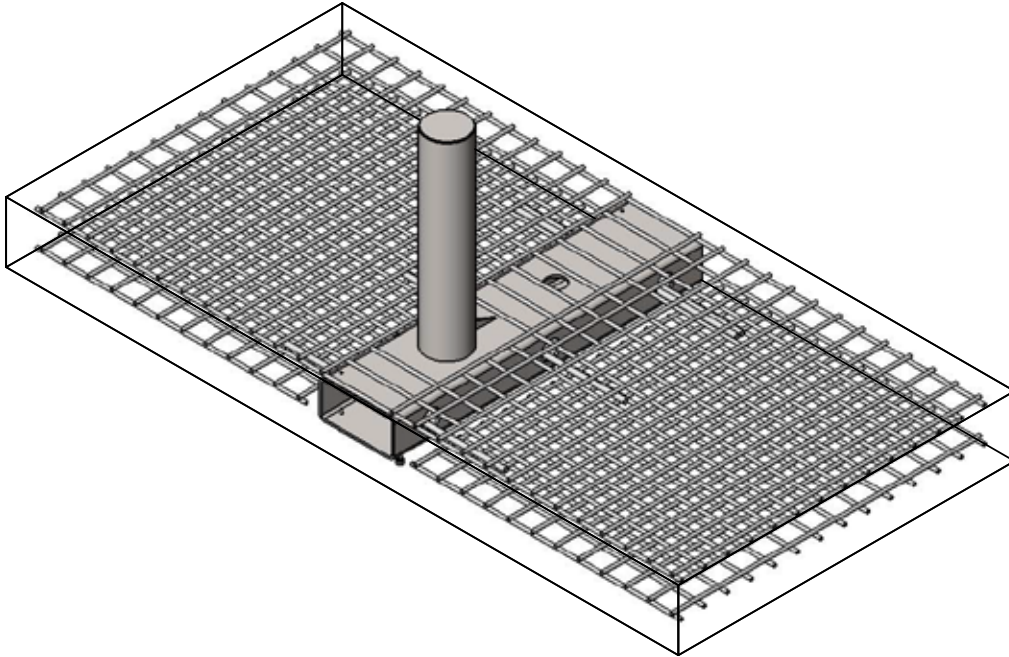


## **BULWARK® BOLLARDS | M30 & M50**

**SINGLE & ARRAY CONFIGURATIONS | FIXED & REMOVABLE | SHALLOW MOUNT INSTALLATION**



### **BULWARK M30 SINGLE BOLLARD FIXED W/ CAP OPTION SHOWN ABOVE**

*NOTE: Installation drawing shown above, rebar is not included with bollards.*

*Bulwark M30 foundation - 72" x 144" x 13" (4000 psi concrete)*

*Bulwark M50 foundation - 96" x 150" x 14.5" (4000 psi concrete)*

***BOLLARD INSTALLATIONS REQUIRE CONCRETE & REBAR  
Refer to installation manual for rebar sizing, placement  
and concrete requirements.***

*Effective: 02/08/19*

## BULWARK® M30 | SINGLE BOLLARD FIXED

ASTM F2656-15 TESTED / P1 | SHALLOW MOUNT | 38" BOLLARD HEIGHT | 8.625" BOLLARD DIAMETER | 13" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Fixed	BKHD30SSⓄ-38G	786 lbs	GALVANIZED*
Fixed	BKHD30SSⓄ-38N	786 lbs	NON-GALVANIZED

NOTE: BOLLARDS SOLD PER EACH. SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.

## BULWARK® M30 | SINGLE BOLLARD REMOVABLE

ENGINEERED P1 | SHALLOW MOUNT | 38" BOLLARD HEIGHT | 8.625" BOLLARD DIAMETER | 13" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Removable	BKHD30SRⓄ-38G	863 lbs	GALVANIZED*
Removable	BKHD30SRⓄ-38N	863 lbs	NON-GALVANIZED

NOTE: BOLLARDS SOLD PER EACH. SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.  
REMOVABLE BOLLARDS REQUIRE CAP OR SLEEVE ACCESSORY

## BULWARK® M30 | ARRAY FIXED

ASTM F2656-15 TESTED / P2 (43") | SHALLOW MOUNT | 38" BOLLARD HEIGHT | 8.625" BOLLARD DIAMETER | 13" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Fixed	BK30SAⓄ-38G	660 lbs	GALVANIZED*
Fixed	BK30SAⓄ-38N	660 lbs	NON-GALVANIZED

NOTE: TESTED CONFIGURATION IS A 3 BOLLARD ARRAY W/ 48" OPEN SPACING. BOLLARDS SOLD PER EACH.  
SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.

