

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

Bollard Array	Bollard Ultimate Load / Max. Capacity	Design Load (lbs.)	Concrete Pier Diameter (in.)	Concrete Pier Height (in.)	Concrete Pier Reinforcing	Bollard Sleeve / Embedment at Concrete Pier	Concrete Grade Beam Depth (In.)	Concrete Grade Beam Width (In.)	Concrete Grade Beam Reinforcing	
									Longitudinal	Stirrups
<i>Individual Footing Option</i>						<i>Continuous Footing Option</i>				
3 (5.0)	7,408	3,333	12	42	4 - #4 vert.	18" Embedment	26	12	4 - #4 cont.	#3 at 12" o.c.
3 (5.0)	7,408	3,333	16	39	4 - #4 vert.	18" Embedment	24	16	4 - #4 cont.	#3 at 10" o.c.
3 (5.0)	7,408	3,333	18	38	4 - #4 vert.	18" Embedment	22	18	4 - #4 cont.	#3 at 10" o.c.
2 (1.0)	7,408	5,000	12	48	4 - #4 vert.	18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
2 (1.0)	7,408	5,000	16	45	4 - #4 vert.	18" Embedment	24	16	4 - #4 cont.	#3 at 10" o.c.
2 (1.0)	7,408	5,000	18	42	4 - #4 vert.	18" Embedment	24	18	4 - #4 cont.	#3 at 10" o.c.
1 (6.0)	---	10,000	12	62	4 - #4 vert.	18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
1 (6.0)	---	10,000	16	56	4 - #4 vert.	18" Embedment	26	16	4 - #4 cont.	#3 at 10" o.c.
1 (6.0)	---	10,000	18	54	4 - #4 vert.	18" Embedment	24	18	4 - #4 cont.	#3 at 10" o.c.

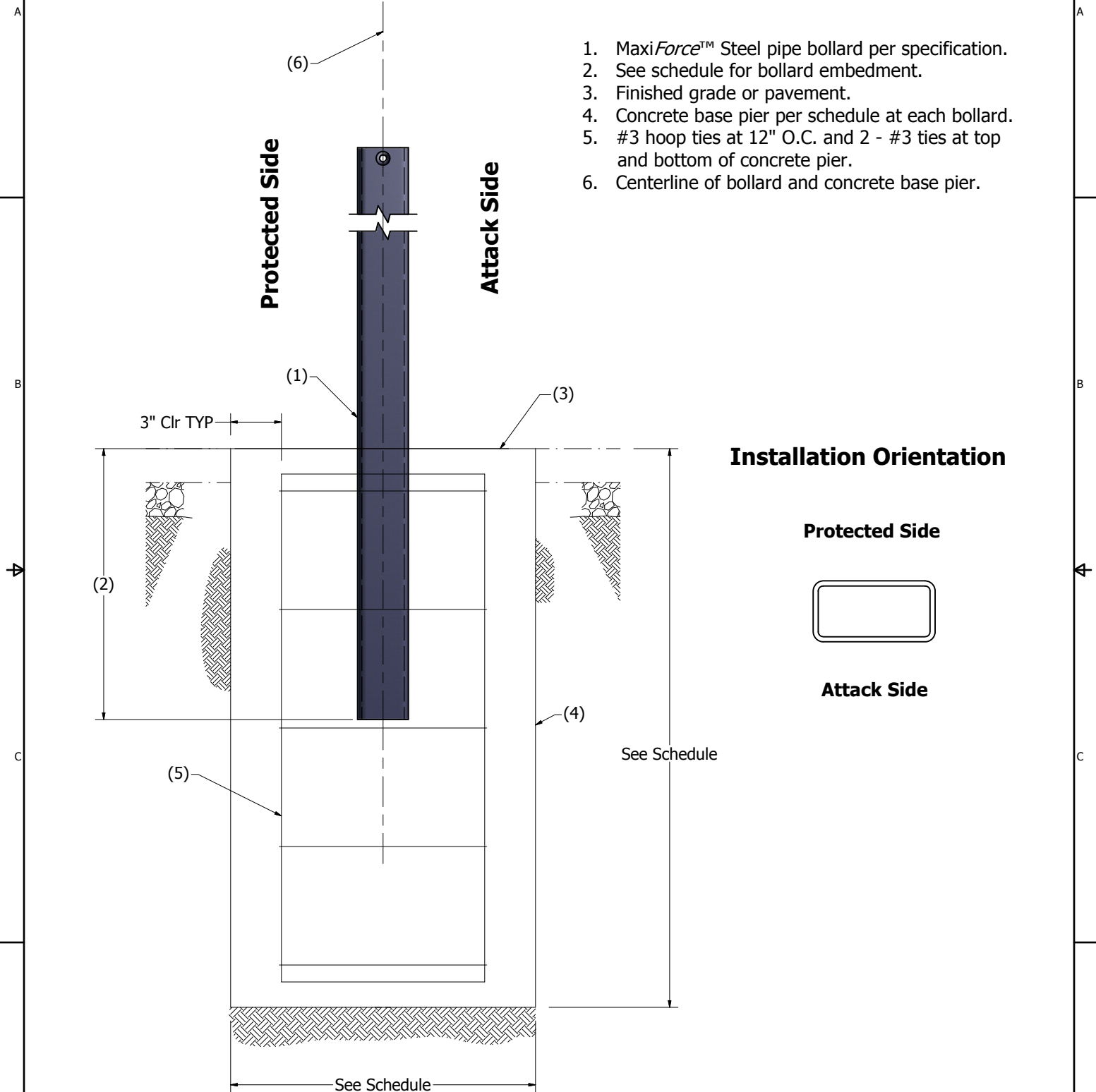
Design and Construction Notes:

- 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.

