

GIBRALTAR
G-1350 M50-P1 Standard Foundation Bollard Array
Section 34 71 13
Passive Vehicle Barriers

PART 1 – GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the anti-ram passive vehicle barrier system defined herein at (*Insert Site Location Here*).

1.02 SYSTEM DESCRIPTION

A. The manufacturer shall supply a total passive vehicle barrier system of the Gibraltar G-1350 M50-P1 Standard Foundation Bollard Array. The system shall include all components required. The barrier shall comply with Gibraltar's System Drawing Number (*Insert Drawing Number Here*.)

B. The G-1350 M50-P1 Standard Foundation Bollard Array was tested to the pass requirements in accordance with ASTM F2656-07 and achieved a rating of M50 P1.

C. The G-1350 M50-P1 Standard Foundation Bollard Array shall consist of a minimum of three 10-inch (254mm) diameter Sch. 60 pipes with 1-1/2 inch (38mm) ASTM A572 internal support members embedded within a continuous concrete foundation. Arrays of greater than three bollards are considered certified when the rebar and foundation are expanded as shown in the Gibraltar drawing SL-1350.

D. Gibraltar products are tested by an ISO 17025 accredited testing facility.

1.03 QUALITY ASSURANCE

A. Gibraltar maintains a quality management system that is certified against ISO 9001-2008. All Gibraltar products are processed under this certified quality management system.

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

1.04 REFERENCES

- ASTM A36 Standard Specification for Carbon Structural Steel
- ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- ASTM A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- ASTM A572 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- ASTM D7803- Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Powder Coating
- 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 G155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
- 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 - Standard Test Method for Vehicle Crash Testing of Perimeter Barriers
- AWS D1.1/D1.1M - Structural Welding Code - Steel (2010)

1.05 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.06 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 vehicle barrier system shall conform to the G-1350 M50-P1 Standard Foundation Bollard Array manufactured by Gibraltar Material Distribution, L.P. in Marble Falls, Texas. This system shall be tested and certified to meet ASTM F2656-07, Impact Condition Designation M50, Penetration Rating P1, with the capability of stopping a 15,000lb vehicle traveling at speeds up to 50mph.

B. The entire anti-ram vehicle barrier system shall be obtained from Gibraltar.

C. Upon request, Gibraltar can supply a full set of "As Built" drawings for all security systems and civil work upon shipment in an easily accessible format.

2.02 MATERIAL

A. Steel material shall conform to the ASTM requirements shown in Table 1.

B. Gibraltar will provide material certifications with each order upon request.

Table 1 – Steel Material Requirements	
<u>Material</u>	<u>Specification</u>
Welded joints	Performed by welders certified to AWS D1.1
Steel tubing	ASTM A500
Steel Plates	ASTM A36/A572 Gr. 50

2.03 FABRICATION

A. Fabrication of the members shall be in accordance to manufacturer's instructions, the plan details, and this specification.

B. Shop drawings can be provided for site specific locations of each barrier upon request.

C. The G-1350 M50-P1 Standard Foundation Bollard Array coating system shall protect against the effects of long term corrosion. The standard coating is Hot Dip Galvanized to ASTM A123. When alternative color is required, the buyer will specify the coating type (wet paint, powder coat, etc.), color and design to the manufacturer at the time of ordering. If complex powder coat design is required, the manufacturer may use a combination of powder coat and wet paint processes to achieve the final design. For standard solid color coating, the powder coating will consist of a multi-step, two coat powder coating process. The bottom coat is a zinc rich primer followed by a standard semi-gloss black top coat. The powder coating system shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2. If the buyer specifies a galvanized, then powder coated finish, the powder coating will be applied in accordance with ASTM D7803.

Table 2 – Coating Performance Requirements		
<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 100% of test area
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 4,000 hours (Scribed per D1654; failure mode is accumulation of 1/8” coating loss from scribe or any blisters).
Impact Resistance	D2794	Impact Resistance over 120 inch lb. (using 0.5” ball).
Weathering Resistance	G155, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 40% loss of gloss or color variance of more than 3 delta-E color units).

D. All Gibraltar products are coated to the customer specification.

PART 3 - EXECUTION

3.01 PREPARATION

A. The purchaser shall indicate the location of passive vehicle barrier line with suitable stakes.

B. The purchaser shall indicate all underground utility locations, USC&G benchmarks, property monuments, and other underground structures that interfere with installation.

C. Before installing the G-1350 M50-P1 Standard Foundation Bollard Array, all necessary site clearing and grading shall be performed by the purchaser. An adequate clearance on both sides of the anti-ram vehicle barrier line is required.

E. The G-1350 M50-P1 Standard Foundation Bollard Array was designed for installation in standard compacted soil.

3.02 INSTALLATION

A. The barrier shall be installed per Gibraltar’s System Drawing Number (*Insert Drawing Number Here*). Construct concrete foundations to the dimensions specified by the plans. Excavate a properly sized area for post foundations and install reinforcing steel in accordance with the plans. Place the concrete, install the posts and plumb. Refer to contract or submittal plans for more installation details.

B. Gibraltar’s passive vehicle barriers are warranted against defects in material and workmanship on structural components for fifteen years when installed by a factory-trained installer.

3.03 MAINTENANCE

General maintenance of the G-1350 M50-P1 Standard Foundation Bollard Array shall consist of typical fence maintenance per the project specific facilities normal standards. This may consist of removal of vegetation, and visual inspection for evidence of tampering. If a vehicle impacts the barrier it is recommended that the owner and/or maintainer of the facility contact Gibraltar to purchase replacement parts.

3.04 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 anti-ram vehicle barrier system.