



BLACK SECURITY PRODUCTS

AVBD 452

PRODUCT DATA · 2026



SHALLOW FOUNDATION WEDGE BARRIER

M50 P1 · CRASH-RATED ACTIVE VEHICLE BARRIER

A twelve-inch foundation instead of a pit. Crash tested to ASTM F2656-23 at M50, where a 15,120-lb truck at 51 mph was stopped in **0.45 ft** — against a P1 allowance of 3.31 ft. Listed on the DoD Anti-Ram Vehicle Barrier List.

12-INCH FOUNDATION

ASTM F2656-23 · M50 P1

MADE IN THE USA

DOD ANTI-RAM LIST

TWELVE INCHES INSTEAD OF A PIT.

The reason wedge barriers are hard to retrofit is not the barrier. It is the hole. A conventional wedge needs a pit deep enough to swallow the mechanism, which usually means relocating whatever utilities run under the lane, dewatering, shoring and rebuilding the road around it.

This one sits in a **twelve-inch slab**. At that depth the excavation is usually above the utilities rather than through them — and the civil work stops being the largest line on the estimate.

It gives up nothing to get there. The tested configuration holds an **M50 P1** rating under ASTM F2656-23 and is listed on the DoD Anti-Ram Vehicle Barrier List. The measured numbers, and the margin behind them, are on page 4.



After impact at Applus IDIADA KARCO — the cab has separated from the chassis.

STOPPED IN FIVE AND A HALF INCHES

P1 permits up to 3.31 ft of penetration. This barrier recorded **0.45 ft** — and a static penetration of ~0.75 ft, meaning it pushed the wreck back out of the protected zone.

12"

FOUNDATION
DEPTH

0.45'

MEASURED PENETRATION
P1 ALLOWS 3.31'

1.5s

EMERGENCY
DEPLOY

39"

BLOCKING HEIGHT
WHEN DEPLOYED

SPECIFIED & DEPLOYED FOR

Entry control points & ACPs
Military installations
Federal & agency facilities

Data centers & network facilities
Electric utilities & substations
Airports & seaports

Chemical & petroleum facilities
Ports, rail & logistics yards
Corporate & institutional campuses

ASTM F2656-23

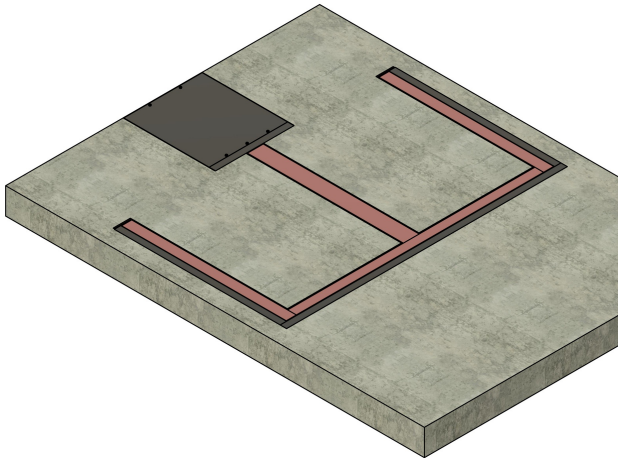
M50 · P1

LISTED — DOD ANTI-RAM VEHICLE BARRIER LIST

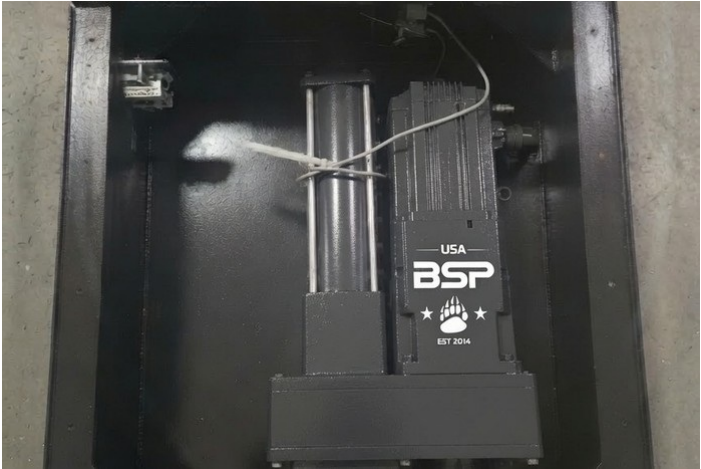
Crash tested by Applus IDIADA KARCO Engineering, 28 May 2024, report TR-P44175-01. Accepted by the U.S. Army Corps of Engineers Protective Design Center, March 2025 — see page 4.

