Protective Street Furniture  PAS 68 / IWA 14
Marshalls has been manufacturing hard landscaping materials for over 120 years and has become the leading supplier of the products that create our urban environment.

Marshalls products are used nationwide by customers who are seeking reliable, high quality goods and services. Whether it’s innovative paving, sustainable drainage systems or street furniture, Marshalls is a brand that businesses can trust.

Indeed Marshalls has earned the status of Superbrand for seven consecutive years, an award bestowed only upon the most reputable, most influential brands in their field.

We believe it is all a consequence of our passion to create better, safer spaces.
Protective Street Furniture is not traditionally viewed as a product to enhance the landscape, more as a necessary evil to ensure our people, places and infrastructure are kept safe from threat. In most cases, crash-tested products are developed with minimal consideration given to the design.

Marshalls has flipped this on its head and taken a range of aesthetically designed street furniture products and incorporated protective RhinoGuard technology within. Through a selection of product types, materials and finishes, the specification of protective street furniture is made more inclusive for all parties.

Protective Street Furniture no longer needs to be limited to a line of bollards or heavy blocks, instead a space can be protected with lighting, seating, cycle parking or even a litter bin.

The usage and requirements for protective street furniture products can be broken down into three key areas:

1. HOSTILE VEHICLE MITIGATION
The primary objective of Hostile Vehicle Mitigation (HVM) is to remove or reduce the threat from hostile vehicles, through a variety of methods and techniques. The concept involves the careful consideration of a number of factors, including the effects of blast loading, assessments of vehicle dynamics and potential vehicle approach routes, solutions for vehicle exclusion and traffic calming. Marshalls has technical experts available who can advise on such considerations on a specific project basis.

2. RAM RAIDING
Ram-raiding is a variation on burglary in which a vehicle is driven at a location with the intention for perpetrators to breach physical security and to loot it. Commercial properties, shop fronts and ATMs are constantly under threat of attack from ram-raiders if not sufficiently protected. Intelligent application of protective street furniture can effectively secure a location from vehicle-borne threats without hindering the aesthetics.

3. VEHICLE RESTRAINT
As more vehicles frequent the country’s roads, the threat of accidental collision increases significantly. Effective vehicle restraint must be integrated into the design of urban spaces to protect people from vehicle collision in accident blackspots. This could be in a busy commercial office space, a major transport hub or even a mixed use residential area prone to the effects of harsh winter weather.

LEGISLATION EXPLAINED

PAS 68
At the heart of the concept of Hostile Vehicle Mitigation is the BSI PAS 68 standard. PAS 68 specifies a performance classification for vehicle security barriers and their foundations when subjected to a horizontal impact.

Whilst it is only through specifying products successfully tested in accordance with PAS 68 that protective security can truly be assured, this does not necessarily mean that the highest specifications of PAS 68 protection are always required.

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

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 encroaching freely between the barriers.

IWA
IWA is an international standard for counter terrorism impact testing agreements which incorporates PAS 68, PAS 69, CEN Workshop Agreement and, eventually, the PAS 170 standards. Hence, no matter where you are based or where you want to create a safe and beautiful space, the IWA workshop agreement standardises all counter terrorism impact testing agreements and models and combines them into one, making the testing and specification of products easier and clearer for all specifiers.

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The table above provides the kinetic energy values (in kJ) created on impact, for each of the vehicle types and speeds used in BSI PAS 68 and CWA 16221 impact testing.
JUST BECAUSE THE AREA HAS TO BE SAFE...

...DOESN’T MEAN THE DESIGN DOES TOO.

LET’S CREATE THE GREATER OUTDOORS
Our integrated street furniture ranges have everything you need to create spaces that people flock to. Places they can meet up, unwind and relax.

Our protective street furniture has been successfully crash tested in accordance with PAS 68. Whatever you’re looking for, whether it’s a specific product or a certain theme, you’ll find everything you need to create the greater outdoors.

Discover more at marshalls.co.uk/greateroutdoors
Choose the right Protective Product for your specification

STAGE 1
CHOOSE YOUR RATING
Once the appropriate speed rating has been determined, relevant products can be sourced.

