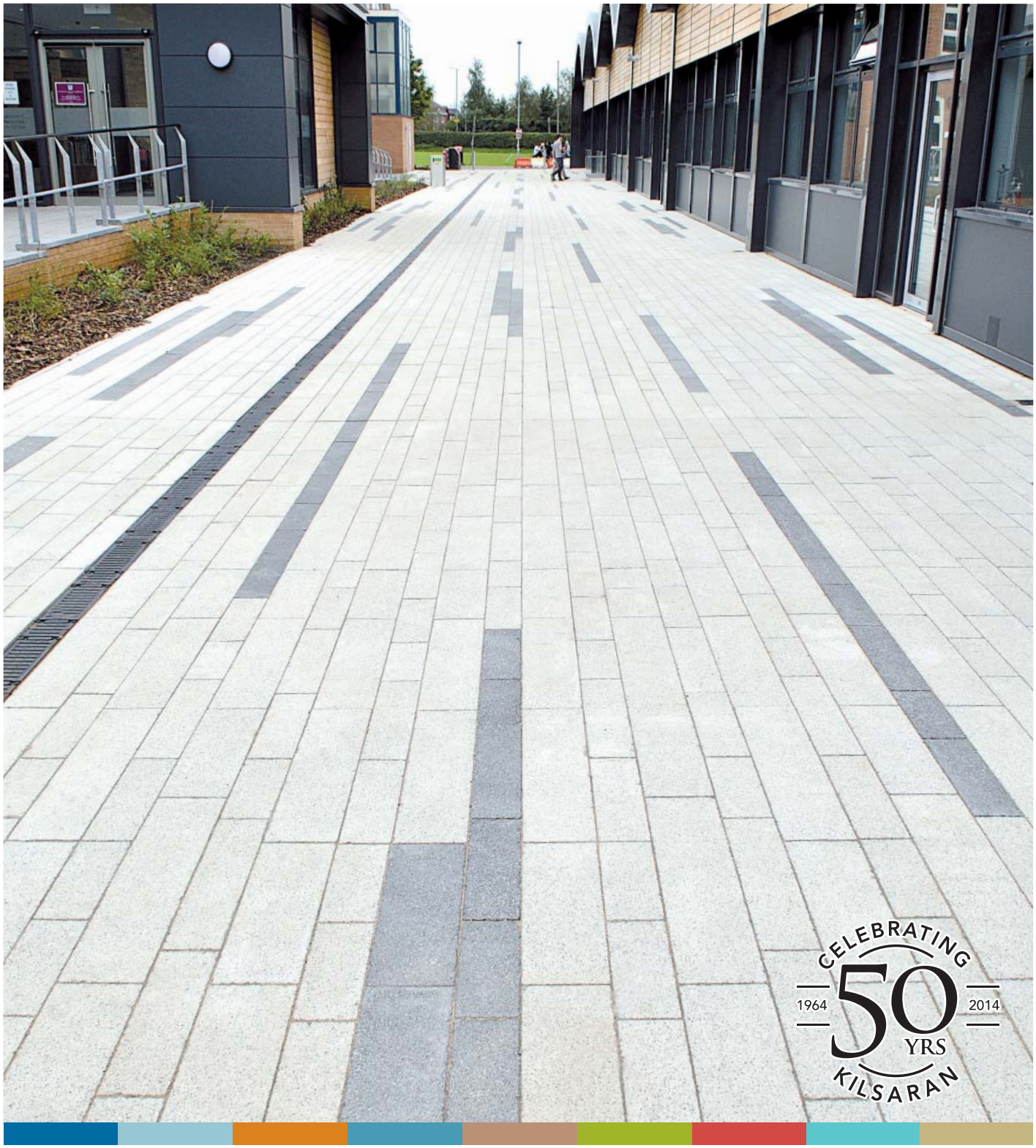
Kilsaran

ideas taking shape

PRODUCT SELECTOR



contents

Introduction

For over five decades Kilsaran International has supplied its bespoke and innovative concrete products to the commercial market helping shape the landscape in both Ireland and the UK. Whether it's creating inspirational public spaces, delivering Sustainable Urban Drainage Systems or designing bespoke hard landscaping solutions, Kilsaran is committed to providing quality, innovation and customer service at the highest level

We are the natural choice for architects, specification and construction professionals seeking solutions to their hard landscaping requirements. Our extensive range of high quality products are backed with unrivalled technical support along with competitive pricing, which means that we can provide our customers with a full support service guaranteeing you will receive a professional service and speedy delivery every time.

Technical Expertise

Over the years we have built up a strong reputation for producing concrete products which push the boundaries of innovation. Our modern, world class manufacturing facilities ensure we are always using the latest technologies to bring unique products to market and our research and development department are always looking for new technologies and processes which will enhance the choice of concrete products available to customers.

Kilsaran prides itself on employing some of the best technical personnel in the industry who strive to produce solutions for our industry partners and stakeholders such as architects, specifiers and engineers. This level of technical expertise and knowledge assures you that you are dealing with people who know and understand your requirements.

Contact Us

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or **Locall 1890 92 99 92** (ROI only) **Email: info@kilsaran.ie**
UK Kilsaran International, Kilsaran International, 6 Crossford Court, Dane Road, Sale M33 7BZ.
Tel: +44 (0)161 872 8899 Email: info@kilsaraninternational.co.uk

Design and Technical Team

With Kilsaran's Design and Technical Team, you will receive in-depth product, design and construction methodology and knowledge. Our team are on hand to provide support and advice when required to customers.

Some of the services available are as follows:

Design concepts for initial appraisal

• Our landscape design team can provide a 2D or 3D concept drawing and estimate associated materials and volumes that are likely to be required for your project. This service is provided for appraisal purposes only and a more detailed site specific design should be carried out by the customer.

Technical Specification Guidance

• The in-house Technical Team are on hand to advise on product suitability, specification standards and appropriate product selection for your scheme.

Permeable Paving Design Services

• Kilsaran can provide a site specific permeable paving design to suit your project. This includes detailed CAD drawings and working drawings. If required Kilsaran can arrange for a Technical Representative to visit site during construction and installation to advise on the process.

Materials Specifications and Technical Data

• Technical literature, materials specifications and product technical data sheets are available from our Sales Personnel, Technical and Specification Teams.

Training

• RIBA/RIAI accredited CPD training is available on various topics relating to hard landscaping, specifications and permeable paving. Customer specific training focused on another specific learning outcome can be arranged with a member of our Specifications Team.

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.241T

Our Facilities

Our Technical division operates a number of laboratories where we test the quality of our own constituent materials and manufactured products. Our Materials Testing and Quality Control Laboratories have been granted accreditation to the international quality management standard IS EN ISO/IEC 17025:2005 by the Irish National Accreditation Board (INAB) in September 2009.

This covers the defined range of testing at the Group's five separate laboratories at our various operations sites in Ireland which gives us the largest Multi-site accreditation in Ireland.

We also have a dedicated laboratory exclusively for testing our paving and walling products and also to facilitate our on-going research and development work to bring new and innovative products to the marketplace.

Our laboratory team is highly experienced in the area of Materials Technology and are drawn from Civil Engineering, Concrete Technology and Chemistry backgrounds. This means we have a wide ranging skills set dealing with all of our quality and technical operations.

Sustainability and the Environment

Sustainability at the forefront of all that we do.

Sustainability is an integral part of all that we do. Our aim is to minimise the impact of our operations, wherever possible, and to benefit our stakeholders by recycling, reusing and creating new innovative systems, products and sales routes.

A sustainable future is one in which a healthy environment, economic prosperity and social justice are pursued simultaneously to ensure the well-being and quality of life is maintained for future generations.

Our part

Over the years we have implemented new Environmental Management Systems (EMS) into our day-to-day operations and employed a dedicated team of full-time professionals in environmental and planning to help us lead the way in sustainability. By taking a close look at our product life cycle, we have limited the impact our business has on the environment and found innovative ways to ensure we are meeting our sustainability targets.

1. Raw Material

Responsible resourcing means we purchase materials that are BES6001 compliant or use locally sourced materials, this not only reduces our carbon footprint, but also provides our local communities with much needed employment. Our quarries also have enough capacity to meet product expectations for the next 50 years, which effectively future proofs our products and services.

2. Manufacturing

Over the last couple of years, we have invested over £20million, with a further £5million budgeted for new technology and manufacturing facilities. This commitment means we have been able to keep costs down, maintain our excellent health and safety record and increase our capacity potential in order to meet the demands of the future. This investment has helped us work towards the ambitious company objective and management guidelines as set out in accordance with ISO9001, ISO14001, 18001 and ISO50001 certification. These certifications will help to create the best working and living environments for all our employees and local communities, whilst still continuing to exceed the demands of all our stakeholders.

3. Distribution

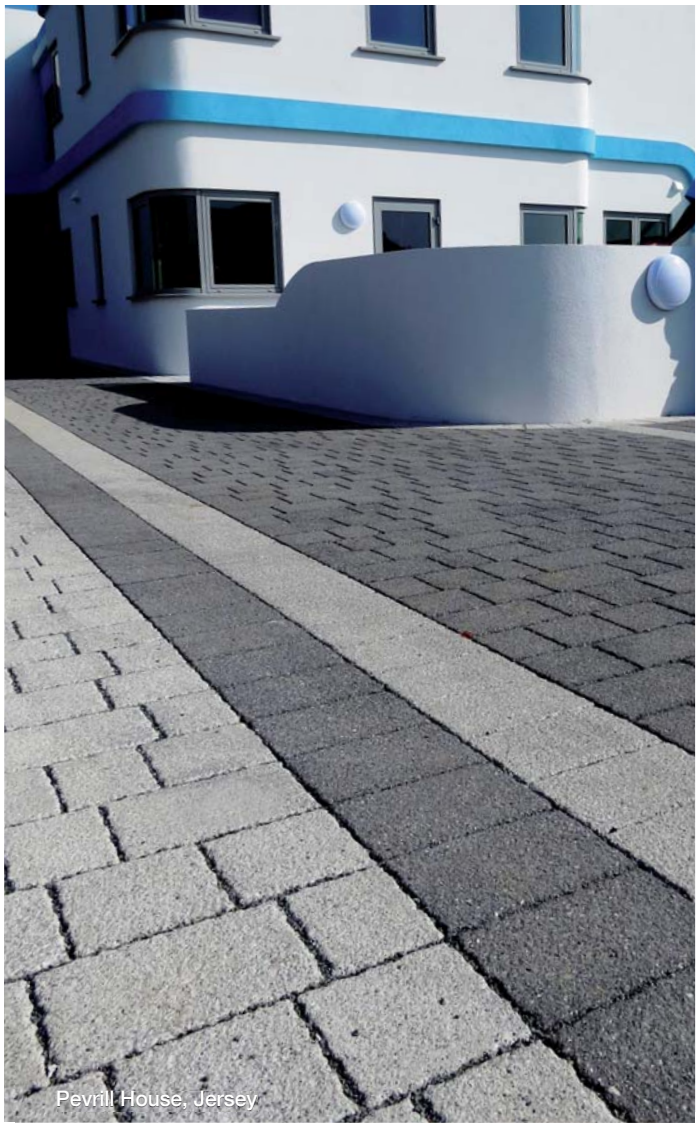
We aim to deliver in stock products within 3-4 working days to provide the best service to our customers. Our policy to sell in full loads means that we utilise transport to its full potential. Exporting to the UK means that we also take advantage of the backload potential of the transport industry. This policy reduces costs and our carbon footprint.

4. Disposal/Recycle

Our concrete products can be 100% recycled, either crushed and added to new products as recycled material or used as hard core as a sub-base material. We also use recycled water within our products.

5. Innovation

We strive to offer our customers the best products and services available in the industry and regularly perform industry reviews. This is not just limited to products but also to the whole customer experience and manufacturing. We have recently introduced new products to the market as well as refining our manufacturing plant to meet our performance and sustainable key performance indicators.


Pevrill House, Jersey

Eco Paving Range

Kilsaran is committed to leading the way in the industry with sustainable and environmentally friendly product manufacturing and continual product development.

All of our products are manufactured in our industry leading best in class manufacturing facilities to reduce the impact of our product range on our environment. All products are manufactured using 100% recycled water and using locally sourced quality materials.
Within our Eco Paving range we have developed and engineered a number of products with further reduced impact on the environment. The Eco Paving range is manufactured with a minimum of 25% non-primary aggregates, up to 10% pre consumer aggregate replacement and 50% of the ordinary Portland cement replaced with a carbon neutral high quality cement replacement.

Amongst them are the following products:

- ClimaPave Collection
- Tara Kerb
- Newgrange Paving
- Pembroke Eco
- Killeen

Carbon Footprint

When evaluating the carbon footprint of Kilsaran paving products to be used in a scheme, our Technical team can provide project specific information on the calculated carbon footprint of the proposed product(s) using the standard PAS 2050:2011.

Please contact our technical team if you require further guidance.

Please look out for our Eco logo throughout the brochure

Technical Support and Design Services

Technical and Specification Guidance

Our Technical team are on hand to advise on product suitability, specification standards and appropriate product selection for your scheme.

Technical Information

Using NBS plus means that all our technical literature is available with the click of a button in one convenient place.

riba product selector

NBS Plus

ribaproductselector.com
Your essential source of building product information

Presentations and Training

Kilsaran's specification team offer RIBA / RIAI accredited CPD (Continuous Professional Development) presentation. By reaching out and working with our customers Kilsaran stays ahead of the field in innovation and customer care.

RIAI

RIBA Royal Institute of British Architects

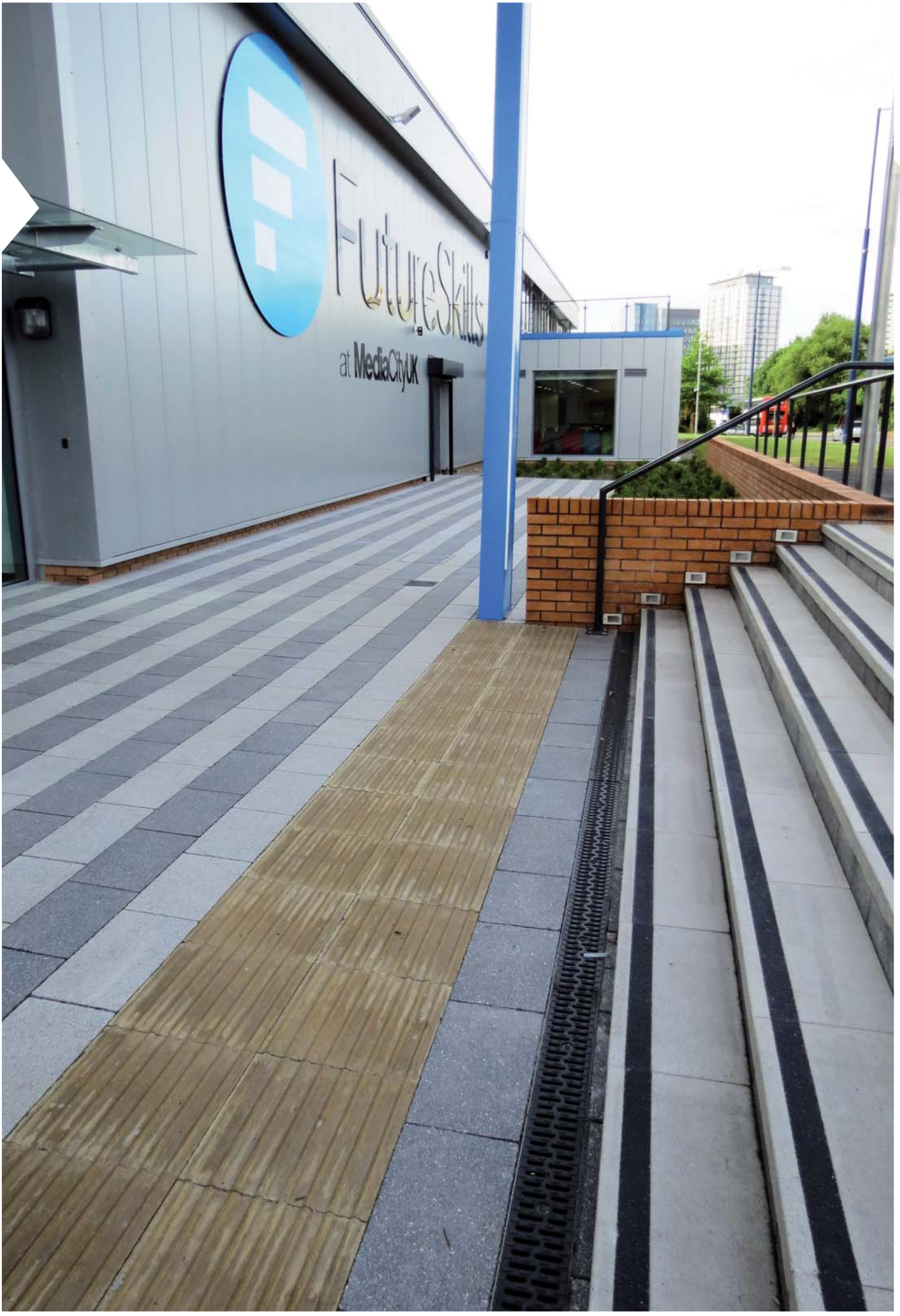
RIBA CPD ASSESSED MATERIAL

Design concepts for initial appraisal

Our landscape design team can provide a 2D or 3D concept drawing and estimate associated materials and volumes that are likely to be required for your project. This service is provided for appraisal purposes only and a more detailed site specific design should be carried out by the customer.

Permeable Paving Design Services

Kilsaran can provide an indemnified site specific permeable paving design to suit your project. This includes detailed CAD drawings and working drawings. If required Kilsaran can arrange for a Technical Representative to visit site during construction and installation to advise on the process. This is a chargeable service.

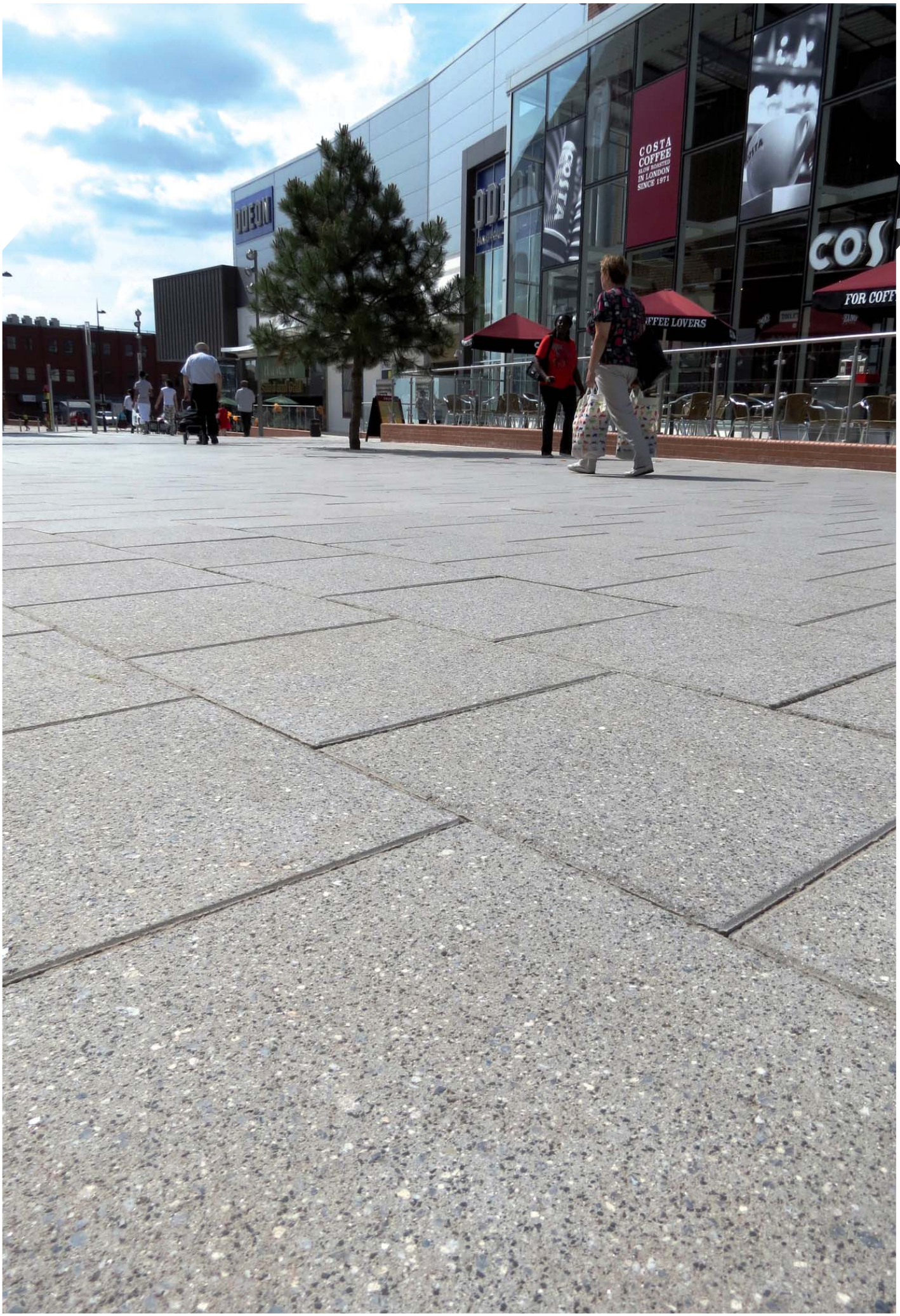

FutureSkills
at MediaCityUK

PAVING FLAGS

Shelbourne
Kent
Tara
Newgrange
Pembroke
Killeen
Textured
Cashel
Classic

New Product Step Flag with delineation strip
Quayside designed by Diarmuid Gavin

Kilsaran
ideas taking shape


COSTA
COFFEE
SLOW ROASTED
IN LONDON
SINCE 1971
COST
FOR COFF
FFEE LOVERS

Shelbourne

Ground Granite Aggregate Flag Paving

Pedestrian Traffic

Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Concrete flag paving
- Elegant ground finish using premium granite aggregate
- Available in 4 colours
- Suitable for use on patios, paths and commercial pedestrian areas
- Can be laid in stack bond or stretcher bond depending on selected unit size(s)

Ground


Silver Granite


Black Granite


Light Granite


Buff Granite

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**6.25**	**12.8**	**80**	**20**	**1100**
450 x 450 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.94**	**12.96**	**64**	**16**	**1150**
400 x 400 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	10.56	66	11	1170
450 x 450 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	11.34	56	14	1010
600 x 300 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**5.55**	**8.64**	**48**	**16**	**1175**
600 x 400 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.16**	**10.56**	**44**	**11**	**1215**
600 x 600 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**2.77**	**10.8**	**30**	**15**	**1180**
400 x 400 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	8.64	54	9	1200
450 x 450 x 70	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	8.1	40	10	950
400 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	6.72	42	7	1130
600 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	4.16	6.72	28	7	1130

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Ground finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Medium to low - Typically USRV 52
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical team for more details.
Joint	Shelbourne Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for Silver and Buff Granite colour flag paving
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001

Kent

Unique Textured Granite Finish Concrete Flag Paving

Pedestrian Traffic | Car & Light Vehicle Traffic* | Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Concrete flag paving
- Unique ground and lightly shot blasted combined finish, gives a elegant peppered finish that emulates natural stone
- Available in 4 colours
- Suitable for use on patios, paths and commercial pedestrian areas
- Can be laid in stack bond or stretcher bond depending on selected unit size(s)


Silver Granite


Black Granite


Buff Granite


Light Granite

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**6.25**	**12.8**	**80**	**20**	**1100**
450 x 450 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.94**	**12.96**	**64**	**16**	**1150**
400 x 400 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	10.56	66	11	1170
450 x 450 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	11.34	56	14	1010
600 x 300 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**5.55**	**8.64**	**48**	**16**	**1175**
600 x 400 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.16**	**10.56**	**44**	**11**	**1215**
600 x 600 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**2.77**	**10.8**	**30**	**15**	**1180**
400 x 400 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	8.64	54	9	1200
450 x 450 x 70	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	8.1	40	10	950
400 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	6.72	42	7	1130
600 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	4.16	6.72	28	7	1130

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Unique ground and lightly shot blasted finish to give an appearance of natural stone
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Medium to low - Typically USRV 60
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical team for more details.
Joint	Kent Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for Silver and Buff Granite colour flag paving
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


Baskerville School
FY60 GYK
Baskerville School
TRANSIT
next
M&S
GAP
Pure Gym

Tara

Heavy Textured Granite Finish Concrete Flag Paving

Pedestrian Traffic | Car & Light Vehicle Traffic* | Part of the Eco Paving Range

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Concrete Flag Paving
- Available in 4 colours
- Heavy textured premium granite aggregate finish
- Suitable for use on Patio, pathways and commercial pedestrian areas
- Can be laid in stack bond or stretcher bond depending on selected unit size(s)


Silver Granite


Black Granite


Buff Granite


Light Granite

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
450 x 450 x 40	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	12.96	64	16	1150
400 x 400 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	10.56	66	11	1170
450 x 450 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	11.34	56	14	1010
600 x 300 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	5.55	8.64	48	16	1175
600 x 400 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	4.16	10.56	44	11	1215
600 x 600 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	2.77	10.8	30	15	1180
400 x 400 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	8.64	54	9	1200
450 x 450 x 70	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	8.1	40	10	950
400 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	6.72	42	7	1130
600 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	4.16	6.72	28	7	1130

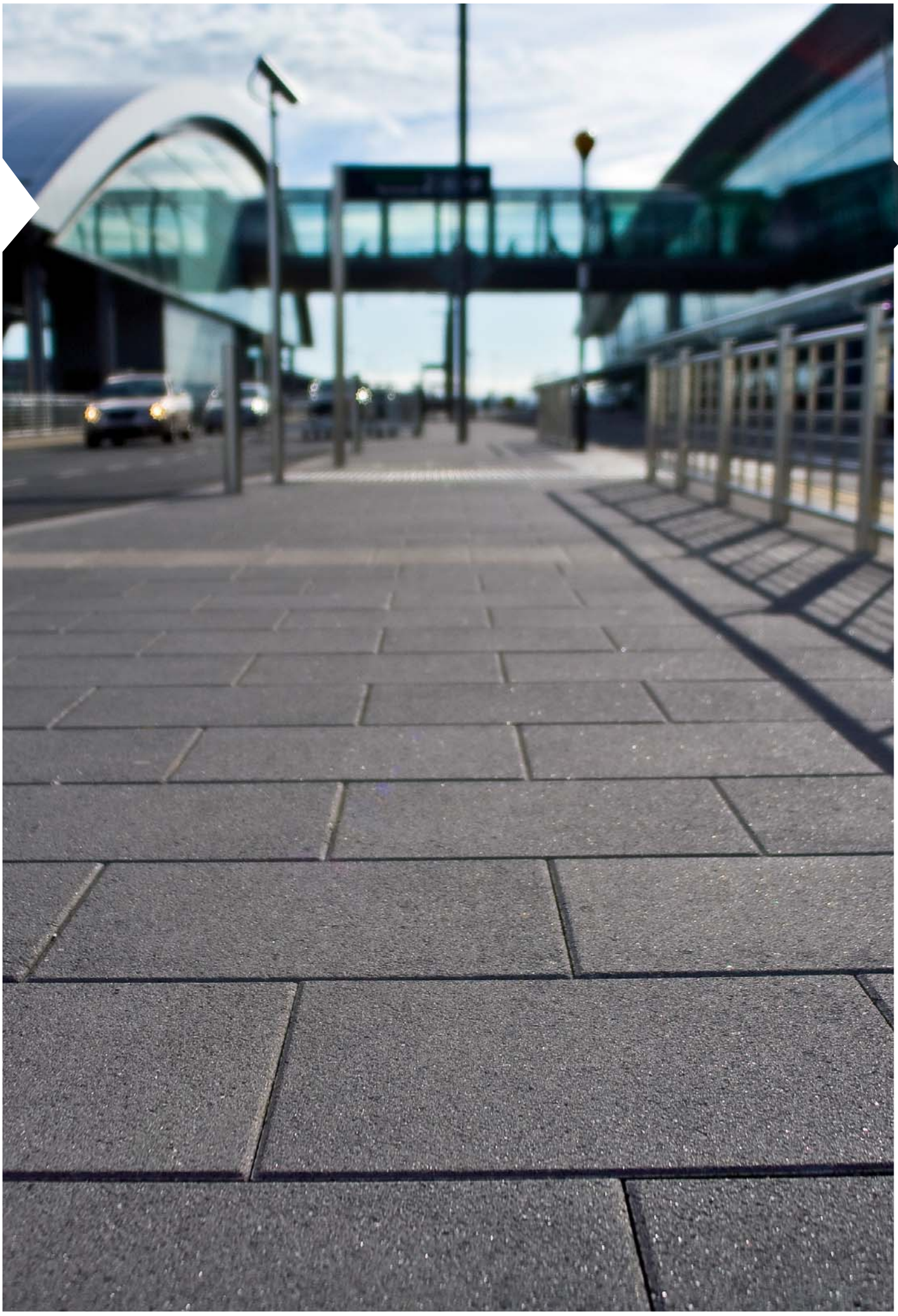
Bold text = in stock Light text = Made to order (Minimum order quantity applies).

