Passive Bollards

Fixed and removable systems for simple, effective security

Ross’ fixed and removable bollards are the ideal solution for perimeter protection of buildings, equipment and walkways. They effectively create a physical barrier to block vehicle access, while allowing easy movement of foot traffic.
ROSS PERIMETER SECURITY

Passive Bollards

(XL-2200) PAS 68 Shallow Mount Fixed Bollard – Heald Fixed Raptor
The ideal solution for locations where anti-ram security is essential but where standard bollard foundations are not practical or permissible. While the Fixed Raptor has a formidable appearance to deter potential threats, it also provides modern architectural appeal.

(XL-2500/2600) PAS 68/IWA 14-1 Shallow Mount Fixed Bollards – Heald Mantis
are a forward-thinking solution for locations where anti-ram security is essential and where standard bollard foundations are not practical or permissible.

(XL-20 Series) K12 & K4 Fixed and Removable Bollards
are an aesthetically pleasing and durable solution for perimeter security. Ross bollards are fabricated with heavy-duty, hot-dip galvanized structural steel.
### Industries
- Government
- Military
- Ports
- Critical Infrastructure – Power, Telecomm, Water, Gas
- Oil and Gas Refinement
- Mass Transportation – Air, Rail, Bus
- Chemicals
- Banking and Financial Institutions
- Corporate Headquarters
- Data Centers
- Stadiums and Arenas
- Institutions – Universities, Hospitals, Cultural Centers
- Industrial Facilities

### Applications
- **The XL-2200 Shallow Mount Fixed Bollard** provides a crash tested rating with only one unit. It can potentially be used to block wider areas than standard fixed bollards, which typically are crash tested in groups of 3 units on 36” centers. The Fixed Raptor is ideal for a wide range of applications, particularly in urban settings such as courthouses, embassies, museums, banks, corporate offices, universities, mass transit facilities and parks.

- **The XL-2500/2600 Shallow Mount Bollard** foundations make them a perfect choice where bollards are desired, but site conditions do not permit deep excavation. The XL-2500 Mantis 64 and XL-2600 Mantis 80 are ideal for a wide range of applications, particularly in urban settings where utilities and other underground conditions exist such as courthouses, embassies, museums, banks, corporate offices, universities, mass transit facilities and parks.

- **The XL-20 Series Fixed and Removable Bollards** offer anti-ram security and pedestrian friendly walkways for a wide range of applications including stadiums, courthouses, airports, museums, historic landmarks, parks, urban streetscapes, mass transit facilities, universities and corporate offices.
The Fixed Raptor is an evolution of Heald’s shallow mount retractable bollard by the same name. It offers a high level of security in a static configuration, and boasts an even smaller excavation depth of just 8” (200 mm). Like its retractable cousin, the Fixed Raptor was crash tested as a single unit, so it can be used as a stand-alone bollard or part of an array of multiple units to secure boundaries of any size.

The XL-2200 consists of a curve-shaped element that extends 39” (985 mm) high and 8” (200 mm) wide. The element is anchored below-grade with a structural frame designed to withstand a large impact. At 8” (200 mm) deep x 63” (1600 mm) wide x 63” (1600 mm) long, the foundation is very compact and requires only ¾ of a cubic yard of concrete. Because the structural frame incorporates factory-provided rebar, there is no need for additional rebar mats to be supplied and built on site.

The Fixed Raptor is ideal for the following conditions:

• **Minimal excavation** – where underground utilities high water tables or other site conditions limit excavation depth

• **Pedestrian and bicycle access** – non-vehicular traffic can move through freely

• **High speed impacts** – where the roadway layout allows vehicles to reach higher speeds

• **Minimal setbacks** – where critical assets or equipment are located close to entrances, such as in urban areas, and a high level of security is required regardless of potential vehicle speed

**Standard Features**

• Crash tested to the PAS 68:2013 test method with a classification of V/7500(N2)/48/90:0.0/0.0 (7.5 tonne vehicle traveling 48 kph @ 90° impact angle, with zero penetration)

• **Bollard Height** - 38.8” (985 mm)

• **Bollard Width** - 7.9” (200 mm)

• Crash tested as a single unit

• **Foundation** – 7.9” (200 mm) deep x 63” (1600 mm) wide x 63” (1600 mm) long

• Constructed from heavy-duty structural steel sections

• Supplied fully finished, with all components required for installation

• Hot-dip galvanized per ASTM A123
Optional Features

- Decorative covers
- Reflective striping

Optional Finish

- Galvanized + primed finish
- Galvanized + painted finish: Wash primer with polyurethane top coat. Contact Ross for color chart