## BULWARK® M30 | ARRAY FIXED

ENGINEERED P1 | SHALLOW MOUNT | 38" BOLLARD HEIGHT | 8.625" BOLLARD DIAMETER | 13" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Fixed	BKE30SAⓄ-38G	665 lbs	GALVANIZED*
Fixed	BKE30SAⓄ-38N	665 lbs	NON-GALVANIZED

NOTE: ENGINEERED CONFIGURATION IS A 3 BOLLARD ARRAY W/ 48" OPEN SPACING. BOLLARDS SOLD PER EACH.  
SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.

Ⓞ = BOLLARD FINISH OPTIONS AVAILABLE

Powder Coated | **B** = Black **N** = Bronze **W** = White **S** = Sand (Powder Coat finish not available with Galvanized Assembly)\*

Wet Paint | **1** = Black Wet Paint

Uncoated | **U** = Uncoated

Effective: 02/08/19

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## BULWARK® M50 | SINGLE BOLLARD FIXED

ENGINEERED P1 | SHALLOW MOUNT | 46" BOLLARD HEIGHT | 10.75" BOLLARD DIAMETER | 14.5" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Fixed	BKHD50SS⊗-46G	1300 lbs	GALVANIZED*
Fixed	BKHD50SS⊗-46N	1300 lbs	NON-GALVANIZED

NOTE: BOLLARDS SOLD PER EACH. SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.

## BULWARK® M50 | SINGLE BOLLARD REMOVABLE

ENGINEERED P1 | SHALLOW MOUNT | 46" BOLLARD HEIGHT | 10.75" BOLLARD DIAMETER | 14.5" BURY

PANEL	ITEM NUMBER	WEIGHT	ASSEMBLY FINISH
Removable	BKHD50SR⊗-46G	1455 lbs	GALVANIZED*
Removable	BKHD50SR⊗-46N	1455 lbs	NON-GALVANIZED

NOTE: BOLLARDS SOLD PER EACH. SEE BOTTOM OF PAGE FOR BOLLARD FINISH OPTIONS.  
 REMOVABLE BOLLARDS REQUIRE CAP OR SLEEVE ACCESSORY

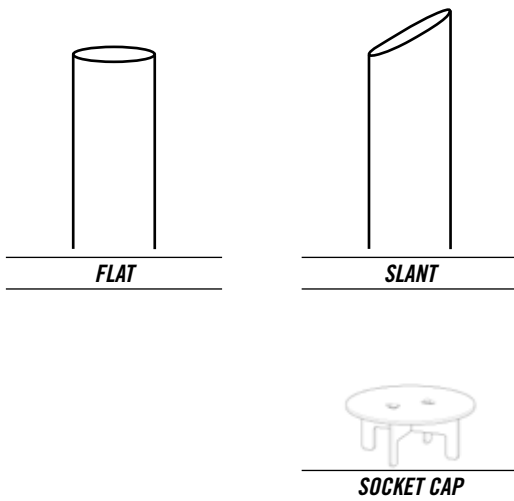
⊗ = BOLLARD FINISH OPTIONS AVAILABLE

Powder Coated | **B** = Black **N** = Bronze **W** = White **S** = Sand (Powder Coat finish not available with Galvanized Assembly)\*

Wet Paint | **1** = Black Wet Paint

Uncoated | **U** = Uncoated

## BULWARK® | BOLLARD SLEEVES, CAPS & SOCKETS ACCESSORIES



SLEEVE OR CAP TYPE	ITEM NUMBER	WEIGHT
M30 FLAT TOP SLEEVE	41983X / 42387X	20 / 20.3 lbs
M30 SLANT TOP SLEEVE	41984X / 42388X	21.4 / 21.7 lbs
M50 FLAT TOP SLEEVE	42424X / 42426X	29.9 / 30.4 lbs
M50 SLANT TOP SLEEVE	42425X / 42427X	30.9 / 31.3 lbs