* with 63mm or 80mm flag only

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Heavy textured finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low - Typical USRV 70
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical team for more details.
Joint	Tara Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for Silver and Buff Granite colour flag paving
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



Newgrange

Textured Granite Finish Concrete Flag Paving

Pedestrian Traffic

Car & Light Vehicle Traffic*

Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Concrete Flag Paving
- Available in 4 colours
- Contemporary finish with standard chamfer detail
- Lightly textured premium granite aggregate finish
- Suitable for use on patios, pathways, and commercial pedestrian areas
- Can be laid in stack bond or stretcher bond depending on selected unit size(s)


Silver Granite


Black Granite


Buff Granite


Light Granite

Product Range

Dimensions (mm)	Colours	Pcs per m^2	m^2 per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**6.25**	**12.8**	**80**	**20**	**1100**
450 x 450 x 40	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.94**	**12.96**	**64**	**16**	**1150**
400 x 400 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**6.25**	**10.56**	**66**	**11**	**1170**
450 x 450 x 50	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	11.34	56	14	1010
600 x 300 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**5.55**	**8.64**	**48**	**16**	**1175**
600 x 400 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**4.16**	**10.56**	**44**	**11**	**1215**
600 x 600 x 50	**Silver Granite, Black Granite, Buff Granite, Light Granite**	**2.77**	**10.8**	**30**	**15**	**1180**
400 x 400 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	8.64	54	9	1200
600 x 600 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	2.77	5.76	16	8	730
600 x 900 x 63	Silver Granite, Black Granite, Buff Granite, Light Granite	1.85	6.48	12	6	1195
450 x 450 x 70	Silver Granite, Black Granite, Buff Granite, Light Granite	4.94	8.1	40	10	950
400 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25	6.72	42	7	1130
600 x 400 x 80	Silver Granite, Black Granite, Buff Granite, Light Granite	4.16	6.72	28	7	1130

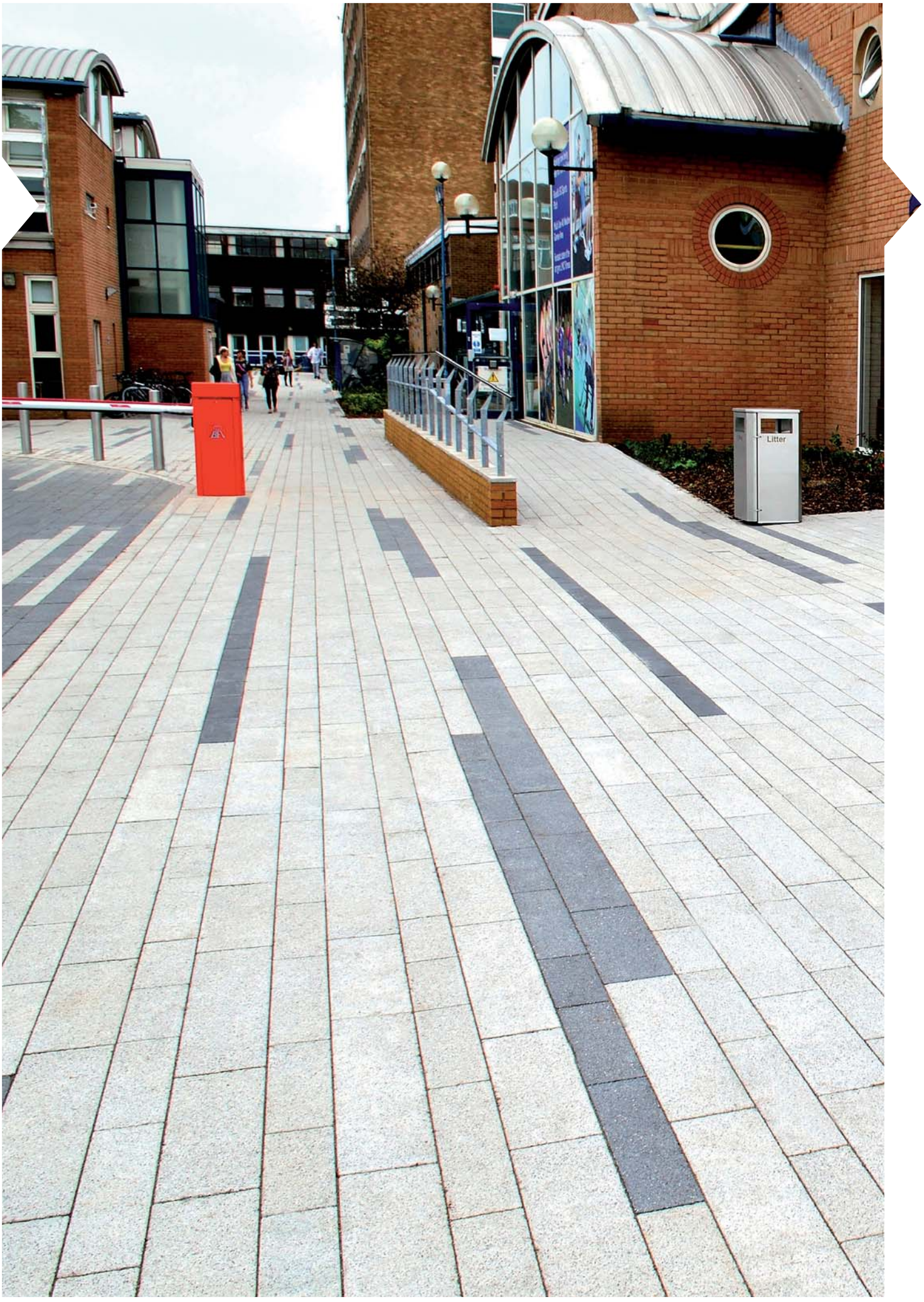
Bold text = in stock Light text = Made to order (Minimum order quantity applies).

* with 63mm or 80mm flag only

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Lightly textured granite aggregate finish.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typically USRV 65.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Newgrange Block Paving

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light vehicular over-run can be accommodated using the correct thickness of flag (63mm or 80mm) used in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical team for more details.
Joint	Newgrange Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for Silver and Buff Granite colour flag paving
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


Litter

Pembroke Flags

Contemporary Flag Range

Pedestrian Traffic | Car & Light Vehicle Traffic | Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Concrete Flag Paving
- Available in 4 colours
- Supplied in mix pack of 5 sizes or as a single 800x200x80mm size option
- Available in three finishes, standard smooth, ground and textured
- Suitable for use on paths, footways, commercial pedestrian applications and light vehicular over-run with suitable sub base design
- Supplied in 80mm depth
- Rectangular units with spacer nibs
- Transverse or longitudinal stretcher bond laying pattern


Silver Granite


Black Granite


Slate


Bracken

5 size mixed pack, unit sizes and quantities per layer, as supplied.

Product Range

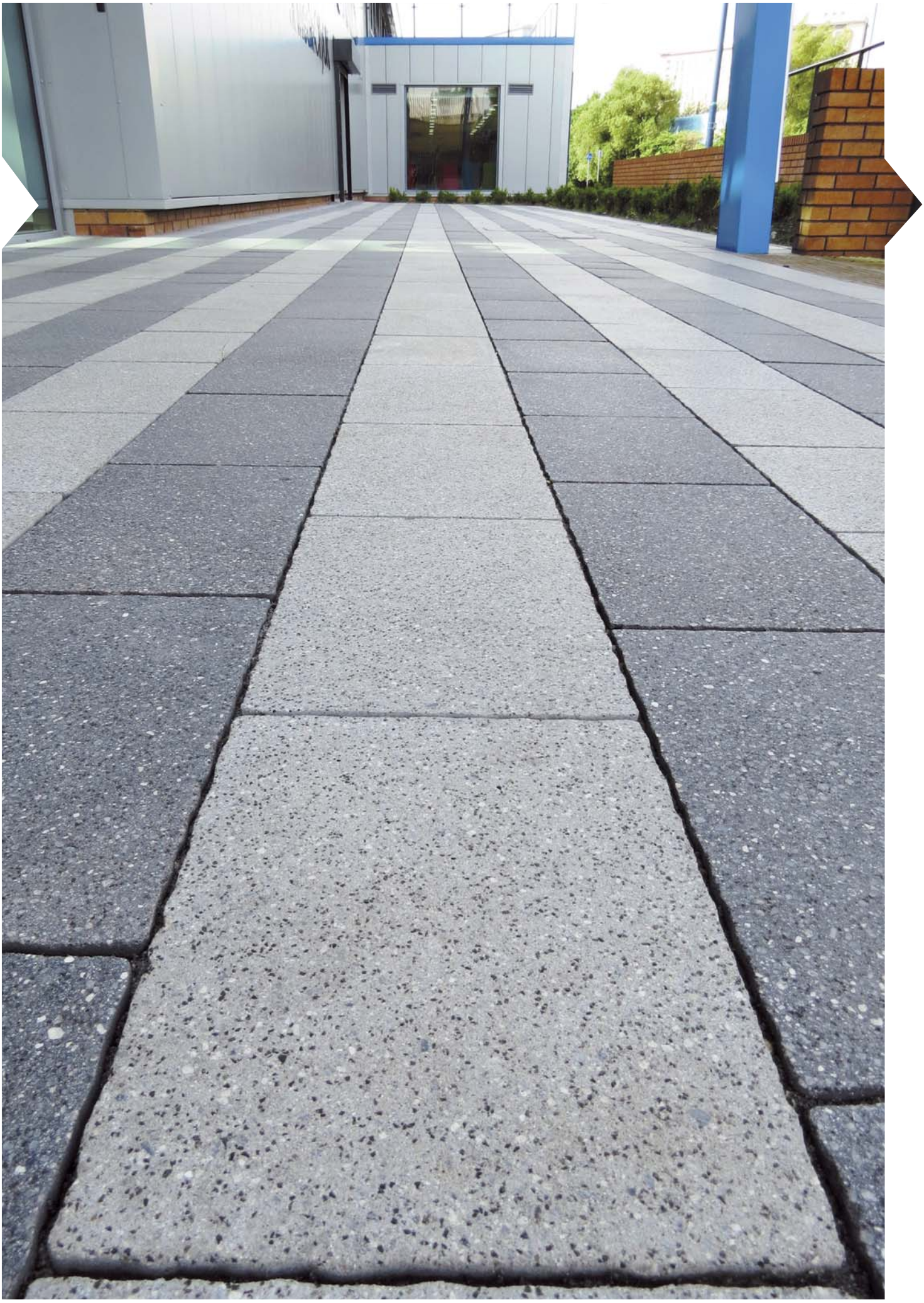
Range	Dimensions (mm) (5 size mix only)	Colours	Pieces Per m²	m² per bale	Pcs per bale	No. of layers per bale	Approx. Bale Weight (Kg)
Pembroke (Standard)	(5 size mix only) 300 x 125 x 80 400 x 125 x 80 500 x 125 x 80 500 x 175 x 80 700 x 175 x 80	Slate, Bracken	N/A	7.2	70	10	1100
Pembroke (Standard)	800 x 200 x 80	Slate, Bracken		available from April 2014			
Pembroke (Textured)	(5 size mix only) 300 x 125 x 80 400 x 125 x 80 500 x 125 x 80 500 x 175 x 80 700 x 175 x 80	Silver Granite, Black Granite	N/A	7.2	70	10	1100
Pembroke (Textured)	800 x 200 x 80	Silver Granite, Black Granite		available from April 2014			
Pembroke (Ground)	(5 size mix only) 300 x 125 x 80 400 x 125 x 80 500 x 125 x 80 500 x 175 x 80 700 x 175 x 80	Silver Granite, Black Granite	N/A	7.2	70	10	1100
Pembroke (Ground)	800 x 200 x 80	Silver Granite, Black Granite		available from April 2014			

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Standard smooth, lightly textured and ground finish.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Medium to low - Typically USRV65 for textured, USRV52 for ground, USRV60 for standard.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light car only over-run can be accommodated in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	No
Joint	Pembroke Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Pembroke flag paving to avoid staining
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



Killeen Flags

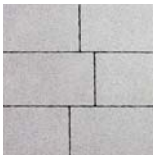
Contemporary Flag Range

Pedestrian Traffic | Car & Light Vehicle Traffic | Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Concrete Flag Paving
- Available in 4 colours
- Irregular edge profile
- Available in antiqued (distressed edges), ground or standard finish
- Suitable for use on patios, paths and commercial pedestrian areas
- Supplied as a mixed pack of 4 sizes
- Laid in a random bond pattern
- Supplied in 70mm depth

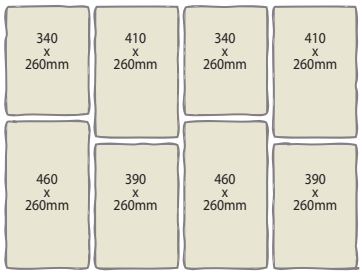


Silver Granite

Black Granite

Sunset Red

Harvest Gold



Unit sizes and quantities per layer, as supplied.

Product Range

Range	Dimensions (mm) (4 size mix only)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
Standard	4 Co-ordinating Mixed Sizes as shown above	**Sunset Red, Harvest Gold**	**N/A**	**7.56**	**72**	**9**	**1180**
Antiqued		**Sunset Red, Harvest Gold**	**N/A**	**7.56**	**72**	**9**	**1180**
Ground		Sunset Red, Harvest Gold, Silver Granite, Black Granite	N/A	7.56	72	9	1180

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Antiqued finish (distressed edges) or ground finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Medium to low - Typically USRV 60 for antiqued, typically USRV 52 for ground finish.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	Yes see Clima Pave section
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light car only over-run can be accommodated in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	No
Joint	Killeen Paving has a 4-6mm approx. integral spacer nib which will give a resulting irregular profile joint width of approx. 6-8mm when laid. Joints should be filled with Kiln dried jointing sand or proprietary wide jointing compound approved for this product – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


201

Textured Flags

Textured Concrete Flag Paving

Q25 315
Q25 31

Pedestrian Traffic | Car & Light Vehicle Traffic*

Features

- Concrete Flag Paving
- Available in 4 colour finishes
- Lightly textured surface and edges
- Suitable for use on patios, pathways and commercial pedestrian areas
- Can be laid in stack bond or stretcher bond depending on selected unit size(s)


Natural


Buff


Charcoal


Red

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	**Natural, Buff, Charcoal, Red**	**6.25**	**12.8**	**80**	**20**	**1100**
450 x 450 x 40	**Natural, Buff, Charcoal, Red**	**4.94**	**12.96**	**64**	**16**	**1150**
400 x 400 x 50	Natural, Buff, Charcoal, Red	6.25	10.56	66	11	1170
450 x 450 x 50	Natural, Buff, Charcoal, Red	4.94	11.34	56	14	1010
600 x 300 x 50	Natural, Buff, Charcoal, Red	5.55	8.64	48	16	1175
600 x 400 x 50	Natural, Buff, Charcoal, Red	4.16	10.56	44	11	1215
600 x 600 x 50	**Natural, Buff, Charcoal, Red**	**2.77**	**10.8**	**30**	**15**	**1180**
400 x 400 x 63	Natural, Buff, Charcoal, Red	6.25	8.64	54	9	1200
600 x 600 x 63	Natural, Buff, Charcoal, Red	2.77	5.76	16	8	730
600 x 900 x 63	Natural, Buff, Charcoal, Red	1.85	6.48	12	6	1195
450 x 450 x 70	Natural, Buff, Charcoal, Red	4.94	8.1	40	10	950
400 x 400 x 80	Natural, Buff, Charcoal, Red	6.25	6.72	42	7	1130
600 x 400 x 80	Natural, Buff, Charcoal, Red	4.16	6.72	28	7	1130

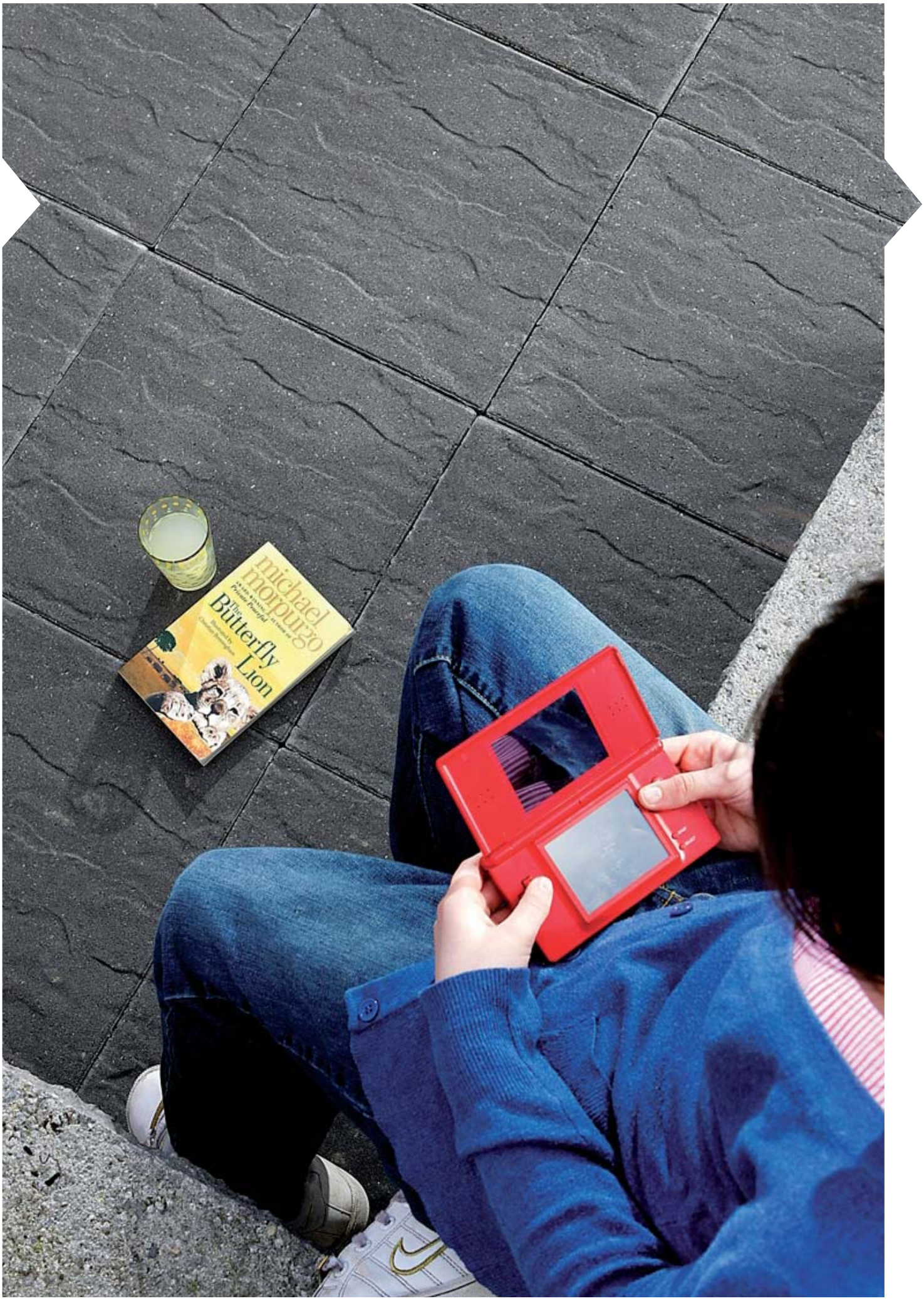
Bold text = in stock Light text = Made to order (Minimum order quantity applies).

* with 63mm or 80mm flag only

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Textured finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typically USRV 65
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Newgrange Block Paving

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light vehicular over-run can be accommodated using the correct thickness of flag (63mm or 80mm) used in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical team for more details.
Joint	Textured Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


michael morpurgo
The Butterfly Lion

Cashel Flags

Riven Finish Flag Paving

Q25 315
Q25 31

Pedestrian Traffic

Features

- Concrete Flag Paving
- Riven surface finish
- Available In 3 colours
- Suitable for use on patios, paths and pedestrian areas
- Cost effective solution
- Can be laid in stack bond or stretcher bond
- Chamfered edge profile


Natural


Charcoal


Gold

Product Range

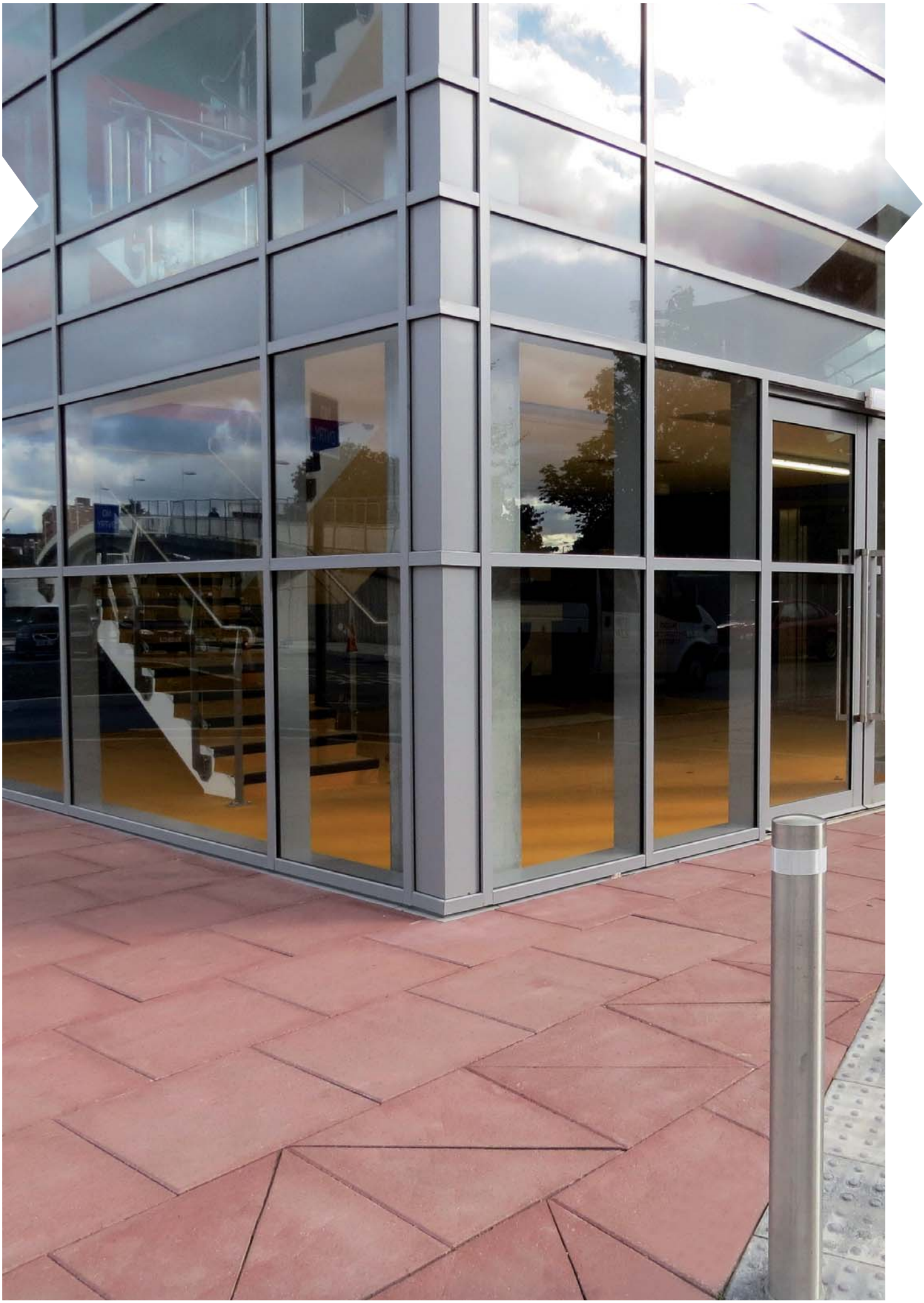
Dimensions (mm)	Colours	Pcs per m^2	m^2 per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	Natural, Charcoal, Gold	6.25	13.44	84	14	1180

