

GIBRALTAR
M50 P1 Wedge Barrier (G-2000 Series)
Section 34 71 13.19
Active Vehicle Barriers

PART 1 – GENERAL

1.01 WORK INCLUDED

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

1.02 SYSTEM DESCRIPTION

A. The manufacturer shall supply a total active vehicle barrier system of the Gibraltar M50 P1 Wedge Barrier design. The system shall include all components (i.e., frames, supports, posts, and hardware) required. The barrier shall comply with Gibraltar's System Drawing Number (*Insert Drawing Number Here*).

B. The Gibraltar M50 P1 Wedge Barrier was tested to the pass requirements in accordance with ASTM F2656-07 and achieved a rating of M50 P1. The barrier was tested to 8ft and 14ft-6in (2.4 m - 4.4 m) blocking widths. Both test reports were approved by the USACE PDC and are both on the DOD list of approved barriers. The USACE PDC has approved interpolation for barriers with blocking widths between 8ft and 14ft-6in (2.4 m - 4.4 m).

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

D. Gibraltar offers both Electro-Mechanical and Hydraulic operated units, both operating off 208V 3Ph 60hz power input (other options available at request).

E. All Gibraltar products are designed to operate in a wide range of environmental conditions. These include the following:

- (1) Ambient temperature ranges without heating or cooling systems: 32 °F (0 °C) to 150 °F (65 °C)
 - a.) heating and cooling options to be used when necessary
- (2) Ambient relative humidity range: 0% to 100%
- (3) High dust environments
- (4) Continuous immersion in up to 3ft (1 m) of water (IP 68 Rating)

F. The Gibraltar M50 P1 Wedge Barrier has a raised height of 36in (915mm) and the entire barrier sits flush to roadway when in the retracted position and shall be capable of supporting a 32,000-pound (14,515 kg) axel load.

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

H. Gibraltar active barriers can be integrated into multiple configurations.

I. The Gibraltar M50 P1 Wedge Barrier shall be capable of 300 complete up/down cycles per hour. The barrier shall be capable of instantly changing direction when cycling through normal operation. Deployment speeds are programmable to match customer specifications. During emergency operation, the barrier shall be capable of less than 1.5 second deployment to secured position with 5HP motor and less than 2 second deployment to secured position with 3HP motor. Normal operation shall be between 4 to 8 seconds.

J. In the event of electrical failure, the Gibraltar M50 P1 Wedge Barrier is designed to hold the last commanded position, including the raised position. The Electro-Mechanical Barrier shall be equipped with an IP68 rated stainless steel submersible brake motor that is capable of holding the raised position for extended periods of time. The Gibraltar Control system options include battery back-up and manual operating capability for use in event of power failure. Back-up operating equipment capable of a minimum three complete cycles (open and close) without use of manual system available upon request. Manual operating capability included as standard issue. Manual operation of barrier shall be simple and without need of special tools or knowledge.

K. The Electro-Mechanical Gibraltar M50 P1 Wedge Barrier shall be capable of performing a minimum of 250,000 complete up/down cycles with no parts replacement when properly maintained by a factory trained installer. Gibraltar provides a maintenance checklist in the Owner's Manual or via the Smart Inspecting phone application.

L. The wedge barrier shall not utilize any pneumatics, springs or assists other than the actuator and motor to deploy the barrier.

1.03 QUALITY ASSURANCE

A. All Gibraltar products are processed under the Gibraltar AISC quality management system. Each Gibraltar M50 P1 Wedge Barrier unit is cycled in house prior to shipment to ensure proper working order and calibration of limit switches.

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

C. Installer Qualifications: Engage an experienced Installer who has completed in last five years an active roadway barrier system installation similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

D. Nameplates: The vehicle barrier shall have the manufacturer's name, contact for service, and catalog or serial number permanently affixed to a plate securely attached to the equipment in a suitable location.

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 A529 - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
- ASTM A992 Standard Specification for Structural Steel Shapes
- 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. Shop drawings available upon request, the following can be found within the Gibraltar M50 P1 Wedge Barrier owner's manual:

- (1) Product data
- (2) Field testing guidelines
- (3) Operation and maintenance instructions
- (4) Spare parts list

B. A Crash Testing certification letter can be available upon request.

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. While Gibraltar does not assume responsibility for injury to persons or property during loading, unloading, transporting or installation, verbal guidance and additional written instructions are available upon request.

D. Gibraltar does not assume responsibility for insuring that the rigging and lifting gear is properly sized and attached when lifting heavy components. Equipment used shall be capable of handling product in an overhang position.