Drawing Rev. 1	Created 11/1/2010
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	MaxiForce™ Traffic Control Bollards		
	7560 Main Street Sykesville, MD 21784 410-552-9888 (phone) - 410-552-9939 (fax) www.maxiforcebollards.com - sales@maxiforcebollards.com		
Model	MFS Inst Sched (AASHTO 2.7)		
Size	File Name	MFS Inst Sched (AASHTO)	
C	Scale	NA	DO NOT SCALE DRAWING Sheet 1 Of 1

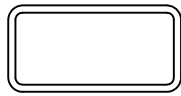
Engineered Anchorage System for the MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard Circular Concrete Pier Footing




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.
6. Centerline of bollard and concrete base pier.

Installation Orientation

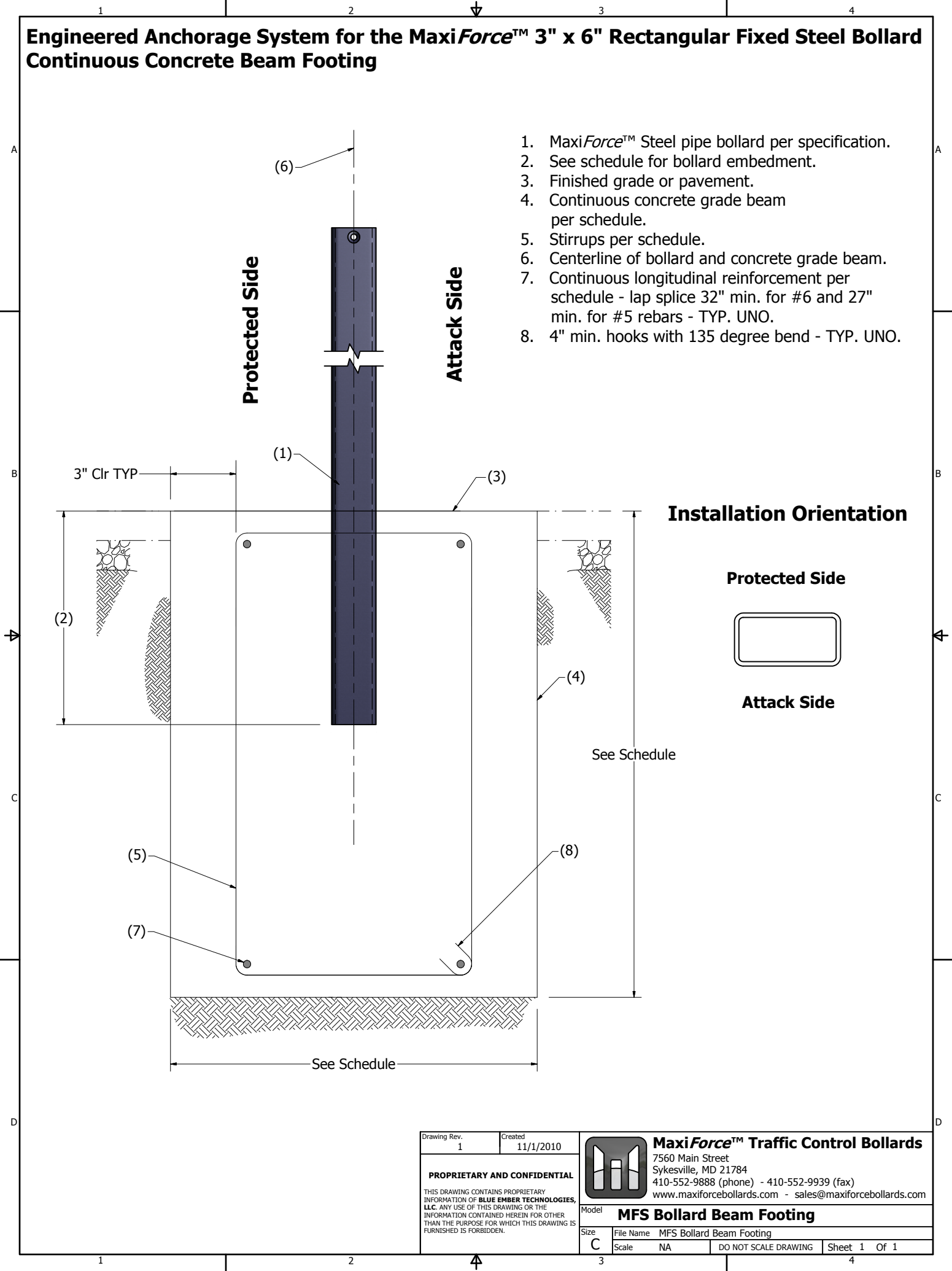
Protected Side



Attack Side

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Model MFS Bollard Pier Footing		
Size C	File Name MFS Bollard Pier Footing	Scale NA
DO NOT SCALE DRAWING		Sheet 1 Of 1

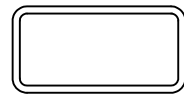
Engineered Anchorage System for the MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard Continuous Concrete Beam Footing



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

See Schedule

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Model MFS Bollard Beam Footing		
Size C	File Name MFS Bollard Beam Footing	
Scale NA	DO NOT SCALE DRAWING	Sheet 1 Of 1