LANDSCAPE PROTECTION

INSPIRATIONAL HVM SOLUTIONS WITH INNER STRENGTH AND OUTER BEAUTY

KEEPING PEOPLE SAFE... NOT SCARED
"SECURITY PRODUCTS DON’T NEED TO COMPROMISE ON THE AESTHETICS OF A LANDSCAPING PROJECT."

LANDSCAPE PROTECTION

Marshalls Landscape Protection offers a design-led approach to Secured by Design Hostile Vehicle Mitigation security products enabling highly effective protection to blend seamlessly into urban landscape design. Our team of architects, planners and designers install security measures without instilling fear. In most cases, crash-tested products are developed with minimal consideration given to the design; however Marshalls have flipped this on its head and taken a range of aesthetically designed street furniture products and incorporated protective RhinoGuard® technology within to create now strength and outer beauty.

We believe in the importance of creating safe, attractive and interesting environments, and we do this by creating a range of security solutions that protect the communities where we operate. We keep our promises to our customers, partners, stakeholders and the people we work with for and with each other.

Our developments in design, manufacture and technology negates the need for bulk and intimidating, obtrusive security measures that aren’t wanted in spaces where people want to spend time. The better our environment, the better we can be. Our aim is to help create a safe and aesthetically pleasing environment where people want to spend time.

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The terror threat posed to the public has evolved dramatically over the last few years. Large-scale, meticulously planned bomb attacks have given way to vehicle assaults that target pedestrians. Our products help protect and enhance our landscape environments, safeguarding people, buildings and the spaces they occupy from multiple levels of threat, whether they are accidental collisions, criminal ram-raids or terrorist attacks.

We believe that those in charge of specifying for security must assign a greater role to design aesthetics when it comes to choosing products to prevent vehicle attacks.

Concrete blocks and barricades have previously been common methods of security used to protect areas of high footfall, such as city centres, airports and sports stadiums. These approaches of security make spaces feel hostile and heavily defended.

Ideally, protective measures should be so well integrated into scenes that uninitiated passers-by don’t realise they have been put in place for their protection, keeping people safe... not scared.
The multi-purpose RhinoGuard® protective EOS seat combines form, function and strength, offering not just a contemporary seating solution, but also security and resilience for a range of applications.

The seat frame has been successfully crash tested at 3 different scenarios using a 7.5 tonne vehicle travelling at 30mph, giving full reassurance of its inner strength.

Conducted using Iroko timber and Ferrocast®, known for its resilience, a variety of looks can be achieved with a range of colour options, in order to suit the requirements of any scheme.

**RHINOGUARD® EOS**

**SECURITY SPECIFICATIONS**

PAS 68

- Rear impact test: V/7500(N2)/48/90:3.1/0.0
- Front impact test: V/7500(N2)/48/90:0.0/0.0
- Gap impact test with bollard: 7.5 Tonne 30 MPH

**MATERIALS / COLOURS**

Ferrocast®, Timber, Mild Steel

- Front and back panels with the option of powder coating in any standard RAL colour.
- Seat ends available in any standard RAL colour.

**RHINO GUARD® EOS SEATING**

- Overall Height Above Ground (mm): 887
- Overall Height Including Roots (mm): 1237
- Foundation Length x Width x Height (mm): 2400 x 1000 x 430
- Seat Height (mm): 460
- Weight (kg): 190
- Length x Width (mm): 1265 x 678

**MATERIALS / COLOURS**

- RAL 6018
- RAL 9006
- RAL 6005
- RAL 7045
- RAL 9010
- RAL 1023
- RAL 8012
- RAL 9007
- RAL 9005
- RAL 9006
- RAL 9016
- RAL 5010
- RAL 9007
- RAL 6005
- RAL 9010
- RAL 7045
- RAL 9010
- RAL 1023
- RAL 8012
- RAL 9016
- RAL 5010

**PROTECTIVE SEATING**

The multi-purpose RhinoGuard® protective EOS seat combines form, function and strength, offering not just a contemporary seating solution, but also security and resilience for a range of applications.

The seat frame has been successfully crash tested at 3 different scenarios using a 7.5 tonne vehicle travelling at 30mph, giving full reassurance of its inner strength.

Conducted using Iroko timber and Ferrocast®, known for its resilience, a variety of looks can be achieved with a range of colour options, in order to suit the requirements of any scheme.
**protective seating**

Completely modular, Igneo can be extended to the length you require by adding additional centre pieces, making it suitable for any space.

**Material / Colours**

- Precast Concrete
- Silver Grey
- Anthracite
- Conservation
- Charcoal
- Standard RAL Powder Coated Colours
  - RAL 9010
  - RAL 7045
  - RAL 9006
  - RAL 7038
  - RAL 1023
  - RAL 6005
  - RAL 9005
  - RAL 3020
  - RAL 9007
  - RAL 5010
  - RAL 8014

**Overall Height Above Ground (mm)**

- 874

**Foundation Type**

- Reinforced Concrete

**Overall Height Including Root (mm)**

- 1159

**Foundation Length x Width x Height (mm)**

- 2400 x 1600 x 500

**Seat Height (mm)**

- 474

**Weight (kg)**

- Ferrocast Arm 21.5
- End Section 1000
- Middle Section 1200

**Length x Width (mm)**

- 3017 x 1240

**vehicular-borne threats are a reality in many modern urban environments and with the RhinoGuard® Igneo Protective Seat, safety and security combined with a subtle visual appeal can be achieved.**

Crash tested on two occasions, pinpointing different locations of the seat, Igneo can successfully withstand impact from a 7.5 tonne vehicle travelling at 40mph.

Manufactured using precast concrete, Igneo is available in 4 colour variations, all finished with an anti-graffiti coating. The optional armrests are manufactured using Ferrocast®, known for its resilience. These are available in a range of RAL colours in order to achieve the look you desire.

**security specifications**

- PAS 68

**Front Impact Test**

- V/7500(N2)/64/90:3.7/0.0

**Gap Impact with Bollard Test**

- V/7500(N2)/64/90:3.5/0.0

- 7.5 Ton 40 MPH
RHINOGUARD® KIRKOS

The Kirkos seating range provides a simple, yet effective way of enhancing any environment whilst providing the appropriate level of protection required.