STAGE 2
CHOOSE YOUR PRODUCT TYPE
Choose the type of street furniture you would like to specify in your design, i.e. bollards, seats, planters, litter bins, etc.

STAGE 3
CHOOSE YOUR AESTHETIC
Select from a wide range of materials and finishes to complement the architectural surrounding.

Furniture Selection Matrix

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<tr>
<th>Average Road Speed</th>
<th>Marshalls Protective Product</th>
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</thead>
<tbody>
<tr>
<td>Up to 30mph</td>
<td>RhinoGuard™ 15/30 Protective Core</td>
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<td>30-40 mph</td>
<td>RhinoGuard™ 25/40 Protective Core</td>
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<tr>
<td>40-50mph</td>
<td>RhinoGuard™ 75/50 Shallow Mount Protective Core</td>
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</table>

SLEEVE OPTIONS

Standard sleeve 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.

FINISH OPTIONS

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.

Steel (Powder coated)
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 Matt & Gloss RAL colours is also available upon request.

Geo Stainless Steel
The GEO bollard features a bead blasted grade 316 stainless steel body, and is finished with a contemporary machine finished stainless steel cap. Exceptionally strong and requiring very low maintenance, the material provides higher resistance to corrosion, pitting and staining compared to other grades.

Ferrocast
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. The material contains colour pigments throughout meaning in the event of any exterior damage, the appearance of scratches are minimized. Bollards are supplied in Black RAL 9005 as standard, however a full range of Matt & Gloss RAL colours is also available upon request.
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.

### STAINLESS STEEL – SLEEK STYLING

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<tr>
<th>BOLLARD TYPE</th>
<th>Core</th>
<th>Steel Sleeves</th>
<th>Stainless Steel Sleeves</th>
<th>Standard Depth</th>
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### STEEL (POWDER COATED) – CLASSIC STYLING

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### GEO – DEFINED BY UNDERSTATE ELEGANCE

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### FERROCAST – DESIGNED AROUND YOU!

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### Geo Stainless Steel

The full Geo range with integrated RhinoGuard can be found on page 18.

* Slimline: 204mm slimline sleeve provides a more subtle appearance.
**Rating: For example 15/30 = 1.5 tonne vehicle @ 30mph
*** Height Above Ground: The height the bollard stands above ground level.

**** Shallow Mount: Up to 75% less excavation required compared to some standard PAS68 systems, meaning a more cost effective installation
***** Standard Depth: Typical excavation required could be upto 1000mm compared to upto 250mm for shallow mount bollards.
MARSHALLS BELIEVES IN CREATING BETTER SPACES AND AS THE UK’S LEADING LANDSCAPE MATERIALS BRAND WE BELIEVE THAT IT’S IMPORTANT TO THINK AHEAD.

Future spaces is our ambition to foresee how the commercial public space we help design, build and share might adapt and evolve over the next ten years.

We set out to predict how changing lifestyles, technology and ecommerce conditions might dictate the look, feel, colour, shape, textures and materials used to create those spaces.

Future spaces is the result of our own intensive research including interviews with academics, industry commentators, journalists, architects, landscape designers, material specialists, engineers and futurologists.

Marshalls has identified four unstoppable global mega-trends driving 12 emerging themes that will most certainly change the nature of our built environment, both subtly and dramatically.

To find out more visit www.marshalls.co.uk/futurespaces

We decided to put these findings to the test and worked with our technical design specialists to provide 3D future visualisations incorporating our range of protective street furniture to denote that safe spaces can be beautiful spaces. We believe protective street furniture shouldn’t clutter but enhance whilst also protecting our shared spaces. Three key scapes have been identified requiring protective street furniture products:

- Mixed Use Space
- Commercial Space
- Transport Space

The blurring of public / private spaces and the need for environments to be designed to serve multiple functions for different types of users will mean spaces will have to work harder and be as flexible as possible whilst encouraging placemaking and social interaction.

As global urbanisation accelerates, cities need to be able to continue to function properly under increasing, multiple stresses. To do that, cities must be consciously designed to resist the impacts of natural, social, political and economic events.

3D sketch up models, mood boards and visualisations are available upon request for all your protective street furniture project requirements. Visit www.sketchup.com and search Marshalls Protective Street Furniture or speak to your sales representative.
Providing effective protection of critical infrastructure, people and places, Marshalls introduces the 15/30 Protective Bollard, providing proven levels of performance at a distinct level of protection and budget.

Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key.

The core diameter is Ø114mm with three sleeve options: steel, stainless steel and Ferrocast.

The system has been designed and tested showing it meets the requirements of PAS 68 and achieved a successful certificated rating.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Excavation depth (mm)</th>
<th>Core Diameter (mm)</th>
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<th>Core Weight (Kg)</th>
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Vehicle: Unladen 1.5 tonne saloon car
Vehicle Speed: 30mph (48km/h)
PAS 68 Classification Code: Standard Bollard
PAS 68-2007/7/1500/5146/991.3/0.0

For sleeve style options please see page 6.
Typical protective PAS 68 bollard foundations consist of a combination of concrete and steel reinforcement, with some product available requiring up to 1000mm of depth below ground. However, for many sites requiring safety and protection, the existence of underground utilities and cramped building foundations can prohibit this level of excavation without serious disruption.

Marshalls helps tackle the shallow excavation problem with the RhinoGuard™ 25/40 Shallow Mount Protective Bollard, requiring up to 75% less excavation than some standard PAS 68 systems, resulting in a cost effective installation and less time spent on site. Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key.

If the application requires protective bollards of standard depth and of a 25/40 PAS 68 rating, Marshalls is able to provide you with the version of the RhinoGuard™ 25/40 Protective Bollard.

The difference is only visible under the ground, meaning the installation will not compromise aesthetics at any cost. It is a perfect solution for sites where medium-sized vehicles can be viewed travelling at average speeds up to 40mph.

For sleeve style options please see page 6.

### RhinoGuard™ 25/40 Protective Bollard

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Excavation depth (mm)</th>
<th>Core Diameter (mm)</th>
<th>Height Above Ground (mm) (FGL)</th>
<th>Core Weight (Kg)</th>
<th>Sleeve diameter</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>RhinoGuard™ 25/40 Protective Bollard</td>
<td>600</td>
<td>Ø168</td>
<td>1000</td>
<td>180</td>
<td>Ø194 Ø204</td>
<td>Steel/Powder Coated</td>
</tr>
<tr>
<td>RhinoGuard™ 25/40 Shallow Mount Protective Bollard</td>
<td>152</td>
<td>Ø168</td>
<td>1000</td>
<td>180</td>
<td>Ø204</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Various</td>
<td>Ferrocast</td>
</tr>
</tbody>
</table>

*Cap and Core finish also available. For further information, please contact our sales office on 0370 600 2425.

Test 1
Vehicle: Unladen 2.5 tonne 4x4 utility vehicle
Vehicle Speed: 40mph (64km/h)

PAS 68 Classification Code: Standard Bollard
PAS 68:2007/V/2500(M2)/64/90.0.0/0.0

PAS 68 Classification Code: Shallow Mount
PAS 68:2010/V/2500(M2)/64/90.2.3/0.0
Typical protective PAS 68 bollard foundations consist of a combination of concrete and steel reinforcement, with some product available requiring up to 1000mm of depth below ground. However, for many sites requiring safety and protection, the existence of underground utilities and cramped building foundations can prohibit this level of excavation without serious disruption.

Marshalls helps tackle the shallow excavation problem with the RhinoGuard™ 75/40 Shallow Mount Protective Bollard, requiring up to 75% less excavation than some standard PAS 68 systems, resulting in a cost effective installation and less time spent on site. Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key.

If the application requires protective bollards of standard depth and of a 75/40 PAS 68 rating, Marshalls is able to provide you with the standard version of the RhinoGuard™ 75/40 Protective Bollard.

The difference is only visible under the ground, meaning the installation will not compromise aesthetics at any cost. It is a perfect solution for sites where medium-sized vehicles can be viewed travelling at average speeds up to 40mph.

