

CHARCON COMMERCIAL LANDSCAPING

PRODUCT
PORTFOLIO
V3 - MARCH 2022

A MEMBER OF
HOLCIM


AGGREGATE
INDUSTRIES

CHARCON
HARD LANDSCAPING

PROVIDING THE BEST
RANGE OF PRODUCTS FOR ANY
HARD LANDSCAPING PROJECT

CHARCON CAN

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QR CODES

To find out more about a specific product, simply scan the QR code at the top of the page using a QR code reader app on your smartphone. You'll be automatically redirected to the product page on our website.

A GUIDE TO THE SYMBOLS

We have placed the following symbols on each product page to help you quickly identify the key features of our products.



STEP
Indicates a product that is available in step units.



SURFACE PROTECTION
Pre-treatment for paving to protect against surface contamination.



WATER DROP
Identifies if a permeable option is available.



DURABILITY
Indicates a product that has been engineered with increased durability.



LIFE
Sustainable products and services based on one or more of our criteria.



SOURCE
Identifies if a product is manufactured in the UK with locally sourced materials.



MOBILITY
Identifies products that are suitable for easy mobility.



CARBON FOOTPRINT
The embodied carbon footprint for the product including all elements of manufacturing.



SuDS
Provides an alternative approach to traditional drainage systems.



BIM
Indicates a product with BIM data available.



ECO FRIENDLY
Contains recycled content.



BREEAM
(Building Research Establishment Environmental Assessment Method) - Sustainability assessment method for products that contributes to the overall sustainability rating of a building.



Aggregate Industries is a major manufacturer and supplier of construction materials. Our Charcon range of hard landscaping offers the industry complete commercial solutions for all types of projects.

Our focus is firmly on providing high quality, innovative and integrated solutions to architects, civil engineers, landscape professionals, housebuilders and contractors in every aspect of the construction industry.

Our Charcon product range provides all the necessary materials to furnish a hard landscaping scheme, from large public realm projects to educational and health facilities, delivering projects from concept to completion as a supply partner. Furthermore, we have unrivalled access to the highest quality raw materials, concrete technology and research teams. This expertise is constantly being channelled into developing new, innovative products in flag paving, block paving, kerbing and drainage solutions.

Delivering value in construction materials and services

We see our goal as not only the provision of the highest quality and most sustainable materials, but also to work closely with our clients and others in the supply chain to find best value solutions. By continually developing new techniques, production processes and delivery solutions, we are able to offer our clients the highest quality and most appropriate products at commercially attractive prices.

About Holcim

Aggregate Industries is part of the Holcim Group. With a well-balanced presence in 80 countries and a focus on cement, aggregates and concrete, Holcim is the world leader in the construction materials industry. The Group has 72,000 employees around the world.

Holcim is the industry benchmark in research and development, supplying products across all customer bases, ranging from the individual home builder up to the largest and most complex projects.

With a commitment to drive sustainable solutions for better building and infrastructure and to contribute to a higher quality of life, the Holcim group is best positioned to meet the challenges of increasing urbanisation.

OUR NET ZERO CLIMATE PLEDGE



Holcim is reinventing how the world builds for people and the planet.

On our way to becoming a net zero company, we are accelerating green construction by joining the net zero pledge with science-based targets.

Walking the talk on our commitment, we are:

- ▶ Setting ourselves ambitious 2030 climate targets that are validated by the Science-Based Targets initiative (SBTi)
- ▶ Accelerating our reduction in CO₂ intensity to exceed 20% (compared to our 2018 baseline)
- ▶ Partnering with SBTi looking beyond 2030, to support the development of the first climate targets for a 1.5°C future in the cement sector





CHARCON CAN



No-one works harder to support you in transforming public spaces.

Within Charcon, we have the expertise and knowledge needed to provide the best solutions for our customers. Whether it's finding the right product to meet a design specification or producing a completely new product to meet a unique requirement. Our partnership approach aims to make the process of specifying, designing and sourcing landscaping products as easy as possible.

Day in day out you endeavour to devise the best ideas to transform public spaces. With a complete range of quality hard landscaping products and dedication to innovation, no-one is more committed than our team of experts who understand what our customers need to reliably support them in transforming public spaces.

Charcon has built a reputation on working harder than anyone else, to help your project become a reality. That's why only the very best technical expertise, product range, innovation, and after sales support comes built-in as standard.

So if anyone can help transform your public spaces, **CHARCON CAN.**



AGGREGATE INDUSTRIES WHAT WE DO



CONCRETE PRODUCTS

Bradstone Garden Landscaping

We provide products for a variety of projects, from paving and block paving to walling and edging. We also have an extensive range of materials available for different aesthetic requirements, including porcelain, concrete and natural stone.

Call: **01335 372222**

Email: bradstone.garden@aggregate.com

Bradstone Structural

The Bradstone walling and roofing range offers the authentic look and feel of highly aesthetic natural stone coupled up with high performance, long life and low maintenance qualities of modern materials.

Call: **01285 646900**

Email: building.products@aggregate.com

Lafarge Cement

We have a leading range of packed products including Premium Cement, Sulfate Resistant and Rapid Set Cement. Plus, we produce and supply bulk cement, including Portland Limestone and Sustainacem, our reduced embodied CO₂ cement.

Call: **01285 646900**

Email: packedcement@aggregate.com

Masterblock

Our Masterblock concrete blocks offer the industry complete solutions for both commercial and residential projects. Manufactured in a wide range of sizes, strengths and finishes offering total flexibility, the range is available nationwide.

Call: **01285 646900**

Email: building.products@aggregate.com

Aggregates

Our aggregates team supply an extensive range of high quality aggregates including crushed rock, specialist sand and gravel, stone and fill materials for various construction applications. Whether by road, rail, river or sea, through our network of quarries across the UK and Northern Europe, we can supply the most sustainable methods of delivering aggregate orders of any size.

Call: **01455 285200**

Email: aggregates@aggregate.com

Asphalt

We manufacture and supply British and European standardised asphalt including a range of asphalt mixes suitable for your road surfacing specifications and other applications. If you need small loads or collect service, our Express Asphalt business is designed to work around you.

Call: **0844 5578396**

Email: asphalt@aggregate.com

Ready-Mixed Concrete and Screed

We are one of the leading ready-mixed concrete and screed producers in Great Britain. We operate from over 70 sites and have local plants across Great Britain. Many of our sites operate an Aggregate Industries Minimix service, which provides small loads of quality assured concrete to locations with site access issues.

Call: **01283 7141187**

Email: concrete@aggregate.com

Contracting

Our Contracting team provides a range of construction solutions and related products for the highways and civil engineering sectors. Services include highway surfacing mobile material production and composite pavements.

Call: **01455 265 600**

Email: contracting@aggregate.com

Lytag

The only UK based manufacturer of environmentally friendly, PFA based lightweight aggregate. Suitable for use in precast concrete, concrete blocks, fill, screed and drainage applications.

Call: **01904 727922**

Email: sales@lytag.com



OUR LIFE PRODUCTS

The construction industry contributes a huge proportion of the UK's emissions each year. So, in line with government carbon neutral targets, we identified a range of sustainable products to help make the UK greener.

Introducing the Life range.

Each product is designed to make the future of construction more eco-friendly. Meeting the needs of environmentally conscious companies and falling under one of these six criteria:



Providing a minimum 20% reduction in Carbon Footprint



Responsibly sourced with a minimum of 20% recycled material



Water conscious materials using SuDs solutions



Products that use less resources to produce



Materials that use less energy to make



Sustainable tech and innovation using the circular economy.

For more information

Talk to our specification team about making greener choices with the Life range of products.

SUSTAINABILITY & CSR

Sustainability and Corporate Social Responsibility (CSR) is at the heart of our business, from our values to our vision, and it is one of our strategic pillars.

Our aim is to be a leading sustainable business, trusted and respected by our stakeholders for the ethics we adopt and the products and services we supply. We continue to collaborate and engage with our customers and our suppliers to build better relationships, develop innovative products and services enabling low carbon sustainable construction. To help achieve this, our people are at the forefront of the construction industry, transforming it for a more sustainable future.

Climate

At Aggregate Industries we'll continue our mission to cut our net CO₂ emissions of all products. With a strong portfolio of sustainable products and services, we will help our customers minimise CO₂ emissions released from buildings and infrastructure over the whole life-cycle. We are also the first materials supply company to be certified to PAS 2080, managing whole life carbon in infrastructure.

Circular Economy

In addition to considering the extraction, production and transportation impacts of our products, we also consider incorporating non-primary materials and the potential to recover, reuse and recycle products at the end of use. Also, all of the products within the Charcon range are fully recyclable.

Water and Nature

As water scarcity and flooding are increasingly important issues for society, our concern for responsible water use and management goes beyond our operational boundaries. We implement biodiversity management plans for all active extraction sites.

People and Commitments

Our people and the communities in which we operate are important to us. We are committed to being a responsible partner, effectively contributing to improving the quality of life of the members of our workforce, their families and the communities around our operations.



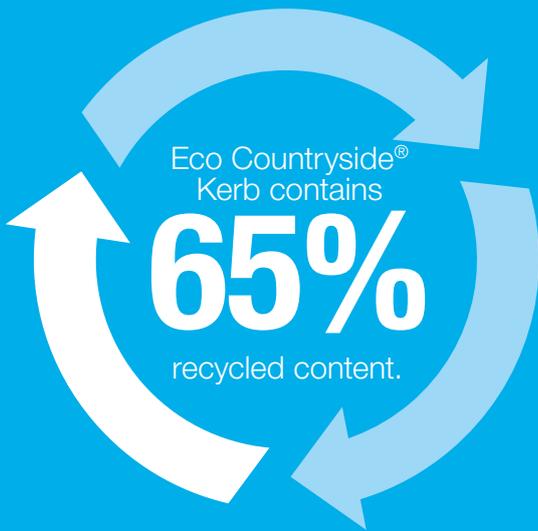
RECYCLED CONTENT

All **British Standard** products contain up to

23% recycled content.

This includes ✓ paving ✓ kerb ✓ edging

ALL CHARCON products contain recycled material*
(*excluding Natural Stone)

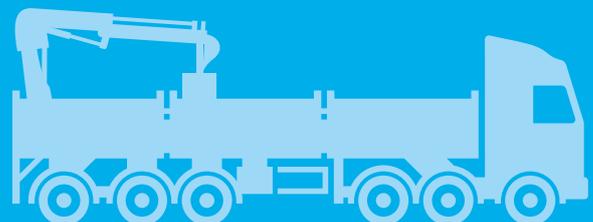


Andover Ground Black Fleck contains a massive

88% recycled content.

Our Ashington site manufactures products with the **HIGHEST** amount of recycled material.

We are constantly looking for ways to produce sustainable products and solutions.



RESPONSIBLE SOURCING & ETHICAL TRADING

As a major supplier of landscaping materials to the construction industry we understand the impact our products have on people, the environment and the economy. All that we build today creates a legacy for the future. Our materials will be part of the built environment for decades, if not centuries, to come. We offer a range of sustainable landscaping materials and systems as well as continually assessing our raw material consumption and manufacturing processes to reduce our environmental impact.

Responsible Source™

Aggregate Industries has been working for more than a decade to create sustainable solutions for our core markets. We have been addressing issues such as health and safety, quality, ethical trading, carbon and water management, biodiversity and social responsibility so that we can offer our customers truly sustainable solutions. This work has culminated in us becoming the first company in the world to be certified to BES 6001, Framework for the Responsible Sourcing of Construction Products, and by the Building Research Establishment (BRE). All Aggregate Industries' UK manufactured products have a certificated minimum rating of GOOD under the BES 6001 standard.



www.greenbooklive.com



OHS 61759



FM 96927



EMS 96928



Ethical trading

We also offer a wide range of CPD seminars, which are designed to help you improve and maintain your industry knowledge and skill base. Being part of the largest construction material company in the world, we have the breadth and diversity of products to find tailored solutions to suit most projects.

- ▶ Prohibition of child labour
- ▶ Provision of safe workplace
- ▶ Provision of all employment rights
- ▶ Prohibition of bonded or forced labour
- ▶ Paying wages that meet or exceed national legal requirements

Modern Slavery

Aggregate Industries is committed to doing business fairly and ethically. We support the aims of the Modern Slavery Act 2015 and we already have a number of policies, robust systems and procedures in place to help ensure we operate an open, honest and ethical business. By implementing our policies and working together with our suppliers, we aim to be the partner of choice for our customers and to operate our business ethically and responsibly.

HEALTH & SAFETY

Manual handling of the product should be avoided so far as is reasonably practical. Mechanical lifting devices should be considered with products over 20kg in weight. Where this is not possible, an assessment should be made, taking into account the load, environment, task, and the individual capability and training. Always employ good lifting techniques.

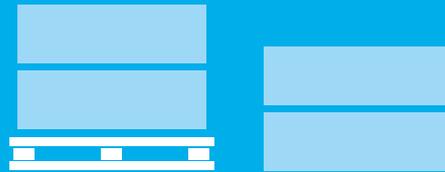
ALWAYS

wear gloves and safety footwear when handling the product.



ENSURE

the delivery location must have clear overhead space and stable level ground. Ideally pallets must not be stacked but if not possible then they must be stacked in accordance with their correct safe working load, contact us if you require more details.



ALWAYS

wear safety goggles, safety footwear, gloves, ear protection and appropriate respiratory protection when using cutting equipment.



ALWAYS

handle with care as breakage and chipping may result from mishandling.



DELIVERY REQUIREMENTS



Any local traffic restrictions must be pre-advised prior to delivery.



The product must be offloaded onto the floor next to the vehicle and there must be clear, visibility of this area at all times.



A minimum width of 3.5m is required for access.



There needs to be 3m clear space either side of the vehicle in order for the stabilising legs to be deployed.



The driver must ensure that it is safe to proceed onto site and deliver any product.

WE'RE COMMITTED TO THE SAFETY OF OUR STAFF

The MPA (Mineral Products Association) Lost Time Injury Frequency is 3.21 and we have managed to achieve 0.38, surpassing our safety objective of 2020!

LOST TIME INJURY FREQUENCY RATE 

Our Total Injury Frequency Rate was 1.7

 Down from 3.31 in 2019



TOTAL INJURY FREQUENCY RATE 

Our Lost Time Injury Frequency Rate was 0.38

 Down from 1.1 in 2019



LOST TIME INJURIES 

Our Lost Time Injuries was 4

 Down from 14 in 2019



ALL INJURIES TOTAL 

All injuries totalled 18

 Down from 36 in 2019



SPECIFICATION

The Concrete Products division of Aggregate Industries has a wealth of technical expertise and knowledge. Consisting of dedicated teams of multi-skilled individuals, covering all areas of knowledge on the specification and installation of hard landscaping materials. At Charcon we believe it is important to fully understand our customers' needs and requirements.



Specification Team

We want our customers to be able to engage with people who are like-minded and can genuinely add value to the specification process.

It is for this reason that the Charcon specification team consists of landscape architects who are on hand to provide project appraisals, assist with product selection and technical advice on the design and installation of our products.

BIM

With a portfolio of more than 200 BIM enabled products, Charcon has ensured that the products our customers use regularly are available to them in exactly the right format. BIM documentation for these products can be easily downloaded from the Aggregate Industries website (aggregate.com).

CPD Seminars/Toolbox Talks

We also offer a wide range of CPD seminars, which are designed to help you improve and maintain your industry knowledge and skill base and cover topics such as Sustainable Drainage Systems, Good and Bad Pavement Detailing and DDA Access and Mobility.

Major Projects Team

Our dedicated Major Projects Team help make sure that your scheme runs smoothly from inception to completion. By working with all stakeholders we make sure the best solutions are identified and you get the best value for money to help complete your design on time and within budget.

Technical Team

For many years the Charcon Technical teams have been working with architects, contractors, clients and local authorities, to support the design process, incorporating best practice for design and installation as detailed in BS 7533 to produce cost effective and highly aesthetic landscaping products.

Services offered by our Technical teams include:

- ▶ Product proposal pack
- ▶ Design advice
- ▶ CAD drawings
- ▶ Take-off schedules
- ▶ Installation advice
- ▶ Value engineered options
- ▶ SuDS advice
- ▶ Technical data sheets
- ▶ Sample service
- ▶ Bespoke products
- ▶ Bespoke colours and finishes
- ▶ Customer presentations

Product Proposals

Our Technical team also produces Product Proposals. These documents and their content are tailor-made for each individual project allowing the customer to see exactly the materials we are proposing and the technical information relating to it. These proposals are popular with architects, clients and contractors alike.

Information with the Product Proposals includes:

- ▶ Company overview
- ▶ Project information
- ▶ Design drawings
- ▶ Costing estimates
- ▶ Product data sheets
- ▶ Case studies
- ▶ Environmental policies
- ▶ Health & Safety policies
- ▶ Other Aggregate Industries services

Take-off and Standard Detailing

Using AutoCAD and other electronic design tools, Charcon can produce detailed design drawings showing laying patterns, edge restraints, section designs and quantities required. All design and installation work is done in accordance with the relevant British Standard and Interpave documentation.

Bespoke Product Design

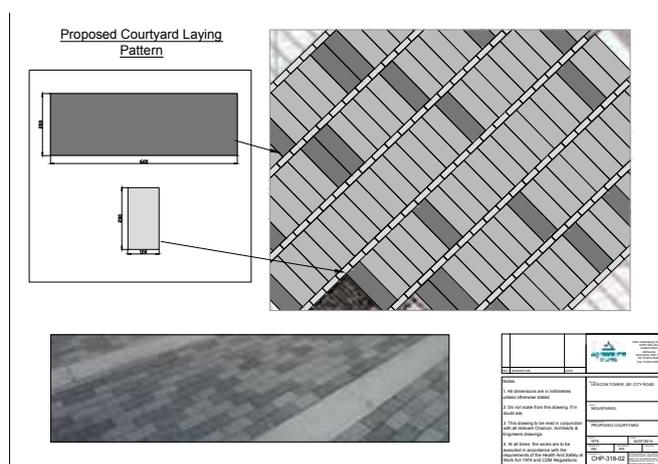
Charcon has a long history of being a manufacturer that customers can come to when they want to do something new and innovative. The Technical team sits at the heart of this process carrying out the design work while coordinating with other internal functions such as production, sales, marketing and factory management to deliver the customer's vision.

Bespoke items produced include:

- ▶ Cycle segregation units
- ▶ Planters
- ▶ Step units
- ▶ Etched flags
- ▶ Drainage units

Sample Service

On larger scale projects, we can offer full size site sample panels along with scale models laid to design and standard sample boards to illustrate the final product appearance once installed. Anything over 20kg is a two man lift. Good manual handling practices should be adhered to at all times.



MEMBERSHIPS & ASSOCIATIONS

We're proud to be a member of a wide range of associations, which covers everything from material sourcing, products and ensuring the effective restoration of our sites.

These include the Construction Products Association (CPA) and the Mineral Products Association (MPA), as well as more product specific bodies like the Concrete Block Association (CBA) and Interpave, which represents the UK's leading manufacturers of precast concrete paving and kerbs.

As part of Aggregate Industries, we sit on the Leadership Advisory Committee.

A MEMBER OF ASSOCIATIONS 30			WE ARE ACCREDITED MEMBERS OF 10 ASSOCIATIONS
WE ARE ON 9 COMMITTEE BOARDS	WE ARE ON 5 ASSOCIATION BOARDS	WE FUND 3 ASSOCIATIONS	WE PARTNER WITH 4 ASSOCIATIONS





The Wildlife Trusts

We now have nine extraction sites certified to The Wildlife Trusts' Biodiversity Benchmark, with Ripon Quarry recently handed over to the Yorkshire Wildlife Trust in 2020.

We will increase the number of sites certified and continue to work with partners on landscape scale projects across the country. In this year's report we are highlighting the on-going work being done at our Blackhill Quarry as part of a project to extend lowland heathland habitats in Devon.

Our positive contribution to ecosystems is measured and monitored using a Biodiversity Indicator Reporting System (BIRS) developed by Holcim. The BIRS methodology requires annual surveys of site habitats and generates a numerical biodiversity score per site. Over time we expect each site's score to increase as restoration takes place to create an enhanced landscape.