Incorporated around a single or double bollard array, Kirkos is manufactured using FSC®-certified Red Grandis Hardwood, and finished with a decorative, mild steel feature which is available in a range of colour options.

Kirkos is durable and weather resistant and offers a long-lasting, low maintenance seating solution.

**Security Specifications**

- **7.2 Tonne 50 MPH**
- **Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification**

**Materials / Colours**

- RhinoGuard® Double Hoop Seat
- RhinoGuard® Single Hoop Seat
- Standard RAL Powder Coated Colours
  - RAL 9010
  - RAL 7045
  - RAL 9006
  - RAL 7038
  - RAL 1023
  - RAL 6005
  - RAL 9005
  - RAL 3020
  - RAL 9007
  - RAL 5010
  - RAL 8014

**RHSADUAR®**

Kirkos seating range provides a simple, yet effective way of enhancing any environment whilst providing the appropriate level of protection required.

Incorporated around a single or double bollard array, Kirkos is manufactured using FSC®-certified Red Grandis Hardwood, and finished with a decorative, mild steel feature which is available in a range of colour options.

Kirkos is durable and weather resistant and offers a long-lasting, low maintenance seating solution.

**Specification Type**

- (IWA14.1/ PAS 68, PAS 170)

**PAS 68**

- **Capability**
  - This product has been crash tested three times and is capable of withstanding a 7.5 tonne vehicle travelling at 50mph
- **Security Rating**
  - V/7500(N2)/48/90:3.1/0.0
  - V/7500(N2)/48/90:0.0/0.0
  - V/7500(N2)/48/90:2.7/0.0

**Additional Test Info**

- Single Frame impact test
- Complete Planter test

*Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification

**Dependent on core selection see page 34 - 35 for options**
Providing inner strength and outer beauty, the RhinoGuard® RhinoBlok seating is available with a choice of timber cladded seat and bench variations, providing the perfect solution to protect people, places and infrastructure without compromising on the appearance of the space.

The Blok can also be used as the central core of a planter, offering the perfect addition to compliment the range.

### CREATE YOUR DESIRED CONFIGURATION
USING A VARIETY OF SEATING ELEMENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>MATERIAL</th>
<th>LENGTH (mm)</th>
<th>WIDTH (mm)</th>
<th>HEIGHT (mm)</th>
<th>WEIGHT (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEAT 1000</td>
<td>Timber top</td>
<td>1600 x 515 x 805</td>
<td>630</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>TIMBER BENCH 1000</td>
<td>Timber end seat 1000</td>
<td>1600 x 460 x 460</td>
<td>630</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>BENCH 1000</td>
<td>Timber double bench 1000</td>
<td>1600 x 460 x 460</td>
<td>630</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>SEAT 1600</td>
<td>Timber seat 1600</td>
<td>1600 x 115 x 460</td>
<td>650</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>TIMBER BENCH 1600</td>
<td>Timber bench 1600</td>
<td>1600 x 460 x 460</td>
<td>630</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>RhinoBlok</td>
<td>Concrete</td>
<td>1600 x 1000 x 50</td>
<td>50</td>
<td>2500</td>
<td></td>
</tr>
<tr>
<td>RhinoBlok</td>
<td>Timber</td>
<td>1600 x 1000 x 50</td>
<td>30</td>
<td>2000</td>
<td></td>
</tr>
</tbody>
</table>

### SECURITY SPECIFICATIONS

**IWA14.1**

- **V/7200 (N2A)/64/90:19.3**
- **7.2 Tonne 40 MPH**

**MATERIALS / COLOURS**

- **Concrete**
- **Silver Grey option.**
- **Timber**
- **Untreated Iroko slats.**

**ARTWORK**

- **RhinoBlok**
- **Timber**
- **Double bench 1600**
- **Timber top**
- **Timber bench 1600**
- **Bench 1000**
- **Seat 1000**
- **Range of planter**

**PROTECTIVE SEATING**

**SEATING**

- **Concrete**
- **Timber**
- **Timber end seat 1000**
**OMILPO**

Olimpo combines functionality and beauty.

Manufactured using reconstituted natural stone, the seat and planter is available with a polished finish for a glossy look or a bush hammered finish for a more rustic appearance, providing the perfect solution for classic and modern urban environments.

Available with a choice of security ratings to suit the requirement. Olimpo is offered with or without the backrest element and in a range of colour options, allowing a range of aesthetic design options to be achieved.

| Overall Height Above Ground (mm) | 880 |
| Foundation Type | *Various |
| Overall Height Including Root (mm) | *Various |
| Foundation Length x Width x Height (mm) | *Various |
| Seat Height (mm) | 480 |
| Weight (kg) | 3550 |
| Length x Width Ø (mm) | 2500 |

**UNIVERSO**

With its sculptured, circular form and unique style, Universo stands out in any environment.

Made from sandblasted natural stone or concrete, the organic seating elements can be used singularly or combined to create a beautiful and creative space.

| Overall Height Above Ground (mm) | 850 |
| Foundation Type | *Various |
| Overall Height Including Root (mm) | *Various |
| Foundation Length x Width x Height (mm) | *Various |
| Seat Height (mm) | 424 |
| Weight (kg) | 2360 |
| Length x Width Ø (mm) | 1900 |

**MATERIALS / COLOURS**

- Precious Stone
- Bianco Carrara
- Giallo Mori
- Porfido
- Nero Ebano
- Rosso Verona
- Botticino
- Veneziano
- Verde Alpi
- Concrete
- White Granite
- Grey Concrete
- Precious Stone
- Bianco Carrara
- Giallo Mori
- Porfido
- Nero Ebano
- Rosso Verona
- Botticino
- Veneziano
- Verde Alpi
- Concrete
- White Granite
- Grey Concrete

**SECURITY SPECIFICATIONS**

- 1.5 - 7.2 Tonne 50 MPH
- **Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification.**

**OPTIONS**

- Available without the 360° backrest.
- Available with a choice of security ratings to suit the requirement.
- Olimpo is offered with or without the backrest element and in a range of colour options, allowing a range of aesthetic design options to be achieved.
**RHINOGUARD® LARGE GIOVE**

The RhinoGuard® Giove planter is available in two sizes and provides a permanent fixed barrier solution to protect public trees.