The system has been designed and tested showing it meets the requirements of PAS 68 and achieved a successful certificated rating

Vehicle: Fully laden 7.5 tonne two axle rigid N2 lorry
Vehicle Speed: 40mph (64km/h)

PAS 68 Classification Code: Shallow Mount:
PAS 68:2013/V/7500(N2)/64/90:1.8/0.0

PAS 68 Classification Code: Standard Bollard:
PAS 68:2010/V/7500(N2)/64/90:8.7/0.0

**Product Name**

<table>
<thead>
<tr>
<th>Excavation depth (mm)</th>
<th>Core Diameter (mm)</th>
<th>Core Weight (Kg)</th>
<th>Sleeve diameter</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>RhinoGuard™ 75/40 Protective Bollard</td>
<td>608</td>
<td>Ø214</td>
<td>2.50</td>
<td>Ø214</td>
</tr>
<tr>
<td>RhinoGuard™ 75/40 Protective Bollard</td>
<td>608</td>
<td>Ø214</td>
<td>2.50</td>
<td>Ø214</td>
</tr>
<tr>
<td>RhinoGuard™ 75/40 Protective Bollard</td>
<td>608</td>
<td>Ø214</td>
<td>2.50</td>
<td>Various</td>
</tr>
</tbody>
</table>

*Cap and Core finish also available. For further information, please contact our sales office on 0370 600 2425.

RhinoGuard™ 75/40 Protective Bollard

For sleeve style options please see page 6.
Providing effective protection of critical infrastructure, people and places, Marshalls introduces the RhinoGuard™ 72/50 Shallow Mount Protective Bollard, providing proven levels of performance at a distinct level of protection and budget.

Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key. The core diameter is Ø244mm with three sleeve options: steel, stainless steel and Ferrocast. The system has been designed and tested showing it meets the requirements of PAS 68 and achieved a successful certificated rating.

For sleeve style options please see page 6.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Excavation depth (mm)</th>
<th>Core Diameter (mm)</th>
<th>Height Above Ground (mm) (FGL)</th>
<th>Core Weight (kg)</th>
<th>Sleeve diameter</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>RhinoGuard 72/50 Shallow Mount</td>
<td>175</td>
<td>Ø244</td>
<td>1000</td>
<td>644</td>
<td>Ø273</td>
<td>Steel Powder Coated</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>Ø244</td>
<td>1000</td>
<td>644</td>
<td>Ø256, Ø273</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>Ø244</td>
<td>1000</td>
<td>644</td>
<td>Various</td>
<td>Ferrocast</td>
</tr>
</tbody>
</table>

Vehicle: 7.2 tonne two axle rigid N2 lorry
Vehicle Speed: 50mph (80km/h)
Classification Code: IWA 14-1:2013 Bollard V/7200(N2A)/80/90/5.7
Providing effective protection of critical infrastructure, people and places, Marshalls introduces the 75/50 Protective Bollard, providing proven levels of performance at a distinct level of protection and budget.

The RhinoGuard 75/50 protective bollard has a Ø244mm core as standard but is also available as a slimline product that can accommodate the Ø204mm sleeve for a more subtle appearance.

Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key.

Both the cores are available with three sleeve options; steel, stainless steel and Ferrocast.

The system has been designed and tested showing it meets the requirements of PAS 68 and achieved a successful certificated rating.
Typical protective PAS 68 bollard foundations consist of a combination of concrete and steel reinforcement, with some product available requiring up to 1000mm of depth below ground. However, for many sites requiring safety and protection, the existence of underground utilities and cramped building foundations can prohibit this level of excavation without serious disruption.

Marshalls helps tackle the shallow excavation problem with the RhinoGuard™ 75/30 Shallow Mount Protective Bollard, requiring up to 75% less excavation than some standard PAS 68 systems, resulting in a cost effective installation and less time spent on site.

Our successfully crash tested RhinoGuard™ technology is built into the core, with a sleeve being placed over it to provide a more attractive finish in all locations where aesthetics and safety are key. The core diameter is Ø168mm, supplied with a shallow frame and has three sleeve options: steel, stainless steel and Ferrocast.

The system has been designed and tested showing it meets the requirements of PAS 68 and achieved a successful certificated rating.

For sleeve style options please see page 6.
The introduction of appropriate physical security measures into crowded places and the critical national infrastructure is essential in ensuring that the UK is protected from vehicle borne threats. It is vital that landscapes remain safe and functional yet attractive, in order to be appreciated by the communities that use them.

