

MaxiForce™ Rectangular Fixed Steel Bollard Installation Schedule Various Design Loads at 18" Impact Height

Engineered Anchorage System for MaxiForce™ 3 x 6 Rectangular Steel Bollard

Soil Lateral Bearing / Bearing Pressure	Design Load (lbs.)	Concrete Pier Diameter (in.)	Concrete Pier Height (in.)	Concrete Pier Reinforcing	Bollard 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>				
225 psf/f / 2,000 psf	3,000	18	38	4 - #4 vert.	18" Sleeve / 18" Embedment	24	12	4 - #4 cont.	#3 at 11" o.c.
225 psf/f / 2,000 psf	3,750	18	40	4 - #4 vert.	18" Sleeve / 18" Embedment	26	12	4 - #4 cont.	#3 at 11" o.c.
418 psf/f / 3,500 psf	6,000	18	38	4 - #4 vert.	18" Sleeve / 18" Embedment	26	12	4 - #4 cont.	#3 at 11" o.c.
200 psf/f / 2,000 psf	6,000	18	48	4 - #4 vert.	18" Sleeve / 18" Embedment	32	12	4 - #4 cont.	#3 at 14" o.c.
525 psf/f / 3,300 psf	7,500	18	38	4 - #4 vert.	18" Sleeve / 18" Embedment	26	12	4 - #4 cont.	#3 at 11" o.c.
250 psf/f / 2,000 psf	7,500	18	48	4 - #4 vert.	18" Sleeve / 18" Embedment	32	12	4 - #4 cont.	#3 at 14" o.c.
175 psf/f / 1,600 psf	7,500	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	36	12	4 - #4 cont.	#3 at 14" o.c.
335 psf/f / 2,700 psf	10,000	18	48	4 - #4 vert.	18" Sleeve / 18" Embedment	32	12	4 - #4 cont.	#3 at 11" o.c.
234 psf/f / 2,100 psf	10,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	36	12	4 - #4 cont.	#3 at 11" o.c.
171 psf/f / 2,000 psf	10,000	18	60	4 - #4 vert.	18" Sleeve / 18" Embedment	40	12	4 - #4 cont.	#3 at 11" o.c.

Design and Construction Notes:

- 1.0 Design load location at 18" above finished grade.
- 2.0 The soil pressure value is shown at design load condition and should be verified that the site soil is adequate for the listed value.
- 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).

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 (18")		
Size	File Name	MFS Inst Sched (18)	
C	Scale	NA	DO NOT SCALE DRAWING
		Sheet	1 Of 1

MaxiForce™ Rectangular Fixed Steel Bollard Installation Schedule

Various Design Loads at 27" Impact Height

Engineered Anchorage System for MaxiForce™ 3 x 6 Rectangular Steel Bollard

Soil Lateral Bearing / Bearing Pressure	Design Load (lbs.)	Concrete Pier Diameter (in.)	Concrete Pier Height (in.)	Concrete Pier Reinforcing	Bollard 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>				
225 psf/f / 2,000 psf	3,000	18	42	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
225 psf/f / 2,000 psf	3,750	18	46	4 - #4 vert.	18" Sleeve / 18" Embedment	32	12	4 - #4 cont.	#3 at 12" o.c.
450 psf/f / 3,500 psf	6,000	18	42	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
210 psf/f / 2,000 psf	6,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	36	12	4 - #4 cont.	#3 at 14" o.c.
558 psf/f / 5,000 psf	7,500	18	42	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
263 psf/f / 3,500 psf	7,500	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	36	12	4 - #4 cont.	#3 at 14" o.c.
192 psf/f / 2,000 psf	7,500	18	60	4 - #4 vert.	18" Sleeve / 18" Embedment	40	12	4 - #4 cont.	#3 at 14" o.c.

