

GIBRALTAR
G-FORCE Post & Beam Anti-Ram Fence – M40 P2 System
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 Gibraltar's G-FORCE Post & Beam Anti-Ram Fence design. The system shall include all components (i.e., beams, braces, posts, and hardware) required. The barrier shall comply with Gibraltar's system drawing number (*Insert Drawing Number Here*).

B. The G-FORCE Post & Beam Anti-Ram Fence is ideal for anti-vehicle and anti-personnel layered approaches to security and exceeds established barrier system requirements.

C. G-FORCE Post & Beam Anti-Ram Fence can be sold with the Gibraltar Palisade or can be integrated with any anti-personnel fence. The G-FORCE Post & Beam Anti-Ram Fence uses a 6-inch (15.24cm) wide structural beam as a horizontal blocking member to impede vehicular ingress.

D. Gibraltar will provide any information requested pertaining to our products to local agents and users upon request to include manufacturing catalogs and/or device specifications.

1.03 QUALITY ASSURANCE

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

1.04 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

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

1.06 PRODUCT HANDLING AND STORAGE

- A. All Gibraltar products shall be packaged to protect the materials from damage during shipment.
- B. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurs during shipping or handling.
- C. For material handling, Gibraltar recommends the following:
- (1) For palletized materials, a 5,000lb (2,250 kg) capacity forklift shall be used. No palletized product shall exceed 3,500lb (1,600 kg).
 - (2) For non-palletized materials, a 10,000lb (4,500 Kg) minimum load capacity telehandler with proper rated rigging shall be used to ensure proper handling of products during storage or installation. Ignoring these recommendations may cause damage to material coatings or compromise the structural integrity of the product.
- D. All Gibraltar barrier products are coated to protect materials from the effects of exposure to all outdoor elements; however, when site storage is required Gibraltar recommends the following guidelines:
- (1) Short term storage (0-12 months): Store in such a manner to ensure proper ventilation and drainage. The storage location shall protect against damage, vandalism and theft.
 - (2) Long term storage (more than 12 months): In addition to the recommendations for short term storage, Gibraltar products shall also be covered to prevent exposure to the elements prior to installation. The purpose of this recommendation is to preserve the aesthetic appearance of the coating finish. Long term exposure to the elements naturally degrade coating appearances; therefore, proper storage is essential for ensuring preservation of the material.

PART 2 – MATERIALS

2.01 MANUFACTURER

- A. The anti-ram vehicle barrier system shall conform to the G-FORCE Post & Beam M40 P2 Anti-Ram Fence design manufactured by Gibraltar Material Distribution, L.P. in Marble Falls, Texas. This system shall be tested and certified by a certified independent testing laboratory to meet ASTM F2656-07, Impact Condition Designation M40, Penetration Rating P2, with capability of stopping a 15,000 lbs. vehicle traveling at speeds up to 40mph.
- B. The entire anti-ram vehicle barrier system, and all associated accessories, fittings, and fasteners shall be obtained from Gibraltar.

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.

<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.
- C. The G-FORCE Post & Beam Anti-Ram Fence coating system shall protect against the long-term 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 that interfere with installation, USC&G benchmarks, property monuments, and other underground structures.

C. Before installing the G-FORCE Post & Beam Anti-Ram Fence, 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.

D. The G-FORCE Post & Beam Anti-Ram Fence 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 the G-FORCE Post & Beam Anti-Ram Fence Owner’s Manual for more details on the system installation.

B. Gibraltar’s G-FORCE Post & Beam Anti-Ram Fence is warranted against defects in material and workmanship on mechanical components for fifteen years when installed by a factory-trained installer. The warranty is void if the product has been modified from its original configuration, damaged by previous impact, installed in a previous location, or suffered abnormal abuse.

C. Gibraltar provides training for all installers of Gibraltar products.

3.03 MAINTENANCE

A. General maintenance of the G-FORCE Post & Beam Anti-Ram Fence shall consist of typical fence maintenance per the project specific facility’s 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 for the repairs needed in order to keep the Gibraltar warranty active.

B. Gibraltar will supply an Owner’s Manual that contains spare parts lists.

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.