

# MaxiForce™ Round Removable and Fixed Steel Bollard Installation Schedule Per International Building Code (IBC) Section 1607.7.3

## Engineered Anchorage System for MaxiForce™ Round Removable and Fixed Steel Bollards per International Building Code (IBC) Section 1607.7.3

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	2,000	12	42	4 - #4 vert.	18" Sleeve / 18" Embedment	26	12	4 - #4 cont.	#3 at 11" o.c.
3" (1.0)	4,778	3,000	16	45	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
3" (1.0)	4,778	3,000	18	42	4 - #4 vert.	18" Sleeve / 18" Embedment	24	16	4 - #4 cont.	#3 at 10" o.c.
4" (5.0)	8,917	2,000	12	42	4 - #4 vert.	18" Sleeve / 18" Embedment	26	12	4 - #4 cont.	#3 at 11" o.c.
4" (1.0)	8,917	3,000	16	45	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
4" (1.0)	8,917	3,000	18	42	4 - #4 vert.	18" Sleeve / 18" Embedment	24	16	4 - #4 cont.	#3 at 10" o.c.
4"	8,917	6,000	16	54	4 - #4 vert.	18" Sleeve / 18" Embedment	28	12	4 - #4 cont.	#3 at 12" o.c.
4"	8,917	6,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
5"	15,140	6,000	16	56	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
5"	15,140	6,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	24	18	4 - #4 cont.	#3 at 9" o.c.
6"	23,613	6,000	16	56	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
6"	23,613	6,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	24	18	4 - #4 cont.	#3 at 9" o.c.
8"	46,671	6,000	16	56	4 - #4 vert.	18" Sleeve / 18" Embedment	26	16	4 - #4 cont.	#3 at 11" o.c.
8"	46,671	6,000	18	54	4 - #4 vert.	18" Sleeve / 18" Embedment	24	18	4 - #4 cont.	#3 at 9" o.c.

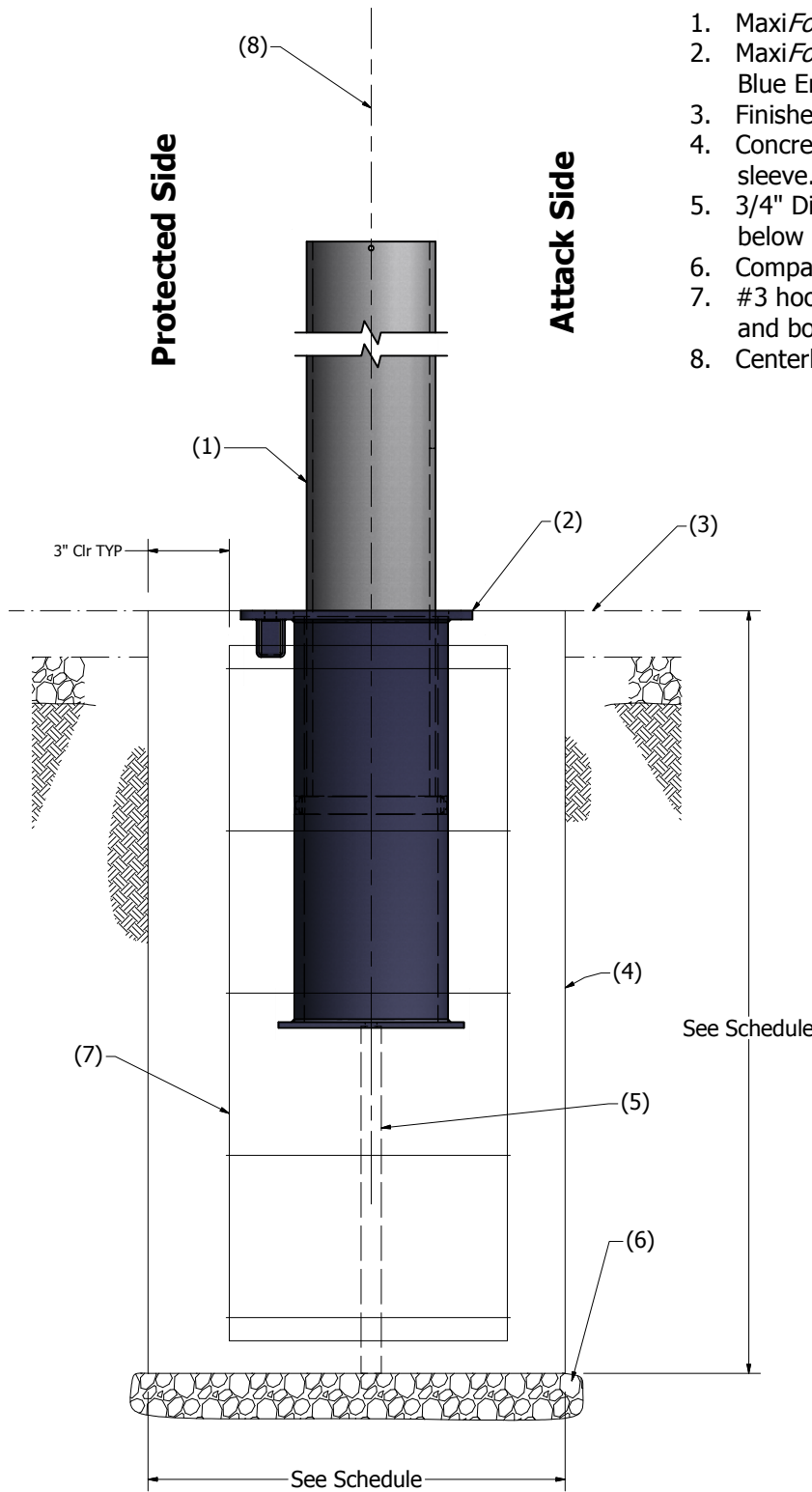
### Design and Construction Notes:

- Two (2) bollard array required to meet IBC section 1607.7.3. 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 IBC section 1607.7.3. 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
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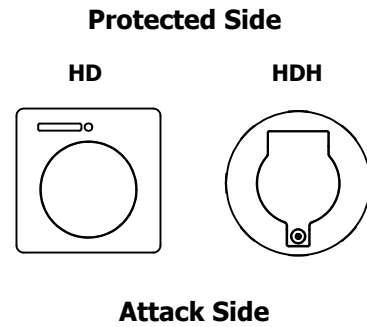
	<b>MaxiForce™ Traffic Control Bollards</b>		
	7560 Main Street Sykesville, MD 21784 410-552-9888 (phone) - 410-552-9939 (fax) www.maxiforcebollards.com - sales@maxiforcebollards.com		
Model	<b>HD/HDH &amp; MFR Inst Sched (IBC 1607)</b>		
Size	File Name	HD_HDH & MFR Inst Sched (IBC)	
C	Scale	NA	DO NOT SCALE DRAWING Sheet 1 Of 1


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



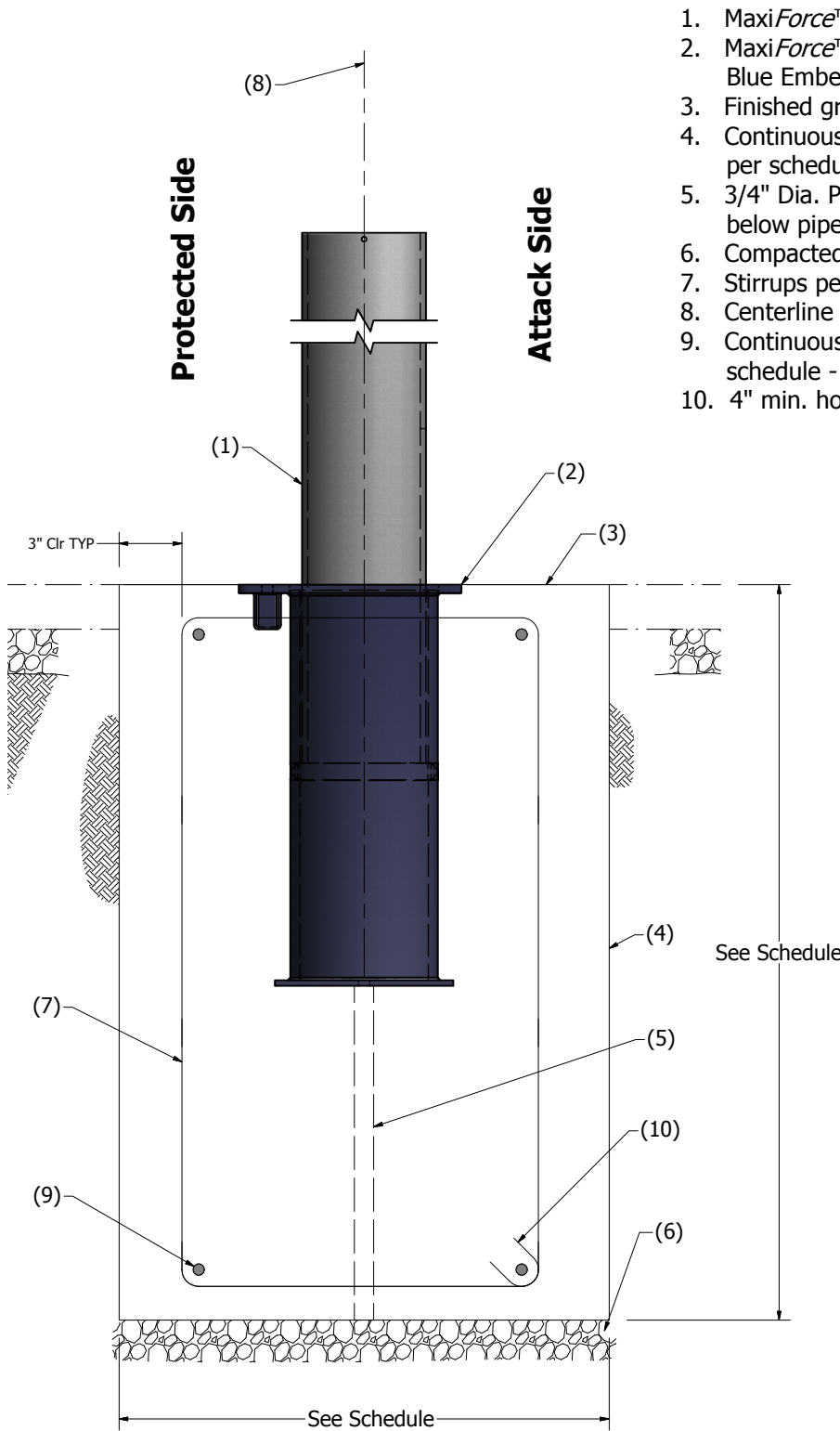
1. MaxiForce™ Steel pipe bollard per specification.
2. MaxiForce™ HD or HDH Base assembly per Blue Ember Technologies.
3. Finished grade or pavement.
4. Concrete base pier per schedule at each pipe sleeve.
5. 3/4" Dia. PVC pipe as needed for drainage below pipe sleeve.
6. Compacted gravel bed (3" minimum).
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



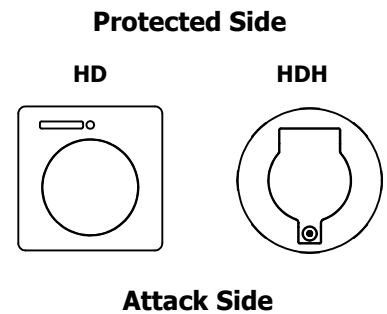
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Model <b>HD/HDH Base Pier Footing</b>		
Size C	File Name HD_HDH Base Pier Footing	Scale NA
DO NOT SCALE DRAWING		Sheet 1 Of 1

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