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Riven finish.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typically USRV 60.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm
Joint	Cashel Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand. – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



Classic

Traditional Flag Paving

Pedestrian Traffic

Very light car traffic*

Q25 315
Q25 31

Features

- Concrete Flag Paving
- Smooth surface finish
- Suitable for use on patios, paths and commercial pedestrian areas
- Cost effective solution
- Can be laid in stack bond or stretcher bond depending on unit size(s)
- Available in 6 colours
- Normally supplied in chamfered edge profile


Natural


Buff


Charcoal


Red


Rustic


Curragh Gold

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 40	**Natural, Charcoal, Buff, Red,Curragh, Rustic**	**6.25**	**12.8**	**80**	**20**	**1100**
450 x 450 x 40	**Natural, Charcoal, Buff, Red,Curragh, Rustic**	**4.94**	**12.96**	**64**	**16**	**1150**
400 x 400 x 50	**Natural , Charcoal**	**6.25**	**10.56**	**66**	**11**	**1170**
450 x 450 x 50	Natural, Charcoal, Buff, Red,Curragh, Rustic	4.94	11.34	56	14	1010
600 x 300 x 50	**Natural**	**5.55**	**8.64**	**48**	**16**	**1175**
600 x 400 x 50	**Natural, Charcoal**	**4.16**	**10.56**	**44**	**11**	**1215**
600 x 600 x 50	**Natural, Charcoal, Curragh Gold**	**2.77**	**10.8**	**30**	**15**	**1180**
400 x 400 x 63	Natural	6.25	8.64	54	9	1200
600 x 600 x 63	Natural	2.77	5.76	16	8	730
600 x 900 x 63	Natural	1.85	6.48	12	6	1195
450 x 450 x 70	Natural, Charcoal	4.94	8.1	40	10	950
400 x 400 x 80	Natural, Charcoal	6.25	6.72	42	7	1130
600 x 400 x 80	Natural, Charcoal	4.16	6.72	28	7	1130

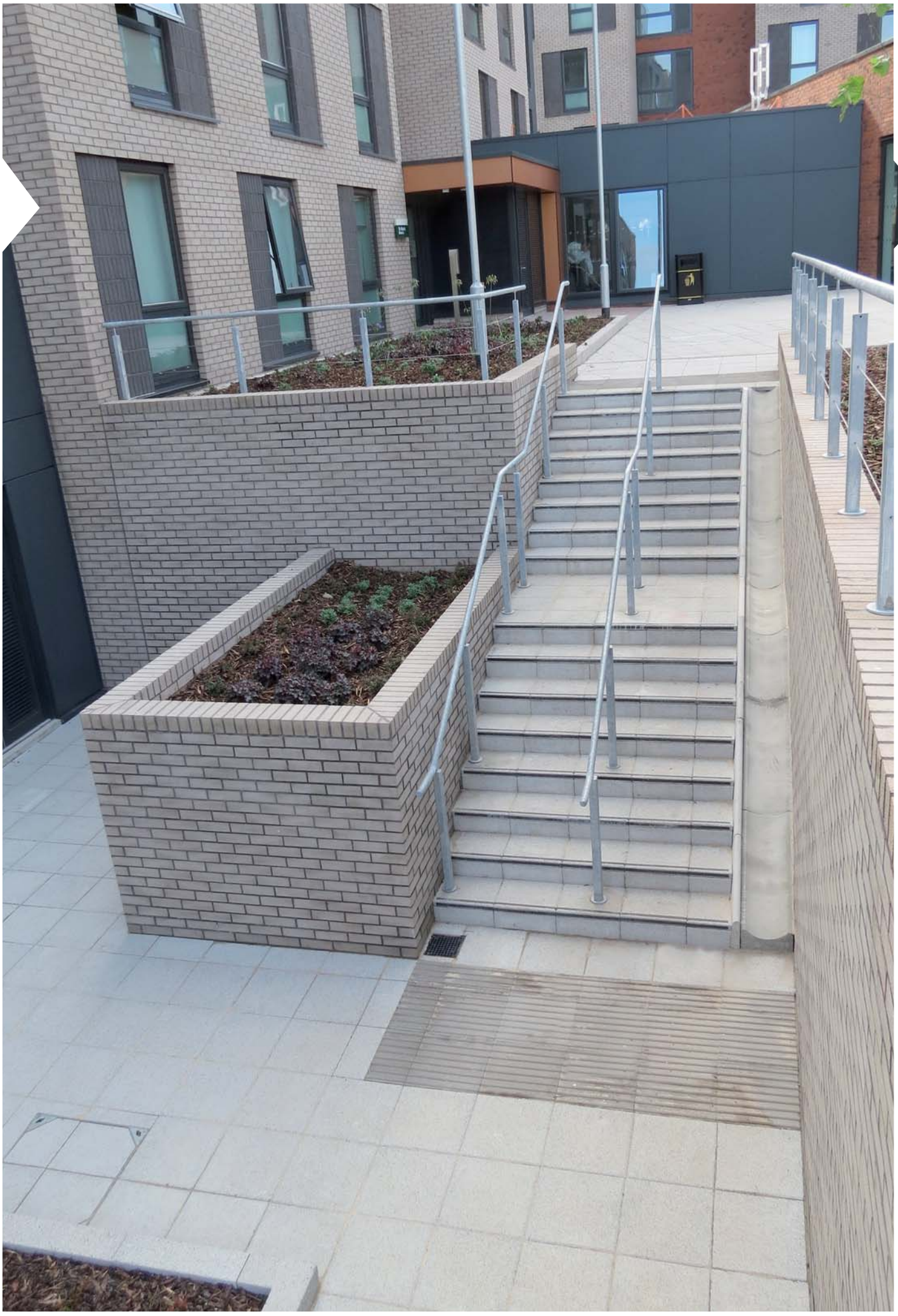
Bold text = in stock Light text = Made to order (Minimum order quantity applies).

* with 63mm or 80mm flag only

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Smooth standard finish.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typically USRV 60.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No.
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light vehicular over-run can be accommodated using the correct thickness of flag (63mm or 80mm) used in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	Standard chamfer of approximately 4mm. Some unit sizes are available with a square edge, please contact the Technical Team for further details.
Joint	Classic Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand. – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



Step Flag

with delineation strip

Pedestrian Traffic

Part of the Eco Paving Range

Q25 315
Q25 31

Features

- Kilsaran's step delineation flag is now available in there ever popular Newgrange and Textured Flag range
- Inserted delineation strip can be made to any RAL colour*.
- 2 size format option 400x400x50mm and 600x300x50mm
- Edges finished to match the tread
- Bespoke riser solutions available upon request
- Part of our Eco Range
- DDA approved strip

Textured Flag Colour Options

Natural

Buff

Charcoal

Red

Newgrange Flag Colour Options

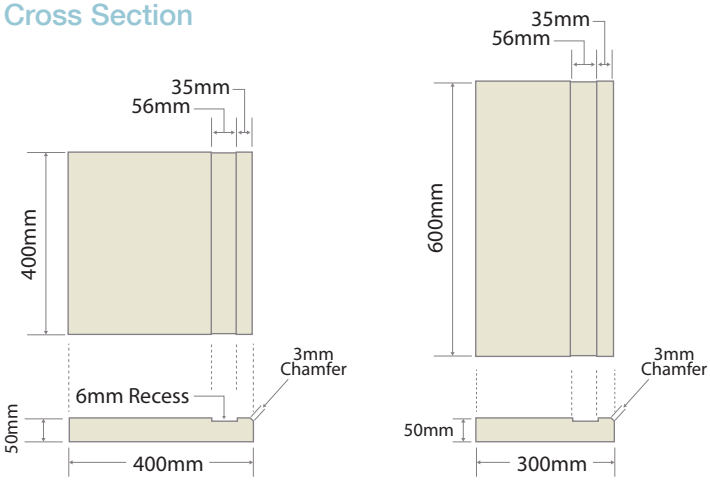
Silver Granite

Black Granite

Buff Granite

Light Granite

Cross Section



Product Range

Product Range	Dimensions (mm)	Colours	Pcs per m²	Approx Flag Weight (kg)
Newgrange Step Delineation Flag	600x300x50	Silver Granite, Black Granite, Buff Granite, Light Granite	5.55 sold individually	13.75 each
Newgrange Step Delineation Flag	400x400x50	Silver Granite, Black Granite, Buff Granite, Light Granite	6.25 sold individually	13.75 each
Textured Flag Step Delineation Flag	600x300x50	Natural, Buff, Charcoal, Red	5.55 sold individually	13.75 each
Textured Flag Step Delineation Flag	400x400x50	Natural, Buff, Charcoal, Red	6.25 sold individually	13.75 each

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Diarmuid Gavin

Kilsaran

PAVING COLLECTION

Kilsaran International are delighted to present an exclusive paving collection in collaboration with renowned Irish garden designer Diarmuid Gavin. The range will comprise of a bespoke range of paving products and accessories that will provide a complete makeover solution for the keen gardener or DIY enthusiast. Kilsaran will supply fully branded point of sale displays to showcase the new range in-store. Contact your Kilsaran rep for more details on stocking the Kilsaran Diarmuid Gavin range.

New for 2014

Quayside Flag

Contemporary Flag

designed by... Diarmuid Gavin

Pedestrian Traffic

Car & Light Vehicle Traffic

Part of the Eco Paving Range

Q25 315
Q25 31

Features

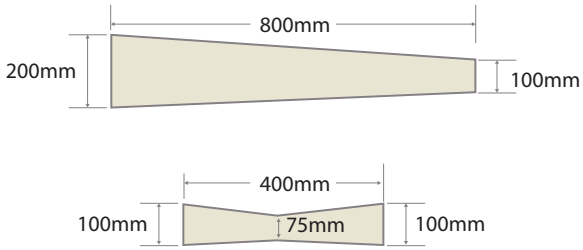
- Concrete Flag Paving
- Available in 4 colours
- Supplied in individual unit sizes 800x200/100x80mm and 400x100/75/100x80mm as per the illustration below.
- Available in three finishes, standard smooth, ground and textured
- Suitable for use on paths, footways, commercial pedestrian applications and light vehicular over-run with suitable sub base design
- Supplied in 80mm depth


Silver Granite


Black Granite


Slate


Bracken



Product Range

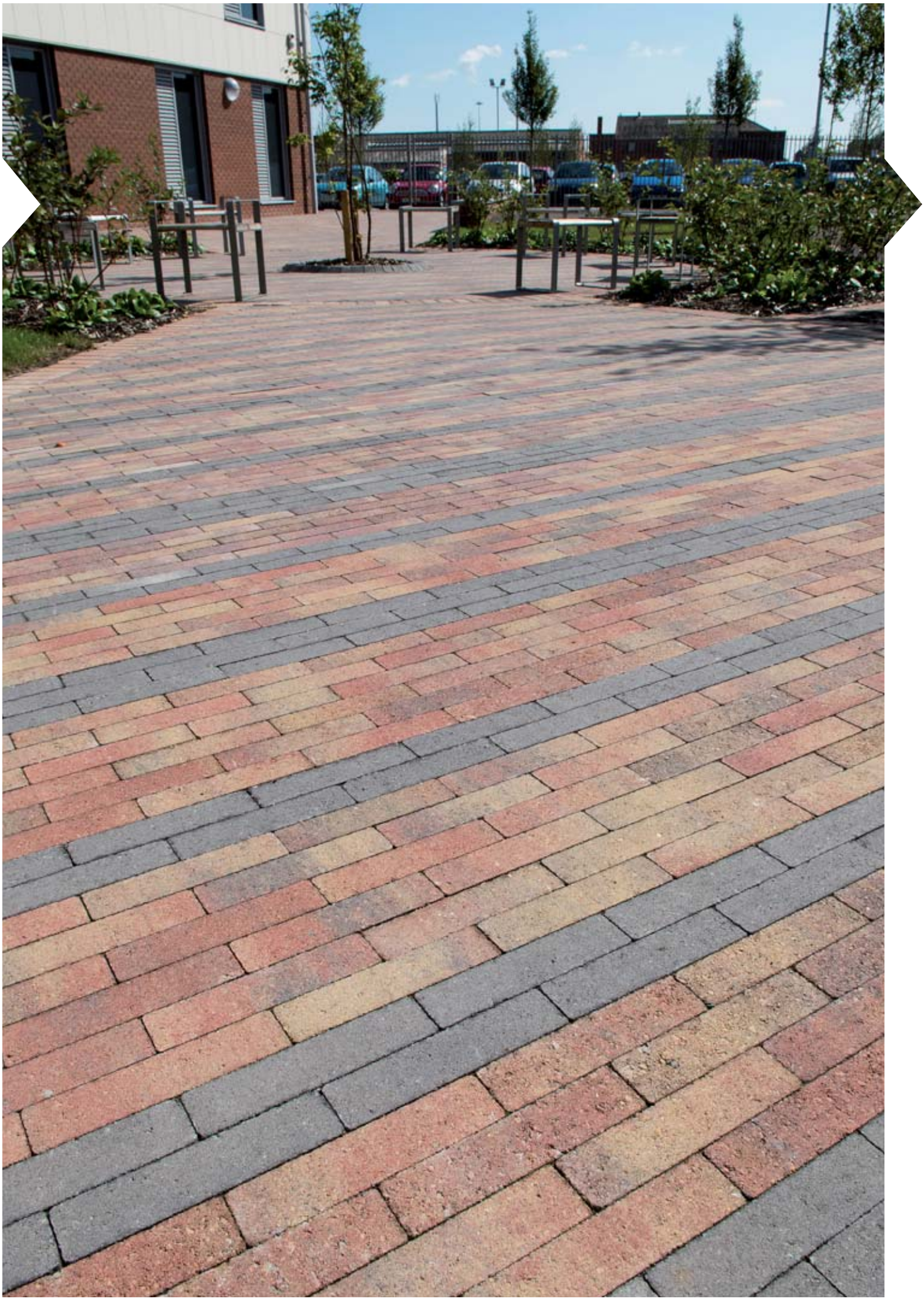
Range	Dimensions (mm) (4 size mix only)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
Piano (Standard)	800x200/100x80	Slate, Bracken	available from June 2014*				1180
Piano (Standard)	400x100/75/100x80	Slate, Bracken	available from June 2014*				
Piano (Textured)	800x200/100x80	Silver Granite, Black Granite	available from June 2014*				
Piano (Textured)	400x100/75/100x80	Silver Granite, Black Granite	available from June 2014*				
Piano (Ground)	800x200/100x80	Silver Granite, Black Granite	available from June 2014*				
Piano (Ground)	400x100/75/100x80	Silver Granite, Black Granite	available from June 2014*				

* Please visit our website for more information

Technical & Performance Data

Product Type	Concrete flag paving
Product Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Standard smooth, lightly textured and ground finish.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Medium to low - Typically USRV65 for textured, USRV52 for ground, USRV60 for standard.
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	No
Application & Trafficking	Product suitable for pedestrian areas and commercial footpaths, light car only over-run can be accommodated in conjunction with the correct site specific sub base design. For further information on design and loading please see installation standards section on pages 96-98.
Chamfer	No
Joint	Quayside Flags have a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Pembroke flag paving to avoid staining
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



BLOCK PAVING

Newgrange
Tara
Mellifont
Inish
Corrib
Lismore
Slane

SETTS:

– Newgrange, Mellifont, Lismore

Kilsaran
ideas taking shape


The Derwent Campus
THE DERWENT CAMPUS

Newgrange

Textured Granite Finish Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Part of the Eco Paving Range

Q24 10
Q24 115
Q24 112
Q24 113

Features

- Concrete Block Paving
- Available in 3 colour finishes
- Lightly textured premium granite aggregate finish
- Various depths available for different traffic loadings
- Normally supplied in a three size mix, single sizes can be obtained separately
- Can be laid in a variety of laying patterns depending on unit size selected


Silver Granite


Black Granite


Buff Granite

Product Range

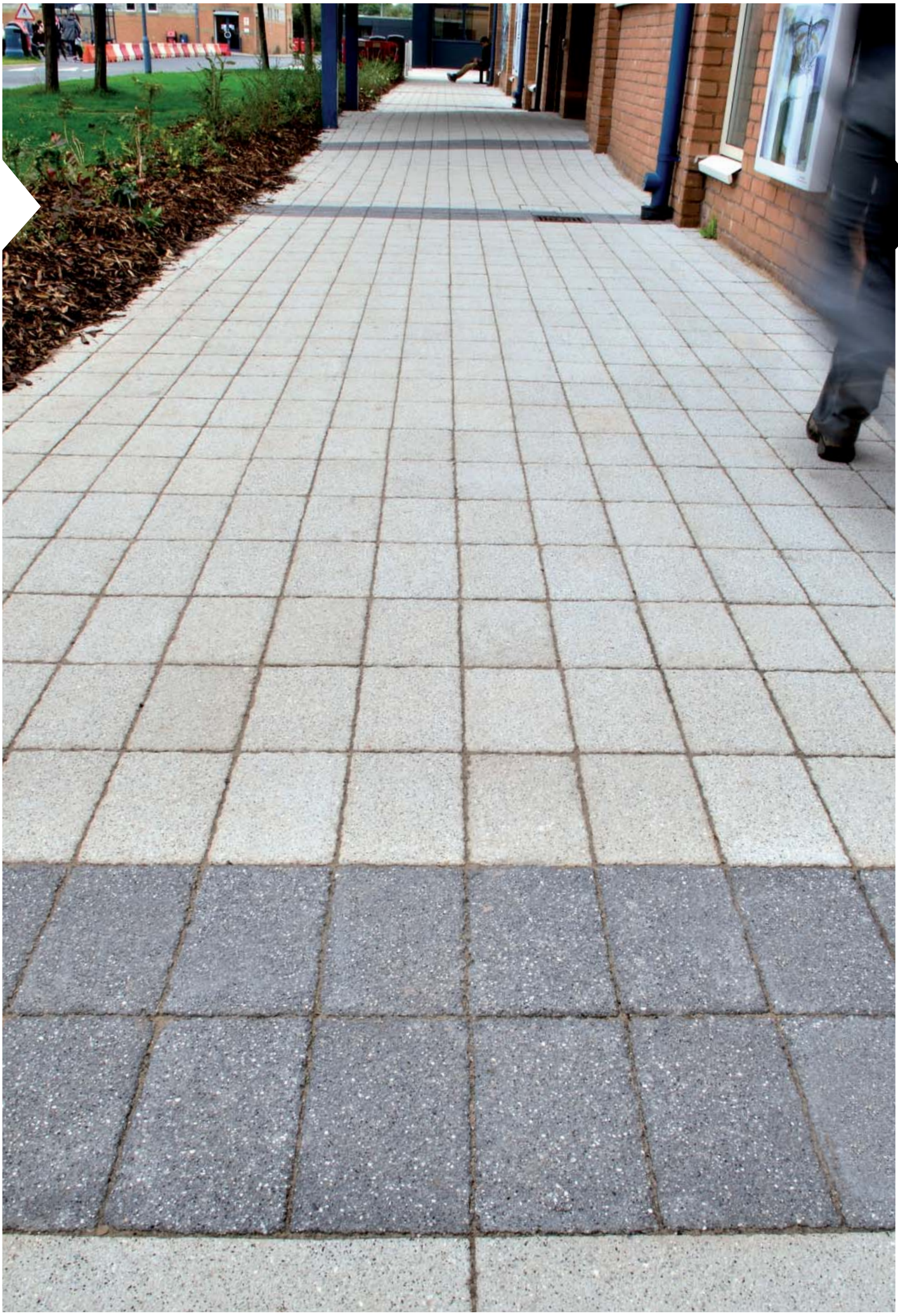
Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
3 size x 50	**Silver Granite, Black Granite, Buff Granite**	**35**	**9.6**	**480**	**10**	**1020**
3 size x 60	**Silver Granite, Black Granite, Buff Granite**	**35**	**9.6**	**350**	**10**	**1205**
3 size x 80	Silver Granite, Black Granite, Buff Granite	35	6.72	245	7	1190
200 x 100 x 50	Silver Granite, Black Granite, Buff Granite	50	12.48	576	13	1310
200 x 100 x 60	Silver Granite, Black Granite, Buff Granite	50	9.6	480	10	1060
200 x 100 x 80	Silver Granite, Black Granite, Buff Granite	50	6.72	336	7	1115
120 x 160 x 60	Silver Granite, Black Granite, Buff Granite	52	9.6	500	10	1185
160 x 160 x 60	Silver Granite, Black Granite, Buff Granite	40	9	350	10	1125
240 x 160 x 60	Silver Granite, Black Granite, Buff Granite	27	9.6	250	10	1195
120 x 160 x 80	Silver Granite, Black Granite, Buff Granite	52	6.72	350	7	1170
160 x 160 x 80	Silver Granite, Black Granite, Buff Granite	40	6.3	245	7	1045
240 x 160 x 80	Silver Granite, Black Granite, Buff Granite	27	6.72	175	7	1075

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Lightly textured granite aggregate finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - USRV 65
Strength	Typical tensile splitting strength of ≥3,6MPa and a failure load of ≥250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Newgrange Setts, Newgrange Flag

Permeable option	Yes, refer to the 'Clima-Pave Brochure'
Application & Trafficking	Product suitable for both pedestrian and car traffic use when installed in conjunction with the correct sub base design. Not suitable for truck / commercial vehicle traffic. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	No, except for the 200x100 unit size
Joint	Newgrange Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard width of approx. 2mm when laid. Joints should be filled with kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Newgrange block paving to avoid staining.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009, 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001



Tara

Heavy Textured Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Commercial Traffic | Part of the Eco Paving Range

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Concrete Block Paving
- Available in 6 colour finishes
- Heavy textured surface and edges
- Suitable for use on patios, pathways, domestic driveways and areas where car traffic or occasional heavier commercial vehicles use the surface
- Various depths available for different traffic loadings
- Supplied in a three size mix, single sizes can be obtained separately in 60mm and 80mm depth only and are made to order
- Can be laid in a variety of laying patterns depending on unit size selected


Silver Granite


Black Granite


Rustic


Curragh Gold


Charcoal


Natural

Product Range

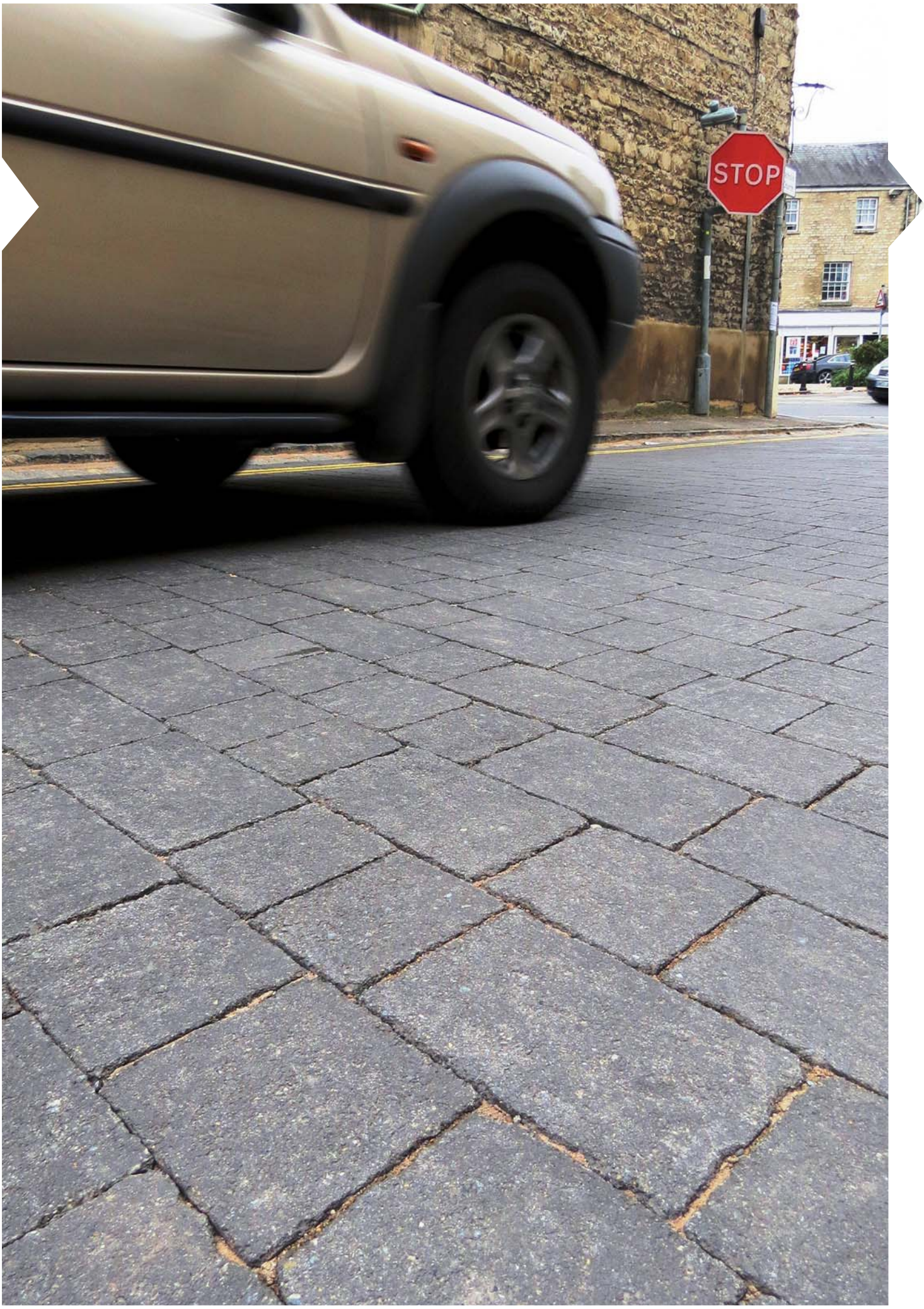
Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
3 size x 60	**Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite**	**35**	**9.6**	**350**	**10**	**1190**
3 size x 80	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	35	6.72	245	7	1190
120 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	52	9.6	500	10	1185
160 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	40	9	350	10	1125
240 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	27	9.6	250	10	1195
120 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	52	6.72	350	7	1170
160 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	40	6.3	245	7	1045
240 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural, Silver Granite , Black Granite	27	6.72	175	7	1075