The planters are cast from a mix of concrete and fine Italian marble aggregates sourced from Italy. The use of high-quality natural marble ensures long-term stability and durability. Each planter can either be polished during manufacture to leave a smooth surface, or bush hammered for a rough appearance.

All visible surfaces are covered with a transparent anti-decay coating and upon request an anti-graffiti coating is also available.

With its 1,225 litre capacity, the large Giove planter has been designed to accommodate the root ball of a tree.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>PAS 68</th>
<th>Single Frame impact test</th>
<th>Complete Planter test</th>
</tr>
</thead>
<tbody>
<tr>
<td>V/7500(N2)/64/90:0.0/0.0</td>
<td>V/7500(N3)/80/90:1.7/0.0</td>
<td>V/7500(N3)/80/90:3.8/35.5</td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

<table>
<thead>
<tr>
<th>Precious Stone</th>
<th>Concrete</th>
<th>White Granite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bianco Carrara</td>
<td>Giallo Mori</td>
<td>Porfido</td>
</tr>
<tr>
<td>Nero Ebano</td>
<td>Rosso Verona</td>
<td>Botticino</td>
</tr>
<tr>
<td>Verde Alpi</td>
<td>Veneziano</td>
<td>Concrete</td>
</tr>
</tbody>
</table>

**PLANTERS**

<table>
<thead>
<tr>
<th>Overall Height Above Ground</th>
<th>Foundation Type</th>
<th>Overall Height Including Root</th>
<th>Foundation Length ( \times ) Width ( \times ) Height</th>
<th>Length ( \times ) Width ( \times ) Ø (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>* Various</td>
<td>* Various</td>
<td>1900 ( \times ) Width Ø (mm)</td>
<td>3005</td>
<td></td>
</tr>
</tbody>
</table>

*Dependent on core selection see page 34 - 35 for options

**RHINOGUARD® SMALL GIOVE**

The RhinoGuard® Small Giove is the younger sister of the Large Giove planter. Scaled down in size, these can be used in conjunction to create a variety of spaces or stand alone to add a single protection but available pleasing feature in any urban landscape.

The strength and durability of the material ensures performance in all climates.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Tonne 40 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 - 7.2</td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

<table>
<thead>
<tr>
<th>Precious Stone</th>
<th>Concrete</th>
<th>White Granite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosso Verona</td>
<td>Botticino</td>
<td>Concrete</td>
</tr>
<tr>
<td>Verde Alpi</td>
<td>Veneziano</td>
<td>Concrete</td>
</tr>
<tr>
<td>Marmi Reali</td>
<td>Marmi Nenni</td>
<td>Concrete</td>
</tr>
</tbody>
</table>

This is an engineered solution based around our current offering of tested products.
### RHINO GUARD® SQUARE

Like the Rhino Guard® Rectangle planter, the square variant provides a durable and aesthetically pleasing Hostile Vehicle Mitigation solution.

Available in a range of colour variations and finishes, the planter has a solid construction and requires little maintenance.

<table>
<thead>
<tr>
<th>MATERIALS / COLOURS</th>
<th>Precious Stone</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Cream</td>
<td>Grey</td>
</tr>
</tbody>
</table>

**SECURITY SPECIFICATIONS**

*Dependent on core selection see page 34 - 35 for options

### RHINO GUARD® RECTANGLE

The Rhino Guard® Rectangle planter provides an economical and flexible way to enhance an urban landscape with natural elements. The durability and strength of the material ensures performance in all climates.

The robust geometric construction allows the planter to be strategically placed to restrict vehicular access and guide pedestrian flow, providing a practical yet decorative addition to any landscape project.

<table>
<thead>
<tr>
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<th></th>
</tr>
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<tr>
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<td>Cream</td>
<td>Grey</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECURITY SPECIFICATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification</strong></td>
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</tr>
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<tbody>
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<td>Cream</td>
<td>Grey</td>
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</table>

**SECURITY SPECIFICATIONS**

*Dependent on core selection see page 34 - 35 for options

### SECURITY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Overall Height Above Ground (mm)</th>
<th>950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Height Including Root (mm)</td>
<td>*Various</td>
</tr>
<tr>
<td>Foundation Type</td>
<td>*Various</td>
</tr>
<tr>
<td>Length x Width (mm)</td>
<td>1100 x 1100</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>877</td>
</tr>
</tbody>
</table>

**Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification**

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**SECURITY SPECIFICATIONS**

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### SECURITY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Overall Height Above Ground (mm)</th>
<th>950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Height Including Root (mm)</td>
<td>*Various</td>
</tr>
<tr>
<td>Foundation Type</td>
<td>*Various</td>
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<tr>
<td>Length x Width (mm)</td>
<td>1800 x 700</td>
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<tr>
<td>Weight (kg)</td>
<td>1265</td>
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</table>

**Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification**

This is an engineered solution based around our current offering of tested products.
### RHINOBLOK STEEL PLANTER SLEEVE

<table>
<thead>
<tr>
<th>Length x Width x Height (mm)</th>
<th>1800 x 1200 x 1000</th>
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</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>295</td>
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</tbody>
</table>

### RHINOBLOK TIMBER PLANTER SLEEVE

<table>
<thead>
<tr>
<th>Length x Width x Height (mm)</th>
<th>1800 x 1200 x 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>295</td>
</tr>
</tbody>
</table>

**Security Specifications**

**IWA14.1**

- V/7200(N2A)/64/90:19.3
- 7.2 Tonne 40 MPH

**Firm Energy Absorption**

<table>
<thead>
<tr>
<th>Material</th>
<th>Energy Absorption (kWh/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**Firm Energy Absorption**

<table>
<thead>
<tr>
<th>Material</th>
<th>Energy Absorption (kWh/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**Ratings Available**

- V/7200(N2A)/64/90:19.3
- 7.2 Tonne 40 MPH

**Dependent upon site specific conditions**

For RhinoGuard® RhinoBlok specification details or for further information on the RhinoBlok seating options please see page 12 – 13.
RHI NO GUARD®
CRISTINA

The Christina planter is composed of a base and two elements which are divided by a central band of copper or stainless steel which follows the full circumference of the planter.