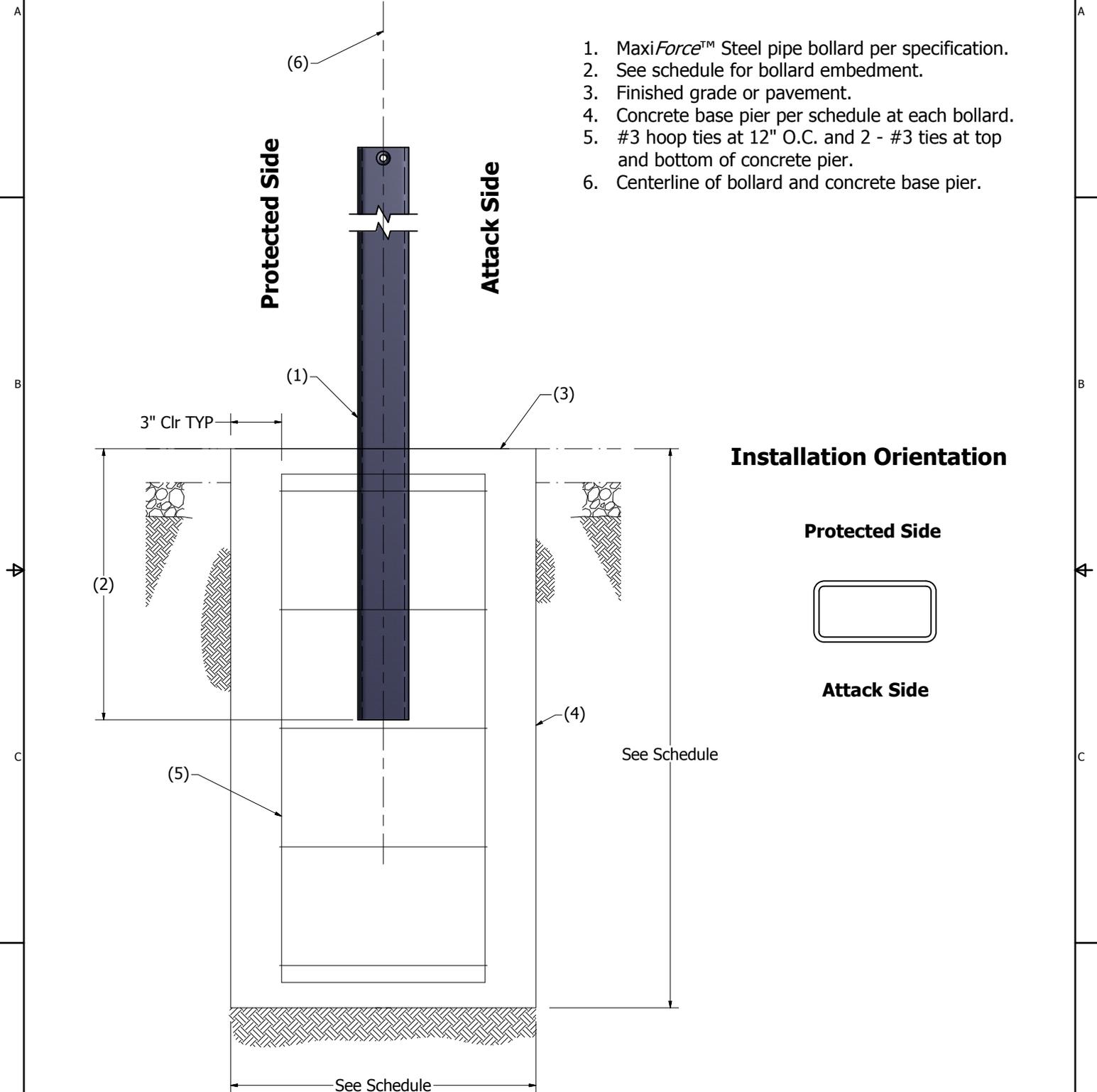
Design and Construction Notes:

- 1.0 Design load location at 27" above finished grade.
- 2.0 The soil pressure value is shown at design load condition and should be verified that the site soil is adequate for the listed value.
- 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).