THREE FINGERS. NOTHING TO WEAR OUT.

The barrier is a three-finger wedge driven directly by its actuator — hydraulic, hybrid or electric, to the site. There are no tracks, springs, pulleys or chains — the components that wear, seize, and let dirt and ice stop a conventional wedge from deploying.



Foundation and barrier recess — the wedge sits within a 12" slab.



The drive unit mounted inside the wedge frame — the whole mechanism, above the wedge line.

WHAT THE DESIGN REMOVES

No tracks or chains

A three-finger wedge driven straight from the actuator. Nothing runs in a track, so nothing packs with grit, and nothing stretches or breaks under cycle.

Sealed against the site

Dust, dirt, snow and sand cannot foul a mechanism they cannot reach. The barrier works in the conditions that stop conventional wedges.

One moving assembly

The wedge is the only thing that moves, and the actuator drives it directly. One motion path instead of a linkage chain, and one place to look if it ever needs attention.



Test article, deployed — 39° of blocking height.



Test article, retracted — flush, no axle limit.

AT A GLANCE	
Rating	M50 P1
Blocking width	8–14 ft
Blocking height	39"
Foundation	12" slab
Deploy	3–5 sec
Emergency	<1.5 sec
Axle load	No limit

THIRTEEN PERCENT OF WHAT P1 ALLOWS.



After impact — the cab has been torn from the chassis and the bed has continued past it. The barrier is in the foreground, still seated.

A 15,120-lb truck at 51.46 mph. Maximum dynamic penetration **0.45 ft** — against a P1 limit of 3.31 ft. That is roughly five and a half inches, and about **13 percent** of what the rating permits.

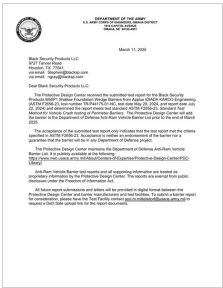
Static penetration was -0.75 ft. The vehicle was disabled and the pathway remained blocked.

WHY THE MARGIN MATTERS

A rating is a threshold, not a score. Two barriers can both hold P1 while one stops the vehicle at the line and the other stops it well short. Standoff is the difference, and standoff is what protects the asset behind the barrier.

THE TEST RECORD

ITEM	RESULT	ITEM	RESULT
Test authority	Applus IDIADA KARCO	Test vehicle	15,120 lb standard truck (M)
Report number	TR-P44175-01	Impact speed	51.46 mph
Test date	28 May 2024	Dynamic penetration	0.45 ft (limit 3.31 ft)
Standard	ASTM F2656-23	Static penetration	-0.75 ft
Rating achieved	M50 · P1	After impact	Disabled; pathway blocked



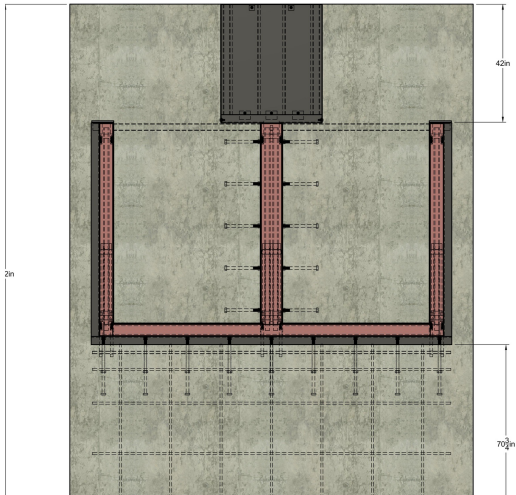
USACE PROTECTIVE DESIGN CENTER — ACCEPTANCE

The Protective Design Center reviewed the KARCO report and confirmed it meets ASTM F2656-23, adding the M50 P1 Shallow Foundation Wedge Barrier to the **DoD Anti-Ram Vehicle Barrier List** in March 2025. The list is published at nwo.usace.army.mil and can be checked by any customer. Acceptance confirms the report met the standard — it is not a DoD endorsement, and BSP does not present it as one.