Manufactured from precious stone or concrete, Cristina is available in a range of security ratings, providing inner strength and outer beauty and will enhance the aesthetics of any environment.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Security Rating</th>
<th>Tonne</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>40</td>
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<tr>
<td>3.0</td>
<td>40</td>
<td></td>
</tr>
<tr>
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<td>40</td>
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<tr>
<td>5.0</td>
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</tr>
<tr>
<td>6.0</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

**Materials & Colours**

- Precious Stone:
  - Rosso Verona
  - Bianco Carrara
  - Botticino
  - Giallo Mori
  - Veneziano
  - Porfido
  - Verde Alpi
  - Nero Ebano

- Concrete:
  - White Granite
  - Grey Concrete

Surface can be polished for a shiny finish or sandblasted for a rough appearance.

**Dimensions**

- Overall Height (mm): 600
- Overall Height Including Root (mm): *Various
- Foundation Length x Width x Height (mm): *Various
- Length x Width (mm): 2000 x 820
- Weight (kg): 880

*Dependent on core selection see page 34 - 35 for options.

Central band is available in copper or stainless steel with a satin finish treatment.

Surfaces can be polished for a shiny finish or sandblasted or bush-hammered for a rough appearance.

All visible surfaces are covered with a transparent anti-decay coating and upon request an anti-graffiti coating is also available.

This is an engineered solution based around our current offering of tested products.

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PROTECTIVE PLANTERS
Classica is available in two sizes - the 300 litre Classica 1220 and the 600 litre Classica 1620.

Manufactured from precious stone or concrete, the versatile, circular form of each planter is enhanced with a band of copper or stainless steel in the central groove which follows the full circumference of the planter.

Surfaces can be polished for a shiny finish or sandblasted or bush-hammered, for a rough appearance.

The central band is available in copper or stainless steel and is finished with a satin finish.

Manufactured from precious stone or concrete, the Classica planters are available in a range of security ratings, providing inner strength and outer beauty and will enhance the aesthetics of any environment.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Security Class</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 - 7.2 Tonne</td>
<td>910 - 1468</td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

- Precious Stone
- Bianco Carrara
- Giallo Mori
- Porfido
- Nero Ebano
- Rosso Verona
- Botticino
- Veneziano
- Verde Alpi
- Concrete
- White Granite
- Grey Concrete
- Silver Grey
- Light Grey

**PLANTERS**

**RHINOGUARD® CLASSICA 1220**

<table>
<thead>
<tr>
<th>Overall Height Above Ground</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Type</td>
<td>Various</td>
</tr>
</tbody>
</table>

| Overall Height Including Root | 910 |
| Foundation Length x Width x Height | 1220 |
| Weight (kg)                   | 910 |

**RHINOGUARD® CLASSICA 1620**

<table>
<thead>
<tr>
<th>Overall Height Above Ground</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Type</td>
<td>Various</td>
</tr>
</tbody>
</table>

| Overall Height Including Root | 918 |
| Foundation Length x Width x Height | 1620 |
| Weight (kg)                   | 1468 |

*Dependent on core selection see page 34 - 35 for options.
The tapered profile of the Esile planter provides an elegant and contemporary Hostile Vehicle Mitigation solution, facilitating its integration in any environment.

Manufactured with Ultra High Performance Concrete which has been developed in recent decades for its exceptional properties of strength and durability, the Esile planter is freeze resistant and abrasion resistant, offering reduced maintenance and an extended lifespan.

Esile is available in a range of subtle or outgoing colour options to create a cheerful and vibrant atmosphere.

### MATERIALS / COLOURS

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>- White Graded</td>
</tr>
<tr>
<td></td>
<td>- Precious Stone</td>
</tr>
</tbody>
</table>

Available in precious stone or concrete in a range of contrasting colour options, Saturno provides a beautiful whilst functional Hostile Vehicle Mitigation solution that doesn’t compromise on the aesthetics of a landscaping project.

Surfaces can be polished for a shiny finish or bush-hammered, for a rough appearance.

### MATERIALS / COLOURS

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Granite</td>
<td>- Bianco Carrara</td>
</tr>
<tr>
<td></td>
<td>- Giallo Mohr</td>
</tr>
<tr>
<td></td>
<td>- Porfido</td>
</tr>
<tr>
<td></td>
<td>- Nero Ebano</td>
</tr>
<tr>
<td></td>
<td>- Rosso Verona</td>
</tr>
<tr>
<td></td>
<td>- Botticino</td>
</tr>
<tr>
<td></td>
<td>- Veneziano</td>
</tr>
<tr>
<td></td>
<td>- Verde Alpi</td>
</tr>
<tr>
<td>Concrete</td>
<td>- Ultratense Concrete UTC1</td>
</tr>
<tr>
<td></td>
<td>- UTC2</td>
</tr>
<tr>
<td></td>
<td>- UTC3</td>
</tr>
<tr>
<td></td>
<td>- UTC4</td>
</tr>
<tr>
<td></td>
<td>- UTC5</td>
</tr>
<tr>
<td></td>
<td>- UTC6</td>
</tr>
<tr>
<td></td>
<td>- UTC7</td>
</tr>
</tbody>
</table>

All visible surfaces are covered with a transparent anti-decay coating and upon request an anti-graffiti coating is also available.

### SECURITY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Security Rating</th>
<th>Tonne</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 - 7.2</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

**Various ratings available with a 7.2 tonne vehicle at 50mph being the strongest specification**

This is an engineered solution based around our current offering of tested products.
**RHINOGUARD® ORIONE**

The Orione planter is the perfect solution to bring timeless style to urban streetscapes, retail centres, and large foyers. Equipped with an optional stainless steel flower vase, this robust Vehicle Mitigation planter is offered in precious stone or concrete in various conglomerate shades.

Pegaso is a cylindrical shaped planter available in conglomerate precious stone or concrete and is available in a variety of colour options.

