The following safety precautions are in **accordance** with normal operating conditions. **supervisors or others in authority may find it necessary to issue supplementary or special precautions in order to cover local conditions and/or unusual circumstances**. Furthermore, if a supervisor deems conditions to be “unusual” such conditions creates the equipment to be unsafe, none of the safety precautions provided are to be understood as authorization for work to continue using these systems.

All **Caution** and **WARNING** notices that may appear throughout this manual are essential for safe use of bollard equipment.

WARNING notices are meant to protect personnel. Failure to comply can result in injury or death.

Caution notices are meant to warn personnel, intending to protecting the Barrier System equipment.

3.2 MAINTENANCE, SERVICE AND REPAIR WARNINGS

A trained and qualified Service Technician is required for all activities regarding maintenance, service, repair and/or adjustment is required and/or if the equipment is malfunctioning/non-operational.

3.3 PEDESTRIAN AND PERSONNEL SAFETY WARNINGS

The Operator and/or Service Technician is responsible for the safe operation of bollards at all times.

Do not operate bollards when pedestrians or personnel are in close proximity to the equipment,

Do not operate if persons are standing, or close in contact with equipment, serious injury or death can occur. Operation includes, raising and lowering of the bollard equipment.

3.4 VEHICLE SAFETY WARNINGS

The Operator and/or Service Technician is responsible for the safe operation of bollards at all times.

Do not operate bollards in the presence of oncoming vehicle or pedestrian traffic, especially if a vehicle is in contact, or directly over bollard equipment. Vehicle passengers can sustain serious injury or death, if a vehicle makes contact or impacts bollard equipment at any speed. Also, damage can occur on vehicles striking the bollards, or if bollard equipment rises up making contact with the vehicle.

3.5 INTRUSION INCIDENT DAMAGE CAUTION

Bollards are deliberately created to prevent vehicle intrusion.

Vehicles can crash into or impact bollards equipment. *Depending on the speed and weight of the vehicle, the bollards may sustain from little to severe damage.* In some scenarios, the bollards can be ruined, or so damaged that it is rendered inoperable after being struck.

Upswung Bollard Systems Corp, states that bollards **must** be thoroughly approved by a trained and qualified Service Technician before use and reset of equipment post incident, even if visible damage is not evident.

3.6 GENERAL SAFETY PRECAUTIONS

The following safety precautions are not specific to any procedure, but should be recognized when operating, maintaining, repairing bollard equipment. All applicable safety precautions relative to the equipment supported by this manual must be adhered to prevent accidental injury to the Operator and/or the Service Technician. These are the minimum precautions that personnel must understand and apply at all times.

4.0 General Installation Guidelines

Bollard Drainage

4.1 Bollard Location

Determine bollard locations and prepare excavation and foundation for insertion of the bollards.

4.2 Drainage:

Once installation configuration is determined and the foundation excavation is prepared, adequate drainage must be installed. Foundation drainage options:

- A. Route drainage from bollards to approved storm drain.
- B. Install sump pit and sump pump to eject water run off from each bollard. Eject into a storm drain or gutter.
- C. Install “French drain” or dry well in the bollard foundation. Use only in extremely dry climates.
 - A. Adequate drainage is required!
 - B. A 2-inch minimum drain line is recommended. Local precipitation may require a larger drainage capacity.
 - C. Consideration should be given to special drainage conditions during winter months.

5.0 Installation of Bollards

Bollard Foundations- concrete work

Install the bollard in an area where there is no running water. Otherwise, make sure that the bollard is protected by a draining channel connected to a drainage system.

It is important to set the barriers at 90 degrees to the surface or premature wear may occur. Bollards must be placed plumb by checking the sides of the bollard with a hand level.

5.1 Excavation of Bollards

Excavate bollard depth

The depth of the bollard excavation will vary. When calculating the depth of the excavation, determine the finish grade of the bollard **allowing for the proper drainage away from the bollard.**

1. add the actual length of the bollard.
2. add the thickness of the concrete slab
3. add the thickness of the compacted gravel base rock
4. add any additional excavation cut necessary to make sure that the slab is below the frostline.