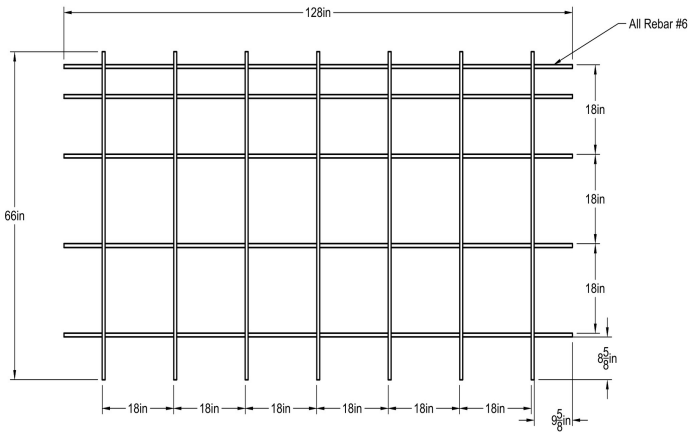
ASTM F2656-23	M50 · P1	LISTED — DOD ANTI-RAM VEHICLE BARRIER LIST
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A SLAB, NOT AN EXCAVATION.

The whole barrier is carried in a reinforced slab twelve inches deep. There is no pit, no shoring, no dewatering and no structure below the wedge — which is what turns a wedge barrier from a civil project into a paving operation.



Plan — 192" × 144" slab, barrier centered in the lane.



Reinforcing mat — #6 bar at 18" centers, 128" × 66".



Section — the barrier and its actuator sit entirely within the 12" slab depth.

WHAT SHALLOW REMOVES FROM THE JOB

Usually above the utilities

Twelve inches is shallower than most services running under a lane. What would otherwise be a utility relocation becomes a slab pour.

No shoring, no dewatering

A pit needs its walls held and its water pumped. A slab needs neither, which removes both the cost and the weather risk from the schedule.

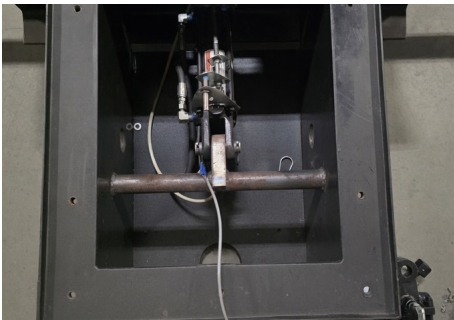
Nothing below to service

There is no chamber under the barrier to drain, light, ventilate or climb into. Maintenance happens at grade.

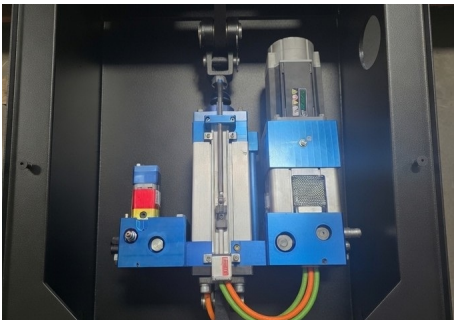
Slab	192" × 144" × 12" deep	Concrete	4,000 PSI min	Rebar	#6 at 18" o.c.
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THREE DRIVES. ONE BARRIER.

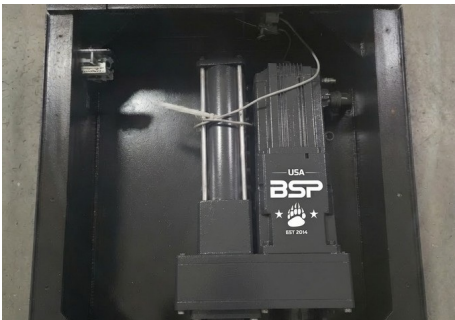
The wedge, the foundation and the crash rating do not change with the drive. All three are engineered to the same cycle times — three to five seconds under normal operation, under one and a half on emergency close — so the lane behaves identically whichever one is specified. What changes is what sits in the ground behind it.