Its subtly curved profile offers a stylish design for both public and private spaces. Available in a range of security ratings, the planter provides inner strength and outer beauty and will enhance the aesthetics of any environment.

**RHINOGUARD® PEGASO**

All visible surfaces are covered with a transparent anti-decay coating and upon request an anti-graffiti coating is also available.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Tonne</th>
<th>40 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td></td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

- White Granite
- Precious Stone
- Concrete
- Piazza
- Gallina
- Giallo Mori
- Porfido
- Nero Ebano
- Botticino
- Veneziano
- Verde Alpi
- Giallo Verona

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Tonne</th>
<th>40 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td></td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

- White Granite
- Precious Stone
- Concrete
- Piazza
- Gallina
- Giallo Mori
- Porfido
- Nero Ebano
- Botticino
- Veneziano
- Verde Alpi
- Giallo Verona

All visible surfaces are covered with a transparent anti-decay coating and upon request an anti-graffiti coating is also available.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Tonne</th>
<th>40 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td></td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

- White Granite
- Precious Stone
- Concrete
- Piazza
- Gallina
- Giallo Mori
- Porfido
- Nero Ebano
- Botticino
- Veneziano
- Verde Alpi
- Giallo Verona

This is an engineered solution based around our current offering of tested products.

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This is an engineered solution based around our current offering of tested products.

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The RhinoGuard® Steel GateKeeper® provides temporary protective measures for a number of applications such as Christmas markets or sporting events.

The steel variation has been successfully crash tested to IWA 14.1, providing protection against vehicles up to 2.5 tonnes traveling at up to 30mph. The tested solution is pedestrian permeable, with vehicle access points and requires no anchorage in any form and can be quickly deployed on any surface without relying on kerbs or structural aids.

GateKeeper® is fully galvanised to protect against corrosion and is available with the option of powder coating and branded customisation. Providing an ideal solution for use on busy high streets or events.

**SECURITY SPECIFICATIONS**

IWA14.1

**C-VAW**

Tested to C-VAW Standards

This product holds a CPNI Vehicle Attack Delay Standard (VADS) rating. During the test, different vehicles were used to demonstrate how the system would perform under various attack angles.

**MATERIALS / COLOURS**

Standard RAL Powder Coated Colours

- RAL 9006
- RAL 6005
- RAL 9007
- RAL 9010
- RAL 7038
- RAL 9005
- RAL 5010
- RAL 7045
- RAL 1023
- RAL 3020
- RAL 8014

**Festival GateKeeper® Individual Unit Design**

- Materials: Concrete
- Standard RAL Powder Coated Colours
- Available in Silver Grey or Mid Grey

**Brick GateKeeper® Individual Unit Design**

- Materials: Brick
- Available in Silver Grey or Mid Grey
- GateKeeper® blocks can be spaced and linked using ramps

**Concrete GateKeeper® Unit**

- Individual Unit H x L x W (mm): 1000 x 1200 x 600
- Individual Unit Weight (kg): 1981
- Tested to C-VAW Standards
- Tested to High Impact Standard (HIS) testing

**RHINOGUARD® CONCRETE GATEKEEPER®**

The pedestrian permeable RhinoGuard® concrete GateKeeper® has been successfully tested to government approved C-VAW standards, which provides proven resistance from ramming vehicles. During the test, different vehicles were used to demonstrate how the system would perform under various attack angles.
Marshalls Landscape Protection offers a range of protective post and rail systems which are available in a variety of styles and materials. We are also able to offer bespoke solutions to suit your requirements. Please get in touch for more information.

**STAINLESS STEEL**
- **Height (mm):** 1000
- **Base Diameter:** Various based on rating requirements
- **Standard Fixing:** Root Fixed
- *Other sizes also available.

**MILD STEEL**
- **Height (mm):** 1000
- **Base Diameter:** Various based on rating requirements
- **Standard Fixing:** Root Fixed

**GEO**
- **Height (mm):** 1000
- **Base Diameter:** Various based on rating requirements
- **Standard Fixing:** Root Fixed

**DECORGUARD**
- **Height (mm):** 1040
- **Base Diameter:** Various based on rating requirements
- **Standard Fixing:** Root Fixed

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Core Security Rating*</th>
<th>15/30</th>
<th>25/10</th>
<th>25/20</th>
<th>25/40</th>
<th>35/30</th>
<th>72/30</th>
<th>72/40</th>
<th>72/50</th>
<th>75/30</th>
<th>75/40</th>
<th>75/50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mild Steel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>Geo</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Decorguard</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Test Standards:
- PAS 68
- PAS 68
- PAS 68
- PAS 68
- IWA 14.1
- IWA 14.1
- IWA 14.1
- IWA 14.1
- PAS 68
- PAS 68
- PAS 68

*Core Security Rating: For example 15/30 = 1.5 tonne vehicle @ 30mph
RHINO GUARD®
PRODUCT OPTIONS

AVAILABLE CORE RATING

The RhinoGuard® range has been designed to fulfil your aesthetic and security needs.

Our RhinoGuard® range of bollards have a wide selection of sleeve options, fixing types and foundation depths available to suit your scheme.

All our cores have been tested from 1.5 tonnes to 7.5 tonnes at various speeds up to 50mph.

The RhinoGuard® bollard range comes with a variety of foundation types, including our RhinoGuard® Ultra Shallow 50™ bollard which only requires a 50mm excavation depth.

<table>
<thead>
<tr>
<th>Test</th>
<th>Security Rating**</th>
<th>Core Diameter (mm)</th>
<th>Height Above Ground allowing for finishes (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAS 68 15/30</td>
<td>114</td>
<td>865</td>
<td></td>
</tr>
<tr>
<td>PAS 170 25/10</td>
<td>75</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>PAS 170 25/20</td>
<td>139</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>PAS 170 25/40</td>
<td>168</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>IWA 14.1 35/30</td>
<td>139</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>IWA 14.1 72/30</td>
<td>N/A</td>
<td>787</td>
<td></td>
</tr>
<tr>
<td>IWA 14.1 72/40</td>
<td>194</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>IWA 14.1 72/50</td>
<td>244</td>
<td>950</td>
<td></td>
</tr>
<tr>
<td>PAS 68 75/30</td>
<td>194</td>
<td>850</td>
<td></td>
</tr>
<tr>
<td>PAS 68 75/40</td>
<td>244</td>
<td>1006</td>
<td></td>
</tr>
<tr>
<td>PAS 68 75/50</td>
<td>194</td>
<td>1006</td>
<td></td>
</tr>
</tbody>
</table>

**Core Security Rating: For example 15/30 = 1.5 tonne vehicle @ 30mph

(Please note not all products are available with each foundation, speak to a member of our team for more information)
Choosing natural stone means opting for a unique product. The natural stone bollard sleeves have an authentic, timeless character and provide a durable and sustainable choice.