The implementation of this new system is in the early phase. In 2017, we hosted a Holcim training event for people from around the world to develop an understanding of the requirements and what could be achieved. Delegates were taken to Holme Park (Cumbria) and Back Lane (Lancashire) to see how biodiversity is managed in hard rock quarry operations and to Newbold (Staffordshire) for progressive restoration in a sand and gravel quarry.



CONCRETE PAVING

Our range of concrete paving offers a choice of distinctive colours, textures, and sizes for all the built environment. Stylish and functional, our versatile range allows you to create durable, aesthetically appealing designs.

The Charcon range of paving is manufactured in accordance with the requirements of BS EN 1338 and 1339, ensuring the materials, properties, and test methods for precast concrete paving flags and complementary fittings complying with the current European and British Standards.



- 22-23** STONEMASTER®
- 24-25** ANDOVER TEXTURED
- 26-27** ANDOVER GROUND
- 28-29** ANDOVER REINFORCED
- 30-31** VIANOVA
- 32-33** MOORDALE® TEXTURED
- 34-35** MOORDALE® GROUND
- 36-37** ELITE DETERRENT
- 38-39** WOBURN ORIGINAL
- 40-41** WOBURN RUMBLED
- 42-43** COUNTRYSETTS
- 44-45** EUROPA
- 46-47** LAFARGE PACKED RANGE
- 48-49** CASE STUDY

STONEMASTER®



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV
*Certain sizes



STEP



Life



SURFACE PROTECTION

UP TO 21%
RECYCLED CONTENT



For details, see page 158



StoneMaster® in Sandy Buff, Sienna Buff and Amber Buff,
Kingsbury Road, London Borough of Brent



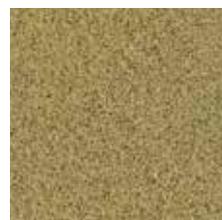
Light Grey



Medium Grey



Dark Grey



Sandy Buff



Amber Buff



Sienna Buff

STONEMASTER®

PRODUCT DATA

Size (mm)	800x200*	600x450*	600x200*	450x450*	300x450*	300x300*
Thickness (mm)	80	80	80	80	80	80
Weight (kg)	28.80	51.00	21.00	38.00	25.00	16.50
Units/m ²	6.25	3.7	8.33	4.94	7.41	11.11
Units/Pack	32	20	36	40	40	54
M ² /Pack	5.12	5.40	4.32	8.10	5.40	4.86
Weight Pack (T)	0.95	1.04	0.76	1.55	1.04	0.89
Shades	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil	Pencil

Size (mm)	300x200*	300x100*	200x200*	200x100*	100x100*
Thickness (mm)	80	80	80	80	80
Weight (kg)	11.00	5.50	7.30	3.80	1.70
Units/m ²	16.67	33.33	25	50	100
Units/Pack	108	216	160	320	560
M ² /Pack	6.48	6.48	6.40	6.40	5.60
Weight Pack (T)	1.18	1.18	1.17	1.16	1.00
Shades	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff	Light Grey, Medium Grey, Dark Grey, Sandy Buff, Amber Buff, Sienna Buff
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Light Wash
Slip Skid	BS EN 1339: USRV >40
Installed To	BS 7533-4

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Light Wash
Slip Skid	BS EN 1339: USRV >40
Installed To	BS 7533-3



StoneMaster® in Light Grey and Dark Grey, North West Cambridge

-  29.5 kgCO₂e/m²
-  Up to 21% Recycled content. For more details, see page 158
-  Permeable option available, see page 58 Infiltra range
-  Manufactured in the UK with locally sourced materials
-  Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ANDOVER TEXTURED



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



STEP



BIM
ENABLED



Life



SURFACE
PROTECTION

PRODUCT DATA

Size (mm)	600x600	450x450*	450x450	400x400	300x300*	300x200
Thickness (mm)	50	70	50	65	80	80
Weight (kg)	44.00	38.70	23.50	25.00	16.50	11.00
Units/m ²	2.78	4.94	4.94	6.25	11.11	16.67
Units/Pack	28	36	40	48	54	108
M ² /Pack	10.08	7.29	8.10	7.68	5.86	6.48
Weight Pack (T)	1.23	1.39	0.94	1.00	0.89	1.18
Shades	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil	Pencil

Size (mm)	300x100*	200x200*	200x100	100x100*	Mixed Size Pack*	600x200
Thickness (mm)	80	80	80	80	80	80
Weight (kg)	5.50	7.30	3.80	1.70	n/a	21.00
Units/m ²	33.33	25.00	50.00	100.00	n/a	8.33
Units/Pack	216	160	320	560	112	36
M ² /Pack	6.48	6.40	6.40	5.60	5.12	4.32
Weight Pack (T)	1.18	1.17	1.16	1.00	0.95	0.76
Shades	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr*, Ch*, Wh*, Oa*, PG*, HP*, TP*
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil	Pencil

Mixed Pack Contents:
500x100 = 24 400x100 = 32
300x100 = 24 500x150 = 8
400x150 = 16 300x150 = 8

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags	Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Textured	Surface Finish	Textured
Slip Skid	BS EN 1339: USRV > 40	Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-4	Installed To	BS 7533-3



31.5 kgCO₂e/m²



Up to 21% Recycled content. For more details, see page 158



Permeable option available, see page 60 Infiltra range



Manufactured in the UK with locally sourced materials



Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ANDOVER TEXTURED



Andover Textured in Dark Grey, Tottenham Hotspur Football Stadium



White (Wh) Silver Fleck (SF) Light Grey (LG) Graphite Grey (GG) Tuscan Porphyry (TP) Pink Granite (PG)



Dark Grey (DG) Oak (Oa) Heather Porphyry (HP) Cream (Cr) Chestnut (Ch)

ANDOVER GROUND

**UP TO 88%
RECYCLED CONTENT**
For details, see page 158



Andover Ground in Leamoor, Grey and Charcoal, Westgate Stevenage



Leamoor



Black Fleck



Grey



Charcoal

ANDOVER GROUND



SCAN ME
FIND OUT MORE
INFO ONLINE



FLAG PRODUCT DATA

Size (mm)	600x600	600x450*	450x450*	450x450*	400x400	400x400
Thickness (mm)	50	63	70	70	65	65
Weight (kg)	44.00	38.90	38.70	38.70	25.00	25.00
Units/m ²	2.78	3.70	4.94	4.94	6.25	6.25
Units/Pack	20	16	30	30	32	32
M ² /Pack	7.20	4.32	6.08	6.08	5.12	5.12
Weight Pack (T)	0.88	0.63	1.16	1.16	0.80	0.80
Shades	Black Fleck, Leemoor, Charcoal*, Grey	Black Fleck, Leemoor, Charcoal, Grey	Black Fleck, Leemoor, Charcoal, Grey	Black Fleck, Leemoor, Charcoal, Grey	Black Fleck, Leemoor, Charcoal*, Grey	Black Fleck, Leemoor, Charcoal*, Grey
Edge Detail	Square	Chamfered	Chamfered	Square	Chamfered	Square



Andover Ground in Leemoor, Grey and Charcoal, Westgate Stevenage

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Ground
Slip Skid	BS EN 1339: USRV > 40
Installed To	BS 7533-4

- 14.70 kgCO₂e/m²
- Up to 88%** Recycled content. For more details, see page 158
- Manufactured in the UK with locally sourced materials
- A** Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ANDOVER REINFORCED

UP TO 75%
RECYCLED CONTENT



For details, see page 158



Andover Reinforced in Witherford, Forest Hill London



Witherford
(steel reinforced ground)



Silver Grey
(steel reinforced textured)



Dark Grey
(steel reinforced textured)



Standard Grey
(fibre reinforced pimple)

ANDOVER REINFORCED



SCAN ME
FIND OUT MORE
INFO ONLINE



FLAG PRODUCT DATA

Size (mm)	750x600*	600x600*	600x450*	750x600*	600x600*	600x450*
Thickness (mm)	63	63	63	63	63	63
Weight (kg)	65.50	51.90	38.90	65.90	53.50	40.00
Units/m ²	2.22	2.78	3.70	2.22	2.77	3.70
Units/Pack	14	14	15	17	17	17
M ² /Pack	6.30	5.05	4.05	7.66	6.14	4.60
Weight Pack (T)	0.92	0.73	0.58	1.12	0.91	0.68
Shades	Silver Grey, Dark Grey, Witherford	Silver Grey	Silver Grey, Dark Grey	Standard Grey	Standard Grey	Standard Grey
Edge Detail	Square	Square	Square	Square	Square	Square
Reinforcement	Steel	Steel	Steel	Fibre	Fibre	Fibre
Finish	Textured/ Ground	Textured	Textured	Pimple	Pimple	Pimple



Andover Reinforced in Silver Grey, with Hearing loop and disabled markers in Dark Grey, Nottingham tram

MATERIAL DATA

Manufacturing	BS EN 1339: Precast Concrete Flags
Surface Finish	Textured, Ground, Pimple
Slip Skid	BS EN 1339: USRV >40
Installed To	BS 7533-4

- 11.70 kgCO₂e/m²
- Up to 75%** Recycled content. For more details, see page 158
- Manufactured in the UK with locally sourced materials
- A** Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO2 figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

VIANOVA



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



PRODUCT DATA

Size (mm)	600x200*	400x200*	200x200*	200x100*
Thickness (mm)	80	80	80	80
Weight (kg)	21.00	14.00	7.00	3.60
Units/m ²	8.33	12.50	25.00	50.00
Units/Pack	80	120	240	480
M ² /Pack	9.60	9.60	9.60	9.60
Weight Pack (T)	1.73	1.73	1.73	1.73
Shades	Light Grey, Dark Grey, Anthracite Charcoal			
Edge Detail	Square	Square	Square	Square



Vianova in Light Grey and Anthracite Grey, Victoria Gate, Leeds

MATERIAL DATA

Manufacturing Standard	BS EN1339: Precast Concrete Flags	Manufacturing Standard	BS EN1338: Precast Concrete Blocks
Surface Finish	Ground	Surface Finish	Ground
Slip Skid	BS EN 1339: USRV > 40	Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-4	Installed To	BS 7533-3

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.



Product contains recycled content.
For more details, see page 158

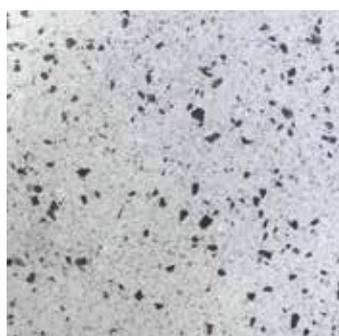


Potential Green Guide Rating

VIANOVA



Vianova in Light Grey and Dark Grey, Victoria Gate, Leeds



Light Grey

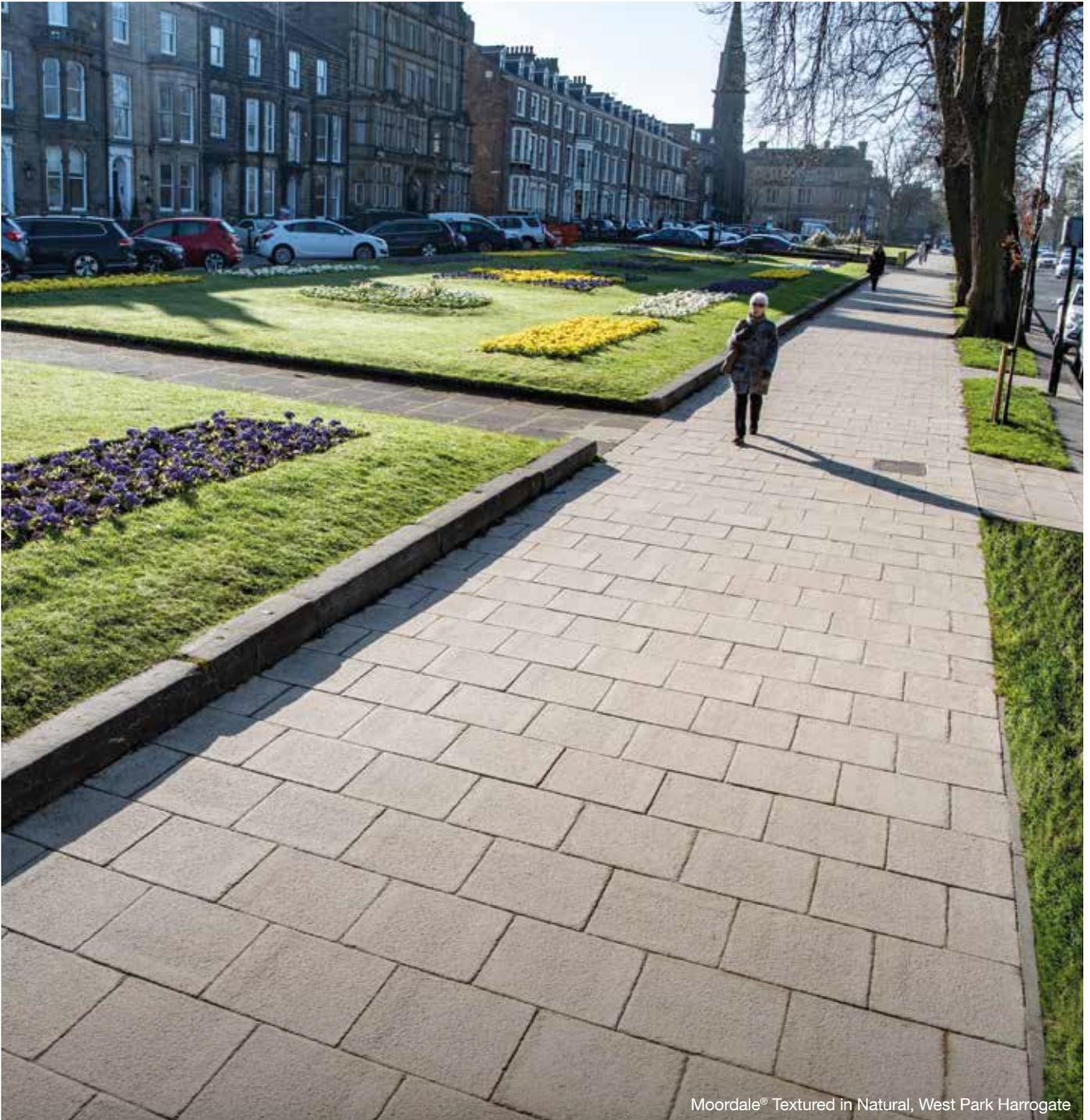


Dark Grey



Anthracite Grey

MOORDALE® TEXTURED



Moordale® Textured in Natural, West Park Harrogate



Academy Grey



Natural



Buff

MOORDALE[®] TEXTURED



SCAN ME
FIND OUT MORE
INFO ONLINE



FLAG PRODUCT DATA

Size (mm)	450x450*	450x450*	400x400*	600x450*	600x600*
Thickness (mm)	70	50	50	63	50
Weight (kg)	33.10	23.10	18.90	40.00	41.70
Units/m ²	4.94	4.94	6.25	3.70	2.78
Units/Pack	26	36	36	16	18
M ² /Pack	5.26	7.29	5.76	4.32	6.47
Weight Pack (T)	0.86	0.86	0.68	0.62	0.75
Shades	Natural, Buff, Academy Grey				
Edge Detail	Square	Square	Square	Square	Square
Surface Finish	Textured	Textured	Textured	Textured	Textured



Moordale[®] Textured in Academy Grey, Loxford School, London

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Textured
Slip Skid	BS EN 1339: USRV > 40
Installed To	BS 7533-4

- 10.60 kgCO₂e/m²
- Product contains recycled content. For more details, see page 158
- Manufactured in the UK with locally sourced materials
- A** Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

Colour swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

MOORDALE® GROUND



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV
*Certain sizes



STEP



FLAG PRODUCT DATA

Size (mm)	600x600*	600x450	450x450*	450x450	400x400*	400x400*	400x400*
Thickness (mm)	50	63	70	50	65	65	50
Weight (kg)	44.00	40.00	34.30	24.00	25.00	25.00	19.00
Units/m ²	2.78	3.70	4.94	4.94	6.25	6.25	6.25
Units/Pack	20	16	30	40	32	32	40
M ² /Pack	7.19	4.32	6.08	8.10	5.12	5.12	6.40
Weight Pack (T)	0.88	0.62	0.96	0.96	0.80	0.80	0.76
Shades	Natural, Buff	Natural, Buff*	Natural, Buff				
Edge Detail	Square	Square	Chamfered	Square	Square	Chamfered	Square
Surface Finish	Ground	Ground	Ground	Ground	Ground	Ground	Ground



Moordale® Ground in Buff, Leeds

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Ground
Slip Skid	BS EN 1339: USRV > 40
Installed To	BS 7533-4



11.70 kgCO₂e/m²



Up to 67% Recycled content. For more details, see page 158



Manufactured in the UK with locally sourced materials



Potential Green Guide Rating

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MOORDALE[®] GROUND



**UP TO 67%
RECYCLED CONTENT**

For details, see page 158



Moordale[®] Ground in Natural, Greenwich Square. Image supplied by Architects: Outerspace



Buff



Natural

ELITE DETERRENT



Elite Format 3

ELITE DETERRENT



SCAN ME
FIND OUT MORE
INFO ONLINE



Hazard
Deterrent

PRODUCT DATA

Size (mm)	298x80*	600x600*
Thickness (mm)	90-132	74
Weight (kg)	5.80	48.80
Units/m ²	42.00	2.77
Units/Pack	140	12
M ² /Pack	3.33	4.32
Weight Pack (T)	0.81	0.55
Shades	Grey	White
Surface Finish	Format 2	Format 3



Format 2 - Grey



Format 3 - White



Elite Format 3



Elite Format 2

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Cast Format 3
Slip Skid	N/A
Installed To	BS 7533-4

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast Format 2
Slip Skid	N/A
Installed To	BS 7533-3

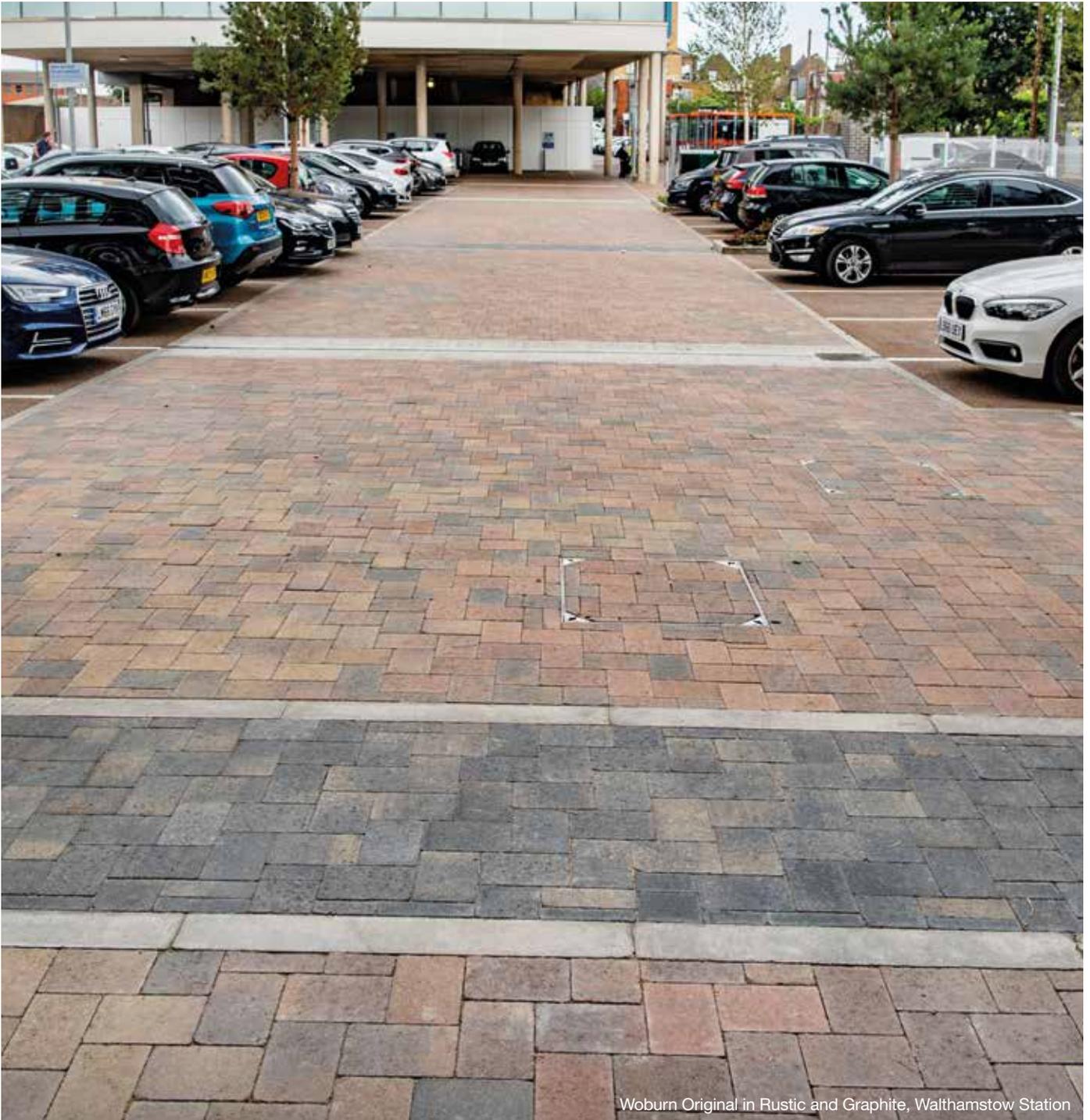
Format 2: 27.70kgCO₂e/m² Format 3: 12.80 kgCO₂e/m²