5.2 Slab Sizing:

Non roadway traffic- light vehicle traffic paths:

Pour a 24" X 24"X 6" slab on grade for each bollard

Roadway traffic- light vehicle traffic paths:

Pour a 24" X 24"X 8" slab on grade for each bollard

A long 24" or 36" continuous slab can be poured for multiple bollards placed in a row with the slab extending 18 inches on each side of the first and last bollard's center.

5.3 Slab Rebar:

Place #4 rebar at 8" O.C. or less in both directions in slab.

Stub up #4 rebar at 12" O.C. or less at the perimeter of the slab to reinforce wall concrete. Keep stub up rebar 3" in from the perimeter of the slab concrete-rebar coverage rule) and 12" bent into the slab and at least 20" vertically out of the slab (40 diameter splice rule).

5.4 Place Drainpipe:

Make sure to place in any drainpipe or conduit that must be placed through the slab now.

5.5 Slab Pour:

Slab is ready to pour with 4000 PSI or better concrete- 6" or 8" thick.

5.6 Wall Rebar:

Splice #4 vertically on to stubbed out rebar to a height of 3" below the finish grade of the concrete and place horizontal rebar at 12" O.C. or less on to the vertical rebar

5.7 Install Drainage:

Install drain lines, connecting to the 2 inch female connector at bollard base. Run drain line to storm water sewer. Maintain an adequate fall for water in the drain lines.

5.8 Test Bollards

Thoroughly test the bollards using the supplied KEY before pouring the concrete to finish grade. Cycle at least 4 times, check for bollard movement and locking mechanism

5.9 Concrete Bollards:

Weight down the bollards with sandbags to avoid the risk of the bollard floating up when concrete is poured around the bollard. The wetter the concrete mix the more risk to floating the bollard. The weight of the sandbags must exceed the weight of the concrete displaced to avoid floating of the bollard.

5.10 Concrete Bollards

Bollard is ready to pour to grade with 4000 PSI or better concrete 6" or 8" thick.

6.0 Installation of Bollards

Bollard Conduit (optional)

It is important to set the barriers at 90 degrees to the surface or premature wear may occur. Bollards must be placed plumb by checking the sides of the bollard with a hand level.

6.1 Install conduits

Install conduits (LED power 12VDC, Heater Power 115VAC conduits) to connect each bollard to the an electrical junction box. Trench from the junction box site to each bollard with the conduit. Lay in the conduit following local building codes. It better to home-run the conduit to the junction from each bollard for easier pulling of the wires, but 2-3 bollards can be interconnected in series from bollard to bollard..

6.2 Install conduits

Install ½ inch PVC conduit with long sweep elbows to accommodate heating wiring or low voltage LED wiring for up to 3 bollards per homerun conduit run to junction box. Keep LED low voltage wiring and heater high voltage wiring in separate conduits.

7.0 Initial Startup and Operation

7.1 Bollard Up Procedure:

1. Assuming bollard is in the down position,
2. Insert key
3. Apply a little foot pressure to the top of bollard to free locking pin and turn key.
4. Let bollard rise up and it will lock automatically.

7.2 Bollard Up Procedure:

1. Assuming bollard is in the up position,
2. Insert key
3. Apply a little pressure to the top of bollard to free locking pin and turn key.
4. Push bollard down to ground level and it will lock down automatically.

8.0 Bollard Annual Maintenance

- 8.1 Remove the Bollard base plate by unscrewing the (4) bolts that hold the plate.
- 8.2 Carefully raise the bollard to the up position.
- 8.3 Remove Bollard cap by unscrewing the (2) cap bolts.
- 8.4 Hose out (if dirty) the bottom of the bollard casing with garden hose. Force water through drain pipe and flush the drain line.
- 8.5 Grease nylon sliders and locking pins with any quality automotive wheel bearing grease.
- 8.6 Lower and lock down bollard.
- 8.7 Reinstall bollard cap with the 2 cap bolts.
- 8.8 Reinstall the bollard base plate by screwing in the (4) bolts that hold the plate