Technical Data

Testing and Certifications
Tested to PAS 68:2013 with a classification of 7500 (N2) 48/90:0:0

Applicable Standards

- ASTM A500: Steel Tube
- ASTM A572: HSLA Structural Steel
- ASTM A36: Structural Steel
- ASTM A615: Steel Reinforcing Bar
- Structural welding in accordance with AWS D1.1/D1.1M

Installation Considerations

- Shallow mount design
- No separate reinforcement of concrete is required
- Crash tested as single unit to allow for maximum flexibility in placement
- Installation consists of excavation, placement of unit and pouring of concrete (5000 psi [34.5 Mpa] min, 28-day strength) and can be accomplished in under an hour

Maintenance
Since the barriers are passive, the only recommended maintenance is a visual inspection of finish quality.

Quality Control
Manufacturing facility certified to ISO 9001:2015.

Availability & Cost
Bollard systems are typically made to order and subject to production lead times at the time of purchase. Contact Ross for details.

Warranty
Ross warrants that all of its manufactured products shall remain free of defects in material and workmanship under normal use for a period of one year from the date of delivery.
Mantis Fixed Bollards offer a unique combination of contemporary style to enhance architectural appeal and an imposing presence to deter potential threats. While boasting higher crash ratings than the Fixed Raptor, the Mantis Series still features shallow excavation depths of just 10" (250 mm) for the Mantis 64 and 12" (300 mm) for the Mantis 80. And like the Fixed Raptor, each model was crash tested as a single unit, so they can be installed as a stand-alone bollard or as part of an array of multiple units.

Mantis Bollards consist of a rectangular shaped element that extends 43" (1100 mm) high and 8" (200 mm) wide for the Mantis 64 or 44" (1112 mm) high and 8" (190 mm) wide for the Mantis 80. The element is anchored below-grade by a structural frame designed to withstand a large impact. The foundations for both models are very compact, and because the structural frames incorporate factory-provided rebar, there is no need for additional rebar mats to be supplied and built onsite. The Mantis Series Bollards are ideal for the following conditions:

- **Minimal excavation** – where underground utilities, high water tables or other site conditions restrict excavation
- **Pedestrian and bicycle access** – Non-vehicular traffic can move through freely
- **High speed impacts** – where the roadway layout allows vehicles to reach higher speeds
- **Minimal setbacks** – where critical assets or equipment are in close proximity to entrances (urban applications) and a high level of security is required, regardless of potential vehicle speed

**Architectural appeal** – clean lines of the available bollard covers complement surrounding building elements

**Low impact security presence** – since bollards are commonly used, they blend in well with the surrounding streetscape and do not raise awareness to high security measures

### Standard Features

- **Mantis 64**: Crash tested to the PAS 68:2013 test method with a classification of V/7500(N2)/64/90:0.0/0.0 (7500 kg vehicle traveling 64 kph @ 90° impact angle, with zero penetration)
- **Mantis 80**: Crash tested to the IWA 14-1:2013 test method with a classification of V/7200[N3C]/80/90: 7.5 (7200 kg vehicle traveling 80 kph @ 90° impact angle, with 7.5 m penetration)
- **Bollard Height** – Mantis 64: 42.5" (1080 mm) / Mantis 80: 43.3" (1100 mm)
- **Bollard Width** - Mantis 64: 7.9" (200 mm) / Mantis 80: 7.5" (190 mm)
- **Crash tested as a single unit**
Optional Features

• Foundation depth – Mantis 64: 9.8” (250 mm) / Mantis 80: 11.8” (300 mm)
• Constructed from heavy-duty structural steel sections
• Supplied fully finished, with all components required for installation
• Hot-dip galvanized per ASTM A123
• Decorative covers
• Reflective striping

Optional Finish

• Galvanized + primed finish
• Galvanized + painted finish: Wash primer with polyurethane top coat. Contact Ross for color chart
• Available with a range of stylish stainless steel covers, finished in a variety of colors to suit any location

Technical Data

Testing and Certifications

• Mantis 64 / XL-2500-FB: Tested to PAS 68:2013 with a classification of V/7500(N2)/64/90:0.0/0.0
• Mantis 80 / XL-2600-FB: Tested to IWA 14-1:2013 with a classification of V/7200[N3C]/80/90:7.5