Product contains recycled content.
For more details, see page 158

Manufactured in the UK with locally sourced materials

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WOBURN ORIGINAL



Woburn Original in Rustic and Graphite, Walthamstow Station



Rustic



Graphite

WOBURN ORIGINAL



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic
Car & Light Vehicle Traffic
Lorry & HGV Traffic
*Certain sizes

BLOCK PRODUCT DATA

Size (mm)	200x134	200x134	134x134	134x134	100x134	100x134
Thickness (mm)	80	60	80	60	80	60
Weight (kg)	5.00	3.70	3.30	2.40	2.40	1.80
Units/m ²	37.20	37.20	55.70	55.70	74.70	74.70
Units/Pack	240	312	360	468	480	624
M ² /Pack	6.46	8.43	6.40	8.35	6.43	8.32
Weight Pack (T)	1.19	1.14	1.17	1.14	1.17	1.14
Shades	Rustic, Graphite					
Edge Detail	Square	Square	Square	Square	Square	Square
Surface Finish	Cast	Cast	Cast	Cast	Cast	Cast



Woburn Original in Rustic

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3

- 16.50 kgCO₂e/m²
- Product contains recycled content. For more details, see page 158
- Manufactured in the UK with locally sourced materials
- Potential Green Guide Rating **A+**

Colour swatches are for indication purposes only, for a true representation of product colours, samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

WOBURN RUMBLED



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



BLOCK PRODUCT DATA

Size (mm)	200x134	200x134	134x134	134x134	100x134	100x134
Thickness (mm)	80	60	80	60	80	60
Weight (kg)	5.00	3.70	3.30	2.40	2.40	1.80
Units/m ²	37.20	37.20	55.70	55.70	74.70	74.70
Units/Pack	240	312	360	468	480	624
M ² /Pack	6.46	8.43	6.40	8.35	6.43	8.32
Weight Pack (T)	1.19	1.14	1.17	1.14	1.17	1.14
Shades	Autumn, Rustic, Graphite					
Edge Detail	Square	Square	Square	Square	Square	Square
Surface Finish	Rumbled	Rumbled	Rumbled	Rumbled	Rumbled	Rumbled



Woburn Rumbled in Rustic, Derby Marina

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast/Rumbled
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3



16.60 kgCO₂e/m²



Product contains recycled content.
For more details, see page 158



Permeable option available, see page 62 Infiltra range



Manufactured in the UK with locally sourced materials



Potential Green Guide Rating

Colour swatches are for indication purposes only, for a true representation of product colours, samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

WOBURN RUMBLED



Autumn



Rustic



Graphite

COUNTRYSETTS NEW PRODUCT

**UP TO 86%
RECYCLED CONTENT**



For details, see page 158



Countrysetts in Silver Grey with Woburn Original in Graphite and Eco Countryside® Kerb



Silver Grey



Dark Grey

COUNTRYSETTS NEW PRODUCT



SCAN ME
FIND OUT MORE
INFO ONLINE



BLOCK PRODUCT DATA

Size (mm)	220x100*	100x100*	290x63*
Thickness (mm)	102	102	102
Weight (kg)	5.10	2.30	4.00
Units/m ²	40.60	88.20	49.90
Units/Pack	192	384	216
M ² /Pack	4.73	4.35	4.26
Weight Pack (T)	1.00	0.89	0.86
Shades	Silver Grey, Dark Grey	Silver Grey, Dark Grey	Silver Grey, Dark Grey
Edge Detail	Straight Edge	Straight Edge	Straight Edge
Surface Finish	Cropped/Rumbled	Cropped/Rumbled	Cropped/Rumbled



Countrysetts in Dark Grey, River Walk

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Flags
Surface Finish	Cropped/Rumbled
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3

- 38.30 kgCO₂e/m²
- Up to 86%** Recycled content. For more details, see page 158
- Manufactured in the UK with locally sourced materials
- B** Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

EUROPA



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



BLOCK PRODUCT DATA

Size (mm)	200x100	200x100	200x100*	200x100 (ML)*
Thickness (mm)	80	60	60	80
Weight (kg)	3.70	2.80	2.80	3.70
Units/m ²	50.00	50.00	50.00	50.00
Units/Pack	308	404	404	369
M ² /Pack	6.16	8.08	8.08	7.38
Weight Pack (T)	1.13	1.12	1.13	1.13
Shades	Autumn, Brindle, Buff, Charcoal, Grey, Red, Painted White*, Painted Black*, Painted Yellow*	Autumn, Brindle, Buff, Charcoal, Grey, Red	Autumn, Brindle, Buff, Charcoal, Grey, Red	Autumn, Brindle, Buff, Charcoal, Grey, Red
Edge Detail	Chamfered	Chamfered	Pencil	Chamfered



Europa in Charcoal

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3



19.80 kgCO₂e/m²



Product contains recycled content.
For more details, see page 158



Permeable option available, see page 64 Infiltra range



Manufactured in the UK with locally sourced materials



Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application. (ML) Indicates Machine Lay option, 90° herringbone pattern.

EUROPA



Europa in Brindle, Temple Green Park and Ride, Leeds



Grey



Buff



Charcoal



Red



Brindle



Autumn



Painted White



Painted Yellow



Painted Black

EVERYTHING YOU NEED IN ONE PLACE

We offer the complete range of Lafarge packed products to make the job easier for you. Manufactured to the highest quality, the Lafarge range offers both paper and plastic options, with reliability offered as standard.

Kiln Dried Sand

Kiln dried sand is a ready-to-use clean, fine, dry sand for brushing into joints of paving to help prevent movement while still allowing drainage. Available in 25kg plastic bags.

Features

- ▶ EW80 Kiln dried sand ranges in size from 0.50 to 0.063mm
- ▶ Water absorption rate of 0.1%
- ▶ Fine dried silica sand designed around the American Foundry Society number 80 (AFS 80)

Why use Kiln Dried Sand?

Primarily used to fill the joints of block paving and paving slabs to help keep the structure of the paving rigid and ensure effective drainage. This stops the paving or slabs moving and becoming loose.



Kiln dried sand



LAFARGE PACKED CEMENT



General Purpose Cement

General Purpose 32,5R Portland limestone cement can be used for traditional nominal mixes for all general above ground applications, including mortars, renders, screeds and DIY applications.

Available in 25kg paper bags.



General Purpose+ Cement

Lafarge General Purpose + Cement is a quality-assured BS EN 197-1 CEM II cement and carries the CE mark. It is produced using sustainable cement technology.

Available in water and tear resistant 25kg plastic packaging for durability



High Performance Concrete

Lafarge High Performance Concrete is a factory produced 40N High Performance Concrete consisting of dried sands, cement and other additives, ideal for applications that require a higher strength.

Available in water and tear resistant 20kg plastic packaging for durability



Sulfate Resistant

Portland-fly ash cement with a high sulfate resistance* and a moderate heat of hydration conforming to BS EN 197-1 CEM II/B-V 42,5N. For use in below ground or where enhanced durability is required, including concrete and mortars.

Available in 25kg paper bags



Premium Cement

Lafarge Premium Cement is a higher strength 42,5N cement for excellent performance. Ideal for applications including concreting, bricklaying, floor screeding and rendering.

Available in 25kg paper bags.



Super White Cement

High early, bright white and 28 day 52,5R strength cement. Ideal for cast stone, architectural precast concrete, paving slabs, street furniture and terrazzo flooring.

Available in 25kg paper bags.



Rapid Set Cement

A quality BS EN 197-1 cement ideal for applications that require a fast setting, low shrinkage cement for screeds and renders.

Available in 25kg paper bags.



Hydrated Lime

A high calcium, non hydraulic, hydrated lime that lightens and brightens mortar, improves the workability, cohesiveness and water retention or Portland cement mortars and renders.

Available in 25kg paper bags.



High Strength Cement

Lafarge High Strength cement is a quality BS EN 197-1 CEM I 52,5N Portland cement ideal for reliable strength and performance. Ideal for precast concrete, civil and groundwork applications including mortar, piling, concreting, renders, grouting, screeds and precast.

Available in 25kg paper bags.



Concrete Mix

Premixed ready to use application composed of a blend of cement and aggregates. Ideal for small concrete jobs, paths, steps, patios, slabs and shed bases.

Available in 20kg plastic packaging.



Mortar Mix

Premixed ready to use mortar composed of a selected blend of cement, lime and aggregates for laying all types of brick and block.

Available in 25kg plastic packaging.

*Can be classified as CEM II/B-V+SR when used in accordance with BS 8500 and BRE SD1

CASE STUDY

THE UNIVERSITY OF SHEFFIELD

Established in 1897, University College of Sheffield, later to become The University of Sheffield, was one of the original nine civic universities founded in the major industrial cities of England during the 19th century and today, is in the top 100 universities in the world. Due to its global reputation for teaching and research, it is a popular educational destination for international students, with more than 7,000 of its 29,000 student population coming from over 150 different countries.

THE BACKGROUND

This demand has driven the need for a new, more multicultural and cohesive student union building surrounded by a well-conceived and enjoyable public space. This will connect the new student union to the heart of the university campus on Western Bank, which includes some of the most historic and recognisable buildings within the campus. The brief was to use a contemporary materials palette that nodded to the past but also connected to the future.

THE CHALLENGE

The challenge was to create a modern and sustainable design that enhanced the human experience using materials that complement the historic aesthetics of the site.

Portuguese granite is used heavily in many streetscapes in this part of Sheffield, in the form of kerbs and detailing. Therefore, the architects HLM, wanted to incorporate Portuguese yellow granite as an accent feature and required a concrete product that had high sustainability values to enhance the credentials of the scheme in accordance with Sheffield City Council's 'Grey to Green' Strategy.

THE SOLUTION

Charcon's Andover Textured 200x300/200x200 x80mm in Silver Grey, Graphite Grey and Dark Grey was chosen due to high aesthetic qualities and its recycled content, of which both the recycled and virgin materials are UK sourced materials. This was combined with the bands of Portuguese yellow granite setts to connect the new space to existing local vernacular of granite kerbs and concrete paving.

To ensure the final product met everyone's expectations Charcon worked in coordination with the architects and the contractor, providing advice on installation and detailing. This materials palette would also form the basis of a newly adopted strategy for all future university developments within the heart of the main campus and its surrounding buildings.

Clinton Young, Specification Manager within Aggregate Industries' Concrete Products Division, comments: *"Through our early and in-depth involvement in the design phase, we were able to help HLM deliver a specification for a well-conceived and cohesive open space. The success of this project highlighted Charcon to be a great project partner from design to completion."*

For further information, visit www.charcon.com
For technical support, please call **01335 372 216**
or email charcon.technical@aggregate.com





NATURAL STONE

Charcon is one of the UK's leading suppliers of natural stone products. Calling on the expertise of our experienced team, we offer our clients complete reliability in sourcing, processing and supplying a wide variety of natural stones in a wide variety of types and finishes.

We adhere to strict ethical trading and internationally recognised corporate and social responsibility standards. We support the ethical working principles of the **Ethical Trading Initiative (ETI)** and adhere to the ethical trading section of the United Nations Global Compact.

All of our natural stone products meet or exceed the relevant BS EN standards. We employ the services of a number of external quality assurance providers to ensure that we maintain a rigorous quality control of all of our natural stone materials. With natural stone reserves across the world and stock locations in the UK for reliable delivery, we enjoy established relationships with our suppliers to meet the needs of demanding project schedules.



52-53 YORKSTONE
54-55 PORPHYRY

YORKSTONE



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV
*Certain sizes



STEP



FLAG PRODUCT DATA

Nominal Size (mm)	300 x Random Length*	450 x Random Length*	600 x Random Length*
Nominal Thickness (mm)	50, 63, 75	50, 63, 75	50, 63, 75
Shade	Lowmoor, Abbeymoor	Lowmoor, Abbeymoor	Lowmoor, Abbeymoor
Finishes	Sand Blasted, Diamond Sawn	Sand Blasted, Diamond Sawn	Sand Blasted, Diamond Sawn

SETTS PRODUCT DATA

Nominal Size (mm)	100x100*	100x200*	100 x Random Length*
Nominal Thickness (mm)	50, 75, 100	50, 63 or 75	50, 63 or 75
Shade	Lowmoor, Abbeymoor	Lowmoor, Abbeymoor	Lowmoor, Abbeymoor
Finishes	Sand Blasted, Diamond Sawn	Sand Blasted, Diamond Sawn	Sand Blasted, Diamond Sawn

Typical sizes shown above, other sizes and thicknesses available on a made to order basis to suit application and anticipated trafficking. Please call the Technical team for information.



Abbeymoor Yorkstone, Shrewsbury

MATERIAL DATA

Manufacturing Standard	BS EN 1341/1342/1343
Surface Finish	Sand Blasted, Diamond Sawn, Tumbled
Slip Skid	USRV >40
Installed To	BS 7533 Part 4 - Flags, Part 6 - Kerbs, Part 7 - Setts

Colour swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Typical sizes shown above, dependent on trafficking, other sizes and thicknesses available to order. DS - Diamond Sawn / TU - Tumbled / SB - Sand Blasted.
*MTO



Manufactured in the UK with locally sourced materials

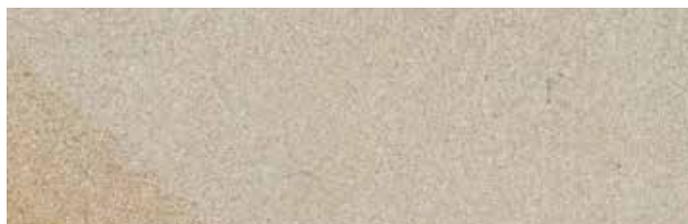


Potential Green Guide Rating

YORKSTONE



Lowmoor Yorkstone, Worcester



Lowmoor



Abbeymoor



Lowmoor



Lowmoor



Abbeymoor

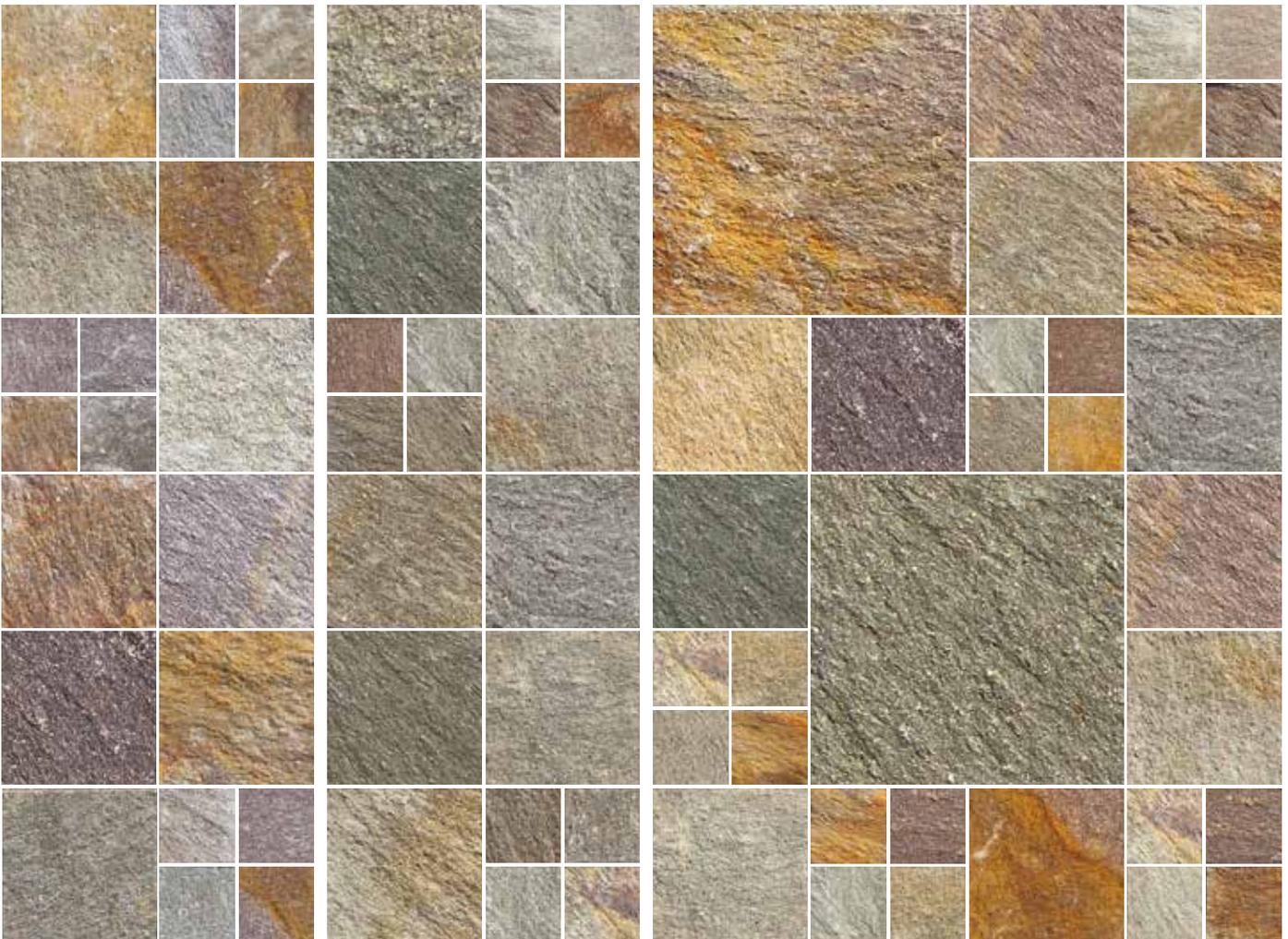


Abbeymoor

PORPHYRY



Porphyry paving in Full Mix, Greengate Square, Salford



Brown Mix

Grey Mix

Full Mix

PORPHYRY



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INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



FLAG PRODUCT DATA

Nominal Size (mm)	300 x Random Length*	450 x Random Length*	600 x Random Length*
Nominal Thickness (mm)	60, 80, 100, 150	50, 63, 70	50, 63, 70
Shade	Brown Mix, Grey Mix, Full Mix	Brown Mix, Grey Mix, Full Mix	Brown Mix, Grey Mix, Full Mix
Finishes	Natural Split top and bottom, Split sides	Natural Split top and bottom, Split sides	Natural Split top and bottom, Split sides

Typical sizes shown above, other sizes and thicknesses available on a made to order basis to suit application and anticipated trafficking. Sawn sides available in some sizes.

SETTS PRODUCT DATA

Nominal Size (mm)	50x50*	80x80*	100x100*	150 x Random Length*
Nominal Thickness (mm)	50, 60	80, 100	80, 100	80, 100, 150
Shade	Brown Mix, Grey Mix, Full Mix	Brown Mix, Grey Mix, Full Mix	Brown Mix, Grey Mix, Full Mix	Brown Mix, Grey Mix, Full Mix
Finishes	Split and Cropped	Split and Cropped	Split and Cropped	Split and Cropped

Typical sizes shown above, other sizes and thicknesses available on a made to order basis to suit application and anticipated trafficking. sizes.