Hydraulic — power unit and valving.



Hybrid — hydraulic actuation, sealed.



Electric — servo cylinder, no fluid.

CHOOSING THE DRIVE

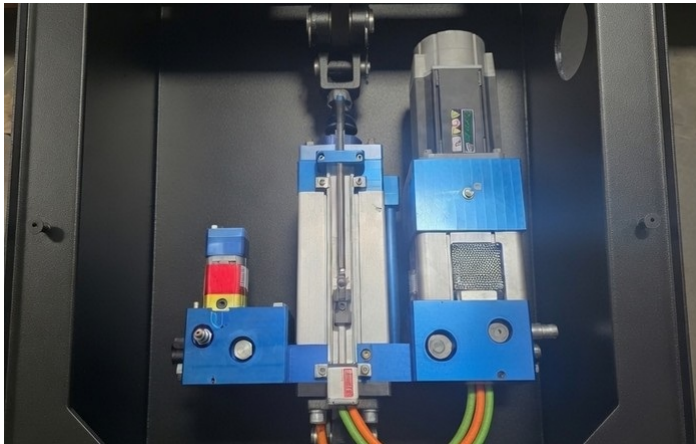
DRIVE	HOW IT ACTUATES	FLUID ON SITE	SPECIFIED WHEN
Hydraulic	Hydraulic power unit driving the wedge actuator	Reservoir and hose runs	The baseline — the simplest and most proven of the three, and the most economical to install and support.
Hybrid	Hydraulic actuation, self-contained	None	You want the reliability of hydraulic actuation without hydraulic fluid in the ground. No reservoir, no hoses.
Electric	Electric cylinder — servo motor, gearbox, belt drive and ball screw	None	The site or the specification does not permit hydraulic fluid at all. No pipes, no valves, nothing to leak.

OPERATING MODES — IDENTICAL ACROSS ALL THREE DRIVES

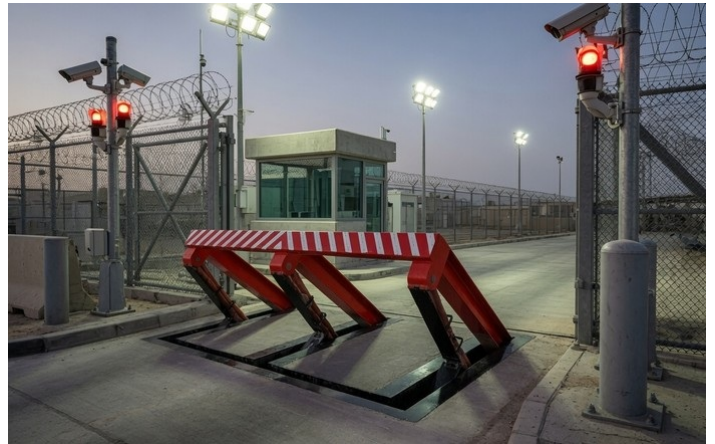
FROM	INPUT	RESULT
Fully open	Emergency Close	Secure position in under 1.5 seconds; alarm sounds until keyed reset
Fully open	Close	Secure position in standard operating time
Fully closed	Open	Fully open position in standard operating time
Part open, closing	Open	Reverses immediately and opens fully — slightly faster over the shorter travel
Part closed, opening	Emergency Close	Reverses immediately to the closed position in approximately 1.5 seconds

THE PARTS THAT FAIL ARE NOT IN IT.

Most wedge barriers do not fail structurally. They fail because a track packs with grit, a chain stretches, a spring fatigues or a pit floods — and the barrier will not deploy when it is asked to. The three-finger design has none of those parts, which is the reason it survives sites that defeat conventional wedges.



The drive acting directly on the wedge — no track, chain, spring or pulley between the two.



Deployed at a high-security entry point — the same mechanism, in service.

WHAT IT SURVIVES

Dust, sand and grit

No track for material to pack into and no chain run to abrade. The design is closed against the conditions that stop wedges at desert and industrial sites.

Snow and ice

No pit to fill and freeze, and no mechanism sitting at the bottom of one. An optional slab heater covers the coldest installations.

Heavy, constant traffic

No axle load limit when retracted, and no posted restriction for the heaviest vehicles using the lane — including the ones the barrier is there to stop.