Igneo is a modular seating system that offers unique contemporary styling, combined with functionality and exceptional impact performance. It can be specified to any length, using any number of modules, dependant on location and the amount of seating places required. Armrests can be installed between seating sections in most RAL colours available to match individual requirements. The seat is available in two colours as standard, coordinating with Marshalls paving.

- Successfully tested based on Government PAS Standards
- Manufactured from Marshalls’ fibre reinforced precast concrete, which makes the seat an extremely durable solution, requiring minimal maintenance
- Supplied with anti-graffiti coating as standard
- Armrests made from Ferrocast for a longer life span and minimal maintenance (optional)

To create a co-ordinated result, Igneo Litter Bin, Chair and Appia Bollard complement the seat, together with the Giove Protective Planter and our stainless steel and Ferrocast sleeved bollards.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Seat Span (mm)</th>
<th>Seat Height (mm)</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igneo 75/40 Protective Seat - centre section</td>
<td>1102</td>
<td>474</td>
<td>Concrete</td>
</tr>
<tr>
<td>Igneo 75/40 Protective Seat - left/right section</td>
<td>1037</td>
<td>474</td>
<td>Concrete</td>
</tr>
</tbody>
</table>

*Please note, the installed spacing between Igneo seating and the outer face of the next successive security measure should be a minimum of 900mm

Vehicle: Fully laden 7.5 tonne two axle rigid N2 lorry
Vehicle Speed: 40mph (64km/h)
PAS 68 Classification Code:
Test 1: Centre: PAS 68:2010:V/7500(N2)/64/90:3.7/0.0
Test 2: Off Centre: V/7500(N2)/64/90:3.5/0.0
Introducing adequate seating facilities is an essential aspect of public realm design. Seating provides people with areas to rest and enjoy their surroundings, and can contribute towards the overall character and identity of an outdoor space.

Marshall’s has developed and impact tested an innovative frame structure, designed to fit seamlessly inside an array of seating styles, providing the ultimate in integrated security solutions. This highly engineered RhinoGuard™ technology signals a remarkable breakthrough in the security industry, enabling exceptional levels of protection to be incorporated into the natural street scene, whilst enhancing both the functionality and design of our public spaces. The structure has been developed to enable seating styles in various materials to be designed around it to coordinate with any environment, and is supplied shrouded with the elegant ‘EOS’ design as standard.

The seat ends are manufactured using our durable Ferrocast polyurethane material, and can be supplied in a wide selection of RAL colours to coordinate with the surrounding environment. Seating slats are manufactured from FSC sourced Iroko hardwood timber, whilst a perforated steel front panel adds to the contemporary design. Utilising the experience and knowledge of our team of design engineers, we can develop bespoke seating styles in many materials, to disguise the crash tested structure and meet the requirements of any project.

To create a co-ordinated result, our Giove Protective Planter and our stainless steel and Ferrocast sleeved bollards are a great choice.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Seat Span (mm)</th>
<th>Height Above Ground (mm)</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOS 75/30 Protective Seat</td>
<td>1800</td>
<td>875</td>
<td>Ferrocast and Timber</td>
</tr>
</tbody>
</table>

*Please note, the installed spacing between the 75/30 Seat Frame and the outer face of the next successive security measure should be a maximum of 900mm.

Vehicle: Fully laden 7.5 tonne two axle rigid N2 lorry
Vehicle Speed: 30mph (48km/h)

PAS 68 Classification Code:
Test 1: Front Facing (Centre): PAS68:2010/48/90.0.0/0.0
Test 2: Back Facing (Centre): V7500/48/90.3.1/0.0
Test 3: Back Facing (Off Centre): V7500/48/90.2.7/0.0
Protecting people, places and existing infrastructure is very important in all spaces, from traditional to commercial and urban environments. However, keeping spaces and their people safe does not have to compromise the aesthetics of the surrounding areas.

Marshalls introduces the RhinoBlok™ 72/40 Protective Seat, a seat which has inner strength, outer beauty and protects people, places and infrastructure without compromising the appearance of the space.

RhinoBlok™ is made from concrete and comes in a variety of finishes: plain smooth grey, stone effect finish to integrate with existing paving or you can add a timber cladded top for a natural look. RhinoBlok™ can also be utilised as the basis of a timber planter, making it harder to be detected while keeping the aesthetics of the surrounding space.

