



COUNTER TERROR & SECURITY SOLUTIONS



## The Threats

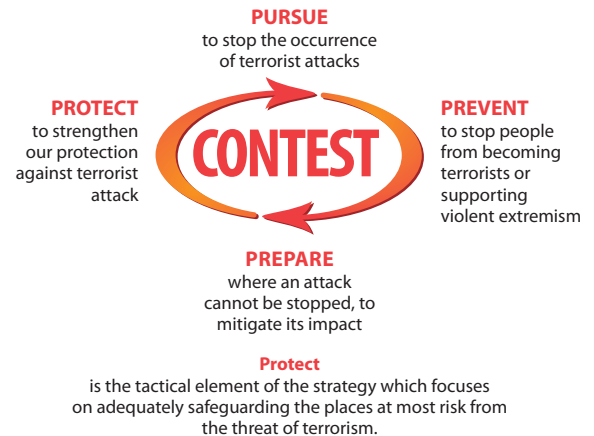
**The concept of terrorism is not new in the UK. However, following events in recent years, the threat of international terrorism has risen to unprecedented levels.**

The attacks on the USA in 2001, and more recently on the London transport system and Glasgow Airport have further highlighted the necessity to protect the UK's infrastructure.

Over the past few years, the terror threat level set by the UK government has fluctuated between 'substantial' and 'severe'. 'Substantial' means that there is a very real threat of an attack occurring without prior warning, with 'Severe' meaning that the possibility of an attack is highly likely.

International terrorist groups have stated their intent to deliberately target innocent people, with the aim of inflicting mass casualties, maximum damage and destruction.

In order to combat this threat, the UK government has devised an integrated counter terrorism strategy. The government's 'CONTEST' strategy incorporates four key strands, which complement and reinforce each other to help reduce the threat to the UK:



## Prepare and Protect

The 'Protect' strand of the strategy is driven by a number of government agencies:

The Home Office, Office for Security and Counter-Terrorism leads the work on delivering the CONTEST strategy, working closely with the UK Police and the Centre for the Protection of National Infrastructure (CPNI).

### CPNI

Centre for the Protection of National Infrastructure

Provides integrated security advice, training and awareness, including designing out vehicle borne terrorism. A key objective of the CPNI is to encourage the implementation of proportionate physical security measures to locations at potential risk across the UK.



The National Counter Terrorism Security Office is a police unit co-located with the CPNI. NaCTSO coordinates the activities of local police force Counter Terrorism Security Advisers (CTSAs), who deliver guidance on protecting a wide range of assets, including crowded places.

The areas at greatest risk of an attack and therefore require protection, are considered to be those which make up the critical national infrastructure.

This includes transport, emergency services and key utilities. Also considered are any 'crowded places' with large gatherings of people, from shopping centres and sports stadia, to commercial centres, rail stations and the public realm.

The use of 'Vehicle-Borne Improvised Explosive Devices' (VBIEDs) is recognised as being one of the most effective weapons in the terrorists' arsenal, with the capacity to inflict large scale damage and loss of life. This involves the use of vehicles containing an explosive device, driven into a target destination before being detonated.

To counter this threat, it is of key importance to keep hostile vehicles as far away from buildings and pedestrian areas as possible, through 'designing in' protective security measures to our streets and landscapes.

Through implementing effective security measures, we can create safe 'stand off distances' between these vehicles and their targets, which protect people and buildings in the event of a hostile attack.





# BSI PAS 68

## BSI PAS 68

Devised and administered by the CPNI, the BSI PAS 68 standard specifies a performance classification for vehicle security products and their foundations when subjected to a horizontal impact.

BSI PAS 68 involves the physical impact testing of perimeter security products at varying speeds with different vehicle types. This ranges from medium-sized saloon cars to large trucks, measuring the penetration of the load-carrying part of the vehicle beyond the security barrier. This enables businesses and organisations to make informed, proportionate decisions on security, necessary to meet their own individual requirements.

It is only through specifying products successfully tested to BSI PAS 68 that protective security can truly be assured, however this does not necessarily mean that the highest specifications of BSI PAS 68 protection are always required.

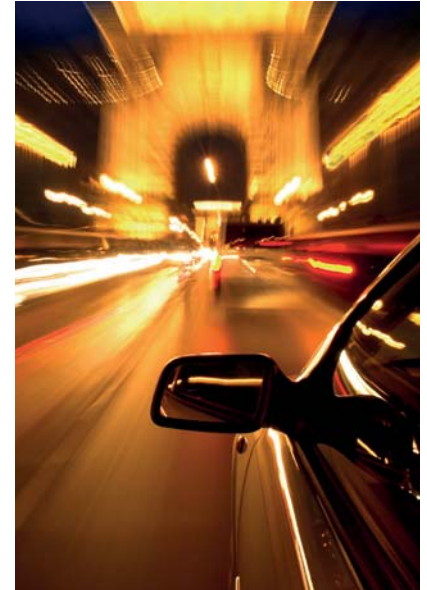
Depending on site-specific conditions, such as the traversability of the surrounding landscape, it is not always physically possible for larger vehicles to reach the required speed to carry out a successful attack. In these cases, lower, more cost effective levels of protection can be employed. This means that tested security and peace of mind can be achieved in proportion with all levels of risk, vulnerability and project budget.