Applicable Standards

• ASTM A500: Steel Tube
• ASTM A572: HSLA Structural Steel
• ASTM A36: Structural Steel
• ASTM A615: Steel Reinforcing Bar

Installation Considerations

• Shallow mount design
• No separate reinforcement of concrete is required
• Crash tested as single unit to allow for maximum flexibility in placement
• Installation consists of excavation, placement of unit and pouring of concrete (5000 psi [34.5 Mpa] min, 28-day strength) and can be accomplished in under an hour

Maintenance

Since the barriers are passive, the only recommended maintenance is a visual inspection of finish quality.

Quality Control

Manufacturing facility certified to ISO 9001:2015.

Availability & Cost

Bollard systems are typically made to order and subject to production lead times at the time of purchase.

Warranty

Ross warrants that all of its manufactured products shall remain free of defects in material and workmanship under normal use for a period of one year from the date of delivery.
Ross Fixed and Removable Bollards are an economical way to protect wide areas and are ideal for the following conditions:

- **Pedestrian and bicycle access** – non-vehicular traffic can move through freely
- **Aesthetic appeal** - complement design elements of the facility and surrounding areas
- **Low impact security presence** – since bollards are commonly used, they blend in well with the surrounding streetscape and do not raise awareness to high security measures
- **High speed impacts** – where the roadway layout allows vehicles to reach higher speeds
- **Equipment protection** – safeguarding expensive equipment, flammables, explosives and guard shacks
- **Vehicle Access** – removable bollards can be lifted out of position to allow vehicle passage
- **Minimal excavation** – where underground utilities, high water tables or other site conditions restrict excavation

### Design Overview

Ross Fixed and Removable Bollards consist of an array of (3) or more units spaced on fixed centers. Each bollard is constructed of 10-3/4" (273 mm) or 8-5/8" (220 mm) structural steel pipe, which is hot-dip galvanized after fabrication. Multiple paint finishes or cast stainless, aluminum and bronze sleeves are available along with various covers, caps and banding to complement the surrounding environment. Ross bollards are a great way to provide a high level of security with a low visual impact.

XL Series Bollards extend approximately 39" (990 mm) above the ground level and are designed to be filled with concrete on site. Foundations require additional steel reinforcement (rebar) to be provided and assembled by the installer.

### Specifications Overview

<table>
<thead>
<tr>
<th>(XL-20 SERIES) K12 &amp; K4 FIXED AND REMOVABLE BOLLARDS</th>
<th>XL-22-FB</th>
<th>XL-24-FB</th>
<th>XL-25-FB</th>
<th>XL-22-RB</th>
</tr>
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<tbody>
<tr>
<td><strong>Ross Product Number</strong></td>
<td>K12 &amp; K4</td>
<td>K12 &amp; K4</td>
<td>K12 &amp; K4</td>
<td>K12 &amp; K4</td>
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<tr>
<td><strong>Type</strong></td>
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<td>Shallow Foundation Fixed Bollard</td>
<td>Standard Foundation Fixed Bollard</td>
<td>Standard Foundation Removable Bollard</td>
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<td><strong>Crash Rating</strong></td>
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<td>DOS K12</td>
<td>DOS K4</td>
<td>DOS K12</td>
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<td><strong>Design Reference</strong></td>
<td>DS-22</td>
<td>DS-24</td>
<td>DS-25</td>
<td>DS-22R</td>
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<tr>
<td><strong>Height</strong></td>
<td>39&quot; (990 mm)</td>
<td>39&quot; (990 mm)</td>
<td>39-1/4&quot; (997 mm)</td>
<td>39&quot; (991 mm)</td>
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<td><strong>Foundation Depth</strong></td>
<td>47-1/4&quot; (1200 mm)</td>
<td>20&quot; (508 mm)</td>
<td>30&quot; (762 mm) or 47-3/4&quot; (1213 mm)</td>
<td>47-1/4&quot; (1200 mm)</td>
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<tr>
<td><strong>Bollard Diameter</strong></td>
<td>10-3/4&quot; (273 mm)</td>
<td>10-3/4&quot; (273 mm)</td>
<td>10-3/4&quot; (273 mm)</td>
<td>10-3/4&quot; (273 mm)</td>
</tr>
<tr>
<td><strong>Bollard Spacing (max)</strong></td>
<td>58&quot; (1473 mm) center-center, 47-1/4&quot; (1194 mm) clear opening</td>
<td>52-3/4&quot; (1340 mm) center-center, 42&quot; (1067 mm) clear opening</td>
<td>Center-center varies depending on diameter: 47-1/4&quot; (1194 mm) clear opening</td>
<td>58&quot; (1473 mm) center-center, 47-1/4&quot; (1200 mm) clear opening</td>
</tr>
</tbody>
</table>

