

**ELECTRIC DROP ARM
FIXED CRASH BEAM, REMOVABLE
MODEL DACB-FCB-400**

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent applicable. The publications are referred to within the text by the basic designation only.

- 1.1.1** AMERICAN SOCIETY OF TESTING (ASTM) F-2656, Standard Test Method for Vehicle Crash Testing of Perimeter Barriers
- 1.1.2** UNIFIED FACILITIES CRITERIA, Selection and Application of Vehicle Barriers
- 1.1.3** Department of Defense (DoD) ANTI-RAM VEHICLE BARRIER LIST, prepared by the Protective Design Center (PDC) located on Omaha, NE.

1.2 SYSTEM DESCRIPTION

- 2.1.1.** Active Drop Arm Crash Beam with ASTM M50 rating, certified to stop a 15,000 lbs. vehicle at 30 mph impact, with less than 1.9 meters of penetration. The DACB-FCB-400 Active Drop Arm manufactured by Barrier1 Systems at www.barrier1.us is approved or a pre-approved equal providing same capabilities.
- 2.1.2.** The design and structural materials of the vehicle barrier furnished shall be the same as those used in the crash tested barrier. Crash test must have been performed and data compiled by an approved independent, third party testing agency in accordance with ASTM F2656, where testing Agency is approved by ASTM and Department of Defense (DoD). Engineering of Record (EoR) for this product shall have discretion to make minor modifications to test article, required by site specific conditions or needs. The EoR must have integral knowledge of the barrier and its components, and certify that the minor modifications made do not reduce the stopping capability of the barrier as certified.
- 2.1.3.** The drop arms must achieve an ASTM M30 rating, with ability to stop vehicle in both the inbound and outbound traffic directions (bi-directional stopping capability).
- 2.1.4.** Crash beam is raised or lowered in about 4.0 seconds. Ability to slow down or speed up raise and lower speeds.
- 2.1.5.** All Electric Barrier components and operations. No hydraulic or pneumatic actuators or components.
- 2.1.6.** Additional surface set blocks connected in series or adjacent to the existing blocks to increase resistance force and reduce vehicle penetration upon impact. The adjacent blocks to be prefabricated with stainless steel plates, anchors, and cables for easy install. R&D from at least 3 past ASTM tests for the same product along with engineering must demonstrate what the vehicle penetration distance will be, based on the number of adjacent blocks connected in series on each side. Documentation must be provided.
- 2.1.7.** Barrier capable of relocating by picking up and moving, without damaging existing components or systems.
- 2.1.8.** Barrier arm to provide a visual deterrent and include safety yellow painted arm, flashing LED beacon lights, retro-reflective striping, and diamond grade stop signs.

- 2.1.9.** Custom control panels shall be designed and provided to meet the customer's requirements. Control panels to include LED lights, EFO buttons, raise and lower buttons, timers to close arms, and secondary control panels to operate barrier from other locations.
- 2.1.10.** Safety features to include safety loops cut into roadway plus 2 light beams (upper and lower) that prevents arm from coming down on vehicle below. Arm to immediately reverse itself if safety features are active. Traffic signal shall be provided to que vehicles.
- 2.1.11.** Trigger loops and timers to be provided to automatically raise and lower the arm and meet site specific traffic controls.
- 2.1.12.** Robust electric actuator with accordion water-proof cover enclosing actuator rod during extension and retraction shall be provided. Actuator shall be rated with IP-67. Actuator and all other electrical components subject to water damage shall be minimum of 6" off grade for protection against flooding.
- 2.1.13.** NEMA 4 Electronics Panel, actuator, electronics, and PLC shall be pre-assembled prior to delivery and ready for AC power supply connection. AC power supply required is one (1) 208/220/230V 1 phase 30A and one 110V, 20A. Optional UPS backup power is available.
- 2.1.14.** Barrier arm and components shall all be comprised of non-rusting stainless steel, aluminum, and hot dip galvanized steel. This includes the structural frames, bearings, arm, plated, covers, bolts, spacing, connections, and other parts.
- 2.1.15.** Aesthetic covers over top of end supports shall be non-rusting aluminum with industrial paint coat or stainless steel. Covers shall have locking stainless steel access doors that allow easy access to the electric actuator, electrical panels, parts, and components. Access panels shall allow for easy maintenance.
- 2.1.16.** Provide Spring assisted operation of barrier arm when being raised and lowered. Arm to have a "soft stop" at final raised motion and final lowered motion, using compression springs.
- 2.1.17.** Manually operated arm by 1 person if downtime occurs. Manual lockable arm.
- 2.1.18.** Electric drop arm shall accommodate differences in grade elevations between "left side" and "right side" of road without operational concerns or voiding crash test certification.
- 2.1.19.** Modular lead brick counterweights that can easily be removed and added to optimize raising and lowering arm.
- 2.1.20.** Pre-assembled drop arm barrier allows for installation in 1-day to minimize traffic disruption.
- 2.1.21.** Simple to use with minimal training. Minimal maintenance required.