1M+

CYCLE
DESIGN LIFE

10

CYCLES PER MINUTE
MAXIMUM RATED

0

TRACKS, CHAINS,
SPRINGS OR PULLEYS

LOW

MAINTENANCE
EFFORT

SIMPLICITY IS THE DURABILITY ARGUMENT

Every component removed from a design is a component that cannot wear, seize, corrode or need replacing. The three-finger wedge is driven directly by its actuator — the shortest mechanical path between the command and the barrier, and the fewest opportunities for that path to break.

EIGHT FEET TO FOURTEEN. ONE FOUNDATION DETAIL.

Blocking width is specified to the lane — eight to fourteen feet — and the barrier presents 39 inches of blocking height when deployed. Wider openings are covered by placing barriers side by side rather than by scaling a single unit beyond its tested configuration.

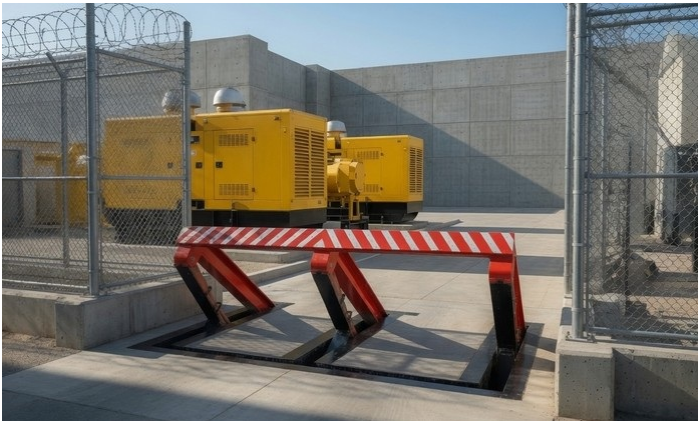
GEOMETRY	
Blocking width	8 to 14 ft
Blocking height	39" above grade (3.25 ft)
Foundation depth	12"
Slab	192" × 144"
Retracted profile	Flush, no axle limit
Wider openings	Barriers placed side by side

FINISH	
Standard	RAL 9005 — jet black
Standard	RAL 3020 — traffic red
Optional	RAL 7021 — black grey
Optional	RAL 1021 — colza yellow
Markings	Fluorescent stripes
Purpose	The approach reads the deployed state at distance

FINISH AND MARKINGS IN SERVICE



RAL 3020 traffic red with fluorescent striping, deployed at a data-center entry.



The same finish reading at distance across an industrial compound approach.

VISIBILITY IS PART OF THE BARRIER

Fluorescent striping is specified so an approaching driver reads the deployed state at distance. A barrier seen in time is a barrier that does not have to be tested — the finish is chosen for that job, not for appearance.

SPECIFY

Width	To the clear lane
Finish	RAL 9005 / 3020
Optional	RAL 7021 / 1021
Striping	Fluorescent

BUILT TO SIT INSIDE WHAT YOU ALREADY RUN.

The barrier is delivered with its own control panel, and integrates with third-party access control, detection and signaling rather than replacing it. Everything below is specified per project — none of it changes the crash rating, the foundation or the barrier itself.

OPTION	WHAT IT DOES
Master control panel	Centralized control of the barrier system, and of multiple barriers at one entry point.
Remote control panel	Operation from a guard position away from the lane.
Loop detector	Detects a vehicle or obstruction over the barrier and holds it open until the lane is clear.
Visual & audible alarms	Sound and light on emergency operation, continuing until the system is reset by key.
Battery back-up	Keeps the barrier operable through a power outage rather than stranding the lane.
Slab heater	Maintains operation in extreme cold, sized to the slab.
Drop arm integration	Pairs the wedge with a BSP M30 P1 Drop Arm, or with third-party security devices.
Traffic signals	Amber, or green and red, driven from the barrier position.