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(XL-22-FB) K12 FIXED BOLLARDS
(XL-24-FB) K12 SHALLOW MOUNT FIXED BOLLARDS
(XL-25-FB) K4 FIXED BOLLARDS

Standard Features

- XL-22-FB, XL-24-FB: DOS K12 crash test certified with a 15,000 pound vehicle traveling 50 mph with less than one meter penetration of the cargo bed
- XL-25-FB: DOS K4 crash test certified with a 15,000 pound vehicle traveling 30 mph with less than one meter penetration of the cargo bed
- Supplied fully finished, with all components required for installation (except concrete and rebar)
- Open top, to allow for easy concrete fill
- Hot-dip galvanized per ASTM A123

Optional Features

- Top plates and caps: flat, angled, rounded and per customer design
- Reflective striping and banding

Optional Finish

- Cast stainless, aluminum and bronze sleeves
- Galvanized + primed finish
- Galvanized + painted finish: Wash primer with polyurethane top coat. Contact Ross for color chart

Technical Data

Testing and Certifications
Tested and certified per U.S. Department of State SD-STD-02.01, Revision A (Ref: DS-22, DS-24, DS-25)

Applicable Standards
- ASTM A53: Steel Pipe
- ASTM A36: Steel Shapes
- ASTM A615: Steel Reinforcing Bar
- Structural Welding in Accordance with AWS D1.1/D1.1M

Installation Considerations
Installation requires excavation of holes and placement of rebar and concrete (3600 psi [24.8 Mpa] min, 28-day strength). Assembly and alignment of the components must be performed in accordance with supplied installation instructions. Foundations require additional steel reinforcement (rebar) to be provided and assembled by the installer.

Maintenance
Since the barriers are passive, the only recommended maintenance is a visual inspection of finish quality.

Quality Control
Manufacturing facility certified to ISO 9001:2015.

Availability & Cost
Bollard systems are typically made to order and subject to production lead times at the time of purchase. Contact Ross for details.

Warranty
Ross warrants that all of its manufactured products shall remain free of defects in material and workmanship under normal use for a period of one year from the date of delivery.
Standard Features

- **DOS K12 crash test certified** to stop a 15,000 pound vehicle traveling 50 mph with less than one meter penetration of the cargo bed
- **Removable to allow vehicular access**
- **Supplied fully finished, with all components required for installation (except concrete, rebar and drain fittings)**
- **Hot-dip galvanized per ASTM A123**

Optional Features

- **Top plates and caps**: flat, angled, rounded and per customer design
- **Reflective striping and banding**

Optional Finish

- **Cast stainless, aluminum and bronze sleeves**
- **Galvanized + primed finish**
- **Galvanized + painted finish**: Wash primer with polyurethane top coat. Contact Ross for color chart
Technical Data

Testing and Certifications
Tested and certified per U.S. Department of State SD-STD-02.01, Revision A (Ref: DS-22R)

Applicable Standards
- ASTM A53: Steel Pipe
- ASTM A36: Steel Shapes
- ASTM A615: Steel Reinforcing Bar
- Structural welding in accordance with AWS D1.1/D1.1M

Installation Considerations
Installation requires excavation of holes, placement of rebar and concrete (3600 psi [24.8 Mpa] min, 28-day strength) and piping of drains. Assembly and alignment of the components must be performed in accordance with supplied installation instructions. Foundations require additional steel reinforcement (rebar) to be provided and assembled by the installer.

Maintenance
Since the barriers are passive, the only recommended maintenance is a visual inspection of finish quality.

Quality Control
Manufacturing facility certified to ISO 9001:2015.

Availability & Cost
Bollard systems are typically made to order and subject to production lead times at the time of purchase. Contact Ross for details.

Warranty
Ross warrants that all of its manufactured products shall remain free of defects in material and workmanship under normal use for a period of one year from the date of delivery.
Ross offers a complete line of Perimeter Security Products

- Wedges & Plates
- Passive Bollards
- Active Bollards
- Gates & Fences

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