MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard Installation Schedule
Per American Association of State Highway and Transportation Officials (AASHTO) 2.7

### Engineered Anchorage System for MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollards
Per American Association of State Highway and Transportation Officials (AASHTO) 2.7

<table>
<thead>
<tr>
<th>Bollard Array</th>
<th>Bollard Ultimate Load / Max. Capacity</th>
<th>Concrete Pier Diameter (in.)</th>
<th>Concrete Pier Height (in.)</th>
<th>Concrete Pier Reinforcing</th>
<th>Bollard Sleeve / Embedment at Concrete Pier</th>
<th>Concrete Grade Beam Depth (in.)</th>
<th>Concrete Grade Beam Width (in.)</th>
<th>Concrete Grade Beam Reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Individual Footing Option</td>
<td>Continuous Footing Option</td>
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</tr>
<tr>
<td>3 (5.0)</td>
<td>7,408</td>
<td>3,333</td>
<td>12</td>
<td>42</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td>3 (5.0)</td>
<td>7,408</td>
<td>3,333</td>
<td>16</td>
<td>39</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>24</td>
<td>16</td>
</tr>
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<td>7,408</td>
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<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>2 (1.0)</td>
<td>7,408</td>
<td>5,000</td>
<td>12</td>
<td>48</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>2 (1.0)</td>
<td>7,408</td>
<td>5,000</td>
<td>16</td>
<td>45</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>24</td>
<td>16</td>
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<td>2 (1.0)</td>
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<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>1 (6.0)</td>
<td>---</td>
<td>10,000</td>
<td>12</td>
<td>62</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>1 (6.0)</td>
<td>---</td>
<td>10,000</td>
<td>16</td>
<td>56</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>1 (6.0)</td>
<td>---</td>
<td>10,000</td>
<td>18</td>
<td>54</td>
<td>4 - #4 vert.</td>
<td>18' Embedment</td>
<td>24</td>
<td>18</td>
</tr>
</tbody>
</table>

### Design and Construction Notes:
1.0 Two (2) bollard array required to meet AASHTO section 2.7. Minimum of 2 bollards shall engage the vehicle in a vehicle barrier design. Maximum bollard spacing at 3'-0" o.c.
2.0 Allowable Foundation Pressure = 2,000 psf. Allowable Lateral Bearing = 150/psf. Assumed in-place soil: Sand, Silty Sand, Clayey Sand, Silty Gravel, or Clayey Gravel. For higher soil allowable design values, site soil investigation by a Registered Geotechnical Engineer is required.
3.0 See supplemental concrete pier / beam details for additional information.
4.0 Material Specifications: Concrete = 3,000 psi (28-day min.); Reinforcing ASTM A615 (60 ksi for all bars #5 and larger/ 40 ksi for all bars #4 and smaller).
5.0 Three (3) bollard array required to meet AASHTO section 2.7. Minimum of 3 bollards shall engage the vehicle in a vehicle barrier design. Maximum bollard spacing at 2'-0" o.c.
6.0 For continuous footing option, maximum single bollard spacing at 4'-0" o.c.
Engineered Anchorage System for the MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard
Circular Concrete Pier Footing

1. MaxiForce™ Steel pipe bollard per specification.
2. See schedule for bollard embedment.
3. Finished grade or pavement.
4. Concrete base pier per schedule at each bollard.
5. #3 hoop ties at 12" O.C. and 2 - #3 ties at top and bottom of concrete pier.

Installation Orientation

Protected Side

Attack Side

Protected Side

Attack Side

See Schedule

See Schedule

See Schedule

See Schedule

See Schedule

See Schedule
Engineered Anchorage System for the MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard Continuous Concrete Beam Footing

1. MaxiForce™ Steel pipe bollard per specification.
2. See schedule for bollard embedment.
3. Finished grade or pavement.
4. Continuous concrete grade beam per schedule.
5. Stirrups per schedule.
6. Centerline of bollard and concrete grade beam.
7. Continuous longitudinal reinforcement per schedule - lap splice 32" min. for #6 and 27" min. for #5 rebars - TYP. UNO.
8. 4" min. hooks with 135 degree bend - TYP. UNO.

Installation Orientation

Protected Side

Attack Side

See Schedule

Protected Side

Attack Side

See Schedule