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Pin Hammered heavy textured finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Very Low potential - Typical USRV 70
Strength	Typical tensile splitting strength of ≥3,6MPa and a failure load of ≥250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	Yes, refer to the 'Clima-Pave brochure'
Application & Trafficking	Product suitable for both pedestrian, vehicular use and commercial traffic when correct block thickness is used in conjunction with the correct sub base design. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	No
Joint	Tara Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard width of approx. 2mm when laid. Joints should be filled with kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Tara block paving to avoid staining.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


STOP

Mellifont

Traditional Distressed Edge Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Commercial Traffic

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Antiqued edges and surface gives the effect of time worn cobble
- Available in 4 colours
- Tumbled effect finish to edges and surface
- Suitable for use on patios, driveways, domestic and commercial applications
- Various depths available for different traffic loadings
- Normally supplied in a three size mix, single sizes can be obtained separately in 60mm and 80mm depth only and are made to order
- Can be laid in a variety of laying patterns depending on unit size selected


Rustic


Curragh Gold


Charcoal


Natural

Product Range

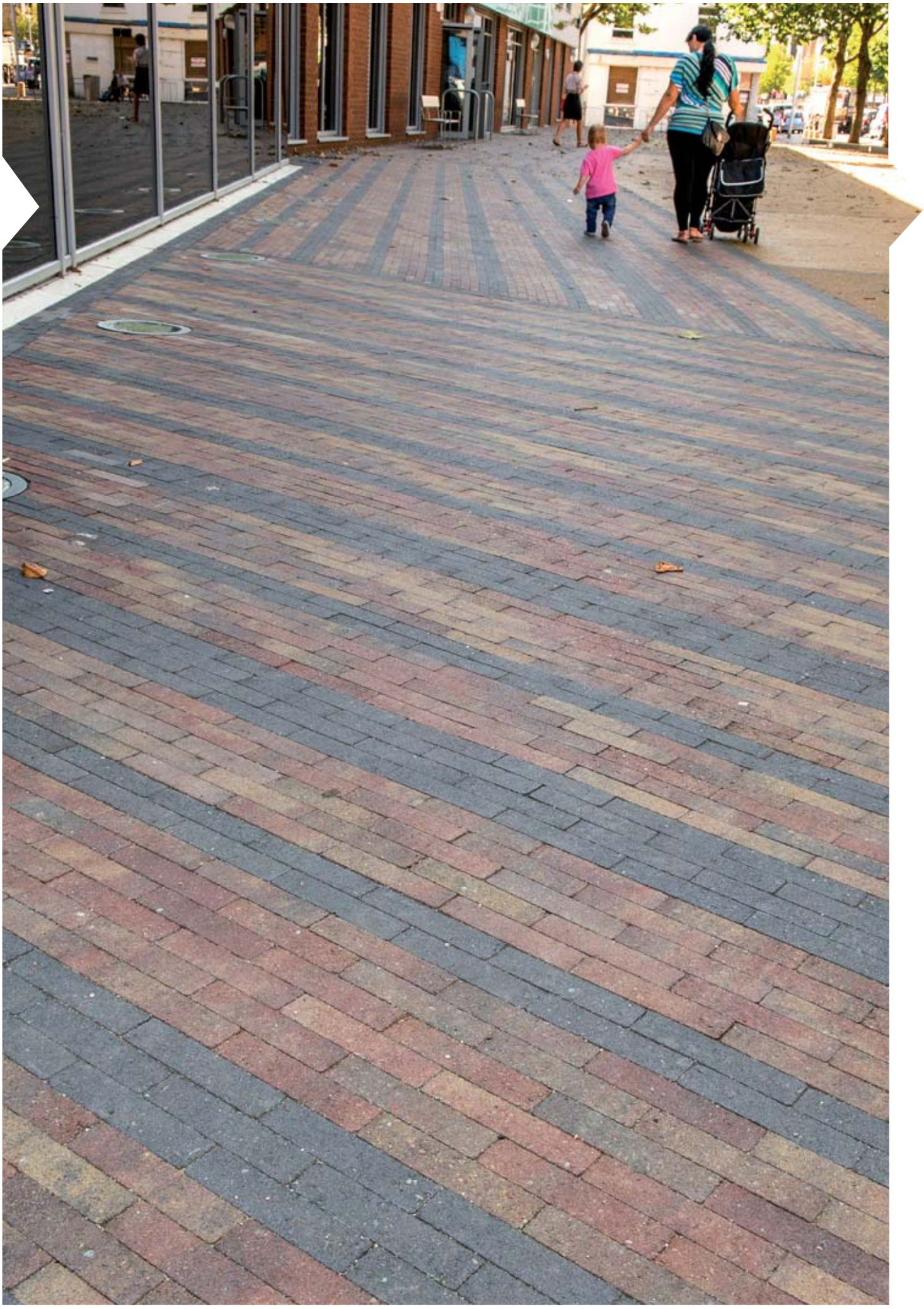
Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
3 size x 50	**Rustic, Curragh Gold, Charcoal, Natural**	**35**	**11.52**	**403**	**12**	**1200**
3 size x 60	**Rustic, Curragh Gold, Charcoal, Natural**	**35**	**9.6**	**350**	**10**	**1205**
3 size x 80	Rustic, Curragh Gold, Charcoal, Natural	35	6.72	245	7	1190
120 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural	52	9.24	480	12	1140
160 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural	40	9.24	360	12	1140
240 x 160 x 60	Rustic, Curragh Gold, Charcoal, Natural	27	9.24	240	12	1140
120 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural	52	6.93	360	9	1170
160 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural	40	6.93	270	9	1170
240 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural	27	6.93	180	9	1170

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Mechanically distressed edges to provide an aged look
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typical USRV 60
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Mellifont Circle and Mellifont size setts

Permeable option	Yes, refer to the 'Clima-Pave Brochure'
Application & Trafficking	Product suitable for both pedestrian, vehicular use and commercial traffic when correct block thickness is used in conjunction with the correct sub base design. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	No
Joint	Mellifont Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard width of approx. 2mm when laid. Joints should be filled with kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Mellifont block paving to avoid staining.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009, 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008



Inish

Old World Charm From a Bygone Era

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Concrete Block Paving
- Available in 4 colour finishes
- Available in standard sharp edged finish or aged worn tumbled edge finish
- Smooth surface finish
- Suitable for use on patios, pathways, domestic driveways and areas where car traffic only uses the surface
- 200x50mm size units with no spacer nibs
- Can be laid in herringbone, stretcher bond and basketweave pattern depending on traffic that will use the area


Rustic


Curragh Gold


Charcoal


Natural


Rustic Tumbled


Curragh Gold Tumbled


Charcoal Tumbled


Natural Tumbled

Product Range

	Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
Inish	**200 x 50 x 60**	**Rustic, Curragh Gold, Charcoal, Natural**	**100**	**9**	**900**	**10**	**1060**
Inish Tumbled	200 x 50 x 60	Rustic, Curragh Gold, Charcoal, Natural	100	9	900	10	1060

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Square edged or tumbled finish
Packaging Information	Baled, strapped & plastic cover. Tumbled finish supplied in tote bag
Slip/Skid Resistance	Low potential - Typical USRV 60
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	Not available
Application & Trafficking	Product suitable for both pedestrian and car traffic use when installed in conjunction with the correct sub base design. Not suitable for truck / commercial vehicle traffic. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	No
Joint	Inish Paving has a narrow finished joint of 1mm approx. This product has no integral spacer nib and no chamfer and is suited to lower maintenance areas. Great care and attention must be paid when handling and installing to avoid chipping and damage to edges. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009, 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

Corrib

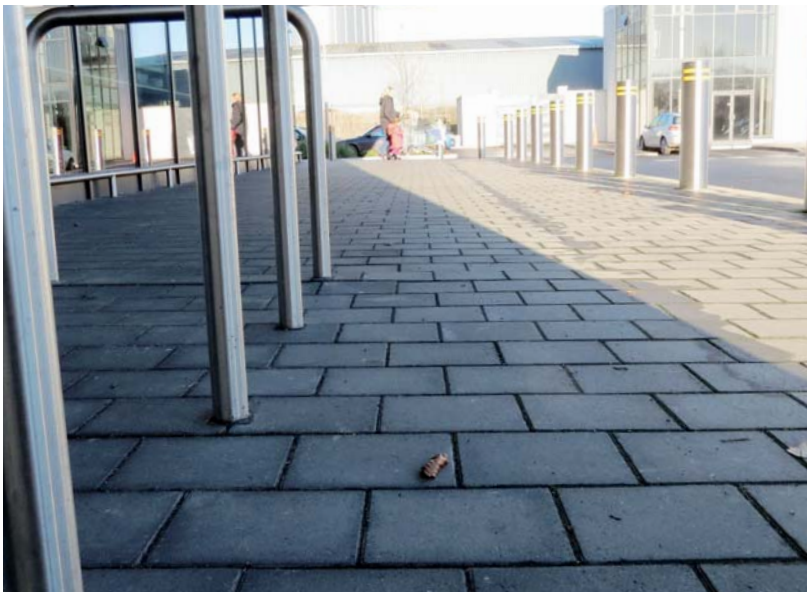
Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Commercial Traffic

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Single size block paving units
- Available in 6 colour finishes
- Suitable for use on patios, driveways, domestic and commercial applications
- Standard or lightly textured surface
- Can be laid in stretcher bond




Black Granite


Silver Granite


Rustic


Curragh Gold


Charcoal


Natural

Product Range

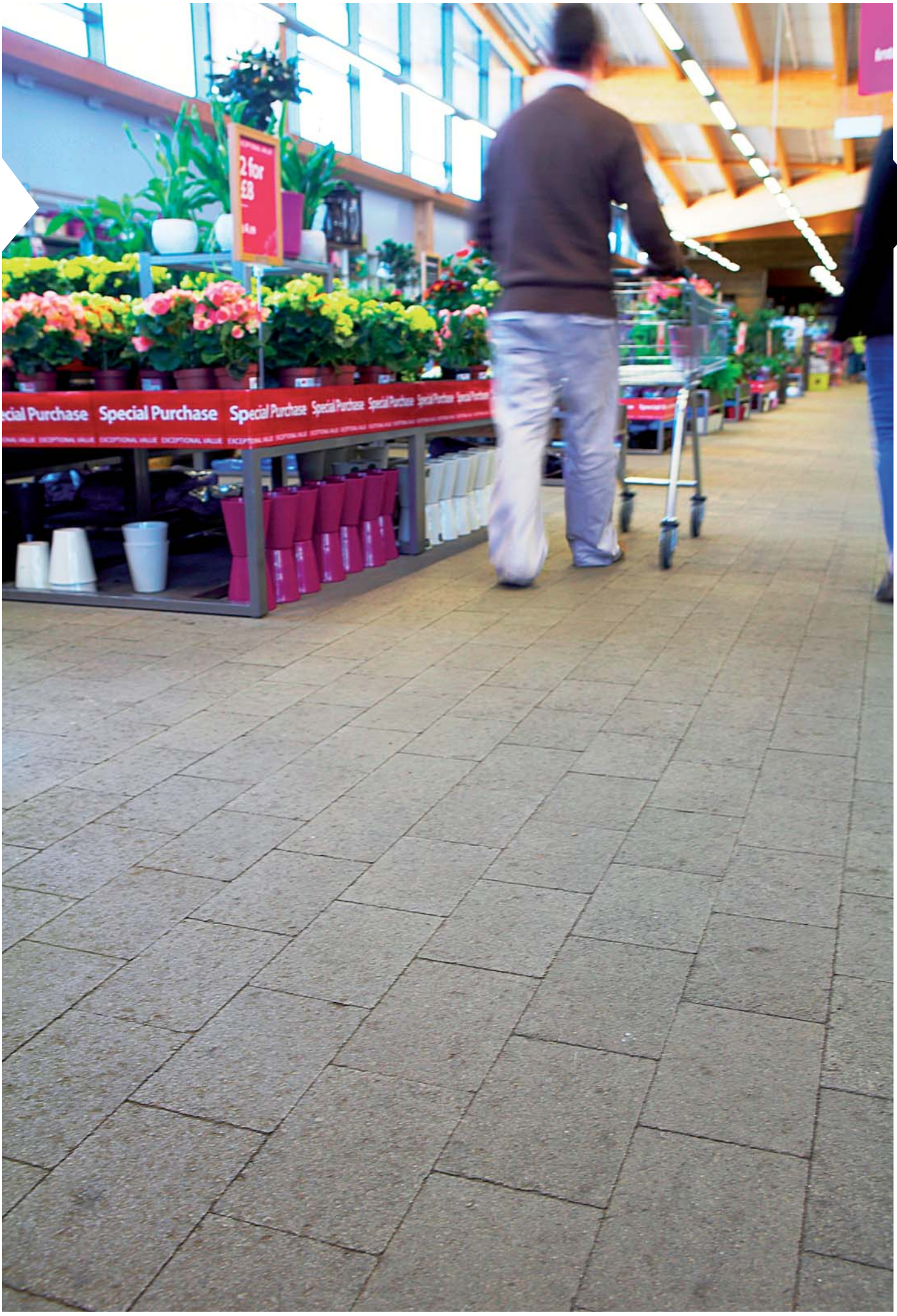
	Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
Corrib Standard	**210 x 170 x 60**	**Rustic, Curragh Gold, Charcoal, Natural**	**28**	**9**	**252**	**9**	**1220**
Corrib Textured	210 x 170 x 60	Silver Granite, Black Granite	28	9	252	9	1220
Corrib Standard	210 x 170 x 80	Rustic, Curragh Gold, Charcoal, Natural	28	6	168	6	1130
Corrib Textured	210 x 170 x 80	Silver Granite, Black Granite	28	86	168	6	1130

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Smooth finish for standard, textured finish for silver and black granite colours.
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typical USRV 60 for smooth 65 for textured
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	Not available
Application & Trafficking	Product suitable for both pedestrian, vehicular use and occasional commercial goods traffic when correct block thickness is used in conjunction with the correct sub base design. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	Standard chamfer of approximately 3mm.
Joint	Corrib Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Corrib block paving to avoid staining.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 over prepared sub base. 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001


2 for
£8
Special Purchase
Special Purchase
Special Purchase

Lismore

Squared Edged Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic

Q24 10
Q24 110
Q24 112
Q24 113

Features

- Concrete Block Paving
- Available in 4 colour finishes
- Standard smooth surface finish
- Suitable for use on patios, pathways, domestic driveways and areas where car traffic use the surface
- Various depths available for different traffic loadings
- Normally supplied in a three size mix, single sizes can be obtained separately in 60mm and 80mm depth only and are made to order
- Can be laid in a variety of laying patterns depending on unit size selected


Rustic


Curragh Gold


Charcoal


Natural

Product Range

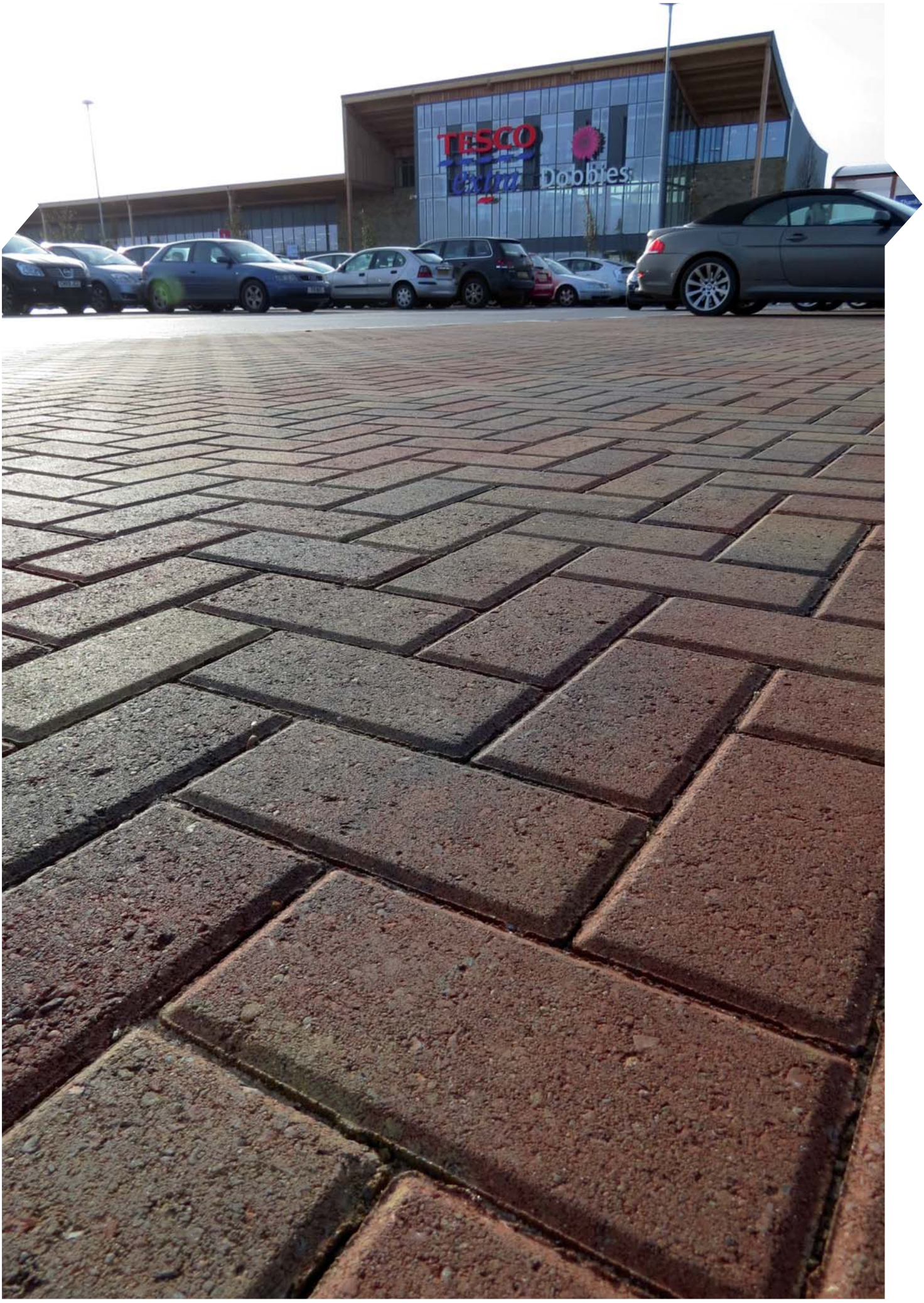
Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
3 size x 50	**Rustic, Curragh Gold, Charcoal, Natural**	**35**	**11.52**	**403**	**12**	**1200**
3 size x 60	**Rustic, Curragh Gold, Charcoal, Natural**	**35**	**9.6**	**350**	**10**	**1205**
3 size x 80	Rustic, Charcoal,Curragh Gold, Natural	35	6.72	245	7	1190
120 x 160 x 60	Rustic, Charcoal,Curragh Gold, Natural	52	9.24	480	12	1140
160 x 160 x 60	Rustic, Charcoal,Curragh Gold, Natural	40	9.24	360	12	1140
240 x 160 x 60	Rustic, Charcoal,Curragh Gold, Natural	27	9.24	240	12	1140
120 x 160 x 80	Rustic, Charcoal,Curragh Gold, Natural	52	6.93	360	9	1170
160 x 160 x 80	Rustic, Charcoal,Curragh Gold, Natural	40	6.93	270	9	1170
240 x 160 x 80	Rustic, Curragh Gold, Charcoal, Natural	27	6.93	180	9	1170

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Standard finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - Typical USRV 60
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Lismore Circle and Lismore six size setts

Permeable option	Yes, refer to the 'Clima-Pave brochure'
Application & Trafficking	Product suitable for both pedestrian and car traffic use when installed in conjunction with the correct sub base design. Not suitable for truck / commercial vehicle traffic. For further information on design and loading please see installation standards section on page 91-93.
Chamfer	No
Joint	Lismore Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard width of approx. 2mm when laid. Joints should be filled with kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for lighter colour Lismore block paving to avoid staining.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009, 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001


TESCO
Extra
Dobbies

Slane

Traditional Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Commercial Traffic | Machine Lay Version Available

Q24 10
Q24 115
Q24 112
Q24 113

Features

- Concrete Block Paving
- Available in 7 colour finishes
- Chamfered profile edge
- Standard surface finish
- Suitable for use on patios, driveways, domestic, commercial and heavy duty applications.
- Various depths available for all traffic loadings
- 200x100 size units with spacer nibs
- Can be laid in a variety of laying patterns including herringbone, stretcher bond and basket-weave pattern
- Machine Lay version available


Rustic


Curragh Gold


Charcoal


Natural


Red


Buff


Brindle

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
100 x 100 x 60	**Rustic, Curragh Gold, Charcoal, Brindle, Natural**	**100**	**8**	**800**	**10**	**1020**
200 x 100 x 50	**Rustic, Charcoal, Brindle, Curragh Gold, Natural, Red, Buff**	**50**	**9.6**	**480**	**12**	**1020**
200 x 100 x 60	**Rustic, Charcoal, Brindle, Curragh Gold, Natural, Red, Buff**	**50**	**9.6**	**480**	**12**	**1060**
200 x 100 x 80	Rustic, Charcoal, Brindle, Curragh Gold, Natural, Red, Buff	50	7.2	360	9	1195

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Standard smooth finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - USRV 60
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Permeable option	Yes, refer to the 'Clima-Pave Brochure'
Application & Trafficking	Product suitable for both pedestrian, vehicular use and commercial goods traffic when correct block thickness is used in conjunction with the correct sub base design. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	Standard chamfer of approximately 4mm.
Joint	Slane Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

Setts

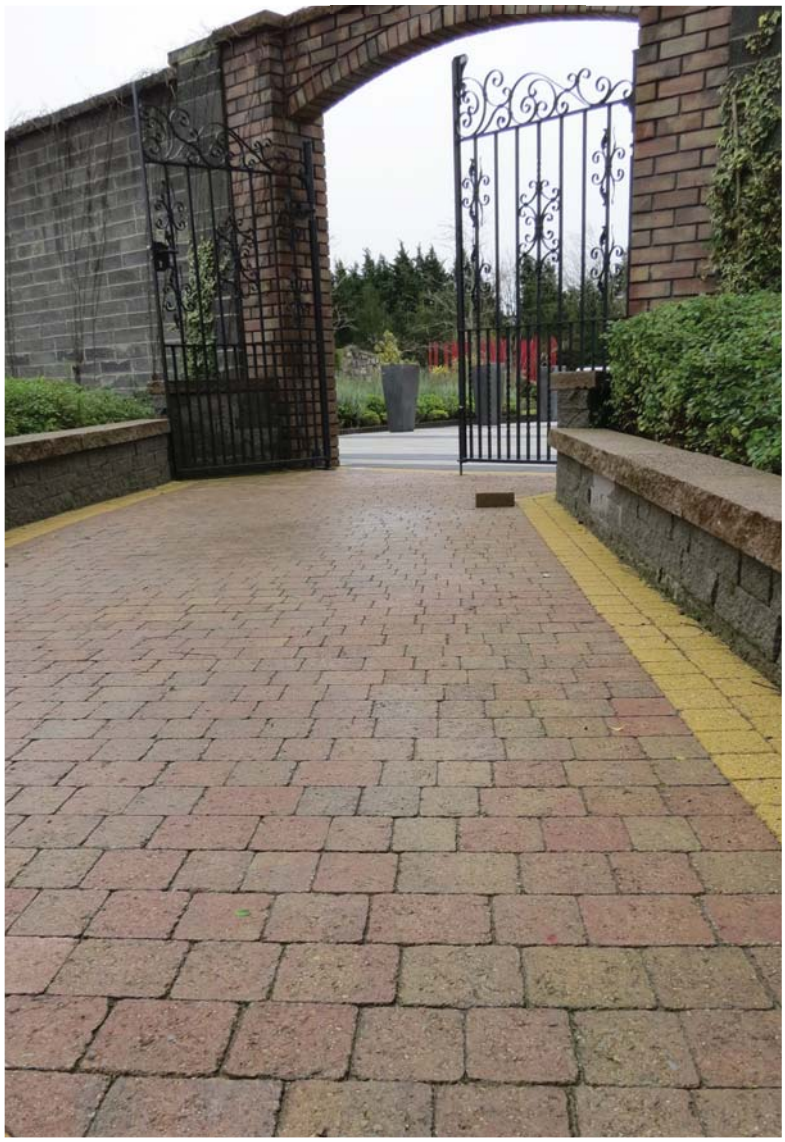
Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Part of the Eco Paving Range

Q24 10
Q24 115
Q24 112
Q24 113

Setts are an ideal product to lift the aesthetics of your project and play a big part in our designer's product portfolio.
The inclusion of a feature border to any hard landscaping area is the attention to detail that our designers look for, to give that WOW factor and make your project stand out from the crowd for all the right reasons.

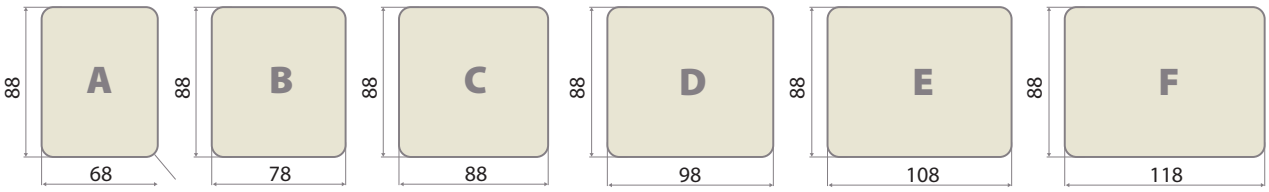
There are 3 styles of Setts to complement our existing range of block paving as well as blending harmoniously with our flag paving range.



Features

- Concrete Block Paving
- Six size co-ordinating mix block paving units
- No spacer nibs providing a narrow jointing space

Suitable for the use on patios, pathways, pedestrian zones, domestic driveways and light car traffic areas only.



Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - USRV 65 for Newgrange Setts, USRV 60 for Lismore Setts, USRV 60 for Mellifont Setts
Strength	Typical tensile splitting strength of ≥3,6MPa and a failure load of ≥250N/mm
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb, Newgrange Setts, Newgrange Flag

Permeable option	No
Application & Trafficking	Product suitable for both pedestrian and car traffic use when installed in conjunction with the correct sub base design. Not suitable for truck / commercial vehicle traffic. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	No
Joint	Newgrange Sett Paving has a narrow finished joint of 1mm approx. This product has no integral spacer nib and no chamfer and is suited to lower maintenance areas. Great care and attention must be paid when handling and installing to avoid chipping and damage to edges. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing. Note that silver granite kiln dried jointing sand is required for Silver and Buff Granite colour block paving
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009, 'A+' rated when used in conjunction with a prepared recycled sub base.
Certification	ISO 9001:2008 ISO 14001

Newgrange Setts

Textured Granite Finish Sett Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Part of the Eco Paving Range

Q24 10
Q24 115
Q24 112
Q24 113

Features

- Available in 3 colour finishes
- Straight edge contemporary finish with no chamfer
- Lightly textured premium granite aggregate finish
- Standard smooth surface finish
- No spacer nibs providing a narrow joint spacing
- Can be laid in random stretcher bond


Silver Granite


Black Granite


Buff Granite

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
6 size x 60	**Silver Granite, Black Granite, Buff Granite**	**108**	**9.24**	**1140**	**11**	**1175**
6 size x 80	Silver Granite, Black Granite, Buff Granite	108	6.72	828	8	1240

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Lismore Setts

Contemporary Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic

Q24 10
Q24 115
Q24 112
Q24 113

Features

- Available in four colour finishes
- Sharp edged contemporary finish
- Standard smooth surface finish
- No spacer nibs providing a narrow joint spacing
- Can be laid in random stretcher bond


Rustic


Curragh Gold


Charcoal


Natural

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
6 size x 60	**Rustic, Curragh Gold, Charcoal, Natural**	**N/A**	**9.24**	**1140**	**11**	**1175**
6 size x 80	Rustic, Curragh Gold, Charcoal, Natural	N/A	6.72	828	8	1240

Bold text = in stock Light text = Made to order (Minimum order quantity applies).

Mellifont Setts

Traditional Distressed Edge Sett Paving

Pedestrian Traffic | Car & Light Vehicle Traffic

Q24 10
Q24 115
Q24 112
Q24 113

Features

- Available in four colour finishes
- Tumbled effect finish to edges and surface give the effect of time worn cobble
- Standard surface finish
- No spacer nibs providing a narrow joint spacing
- Can be laid in random stretcher bond


Rustic


Curragh Gold

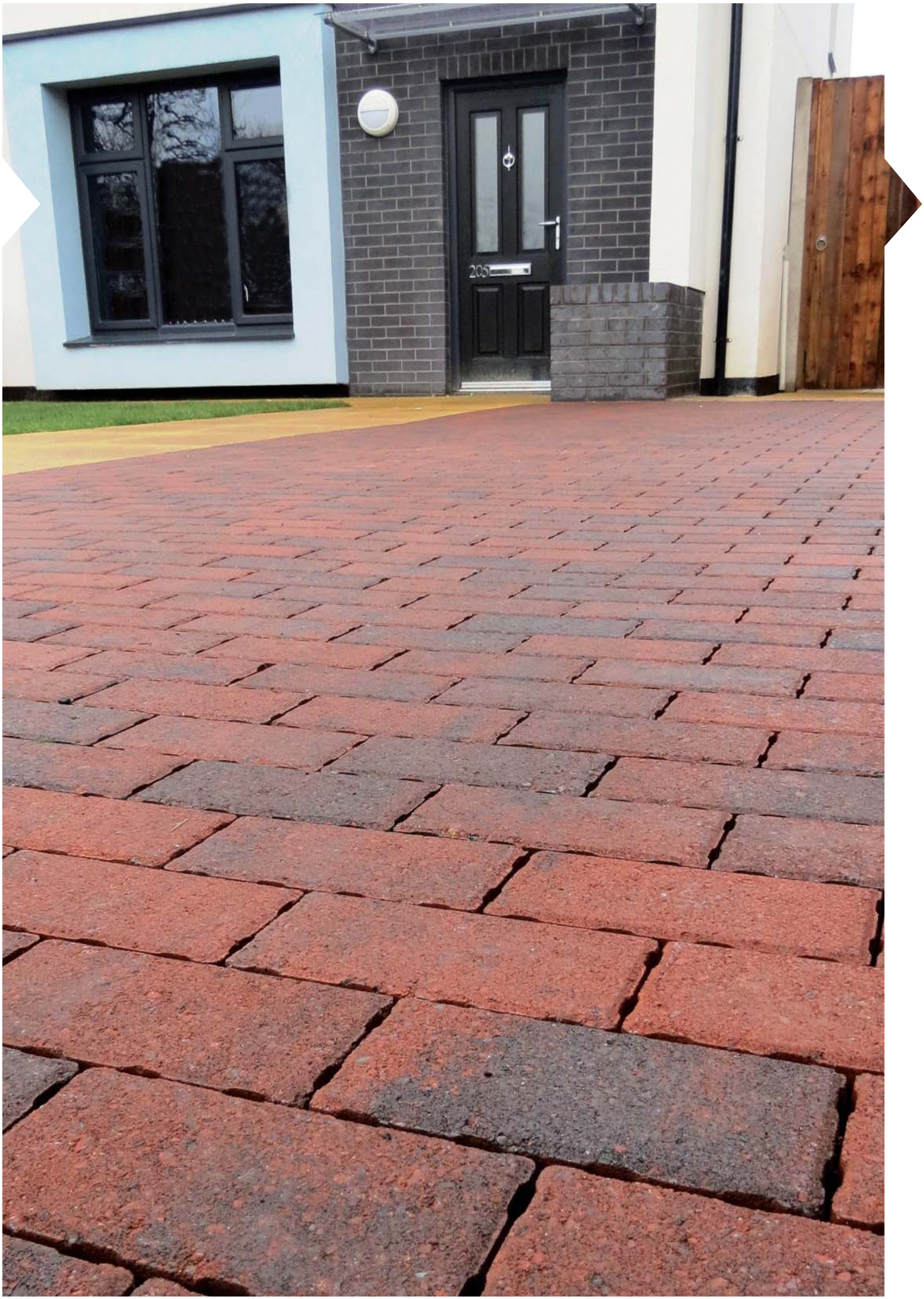

Charcoal


Natural

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
6 size x 60	**Rustic, Curragh Gold, Charcoal, Natural**	**108**	**9.24**	**1140**	**11**	**1175**
6 size x 80	Rustic, Curragh Gold, Charcoal, Natural	108	6.72	828	8	1240

Bold text = in stock Light text = Made to order (Minimum order quantity applies).


205

PERMEABLE PAVING SOLUTIONS

Sustainable Urban Drainage Systems
Advantages of Permeable Paving
Paving for your project

Clima-pave Permeable Paving

Product Range

Slane
Lismore
Mellifont
Newgrange
Boyne
Killeen Flags
Belvedere Flags

Kilsaran
ideas taking shape

Sustainable Urban Drainage Systems and Water Source Control

The rapid development of previously green-field sites and the associated creation of impermeable areas such as roofs, car parks and footpaths will mean that at project conception stage there will be potentially large volumes of surface water to be dealt with. Traditionally this has been done by piping the surface water into storage tanks or discharging it into nearby streams or surface water drainage. This method of drainage is not currently favoured by planners and designers, as it simply moves the surface water downstream where it still has to be dealt with. This is especially important where large volumes of water need to be handled during heavy rainfall events. Piping large volumes of water into streams and rivers increases the risk of flooding and also allows for the potential pollution of local water courses and drinking water supplies.

Planners are encouraging the use of Sustainable Urban Drainage Systems (SUDS) in all new developments. In particular the use of appropriate source control techniques is important as this allows for the containment of the surface water collected on the site, and for this surface water to be dealt with on-site as opposed to traditionally draining it off-site. SUDS, as a sustainable development approach to Surface Water Design Techniques, has the aim of attaining the following:

1 To manage water run-off from developed areas to similar quantities prior to development (Source Control)
2 Reduce and avoid incidences of downstream flooding
3 To protect or enhance water quality of the run-off
4 To improve or enhance the amenity where possible

Advantages of Permeable Paving

- Permeable paving is a 'source control' method. Water is managed and dealt with on-site without piping off to storage tanks or surface water treatment systems
- The Water Framework Directive (Directive 2000/60/EC) requires that surface water discharges are managed to ensure that risk of contamination or pollution are mitigated. Permeable paving systems filter contaminants by microbial action. There is no requirement for additional filtering/polishing with permeable paving in normal use
- Separate attenuation tank systems are not required
- No need for gullies or channels or conventional drainage
- Recharges ground water
- Roofs, roads and other non-permeable areas can be discharged into permeable paving (no gullies required)
- No ponding or surface water
- Collected water can potentially be re-used for non-potable purposes
- Improves water quality

Clima-pave Permeable Paving offers an advantage over traditional SUDS techniques, such as storm water attenuation tanks. This is because the stone based sub-base, which needs to be installed for any type of surfacing material, is adapted to an open graded material in permeable paving systems. This allows the water collected from the site to be stored in the pavement and either infiltrated back into the ground or discharged at a controlled rate into the surface water drainage system.

The Clima-pave system is constructed using our specially engineered permeable paving block, which has enlarged joints on all sides, typically 4-8mm in width. When the blocks have been laid, a corresponding slot is formed between the paving blocks which are then filled with a clean 3mm aggregate. This allows water to rapidly drain from the surface down into the pavement.

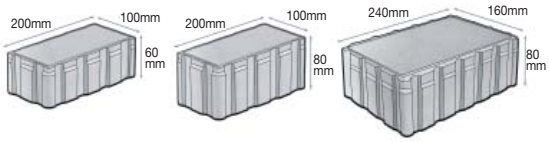
Advantages of Clima-pave Permeable Paving For Your Project

Clima-pave offers one of the widest ranges of permeable paving products for use in commercial, retail and civic projects. Kilsaran can also offer a full site-specific permeable paving design for your project, taking into account the siteground conditions, drainage requirements and structural and traffic loading requirements for the site.

Clima-pave Slane

Benefits

- Unique spacer design maximises drainage whilst maintaining a smaller finished joint, i.e., the paved area is safer for heels etc. and easier to maintain
- Traditional 200 x 100 size unit
- Suitable for laying in stretcher course and herringbone pattern for heavier use
- Machine lay option available



Technical & Performance Data

Sizes	200x100x60/80mm, 240x160x80mm
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential - Typical USRV 60
Finish	Standard
Applications	Domestic, Civic, Commercial and Heavy Industrial


Natural


Charcoal


Rustic


Curragh Gold

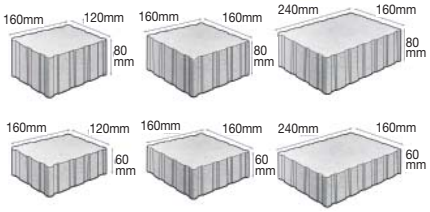

Brindle


Red

Clima-pave Lismore

Benefits

- Clean, sharp edges
- No chamfer: Ideal for areas where trollies are used
- 3 Size mix
- Available in a range of colours



Technical & Performance Data

Sizes	Single Size: 240x160x80mm 3 Size Mix: 240x160x80mm, 160x160x80mm, 120x160x80mm The 3 size mix also comes in a 60mm depth
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential - Typical USRV 60
Finish	Standard, squared edged
Applications	Domestic, Civic and Commercial


Natural


Charcoal

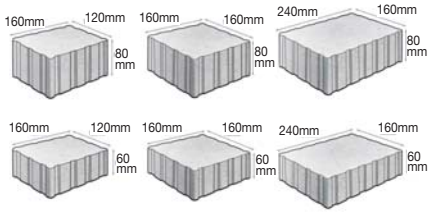

Rustic


Curragh Gold

Clima-pave Mellifont

Benefits

- Antiqued finish gives the look of time-worn cobble
- 3 Size mix
- Available in a range of colours



Technical & Performance Data

Sizes	Single Size: 240x160x80mm 3 Size Mix: 240x160x80mm, 160x160x80mm, 120x160x80mm The 3 size mix also comes in a 60mm depth
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential - Typical USRV 60
Finish	Mechanically distressed edges to provide an aged look
Applications	Domestic, Civic and Commercial


Natural


Charcoal


Rustic

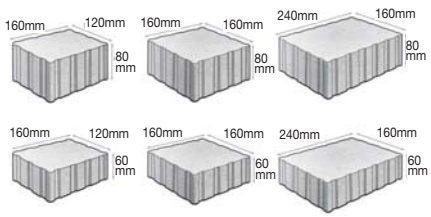

Curragh Gold

Clima-pave Newgrange

Part of the Eco Paving Range

Benefits

- Textured granite-effect finish
- 3 size mix
- Available in a range of colours
- Textured granite-effect finish
- Part of the eco paving range



Technical & Performance Data

Sizes	Single Size: 240x160x80mm 3 Size Mix: 240x160x80mm, 160x160x80mm, 120x160x80mm The 3 size mix also comes in a 60mm depth
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential - Typical USRV 65
Finish	Textured
Applications	Domestic, Civic and Commercial


Silver Granite

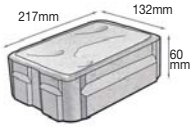

Black Granite


Buff Granite

Clima-pave Boyne

Benefits

- Cobble-effect paving stone
- Embossed finish
- Larger spacer unit



Technical & Performance Data

Sizes	217x132x60mm
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential
Finish	Embossed
Applications	Domestic, Civic and Commercial


Natural


Charcoal


Rustic

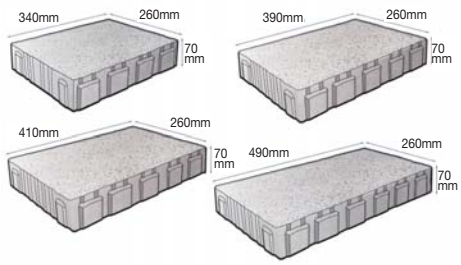
Clima-pave Killeen Flags

Part of the Eco Paving Range

Benefits

- Sharp edge
- 4 co-ordinating sizes
- Granite-effect finish available
- 70mm depth
- Part of our Eco Range

Technical & Performance Data



Technical & Performance Data

Sizes	4 size mix: 490x260x70mm, 410x260x70mm
Manufacturing Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Strength	Typical Tensile Splitting Strength of ≥ 3.6 MPa and a failure load of ≥ 250 N/mm
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential - Typical USRV 60
Finish	Ground or Antiqued finish
Applications	Domestic, Civic and Commercial


Black Granite


Silver Granite


Autumn Harvest

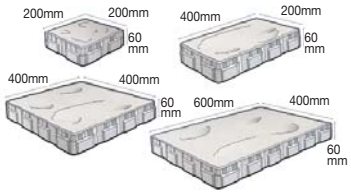

Sunset Red

Clima-pave Belvedere Flags

Part of the Diarmuid Gavin Range

Benefits

- Embossed riven finish
- 4 co-ordinating sizes
- Random pattern
- 60mm depth



Technical & Performance Data

Sizes	4 size mix: 600x400x60mm, 400x400x60mm
Manufacturing Standard	BS EN 1339:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Constituents	Aggregates, cement, admixture and colour pigment
Permeability	1800 litres/second/hectare
Slip/Skid Resistance	Low potential
Finish	Standard or Curled (selected colours)
Applications	Domestic and Pedestrian


Stone


Silver Granite


Yellow


Curragh Gold


Rustic

Clima-pave

Design Guidance

Clima-pave Permeable Paving provides a structural pavement suitable for both pedestrian and vehicular traffic depending on design. The water management and permeable functionality of the pavement is largely dependent on the correct specification and design of the pavement to meet the unique requirements of the individual site. The correct specification, testing and installation of aggregates is of paramount importance with any permeable paving system to ensure the finished pavement meets both initial and long term design requirements.

We advise that all permeable pavements require a site-specific design which should be carried out in accordance with BS 7533-13:2009 Pavements constructed with clay, natural stone or concrete pavers: Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers.

We can provide a design service to customers who require a site specific design to be carried out for their project. In order to create a site specific design we will require the following information to be emailed to: specification@kilsaran.ie

The information required includes:

- Drawings of proposed site layout in AutoCad
- Full existing and proposed site levels for the pavement
- Full site investigation report to establish ground conditions and soaked CBR values of the sub-grade at formation level
- Infiltration values from soak-pit testing to BRE 365
- Overall drainage design strategy for the site
- Planning requirements or conditions for the site relating to paving and drainage (e.g., discharge limits)
- Any other pertinent site specific information or client / contractor requirements

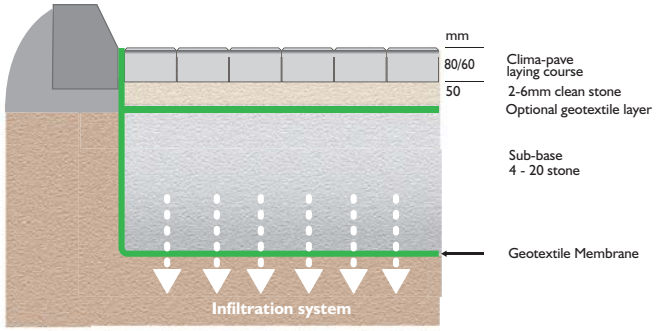
Design Guidance Basics

The below information is provided for guidance purposes only at project conception stage to allow appraisal of a permeable pavement system. Full independent advice should be sought from both the Consulting Engineer and the Contractor prior to the commencement of works. A full site-specific design will always be required in accordance with the above guidelines and BS 7533-13:2009.

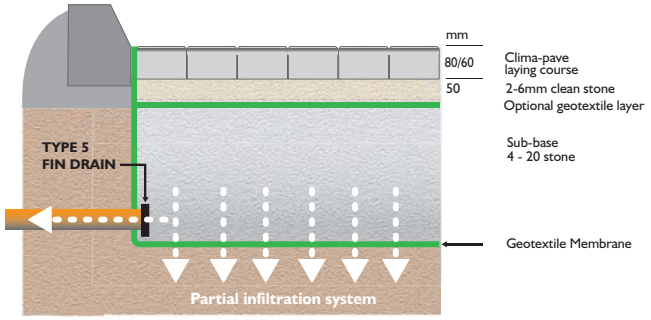
Clima-pave

Types of Permeable Pavement

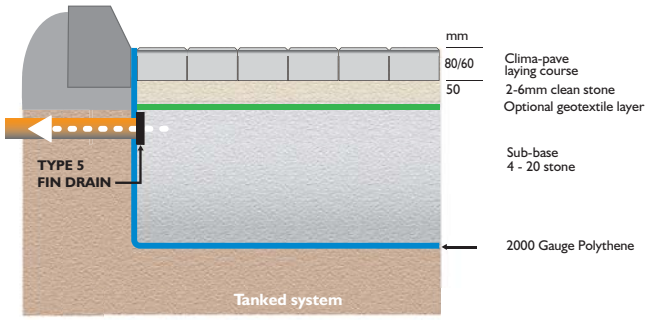
There are three main types of permeable pavement commonly used on sites:



System A - Full Infiltration: All water from the pavement is infiltrated to the ground. Suitable for sites with good ground conditions, higher CBR values and soils which will readily allow water to dissipate through the ground. These favourable conditions are rarely encountered on larger sites.



System B - Partial Infiltration: Most water infiltrated to ground with excess water piped off. Suitable for sites with medium ground conditions. The sub-grade soil will infiltrate some of the water in the system. When storm events occur and water builds up in the system due to the soil being at capacity for drainage, perforated pipes are laid in the bottom of the sub-base to deal with the excess, taking it to the surface water drainage system. This is the most commonly used type of permeable pavement.



System C - Fully Tanked System: No water is allowed to infiltrate to ground. This type of system is used where poor sub-grade drainage conditions exist (heavy clays and brown field sites), where the stability of the sub-grade would diminish if extra surface water was introduced, or where ground water levels are within 1 metre of the formation level (system could gain water). In this system the sub-base acts essentially as an attenuation tank, wrapped in an impermeable polythene membrane and all water is piped out.

The diagrams above are typical build-up details for permeable pavement systems based on BS 7533-13:2009. These diagrams are based on ideal site conditions for drainage and CBR values of 5% or greater. The diagrams are for project appraisal purposes only and in all cases a site specific design in accordance with BS 7533-13:2009 will be required.

Sloping Sites

Where sloping sites are unavoidable due to site layout, it will be necessary to reduce any sharp falls to maintain the water attenuation capacity of the system. This can be achieved by creating ‘dams’ in the sub-base of the pavement which will ‘step’ the pavement sub-base and reduce the overall falls. On extreme slopes, the pavement can be terraced with a step down and a dam between the two levels to restrict water flow.

Selection of Pavement Type

The type of permeable pavement system to be adopted is based primarily on site ground conditions, site suitability and the permeability values of the sub-grade encountered on site from infiltration soak-pit testing. Table 1 gives guidance on the suitability of the three types of permeable pavement system.

Table 1: Guidance on selection of a pavement system

		System A Total Infiltration	System B Partial Infiltration	System C No Infiltration
Permeability of sub-grade defined by coefficient of permeability, k (m/s)	10-6 to 10-3	3	3	3
	10-8 to 10-6	7	3	3
	10-10 to 10-8	7	7	3
Highest recorded water table within 1000mm of formation level		7	7	3
Pollutants present in sub-grade		7	7	3

Table 2: Loading categories

1 DOMESTIC PARKING	2 CAR	3 PEDESTRIAN	4 SHOPPING	5 COMMERCIAL	6 HEAVY TRAFFIC
No Large Goods Vehicles	Emergency Large Goods Vehicles only	One Large Goods Vehicle per week	Ten Large Goods Vehicles per week	100 Large Goods Vehicles per week	1000 Large Goods Vehicles per week
Zero standard axles	100 standard axles	0.015msa	0.15msa	1.5msa	15msa
Patio	Car Parking Bays and Aisles	Town/city Pedestrian Street	Retail development delivery access route	Industrial Premises	Main road
Private Drive	Railway Station Platform	Nursery Access	School/college access road	Lightly Trafficked Public Road	Distribution Centre
Decorative feature	External Car Showroom	Parking area to residential development	Office block delivery route	Light Industrial development	Bus Station (bus every 5 minutes)
Enclosed Playground	Sports Stadium Pedestrian route	Garden centre external display area	Deliveries to small residential development	Mixed retail/ industrial development	Motorway Truck Stop
Footway with zero vehicle overrun	Footway with occasional overrun	Cemetery Crematorium	Garden centre delivery route	Town Square	Bus Stop
-	Private drive/ footway crossover	Hotel Parking	Fire Station Yard	Footway with regular overrrun	Roundabout
-	-	Airport Car Park with no bus pickup	Airport Car Park with bus to terminal	Airport landside roads	Bus Lane
-	-	Sports Centre	Sports Stadium access route/ forecourt	-	-

msa = millions of standard 8,000 kg axles

Clima-pave

The design of the sub-base for the permeable pavement should take into account the traffic loadings likely to use the pavement. It is essential to take into account any future increase in traffic volume and any HGV traffic which may use the pavement irrespective of how frequent. The correct loading category should be then selected from Table 2 taking into account the above considerations. It should be noted that no layers of the permeable pavement are designed for site traffic to use them and when finished the permeable pavement surface should not be trafficked by site traffic vehicles which are heavier than that for which the pavement was designed. It is advisable to complete paving works after all other work in the vicinity has been completed.

Sub-Base Thickness For Water Storage

The sub-base depth must also take into consideration the water storage requirements for the site. The depth of sub-base may have to be adjusted to allow for increased site specific water storage. Further guidance on hydraulic factors can be found in BS 7533-13:2009 section 5.4.

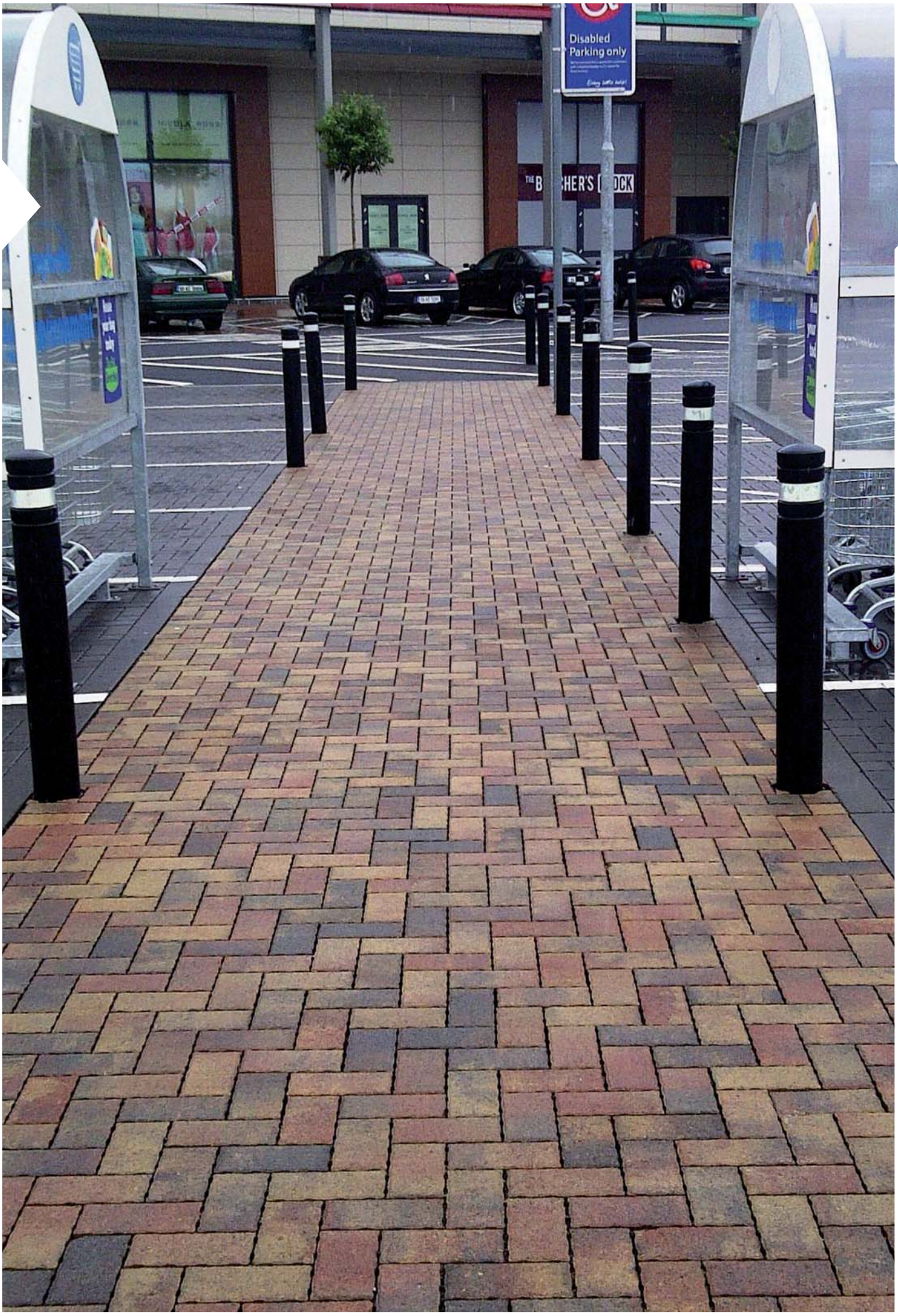
Adjustment To Pavement Design For Low CBR Sub-Grade

In the case of CBR values below 5%, either ground improvement work will be required for the site, or the thickness of the coarse graded aggregate sub-base will have to be adjusted in accordance with 5.6.3 and table 9 of BS 7533-13:2009.