Available in 5 colour variations, the sleeves are tailored around your requirements and core selection so are available in numerous ratings to suit your scheme.

**Material Specifications**

- **Height (mm)**: 1000
- **Base Diameters Ø (mm)**: 204, 254
- **Weight (Kg)**: 35, 52

**MATERIALS / COLOURS**

- Standard RAL and ADAPTA Powder Coated Colours
- The decorative outer sleeve is offered in brushed stainless steel as standard but can also be offered in and standard RAL or ADAPTA powder coat.
- The inner core is also available in any standard RAL or ADAPTA powder coat.

**RAL Colours**

- RAL 9006
- RAL 6005
- RAL 9007
- RAL 9010
- RAL 7038
- RAL 9005
- RAL 5010
- RAL 7045
- RAL 1023
- RAL 3020
- RAL 8014
Utilising the experience and knowledge of our team of design engineers, we can develop bespoke sleeve styles in a range of materials and colour options to meet the requirements of any project.

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.

Please get in touch if you would like more information.
**RHINOGUARD® ULTRA SHALLOW 50™**

Along with the Westminster style Ferrocast® sleeve design and the standard mild and stainless steel options, the slim profile of the bollard core allows for a varied choice of sleeves.

**RHINOGUARD® SUPER SHALLOW 100™**

As the Super Shallow 100™ requires just a 50mm excavation depth, it makes the perfect solution for use in areas with high utilities or services. Additionally, the level of waste during installation is minimal.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Impact Speed</th>
<th>Impact Energy</th>
<th>Height Above Ground (mm)</th>
<th>Width x Depth Ø (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footpath foundation impact test</td>
<td>V/7200(N2A)/48/30:1.1</td>
<td>30mph</td>
<td>995</td>
<td>194</td>
<td>520</td>
</tr>
<tr>
<td>Cycleway foundation impact test</td>
<td>V/7200(N2A)/64/90:7.6</td>
<td>40mph</td>
<td>995</td>
<td>194</td>
<td>520</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIALS / COLOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Steel Galvanised finish, several sleeve options available.</td>
</tr>
<tr>
<td>Stainless steel</td>
</tr>
<tr>
<td>Ferrocast®</td>
</tr>
<tr>
<td>Bespoke designs</td>
</tr>
</tbody>
</table>

**Also available with Standard RAL Powder Coated Colours**

See page 30
**RHINOGUARD® STANDARD SLEEVE OPTIONS**

Standard sleeve designs are available in mild steel, stainless steel and Ferrocast® polyurethane and can be specified with reflective banding for increased visibility and safety.

Available in standard and bespoke sleeve options, please see pages 34-39 for more information.

**RHINOGUARD® 25/10 AND 25/20 PAS 170 CORES**

Able to withstand the force of a 2.5-tonne vehicle driving at up to 20mph, the RHINOGUARD® PAS 170 cores are an excellent choice for protecting public spaces, providing assurance against lower speed ram-raids and impacts.

The certified steel cores are available with a choice of standard and bespoke sleeve options.

**STAINLESS STEEL SLEEVES**

- **Height (mm)**: 1000
- **Diameters Ø (mm)**: 132, 154, 204, 256

**GEO STAINLESS STEEL SLEEVES**

- **Height (mm)**: 1000
- **Diameters Ø (mm)**: 140, 204, 254

**LED MARKER SLEEVES**

- **Height (mm)**: 1000
- **Diameters Ø (mm)**: 140, 204, 254

**STEEL SLEEVES**

- **Height (mm)**: Assorted sizes
- **Diameters Ø (mm)**: Assorted sizes

**FERROCAST® SLEEVES**

- **Height (mm)**: Assorted sizes
- **Diameters Ø (mm)**: Assorted sizes

Sleeve size is tailored around the bollard core selected.

**SECURITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Diameter (mm)</th>
<th>Overall Height Above Ground (mm)</th>
<th>Overall Height Including Root (mm)</th>
<th>Foundation Type</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAS 170 25/10</td>
<td>75</td>
<td>800</td>
<td>1100</td>
<td>Root Fixed</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>140</td>
<td>1300</td>
<td>1700</td>
<td>Root Fixed</td>
<td>55</td>
</tr>
<tr>
<td>PAS 170 25/20</td>
<td>500</td>
<td>650 x 300 (3 x 100 mm)</td>
<td>800 x 350 x 300 (4 x 150 mm)</td>
<td>Root Fixed</td>
<td>45</td>
</tr>
</tbody>
</table>

**MATERIALS / COLOURS**

- **Mild Steel**
- **Standard RAL Powder Coated Colours**
- **RAL 9010**
- **RAL 7045**
- **RAL 9006**
- **RAL 7038**
- **RAL 1023**
- **RAL 6005**
- **RAL 9005**
- **RAL 3020**
- **RAL 9007**
- **RAL 5010**
- **RAL 8014**

Available in a range of standard and bespoke sleeve options, please see pages 34-39 for more information.

**FINISH**

- **Galvanised Mild Steel with the option of powder coating.**
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.

Manufactured using a bead blasted grade 316 stainless steel, the GEO products are exceptionally strong and require very low maintenance.

