

MaxiForce™ Round Removable and Fixed Steel Bollard Installation Schedule

Per Florida Building Code (FBC) Section 1618.5.3

(Applicable to other high velocity hurricane zones/regions)


Engineered Anchorage System for MaxiForce™ Round Removable and Fixed Steel Bollards

per Florida Building Code (FBC) Section 1618.5.3

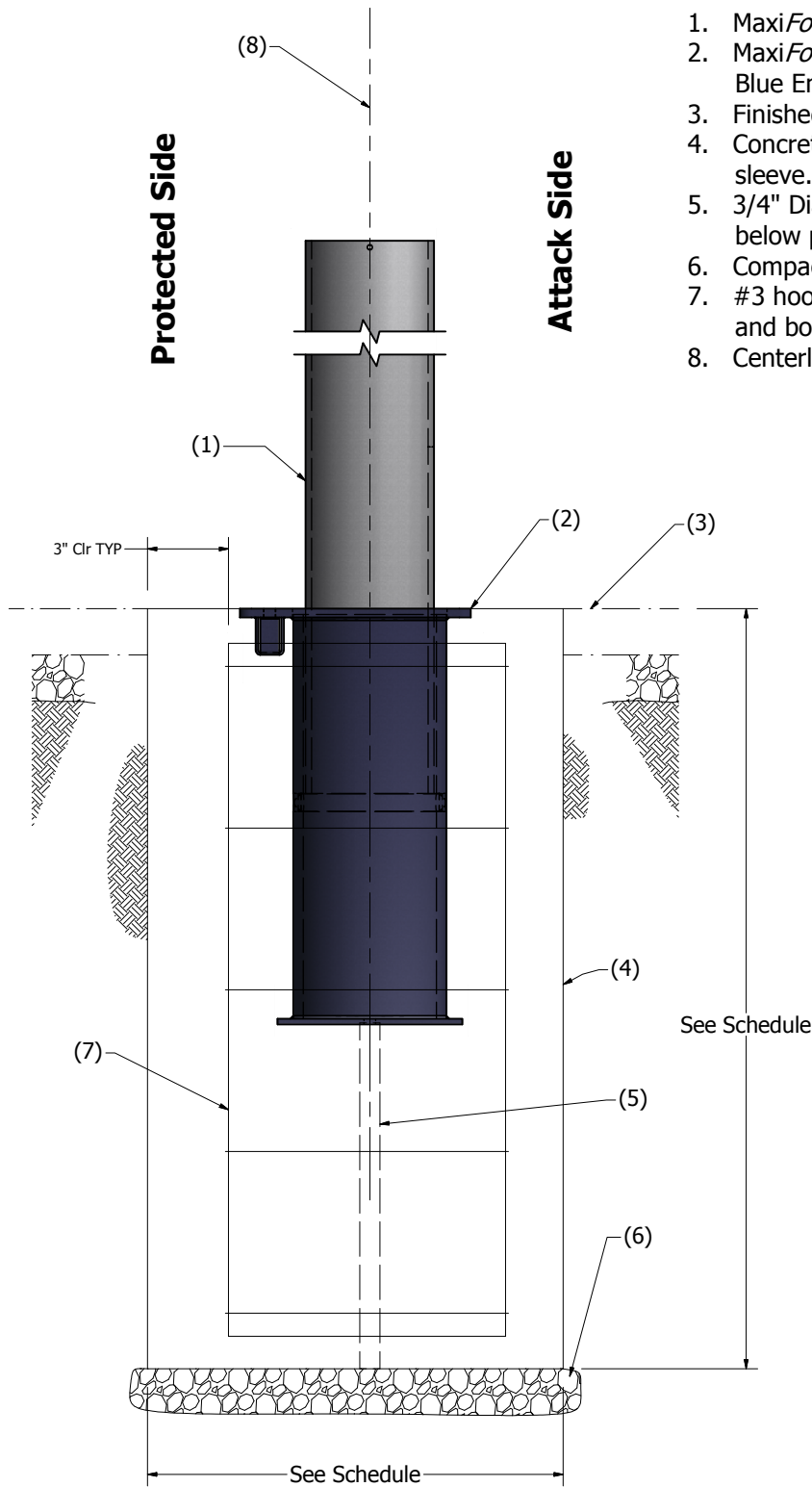
MRHD / HDH or MFR Size	Bollard Ultimate Load / Max. Capacity	Design Load (lbs.)	Concrete Pier Diameter (in.)	Concrete Pier Height (in.)	Concrete Pier Reinforcing	Bollard Sleeve / Embedment at Concrete Pier	Concrete Grade Beam Depth (In.)	Concrete Grade Beam Width (In.)	Concrete Grade Beam Reinforcing	
									Longitudinal	Stirrups
<i>Individual Footing Option</i>						<i>Continuous Footing Option</i>				
3" (5.0)	4,778	2,500	12	47	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
3" (1.0)	4,778	3,750	16	53	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
3" (1.0)	4,778	3,750	18	47	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
4" (5.0)	8,917	2,500	12	47	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
4" (1.0)	8,917	3,750	16	53	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
4" (1.0)	8,917	3,750	18	47	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
4"	8,917	7,500	16	60	4 - #4 vert.	18" Sleeve / 18" Embedment	30	12	4 - #4 cont.	#3 at 13" o.c.
4"	8,917	7,500	18	57	4 - #4 vert.	18" Sleeve / 18" Embedment	28	16	4 - #4 cont.	#3 at 11" o.c.
5"	15,140	7,500	16	60	4 - #4 vert.	18" Sleeve / 18" Embedment	28	16	4 - #4 cont.	#3 at 11" o.c.
5"	15,140	7,500	18	57	4 - #4 vert.	18" Sleeve / 18" Embedment	26	18	4 - #4 cont.	#3 at 9" o.c.
6"	23,613	7,500	16	60	4 - #4 vert.	18" Sleeve / 18" Embedment	28	16	4 - #4 cont.	#3 at 11" o.c.
6"	23,613	7,500	18	57	4 - #4 vert.	18" Sleeve / 18" Embedment	26	18	4 - #4 cont.	#3 at 9" o.c.
8"	46,671	7,500	16	60	4 - #4 vert.	18" Sleeve / 18" Embedment	28	16	4 - #4 cont.	#3 at 11" o.c.
8"	46,671	7,500	18	57	4 - #4 vert.	18" Sleeve / 18" Embedment	26	18	4 - #4 cont.	#3 at 9" o.c.