Construction & Maintenance Guidelines

To ensure correct performance and durability of a permeable pavement, a fully detailed design should be carried out in accordance with BS 7533-13:2009 taking into account all site specific requirements for the project. Construction should be carried out strictly in accordance with BS 7533-13:2009 and BS 7533-3 by a fully competent and experienced contractor, familiar with permeable paving standards and installation methodology. All materials to be used shall be tested for full compliance to the above standard both before supply and during construction. It is also advised not to use any of the layers of permeable pavement construction for site traffic unless the build-up has been specifically designed to accommodate this. Additionally site equipment such as tele-handlers and forklifts should not be used on the paving surface after construction has been completed unless the pavement has been designed to accommodate this.

Clima-pave™
Permeable Paving Solutions


Disabled
Parking only

Maintenance

Kilsaran advise that all design, construction and maintenance be carried out to the full requirements of BS 7533-13:2009 and the Interpave 'Guide to the Construction and Maintenance of Concrete Block Permeable Pavements'. The contractor should ensure that all aspects of the aforementioned standard are adhered to at all times. Workmanship of the block paving at both installation stage and during subsequent site inspections should fully meet the requirements of BS 7533-3. Periodic visual inspection of the paving initially after 6-12 weeks from installation should be carried out to ensure all joints are full and no movement or damage to any localized areas. Afterwards a 6 to 12 month full visual inspection should be carried out to ensure continuing compliance with the BS 7533-13:2009 standard.

Permeable pavements should not be contaminated with soft landscaping materials, soil, detritus or general dirt as this may wash into the pavement. Also the pavement should not be trafficked by construction traffic or unsuitably heavy vehicles above that for which the pavement was designed.

To keep any growths or weeds to a minimum it is advised that the installed permeable paving be sealed with an appropriate sealer, such as Kilsaran Paving Sealer. Where the paved area is beneath overhanging trees or in a very damp area, an annual treatment of an environmentally friendly weedkiller can be applied. Note the weedkiller should be applied as directed by the supplier and only in very dry weather where rain is not expected, active weedkiller could be washed into the subsystem otherwise.

The pavement should be inspected on a routine basis as determined by local site factors, and carefully swept as required using a mechanical sweeper or by hand for smaller areas. The sweeping action may remove some of the jointing grit from the surface, the joints should be topped up after sweeping if required.

Should silting or blocking of the joints occur perhaps after a period of time, the use of a suitable jet wash and suction sweeper should be used to remove the defective material. It is likely that the jetting of the pavement will remove some jointing grit. This grit should be replaced immediately after cleaning to fill all joints.

As with conventional block pavements, depressions, rutting and cracked or broken blocks which may be a structural concern or a hazard to users should be remedied immediately in line with the above standards.

Permeable Pavements will drain relatively quickly compared with other types of surfacing, and are not as liable to freezing over of standing water, hoar frosts may occur which can cause surface slip on any material. The use of de-icing salts on permeable pavements, as with any other concrete surface, should be kept to a minimum as the chlorides in the salt will penetrate the concrete and excessive use will damage the surface. Where it is decided by the paving user to use de-icing material, any de-icing material applied should not cause blockage or clogging of the permeable pavement joints (if blockage occurs in localised areas this will need to be removed by suction sweeper and joints topped up with appropriate jointing grit). De-icing materials must always be applied prior to frost or snow forming on the surface ie the material should be spread on the surface the night before frost or snow occurs, de-icing materials are significantly less effective after freezing conditions have occurred on a surface and application to a surface which has already frozen over is likely to increase any potential damage caused to the surface through over-application and thermal shock to the surface. All de-icing materials should be swept off and fully cleaned off the surface immediately after the freezing conditions have passed. It should also be considered that any de-icing material used may drain into either the subgrade or the drainage system through the permeable pavement. Care should be taken to ensure no contamination of water courses or drainage systems.

It is of paramount importance that all permeable pavements should have jointing checked on an ongoing basis to ensure all joints are clear and free from dirt and debris and that any joints which are clogged or dirty are cleaned out fully. Joints should then be topped up fully at all times with suitably compliant jointing grit ensuring all joints are completely full. The frequency of inspection and top up of joints will depend on the usage of the pavement and cleaning regimes in place

Presentations and Training

As a member of the RIBA accredited CPD provider's network, Kilsaran is offering a CPD seminar on the fundamentals of installing permeable paving. Kilsaran's experts will guide you through planning, design and the building constraints associated with installing a cost effective SuDs solution, including product selection and maintenance issues. If you are unsure of the potential of using permeable paving, ask for a presentation and discuss your requirements in more detail with a Kilsaran representative.

RIAI · RIBA Royal Institute of British Architects · RIBA CPD Providers Network · riba product selector · NSSPlus

TACTILE PAVING

Overview of Tactile Paving
Blister
Corduroy
Cycleway

Kilsaran
ideas taking shape

Overview of Tactile Paving

Tactile Paving is used to assist and guide the visually impaired in various situations including pedestrian crossings and around hazards and obstructions.

Tactile paving comes in 5 varieties – Blister, Directional Guidance, Corduroy Hazard Warning, Lozenge and Cycle-Way Tactile Paving.
Tactile paving is a functional, as opposed to aesthetic product and as such the profile and colour of the tactile paving should be as specified by the Local Authority or client.

For detailed technical information and advice on using Tactile Flags in your project please contact our expert Technical team

Blister Profile Tactile Paving

Provides a warning to visually impaired people who would otherwise, in the absence of a kerb upstand <25mm high, find it difficult to differentiate where the footway ends and the carriageway begins. The most extensively used tactile at almost all pedestrian crossings in urban and residential situations.

Corduroy Hazard Warning Tactile Paving

Provides a warning to visually impaired people of the presence of specific hazards, eg steps, level crossings or the approach to on street light rapid transit platforms.

The most common use for the Corduroy Hazard Warning unit is at the top and bottom of steps.

Usually Laid in buff yellow colour

Directional Guidance Tactile

Provides a guide to visually impaired people along a route when traditional cues, such as a property line or a kerb edge are not available. It can also be used to guide people around obstacles, for example street furniture in pedestrian areas.

This type of tactile is used sparingly to maximise its effectiveness

Usually laid in a buff yellow colour

Cycleway Tactile Paving

Provides a warning to visually impaired people of the presence of specific hazards, eg steps, level crossings or the approach to on street light rapid transit platforms.

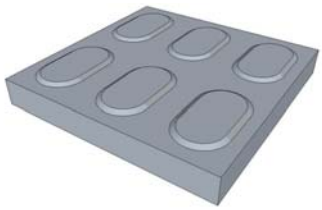
The most common use for the Corduroy Hazard Warning unit is at the top and bottom of steps.
Usually Laid in buff yellow colour

Lozenge on-street Platform Edge Tactile Paving

Provides a warning to visually impaired people that they are approaching the edge of an on street light rapid transit platform or a bus stop.

Often on street light rapid transit platforms are shared with footways.

Usually laid in a buff yellow colour.



Blister

Concrete Tactile Paving Units

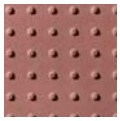
Q25 320

Pedestrian Traffic

Features

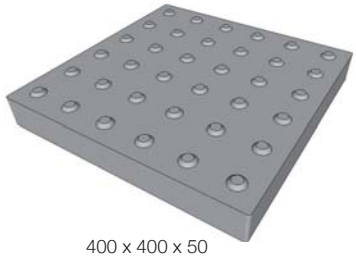
Blister tactile paving provides a profiled finish comprising of rows of flat top domes on the surface. The blister surface provides a warning to visually impaired people in the absence of a kerb up-stand at controlled and uncontrolled crossings.


Buff


Red


Natural


Charcoal


400 x 400 x 50
Blister Tactile Paving Unit Profile

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
400 x 400 x 50	**Red, Buff, Red Textured, Buff Textured,** Natural, Charcoal, Natural Textured, Silver Granite	6.25	10.56	66	11	1226

Bold text = in stock
Natural, Charcoal and Textured finish available by special order

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1339:2003, BS7997 BS:2003, DDCEN-TS15209:2008
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Blister pattern. *Available in alternative textures and colours upon request.*
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Application & Trafficking	Product suitable for pedestrianized areas
Chamfer	No
Joint	Blister Tactile Paving has a narrow finished joint of 1mm approx. This product has no integral spacer nib and no chamfer. Great care and attention must be paid when handling and installing to avoid chipping and damage to edges. Joints should be filled with Kiln dried jointing sand or if laid on a mortar bedding then a mortar joint should be used – see page 95 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

Corduroy

Hazard Warning concrete tactile paving

Q25 320

Pedestrian Traffic

Features

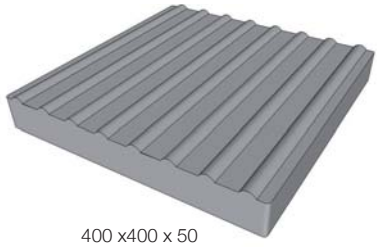
Corduroy Hazard Warning tactile flags are used to denote a hazard

Examples of typical use applications are:

- the top and bottom of a flight of steps
- level crossings

The flat top rods are laid parallel to the edge of the hazard at a distance of 400mm away

Buff | Red | Natural | Charcoal | Silver Granite



400 x400 x 50
Corduroy Tactile Paving Unit Profile

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
*400 x 400 x 50	Buff, Red, Natural, Red Smooth, Buff Smooth, Red Textured, Buff Textured, Natural , Charcoal, Natural Textured, Silver Granite	6.25	10.56	66	11	1226

* Made to order. Minimum order quantity applies.

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1339:2003, BS7997 BS:2003, DDCEN-TS15209:2008
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Corduroy pattern. *Available in alternative textures and colours upon request.*
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Application & Trafficking	Product suitable for pedestrianized areas
Chamfer	No
Joint	Corduroy Hazard Warning Tactile Paving has a narrow finished joint of 1mm approx. This product has no integral spacer nib and no chamfer. Great care and attention must be paid when handling and installing to avoid chipping and damage to edges. Joints should be filled with Kiln dried jointing sand or if laid on a mortar bedding then a mortar joint should be used – see page 95 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

Cycleway

Shared cycle route concrete tactile paving

Q25 320

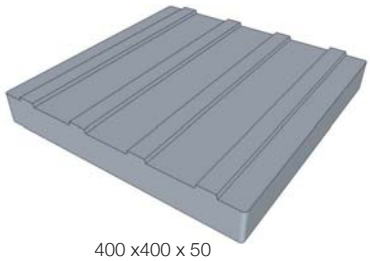
Pedestrian Traffic

Features

Cycleway Tactile paving is used to indicate the beginning and end of shared pedestrian and cycleway paths which are not differentiated by two levels.

Normally cycleway tactile paving is laid transverse to indicate the pedestrian surface and longitudinally to indicate the cycling surface at the start and end of shared path routes

Buff



400 x400 x 50
Cycleway Tactile Paving Unit Profile

Product Range

Dimensions (mm)	Colours	Pcs per m²	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
*400 x 400 x 50	Red Smooth, Buff Smooth, Red Textured, Buff Textured, Natural, Charcoal, Natural Textured, Silver Granite	6.25	10.56	66	11	1226

* Made to order. Minimum order quantity applies.

Technical & Performance Data

Product Type	Concrete Block Paving
Product Standard	BS EN 1339:2003, BS7997 BS:2003, DDCEN-TS15209:2008
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Cycleway pattern. *Available in alternative textures and colours upon request.*
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential
Strength	Typically class 3 compliant to BS EN 1339:2003
Complimentary Products	Kerb setts, Kerb blocks, Tara kerb, Mellifont kerb

Application & Trafficking	Product suitable for pedestrianized areas
Chamfer	No
Joint	Cycleway Tactile Paving has a narrow finished joint of 1mm approx. This product has no integral spacer nib and no chamfer. Great care and attention must be paid when handling and installing to avoid chipping and damage to edges. Joints should be filled with Kiln dried jointing sand or if laid on a mortar bedding then a mortar joint should be used – see page 95 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

KERBING

Tara Kerb Range
Kerb Block and Kerb Sett
Mellifont Kerb Stone
Lismore Kerb Stone
Channel Block

Kilsaran
ideas taking shape

Tara Kerb

Concrete Kerbing

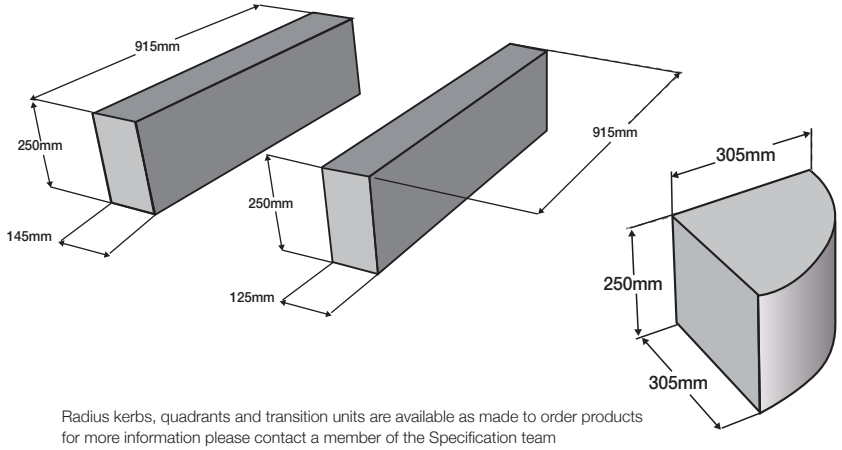
Part of the Eco Paving Range

Q25 320
Q10 110

Features

Kilsaran's kerb range is best suited for use in commercial, industrial, retail, domestic and landscape developments.

The Tara Kerb range is part of our Eco Paving range of hard landscaping products.
A minimum of 55% non primary, recycled Aggregates and Environmentally Friendly cement alternatives are used in the manufacture of this product.



Radius kerbs, quadrants and transition units are available as made to order products for more information please contact a member of the Specification team

Tara Black Granite

Tara Silver Granite

Product Range

	Dimensions (mm)	Colours	Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
Tara Kerb 125	915 x 250 x 125mm	Silver Granite, Black Granite	0.915	14.64	16	4	1010
Tara Kerb 145	**915 x 250 x 145mm**	**Silver Granite, Black Granite**	**0.915**	**14.64**	**16**	**4**	**1128**

Bold text = in stock

Technical & Performance Data

Product Type	Precast concrete kerb
Product Standard	BS EN 1340:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Textured granite aggregate effect
Packaging Information	Plastic straps on pallets.
Slip/Skid Resistance	Low potential – Typically USRV 68

Strength	Compliant to BS EN 1340:2003
Complimentary Products	Lismore blocks, Mellifont blocks, Newgrange blocks, Newgrange Flag, Shelbourne Flag
Application	Residential and commercial.
Chamfer	No
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009
Certification	ISO 9001:2008 ISO 14001

Kerb Block

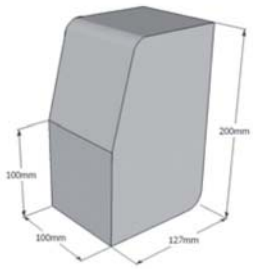
Traditional Bullnose Small Element Kerbs

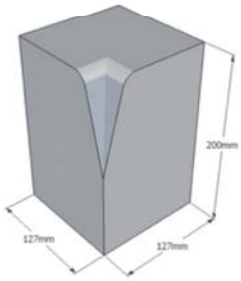
Q25 320
Q10 110

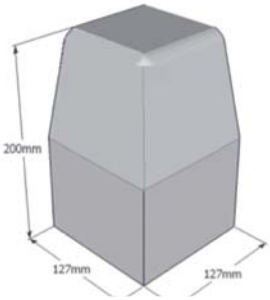
Features

- Standard Kerb block unit with bullnose profile
- Internal and external corners are available for high rise installation
- Available in 4 colours
- Suitable for domestic and commercial schemes

Charcoal Brindle Red Curragh Gold







Product Range

Dimensions (mm)		Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
200 x 127 x 100	Charcoal, Brindle, Red, Curragh Gold	10	24	240	8	1225

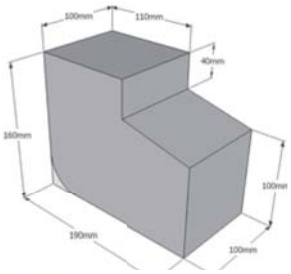
*Any additional colours are made to order

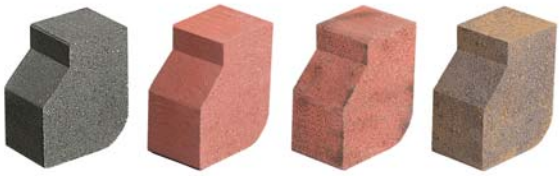
Kerb Sett

Small unit kerb block

Features

- Kerb sett unit which can be laid in either high rise or low rise profile to give a different appearance
- Corners are not available for this product type
- Suitable for domestic and commercial schemes
- Available in 4 colours





Charcoal Brindle Red Curragh Gold

Product Range

Dimensions (mm)		Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
190 x 160 x 100	Charcoal, Brindle, Red, Curragh Gold	10	20	200	8	1135

*Any additional colours are made to order

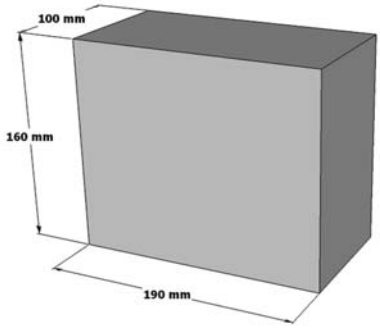
Mellifont Kerb Stone

Small Element Kerbs

Q25 320
Q10 110

Features

- Tumbled finish kerb stone
- Designed to complement the Mellifont Block Paving Range and other Kilsaran Paving products
- Ideal for use as a border, edging or for step riser units
- Suitable for domestic and commercial schemes
- Available in 4 colours



Natural

Curragh Gold

Rustic

Charcoal

Product Range

Dimensions (mm)		Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
190 x 160 x 100	Charcoal, Natural, Rustic, Curragh Gold	5.25	33	175	7	1140

*All Colours in Stock

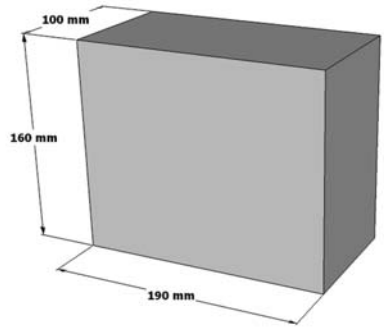
Lismore Kerb Stone

Small Element Kerb Stone

Q25 320
Q10 110

Features

- Designed to complement the Lismore Block Paving Range and other Kilsaran Paving Products
- Ideal for use as a border, edging or for step riser units
- Suitable for domestic and commercial use
- Clean line edges give a contemporary look
- 4 colours available




Natural


Rustic


Charcoal


Curragh Gold

Product Range

Dimensions (mm)		Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
190 x 160 x 100	Natural, Curragh Gold, Rustic, Charcoal	5.25	33	175	7	1140

*All Colours in Stock

Channel Block

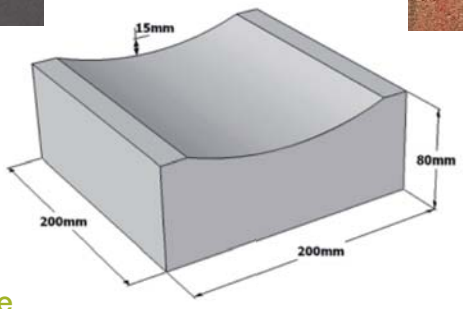
Traditional dished channel block unit

Features

- Dished channel complimentary unit for all types of block paving
- Suitable for trafficking – 80mm in depth
- Available in 2 colours
- 200 x 200 unit – 5 required per linear metre


Natural


Charcoal



Product Range

Dimensions (mm)		Pcs per Lin m²	Lin m² per bale	Pcs per bale	No. of layers per pack	Pack Weight (Kg)
200 x 200 x 80	Natural, Charcoal	5	36	180	9	1150

INDUSTRIAL & COMMERCIAL SOLUTIONS

Machine Lay Paving

CASE STUDY – Waterford Port

Slane Interblock

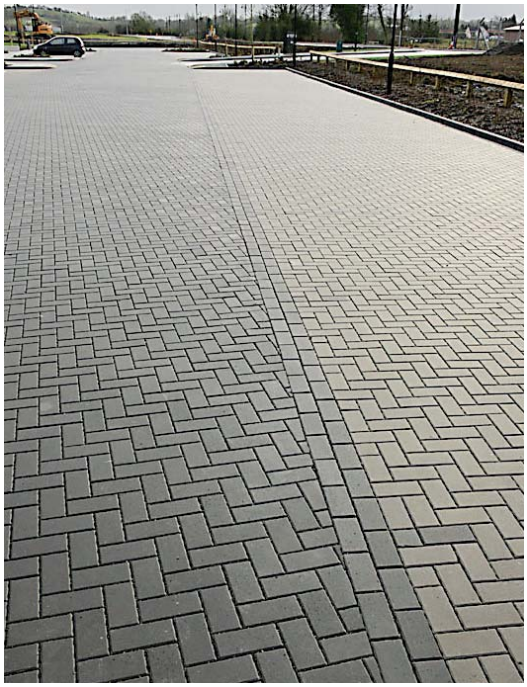
Kilsaran

ideas taking shape


Grobst

Machine Lay Block Paving

Machine lay paving offers significant benefits during installation on commercial and large scale schemes, principal benefits include greatly increased installation speed, cleaner safer sites, less skilled labour required on site and a more environmentally friendly installation process.



Kilsaran offer a range of block paving products in machine lay format.

These products are available to order by contacting our sales team:

- **Slane** 200 x 100 x 80mm
- **Slane** 200 x 100 x 60mm
- **Clima-Pave™** 200 x 100 x 80mm

Recently completed project – Edinburgh Royal Infirmary

Kilsaran was selected to supply this concrete block permeable paving to the Edinburgh Royal Infirmary in 2011.

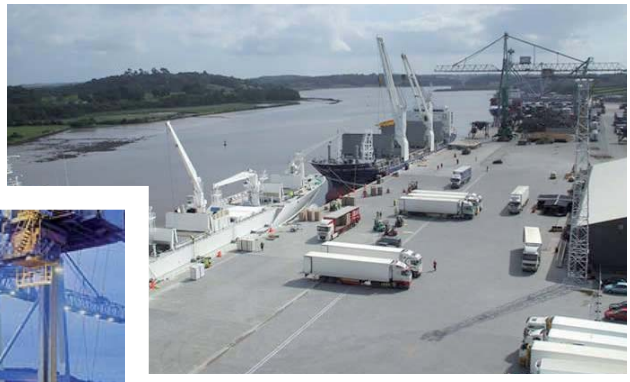
Our Technical and Specification Team worked with main contractor and their client and selected our Clima-Pave™ Slane 200x100x80mm concrete block permeable paving and 8,000m² was supplied to this project in the summer of 2011.

CASE STUDY

Waterford Port

Reinforced Fibre Paving at Port of Waterford, Ireland.

CLIENT:	Waterford Port Authority
CONTRACTOR:	BAM
DURATION:	6 months



Heavy duty paving
at Waterford Port

The Challenge

Kilsaran supplied in excess of 15,000m² of its Fibre reinforced 200x100x80mm to the new extension of the Container and Bulk Cargo Terminal at Waterford Port, Ireland.

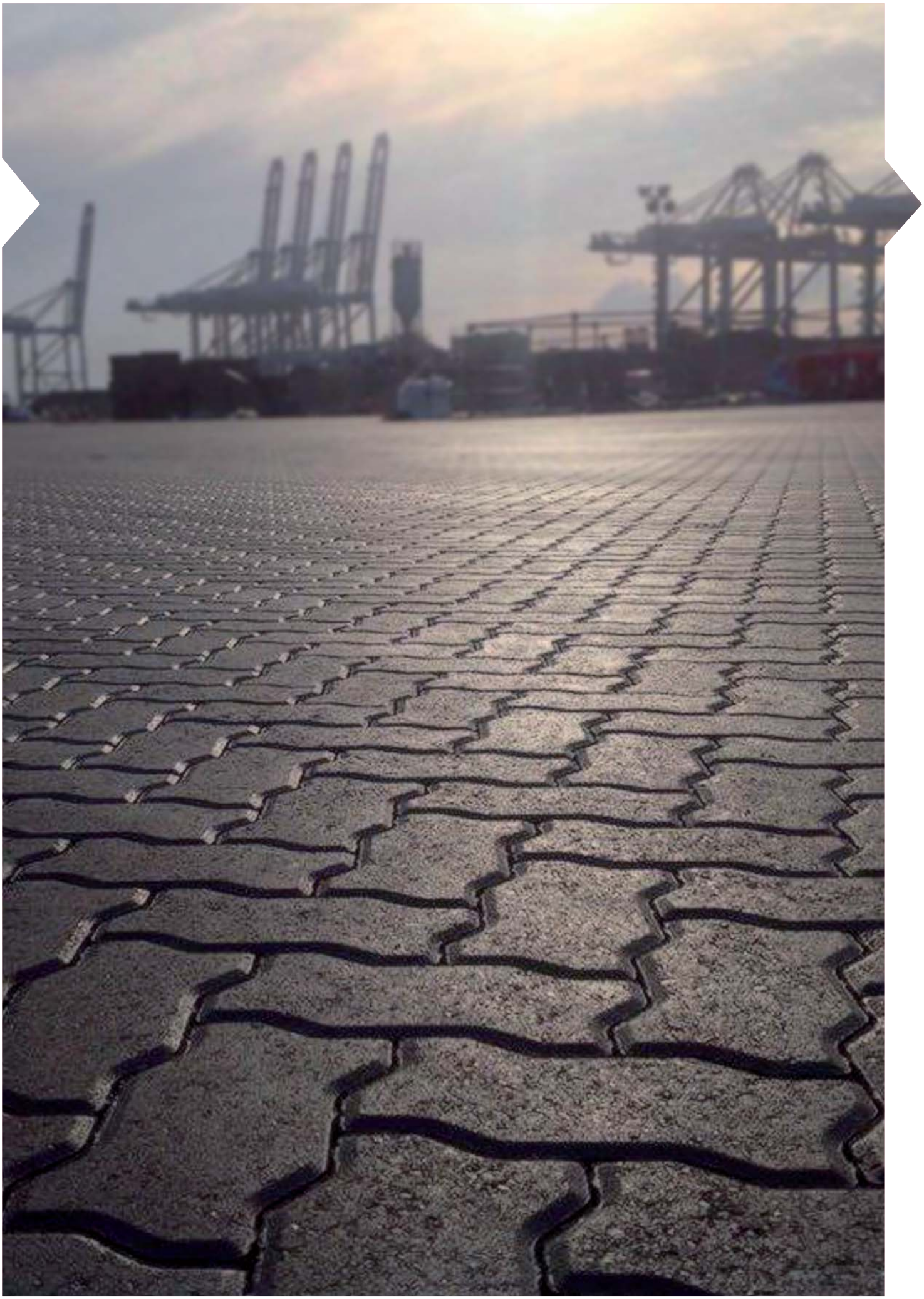
Working alongside the appointed contractor BAM on the project, Kilsaran helped create a pavement design suitable for the project. The pavement design was carried out in accordance with the guidelines set out in 'The structural design of heavy duty pavements for ports and other industries'.