1.3 SUBMITTALS

1.3.1. Drawings

Initial submittals with detailed drawings and specifications shall be provided for approval. Barrier system components, equipment, control panels, site layout, power requirements, subpanels, safety devices, and other components. Wiring diagrams shall be provided. Control panels and operational sequencing of devices shall be provided. Sign sizes and dimensions shall be provided. Alarms, signals, and lights shall be demonstrated in drawings. Bill of materials shall be included. Installation and set-up requirements shall be provided. Drawings containing wiring schematics shall be provided. Conduits and sizes shall be shown, and how systems integrate and connect.

1.3.2. O&M Manuals

Prior to turnover, Operations & Maintenance (O&M) manuals shall be submitted. The O&M manual shall cover operation of the vehicle barrier and periodic maintenance required. Maintenance manuals shall include routine maintenance procedures, checklists, and troubleshooting guide. Cut sheets on products and system components shall be provided.

1.3.3. Testing and Commissioning

Prior to turnover, Testing & Commissioning shall be completed. Field test to be performed so that each control panel button, traffic light, safety loop, safety light, and other features are tested. Formal Testing & Commissioning are completed with customer in field, where barrier system and operations are signed off as "APPROVED" prior to turnover.

1.3.4. Warranty

A standard 1-year warranty including Parts and Labor is provided and starts at acceptance in turnover date. The barrier manufacturer shall be the direct contact for warranty issues and questions and have immediate access to replacement parts. Manufacturer shall provide contact names, emails, and cell phone numbers to be contacted at nights, and weekends to address warranty concerns.

1.3.5. Spare Parts

Prior to turnover, a list of optional spare parts and supplies shall be provided with unit prices.

PART 2 PRODUCTS

2.1 DROP ARM CRASH BEAM

2.1.22. The barrier system consists of two steel prefabricated end supports with enclosures and barrier arm that is raised and lowered vertically across roadway. All operations are electric and there are no hydraulic or pneumatic components. The drop arm is crash test certified to stop a 15,000 lb. vehicle traveling at 50 mph. (ASTM M50). The barrier will stop both inbound and outbound vehicle impacts. All barrier arm clear span distances from 14' to 34' are ASTM M30 certified. The DACB-FCB-400 Active Drop Arm manufactured by Barrier1 Systems at www.barrier1.us is approved or a pre-approved equal providing same capabilities.

2.1.1. Barrier Functions

Raise or lower arm in about 4 seconds. High cycle capability with arm lengths at 22 feet and less. Surface set and no roadway modifications or no concerns with drainage. Modular design where barrier arm can be removed and replaced after a significant vehicle impact. If safety loop or safety light beam is interrupted by vehicle, the barrier arm will reverse its downward direction and raise up. Custom control panels and alarms. All electric operations (no hydraulics or pneumatics). Arm provides visual deterrent including flashing lights, retroreflective tape, and diamond grade stop signs. Surface set barrier which is pre-assembled and factory tested.

2.2 SYSTEM FEATURES

2.2.1 Movable

The barrier can be relocated without destroying or having to replace systems or components.

2.2.2 Bi-Directional Vehicle Arresting

The barrier will arrest vehicle impacts from either traffic direction with ASTM M30 certification. It is “bi-directional”.

2.2.3 Barrier Composition

The barrier shall be comprised on nonrusting parts and components which are stainless steel, hot dip galvanized, or aluminum with industrial paint coat.

2.2.4 Uninterrupted Backup Power Source

Power supply backup systems available to provide at least 10 uninterrupted cycles. Traffic signals, safety loops, PLC, and other components are also backed up during a power outage.

2.2.5 EFO Operation

The barrier system may include emergency fast operation button to lock down all arms while deactivating safety features.

2.2.6 Signs, Signals, Safety Loops

Signage, traffic signals, warning lights, audible alarms, safety loops and other devices shall be incorporated into the active vehicle barrier system to conform to site specific requirements.

2.2.7 Heating and Drainage

Barrier system shall operate in all weather conditions. System shall be equipped with thermostatically controlled heating inside power side enclosure to ensure normal operation in cold weather.