The seat has been designed and tested showing it meets the requirements of IWA14-1:2013 and achieved a successful certificated rating.
GEO
Coordinated Range

The coordinated GEO range with integrated RhinoGuard™ Protective Technology reflects the best of modern urban design: simplicity, sustainability and robust materials in a low profile form.

The GEO “shadow gap” design theme continues throughout the product range to enhance the sense of place and identity. This enables a consistent project signature to be established and helps minimise visual clutter.

The range consists of a bollard, lightstack, living wall, fingerpost, litter bin and lamppost, all with the possibility of integration.

The GEO Living Wall with integrated protective technology combines natural landscaping with the requirement to protect and secure a public space. The 1m high unit features three upright PAS 68 certified GEO bollards with an integrated steel frame to encourage extensive plant growth throughout the product. The product utilises winter hard ivy to ensure dense growth all year round with limited maintenance.

For more information, please contact our sales office on 0370 6002425.
Introducing trees and planting into urban landscapes provides numerous benefits, with research showing positive effects on social and environmental well-being, evoking a sense of pride of place within communities.

To facilitate the integration of attractive planting into our public spaces whilst also mitigating the threat of vehicle-borne attacks, Marshalls has developed and impact tested a high strength steel frame, designed to fit inside a range of planters.

The RhinoGuard™ frame allows for the root ball of a medium sized tree to be contained inside the planter, providing landscape architects with the freedom they require to introduce creative planting solutions into the built environment. The high strength frame is designed to fit seamlessly inside a range of cosmetic planter styles in various materials, providing a design-led, high performance security solution that can both aesthetically enhance and protect any scheme.

Planners are available in both traditional and contemporary designs, with a variety of material options, including concrete, timber and steel. For larger schemes, the frame also provides an ideal opportunity for completely bespoke solutions.
**Protective Planters**

**Integrated RhinoGuard™ Technology**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Excavation depth (mm)</th>
<th>Height Above Ground (mm)</th>
<th>Width (mm)</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>RhinoGuard™ 75/50 Protective Planter Frame</td>
<td>950</td>
<td>955</td>
<td>952</td>
<td>Powder Coated</td>
</tr>
<tr>
<td>RhinoGuard™ 75/50 Protective Planter Frame with Giove Planter</td>
<td>950</td>
<td>1090</td>
<td>2000</td>
<td>Precious Stone</td>
</tr>
</tbody>
</table>

**Test 1 (frame)**

Vehicle: Fully laden 7.5 tonne two axle rigid N2 lorry  
Vehicle Speed: 40mph (64km/h)  
PAS 68 Classification Code: PAS 68:2010/V/7500(N2)/64/90:0.0/0.0

**Test 2 (frame)**

Vehicle: Unladen 7.5 tonne two axle rigid N3 lorry (empty 18 tonner)  
Vehicle Speed: 50mph (80km/h)  
PAS 68 Classification Code: PAS 68:2010/V/7500(N3)/80/90:3.8/35.5

**Test 3 (frame with Giove planter)**

Vehicle: Unladen 7.5 tonne two axle rigid N3 lorry (empty 18 tonner)  
Vehicle Speed: 50mph (80km/h)  
PAS 68 Classification Code: PAS 68:2010/V/7500(N3)/80/90:1.7/0.0

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**Street Furniture**

<table>
<thead>
<tr>
<th>Sineu Graff Marquise Planter</th>
<th>Sineu Graff Optima Planter</th>
<th>Sineu Graff Domino Planter</th>
</tr>
</thead>
</table>

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**www.marshalls.co.uk/pas68**
Problem
The client BAM Construction was seeking a solution to protect the glass frontage of the shops and restaurants located at this leisure park. A depth restriction of 200mm was placed on any installed products.

The client was seeking protective products which complemented the modern surroundings of the leisure park.

The client also required a range of other street furniture products, such as cycle and motorcycle stands.

Solution
Marshalls worked with the client to find the best solutions for this project. Because of the depth restriction placed on installation in certain areas, 5 No RhinoGuard™ 25/40 Protective Bollards and 25 No 25/40 Shallow Mount Protective Bollards were chosen. The client opted for Stainless Steel Sleeves, which offer a sleek and modern aesthetic to the products. All of the chosen products are PAS 68 rated classified, reassuring clients and space users of the safeguarding of the space, people and infrastructure.