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Model	MFS Inst Sched (27")		
Size	File Name	MFS Inst Sched (27)	
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



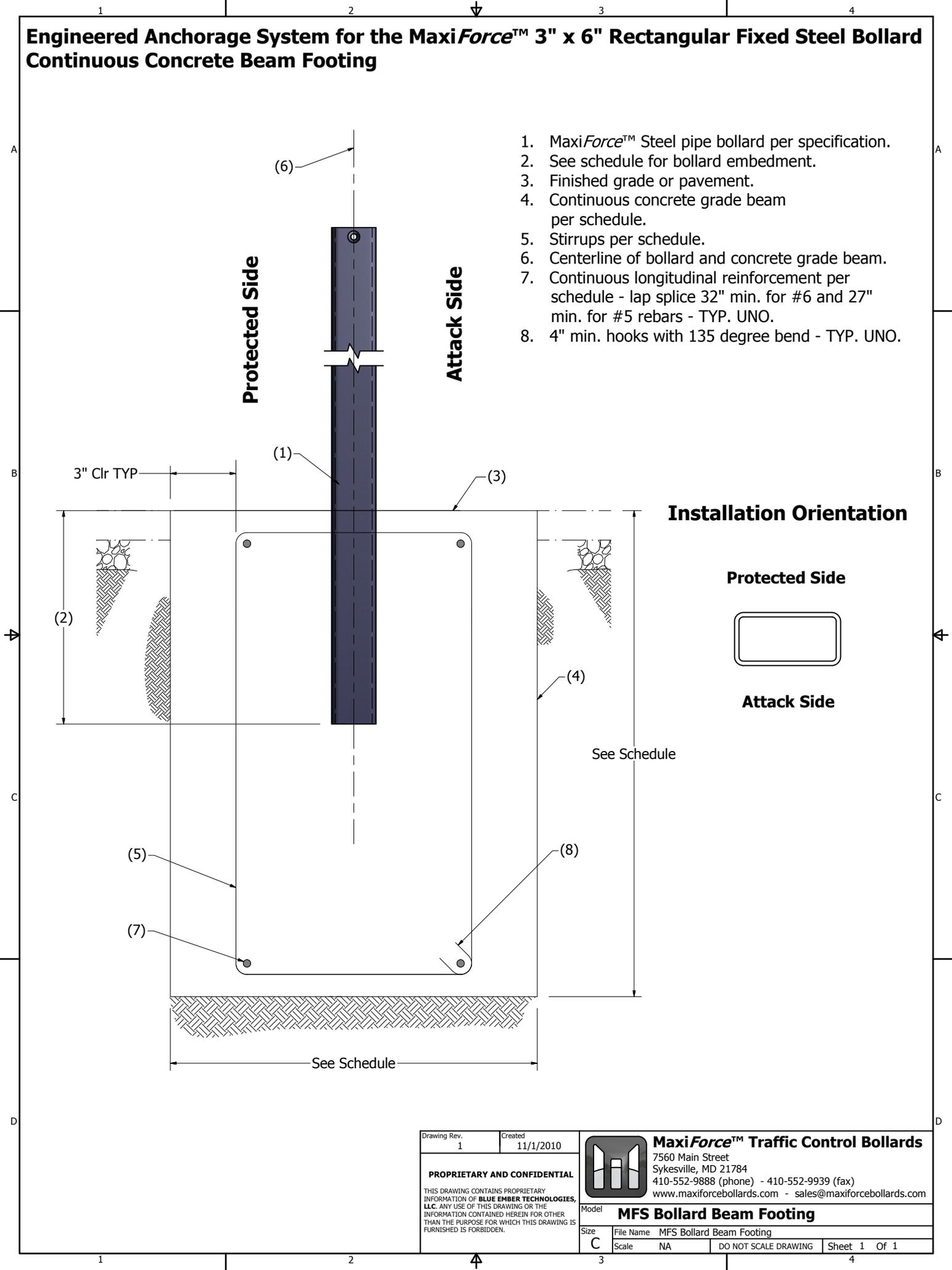
1. MaxiForce™ Steel pipe bollard per specification.
2. See schedule for bollard embedment.
3. Finished grade or pavement.
4. Concrete base pier per schedule at each bollard.
5. #3 hoop ties at 12" O.C. and 2 - #3 ties at top and bottom of concrete pier.
6. Centerline of bollard and concrete base pier.

Installation Orientation



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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

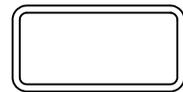
Engineered Anchorage System for the MaxiForce™ 3" x 6" Rectangular Fixed Steel Bollard Continuous Concrete Beam Footing



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

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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