CONTROLLER

System	PLC, relays and timers	Traffic signals	Amber, or green and red
Operation	Momentary switch, raise or lower	Run-up timer	Adjustable, approx. 10 seconds
Position holding	Holds the selected position	Monitoring	Real-time, from the control panel
Status	Indicator lights for barrier position	Power	Per drive selection, see page 6
Audible alert	Sounds on emergency, until keyed reset	Enclosure	Delivered with the barrier

PART OF A BSP PERIMETER

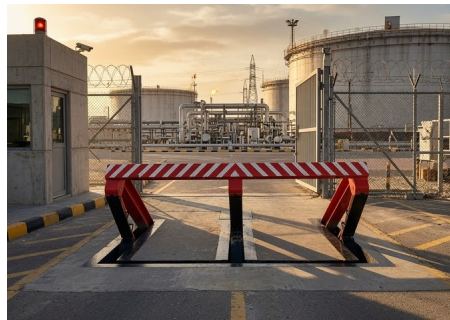
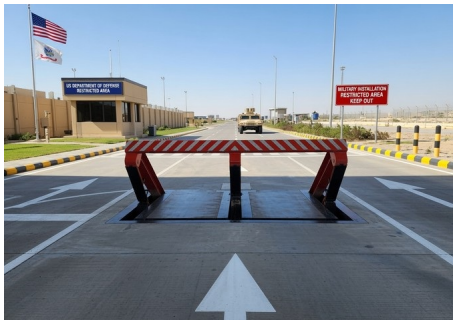
The wedge barrier holds the lane. Either side of it, the BSP **Passive Cable Barrier** carries the boundary; at openings that cycle constantly, the **M30 P1 Drop Arm** or **Bi-Folding Speed Gate** controls access. All are manufactured by BSP, and the crash-rated products are tested to ASTM F2656 and listed on the DoD Anti-Ram Vehicle Barrier List.

ONE MANUFACTURER ACROSS THE ENTRY POINT

Specifying the wedge, the gate and the boundary from one source means one set of drawings, one submittal package and one party responsible when the installation is inspected — rather than three vendors describing the same interface three different ways.

WHERE THE GROUND SAYS NO TO A PIT.

A wedge barrier is specified where the threat is a vehicle that will not stop and the requirement is to arrest it in the lane. A shallow one is specified where that has to happen on ground already full of services, on a live site, or inside a schedule that cannot absorb a deep excavation.



Installed M50 P1 Shallow Foundation Wedge Barriers — a DoD installation entry, an energy facility and a transportation terminal.

INDUSTRIES & FACILITIES SERVED

Entry control points & ACPs
Military installations & bases
Federal & agency facilities
Federal law-enforcement facilities

Data centers & network facilities
Electric utilities & substations
Chemical & petroleum facilities
LNG & energy infrastructure

Airports & seaports
Ports, rail & logistics yards
Embassies & diplomatic posts
Corporate & institutional campuses

SPECIFIED & INSTALLED FOR

BSP perimeter systems protect facilities for the U.S. Army Corps of Engineers, NAVFAC, the U.S. Air Force and federal agencies, alongside commercial operators in data-center, energy and logistics infrastructure. Named references are available under NDA for qualified projects.

RETROFIT IS THE HARD CASE

New construction can design a pit in. An existing entry point usually cannot — the services are already under the lane and the road cannot close for a month. Twelve inches is what makes the difference between adding a rated barrier and rebuilding the approach around one.

SITE ASSESSMENT

BSP provides free site assessments. Our engineering team reviews the approach, standoff, services under the lane and traffic before specifying width, finish and controls.

sales@blacksp.com
(512) 926-0800
blacksp.com/contact

SPECIFICATIONS & STANDARDS.

SYSTEM	
Crash rating	ASTM F2656-23, M50 P1
Measured penetration	0.45 ft dynamic · –0.75 ft static
Impact energy	1,698.68 kJ
Blocking width	8 to 14 ft
Blocking height	39" above grade (3.25 ft)
Foundation	Reinforced slab, 12" deep
Slab	192" × 144"
Concrete	4,000 PSI minimum
Reinforcement	#6 at 18" o.c., ASTM A615 Gr 60
Actuation	Direct-acting, three-finger wedge
Drive options	Hydraulic · hybrid · electric
Deploy / retract	3 – 5 seconds
Emergency deploy	Under 1.5 seconds
Cycling	6 – 10 cycles per minute
Hydraulic drive	10 HP, 1,800 RPM, 380–415 V, braking
Hydraulic pressure	725 psi (50 bar) max
Electric drive	Servo, 11 kW with brake, 1,500 rpm, IP67
Axle load	No weight restriction
Ambient range	14 °F to 140 °F
Controller	PLC, relays and timers
Finish	RAL 9005 or 3020; 7021 / 1021 optional
Markings	Fluorescent high-visibility striping
Warranty	1 year parts · 5 years labor
Origin	Manufactured in the United States