2.2.8 Counter

Barrier shall have electronic counter in PLC that tracks number or arm cycles.

2.6 ADDITIONAL OPTIONAL EQUIPMENT

A. Touch Screen Control Panels

Touch screen control panels are available at request of customer. Touch screen control panels can be provided inside NEMA 4 box at barrier location, and at control panel in guard house.

B. Wireless Remote Controllers

Wireless Remote controllers can be provided to raise and lower arm using a smart phone or using a separate remote controller. Customer can activate and deactivate wireless controllers/ devices.

C. Flashing Warning Lights- Pole Mounted

Pole-mounted flashing yellow warning lights can be provided to signal arm is being lowered.

D. Audible Warning

Provide a warning annunciator(s) at the barrier end support that produces an audible sound when the arm is being lowered.

E. Additional Blocks Connected Adjacent to Existing End Support Blocks

Additional surface set blocks connected in series or adjacent to the existing blocks to increase resistance force and reduce vehicle penetration upon impact. The adjacent blocks are prefabricated with stainless steel plates, anchors, and cables for easy install.

F. In Pavement Lights

In ground warning lights active when the arm is being lowered. Installed flush with pavement.

G. Controllers Inside Barrier End Support

Inside barrier end support enclosure, controls can be provided to raise and lower arm.

H. Camera at Barrier Arm Location and Fed to CCTV

Day / Night Camera installed at Barrier with view that continuously records to DVR and shows vehicles going in and out across barrier. Camera view is fed to CCTV. Continuous recording allows operator to review tail gating, vehicles hitting barrier, and other upset conditions.

2.6.2 Heaters and Cold Weather Package

Enclosure heaters with thermostat controls provided inside power side enclosure. Power side enclosure insulated. All doors shall have weather seals.

2.6.3 Signage

Additional barrier warning signs in retroreflective diamond grade are available on a site-specific basis.

2.6.4 Continuous Over Speed Detection System

Provide early warning to guards that vehicle(s) are approaching access control point (ACP) at high speed. Guards preset an alarm activation speed, where an alarm will activate if approaching vehicle(s) exceed the preset alarm speed. The over speed detection system will annunciate an audible and/or visual alarm. Over speed Detection System shall:

- a. Use digital wave radar technology that continuously reads all vehicles within radar detection zone.
- b. Continuously monitor speed of multiple vehicles in radar detection zone. Allow for easy changing the preset alarm activation speed desired.
- c. Set alarm activation at desired vehicle speed, with ability to change alarm activation speed in field using software.
- d. Customize radar detection zone distance (detection distance from 100 to 600 feet).
- e. Set radar detection for directionality, where it picks up inbound vehicles only.
- f. Integrate audio and/or visual alarms.
- g. Allows for multiple over speed detection zones within radar zone.
- h. Allow filtering of interferences that can cause false positives, using software capabilities built into system.
- i. Allow all weather use.
- j. Approved for use and installed at minimum of 10 facilities, where the radar's operational frequency has been determined not to interfere with operations on bases.

2.6.5 Wrong Way Detection

Provides early warning to guard(s) that vehicle(s) are traveling in wrong direction using audible and/or visual alarms. Wrong Way Detection shall provide:

- a. Detection at desired location(s) using magnetic detection loops installed in roadway. Vehicles traveling in wrong direction will trigger magnetic loops and send alarm signal.
- b. Multiple wrong-way detection locations with different ring tones and visual alarms for each zone.
- c. High reliability of detection.
- d. Integrate audio and visual alarms.

- e. Allow all weather use.

PART 3 EXECUTION

3.1.1 Installation

Perform installation in accordance with manufacturer's instructions, drawings, and submittals. Manufacturer's representative shall be present during equipment adjustments onsite and operation of the equipment provided. The manufacturer shall also be present during the testing, training and turnover of the barrier equipment and control systems. The DACB-FCB-400 Active Drop Arm manufactured by Barrier1 Systems at www.barrier1.us is approved or a pre-approved equal providing same capabilities.

3.1.2 Field Commissioning

Upon completion of installation and testing, perform a comprehensive list of all barrier testing with Customer present, and document results. Any failed operations of the barrier system disclosed by the test, shall be corrected at no additional cost to the Customer. If Customer requests modifications to operations different from design plans and submittals, extra costs will be incurred. Customer shall sign off on acceptance testing of barrier, prior to turnover.

3.1.2 Field Training

Field training shall be provided for up to 4 hours and shall start after the system is functionally complete. Customer shall have designated persons onsite for field training. Field training shall cover items contained in the operating and maintenance instructions.

END OF SECTION