## BSI PAS 69

**BSI PAS 68 is complemented by the BSI PAS 69 document, which provides guidance on the selection, installation, foundations and use of BSI PAS 68 security products, taking into account site-specific conditions.**

BSI PAS 69 suggests a maximum gap of 1.2m between the installed, upright faces of successive security products, to ensure that vehicles are prevented from passing freely between the barriers.

The table below provides the kinetic energy values (in kJ) created on impact, for each of the vehicle types and speeds used in BSI PAS 68 impact testing.



Vehicle Speed km/h (mph)	Vehicle Mass (kg)				
	1500	2500	3500	7500	32000
16 (10)	15kJ	25kJ	35kJ	74kJ	296kJ
32 (20)	59kJ	99kJ	138kJ	296kJ	1185kJ
48 (30)	133kJ	222kJ	311kJ	667kJ	2667kJ
64 (40)	237kJ	395kJ	553kJ	1185kJ	4741kJ
80 (50)	370kJ	617kJ	864kJ	1852kJ	7407kJ
96 (60)	533kJ	889kJ	1244kJ		
112 (70)	726kJ	1210kJ			

# RhinoGuard



COUNTER TERROR & SECURITY SOLUTIONS

**Rhino specialise in perimeter protection, providing exceptional security and peace of mind. Over the past fifteen years, the Rhino name has become synonymous with quality and trusted performance in the perimeter security market.**

**Rhino products are manufactured by Marshalls Street Furniture, a specialist business unit within Marshalls Plc, the UK's leading hard landscaping transformation company.**

## **RhinoGuard – Counter Terror & Security Solutions**

In order to meet the ever evolving security threats faced by modern day society, Marshalls Street Furniture has developed a specialist range within the Rhino perimeter protection portfolio, focused on providing high security and counter terrorist solutions.

RhinoGuard products are designed to provide effective hostile vehicle mitigation suitable for any application, in proportion with all levels of risk of an attack, site vulnerability and project budget.

## **Expertise**

Marshalls Street Furniture has assembled a highly specialised team of design engineers to develop RhinoGuard security products. Development places an emphasis on the importance of protective security measures being seamlessly integrated into the street scene, without compromising the aesthetics, character and accessibility of the surrounding landscape.

We also offer a wealth of security specification expertise and can advise the appropriate product for any scheme, ensuring that all security, aesthetic and budgetary objectives are met.

## **Security and Design Principles**

To fulfill the security needs of locations which require very different levels of perimeter protection, Marshalls Street Furniture has developed and successfully impact tested a range of new high security RhinoGuard bollards to BSI PAS 68.

Independently crash tested at the MIRA research facility, the RhinoGuard bollard cores provide assured impact performance at distinct levels of protection and budget.

The tested cores can be sleeved in a variety of cosmetic designs in steel and stainless steel, to meet individual project requirements.



Marshalls Street Furniture offers a full design and manufacture service for RhinoGuard BSI PAS 68 products, which can also be sleeved with Ferrocast polyurethane in bespoke styles, to complement any surrounding environment.

# RhinoGuard PAS 68 Bollards

## RhinoGuard 15/30

### Performance

**Vehicle:** 1.5 tonne saloon car

**Vehicle Speed:** 30mph (48km/h)

**PAS 68 Classification Code:**

Fixed Bollard V/1500/48/90:1.3/2.5

**Test results:** The bollard brought the vehicle to rest, immobilising it completely, making a second ram attempt impossible.

### Designed for

- Areas at lower risk of a high-energy vehicular attack
- Locations with tighter vehicle access, making it impossible for larger vehicles to reach significant speed
- Locations which require protection against criminal ram raiding.

The bollard provides the ideal security solution for a wide range of applications which previously would have required a generic 'anti ram' bollard specification, including:

- Retail parks
- Garage forecourts
- Supermarkets
- Protected parking
- Cash machine protection
- Public Realm Projects.

These locations can now achieve a guaranteed level of protection, which was previously unquantifiable and left somewhat to chance.

### Product Specification

**Core:**

- RhinoGuard 114mm core

**Outer Diameter:**

- Steel – **168mm**
- Stainless Steel – **129mm**
- Ferrocast Polyurethane – **designed to order**
- Height Above Ground – **1000mm**

### Sleeve Options

Available in a variety of standard sleeve designs in steel and stainless steel. See page 8 for standard sleeve options.



## RhinoGuard 25/40

### Performance

**Vehicle:** 2.5 tonne 4x4 utility vehicle

**Vehicle Speed:** 40mph (64km/h)

**PAS 68 Classification Code:**

Fixed Bollard V/2500/64/90:0.0/0.0

**Test results:** The bollard successfully brought the vehicle to a stop, with zero penetration beyond the bollard. The vehicle was completely immobilised, eliminating the chance of a second attack.

### Designed for

The bollard is ideal for applications requiring a higher level of protection and that are more vulnerable to a vehicular attack.