Porphyry paving in Full Mix, Ashton Market, Tameside

MATERIAL DATA

Manufacturing Standard	BS EN 1341/1342/1343
Surface Finish	Split and Cropped
Slip Skid	USRV >40
Installed To	BS 7533 Part 4 - Flags, Part 6 - Kerbs, Part 7 - Setts

E Potential Green Guide Rating

Colour swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Typical sizes shown above, dependent on trafficking, other sizes and thicknesses available to order. Sawn sides available in some sizes. *Due to the nature of Porphyry, supplied thicknesses will vary over a range from the nominal - please see the data sheet for further information.

SUSTAINABLE DRAINAGE SYSTEMS

Sustainable Drainage Systems aim to solve the potential issue that excessive rainfall may cause, including flooding from drains, groundwater and the run-off from land and watercourses.

Ever-changing weather systems, increasing urbanisation and rapid run-off have put a tremendous strain on conventional water drainage systems. This has resulted in sewers and culverts becoming overloaded, causing floods and contaminating natural waterways.

Sustainable Drainage Systems (SuDS) provide an alternative approach to traditional drainage systems. They mitigate many of the adverse impacts of storm water run-off on the environment in terms of both volume and pollutants.



- 58-59** STONEMASTER® INFILTA
- 60-61** ANDOVER TEXTURED INFILTA
- 62-63** WOBURN RUMBLED INFILTA
- 64-65** EUROPA INFILTA
- 66-67** GRASSGRID
- 69** SUPERFLOW® AGGREGATES
- 70** ARMOURSTONE
- 71** BASALTON
- 72** BETOWALL
- 73** BETOMAT

STONEMASTER® INFILTA



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INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



SuDS
Solutions



BIM
ENABLED

Life

SURFACE
PROTECTION



StoneMaster® Infilta in Amber and Sandy Buff



Sandy Buff



Amber Buff



Sienna Buff

STONEMASTER® INFILTA

PRODUCT DATA

Size (mm)	600x300*	450x300*	300x300*	200x200*
Thickness (mm)	80	80	80	80
Weight (kg)	34.00	25.00	16.50	7.30
Units/m ²	5.50	7.41	11.11	25.00
Units/Pack	20	40	54	160
M ² /Pack	3.60	5.40	4.86	6.40
Weight Pack (T)	0.68	1.00	0.89	1.17
Shades	SB, SaB, AB	SB, SaB, AB	SB, SaB, AB	SB, SaB, AB
Edge Detail	Pencil	Pencil	Pencil	Pencil



StoneMaster® Infilta in Amber and Sandy Buff

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags	Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Light Wash	Surface Finish	Light Wash
Slip Skid	BS EN 1339: USRV > 40	Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-4	Installed To	BS 7533-3

 22.10 kgCO₂e/m²

 Product contains recycled content. For more details, see page 158

 This is the permeable product option

 Manufactured in the UK with locally sourced materials

 A+ Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ANDOVER TEXTURED INFILTA



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INFO ONLINE



PRODUCT DATA

Size (mm)	600x300*	450x300*	300x300*	200x200*	200x170*
Thickness (mm)	80	80	80	80	80
Weight (kg)	34.00	25.00	16.50	7.30	5.80
Units/m ²	5.50	7.41	11.11	25.00	29.41
Units/Pack	20	40	54	160	200
M ² /Pack	3.60	5.40	4.86	6.40	2.94
Weight Pack (T)	0.68	1.00	0.89	1.17	1.16
Shades	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil

Size (mm)	200x134*	200x100	134x134*	100x134*	100x100*
Thickness (mm)	80	80	80	80	80
Weight (kg)	4.80	3.30	3.20	2.40	1.70
Units/m ²	37.00	50.00	55.00	74.63	100.00
Units/Pack	240	320	360	420	560
M ² /Pack	6.46	6.46	6.46	7.46	5.60
Weight Pack (T)	1.14	1.16	1.14	1.01	1.00
Shades	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG*, GG*, DG, SF, Cr*, Ch*, Wh, Oa*, PG*, HP*, TP*	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP	LG, GG, DG, SF, Cr, Ch, Wh, Oa, PG, HP, TP
Edge Detail	Pencil	Pencil	Pencil	Pencil	Pencil

Please note that Infilta blocks in sizes - 200x134, 134x134, 100x134 (80mm) are designed to be laid together only and ARE NOT suitable to be laid with other sizes indicated in the table.

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags	Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Textured	Surface Finish	Textured
Slip Skid	BS EN 1339: USRV > 40	Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-4	Installed To	BS 7533-3

- 22.70 kgCO₂e/m²
- Up to 21% Recycled content. For more details, see page 158
- This is the permeable product option
- Manufactured in the UK with locally sourced materials
- Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ANDOVER TEXTURED INFILTA



Andover Infilta in Graphite Grey and Light Grey, Temple Farm, London



White (Wh)

Silver Fleck (SF)

Light Grey (LG)

Graphite Grey (GG)

Pink Granite (PG)

Porphyry (HP)



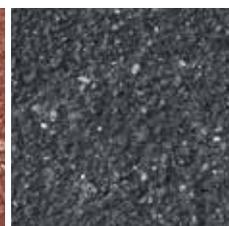
Cream (Cr)



Chestnut (Che)



Tuscan Porphyry (TP)



Dark Grey (DG)



Oak (Oa)

WOBURN RUMBLED INFILTA



Woburn Rumbled Infilta in Graphite and Autumn, Wolverhampton University



Autumn



Rustic



Graphite



Painted White

WOBURN RUMBLED INFILTA



PRODUCT DATA

Size (mm)	200x134	200x134	134x134	134x134	100x134	100x134
Thickness (mm)	80	60	80	60	80	60
Weight (kg)	4.80	3.50	3.30	2.40	2.40	1.80
Units/m ²	37.00	37.00	55.70	55.70	74.70	74.70
Units/Pack	240	312	360	468	480	624
M ² /Pack	6.40	8.43	6.40	8.35	6.43	8.32
Weight Pack (T)	1.14	1.14	1.14	1.14	1.14	1.14
Shades	Graphite, Rustic, Autumn, Painted White*					
Edge Detail	Square	Square	Square	Square	Square	Square
Surface Finish	Rumbled	Rumbled	Rumbled	Rumbled	Rumbled	Rumbled

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Rumbled
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3

	16.60 kgCO ₂ e/m ²
	Product contains recycled content. For more details, see page 158
	This is the permeable product option
	Manufactured in the UK with locally sourced materials
	A Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

EUROPA INFILTA



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PRODUCT DATA

Size (mm)	200x100	200x100
Thickness (mm)	80	60
Weight (kg)	3.70	2.80
Units/m ²	6.16	8.08
Units/Pack	308	404
M ² /Pack	6.46	8.43
Weight Pack (T)	1.13	1.13
Shades	Autumn, Brindle, Buff*, Charcoal, Grey, Red*, Painted White*, Painted Black*, Painted Yellow*	Autumn, Brindle, Buff*, Charcoal, Grey, Red*
Edge Detail	Chamfered	Chamfered



Europa Infilta in Grey, Sybil Andrews Academy, Bury St Edmunds

MATERIAL DATA

Manufacturing Standard	BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast
Slip Skid	BS EN 1338: USRV > 40
Installed To	BS 7533-3

- 19.80 kgCO₂e/m²
- Product contains recycled content. For more details, see page 158
- This is the permeable product option
- Manufactured in the UK with locally sourced materials
- Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

EUROPA INFILTA



Europa Infilta in Grey with Andover Textured in Anthracite Charcoal, Barking Riverside



Grey



Buff



Charcoal



Red



Brindle



Autumn



Painted White



Painted Yellow



Painted Black

*Swatches shown are for colour purpose only

GRASSGRID

**UP TO 26%
RECYCLED CONTENT**
For details, see page 158



Grassgrid, Nantwich

GRASSGRID



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Grassgrid is a semi dry pressed unit manufactured generally in accordance with BS EN 1338. The dimensions of the unit are 366x274x100mm and is suitable for trafficked applications such as HGV applications, emergency vehicle access, maintenance vehicles and overspill car park.

Using a suitably engineered sub base design based on the relevant section of BS 7533, Grassgrid has been proven over many years in a variety of heavy applications such as major trunk road laybys.

PRODUCT DATA

Size (mm)	366x274
Thickness (mm)	100
Weight (kg)	19.80
Units/m ²	10.00
Units/Pack	48
M2/Pack	4.80
Weight Pack (T)	0.76
Shades	Grey



Grassgrid

MATERIAL DATA

Manufacturing Standard	Generally in accordance with BS EN 1338: Precast Concrete Blocks
Surface Finish	Cast
Slip Skid	BS EN 1339: USRV >40
Installed To	Follow Installation Guide found on page 134-135

	31.70 kgCO ₂ e/m ²
	Up to 26% Recycled content. For more details, see page 158
	Manufactured in the UK with locally sourced materials
	Potential Green Guide Rating

Grassgrid is a stocked item. This paving comes banded to a pallet. Colour swatches are for indication purposes only, for a true representation of product colours, samples can be ordered from www.aggregate.com. CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.



SUPERFLOW[®] AGGREGATES



The SuperFlow product range is Aggregate Industries' line of high performance aggregates specifically designed to provide controlled water management within Sustainable Drainage Systems (SuDS).

- ▶ **Super Sustainability:** Working with the environment to help prevent flooding and water pollution
- ▶ **Super Production:** Expert production techniques ensures the highest levels of quality and consistency are achieved
- ▶ **Super Performance:** Carefully graded crushed rock offering lasting stability and optimal water management
- ▶ **Super Support:** Dedicated technical and specification teams to assist with any SuDS design criteria



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PRODUCTS

SUPERFLOW 6

Aggregate Type: 2/6.3mm crushed angular rock
Application: Laying course aggregate
Drainage Solution: Infilta Block Paving

SUPERFLOW 20

Aggregate Type: 4/20mm crushed angular rock
Application: Upper sub-base reservoir layer
Drainage Solution: Hand laid Drinasphalt, Infilta Block Paving & Hydromedia[®]

SUPERFLOW 63

Aggregate Type: Coarse crushed angular rock
Application: Lower sub-base reservoir/capping layer
Drainage Solution: Infilta Block Paving

SUPERFLOW SUDSAGG

Aggregate Type: 0/40mm crushed rock
Application: Sub-base reservoir layer
Drainage Solution: SuperDrinasphalt & Hydromedia[®] Concrete

SUPERFLOW JOINTAGG

Aggregate Type: Crushed rock
Application: Jointing grit
Drainage Solution: Infilta Block Paving



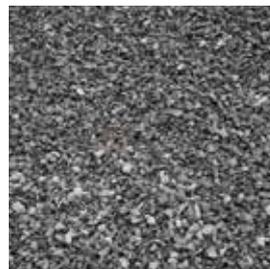
Superflow 6



Superflow 20



Superflow 63



SuperFlow SuDSAgg



SuperFlow JointAgg

FOR MORE INFORMATION

E: suds@aggregate.com

W: www.aggregate.com/suds



ARMOURSTONE



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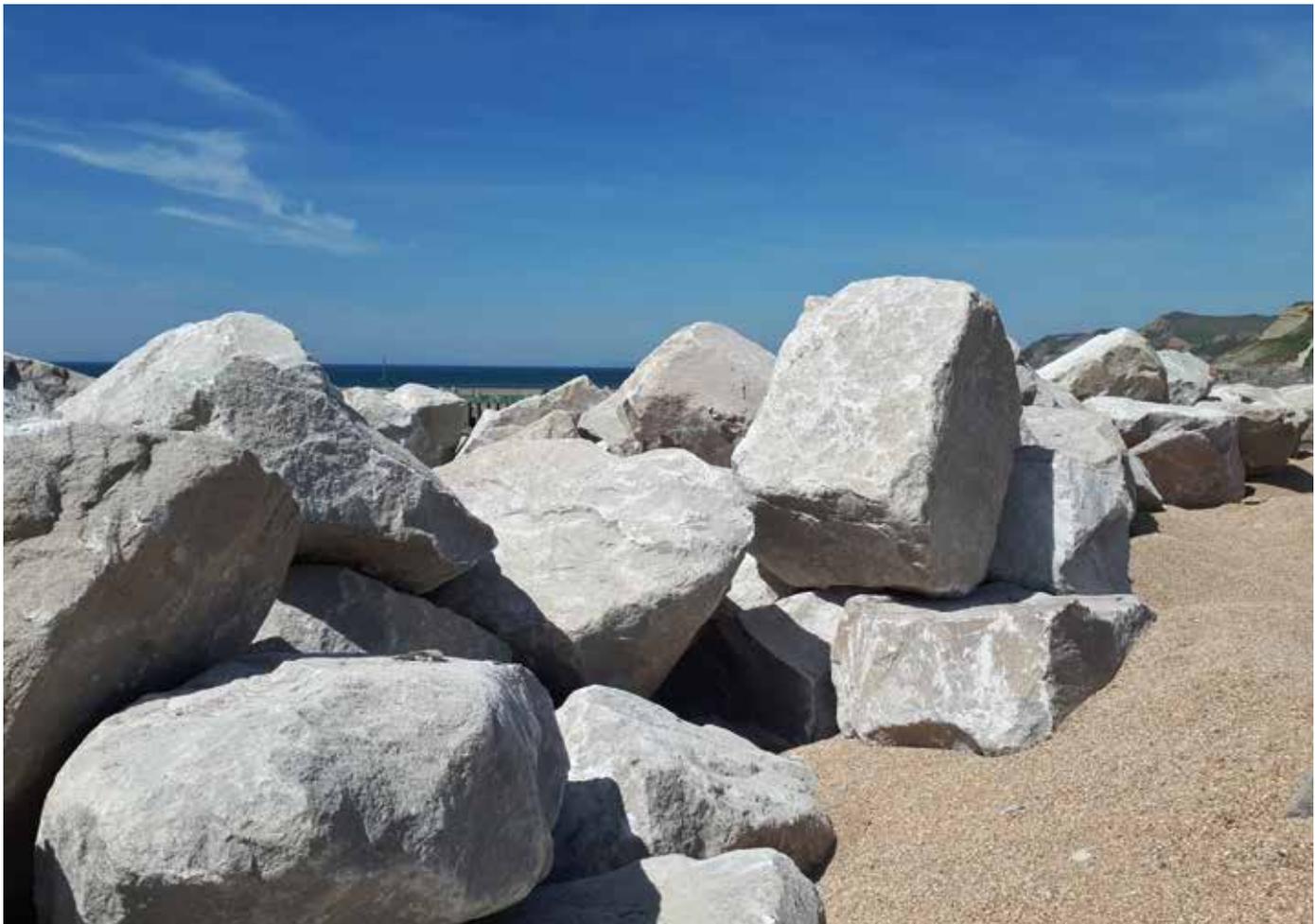
Armourstone is natural quarry stone, chosen for its durability and resistance to wear and erosion. For offshore subsea engineering, coastal defence and flood protection applications the sizes range from 45mm to 10+ tonne rock.

Our full range of Armourstone rock products meet current industry standard specifications. We are able to offer supply from various sources supported by specialist logistic services that enable us to deliver Armourstone by sea, road or rail direct to your project.

The various source quarries offer different rock pigmentation due to their composition and petrography should colour match to an existing Armourstone structure be required.

PRODUCT DATA

Coarse Grading (mm)				
45-125	63 - 180	90 - 250	45 - 180	90 - 180
Light Grading (kg)				
5 - 40	10 - 60	40 - 200	60 - 300	15 - 300
Heavy Grading (mm)				
300 - 1000	1000 - 3000	3000 - 6000	6000 - 10,000	10,000 - 15,000



MATERIAL DATA

Specification	BS EN-13383:1 - 2002
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For more information, contact the Armour stone team:

TELEPHONE 01291 318630

EMAIL aieu-armourstone-enquiries@aggregate.com

TECHNICAL INFORMATION: charcon.technical@aggregate.com

BASALTON

Basalton is the concrete version of natural stone basalt and is used for the protection of dykes, coastlines and embankments. The modern Basalton revetment was developed based on the basalt columns at the famous “Giant’s Causeway” in Ireland, which have been protecting the coastline against waves and currents for millions of years. The Basalton concept consists of individual concrete columns that are joined together in layers to form a strong revetment. Basalton is a proven product for coastal and inland revetments for over 40 years in The Netherlands and beyond.

Basalton concrete columns provide stability and increase the integrity of foundations and it is one of the world’s best-selling revetment stones. They are a high-quality replacement for protection against erosion from strong currents and wave activity. Basalton is also used in road construction and can be applied vertically for decorative purposes.

PRODUCT DATA

Product	Height (cm)	Dimensions (cm)	kg/m ²	kg/set	m ² /set
Basalton Quattroblock	20	108.5 x 108.5 cm	405	478	1.18
	25	108.5 x 108.5 cm	505	596	1.18
	30	108.5 x 108.5 cm	605	714	1.18
	35	108.5 x 108.5 cm	705	832	1.18
	40	108.5 x 108.5 cm	805	950	1.18
	45	108.5 x 108.5 cm	905	1068	1.18
	50	108.5 x 108.5 cm	1005	1186	1.18
	55	108.5 x 108.5 cm	1105	1304	1.18
Basalton Standard	15	120 x 110 cm	305	397	1.3
	20	120 x 110 cm	405	527	1.3
	25	120 x 110 cm	505	657	1.3
	30	120 x 110 cm	605	787	1.3
	35	120 x 110 cm	705	917	1.3
	40	120 x 110 cm	805	1047	1.3
	45	120 x 110 cm	905	1177	1.3
	50	120 x 110 cm	1005	1307	1.3
Basalton Regulars	15	110 x 110 cm	310	375	1.21
	20	110 x 110 cm	410	496	1.21
	25	110 x 110 cm	510	617	1.21
	30	110 x 110 cm	610	738	1.21
	35	110 x 110 cm	710	859	1.21
	40	110 x 110 cm	810	980	1.21
	45	110 x 110 cm	910	1101	1.21
	50	110 x 110 cm	1010	1222	1.21
Basalton Slab	25	120 x 108 cm	510	663	1.3
Basalton Infra	15	120 x 110 cm	292	380	1.3



Basalton Quattroblock



Basalton Standard



Basalton Regulars



Basalton Slab



Basalton Infra

For more information, contact:

TELEPHONE 01291 318630

EMAIL aieu-armourstone-enquiries@aggregate.com

TECHNICAL INFORMATION: charcon.technical@aggregate.com

BETOWALL

Betowall utilises the products from Holcim to create façade elements for the protection and decoration of quays and building walls in cities and towns. Betowall gives a protective and decorative finish along quays refreshing any canal, marina or river wall.

The Basalton prefabricated wall, gives the characteristic Basalton 'look', and is ideal for use as a promenade wall along rivers.

TYPICAL BETOWALL APPLICATIONS

- ▶ Buildings
- ▶ Quays
- ▶ Marinas
- ▶ Facades
- ▶ Gardens
- ▶ Waterfront
- ▶ Slope protection
- ▶ Acoustic screens

Betowall products are delivered ready to use and easy to install onsite.



BETOWALL BASALTON

The Basalton wall is applied vertically creating a stable construction with the appearance of a brick basalt wall or ordinary bricks. The wall elements must be placed vertically on a H-shaped steel beam.



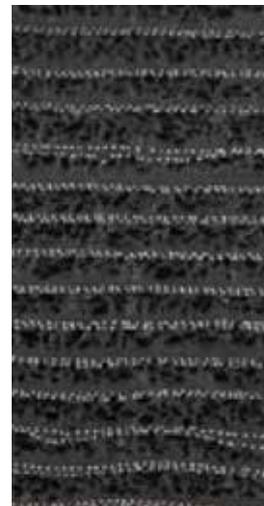
BETOWALL NATURAL STONE

For historical settings, it can be essential to use natural stone materials. Also these elements can be prefabricated by our experts.



BETOWALL CONCRETE PRINT

Create the look you like, from traditional to ultra-modern. We are able to tailor your needs.



BETOWALL LUCEM

Let your concrete work for you. Enlighten your concrete. LUCEM Wall elements with LINE, STARLIGHT and PURE panels are able to create an unique ambiance.



BETOWALL BIO ACTIVE

Green cities are more livable by improving water retention as well as acoustic insulation. But it also makes it possible to fight against urban heat islands, to develop biodiversity, to filter out hydrocarbon dust. A full turnkey concept, including the structural wall, the vegetable pervious support and the vegetation.