One of the challenges of the project was the channelized traffic and pinpoint loading that occurs in the harsh marine environment such as Waterford Port. This led to the recommendation of our Slane-Plus block paver.

The product can also be machine laid in a 90 degree herringbone pattern which is recommended to optimize the full strength of the system required for this type of project.

By using a machine lay product from Kilsaran it meant the contractor was able to lay in excess 500sqm a day, meaning the project was delivered on time and within budget.

Kilsaran supplied in excess of 15,000m² of its Fibre reinforced Slane-Plus block paving to the new extension of the Container and Bulk Cargo Terminal at Waterford Port, Ireland.



Slane Interblock

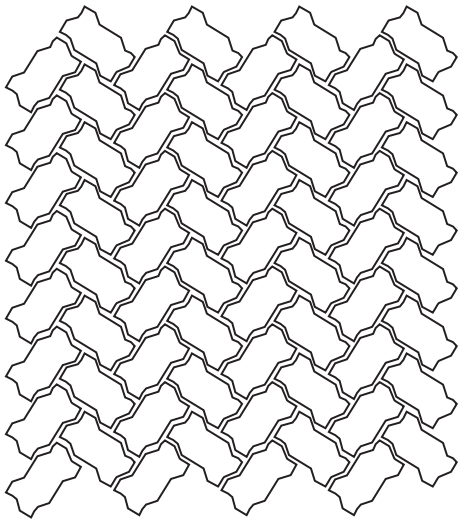
Machine Lay Block Paving

Pedestrian Traffic | Car & Light Vehicle Traffic | Commercial Traffic | Machine Lay Version Available

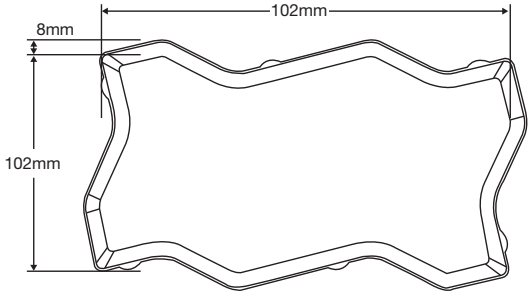
Q24 10
Q24 115
Q24 112
Q24 113

Features

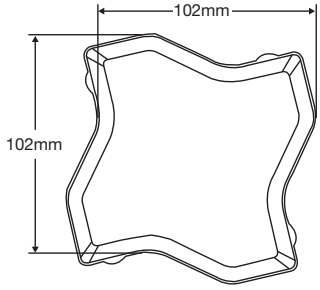
- 16 Side Interlocking Concrete Block Paving
- Available in 6 colour finishes
- Chamfered profile edge
- Standard surface finish
- Suitable for use on patios, driveways, domestic, commercial and heavy duty applications.
- Can be laid in 45° herringbone pattern
- Machine Lay version available
- Half block available



Cluster arrangement



Full block plan detail and sectional elevation detail



Half block plan detail

Curragh Gold | Charcoal | Natural | Red | Buff | Brindle

Swatches for colour reference only. Not actual product.

Product Range

Dimensions (mm)	Colours	Cluster Plan Size (64 Cluster Layout)	m² per pack	Pcs per pack	No. of layers per pack	Pack Weight (Kg)
204 x 102 x 80	Charcoal, Brindle, Curragh Gold, Natural, Red, Buff	1200 x 1520mm	9.33	448	7	1550
102 x 102 x 80	Charcoal, Brindle, Curragh Gold, Natural, Red, Buff	As Supplied				

Made to order (Minimum order quantity applies).

Technical & Performance Data

Product Type	Interlocking Concrete Block Paving
Product Standard	BS EN 1338:2003
Manufacturing Method	Hydraulically pressed semi-dry concrete
Finish	Standard smooth finish
Packaging Information	Baled, strapped and plastic cover
Slip/Skid Resistance	Low potential - USRV 60
Strength	Typical tensile splitting strength of ≥ 3,6MPa and a failure load of ≥ 250N/mm
Complimentary Products	Tara kerb

Permeable option	No
Application & Trafficking	Product suitable for vehicular use and commercial goods traffic when used in conjunction with the correct sub base design. For further information on design and loading please see installation standards section on pages 91-93.
Chamfer	Standard chamfer of approximately 4mm.
Joint	Slane Interblock Paving has a 1.5mm approx. integral spacer nib which will give a resulting standard joint width of approx. 2mm when laid. Joints should be filled with Kiln dried jointing sand – see page 99 for further details on jointing.
BREEAM	'A' rated in accordance with the Green Guide Specification Edition 4, 2009 'A+' rated when used in conjunction with a prepared recycled sub-base.
Certification	ISO 9001:2008 ISO 14001

COMPLIMENTARY PRODUCTS

Kiln Dried Jointing Sand
Paving Sealer
Pedestals
Recessed Manhole Covers

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Kiln Dried Jointing Sand

Jointing Sand
(Buff)

Jointing Sand
(Silver Granite)

Kiln dried jointing sand is a specifically graded free flowing jointing sand designed for use with concrete block and flag paving. Kiln dried sand should be used in dry conditions where both the surface of the paving and the full depth of the joints are completely dry to ensure joints can be filled fully. Joints are normally filled before the paved surface receives its final pass of the plate vibrator and they are then topped up afterwards as this process 'beds in' the jointing sand and it will naturally settle down into the joint. It is also essential to check joints 4-6 weeks after completion of the paving installation and top up as required as some further initial settling may occur.

Kiln dried jointing sand is also suited to topping up areas during maintenance or after cleaning regimes. Note that cement or other binding material must never be mixed with kiln dried jointing sand as this will prevent joints from filling properly.

Kiln dried jointing sand is available in standard buff (orange brown) for most applications and also in silver granite colour. All Kilsaran products in silver granite, buff granite and Pembroke range must be jointed with silver granite jointing sand. The use of buff coloured jointing sand with these products may result in unsightly staining which can be difficult to remove. Silver granite kiln dried jointing sand may be used with other colour products / ranges for decorative effect if desired.

Technical Information

Kilsaran kiln dried jointing sand complies with the requirements of BS 7533-3 section D.1.2 and BS EN 12620:2002 GF 85 0/1 (FP). The target grading envelope of the kiln dried sand is as follows:

Sieve Size	Percentage passing by mass (%)
2mm	100
1mm	85 – 99
0.5mm	55 – 100
0.063mm	0 – 2

The spread rate of Kilsaran kiln dried jointing sand will vary depending on joint depth and width and if joints are being filled for the first time or if merely being topped up. As a guide one 25kg bag will cover approximately 7m2 of newly installed Slane 200x100x60mm block paving.

Joints should be fully clean, dry and free of any grit or debris before jointing commences. Kiln dried sand is suitable for all standard paving with a parallel vertical joint no more than 4-5mm in width. For other paving joint profile types please contact a member of the Kilsaran technical team.

Paving Sealer

The Kilsaran sealer product range is a premium grade impregnating sealer which provides comprehensive surface protection and natural propulsion against general dirt and traffic film, oil and fat stains and aids the easy removal of chewing gum.

The specially formulated product provides a long term sealing effect which does not need to be applied on an annual basis. Protecting your investment with Kilsaran sealer will reduce cleaning and maintenance requirements for all types of paving and result in a visually pleasing surface for longer.

Kilsaran sealer is available in natural or wet look satin finish. The natural sealer range leaves a clear visually undetectable coating and is suitable for all paving and natural stone products while wet look is suited to products where a more intensive colour effect is desired or older paving which has been re-cleaned and where there is a desire to deepen the colour tone.

Sealer - Wet Look Finish

Sealer - Clear Finish

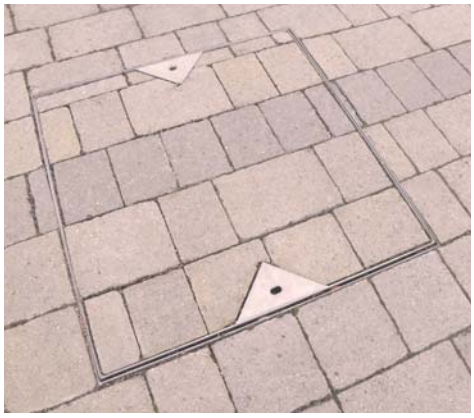
Pedestals

Kilsaran pedestal and spacer systems are supplied to projects where paving flags are to be used on concrete balconies and flat roof areas. Standard 20mm high spacers with integral 4mm spacers are available in stock and adjustable spacers from 50mm to 600mm are available to order. For further guidance and information please contact a member of the Kilsaran technical team

Recessed Manhole Covers

Kilsaran recessed manhole covers are produced in galvanised steel in two sizes for use on domestic and light traffic duty pavements. Kilsaran recommend the use of purpose made Kilsaran Engineering Quality Concrete Brick for build up work to manhole covers and Kilsaran T60 rapid setting grout for placing and surround work.

Description	Size
Galvanised steel recessed manhole cover	300 x 300 x 85mm
Galvanised steel recessed manhole cover	600 x 600 x 85mm



SPECIFICATION & INSTALLATION GUIDANCE

Specification & Design Standards
Block Paving Design Guidance
Laying Patterns
Flag Paving Design Guidance
Joints
Colour Selection
Slip / Skid Guidance
Cleaning & Maintenance Guidelines
Disclaimers / Terms & Conditions

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Specification and Design Guidance

The extensive range of paving products available from Kilsaran will provide a full range of solutions for any project whether commercial, civic, industrial or a residential scheme.

This section will give some basic specification and design guidance for project appraisal purposes

Paving Unit Advice

Generally **Concrete Flag Paving** (large element) paving units are used for pedestrian, civic, amenity and street footpath construction and are not suitable for vehicular trafficking unless a suitable sub base design has been prepared and guidance to this effect has been given on the individual product page.

Concrete Block paving is suitable for a wide range of schemes from light pedestrian areas, domestic driveways, to commercial and HGV trafficked areas, utility areas and adapted roadways. Block paving can be adapted for a full and versatile range of visual and functional uses.

Product Standards and Specifications

The full range of Kilsaran products are manufactured to fully meet all requirements of all current British and European Standards.

To ensure the best application and performance of all products it is the responsibility of the client to ensure that during the design and installation process the relevant complimentary standards for design, installation, construction and maintenance are followed.

Product Type	Manufacturing Standards	Site Specific Design Standards	Installation/ Construction Standards
Paving Blocks	BS EN 1338:2003	BS 7533 Part 1 or 2	BS 7533-3
Paving Flags	BS EN 1339:2003	BS 7533 Part 8 or 12	BS 7533-4
Permeable Paving	BS EN 1338:2003	BS 7533-13	BS 7533-13
Kerbing	BS EN 1340	BS 7533-6	BS 7533-6
Tactile Paving	BS 7997, DD CEN/TS 15209:2008	DETR Tactile Paving Guidance Document	BS 7533-4

Block Paving Design & Specification Guidance

The below information is provided as a guideline for appraisal purposes only on the basics of block pavement design and considerations. In all cases the user is advised to review this guidance against the detailed requirements of the BS 7533 suite of standards which provide in-depth detail on design, installation, construction and maintenance of concrete block pavements

BS / EN Standard	Title
BS EN 1338:2003	Concrete paving blocks — Requirements and test methods
BS 7533-1	Guide for the structural design of heavy duty pavements constructed of clay pavers or precast concrete paving blocks
BS 7533-2	Guide for the structural design of lightly trafficked pavements constructed of clay pavers or precast concrete paving blocks
BS 7533-3	Code of practice for laying precast concrete paving blocks and clay pavers for flexible pavements
BS 7533-11	Code of practice for the opening, maintenance and reinstatement of pavements of concrete, clay and natural stone

Principles of Concrete Block Pavements

The principle on which concrete block pavements operate is that it is a flexible construction technique. For this is reason no cement based materials are permitted for use as a sub base layer and especially in the laying course material. The pavement must maintain its flexible construction to perform effectively.

This flexible nature of the pavement construction allows concrete block pavements to carry from very light to extremely high loadings from trucks and commercial vehicles to aircraft and handling and stacking machinery. This is not always possible with in situ concrete or bituminous macadam surfaces which may suffer pavement fatigue under the same loading stresses.

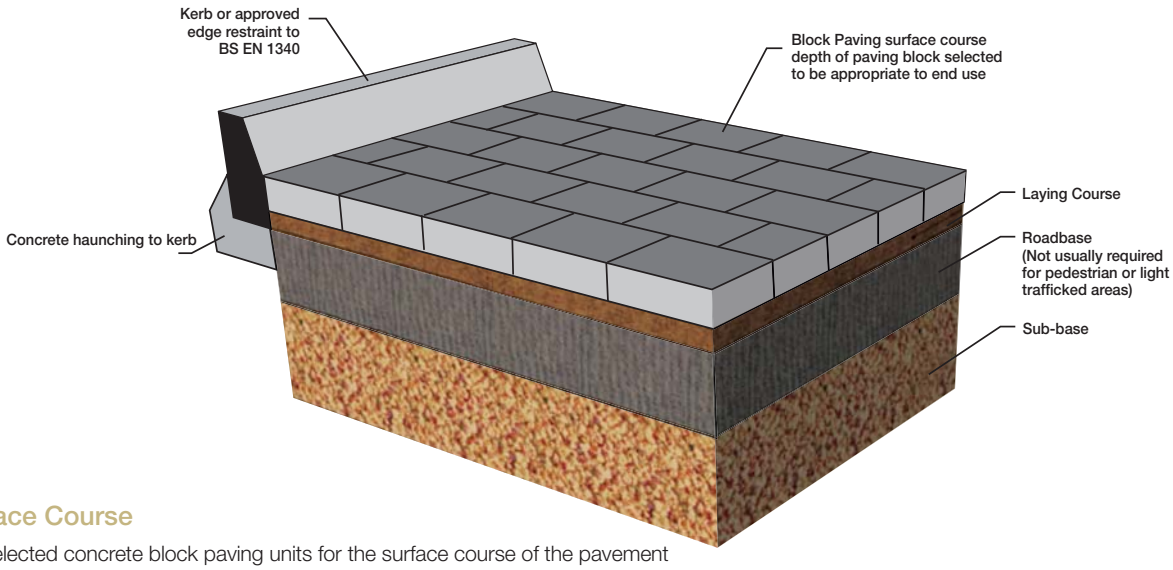
The individual concrete paving blocks are ‘locked’ together in their laying pattern and as one block is loaded it spreads its load to its neighbouring block and the load is spread outwards in a radial pattern, effectively dissipating the load over a larger area.

Since there is no bound surface and paving blocks are relying on their neighbouring block to provide frictional interlock to hold them in place, it is an essential part of the block pavement design that there is a rigid edge restraint on all sides of the pavement, this can consist of an appropriate kerb haunched in concrete, an existing structure or a rigidly fixed perimeter course. It is also essential that during construction all joints are fully filled with the correct grade of jointing sand and the joints are inspected and topped up as required immediately after construction and for the future life of the pavement. The jointing material assists with the interlock of the pavement, and improperly filled joints is likely result in deterioration of the surfacing layer and the sub base layers underneath.

Block Paving Design & Specification Guidance

Concrete block pavements typically consist of either three or four layers of construction as detailed in the cross section below:

Typical Cross Section of Concrete Block Pavement



Surface Course

The selected concrete block paving units for the surface course of the pavement

Laying Course

The layer of material on which the block paving units are bedded. It is essential that this material complies with the requirements of BS 7533-3 tables D.1, D.2 and D.3 and is appropriate to the end use of the pavement. It is not permitted to add cement or lime to the laying course material to act as a binder. Note that for more heavily trafficked sites the nominal depth of the laying course material is reduced and the allowable fines content is also reduced to minimise the potential for settlement and deterioration in use.

Roadbase

The material placed above the sub-base and beneath the laying course layers. A roadbase layer will typically only be required in pavements that will be required to accommodate medium to heavier duty commercial traffic loadings, or where the subgrade (ground conditions) are poor and require improvement for the desired traffic loadings. The roadbase layer will act as a 'stiffening layer' in the pavement construction and may be a cement bound granular material (CBM) or a bituminous macadam material. Note that conventional lean mix concrete or mass concrete is not suitable for use in block pavements that are to receive vehicular traffic.

Sub-base

All concrete block pavements will require a sub-base layer. This is usually a high quality granular all in aggregate material which is installed and compacted in layers. Normally this material will be a 'Type I' material in accordance with clause 803 of the Department for Transport Specification for Highway Works or clause 804 type B in accordance with the National Roads Authority Specification for Road Works. The use of lower quality fill materials and recycled rubble fill should be avoided unless the material has been independently tested to demonstrate it meets or exceeds the requirements of the specified sub-base material above.

Paving Block Thicknesses

Most of the Kilsaran range of block paving is available in a variety of thicknesses to suit different end use requirements. While the depth of paving block selected must be appropriate to the end use, the maximum loading capacity that a constructed pavement can withstand will also be heavily dependent on the pavement build up and construction being appropriate to that end use.

Table 1 - Pavement Type / End Use	Minimum thickness of Block Paving (mm)
Domestic & pedestrian footpaths	40mm
Domestic driveways (light traffic) & pedestrian footpaths	50mm
Normal duty trafficked areas, car parking, retail, public areas with lower volume commercial traffic	60mm
Service roads in retail, commercial and civic public areas. Adapted public roadways and commercially and heavier trafficked areas	80mm

Note details in this table are intended as a quick reference guide only. For more detailed description of loading categories and trafficking types please review table 2 below and BS 7533 part 1 or 2.

Site Assessment for Design Purposes

Stage 1 – Establishing bearing capacity of the existing sub-grade

For pavement design purposes it is necessary to know the strength or bearing capacity of the underlying sub grade (soil / clay). A simple site test method known as the CBR test (California Bearing Ratio) is used to determine subgrade bearing capacity. This is a simple test where a plunger of standard size and mass is forced into the sub-grade and the force at which the plunger stops at is recorded.

The CBR value is calculated from this. Typical values are in the range of 3-5% for normal clay sub-grades. Wet, poorly drained and made up ground will have lower values. The lower the value, the more sub base / pavement build-up will be required as per **table 2**.

CBR Testing being carried out on site

On most schemes the pavement designer will already have site CBR values to hand as this testing would have been carried out at site investigation stage prior to designing other buildings or structures on site. The Structural Engineer would have required this for the foundation design of the building and you are likely to find CBR values in this report. Note the lowest average CBR values will be taken for the site.

For smaller schemes and residential schemes where it is not economically feasible to carry out site investigation and CBR testing, BS 7533-2 provides guidance in table 1 on likely CBR values for different physical ground conditions determined on site. An experienced paving and groundwork's contractor is likely to be able to advise on the basis of a site visit.

Stage 2 - Commercial Traffic Assessment

When the site appropriate CBR value for the site has been determined at stage 1, it will be necessary to decide on the appropriate traffic category for the pavement and select a loading category as detailed in the table below. It is essential at this design stage that all commercial traffic including occasional service vehicles and emergency vehicle access is taken into account within the design process. Pavements which have not been designed to accommodate HGV traffic should never receive service vehicles or emergency vehicles. It is also necessary to factor in increasing traffic volumes over the design life of the pavement. The BS 7533 design standards provide further guidance in this area.

Stage 3 – Pavement Construction Thickness

When details from stage (1) CBR assessment and stage (2) traffic assessment have been ascertained it is possible to determine the required thicknesses of block paving, laying course and sub base that are likely to be required for the scheme. Table 2 below is based on Table 4 of BS 7533-2 which gives guidance on construction thickness of block pavements. Note very heavily trafficked sites will have to be designed separately to the requirements of BS 7533-1.

Table 2 - Pavement Construction Thickness

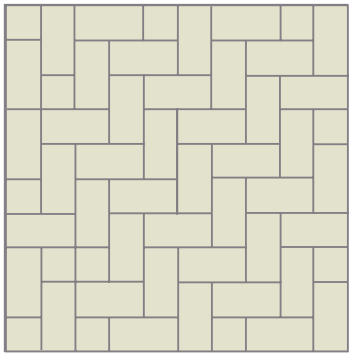
Loading or end use Description	BS 7533-2 Loading Category	Maximum commercial vehicle movements per day	Minimum compacted sub base thickness (mm)					Nominal compacted thickness (mm)		Minimum Paving Block thickness (mm)
			Design CBR							
			≤2%	3%	4%	5%	≥6%	Roadbase	Laying Course	
Commercially trafficked pavements, roadways, heavily trafficked commercial areas, adopted major roadways and streets, freight depots, container and shipping terminals, rail depots etc	Category I	For commercially heavy trafficked pavements the design guidance in this table and BS 7533-2 is not appropriate and a more detailed site specific design will be required to be carried out in accordance with the requirements of BS 7533-1 with the assistance of an appropriate Consulting Engineer with detailed experience of Pavement Design.								
Adopted minor roadways and access roads, delivery roads within business areas and shopping facilities, cul de sac's, petrol station forecourts, pedestrianised areas subject to heavy vehicle movements, footways regularly overridden by vehicles and car parks receiving heavy traffic regularly	Category II	≥ 5 For commercial vehicle movements above 10 per day consult BS 7533-1 and seek specialist design guidance	400	350	250	150	150	125	30	80 in more heavily trafficked areas 60 in medium traffic
Pedestrianised and car trafficked areas receiving only occasional heavy traffic (1 commercial vehicle per week max)	Category IIIa	Less than 1	350	300	225	150	150	0	50	50
Car parks receiving no heavy traffic, footways receiving no vehicle traffic	Category IIIb	Zero	300	250	175	100	100	0	50	50
Private drives, patios and hard landscaping areas which never receive commercial traffic	Category IV	Zero	200	150	125	100	75	0	50	40 (no traffic) 50 with light traffic

Construction

All materials used and installation and construction methodology should fully comply with the requirements of BS 7533-3. Maintenance and re-instatement work where required should also meet the requirements of this standard and BS 7533-11.

Block Paving Laying Patterns

The laying pattern has a significant impact on the long term stability of the paved surface and its load bearing abilities. Block paving schemes which have been designed to accommodate heavier traffic loads and commercial and service vehicles are normally completed in herringbone pattern (either 45 or 90 degree) as this has been time proven to be the most effective laying pattern for dissipating heavy loads and resisting spread from continual turning movements. Patterns such as stretcher bond will also be effective for medium traffic loading while patterns such as parquet or stack bond will not be suitable for vehicular trafficking.