E. 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.

F. Upon delivery of Gibraltar M50 P1 Wedge Barrier control systems, the crate or pallets containing any electrical components shall be marked as such and stored in a covered location that ensures proper ventilation and drainage. The storage location shall protect against damage, vandalism and theft. Control cabinets may not be rated for outdoor exposure; therefore, higher storage measures should be taken.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. The active vehicle barrier system shall conform to the Gibraltar M50 P1 Wedge Barrier design 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 capability of stopping a 15,000 pound (6804 kilogram) vehicle traveling at speeds up to 50mph (80km/h).

B. Gibraltar products are designed and tested with standard steel components to meet ASTM F2656 requirements.

C. The entire active vehicle barrier system, and all associated accessories, fittings, and fasteners shall be obtained from Gibraltar.

D. Life cycle and duty cycle reports on Gibraltar anti-ram vehicle barrier systems are available upon request.

E. Traffic light type indicators/lighting can be installed per the customer requirements.

F. Upon request, Gibraltar can supply a full set of “As Built” drawings for all electronic, hydraulic, or mechanical systems work upon shipment in an easily accessible format.

G. All Gibraltar active anti-ram barrier products requiring control panels/switches, motors, sensors, etc., are installed and controlled per customer requirements.

H. Gibraltar can provide a Plug and Play product that can interface with other access control systems.

2.02 MATERIAL

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

Table 1 – Steel Material Requirements	
<u>Material</u>	<u>Specification</u>
Welding	Performed by welders certified to AWS D1.1
Steel tubing	ASTM A500
Solid round bars	ASTM A36/A529 GR50 Dual Grade
W-Beams	ASTM A992
Steel Plates	ASTM A36

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

2.03 FABRICATION

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

B. Upon request, shop drawings will be provided for site specific locations of each barrier.

C. The Gibraltar M50 P1 Wedge Barrier coating system shall protect against the effects of long term corrosion. Gibraltar can provide systems in galvanized with wet painted finishes. The standard coating design shall be all structural members hot-dip galvanized to ASTM A123. In addition to the galvanizing, the blocking beams are painted white. The blocking beam is coated with nonskid reflective glass beading and painted with 4in (102 mm) wide red reflective stripes 4in (102 mm) apart on the roadway surface. All stripes are diagonal at 45 degrees and pointing down and outward from the center of the blocking assembly. When alternative color pattern is required, the buyer will specify the custom color and design to the manufacturer at the time of ordering.

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

PART 3 - EXECUTION

3.01 PREPARATION

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

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

C. Before installing the Gibraltar M50 P1 Wedge Barrier, all necessary site clearing and grading shall be performed by the purchaser. An adequate clearance on both sides of the active vehicle barrier line is required.

D. Soil strength shall be equivalent to soil strength recorded during the ASTM F2656-07 certification test or the footer size and depth must be adjusted accordingly based on professional engineering analysis.

E. The barrier frame shall require no more than 14-inches (355 mm) depth to accommodate its foundation. An additional 4-inches (102mm) may be required for drainage connection pipes.

F. Power Lines: Where power and hydraulic lines are required and are below grade they must be protected with rigid electrical conduit. Where temperatures will exceed 100 °F (38 °C) for extended periods of time provide a cooling unit for the hydraulic fluid when a hydraulically operated barrier is installed.

3.02 INSTALLATION

A. The barrier shall be installed per Gibraltar's System Drawing Number (*Insert Drawing Number Here*).

B. Gibraltar active barrier products are warranted against defects in material and workmanship on fabricated barrier components for three years when installed by a factory-trained installer. Gibraltar will pass on the original manufacturer's 1-year warranty of all mechanical, electrical, electronic, and hydraulic components to the purchaser of any active barrier.

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

D. Where necessary, Gibraltar can provide operator training, supervisor training, and maintenance training.

3.04 MAINTENANCE

A. General maintenance of the Gibraltar M50 P1 Wedge Barrier shall consist of removing foreign materials from frame or sub-grade frame as debris may cause damage to the barrier and may cause safety concerns. Refer to the Gibraltar M50 P1 Wedge Barrier owner's manual for more details on the system maintenance.

B. Gibraltar will supply an operator manual that contains recommended maintenance intervals, procedures and replacement parts lists.

C. Maintenance instructions shall include routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guide. The instructions shall include piping layout, equipment layout and simplified wiring, and control diagrams of the systems as installed.

3.05 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