For more information, contact the Armour stone team:

TELEPHONE 01291 318630

EMAIL aieu-armourstone-enquiries@aggregate.com

TECHNICAL INFORMATION: charcon.technical@aggregate.com

BETOMAT

REINFORCEMENT OF NATURAL BANKS

Holcim offers Betomat, a precast articulated concrete block mat, as a defence solution to the erosion of embankments and bottoms of waterways, due to high winds, waves or currents. Ultimately, the open Betomats can blend in completely with the natural environment. Betomats come in various sizes and weights of interlocking concrete block mats with versatile application possibilities. They can be installed both above and below water to strengthen and protect banks, while increasing the integrity and stability of the construction.

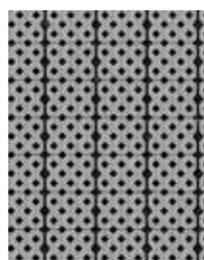
The application of the Betomat in engineering projects makes it possible for construction teams to easily install secure bank defences quickly. The Betomat can be laid underwater and extended without disturbing the upper embankment. The geotextile, which is inseparably linked to the concrete blocks, prevents the soil from washing out. Thanks to its flexibility, Betomat can even compensate for minor subsidence of the soil.

TYPICAL BETOMAT APPLICATIONS

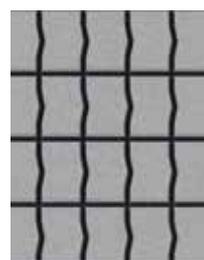
- ▶ Buildings
- ▶ Quays
- ▶ Marinas
- ▶ Facades
- ▶ Gardens
- ▶ Waterfront
- ▶ Slope protection
- ▶ Acoustic screens

PRODUCT DATA

Product	Tile Thickness (cm)	Tile Length (cm)	Tile Width (cm)	Weight (kg/m ³)	Open Surface (%)
Betomat Porous	7	44	33	approx. 115	25
	9	44	33	approx. 150	25
	11	44	33	approx. 180	25
Betomat Solid	9	30	40	approx. 180	5
	10	25	40	approx. 215	5
	15	40	60	approx. 310	5
Betomat Heavy Duty	17	60	50	approx. 300	9
	23	60	50	approx. 400	9
	30	60	50	approx. 500	9
Betomat Basalton	15	30	29	approx. 300	9
Betomat Offshore	30	59	33	approx. 475	5



Betomat Porous



Betomat Solid



Betomat Heavy Duty



Betomat Basalton



Betomat Offshore

For more information, contact:

TELEPHONE 01291 318630

EMAIL aieu-armourstone-enquiries@aggregate.com

TECHNICAL INFORMATION: charcon.technical@aggregate.com

SURFACE WATER DRAINAGE

We have a broad range of linear drainage products that can minimise the impact of surface water run-off and flooding in hard landscaped areas. Our product ranges can be used in a variety of settings including city and urban areas, car parks and landscaped areas, as well as heavier duty applications such as industrial sites.

76-77 H₂O LINEAR DRAINAGE
78-79 CLEARWAY
80-81 SAFETICURB®
82-83 HIGHWAY
84-85 MINI HIGHWAY
86-87 SuDS



H₂O LINEAR DRAINAGE



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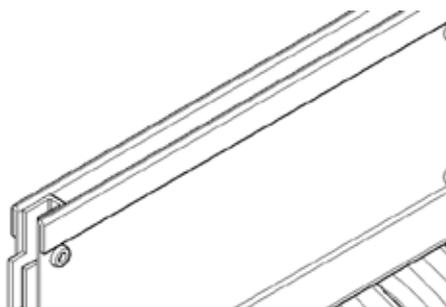


Pedestrian Traffic Car & Light Vehicle Traffic Lorry & HGV *Certain sizes

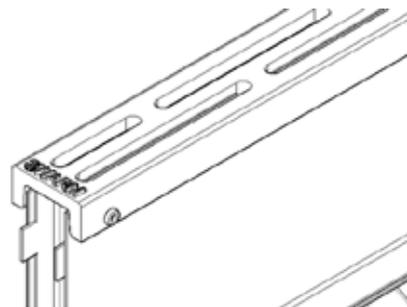
PRODUCT DATA

Type	Paving	F900kN
Class	D (400kN)	F (900kN)
Length (mm)	2000	2000
Width (overall mm)	112 - 680	112 - 680
Depth (overall mm)	232 - 800	282 - 850
Nominal bore (mm)	100 - 600	100 - 600
Weight (approx. kg)	14 - 46	24 - 56
Intake area (mm ²)	8500	14490

Design calculations available, ask the Charcon Technical team for information



H₂O Linear Drainage for paving is supplied with a discrete galvanised steel top



H₂O Linear Drainage F900kN is supplied with a ductile iron top



MATERIAL DATA

Manufacturing Standard	BS EN 1433: Drainage channels for vehicular and pedestrian areas
Surface Finish	Galvanised Steel / Ductile Iron

Pipe: 99% recycled content. Ductile Iron: 75% recycled content. For more details, see page 158

Manufactured in the UK with recycled materials

H₂O Linear Drainage F900kN is supplied with a ductile iron top which can be used in concrete, asphalt and paving surface finishes. H₂O Linear Drainage for paving is a discrete, D400kN rated system with a drainage aperture designed to be recessed and hidden when used in high-end paving finishes. Accessories - Combined boxes provide access and outlets for the drainage system. End caps and range of standard fittings are available.

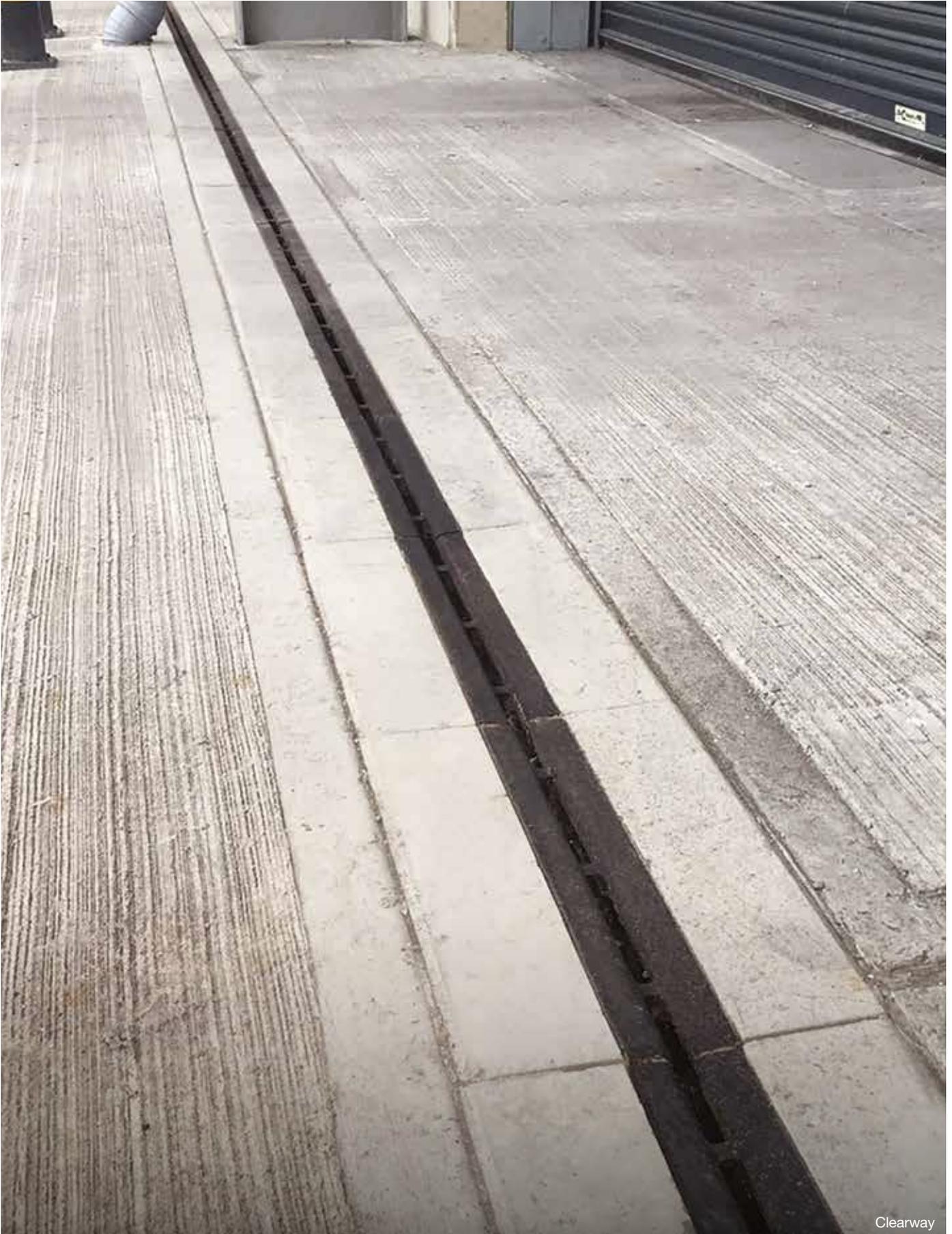
H₂O LINEAR DRAINAGE



99% RECYCLED CONTENT IN PIPE
75% RECYCLED CONTENT IN DUCTILE IRON
For details, see page 158



CLEARWAY



Clearway

CLEARWAY



SCAN ME
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INFO ONLINE



PRODUCT DATA

Unit Type	Slot Unit	Super Heavy Duty Grid
Length (mm)	400	400
Width (overall) (mm)	324	324
Depth (overall) (mm)	257	257
Weight approx (kg)	53	48
Class (up to)	F (900kN)	F (900kN)
Shade	Grey	Grey
Surface Finish	Cast	Cast

MATERIAL DATA

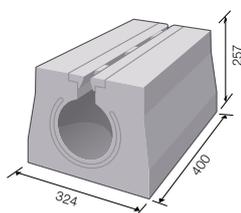
Manufacturing Standard	BS EN 1433
Surface Finish	As Cast
Slip Skid	USRV > 40
Installed To	Installed to manufacturers details which can be found on page 142-143

TRAFFICKING SELECTOR (BS EN 1433 STANDARD CLASSIFICATION)

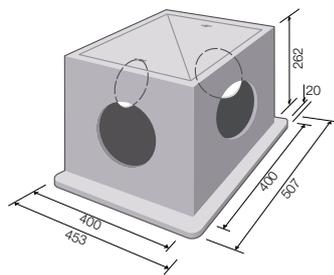
Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN	Unit Weight (kg)
Main units							
Slot/150	•	•	•	•	•	•	53
Super heavy duty/150 ductile iron	•	•	•	•	•	•	48
Accessories							
Silt box top	•	•	•	•	•	•	148
Silt box top with grate	•	•	•	•			148
Inspection unit super heavy duty/150	•	•	•	•	•	•	48

• indicates suitability

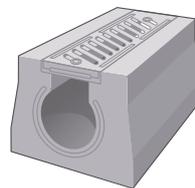
CLEARWAY UNITS



Clearway Slot



Silt Box Top (ductile iron). 01195 Supplied with solid top (D400 Grate available to order)



Clearway Heavy/Super Heavy



Grey

Key to unit abbreviations:

BS EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

Class D (400kN): Public highways and general parking areas.

(Note: Grid systems should not be used for fast moving traffic.)

Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.



Figures available on request



Product contains recycled content.
For more details, see page 158



Manufactured in the UK with locally sourced materials

Available from stock and supplied in pallet packs.
CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

SAFETICURB®



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



PRODUCT DATA

Unit Type	Standard (DBA)	Heavy Duty (DBM)	Standard (DBG-DI)	Standard (DBK)
Length (mm)	914	914	914	914
Width (overall) (mm)	263-254	263-254	263-254	250
Depth (overall) (mm)	250	250	250	350
Nominal Bore	125	125	125	125
Weight approx (kg)	102	106	107	129
Class (up to)	C (250kN)	F (900kN)	C (250kN)	D (400kN)
Slot Drain aperture width	15	15	15	15
Grid width	-	-	124	-
Shade	Grey	Grey	Grey	Grey
Surface Finish	Cast/Textured	Cast/Textured	Cast/Textured	Cast/Textured

Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN	Unit weight (kg)
Main units							
DBA/125	•	•	•				102
DBM/125	•	•	•	•	•	•	106
DBG/DI/125	•	•	•	•			107
DBK HB2/125	•	•	•	•			129
Accessories							
Type A silt box top	•	•	•				115
Type H silt box top	•	•	•	•	•	•	148
Inspection unit DBG/DI/125	•	•	•	•			107
Inspection unit kerb HB2/125	•	•	•	•			129
Manhole cover kerb HB2/125	•	•	•	•			175
Transition kerb HB2/125	•	•	•	•			109

• indicates suitability

Key to unit abbreviations:

HB half batter, DI ductile iron

BS EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

Class D (400kN): Public highways and general parking areas.

(Note: Grid systems should not be used for fast moving traffic.)

Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.



Figures available on request



Product contains recycled content.
For more details, see page 158



Manufactured in the UK with locally sourced materials

Inlet options - Slot drain aperture width 15mm, Grid aperture width 15mm, Ductile iron grid width 143mm.
Accessories - Silt top boxes with chequered grating (Class D), Super heavy duty silt box type H (Class F) - weight 96kg solid, 84kg grated lid. Supply of complete silt boxes only (either with a solid lid or grating) - separate supply of boxes, lids and gratings is prohibited in line with BS EN 1433.

CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

SAFETICURB®



Safeticurb®, Derby

MATERIAL DATA

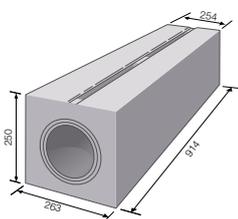
Manufacturing Standard	BS EN 1433
Surface Finish	As Cast / Textured
Slip Skid	USRV > 40
Installed To	Aggregate Industries recommendations



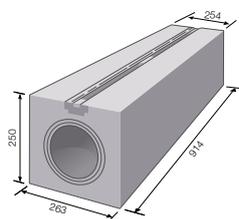
Grey Cast



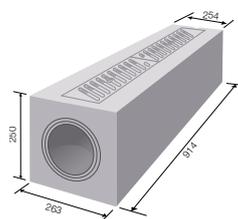
Grey Textured



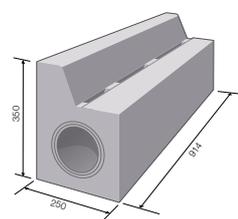
Safeticurb® slot unit DBA (125mm bore).



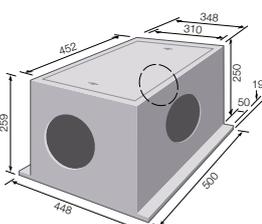
Safeticurb® slot unit with ductile iron insert DBM (125mm bore).



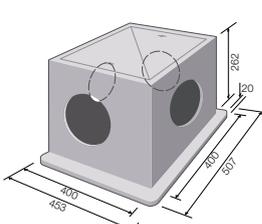
Safeticurb® grid unit DBG/DI (125mm bore).



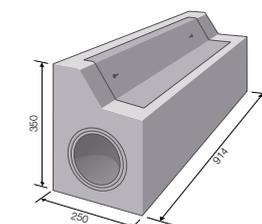
Safeticurb® kerb profile unit (illustrated) DBK HB2 (125mm bore).



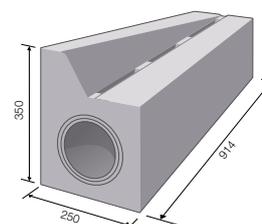
Silt box top type A (ductile iron) 00978. For use with DBA, DBM and DI. Supplied with solid top (grating available to order 01128).



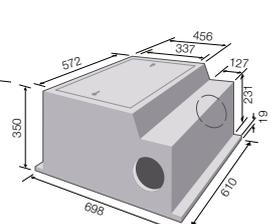
Silt box type H (ductile iron) 01195. For use with DBM. Supplied with solid top (D400 grate available to order 00980).



HB2 Inspection Unit - for use with DBK.



Transition unit HB2 LH (RH.) For use with DBK HB2 to DBA, DBM and DBG.



Manhole cover HB2 (ductile iron) 01095.

HIGHWAY



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PRODUCT DATA

Unit Type	Base unit	Top Unit
Length (mm)	400	400
Width (overall) (mm)	460	460
Depth (overall) (mm)	369	245
Weight approx (kg)	84	67
Shade	Grey	Grey
Surface Finish	Cast	Cast

MATERIAL DATA

Manufacturing Standard	BS EN 1433
Surface Finish	As Cast
Slip Skid to Top Unit	USRV > 40
Installed To	Installed to manufacturers details which can be found on page 138-139

TRAFFICKING SELECTOR (BS EN 1433 STANDARD CLASSIFICATION)

Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN
Main units						
Base / HB Top Complete	•	•	•	•		
Base / SP Top Complete	•	•	•	•		
Silt Box Top - Splay	•	•	•	•		
Silt Box Top - Half Batter	•	•	•	•		
Base / Channel D Grating Complete	•	•	•	•		
Base / Channel E Grating Complete	•	•	•	•	•	
Channel E Inspection Grating	•	•	•	•	•	

• indicates suitability



Grey

Key to unit abbreviations:

SP splayed, HB half batter, BS EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

Class D (400kN): Public highways and general parking areas.

(Note: Grid systems should not be used for fast moving traffic.)

Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.

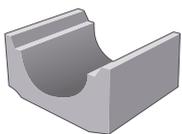
-  Figures available on request
-  Product contains recycled content. For more details, see page 158
-  Manufactured in the UK with locally sourced materials

Available from stock and supplied in pallet packs.
Channel dimensions 300x300mm (approx.) Inlet dimensions 65x150mm ellipse (approx.).
Radius units available: 25/11, 10/8 and 7/6m External and Internal Radius on a made to order basis.
CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

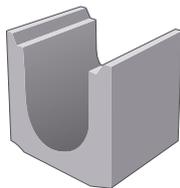
HIGHWAY



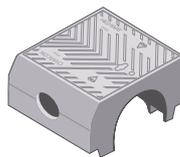
Highway



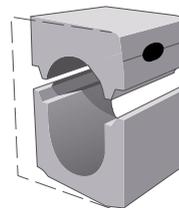
Highway Shallow Base Unit.



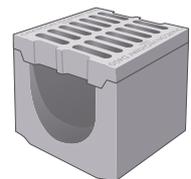
Highway Deep Base Unit (for extra capacity).



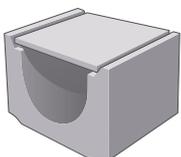
Highway Silt Box Top and Cover 01460 (ductile iron).



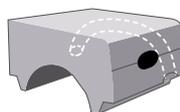
Highway External Radius Unit
Also available: Internal Radius (dotted).



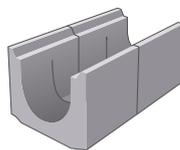
Highway Base Unit with Ductile Iron Grid 01604 (class D400 & E600).



Highway Crossing Base Unit (with galvanised steel plate).



Highway Cable Duct Unit.



Highway Outlet Onits (two units form outlet).

MINI HIGHWAY



Mini Highway

MINI HIGHWAY



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PRODUCT DATA

Unit Type	Base unit	Top Unit
Length (mm)	500	500
Width (overall) (mm)	250	250
Depth (overall) (mm)	235,285,335	285
Weight approx (kg)	41, 45, 58	48
Shade	Grey	Grey
Surface Finish	Cast	Cast

MATERIAL DATA

Manufacturing Standard	BS EN 1433
Surface Finish	As Cast
Slip Skid	USRV > 40
Installed To	Installed to manufacturers details which can be found on page 140-141

TRAFFICKING SELECTOR (BS EN 1433 STANDARD CLASSIFICATION)

Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN
Main units						
Base / HB Top Complete	•	•	•	•		
Base / SP Top Complete	•	•	•	•		
Silt Box Top - Splay	•	•	•	•		
Silt Box Top - Half Batter	•	•	•	•		
Rodding / Inspection HB	•	•	•	•		
Rodding / Inspection SP	•	•	•	•		

• indicates suitability

BS EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

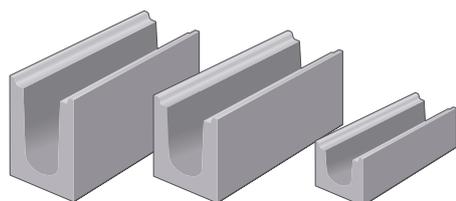
Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

Class D (400kN): Public highways and general parking areas.

Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.

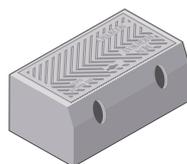
BASE UNITS



335mm depth

285mm depth

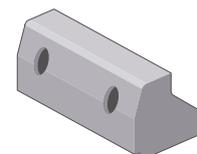
235mm depth



Silt box



Rodding eye kerb unit



Top unit



Grey

Radii units available - 25/11, 10/8 and 7/6 Internal and External as Highway on a made to order basis. CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.



Figures available on request



Product contains recycled content. For more details, see page 158



Manufactured in the UK with locally sourced materials

SuDS

In addition to the Charcon Hard Landscaping portfolio of water management products, Aggregate Industries has a comprehensive range of products suitable for a wide range of SuDS applications.



SUPERDRAINASPALT®

Aggregate Industries manufactures and supplies British and European standardised asphalts as well as a comprehensive range of performance asphalts to meet a wide range of applications.

Our porous asphalt range includes SuperDrainasphalt® and SuperSport® which offer highly durable and effective transition layers, allowing water to flow quickly to the storage area below. These products come in various aggregate sizes to suit a range of applications and can be combined with our wide range of other sustainable drainage products to offer the perfect Sustainable Drainage Systems solution.

Designed to reduce the potential impact of surface water drainage in new and existing developments.

- ▶ SuperDrainasphalt is a product that has been developed for use within a SuDS system
- ▶ Low environmental impact surfacing
- ▶ Durability maximised by careful mix design and use of a carefully selected polymer modified binder
- ▶ SuperDrainasphalt and SuperSport offer high hydraulic conductivity levels



SUPERFLOW AGGREGATES

The SuperFlow® product range is Aggregate Industries' line of high performance aggregates specifically designed to provide controlled water management within SuDS.

Products:

SuperFlow® SuDSAgg

- ▶ Aggregate Type: 0/40mm crushed rock
- ▶ Application: Sub-base reservoir layer
- ▶ Drainage Solution: SuperDrainasphalt and Hydromedia®

SuperFlow® 20

- ▶ Aggregate Type: 4/20mm crushed angular rock
- ▶ Application: Upper sub-base reservoir layer
- ▶ Drainage Solution: Hand laid SuperDrainasphalt, Infilta Block Paving and Hydromedia®

SuperFlow® 63

- ▶ Aggregate Type: Coarse crushed angular rock
- ▶ Application: Lower sub-base reservoir/capping layer
- ▶ Drainage Solution: Infilta Block Paving

SuperFlow® 6

- ▶ Aggregate Type: 2/6 Crushed angular stone
- ▶ Application: Laying course/bedding aggregate
- ▶ Drainage Solution: Infilta block paving

SuperFlow® JointAgg

- ▶ Aggregate Type: Crushed stone grit
- ▶ Application: Brushing in grit aggregate
- ▶ Drainage Solution: Infilta block paving



READY-MIXED CONCRETE

Hydromedia is an ideal solution for surface and storm water management. It's a fast draining, engineered concrete pavement solution that rapidly directs storm water off streets, parking surfaces, driveways and walkways. It minimises costs and long-term maintenance for local authorities and developers of storm water management and there are a range of strengths available. Designed with a sub-base to contain typically 30% voids, water flows freely through Hydromedia ranging from rates of 150 - 1000 litres/minute/m².

Products:

There are four prime versions of Hydromedia in the product range:

Hydromedia Pedestrian

- ▶ No traffic applications

Hydromedia Car park

- ▶ Light traffic conditions

Hydromedia Underlayer

- ▶ Non traffic

Hydromedia Underlayer

- ▶ Light traffic

A range of strengths are available. Please speak to our technical specialists to find out which grade suits your project.

FOR MORE INFORMATION

E: suds@aggregate.com

W: www.aggregate.com/suds



LYTAG®

Lytag® is made from pulverised fuel ash, a waste material produced from electricity production in coal-fired power stations. Manufactured in accordance with EN 13055, the standard for lightweight aggregates, Lytag is widely available within the UK and Europe.

Lytag products are classified as secondary aggregates. This means that the quantity of fly ash being tipped is reduced and virgin aggregate extraction is reduced. By considering the use of Lytag products at an early stage in the design process, you have the potential to reduce the quantities of construction material required in a project. This leads to overall cost savings. Due to the reduced weight of Lytag products, larger volumes can be transported, reducing vehicle movements both on the public highway and site.

Products:

Geofill®

- ▶ An 8/14mm lightweight aggregate used to raise levels or reduce pressure on retaining walls. Due to its shape and absorptive qualities, it will initially absorb up to 20% of the Geofill®'s weight in water, followed by letting water pass through without silting up

Sportag®

- ▶ A 4/8mm material used extensively in sports pitches and golf courses, acting as localised water run-off channels

Hortag®

- ▶ A 4/8mm material used within the horticulture market, available in small bags for use in garden drainage as well as improving root growth

KERB AND EDGING

Our extensive range of concrete kerbs and integrated accessories are designed to improve delineation of traffic flow, protect pedestrians, reduce maintenance and improve the overall aesthetics of pavement construction from contemporary to heritage style projects.



- 90-91** ECO COUNTRYSIDE® KERB
- 92-93** K-LITE® TRADITIONAL KERB
- 94-97** BLOCK KERB
- 98-99** ACCESS KERB
- 100-101** HGV KERB
- 102-103** CYCLE DEMARCATION KERB
- 104** CYCLE SEGREGATION UNIT
- 105** DUTCH ENTRANCE KERB
- 106-107** CASE STUDY

ECO COUNTRYSIDE®



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INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV
*Certain sizes



STEP



BIM
ENABLED



Kerb



Life

**UP TO 65%
RECYCLED CONTENT**

For details, see page 158



Eco Countryside® Widetop Kerb with StoneMaster® Medium Grey and Dark Grey Setts, North West Cambridge

MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



Black Fleck

14.00 kgCO₂e/m

Up to 65% Recycled content. For more details, see page 158

Manufactured in the UK with locally sourced materials

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Classic Half Batter radius units available in 2,3,4,6 and 10 meter external radius versions. Classic Square radius units available in 1.8, 3, 4, 6 and 9 metre external radius versions. Internal radius units available by request in 1.655, 2.855, 3.855, 5.855 and 8.855m. Classic Wide Top radius units available in 3, 6 and 9m external radius. Internal radius units available by request in 2.71, 5.71 and 8.71m. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

ECO COUNTRYSIDE®

PRODUCT DATA

Unit Type	Classic	Classic 255	Standard Kerb	Classic Crossing	Classic Dropper	Classic Radius	Classic Quadrant	Classic Internal Angle	Classic External Angle	LH Transition	RH Transition
Length (mm)	914	914	914	914	914	780	305	305	305	914	914
Height (mm)	255	205	255	150	255-150	255	255	255	255	255	255
Width (mm)	145	255	145	145	145	145	R305	145	145	145/125	145/125
Weight approx. (kg)	80.00	110.00	72.00	50.00	65.00	69.00	40.00	34.00	34.00	80.00	80.00
Shades	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck
Profile	Square	Square	Splay	Square	Square	Square	Square	Square	Square	Square/ Half Batter	Square/ Half Batter

Unit Type	Classic	Classic Crossing	Classic Dropper	Classic Radius	Classic Quadrant	Classic Internal Angle	Classic External Angle	Classic Dish Channel*
Length (mm)	914	914	914	780	780	305	305	914
Height (mm)	255	150	255-150	255	255	255	255	125
Width (mm)	125	125	125	125	R305	125	125	255
Weight approx. (kg)	67.00	40.00	60.00	54.00	40.00	30.00	30.00	67.00
Shades	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck
Profile	Half Batter	Bullnose	Half Batter	Half Batter	Half Batter	Half Batter	Half Batter	Dished

Unit Type	Classic Wide Top	Classic Wide Top Crossing	Classic Wide Top Dropper	Classic Wide Top Radius	Wide Top Internal Angle	Wide Top External Angle
Length (mm)	914	914	914	780	290	290
Height (mm)	205	100	205-100	205	205	255
Width (mm)	290	290	290	290	290	290
Weight approx. (kg)	125.00	60.00	60.00	100.00	40.00	40.00
Shades	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck
Profile	Square	Square	Square	Square	Square	Square

Unit Type	Standard Kerb	Standard Kerb	Classic Flat Top Edging	LH Transition	RH Transition
Length (mm)	914	914	914	914	914
Height (mm)	175	175	150	175	175
Width (mm)	145	145	50	145	145
Weight approx. (kg)	54.00	48.00	15.00	51.00	51.00
Shades	Black Fleck	Black Fleck	Black Fleck	Black Fleck	Black Fleck
Profile	Splay	Square	Square	Splay/ Square	Splay/ Square

K-LITE® TRADITIONAL



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



PRODUCT DATA

Unit Type	Kerb	Kerb
Length (mm)	440	290
Height (mm)	140	215
Width (mm)	100	100
Weight (kg)	16.00	16.00
Shades	Silver Grey, Dark Grey	Silver Grey, Dark Grey



K-Lite® Traditional kerb in Silver Grey, Truro, Cornwall

MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



5.06 kgCO₂e/m



Up to 60% Recycled content. For more details, see page 158



Manufactured in the UK with locally sourced materials

Colour swatches are for indication purposes only, for a true representation of product colours, samples can be ordered from www.aggregate.com. CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

K-LITE® TRADITIONAL



 **UP TO 60%
RECYCLED CONTENT**
For details, see page 158

K-Lite® Traditional kerb in Silver Grey, Truro, Cornwall

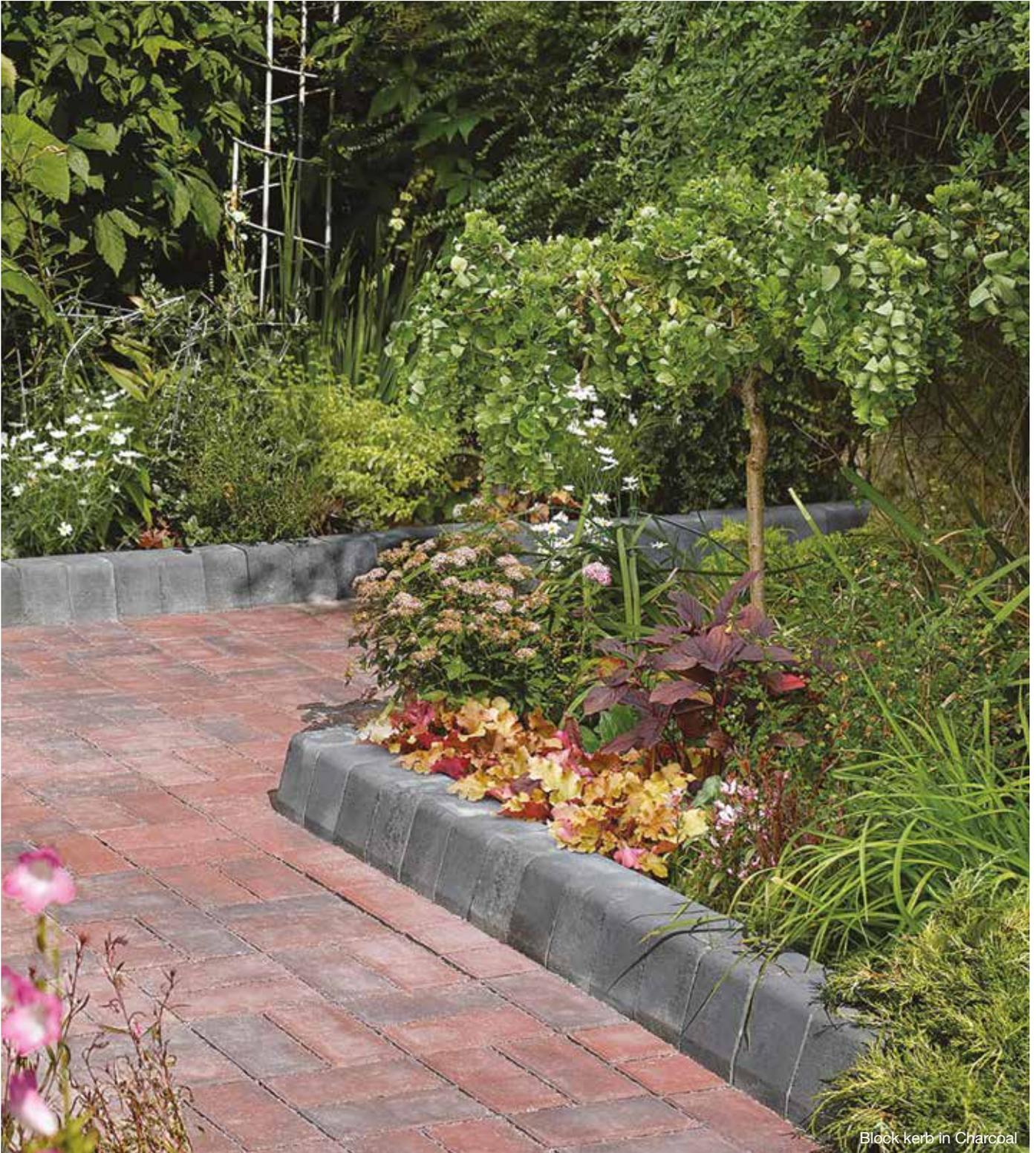


Silver Grey



Dark Grey

BLOCK KERB



Block kerb in Charcoal



Graphite



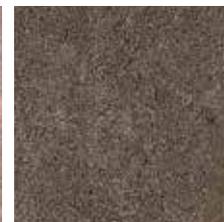
Autumn



Rustic



Brindle



Charcoal

BLOCK KERB



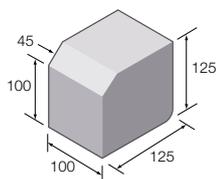
SCAN ME
FIND OUT MORE
INFO ONLINE



PRODUCT DATA

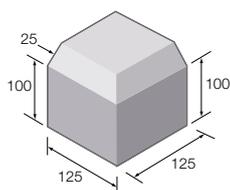
Unit Type	Large	Medium	Small	Woburn
Length (mm)	100	100	100	100
Height (mm)	200	150	125	200
Width (mm)	125	150	125	125
Weight (kg)	5.20	4.40	3.00	5.20
Units/lm (approx.)	10	10	10	10
No. Per Pack	192	240	288	192
LM/Pack (approx.)	19.20	24.00	28.80	19.20
Pack Weight (T)	0.99	1.06	0.86	0.99
Surface Finish	Cast	Cast	Cast	Rumbled
Shade	Charcoal, Brindle	Charcoal	Charcoal, Brindle	Rustic, Autumn, Graphite

SMALL KERBS

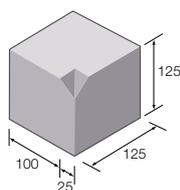


Main unit SK

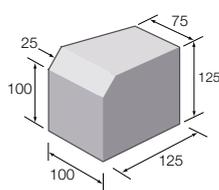
SMALL KERB ACCESSORIES



External Angle SK/A

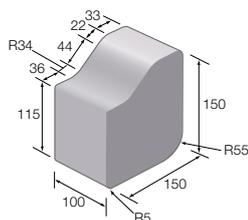


Internal Angle SK/B



External Radius SK/D

MEDIUM KERBS

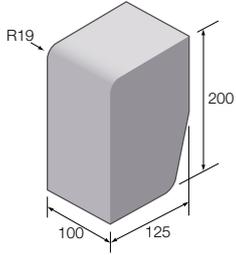


Main unit MK

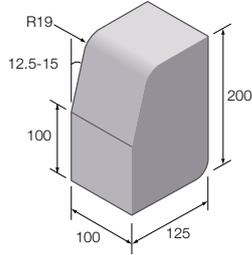
Colour swatches are for indication purposes only, for a true representation of product colours, samples can be ordered from www.aggregate.com.

BLOCK KERB

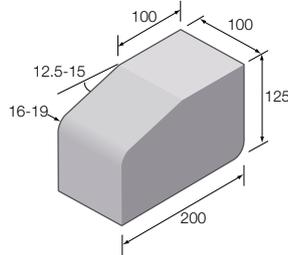
LARGE/WOBURN KERBS



HB/BN main unit LK

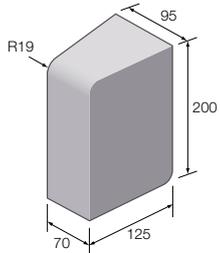


HB/BN main unit LK

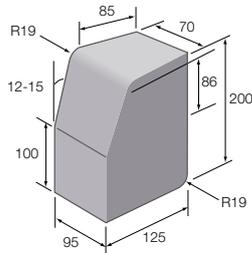


HB/BN main unit laid flat LK

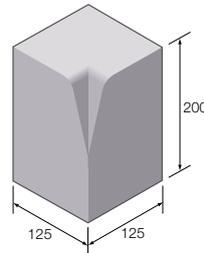
LARGE KERB ACCESSORIES



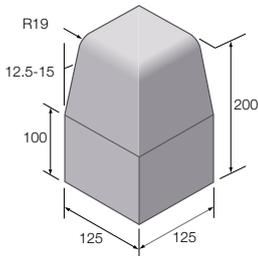
BN upright internal/external radial block (internal shown) LK/B



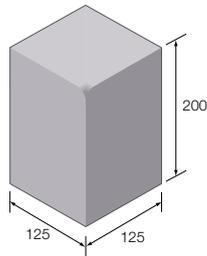
HB external radial block LK/C



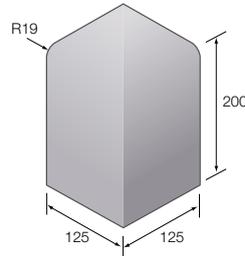
HB upright internal angle LK/D



HB upright external angle LK/E

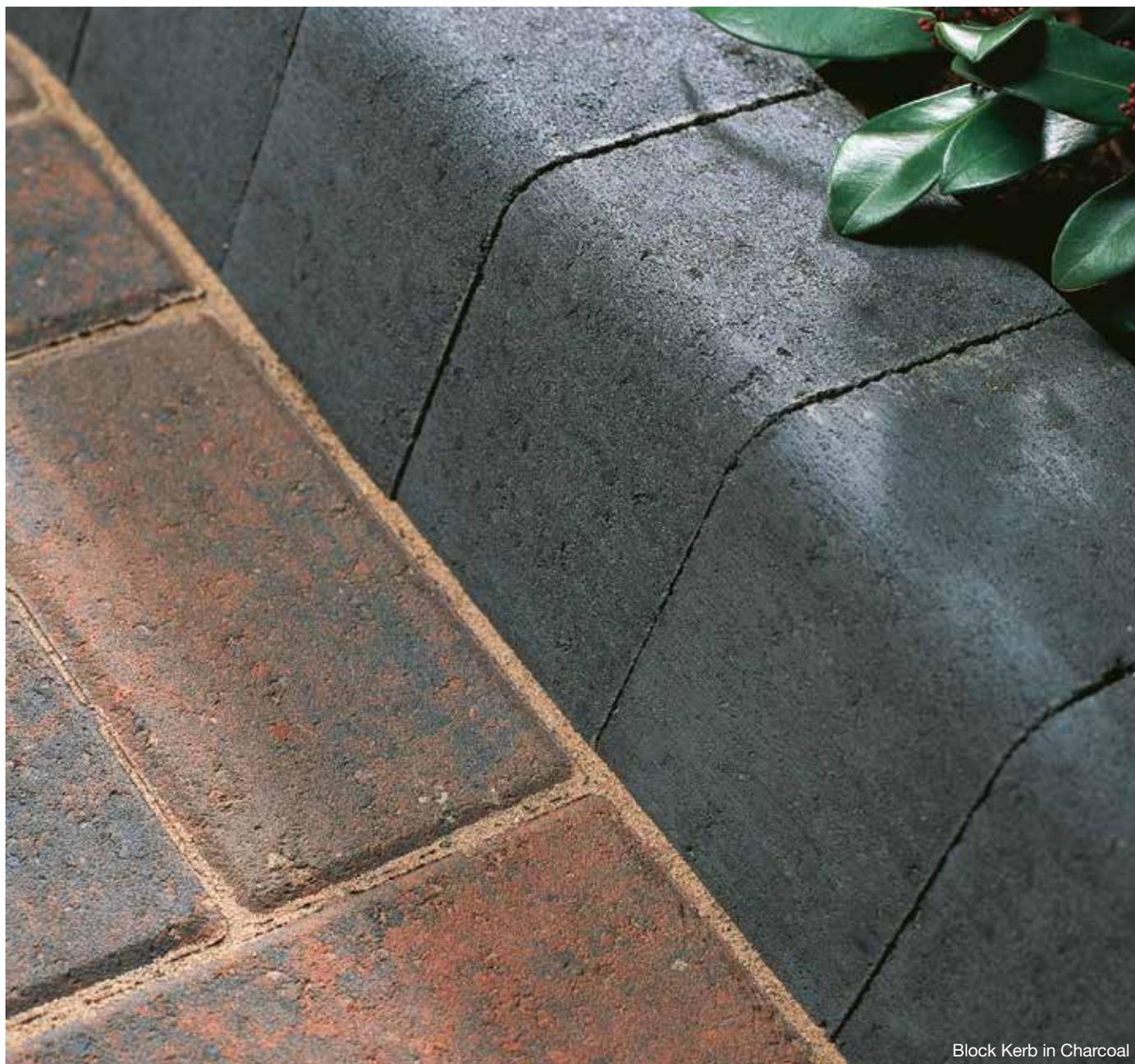


BN upright internal angle LK/F



BN upright external angle LK/G

BLOCK KERB



Block Kerb in Charcoal

MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Cast/Rumbled
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6