The bollard provides the perfect solution for sites where a medium-sized vehicle could reach considerable speed, but also where it would be physically impossible for a larger vehicle to gain access or achieve the required acceleration.

These can include:

- Rail Stations
- Sports Stadia
- Leisure Venues and Arenas
- Bus Depots
- Ports
- Public Realm Projects
- Large Shopping Centres.

### Product Specification

**Core:**

- RhinoGuard 168mm core

**Outer Diameter:**

- Steel – 194mm

- Stainless Steel – 204mm

- Ferrocast Polyurethane – **designed to order**

- Height Above Ground – 1000mm

### Sleeve Options

The RhinoGuard 25/40 is available in a variety of standard sleeve designs in steel and stainless steel. See page 8 for standard sleeve options.





# RhinoGuard PAS 68 Bollards

## RhinoGuard 75/40

### Performance

**Vehicle:** Fully-laden 7.5 tonne two axle rigid lorry

**Vehicle Speed:** 40mph (64km/h)

**PAS 68 Classification Code:**

Fixed Bollard V/7500(N2)/64/90:8.7/0.0

**Test results:** The vehicle was completely disabled, eliminating its ability to carry out a second attack. Penetration beyond the bollard was 8.7m.

### Designed for

The bollard is suitable for high risk applications and for sites with a sufficient stand-off distance between the bollard and the area it is protecting.

The bollard provides an ideal solution for locations where large vehicles capable of carrying out high-energy attacks are able to reach considerable speed. This includes:

- Rail Stations
- Sports Stadia
- Leisure Venues and Arenas
- Bus Depots
- Ports
- Public Realm Projects
- Large Shopping Centres.

### Product Specification

**Core:**

- RhinoGuard 168mm core

**Outer Diameter:**

- Steel – 194mm

- Stainless Steel – 204mm

- Ferrocast Polyurethane – **designed to order**

- Height Above Ground – 1200mm

### Sleeve Options

The RhinoGuard 75/40 is available in a variety of standard **flat top** sleeve designs in steel and stainless steel. See page 8 for more details.





Introducing protective security into an environment does not mean that the aesthetics of the surrounding area must be compromised.

RhinoGuard bollard cores have been developed and tested so that they can be specified with cosmetic sleeves in various materials, to complement any surrounding area.

## Sleeve Options

Standard sleeves designs are available in steel and stainless steel and can be specified with reflective banding for increased visibility and safety. Bespoke design commissions for other styles and finishes can also be accommodated on request.

### Steel

Steel sleeves are treated with the Akzo Nobel, Interpon PZ 770 system, being first treated with a zinc primer for enhanced corrosion protection and finished with a polyester powder topcoat. Bollards are supplied in Black RAL 9005 as standard; however a full range of RAL colours is also available.

Steel sleeves are available in three standard flat top designs; Plain and with single or double grooved reflective bands.

### Stainless Steel

Stainless steel sleeves are manufactured from a carefully selected Grade 316L (1.4401). Exceptionally strong and requiring very low maintenance, the material provides higher resistance to corrosion, pitting and staining, compared to other grades. Stainless steel sleeves are provided with a brushed satin finish as standard. A bright polished finish is also available on request.

Stainless steel cosmetic sleeves are available in six standard styles, which include plain, single and double-banded designs, with a choice of either a flat or mitred top.

## RhinoGuard 15/30



Steel

Stainless Steel Flat Top

Stainless Steel Mitre Top

## RhinoGuard 25/40



Steel

Stainless Steel Flat Top

Stainless Steel Mitre Top

## RhinoGuard 75/40 Sleeve Options

The RhinoGuard 75/40 bollard is available in the same standard **flat top** designs as the RhinoGuard 25/40 bollard. However, due to the slightly greater height of the RhinoGuard

75/40 core, the bollard has a total height above ground of 1200mm, as opposed to 1000mm for the RhinoGuard 25/40.

# Bespoke Design

## Ferrocast Polyurethane



Ferrocast is an engineering grade polyurethane, which can be cast into any shape around a steel core.

With Ferrocast, it is possible to cast pieces of street furniture which have an appearance and finish identical to cast iron but which have all of the benefits of polyurethane.

Ferrocast has successfully been used to replicate Victorian style bollards, lamp columns and post and rail systems, for schemes where existing street furniture needed to be replaced or complemented. Ferrocast has also more recently been used in the design of unique, contemporary street furniture.

Ferrocast is a low-maintenance solution that provides an exceptionally strong, non-ferrous

exterior which is completely resistant to the effects of rust and corrosion. Ferrocast polyurethane contains coloured pigments throughout to match the ultimate paint colour, meaning that in the event of any exterior damage, the appearance of scratches and abrasions are minimised.

RhinoGuard Ferrocast bollards can be designed in almost any style to complement any landscape and meet individual project requirements. Bollards can be designed to recreate an existing traditional theme ideal for heritage sites, or to create a more unique contemporary styling. The Design Team at Marshalls Street Furniture will help to take a design from concept to manufacture. Tooling for bespoke designs is simple, easy and cost effective.



Manchester, Westminster and Waterside styles shown above







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