Note: Item numbers are represented as Fixed / Removable  
 Sleeves are Stainless Steel

TYPE	ITEM NUMBER	WEIGHT
M30 Socket Cap (8.625")	42368	9 lbs
M50 Socket Cap (10.75")	42364	12.5 lbs
M30 Bollard Cap (8.625")	?????	??? lbs
M50 Bollard Cap (10.75")	?????	??? lbs

Socket Cap used to fill void after bollards have been removed from base.  
 Bollard Cap for Removable Bollards.

Effective: 02/08/19

# BULWARK® M30 | CONSTRUCTION SPECIFICATION 32 41 00

## SHALLOW MOUNT BOLLARDS

### PART 1 - GENERAL

#### 1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the anti-ram bollard system defined herein at (specify project site).

#### 1.02 RELATED WORK

Section \_\_\_\_ - Earthwork

Section \_\_\_\_ - Concrete

#### 1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total anti-ram bollard system of the Ameristar® Bulwark® M30 design. The system shall include all components (i.e., levelers, bollard and base) required.

#### 1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

#### 1.05 REFERENCES

- **ASTM A106** – Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service
- **ASTM A500** – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- **ASTM A653/A653M** – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
- **ASTM B117** – Practice for Operating Salt-Spray (Fog) Apparatus
- **ASTM D523** – Test Method for Specular Gloss
- **ASTM D714** – Test Method for Evaluating Degree of Blistering in Paint
- **ASTM D822** – Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus
- **ASTM D1654** – Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- **ASTM D2244** – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
- **ASTM D2794** – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- **ASTM D3359** – Test Method for Measuring Adhesion by Tape Test
- **ASTM F2656-15** – Standard Test Method for Vehicle Crash Testing of Perimeter Barriers

#### 1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

#### 1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

### PART 2 - MATERIALS

#### 2.01 MANUFACTURER

- A.** The anti-ram single bollard fixed system shall conform to the Bulwark M30/P1 design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be tested and certified to meet ASTM F2656-15, Impact Condition Designation M30, Penetration Rating P1, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 30 mph.
- B.** The anti-ram single bollard removable system shall conform to the Bulwark M30/P1 engineered design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be M30/P1 Engineered based on test results of similar design. Engineering analysis shall be based upon ASTM F2656-15, Impact Condition Designation M30, Penetration Rating P1, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 30 mph.
- C.** The anti-ram array fixed bollard system shall conform to the Bulwark M30/P2 design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be tested and certified to meet ASTM F2656, Impact Condition Designation M30, Penetration Rating P2, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 30 mph.
- D.** The anti-ram array fixed bollard system shall conform to the Bulwark M30/P1 engineered design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be M30/P1 Engineered based on test results of similar design. Engineering analysis shall be based upon ASTM F2656, Impact Condition Designation M30, Penetration Rating P1, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 30 mph.
- E.** The entire anti-ram bollard system, and all associated accessories and fittings shall be obtained from a single source.

Effective: 02/08/19

# BULWARK® M30 | CONSTRUCTION SPECIFICATION 32 41 00

## SHALLOW MOUNT BOLLARDS

### 2.02 MATERIAL

- A. Steel material for bollard base shall conform to the requirements of ASTM A500B, with a minimum yield strength of 46,000psi. Steel material for bollard tube shall comply with ASTM A106B, with a minimum yield strength of 35,000psi.
- B. Bollard tube shall be a minimum 8.625" diameter with a singular structural steel internally reinforcing rib located at bollard midpoint. Bollard assembly base shall be 8" x 16" structural steel.