5.40 kgCO₂e/mProduct contains recycled content.
For more details, see page 158

Manufactured in the UK with locally sourced materials

CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

ACCESS KERB



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV
*Certain sizes



PRODUCT DATA

Unit Type	220	180	160	180 GB
Length (mm)	1000	1000	1000	1000
Height (mm)	350	310	290	310
Width (mm)	323/271	310	276/224	260
Profile	Standard/Marker Bump	Marker Bump	Standard/Marker Bump	Guided Bus
Weight Approx. (kg) with marker bump	170	150	130	n/a
Weight Approx. (kg) without marker bump	160	n/a	120	150
Dropper Unit Height	220-160	180-125	160-125	180-125
Surface Finish	Cast/Textured	Cast/Textured	Cast/Textured	Cast/Textured
Shade	Grey, Black Fleck*	Grey, Black Fleck*	Grey, Black Fleck*	Grey, Black Fleck*



Access Kerb in Black Fleck, North West Cambridge

MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Cast, Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



23.60 kgCO₂e/m



Product contains recycled content.
For more details, see page 158



Manufactured in the UK with locally sourced materials



Black Fleck

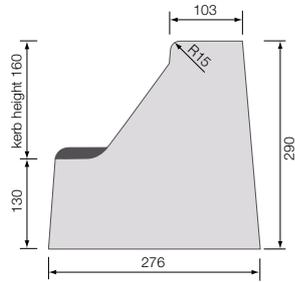


Grey

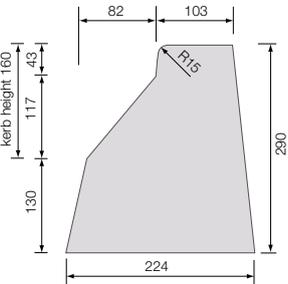
*Indicates where the product is MTO, minimum order quantities will apply.

ACCESS KERB

160MM ACCESS KERB

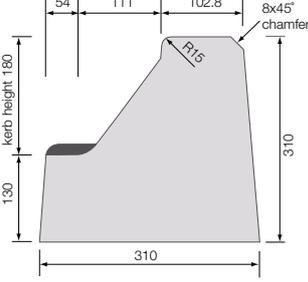


160mm standard profile with marker bump (side view)

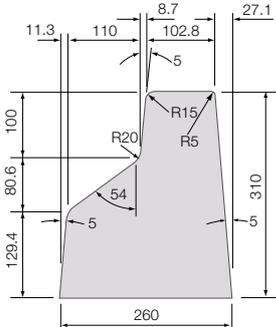


160mm standard profile without marker bump (side view)

180MM ACCESS KERB

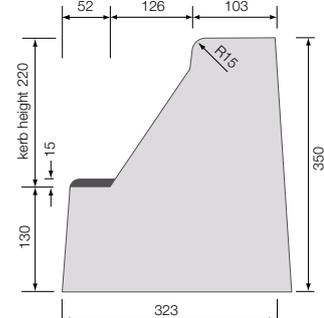


180mm standard profile with marker bump (side view)

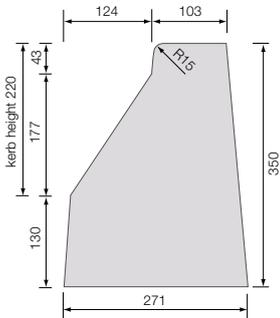


180mm guided bus

220MM ACCESS KERB

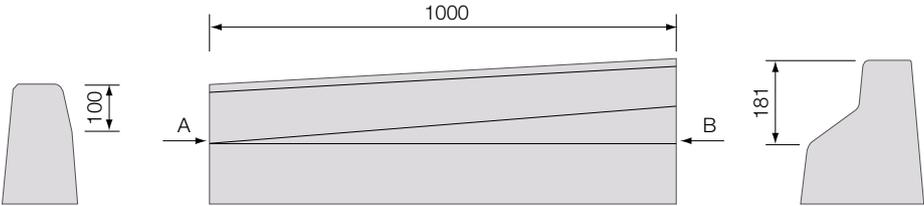


220mm standard profile with marker bump (side view)

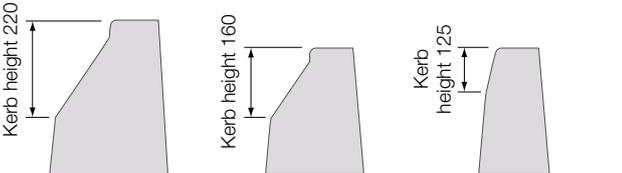
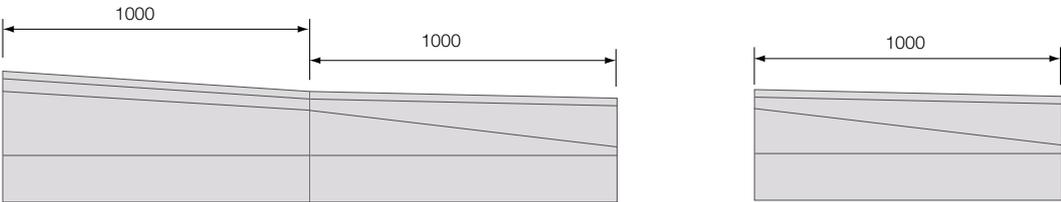


220mm standard profile without marker bump (side view)

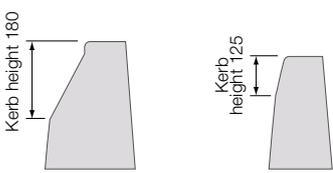
TRANSITION UNITS



180mm off line transition unit



220mm standard body profile to 160mm, standard body profile to 125mm half batter



180mm standard profile to 125mm half batter

*Indicates where the product is MTO, minimum order quantities will apply. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

HGV KERB



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



PRODUCT DATA

Unit Type	Main Unit	Half Unit*	Radius Unit*	Dropper Unit (Types A&B)**
Length (mm)	1000	500	Various	1000
Height (mm)	415	415	415	415-318
Width (mm)	215/310	215/310	215/310	170/215
Weight Approx. (kg)	220	110	Varies	Varies
Surface Finish	Cast	Cast	Cast	Cast
Shade	Grey	Grey	Grey	Grey



HGV Kerb, Premier Travel Inn, Heathrow

MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Cast
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



23.61 kgCO₂e/m



Product contains recycled content.
For more details, see page 158

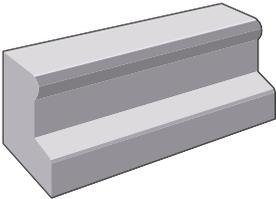
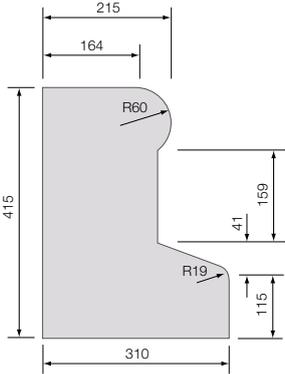


Manufactured in the UK with locally sourced materials

*Indicates where the product is MTO, minimum order quantities will apply. **Transition Units: left hand and right hand versions, type A and B are both required to create transition from HGV Kerb to British Standard Kerb 125x255mm HB. Quadrant sizes available: 415x310x90, 415x310x45. Internal angle 90°. Dowel bars available to order. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. A Quadrant is available in 220mm. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

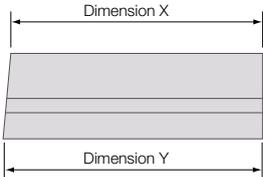
HGV KERB

MAIN UNIT

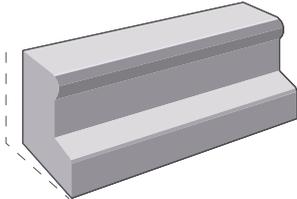


EXTERNAL RADIUS UNITS

Radius unit designation	Dimension X	Dimension Y
36/12	958mm	975mm
11/7	940mm	975mm
6/4.5	916mm	975mm
3	602mm	672mm
2	441mm	523mm
1.5	311mm	392mm

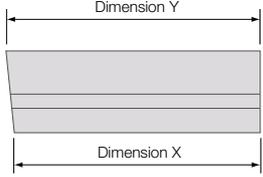


HGV kerb external radius plan view

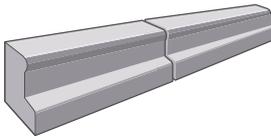


INTERNAL RADIUS UNITS

Radius unit designation	Dimension X	Dimension Y
36/12	958mm	975mm
11/7	940mm	975mm
6/4.5	916mm	975mm
3	602mm	672mm

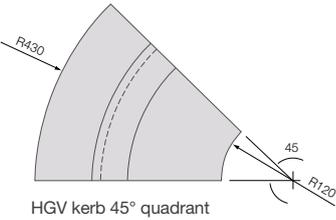


HGV kerb internal radius plan view

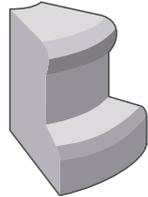


Transition units to HB2 kerb (left hand version shown)

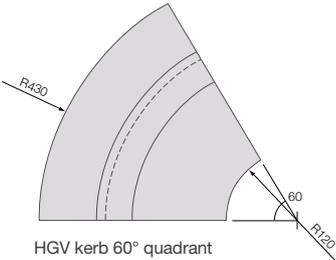
QUADRANTS AND ANGLES



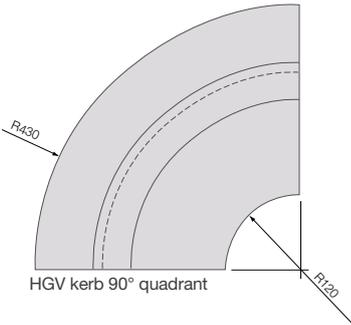
HGV kerb 45° quadrant



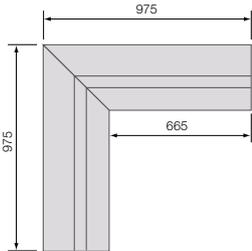
Quadrant



HGV kerb 60° quadrant



HGV kerb 90° quadrant



HGV kerb internal 90° angle plan view

CYCLE DEMARCATI KERB

NEW PRODUCT



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



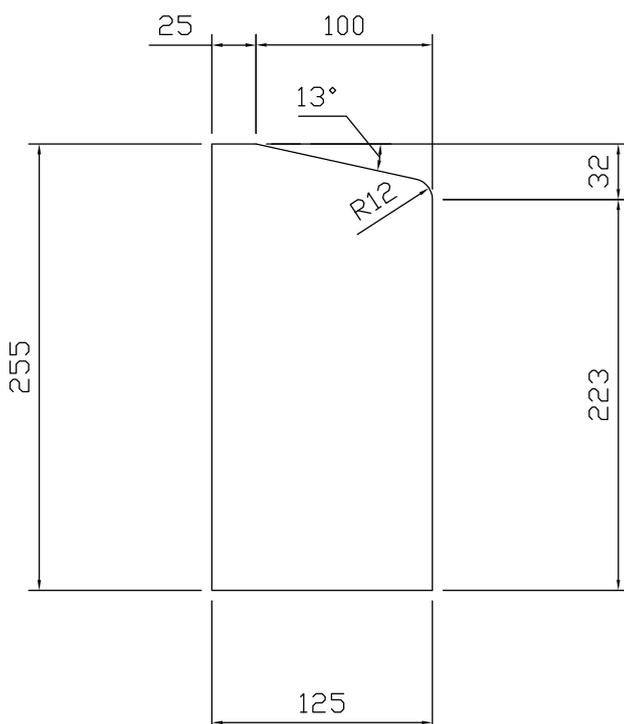
Lorry &
HGV



The demarcation kerb has an angled profile creating a gentle and smooth transition between the carriageway and the cycle lane. Cycle demarcation kerb is ideal for use in areas where product appearance and environmental considerations are an important criteria.

CYCLE DEMARCATI KERB 13° PRODUCT DATA

Unit Type	Cycle Demarcation Kerb*	Cycle Kerb Reduced Depth*	Cycle Kerb to Square Transition LH*	Cycle Kerb to Square Transition RH*	Cycle Kerb to HB2 Transition LH*	Cycle Kerb to HB2 Transition RH*	Cycle Kerb to BN3 Transition LH*	Cycle Kerb to BN3 Transition RH*
Length (mm)	914	914	914	914	914	914	914	914
Height (mm)	255	150	255-223	255-233	255-162	255-162	255-248	255-248
Width (mm)	125	125	125	125	125	125	125	125
Weight (kg)	65.00	38.00	62.00	62.00	53.00	53.00	65.00	65.00
Pack Size (Unit No.)	18	18	1	1	1	1	1	1
Profile	Angled	Angled	Angled	Angled	Angled	Angled	Angled	Angled
Profile Angle	13	13	13-Square	13-Square	13-HB2	13-HB2	13-BN3	13-BN3
Surface Finish	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured
Shade	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck



MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Cast, Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6

6.50 kgCO₂e/m

Up to 65% Recycled content. For more details, see page 158

Manufactured in the UK with locally sourced materials

*Indicates where the product is MTO, minimum order quantities will apply. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

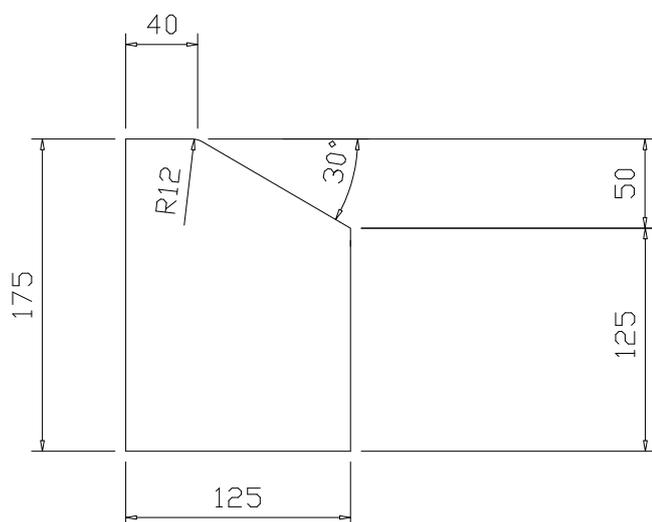
CYCLE DEMARCATION KERB

NEW PRODUCT



CYCLE DEMARCATION KERB 30° PRODUCT DATA

Unit Type	Cycle Demarcation Kerb*	Cycle Demarcation Kerb*	Cycle Kerb to Square Transition LH*	Cycle Kerb to Square Transition RH*	Cycle Kerb to HB2 Transition LH	Cycle Kerb to HB2 Transition RH
Length (mm)	914	914	914	914	914	914
Height (mm)	175	255	175-125	175-125	175-125	175-125
Width (mm)	125	125	125	125	125	125
Weight (kg)	42.00	60.00	38.00	38.00	56.00	56.00
Pack Size (Unit No.)	18	18	1	1	1	1
Profile	Angled	Angled	Angled	Angled	Angled	Angled
Profile Angle	30	30	30-0	30-0	30	30
Surface Finish	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured
Shade	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck



Black Fleck



Grey

*All products are MTO.

CYCLE SEGREGATION UNIT

NEW PRODUCT



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian Traffic



Car & Light Vehicle Traffic



Lorry & HGV



UP TO 65% RECYCLED CONTENT

For details, see page 158

Featuring either a half batter or square edge profile along the carriageway, capable of withstanding vehicular impact and a splay edge on the cycleway side, which significantly reduces the chance of cyclists catching a pedal. The system is installed on one side of the carriageway to safely segregate cyclists from passing traffic, even when on the blind side of a lorry or bus.

Segregation Unit 500 is quick and simple to install by planing off wearing course and installing on a high strength mortar system and subsequently bolted down to the base course for addition lateral restraint, speeding up the process of installation and reducing waste from a full excavation / installation. See page 137 for further details.

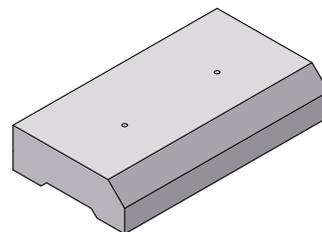


CYCLE SEGREGATION UNIT 500 PRODUCT DATA

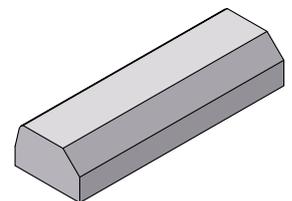
Unit Type	Cycle Segregation Unit 500*	Cycle Segregation Unit 500*	Transition Quadrant End LH*	Transition Quadrant End RH*	Quadrant 250*	Quadrant 450*	Quadrant 500*
Length (mm)	914	914	914	914	250	450	500
Height (mm)	175	125	175	175	255	175	175
Width (mm)	500	500	500	500	250	450	500
Weight (kg)	170.00	122.00	170.00	170.00	30.00	55.00	60.00
Pack Size (Unit No.)	3	3	3	3	4	2	2
Profile	Splay/Square	Splay/Square	Splay/Square	Splay/Square	Square	Square	Square
Surface Finish	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured	Cast, Textured
Shade	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck

CYCLE SEGREGATION UNIT 290 PRODUCT DATA

Unit Type	Cycle Segregation Unit 290*	Transition Quadrant End LH*	Transition Quadrant End RH*
Length (mm)	914	914	914
Height (mm)	205	205	205
Width (mm)	290	290	290
Weight (kg)	115.00	115.00	115.00
Pack Size (Unit No.)	8	1	1
Profile	Splay/Half Batter	Splay/Half Batter	Splay/Half Batter
Surface Finish	Cast, Textured	Cast, Textured	Cast, Textured
Shade	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck



Cycle Segregation Unit 500



Cycle Segregation Unit 290

Manufacturing Standard	BS EN 1340
Surface Finish	Cast, Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6

Cycle Kerb 500: 33.15 kgCO₂e/m. Cycle Kerb 290: 12.10 kgCO₂e/m

Up to 65% Recycled content. For more details, see page 158

Manufactured in the UK with locally sourced materials

*Indicates where the product is MTO, minimum order quantities will apply. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

DUTCH ENTRANCE KERB

NEW PRODUCT

Pedestrian
TrafficCar & Light
Vehicle
TrafficLorry &
HGVUP TO 65%
RECYCLED
CONTENTFor details,
see page
158SCAN ME
FIND OUT MORE
INFO ONLINE

New for 2021, the design of our Dutch Entrance Kerb is based on the leading, safety cycling kerb from the Netherlands. The Dutch Entrance Kerb allows safe vehicular crossing over the cycle carriageway when accessing from main streets into side streets, and entrances to buildings, where drivers need to cross footways and cycle lanes.

Features

Keep footways and cycle tracks at a constant level to improve walking and cycling service.

Drivers have to negotiate change in level, therefore slowing traffic speed and improving safety.