Design and Construction Notes:

- Two (2) bollard array required to meet FBC section 1618.5.3. Minimum of 2 bollards shall engage the vehicle in a vehicle barrier design. Maximum bollard spacing at 3'-0" o.c.
- 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.
- See supplemental concrete pier / beam details for additional information.
- 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).
- Three (3) bollard array required to meet FBC section 1618.5.3. Minimum of 3 bollards shall engage the vehicle in a vehicle barrier design. Maximum bollard spacing at 2'-0" o.c.
- For continuous footing option, maximum single bollard spacing at 4'-0" o.c.

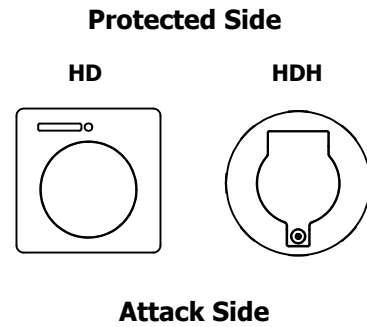
Drawing Rev. 1	Created 11/1/2010		MaxiForce™ Traffic Control Bollards		
PROPRIETARY AND CONFIDENTIAL			7560 Main Street Sykesville, MD 21784 410-552-9888 (phone) - 410-552-9939 (fax) www.maxiforcebollards.com - sales@maxiforcebollards.com		
THIS DRAWING CONTAINS PROPRIETARY INFORMATION OF BLUE EMBER TECHNOLOGIES, LLC. ANY USE OF THIS DRAWING OR THE INFORMATION CONTAINED HEREIN FOR OTHER THAN THE PURPOSE FOR WHICH THIS DRAWING IS FURNISHED IS FORBIDDEN.		Model	HD/HDH & MFR Inst Sched (FBC 1618)		
Size C	File Name	HD_HDH & MFR Inst Sched (FBC)		Scale	NA
			DO NOT SCALE DRAWING	Sheet	1 Of 1


Engineered Anchorage System for the MaxiForce™ HD and HDH Base Circular Concrete Pier Footing