### 2.03 FABRICATION

- A. Bollard system components shall be pre-cut to specified lengths and fabricated by welding. Bollard assembly base shall have pre-cut holes located per the design to allow for concrete flow. Assembly base shall have self-leveling feet at each corner of base.
- B. Powder Coat option: The manufactured bollard system shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash, an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify black, bronze, white, or desert sand).
- C. Wet paint option: The manufactured bollard system shall be subjected to a wet paint coating process including, a pretreatment/wash, a primer spray application base, and a separate topcoat application of a paint finish.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. The purchaser shall indicate the location of all bollards with suitable means.
- B. The purchaser shall indicate all underground utility locations, USC&G benchmarks, property monuments, and other underground structures.
- C. Before installing the Bulwark bollards, all necessary site clearing and grading shall be performed by the purchaser. An adequate clearance around entire bollard system layout is required.

### 3.02 FENCE INSTALLATION

- A. The bollard shall be installed per Ameristar System Drawings (supplied upon request). Bollards shall be installed per product drawings and installation instructions. The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer unless otherwise specified by the product drawings or installation instructions.
- B. Rebar structure shall be installed as represented in the system drawings with a minimum 4000 psi concrete. Shallow mount bollard system shall not exceed 13" bury depth.

### 3.03 CLEANING

The contractor shall clean the jobsite thoroughly to ensure it is left neat and free of any debris caused by the installation of the bollard system.

# BULWARK® M50 | CONSTRUCTION SPECIFICATION 32 41 00

## SHALLOW MOUNT BOLLARDS

### PART 1 - GENERAL

#### 1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the anti-ram bollard system defined herein at (specify project site).

#### 1.02 RELATED WORK

Section \_\_\_\_ - Earthwork

Section \_\_\_\_ - Concrete

#### 1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total anti-ram bollard system of the Ameristar® Bulwark® M50 design. The system shall include all components (i.e., levelers, bollard and base) required.

#### 1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

#### 1.05 REFERENCES

- **ASTM A106** – Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service
- **ASTM A572** – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- **ASTM A653/A653M** – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
- **ASTM B117** – Practice for Operating Salt-Spray (Fog) Apparatus
- **ASTM D523** – Test Method for Specular Gloss
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- **ASTM D2244** – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
- **ASTM D2794** – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- **ASTM D3359** – Test Method for Measuring Adhesion by Tape Test
- **ASTM F2656-15** – Standard Test Method for Vehicle Crash Testing of Perimeter Barriers

#### 1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

#### 1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

### PART 2 - MATERIALS

#### 2.01 MANUFACTURER

- A. The anti-ram single fixed bollard system shall conform to the Bulwark M50/P1 engineered design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be M50/P1 Engineered based on test results of similar design. Engineering analysis shall be based upon ASTM F2656-15, Impact Condition Designation M50, Penetration Rating P1, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 50 mph.
- B. The anti-ram single bollard removable system shall conform to the Bulwark M50/P1 engineered design manufactured by Ameristar Perimeter Security Inc., in Tulsa, Oklahoma. This system shall be M50/P1 Engineered based on test results of similar design. Engineering analysis shall be based upon ASTM F2656-15, Impact Condition Designation M50, Penetration Rating P1, with the with capability of stopping a 15,000 lb. vehicle traveling at speeds up to 50 mph.
- C. The entire anti-ram bollard system, and all associated accessories and fittings shall be obtained from a single source.

#### 2.02 MATERIAL

- A. Steel material for bollard base shall conform to the requirements of ASTM A572 Grade 50. Steel material for bollard tube shall comply with ASTM A106B, with a minimum yield strength of 35,000psi.
- B. Bollard tube shall be a minimum 10.75" diameter with a singular structural steel internally reinforcing rib located at bollard midpoint. Bollard assembly base shall be structural steel fabricated box of size and shape depicted on bollard system drawings.

Effective: 02/08/19

# **BULWARK® M50 | CONSTRUCTION SPECIFICATION 32 41 00**

## **SHALLOW MOUNT BOLLARDS**

### **2.03 FABRICATION**

- A.** Bollard system components shall be pre-cut to specified lengths and fabricated by welding. Bollard assembly base box shall have pre-cut holes located per the design to allow for concrete flow. Assembly base shall have self-leveling feet at each corner of base.
- B.** Powder Coat option: The manufactured bollard system shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash, an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a “no-mar” TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify black, bronze, white, or desert sand).
- C.** Wet paint option: The manufactured bollard system shall be subjected to a wet paint coating process including, a pretreatment/wash, a primer spray application base, and a separate topcoat application of a paint finish.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A.** The purchaser shall indicate the location of all bollards with suitable means.
- B.** The purchaser shall indicate all underground utility locations, USC&G benchmarks, property monuments, and other underground structures.
- C.** Before installing the Bulwark bollards, all necessary site clearing and grading shall be performed by the purchaser. An adequate clearance around entire bollard system layout is required.