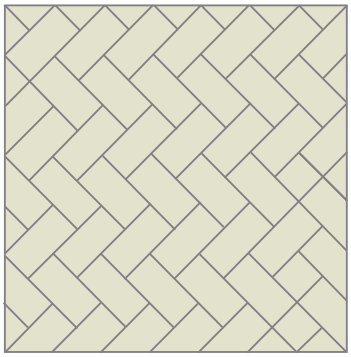


90 Degree Herringbone

Suitable for all loading categories up to and including heavier duty commercially trafficked pavements

Products which can be laid in this pattern:

- Slane 200 x 100mm
- Mellifont Large size only (240 x 160mm)
- Lismore Large size only (240 x 160mm)
- Newgrange Large size only (240 x 160mm)

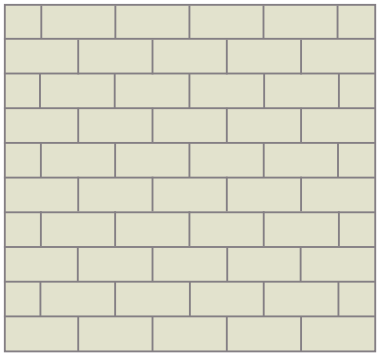


45 Degree Herringbone

Suitable for all loading categories up to and including heavier duty commercially trafficked pavements

Products which can be laid in this pattern:

- Slane 200 x 100mm
- Mellifont Large size only (240 x 160mm)
- Lismore Large size only (240 x 160mm)
- Newgrange Large size only (240 x 160mm)

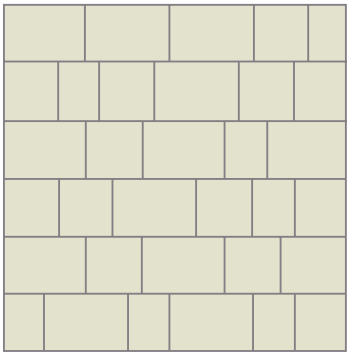


Stretcher Bond

Suitable for all loading categories up to medium traffic commercial pavements having once to twice weekly goods vehicle traffic. Should be laid with longitudinal joints at 90 degrees to the direction of traffic

Products which can be laid in this pattern:

- Slane 200x100mm
- Mellifont Large size only (240x160mm)
- Lismore Large size only (240x160mm)
- Newgrange Large size only (240x160mm)
- Boyne

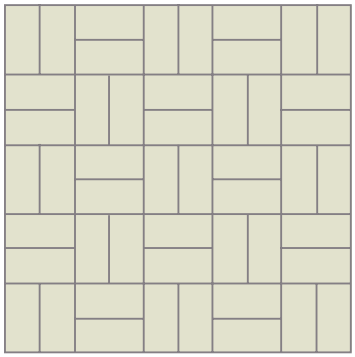


Random Stretcher Bond

Suitable for all loading categories up to medium traffic commercial pavements having once to twice weekly goods vehicle traffic. Should be laid with longitudinal joints at 90 degrees to the direction of traffic

Products which can be laid in this pattern:

- Mellifont 3 size mix
- Lismore 3 size mix
- Newgrange 3 size mix

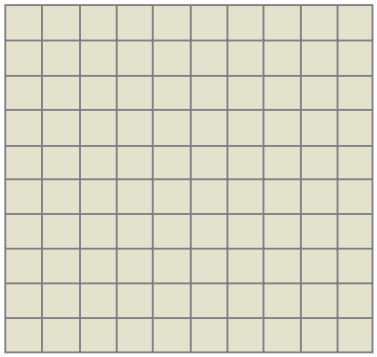


Parquet or Basket-weave

Generally suitable for pedestrian areas only. Not recommended for areas which are to receive vehicular traffic

Products which can be laid in this pattern:

- Slane 200x100mm



Stack Bond

Generally suitable for pedestrian areas only. Not recommended for areas which are to receive vehicular traffic

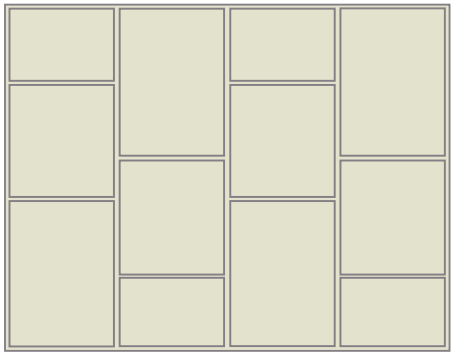
Products which can be laid in this pattern:

- Slane 100x100 size
- Mellifont Medium size only (160x160mm)
- Lismore Medium size only (160x160mm)
- Newgrange Medium size only (160x160mm)

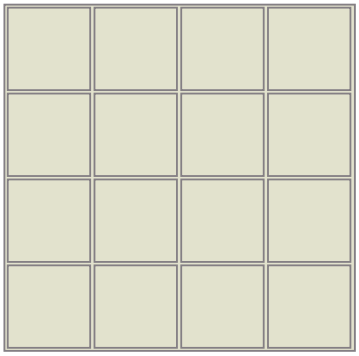
Flag Paving
Flag Paving Laying Patterns

Flag paving is generally not laid in the same style of laying pattern as block paving as many traditional unit sizes in flag paving are square in shape and commonly either a stack bond or variations on a stretcher bond is adapted on many schemes

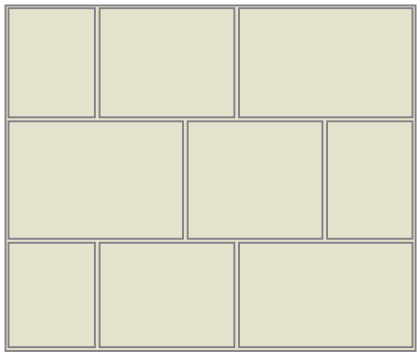
As flag paving is generally not used for vehicular trafficking the laying pattern will not have the same impact on the long term structural stability of the paved surface as it does for block paved surfaces. It should be noted however that often for public schemes and local authority utility schemes that transverse bond laying patterns are often favoured where the longitudinal joint is at 90 degrees to the direction of pedestrian traffic



Transverse Stretcher Bond



Stack Bond



Longitudinal Stretcher bond

Flag Paving Design & Specification Guidance

The below information is provided as a guideline for appraisal purposes only on the basics of flag pavement design and considerations. In all cases the user is advised to review this guidance against the detailed requirements of the BS 7533 suite of standards which provide in-depth detail on design, installation, construction and maintenance of concrete flag pavements

BS / EN Standard	Title
BS EN 1339:2003	Concrete paving blocks — Requirements and test methods
BS 7533-1	Code of practice for the construction of pavements of precast concrete flags or natural stone slabs
BS 7533-2	Guide for the structural design of lightly trafficked pavements constructed of clay pavers or precast concrete paving blocks
BS 7533-3	Guide to the structural design of trafficked pavements constructed on a bound base using concrete paving flags and natural stone slabs
BS 7533-11	Code of practice for the opening, maintenance and reinstatement of pavements of concrete, clay and natural stone

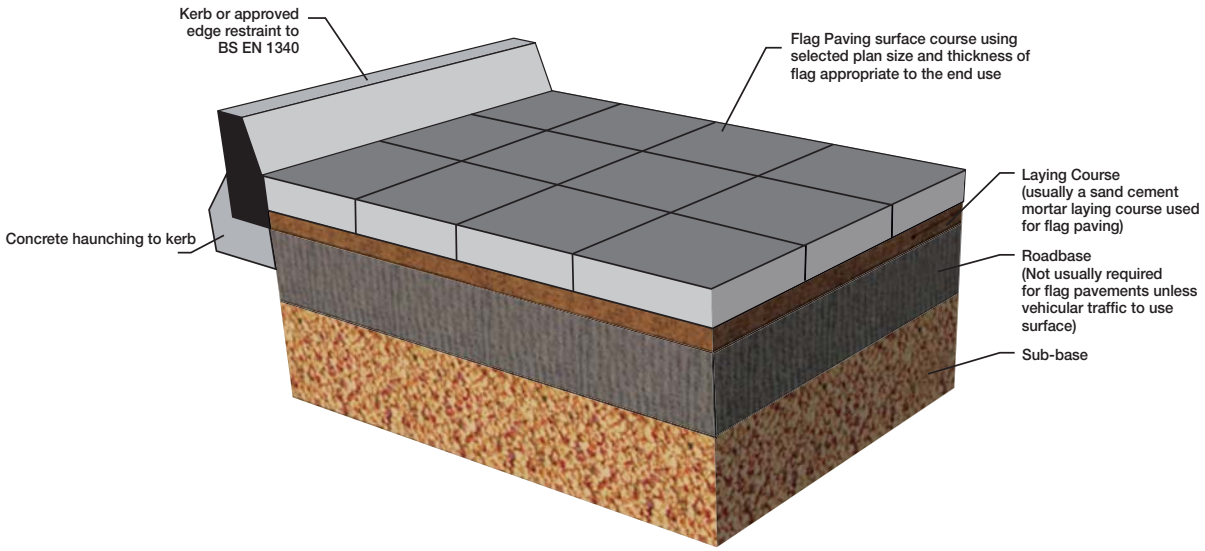
Principles of Concrete Flag Pavements

Flag pavements are generally constructed for pedestrian use or occasionally for emergency or service vehicle access. Since flag paving is not frequently designed and installed to be trafficked, often it will be installed as a rigid bedding construction and so unlike block paving will not be flexible in construction and accommodate vehicle traffic. Experience has shown however that rigidly constructed flag pavements are a long term low maintenance solution and often adapted by local authorities for streetworks and repairs.

Like block paving, it is advised for flag pavements that there is a rigid edge restraint on all sides of the pavement, this can consist of an appropriate kerb haunched in concrete, an existing structure or a rigidly fixed perimeter course. It is also essential that during construction all joints are fully filled with the correct grade of jointing sand and the joints are inspected and topped up as required immediately after construction and for the future life of the pavement. The jointing material in flag pavements prevent water ingress into the pavement layers and potential deterioration of the sub base layers underneath.

Concrete block pavements typically consist of either three or four layers of construction as detailed in the cross section below:

Typical Cross Section of Concrete Flag Pavement



Surface Course

The selected concrete flag paving units for the surface course of the pavement

Flag Paving Design & Specification Guidance

Laying Course

The layer of material on which the block paving units are bedded. It is essential that this material complies with the requirements of BS 7533-3 tables D.1, D.2 and D.3 and is appropriate to the end use of the pavement. It is not permitted to add cement or lime to the laying course material to act as a binder. Note that for more heavily trafficked sites the nominal depth of the laying course material is reduced and the allowable fines content is also reduced to minimise the potential for settlement and deterioration in use.

Sand laying course should comply with the requirements of BS 7533-4 section 5.4.6.2 and table 5. Where a sand laying course is adapted it is not permitted to add cement or lime to the laying course material to act as a binder. For bound construction a cement based mortar complying with the requirements of section 5.4.4.2 of BS 7533-4 should be used. Note that normally the finished / compacted depth of laying course material for flag construction should be 25mm for both sand and mortar based laying course materials. Concrete flag paving laid on a bound cement based laying course (mortar bed) should have 4-6mm joints filled with a cement based mortar class M6 to BS EN 998-2.

Roadbase (Not usually required)

The material placed above the sub-base and beneath the laying course layers. A roadbase layer will typically only be required in flag pavements that will be required to accommodate vehicular traffic loadings or where emergency vehicle access must be allowed for, or where the subgrade (ground conditions) are poor and require improvement for the desired traffic loadings. The roadbase layer will act as a 'stiffening layer' in the pavement construction and may be a cement bound granular material (CBM) or a bituminous macadam material

Sub-base

All concrete flag pavements will require a sub-base layer. This is usually a high quality granular all in aggregate material which is installed and compacted in layers. Normally this material will be a 'Type I' material in accordance with clause 803 of the Department for Transport Specification for Highway Works or clause 804 type B in accordance with the National Roads Authority Specification for Road Works. The use of lower quality fill materials and recycled rubble fill should be avoided unless the material has been independently tested to demonstrate it meets or exceeds the requirements of the specified sub-base material above.

Paving Flag Thicknesses

Most of the Kilsaran range of flag paving is available in a variety of thicknesses to suit different end use requirements. Most of the paving flag range is supplied in 50mm depth as standard. While the depth of paving flag selected must be appropriate to the end use, the maximum loading capacity that a constructed pavement can withstand will be substantially more dependent on the pavement build up and construction being appropriate to that end use than the paving flag unit itself.

Flags have been traditionally specified for many years in the common British Standard sizes detailed in BS 7263-1 and the national annex of BS EN 1339:2003

BS Size Flag Designation	Work Size (mm)	Thickness (mm)	Class 3 Flags	
			Characteristic Breaking Load	Minimum Individual Breaking Load
B50	600 x 600	50	9.1	7.3
B63	600 x 600	63	14.4	11.6
E70	400 x 400	70	18.4	14.7
F40	400 x 400	40	9.5	7.6
F5	400 x 400	50	9.5	7.6
F63	400 x 400	63	16.1	12.9
F80	400 x 400	80	16.1	12.9

Information contained in this table is based on BS EN 1339:2003 NA.2 and BS 7263-1:2001 and how these standards best apply to the relevant Kilsaran concrete paving flag products

Pavement Type / End Use	Minimum Thickness and Flag Type
No vehicle traffic at any time, patios, paths and pedestrian only areas	All unit sizes, 40mm in domestic and 50mm in public areas
Very occasional use by cars and cleaning equipment	All unit sizes in 50mm depth or greater with appropriately robust sub base design
Pavements with light vehicular (car only) crossings	All unit sizes in minimum 63mm depth with appropriately robust sub base design
Pavements with light vehicular (car only) traffic or where emergency vehicle access may be required	F80 minimum with appropriately robust sub base design

Information contained in this table is based on guidance within the National Annex of BS EN 1339:2003 and is interpreted as it best applies to the relevant Kilsaran concrete paving flag products

Site Assessment for Design Purposes

Similar to block paving structural design, for commercial flag paving schemes the ground conditions (drainage and CBR values) and current and predicted traffic volumes (only for trafficked flag pavements) need to be determined to select the most suitable paving flag unit size and depth and also to allow a suitable sub base design to be carried out.

Unlike block paving structural design, the depth of sub base and roadbase (when required) construction is determined using graphs for the paving flag unit stress limit and separately for sub base material stress limit. These graphs are detailed in section 6.4 of BS 7533-8 and the higher value obtained from the two graph interpretations should be used.

For flag paving schemes where no vehicular traffic is to use the surface a simplified approach is often used where the sub base depth will be in the region of 100-150mm and an experienced paving / groundworks contractor will be able to advise at appraisal stage if this should be sufficient.

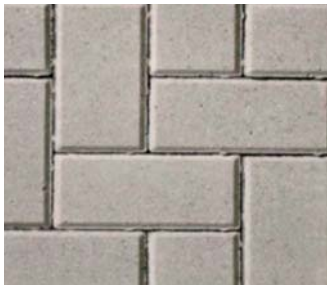
Construction

All materials used and installation and construction methodology should fully comply with the requirements of BS 7533-4. Maintenance and re-instatement work where required should also meet the requirements of this standard and BS 7533-11.

Kilsaran strongly advise that all paving works should be carried out by an experienced paving contractor. It is a specialist skill and the integrity and durability of the completed paving is highly dependent on expert skill, care and attention during construction and installation.

Joint Width
Selection of the Appropriate Paving Unit

Narrow Joints
≤1mm



Standard Joint
1.5-2mm

Wide Joint
4-8mm

Most types of block and flag paving will have an integrated spacer nib which is part of the side profile of the unit when manufactured. Spacer nibs are designed to give an even distance between each unit and allow for even and consistent straight lines when laying paving. The spacer nib in conjunction with the chamfer detail it provides an even joint profile and protects the units from damage during laying and trafficking when in use.

Each product in this brochure is classified in terms of joint profile as shown above and consideration should be given to the most appropriate joint profile for the scheme

- ✓ Narrow joints should be selected for areas where low joint maintenance is desired, eg indoor areas and shopping trolley areas. Products with narrow joints will usually have no integral spacer nib and no chamfer and must be laid with care and attention to strict surface regularity tolerances. Re-jointing may never be required during normal design life. This type of joint profile will not be suitable for anything above lightly trafficked areas due to potential chipping of edges of units.

- ✓ Standard Joint products is the most commonly used type of paving suitable for all locations, traffic categories and schemes, especially commercial projects where maintenance will be lower. Jointing will require inspection every 6-12 months normally and re joint possibly every 5-10 years in normal use.

- ✓ Most types of flag paving is supplied with a standard joint profile, eg Classic Flags, Newgrange and Shelbourne Flag ranges.

- ✓ Wide joints will require more maintenance to maintain joints topped up. Products with wide joints are generally used where an olden look and feel of cobble type paving is desired. Normally traditional kiln dried jointing sand is not suited to wide joints as experience has shown that wind and rain naturally removes the sand along with routine washing and cleaning of the area. Usually wide joint paving will require a polymeric (self hardening) jointing sand compound such as Kilsaran PermaJoint 200.

Joint Maintenance

All joint profile units will require routine inspection and maintenance where required both after initial installation and on an ongoing basis. It is essential for all types of block and flag paving that joints are maintained full in all areas for the lifetime of the pavement. The frictional interlock of block paving depends on joints being full at all times and this also prevents water entering the laying course and sub base layers and causing more serious damage.

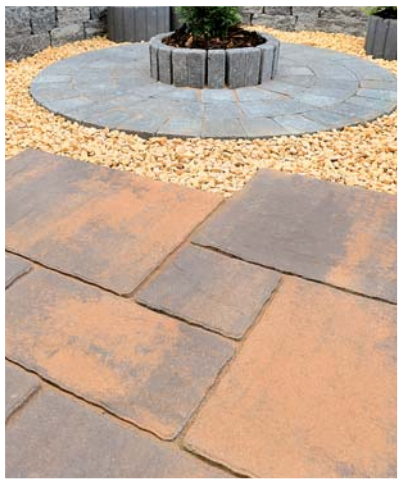
Newly jointed areas or areas which have had jointing material recently replaced will need to be inspected shortly after jointing and topped up as some initial settlement of jointing materials will inevitably occur. After pressure washing or cleaning paving it is likely that joints will also require topping up.

Colour Selection

It should be noted that brighter colours, such as silver, buff, red etc along with textured finishes will require additional routine cleaning to maintain the colour and finish of the paved surface. Natural and charcoal colours lend themselves more to commercial projects where it is desired to have reduced cleaning and maintenance routines. Silver and buff colours can be susceptible to discolouration if weed killer, chemical treatments or rust inadvertently come into contact with the surface.

During installation great care must be taken especially with brighter / lighter colours not to get dirt, laying course materials or soil on the surface of paving. The correct colour of jointing material must also be selected for the paving unit. See jointing section of this guide.

All Kilsaran paving products are produced to the highest quality standards however it must be accepted by the customer that all paving products are subject to slight variations in colour tone and shade due to minor variations in naturally occurring raw materials and manufacturing. The full and accurate quantity required for a project must be advised in advance to Kilsaran to include an allowance for any waste or extra material that may be required to allow us to supply from one production batch. On site it is essential to lay from three to six packs working alternately through each pack and layer to achieve an even blend on site. This is especially important for blended colour products.



Slip/Skid Guidelines

The current product standards for block paving and flag paving are BS EN 1338 / 1339 respectively. Section 5.3.5 of both standards deals with slip/skid resistance states that 'Concrete paving blocks have satisfactory slip/skid resistance provided that their whole upper surface has not been ground and/or polished to produce a very smooth surface'. Essentially this means there is not a current clearly defined standard for what is deemed 'slip resistant' or not.

For guidance purposes on previous standard specification for slip / skid values, the table below from the now superceded BS product standards below illustrates the previous BS standard guidance in this area. A minimum guidance value of 35 in pedestrian areas and 45 in vehicular trafficked areas is advised.

All Kilsaran paving products have their specific slip/skid test value quoted in the product technical & performance data section on each product page. This is quoted as the wet tested USRV (unpolished slip resistance value) rating for the product. Most products with a standard finish will have a minimum value of 60 or greater with the exception of products with a ground finish which will have a typical value in the range of 50 – 55.

If a specific slip skid value is required for a project, this should can be discussed with a member of the Kilsaran technical team.

Slip / Skid Pendulum Testing Apparatus

Table below based on BS 6717: 2001 (Table 5) and BS 7263-1:2001 (Table 9)

Class	Mean Slip/Skid Resistance Value C Scale Units
S1	No performance determined
S2	≥ 35
S3	≥ 45
S4	Manufacturer's declared value

NOTE For special applications, e.g. approaches to traffic lights, a higher value may be appropriate Paving blocks of class S2 are suitable for use in pedestrian areas and paving blocks of class S3 are suitable for use in vehicular areas.

NOTE For special applications, e.g. approaches to traffic lights, a higher value may be appropriate

Cleaning & Maintenance Guidelines
For Concrete Block and Flag Paving

Concrete block and flag paving provides a sound, durable and visually pleasing surface and finish which should last for many years when installed and maintained correctly.

Unfortunately all types of paving irrespective of supplier and quality of installation, will require some ongoing maintenance over its lifetime, however with a little regular maintenance you can keep your paving in looking at its best.

Paving should be kept clean and free from detritus to retain its aesthetic appeal. The most effective and suitable method to clean paving is regular sweeping by hand. Where further cleaning is required, this should be done with a stiff brush and hot water and a mild detergent if required. If paving is cleaned regularly there will be no need for power-washing or chemicals which may degrade the surface with continued use. Cleaning with a brush and water will generally not wash the sand from the joints.

Kilsaran recommend that to aid cleaning and maintenance paving should be sealed with a suitable sealing product, such as our Kilsaran Paving Sealer product.

The surface should be inspected a few weeks after laying and afterwards one to twice per year and after cleaning to check that the joints are full. Any joints which are not full should be topped up (in dry conditions only) with Kilsaran kiln dried jointing sand. Joints which are not adequately filled can allow movement of the pavement and can allow water to wash out underneath the paving and cause settlement of the blocks.

Weeds

Certain types of weeds and grasses can grow in between the joints in a paved surface. This is because the jointing sand will hold a certain amount of moisture and over time detritus builds up in the sand and the weeds will live off this. Usually weeds only grow in areas where the paving receives very little traffic (eg in a quiet corner of the driveway) or if it has been neglected for a period of time. Weeds can be treated relatively easily, they can be removed manually before they become established. Often treating the area with a suitable weedkiller will treat the rest. When using weedkiller it is best to try the selected product and concentration in an inconspicuous area first and make sure it doesn't stain or damage the surface of the paving. Weedkiller should be applied in dry conditions for optimal effect. Where the area being treated has been particularly neglected, a second treatment may be required. The weeds may take some time to die and can then be removed by hand.

Algae & Moss

Algaes generally form in damp areas and tend to grow in or around the paving joints and may spread over time. Algae is more common with clay bricks than concrete. Usually seen as a thin green growth on the paving, algae shouldn't be mistaken for moss which tends only to grow in very damp joints. Algae can be treated fairly easily using an appropriate water based fungicide. The colour fastness of the surface should be checked in a small inconspicuous area before treating the whole area. Sealing the treated pavement will dramatically reduce recurrence and aid future maintenance.

Moss is commonly seen in all areas of gardens and on various types of materials. Moss tends to grow in shaded, damp and unmaintained areas. Typically moss will form in the joints of paved areas where the sand remains damp and nurtures the growth of moss.
Moss can be treated again using an appropriate water based fungicide ensuring that it does not stain the surface, make sure to test first on an inconspicuous area. When the moss had been killed it can be brushed or scraped off and the surface cleaned.

Lichens

Paving which hasn't been cleaned or treated for long periods of time is prone to developing Lichen growths which can spread over large areas in some cases. This is very common and seen as white or black spots dotted around the paving. It is a fungus which can live off the minerals deposited on the surface and within the paving. This type of growth unlike algae tends to penetrate the surface and the longer its left, the harder it is to remove. Again like algae, a fungicide or bleach is required to treat this and it may take several treatments to kill stubborn deposits. After successful treatment the deposit can be scraped off. It is likely that a good thorough washing of the surface will be required to remove traces of the deposit. After treatment, sealing of the surface will reduce recurrence and aid future maintenance.

Efflorescence

Efflorescence may occur on the surface of paving as a patchy white or milky deposit. In simple terms this occurs as a natural phenomenon where the free lime from the cement used to manufacture paving can react with the moisture and local environment to produce a Calcium Carbonate deposit on the surface. Efflorescence causes no damage to the paving in any way and although deposits can be unsightly, they will disappear over time and more quickly in areas where the paving receives more traffic. Efflorescence is not caused by a problem with the Paving or the manufacture of it. It is naturally occurring and while Kilsaran employ best practice in trying to minimise efflorescence, it is unfortunately not possible to completely eliminate this. There are commercially available acids from DIY retailers which will remove the surface deposit of efflorescence, however these are very harsh on the surface and may cause permanent surface damage. It is best to let efflorescence weather away naturally. Kilsaran would advise against the use of any acid cleaners to remove efflorescence.

General Maintenance

A small amount of regular maintenance is all that is required. Paving in areas which are prone to growth or which don't get much traffic should be treated with a suitable weedkiller or fungicide twice to three times per year to keep growth at bay.

Any cracked or broken units should be replaced and all sand joints should be checked once to twice per year and topped up with Kilsaran Jointing sand as required. Any defective areas should be reviewed against the requirements of BS 7533-3.

Regular brushing and hosing down with water should be all that is required to clean properly maintained paving.

Pressure washing is not recommended by Kilsaran for regular cleaning. This should be reserved for very dirty areas and carried out without using excessive pressure and keeping the lance at a low angle relative to the surface. Joints are likely to need topping up after pressure washing operations.

Cleaning & Maintenance for Heavy Pedestrian Use Areas

For commercial schemes with high footfall and/or increased levels of traffic, the Kilsaran Technical Team can assist with providing a specification for cleaning and maintenance to meet with site specific requirements and product type used on the scheme. Please contact the Kilsaran Technical Team for further assistance.

Terms & Conditions

This Brochure

This brochure was printed in February 2014 and the information within it supersedes all previous brochures. We have taken every reasonable precaution to ensure that all details contained in the brochure are accurate. We are an innovative company and we seek to develop our product ranges and product lines on an on-going basis. We recommend that you check online or by calling us to ensure that you have the most up-to-date product information to hand.

Our Paving Products

When our product is delivered and before it is laid, the customer should satisfy themselves that the product is free from defects or damage. Any product failing to meet the product specification will be replaced as per our product promise. Our product promise relates strictly to the product only. Kilsaran cannot accept liability for replacement installation costs and/or delays incurred as a result of product that is defective or damaged which is laid. Any defects must be notified to Kilsaran immediately.

Small scuffs or scratches on the surface of our paving products may arise during transportation, handling of the product on site or compaction. These scratches are quite normal and will disappear over time. They do not affect the integrity of the product in any way.

Efflorescence

Efflorescence may occur as a naturally occurring phenomenon when temporary white stains may appear on the paving product surface. This is inherent in high quality concrete products produced with natural materials, this is not a product defect. Over time, these stains are gradually washed away by rain and weathering. Kilsaran cannot accept responsibility for these natural occurrences. Kilsaran do not accept returns on any material exhibiting signs of efflorescence.

Colour Illustrations

Through the use of the most modern photographic techniques available we endeavour to ensure that the colour illustrations of our paving products in this brochure are as accurate as possible. We do recommend that any final decision is based upon viewing a sample of the product. These samples can be provided by our regional Sales & Specification Team, your laying contractor or at our Display Showrooms in Dunboyne, County Meath, Ireland. Please visit our website where your local stockist and display centre will be listed.

Colours and Blending

Kilsaran uses high-quality photo stable iron oxide pigments to create the various colours in the paving products range. As with all concrete products, our paving products may be subject to slight colour variation due to the natural variation in raw materials used and from weathering over time. These are natural occurrences inherent in all concrete products, Kilsaran cannot accept responsibility for these natural occurrences.

When laying, in order to achieve an even blend of colour, it is essential to work equally from a minimum of 3 - 6 packs, laying evenly from each. It is essential to measure the area to be paved accurately allowing for waste. The full quantity of required product should be advised to Kilsaran so that we may deliver as one batch. Additional material subsequently ordered may delay the completion of your project and may be from a separate production batch and there may be a shading difference.

Returned Products

Kilsaran do not accept returns on any materials.

Commitment to Customer Satisfaction

We strive to provide the best products in the market backed up by superior customer service. If our products or service do not meet your expectations please contact us.

Special Orders

The colour swatches displayed in this brochure best reflect our most popular colours within specific product ranges at the time of going to print. It may be possible to produce these products in other colours not displayed on the relevant swatch depending on the order volume. Kilsaran reserves the right to refuse to manufacture products in specific colours. Special colours may be subject to greater lead time than standard stock colours.

The above is a summary of our Terms and Conditions as they apply to our Paving Product range only. A full copy of the Kilsaran Group Terms and Conditions of sale can be obtained from any Kilsaran Office or from our website.

get in touch

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