### GEO LITTER BIN
- Stainless Steel / Brushed Satin
- Overall Height Above Ground (mm): 1100
- Foundation Root Depth (mm): 500
- Surface Finishing (mm): 100
- Overall Length (mm): 1700
- Overall Width (mm): 1132
- Core Diameter Ø (mm): *Various
- Sleeve Diameter Ø (mm): 204
- Bin Diameter Ø (mm): 500
- Weight (kg): 46

### GEO CYCLE STAND
- Stainless Steel / Brushed Satin
- Overall Height Above Ground (mm): 1100
- Foundation Root Depth (mm): 500
- Surface Finishing (mm): 100
- Overall Length (mm): 1700
- Overall Width (mm): 4000
- Core Diameter Ø (mm): *Various
- Sleeve Diameter Ø (mm): 350
- Standard Fixing Type: Root Fixed
- Weight (kg): 298

**Various bollard cores available depending on security rating required.**

**Security Specifications**

**7.5 Tonne 50 MPH**

**Various ratings available with a 7.5 tonne vehicle at 50mph being the strongest specification**

### Materials / Colours
- RAL 9010
- RAL 9006
- RAL 9045
- RAL 1023
- RAL 6005
- RAL 9005
- RAL 3020
- RAL 9007
- RAL 5010

**Standard RAL Powder Coated Colours**

**Stainless Steel**

### RhinoGuard®
- RhinoGuard® Automated Gates
- RhinoGuard® Automated Blocks
- RhinoGuard® Automated Bollards

**Security Specifications**

**7.5 Tonne 50 MPH**

**Various ratings available with a 7.5 tonne vehicle at 50mph being the strongest specification**

**Various bollard cores available depending on security rating required.**

**Heights and widths vary depending on rating options. Other options available, please speak to a member of our team about your automated product requirements.**

**MATERIALS / COLOURS**

- RAL 9010
- RAL 9006
- RAL 9045
- RAL 1023
- RAL 6005
- RAL 9005
- RAL 3020
- RAL 9007
- RAL 5010

**Standard RAL Powder Coated Colours**

**Stainless Steel**

### Reflective Banding Options

**Height (mm):**
- Max 100
- Max 2400

**Base Diameter Ø (mm):**
- Max 350
- Max 4000

**Std Fixing Type:**
- Root Fixed
- Root Fixed
- Root Fixed

*Heights and widths vary depending on rating options. Other options available, please speak to a member of our team about your automated product requirements.*

**GEO RANGE**

- Geo Litter Bin
- Geo Cycle Stand

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The Redi-Rock™ system is also available as a standard walling system for the retention of earth, landscaping and flood protection applications. For more information on this system please contact a member of the team.

SECURITY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Material Type</th>
<th>PAS68 2007V/7500(N2)/48/90:1.6/0.0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.5 Tonne 30 MPH</td>
</tr>
</tbody>
</table>

MATERIALS / COLOURS

- Limestone
- Cobblestone
- Kingstone
- Ledgestone
- Into the background and is aesthetically pleasing, protecting its surrounding without looking out of place.

The RhinoGuard® Titan® Kerb is a high containment solution designed to keep vehicles on their intended path, and to prevent the overrun of vulnerable areas adjacent to the carriageway via a physical and visual barrier.

The 400mm high Titan® Kerb not only offers clear visual delineation between trafficked and non-trafficked areas, it also ensures that any errant traffic is safely redirected back onto its intended path. The product is an essential tool for designers, acting as a passive system that protects vulnerable installations like pedestrian refuges.

SECURITY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Material Type</th>
<th>IWA14.1 V/1500[M1]/80/20:0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5 Tonne 50 MPH</td>
</tr>
</tbody>
</table>

The Redi-Rock™ HVM wall is proven to stop a 7.5 tonne truck at 30mph and is an effective, removable solution that requires minimal maintenance. Interconnected with steel cables and with no ground anchors required, the fast to install freestanding blocks can be deployed, picked up and moved with no ground work tomarke the solution ideal for zero set places, behind buildings and in buildings of high significance. Due to its resilience properties a low stack work onto the background and is aesthetically pleasing, protecting its surrounding without looking out of place.
Installing protective measures to defend public spaces against vehicle-borne terror attacks or accidental collisions has traditionally been viewed as a necessary evil in areas such as city centres, stations and sporting venues. This has led to a tendency to give minimal consideration to how these measures fit with the aesthetics of the surrounding environment. Too often, the result is ugly, obtrusive installations that remind people of the threat that exists, potentially putting them off from visiting and enjoying public spaces.

We design and build protective street furniture that blends in seamlessly with the landscape. Our approach enables architects, planners and designers to secure spaces without instilling fear.

AESTHETICALLY PLEASING LANDSCAPE PROTECTION IS THE WAY FORWARD...

Secured by Design have many partner organisations, ranging from the Home Office, local authorities, housing associations, developers and manufacturers. Working closely with standards and certification bodies, Secured by Design ensures that publicly available standards actually meet the needs of the police and public alike.

Our RhinoGuard® products are all Secured by Design which means they have all been subject to rigorous testing and have been fully certificated by an independent, third-party certification body.

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IF YOU CAN’T FIND WHAT YOU NEED...

within the Marshalls Landscape Protection range, your options don’t end there.

Our specialist design and engineering teams are experienced in a range of materials from natural stone and concrete to mild steel, stainless steel and timber.

Only by consistently pushing boundaries and challenging convention can we create public spaces that stand out.

With every element sourced, tailored or created around your project vision, our theoretical and practical understanding of urban space is unrivalled.

Our exceptional bespoke products often start with a flash of inspiration that needs to be fully explored and carefully nurtured throughout the project.

We love to stretch our creativity beyond the typical. Inspired by your vision, ambition and aspiration our open-minded approach means:

“We will where others won’t.”

To ensure projects run smoothly, Marshalls follow a structured 7 STEP approach led by a dedicated Project Manager from the initial programme of works through to the site inspection and project handover.

01 PROJECT MANAGER ALLOCATED

A specialist project manager is allocated to the client giving a single point of contact from initial project scoping through to installation and handover.

02 PROVISIONAL PROGRAMME

Working alongside the client, the dedicated Project Manager will detail a provisional programme of works considering site conditions, site programme, contractual implications and health and safety.

03 SITE SURVEY

If a site survey is required it will be conducted by a fully qualified member of the Marshalls team, following which the client will be provided with layout drawings for approval.