To avoid delays, Marshalls worked closely with BAM to ensure that they could excavate foundations prior to the products being delivered to site to enable them to move on to other areas of the project.

Benefit
Marshalls worked with the client to seek the best possible solutions for this project. The chosen bollards offer the required level of protection whilst also allowing for shallow installation and enhancing the aesthetics of the project.

Marshalls was also able to offer a range of highly durable, functional and aesthetically pleasing street furniture solutions for this project. A range of other street furniture products were also supplied by Marshalls, such as standard stainless steel and steel powder coated bollards, Cycle Stands and Motorcycle Stands.
Problem

The client Land Securities completed a large outlet village in the South East of England. As a key part of the public realm section of the project, the client sought protective street furniture solutions which would not only offer the required level of protection but would also complement the surroundings of the shopping centre.

The client approached Marshalls to seek advice on what solutions would work best bearing in mind that the development sits on top of a major road tunnel and therefore only products which require shallow installation would be appropriate.

The client was also seeking solutions which would suit the modern aesthetic of the development and which would enhance the surroundings.

Solution

The client opted to use a range of different types of protective street furniture solutions on this project.

Marshalls recommended the use of RhinoGuard™ 75/30 Shallow Mount Protective bollards, as well as Igneo seating and Giove Protective Planters with integrated RhinoGuard™ technology to break up the line of the bollards.

The RhinoGuard™ 75/30 Shallow Mount Protective bollards only require a depth of 152mm for installation; they have been successfully crash tested in accordance with the BSI PAS 68 Standard, creating effective hostile vehicle mitigation measures and protecting people, places and existing infrastructure.

The large Giove Protective Planter features a large capacity which is designed to accommodate the root ball of a tree.

The Igneo modular seating system offers unique styling, combined with functionality and exceptional impact performance. The Igneo seat has been successfully crash tested in accordance with PAS 68 Standards as set by the Government and it is manufactured from Marshalls’ fibre reinforced precast concrete.

Benefit

The chosen products offer the required level of protection, however they do not look like protective items, instead they are attractive additions to the shopping centre. The large Giove Planters house mature trees which not only attract biodiversity but also offer shade and a pleasing aesthetic. The protective seating, ultra modern in design, is highly durable and offers areas for shoppers to rest.
Marshalls Bespoke Product Solutions Service

Marshalls Street Furniture promises to bring your vision to life through our bespoke product solutions service.

Our design experience and production expertise are your guarantee of success. We strive to offer a unique service that supports you from your first concept sketches right through to installation of the finished product.
Marshalls 360 brings together our design, technical, engineering and consultancy expertise to offer you a support programme like no other. With a full suite of services, all designed around you, Marshalls 360 helps you add certainty to each and every project – all for no additional cost.

**Design and Technical Services**

Enjoy comprehensive support with a range of services including pre-construction appraisals, product sampling and CAD facilities. And because it’s Marshalls, you can be sure it’s all backed by a seamless after-sales service.

**Construction Services**

Discover the UK’s leading traffic planning software, with real-time tracking and priority delivery scheduling. With 12 strategically positioned distribution centres across the UK, our expert construction detailing team is always on hand to make sure your project goes smoothly from start to finish.

**Skills Services**

We’re dedicated to helping you maintain the highest standards. With RIBA-accredited CPD seminars, bespoke Machine Lay training and in-depth toolbox talks, Marshalls 360 skills services ensure your skill set stays up to date.

**Maintenance Services**

Give your projects the longevity they deserve with post-construction cleaning regime and a full selection of O&M Manuals. Plus, improve your working practices with our reinstatement and repair advice.

**Accreditation Services**

Take a holistic approach to sustainability with specification data and certification alongside our wide-ranging advice on environmental, economic and social issues. Benefit from a business model that provides you with an ever-increasing range of sustainable products.

To find out how your project could benefit from Marshalls 360, visit marshall.co.uk/360 or speak to a member of our team today.
For our full range of street furniture please visit:
www.marshalls.co.uk/street-furniture