### **3.02 FENCE INSTALLATION**

- A.** The bollard shall be installed per Ameristar System Drawings (supplied upon request). Bollards shall be installed per product drawings and installation instructions. The “Earthwork” and “Concrete” sections of this specification shall govern material requirements for the concrete footer unless otherwise specified by the product drawings or installation instructions.
- B.** Rebar structure shall be installed as represented in the system drawings with a minimum 4000 psi concrete. Shallow mount bollard system shall not exceed 14.5” bury depth.

### **3.03 CLEANING**

The contractor shall clean the jobsite thoroughly to ensure it is left neat and free of any debris caused by the installation of the bollard system.

## **BULWARK® | LIMITED WARRANTY**

### **SHALLOW MOUNT BOLLARDS**

The Bulwark security bollards by Ameristar is manufactured from the highest quality materials by skilled craftsmen to meet the highest standards of workmanship in the industry. Ameristar warrants its Bulwark security bollards against defects in material and workmanship for a period of 1 year from the date of substantial completion, or 1.5 years from the date of shipment. Bollard warranty requires that the requirements and instructions described in the operation and maintenance manual be followed and records of all maintenance activities be kept. Records should be available upon request and may be required for warranty claims.

Should the bollard fail in accordance with the details described herein, Ameristar warrants to the original purchaser their redemption through replacement, renewal or issuance of a pro-rated credit. Notice of failure under the conditions of this warranty shall be sent to Ameristar or its authorized representative, in writing, together with proof of purchase and shall specify the nature of the defect and when it was first observed.

Should the bollard be improperly installed, Ameristar shall not be responsible for guaranteed performance or appearance of bollard. Failure to install bollard with a professionally licensed and manufacturer-approved installer shall negate warranty.

Warranty does not apply when failure or damage is due to improper use or application, abuse or misuse, vandalism, natural disasters/catastrophes, or if products have been altered or modified, subjected to improper storage, improper maintenance, negligence, or used with parts not authorized by the manufacturer including but not limited to: excessive vehicle speed, excessive vehicle weight, temperature extremes, long term flooding or lack of drainage, packed debris, snow or ice around the bollard.

This warranty excludes wear, scratches and/or other damage to finishes and painted surfaces due to normal use. The manufacturer shall not be liable for damage to the product which results in the use of the bollard as a protective device (i.e. sustains a vehicle crash), due to damage caused by any other vehicle contact when the bollard is not in the active bollard position, and/or due to damage caused by snow plow operations. The manufacturer shall not be liable for any special, incidental or consequential damages, which result from the use of the products by Buyer, Owner/Operator (End User) and/or any other party, and limits the liability to the amounts paid by Buyer for the Product.

Ameristar reserves the right to inspect the material to determine validity of the claim. Upon validation of the claim by Ameristar or its authorized representative, redemption by replacement, renewal or issuance of a pro-rated credit shall be made by Ameristar. If a warranty claim does not meet the warranty criteria, then the Buyer or Owner/Operator (End User) shall be responsible for reimbursing the manufacturer for service and/or repair costs. This warranty may exclude any on site labor, travel costs to site and/or expenses in performing service or repair on site, for valid warranty claims.

The above constitutes the complete warranty by the manufacturer. No other agreement, written or implied, is valid. Ameristar does not authorize any other person or agent to make any other express warranties. Ameristar neither assumes nor authorizes any other person or agent to assume any other liability in connection with the bollard. Some jurisdictions do not allow limitations on how long an implied warranty lasts, nor do they allow an exclusion or limitation of incidental or consequential damages; therefore, the limitations and exclusions noted herein may not apply.

*Effective: 02/08/19*