04 DESIGN

Following layout approval, product specification drawings will be issued and prototype products can be provided within this stage for certain bespoke projects.

05 FINAL REVIEW

Product design and project time-frames are confirmed in preparation for commencement of works.

06 INSTALLATION

Installation conducted by a specialist Marshalls Landscape Protection install team working in collaboration with the Project Manager.

07 PROJECT HANDOVER AND O&M

Project handover and operational and maintenance evaluation with the client.
At the heart of Hostile Vehicle Mitigation are the BSI Publicly Available Specifications (PAS) and International Workshop Agreements (IWA). These have changed how security products are tested, designed and procured in order to protect people and places from hostile vehicle attacks, criminal activity and accidental damage.

All accreditations, overseen by the British Standards Institution (BSI), are designed for impact testing and rating Hostile Vehicle Mitigation (HVM) measures, such as bollards, blockers, planters, seating and barriers used for security and counter-terrorism purposes.

PAS 68

PAS 68 was created in 2005, the Publicly Available Specification, PAS 68 became the first UK impact test specification and has endured several reviews since, the most recent taking place in 2013. PAS 68, specifies a performance classification for vehicle security barriers and their foundations when subjected to a horizontal impact.

The standard was devised and administered by the Centre for the Protection of National Infrastructure (CPNI), and tests security barriers at varying speeds, using different sized vehicles. 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

PAS 69 complements the PAS 68 document, which provides guidance on the selection, installation, foundations and use of PAS 68 tested security products, taking into account site specific conditions, to ensure they are placed as effectively as possible. 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.

PAS 170

PAS 170 delivers a testing standard for vehicles of up to 2.5 tonnes travelling at 10 or 20mph. Lower than the regulations developed to mitigate against vehicle born terror attacks. Unlike previous and new solutions, new products tested and certified by PAS 170 provide businesses and local authorities with assurance and proof of performance for the first time.

IWA 14.1

IWA 14.1 is the global standard which has been developed directly from PAS 68 and has become the preferred accreditation of the two. No matter where you are based or where you want to create a safe and beautiful space, the IWA 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.

IWA 14.2

IWA 14.2 provides guidance for the selection, installation and use of vehicle security barriers (VSBs) and describes the process of producing operational requirements (ORs). IWA 14.2 also gives guidance on a design method for assessing the performance of a VSB.

C-VAW

C-VAW testing is a government approved approach to proving a product’s resistance from a ramming vehicle attack. Various vehicles are used to see how the system will perform from other attacks including angular and driving at gaps between the products.
Over the last 15 years the Hostile Vehicle Mitigation testing standards have progressed and now more than one standard is used globally.

The table below shows comparisons between the USA and international testing standards.

For further information please contact the Marshalls Landscape Protection team on: +44(0) 1422 312 993.

### VEHICLE MASS EQUIVALENTS (kg) AND VEHICLE CLASS

<table>
<thead>
<tr>
<th>USA (ASTM TESTING)</th>
<th>UK (IWA/ PAS TESTING)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500 – PAS/ IWA</td>
<td>1100 - ASTM</td>
</tr>
<tr>
<td>2500 – PAS/ IWA</td>
<td>2300 (P) - ASTM</td>
</tr>
<tr>
<td></td>
<td>3500 - PAS/ IWA/ ASTM</td>
</tr>
<tr>
<td></td>
<td>7200 (N2) – IWA/ ASTM</td>
</tr>
<tr>
<td></td>
<td>7500 (N3) - PAS</td>
</tr>
<tr>
<td></td>
<td>6800 (M) - ASTM</td>
</tr>
<tr>
<td>30000 – PAS/ IWA</td>
<td>29500 (H) - ASTM</td>
</tr>
</tbody>
</table>

### OLD USA K RATING TEST

- **16 (10)**
  - 15 25 35 71 74 296
- **32 (20)**
  - 133 222 311 640 667/656 267/2550 K4*
- **48 (30)**
  - 237/179 395/375 553 1138 1185/1110 4741/4810 K8*
- **64 (40)**
  - 370/271 617/568 864 1778 1852/1680 7407/7283 K12*
- **80 (50)**
  - 533/424 889/887 1244
- **96 (60)**
  - 726

### PAS 68 AND IWA 14.1

The PAS 68 and IWA14.1 classification is set out with a row of letters, symbols and numbers that indicate the specification that the product has been tested to. The key difference between the IWA14.1 rating and the PAS 68 is that with IWA14.1 the debris dispersion is not included.

### INTERNATIONAL STANDARDS COMPARISON RATINGS EXPLAINED

* old USA K rating test which use a 6800 (M) vehicle.

The table above provides the kinetic energy values (in kj) created on impact, for each of the vehicle types and speeds used in IWA, PAS and ASTM impact testing. All test standards use a similar array of vehicles and speeds for testing and therefore deliver similar energy in terms of impact force.

### ASTM 2656

ASTM 2656 is the USA testing standard which has grown from the original K ratings standard.

**ASTM 2656 performance rating example:** Fixed Bollard V/7500(N2)/48/90:2.5/1.2

**IWA14.1 performance rating comparison example:** Fixed Bollard V/7500(N2)/48/90 2.5

**Fixed Bollard, V/ 7500(N2)/ 48 / 90: 2.5 / 1.2**

**M 50 P1**

**Vehicle Penetration Distance beyond the VDB datum line:**

- **Vehicle Classification:** Medium duty truck of 6800kg
- **Impact Speed:** 50mph / 80kph
- **Vehicle penetration Distance:** Less than 1m

**PAS 68 performance rating example:** Fixed Bollard V/7500(N2)/48/90:2.5/1.2

**IWA14.1 performance rating comparison example:** Fixed Bollard V/7500(N2)/48/90 2.5

**M 50 P1**

**Vehicle Penetration Distance beyond the VDB datum line:**

- **Vehicle Classification:** Medium duty truck of 6800kg
- **Impact Speed:** 80mph / 130kph
- **Vehicle penetration Distance:** Less than 1m

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**Landscape Protection**

marshalls.co.uk/landscapeprotection

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**Additional Information**