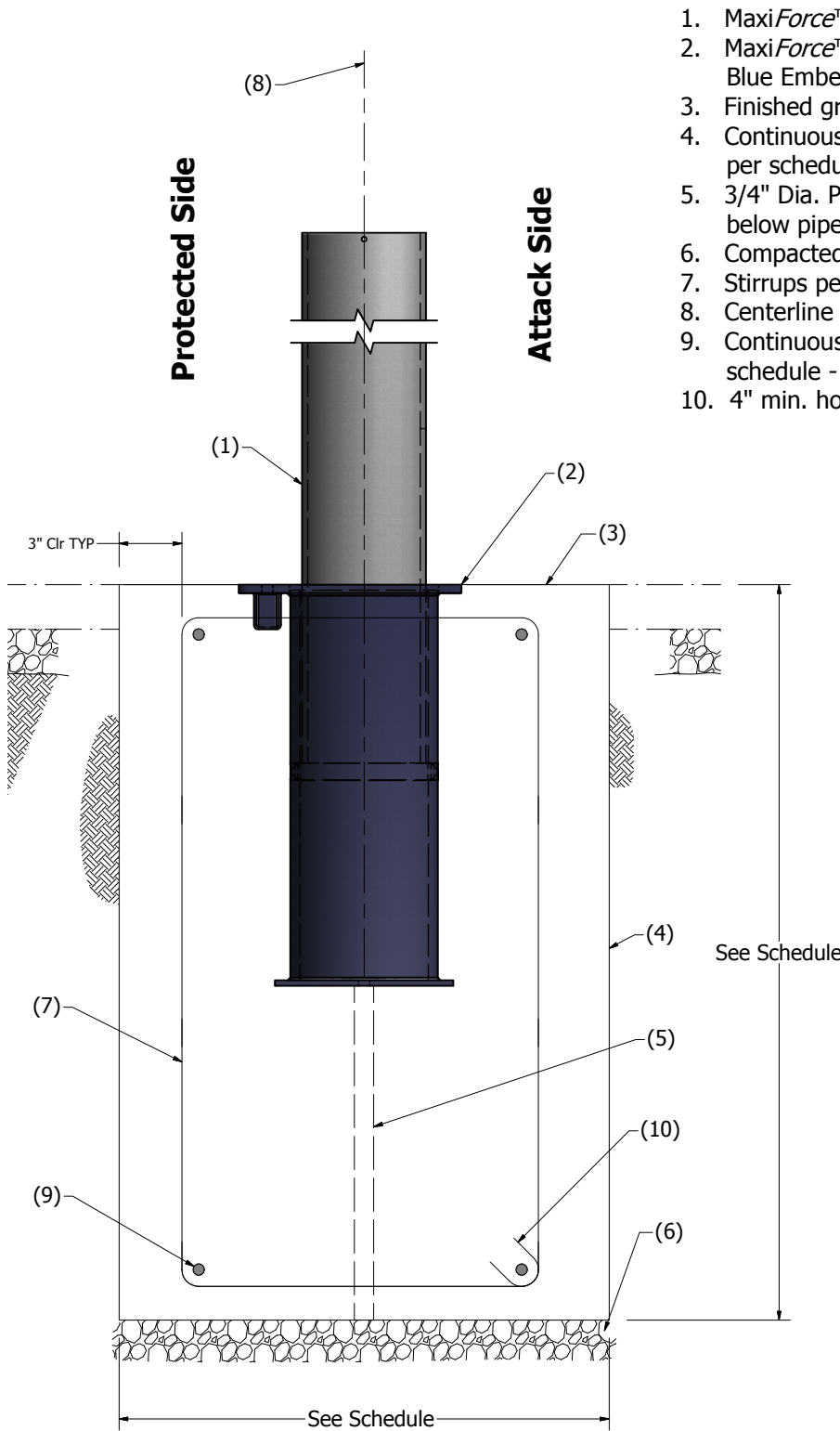
1. MaxiForce™ Steel pipe bollard per specification.
2. MaxiForce™ HD or HDH Base assembly per Blue Ember Technologies.
3. Finished grade or pavement.
4. Concrete base pier per schedule at each pipe sleeve.
5. 3/4" Dia. PVC pipe as needed for drainage below pipe sleeve.
6. Compacted gravel bed (3" minimum).
7. #3 hoop ties at 12" O.C. and 2 - #3 ties at top and bottom of concrete pier.
8. Centerline of bollard and concrete base pier.

Installation Orientation



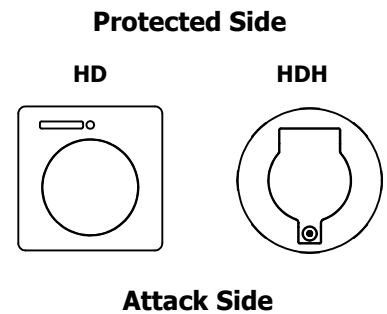
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Model	HD/HDH Base Pier Footing	
Size C	File Name HD_HDH Base Pier Footing	
Scale NA	DO NOT SCALE DRAWING	Sheet 1 Of 1


Engineered Anchorage System for the MaxiForce™ HD and HDH Base Continuous Concrete Beam Footing



1. MaxiForce™ Steel pipe bollard per specification.
2. MaxiForce™ HD or HDH Base assembly per Blue Ember Technologies.
3. Finished grade or pavement.
4. Continuous concrete grade beam per schedule.
5. 3/4" Dia. PVC pipe as needed for drainage below pipe sleeve.
6. Compacted gravel bed (3" minimum).
7. Stirrups per schedule.
8. Centerline of bollard and concrete grade beam.
9. Continuous longitudinal reinforcement per schedule - lap splice 32" min. for #4 rebar.
10. 4" min. hooks with 135 degree bend - TYP. UNO.

Installation Orientation



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Model HD/HDH Base Beam Footing		
Size C	File Name HD_HDH Base Beam Footing	
Scale NA	DO NOT SCALE DRAWING	Sheet 1 Of 1