

# New Crash-Resistant Fixed Bollard Modules Protect Facilities from Terrorist & Errant Vehicles



**Tested to K12 & ASTM M50 P1**



Delta Scientific's DSC650 Shallow Foundation Bollard arrays are a downscaled version of the DSC600 arrays. The DSC650 fixed bollard modules will stop a 5000-pound (2300 kg) vehicle going 50 mph (80 kph) while the DSC600 array stops a 15,000-pound (6900 kg) vehicle going the same speed.

***Stops car bombers  
dead in their tracks***



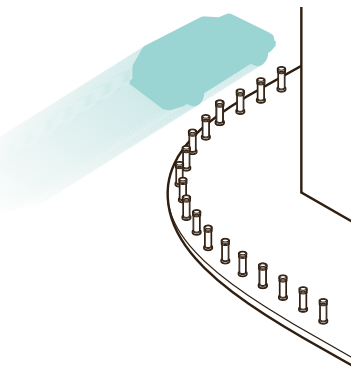


## No More “Make-Do” Fixes

There is a great demand for a crash-resistant device that is easy to install and attractive. Delta’s new DSC 600 Shallow Foundation Bollards will protect approaches to buildings, drop-off and passenger loading areas at transportation hubs, storefronts, sports arenas, office buildings and other presently unprotected locations where vehicle bombers and errant drivers have no obstacles to stop them. With the DSC 600 bollard modules, those facilities surrounded by streets, abutting sidewalks and set back on lawns, such as many state capitals, other government structures, stadiums, theaters, and commercial buildings, can now be effectively protected.

### Foundation only 14 inches (35.5 cm) deep

From using a vehicle to break into a pharmacy to stopping terrorists at airports, the DSC 600 provides a significant blocking device solution that continues to challenge security directors, how to easily install fixed bollards, especially on shallow substrates, including those that are not level or have turns. No longer will facilities, such as airports, the upper levels of parking structures and other unprotected locales have to use unsightly ‘make-do’ solutions to stop car bombers or wayward drivers.



CORNER ARRAY

With a foundation only 14 inches (35.5 cm) deep versus the four feet (1.2 m) typically required, Delta’s new DSC 600 Shallow Foundation Bollards can be installed within sidewalks, on top of concrete deck truss bridges or in planters as well as conform to the inclines and turns of a locale. The new 2-bollard modules, which can be arrayed in whatever length is required, will stop and destroy a 15,000-pound (66.7 kN) truck traveling 50 miles per hour (80 kph).

They have already successfully passed a K12 rating crash test, providing proof of their ability to provide high-energy stops. In fact, the DSC 600 is the first Shallow Foundation Bollard to successfully meet the U.S. Department of State Specification, Revision A that requires the bed of the attacking truck to go less than 39 inches (1 m) beyond the point of impact.

In its crash test on July 31, 2007, the penetration of the truck was only 15 inches (38.1 cm), with only minor damage to the DSC 600 bollards, meeting both the US and United Kingdom 1-meter requirements. Both bollards in the module were structurally sound and the foundation pad was intact. The system stood ready to accept a subsequent hit, a tactic employed by terrorists.

The DSC 600 bollard modules also eliminate the major installation problems of traditional barriers caused by rough surfaces and turns. Conventional barriers require surface areas to be completely leveled. On curves, setbacks often end up too close to the facility. With the new DSC 600 bollards, designers and installers can easily create corner and incline arrays since each 2-bollard module is stand-alone and does not need to be linked to others to create a system. Thus, the new fixed bollards will blend into curves, rough terrain or inclines easily. Setbacks can be as short as 2 feet (61 cm), providing a much greater safety cushion for the facility.

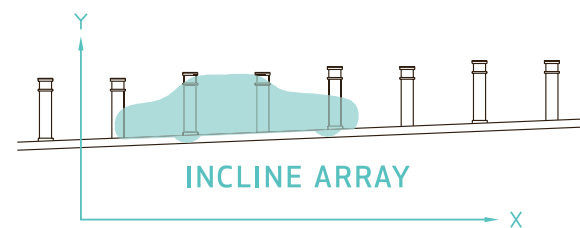
The DSC 600 Shallow Foundation Bollards are also perfect for high water table locations and areas with corrosive soils. The shallow foundation obviates the concerns of interference with buried water, gas and fuel pipes, storm drains, power lines and fiber optic communication lines. This foundation also reduces installation complexity, time, materials and corresponding costs. By simply staggering the DSC 600 bollard modules, installers can additionally provide protection to shallow underpinnings locales with uneven approaches and those with curves.

Additionally, since each 2-bollard module is independent, access to underground utilities is eased by having to lift out only one module instead of disassembling an entire system.

The bollards can even be architecturally enhanced to blend in with their surroundings using Delta's decorative bollard option.

The new bollard modules also meet the 1-meter clearance regulations mandated by the Americans with Disabilities Act (ADA). Although the DSC 600 bollards will let people pass through them, they will stop vehicles dead in their tracks.

The front to back length of a DSC 600 Shallow Foundation Bollard module is 7.5 feet (3 m).



## DSC650 Fixed Bollard Modules Rated PU50/P1

The DSC650 module functions as a standalone module or part of an extended array on shallow substrates, including those that are not level or have turns. Two modules are available. The first model provides a choice of having either one or two of the bollards being removable, to let vehicles through, and lockable so they cannot be removed by unauthorized people. The second is a corner module of 90 degrees featuring three bollards. Both versions are available with Delta standard or custom decorative cast aluminum or fiberglass coverings.

For easy installation, their foundation is only 12 inches (30.4 cm) deep. The DSC650 is also supplied with steel reinforcing mesh welded in place so that no additional rebar is needed.

The new DSC650 bollard modules were tested in accordance with ASTM Designation F 2656-07 Standard Test Method for Vehicle Crash Testing of Perimeter Barriers – August 1, 2007 with a rating of PU50/P1 with a 5,070 pound (2300 kg) truck traveling 50 mph (80 kph). The certified dynamic and final penetrations were less than 1 meter. As a result, the DSC650 successfully meets the U.S. Department of State Specification, Revision A that requires the bed of the attacking truck to go less than 39 inches (1 m) beyond the point of impact.

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## Also available in decorative models –

Like Delta's standard bollards, fixed bollards can be architecturally enhanced to blend in with their surroundings using Delta's decorative bollard option. Architects and security consultants can create any look they want, from fluted and tapered to various colors to adding rings and ripples. The bollards will blend with the rest of the architecture and façade of the facility.

To do so, a fixed bollard customer simply specifies having ornamental steel trim attached directly to the bollard or selects decorative cast sleeves in a variety of castings or their

own designs made of aluminum, iron or bronze. These sleeves slip right over the crash tube. Using the cast sleeve, project architects are virtually unlimited in styles and aesthetics. If damaged, the old sleeve is simply slipped off and a new sleeve slipped on. Bollards can be galvanized for corrosion resistance or filled with an internal warning light for increased visibility.



Delta Scientific Corporation is the leading worldwide manufacturer of vehicle access control equipment with over 260,000 square feet of production facilities in Palmdale, CA. Delta's three product lines consist of high-security vehicle barricade systems, parking control equipment and guard booths.

**Contact us today.**

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