REFERENCE STANDARDS

ASTM F2656-23	Vehicle crash testing of perimeter barriers
ASTM A615	Deformed carbon-steel reinforcing bars
AWS D1.1	Structural welding
Buy American	Compliant

SECTION 34 71 19.16
ACTIVE VEHICLE BARRIER — WEDGE

PART 2 — PRODUCTS

2.01 MANUFACTURER

The active wedge vehicle barrier shall be the M50 P1 Shallow Foundation Wedge Barrier, AVBD 452, manufactured by Black Security Products, LLC, Houston, Texas. Blocking width [] ft.

2.02 PERFORMANCE

- A. The barrier shall be crash tested to ASTM F2656-23 at the M50 condition designation and achieve a P1 penetration rating.
- B. The as-tested configuration shall be listed on the U.S. Department of Defense Anti-Ram Vehicle Barrier List maintained by the USACE Protective Design Center.
- C. Maximum dynamic penetration in the certified test shall not exceed 0.50 ft.
- D. The barrier shall carry no axle load restriction in the retracted position.

2.03 FOUNDATION

- A. The barrier shall be installed in a reinforced concrete slab not exceeding 12 inches in depth. Pit-type excavation shall not be required.
- B. Concrete shall be 4,000 PSI minimum, reinforced with #6 bar at 18 inches on center.

2.04 OPERATION

- A. Actuation shall act directly on the wedge. Tracks, chains, springs and pulleys shall not be used. Drive shall be [hydraulic] [hybrid] [electric] as scheduled.
- B. Normal deploy and retract shall not exceed 5 seconds; emergency deploy shall not exceed 1.5 seconds.
- C. Emergency operation shall sound a continuous alarm until reset by key.
- D. The barrier shall hold the selected position on loss of command.

PROCUREMENT

CAGE	7MT82
DUNS	83-888-8670
NAICS	339999
CSI section	34 71 19.16
Product code	AVBD 452
Test report	TR-P44175-01
Origin	Made in the USA

ENGINEERING SUPPORT

Submittal drawings, CAD, O&M manual and foundation details on request. BSP engineering reviews the approach and the services under the lane before the slab is designed.



BLACK SECURITY PRODUCTS



STOPPED IN INCHES. NOT IN FEET.

Black Security Products designs and manufactures high-security perimeter protection systems for military installations, government facilities, data centers, utilities and critical infrastructure worldwide — with an emphasis on anti-terrorism and force protection.

PERIMETER SECURITY PRODUCT FAMILY

ACTIVE VEHICLE BARRIERS

Shallow Wedge M50 P1 — AVBD 452
Wedge Barrier M50 P1 — AVBD 451
M50 Drop Arm — AVBD 551/552
M30 P1 Drop Arm — AVBD 531
Defender Net Barrier — AVBD 651
Bi-Folding Speed Gate — AVBD 210
Anti-Ram Crash Gates — AVBD 230/250

PASSIVE VEHICLE BARRIERS

Drill-and-Set Bollard — AVBD 331
Crash-Rated Bollards — AVBD 300
Cable Barrier M30 — AVBD 131/132
Cable Barrier M50 — AVBD 151/152
Rapid Deployment MPPD — AVBD 700

SECURITY FENCING

SecurePale™ Palisade — AVBD 1101
SecureMesh™ — AVBD 1001
SecureMesh™ Integrated PVB — AVBD 1002
SecureMesh™ Delay — AVBD 1003
ENC Non-Conductive — AVBD 1200
Ballistic Rated Fence — AVBD 1300

HEADQUARTERS

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PROCUREMENT

CAGE 7MT82
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Made in the USA

REQUEST A FREE SITE ASSESSMENT

Talk to a BSP perimeter specialist about your project.

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