Making it safer and easier for people travelling on foot and by bicycle in the urban environment

Helps safely manage vehicular crossing points

*Indicates where the product is MTO, minimum order quantities will apply. Our kerbs come banded. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

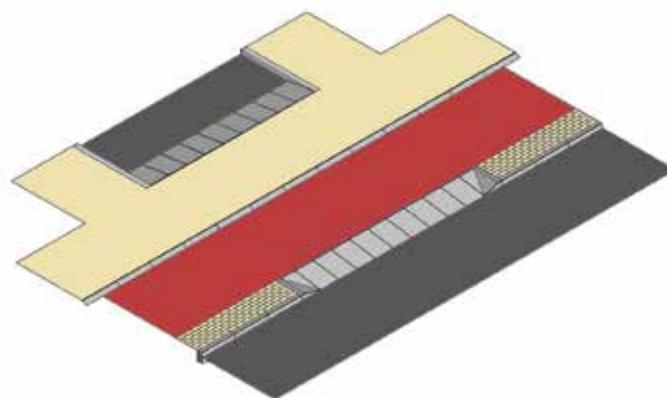
Applications

Dutch Kerb is for use in a range of applications including carriageways, footpaths, carpark entrances, crossings, cycleways. Refer to technical services for advice on specific applications tel: 01335 372222

Performance

STRENGTH: The products are manufactured to meet the strength requirements of BS EN 1340

SLIP AND SKID RESISTANCE: Dutch Kerb conforms to the requirements of manufacturing standard BS EN 1340



Black Fleck



Grey

PRODUCT DATA

Unit Type	Main Ramp Unit*	LH Corner Transition Unit*	LH Corner Transition Unit*
Length (mm)	750	750	750
Height (mm)	215-150	215-150	215-150
Width (mm)	500	500	500
Weight (kg)	185.00	175.00	175.00
Surface Finish	Cast, Textured	Cast, Textured	Cast, Textured
Shade	Grey, Black Fleck	Grey, Black Fleck	Grey, Black Fleck

Manufacturing Standard	BS EN 1340
Surface Finish	Cast, Textured
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



Up to 65% Recycled content. For more details, see page 158

CASE STUDY

THE NORTH WEST CAMBRIDGE DEVELOPMENT

The North West Cambridge Development is the University of Cambridge's ambitious £1bn scheme to create a new sustainable district of homes, shops and schools on the city's outlying farmland.

THE BACKGROUND

Aimed at addressing the escalating housing shortage in Cambridge, once complete the development will include 3,000 homes, accommodation for 2,000 postgraduate students and 100,000m² of academic, research and development space. There will also be a range of community, retail and leisure facilities along with sustainable transport provisions, such as cycle ways.

THE CHALLENGE

From an asphalt perspective, planners were keen to avoid the use of traditional blacktop asphalt for road surfacing to ensure the new district was in keeping with the surrounding countryside – preferring materials that would produce a more natural aesthetic but were also durable enough to withstand the high levels of traffic expected to the site.

The task proved challenging as many of the decorative asphalt solutions currently available on the market, although capable of achieving the desired look, were not robust enough to meet the technical performance required.

When it came to landscaping, it was difficult to source paving products that would work with all the different architectural elements, meet sustainability standards, be cost effective for such a large project and be available for future phases of the development for continuity of design.

THE SOLUTION

Through a collaborative cross-divisional approach, Aggregate Industries was ideally placed to provide a raft of bespoke solutions to the first phase of the development, spanning specialist asphalt, ready-mixed concrete, and landscaping products.

A bespoke decorative asphalt solution was developed using Aggregate Industries SuperColour® Exposed Golden Gravel formula and the team carried out extensive skid resistance testing on the scheme prior to installation, to ensure it met exacting safety requirements.

When it came to landscaping, the architects were keen to work with the Charcon commercial landscaping team – having worked together on a number of successful projects. The solution was StoneMaster® paving, a revolutionary range of flag and block paving made from a fine sand mix that replicates the appearance of natural sandstone, thus making it more economical in terms of achieving a high-end landscaping look. The products also offered a sustainable solution, containing over 50% reclaimed or recycled materials.

Aggregate Industries has also supplied 14,000m³ of ready-mixed concrete, which has seen the construction of 91 residential homes on top of an underground car park. This included 3,000m³ of its innovative and highly-durable Watertight concrete mix to protect the car parks' basement and ground floor slab from water ingress and potential damp.

Clinton Young, Specification Manager of Aggregate Industries' Concrete Products Division, said:

"As a ground-breaking model for affordable urban housing in the UK, the contractors working on the North West Cambridge Development were looking for a best practice partner that could provide a time efficient, tailored approach to bespoke product specification, which spanned asphalt, concrete and paving. During often complex installation processes, our technical teams were always on hand to provide support where necessary and within a timely manner.

"It was through this level of dedicated service and a holistic, collaborative approach, that the team was able to create a superior result that exceeded performance requirements, along with client expectations."

For further information, visit www.charcon.com
For technical support, please call **01335 372 216**
or email charcon.technical@aggregate.com



BRITISH STANDARD FLAG, KERB, CHANNEL AND EDGINGS

Produced to adhere to the requirements of the current British Standards, our range of kerbs, channels, edging and paving are the perfect solution for multiple applications.

British Standard Kerbs are designed to provide edge restraint in pedestrian and vehicular applications. Our product offer includes an extensive range of accessories to suit a variety of applications.

British Standard paving is a cost effective product. Manufactured utilising locally sourced aggregates, it comes in two colours and an extensive range of sizes, both in Standard and Barfaced finishes.

All of our British Standard products are manufactured using up to 23% recycled aggregate.



110-111 BRITISH STANDARD PAVING
112-113 BRITISH STANDARD TACTILE
114-115 BRITISH STANDARD KERB
116-117 BRITISH STANDARD KERB,
CHANNEL AND EDGING

BRITISH STANDARD PAVING



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INFO ONLINE



Pedestrian
Traffic



Car & Light
Vehicle
Traffic



Lorry & HGV
*Certain
sizes



**Certain
sizes



BIM
ENABLED

PRODUCT DATA

Size (mm)	900x600	900x600	900x300	750x600	750x600	600x600	600x600	600x600	600x600
Thickness (mm)	50	63	50	50	63	50	63	50	37
Weight (kg)	63.00	77.00	31.00	52.00	66	42.00	52.00	42.00	31.00
Units/m ²	1.85	1.5	3.8	2.22	2.22	2.77	2.77	2.77	2.77
Units/Pack	22	17	20	22	17	22	17	22	25
M ² /Pack	11.89	9.19	5.40	9.91	7.66	6.14	7.94	6.14	9.03
Weight Pack (T)	1.39	1.36	0.62	1.14	1.08	0.91	0.92	0.91	0.78
Shades	Grey, Buff	Grey, Buff	Grey	Grey, Buff	Grey				
Finish	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Barface	Standard
Edge Detail	Square	Square	Square	Square	Square	Square	Square	Square	Square

Size (mm)	600x450	600x450	600x300	450x450**	450x450	450x450	400x400	400x400**	400x200**
Thickness (mm)	50	63	50	70	50	50	50	65	65
Weight (kg)	31.00	40.00	21.00	34.00	24	24.00	19.00	24.00	12.00
Units/m ²	3.7	3.7	5.6	4.94	4.94	4.94	6.25	6.25	12.5
Units/Pack	22	17	22	30	40	40	40	32	32
M ² /Pack	5.95	4.59	3.93	6.07	8.10	8.10	6.40	5.12	2.56
Weight Pack (T)	0.68	0.68	0.46	1.02	0.96	0.96	0.76	0.77	0.38
Shades	Grey, Buff	Grey, Buff	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Finish	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Edge Detail	Square	Square	Square	Chamfered	Chamfered	Square	Chamfered	Chamfered	Chamfered

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Cast
Slip Skid	BS EN 1339: USRV >40
Installed To	BS 7533-4

10.40 kgCO₂e/m²

Up to 20% Recycled content. For more details, see page 158

Manufactured in the UK with locally sourced materials

Potential Green Guide Rating

**Indicates where the product is suitable for traffic applications. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

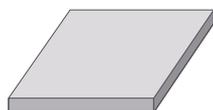
BRITISH STANDARD PAVING



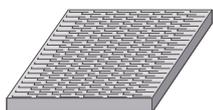
Grey



Buff



Standard



Barfaced

BRITISH STANDARD TACTILE

**UP TO 20%
RECYCLED CONTENT**
For details, see page 158



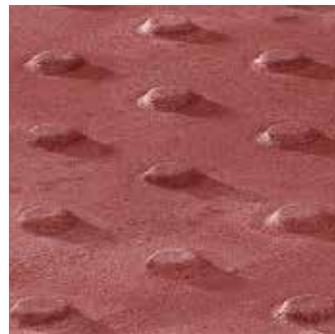
Cycleway paving in Buff with StoneMaster® in Light Grey and Medium Grey, North West Cambridge



Grey



Buff



Red



Charcoal



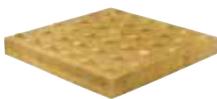
Hazard warning paving



Blister paving



Guidance paving



Platform edge warning (offset blister)



Platform edge warning (lozenge)



Cycleway paving

BRITISH STANDARD TACTILE



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INFO ONLINE



Pedestrian
Traffic

Car & Light
Vehicle
Traffic

Lorry & HGV
*Certain
sizes



**Certain
sizes



PRODUCT DATA

Size (mm)	450x450	450x450**	400x400	400x400**	400x400
Thickness (mm)	50	70	50	65	50
Weight (kg)	24.70	34.00	18.80	24.70	18.80
Units/m ²	4.94	4.94	6.25	6.25	6.25
Units/Pack	34	28	34	30	34
M ² /Pack	6.88	5.67	5.44	4.80	5.44
Weight Pack (T)	0.80	0.95	0.64	0.74	0.64
Shades	Buff, Red	Buff, Red	Grey, Buff, Charcoal	Grey, Buff, Red, Charcoal	Grey, Buff, Charcoal
Finish	Blister	Blister	Blister	Blister	Hazard Warning Corduroy
Edge Detail	Square	Square	Square	Square	Square

Size (mm)	400x400*	400x400	400x400	400x400
Thickness (mm)	50	50	50	50
Weight (kg)	18.80	18.80	18.80	18.80
Units/m ²	6.25	6.25	6.25	6.25
Units/Pack	34	34	34	34
M ² /Pack	5.44	5.44	5.44	5.44
Weight Pack (T)	0.64	0.64	0.64	0.64
Shades	Buff, Charcoal	Buff	Buff	Grey, Buff
Finish	Platform Edge Warning Offset Blister	Platform Edge Warning Lozenge	Guidance	Cycleway
Edge Detail	Square	Square	Square	Square

MATERIAL DATA

Manufacturing Standard	BS EN 1339: Precast Concrete Flags
Surface Finish	Cast
Slip Skid	BS EN 1339: USRV >40
Installed To	BS 7533-4

10.40 kgCO₂e/m²

Up to 20% Recycled content. For more details, see page 158

Manufactured in the UK with locally sourced materials

Potential Green Guide Rating

*Indicates where the product is MTO, minimum order quantities will apply. **Indicates where the product is suitable for traffic applications. Colours swatches are for indication purposes only, for a true representation of product colours samples can be ordered from www.aggregate.com. Our paving comes banded and shrink-wrapped to a pallet. CO₂ figures are guidelines only, contact the Charcon Technical Helpline for accurate figures to suit your given application.

BRITISH STANDARD KERB



Pedestrian Traffic



Car & Light Vehicle Traffic



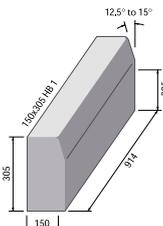
Lorry & HGV
*Certain sizes



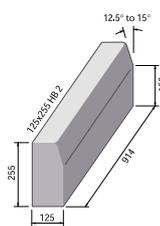
SCAN ME
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INFO ONLINE

PRODUCT DATA

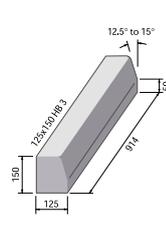
Unit Type	HB1	HB2	HB2	HB3	BN1	BN2	BN2	BN3	BN3	SP2	SP2	SP3
Length (mm)	914	914	609	914	914	914	609	914	609	914	609	914
Height (mm)	305	255	255	150	305	255	255	150	150	255	255	150
Width (mm)	150	125	125	125	150	125	125	125	125	125	125	125
Weight approx.(kg)	100.00	70.00	46.00	40.00	100.00	70.00	46.00	40.00	30.00	60.00	40.00	30.00
Unit/Pack	14.00	18.00	18.00	18.00	14.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Weight Pack (T)	1.40	1.26	0.83	0.72	1.40	1.26	0.72	0.72	0.54	1.26	0.72	0.54
Units/LM	1.09	1.09	1.64	1.09	1.09	1.09	1.64	1.09	1.64	1.09	1.64	1.09
LM/Pack	12.80	16.45	10.98	16.45	12.80	16.45	10.98	16.45	10.96	16.45	10.98	10.96
Shades	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Profile	Half Batter	Half Batter	Half Batter	Half Batter	Bull Nose	Splay	Splay	Splay				



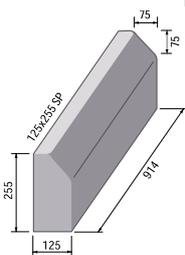
HB1



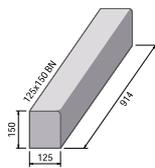
HB2



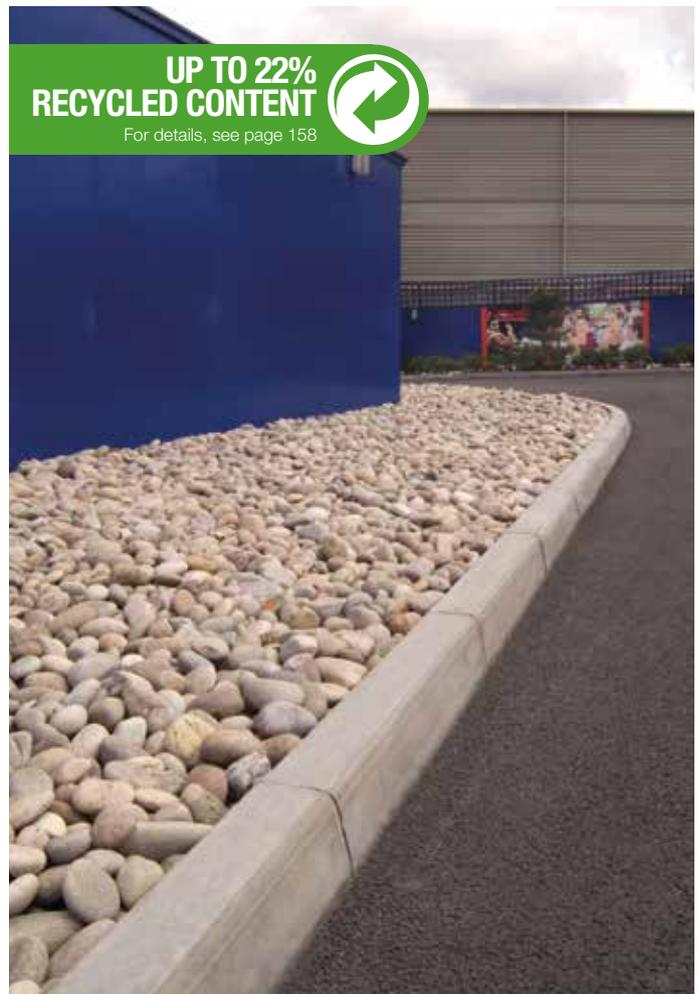
HB3



SP2



BN3



MATERIAL DATA

Manufacturing Standard	BS EN 1340
Surface Finish	Cast
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



6.50 kgCO₂e/m



Up to 22% Recycled content. For more details, see page 158



Manufactured in the UK with locally sourced materials

CO₂ figures are guidelines only, contact Charcon Technical for accurate figures to suit your given application.

BRITISH STANDARD KERB

PRODUCT DATA

125x255mm HB – 125x150mm BN (LH) DL1
 125x255mm HB – 125x150mm BN (RH) DR1
 125x255mm SP – 125x150mm BN (LH) DL2
 125x255mm SP – 125x150mm BN (RH) DR2
 125x150mm BN As Crossing Kerb
 125x255mm BN – 125x150 BN (LH) non BS
 125x255mm BN – 125x150 BN (RH) non BS

RADIUS KERBS AND CHANNELS BS:EN1340

The table shown is an approximate guide only.

All radii over 15m (40ft) can be achieved by using standard 914mm (3ft) or 609mm (2ft) kerbs.

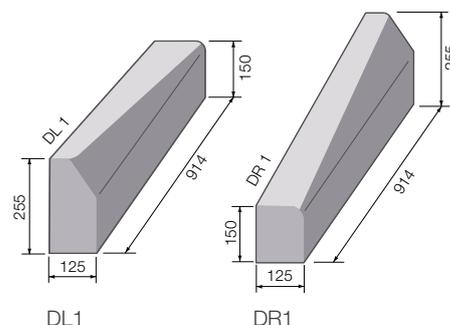
Before ordering, check availability of size and profile.

Also when ordering, please state the dimensions first, then the profile, then the radii followed by Internal or External, e.g. 125x150 BN 4m ext.

RADIUS DROPPERS BS:EN1340

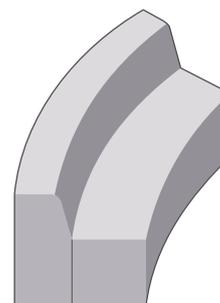
125x255mm HB – 125x150mm BN (LH)
 125x255mm HB – 125x150mm BN (RH)

Available in 4, 5, 6, 8 and 10m - external radius only.

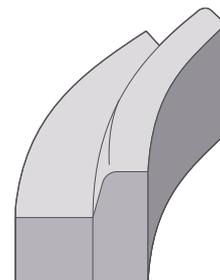


APPROX NO. UNITS PER 1/4 CIRCLE

Size of radius (m)	Units per 1/4 circle
0.5	1
1	2
2	4
3	6
4	8
5	10
6	12
8	16
10	20
15	30



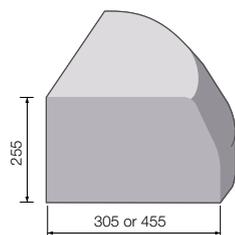
Internal Kerb with External Channel



External Kerb with Internal Channel

QUADRANTS BS:EN1340

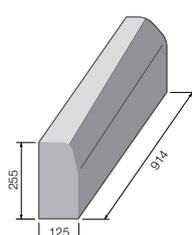
305x255mm QHB
 455x255mm QHB
 305x255mm QSP
 305x255mm QBN



HB305 HB455

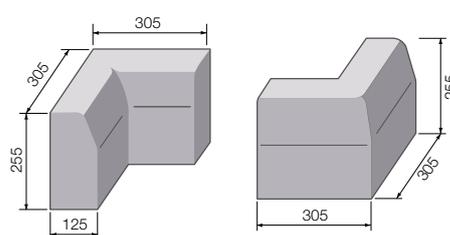
TRANSITION KERBS BS:EN1340

125 x 255mm HB RH - 125 x 255mm SP LH-TR
 125 x 255mm HB LH - 125 x 255mm SP RH-TL



ANGLES BS:EN1340

125x255mm HB Ext Angle HBXA
 125x255mm SP Ext Angle SPXA
 125x255mm HB Int Angle HBIA
 125x255mm SP Int Angle SPIA



IA

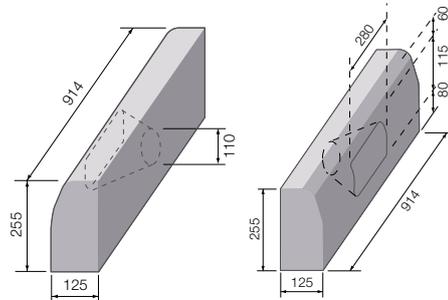
XA

BRITISH STANDARD KERB, CHANNEL AND EDGING

OFFLETS (WEIR KERBS)

Designed to allow surface water to be discharged through the opening in the face of the kerb to a 100mm pipe.

Available in Half Batter and Splay.



NON-STANDARD KERBS & CHANNELS

Subject to availability and minimum order quantity.

Kerbs

150x305mm BN
125x255mm BN
150x125mm HB

Scotland

150x175mm SP
150x175mm HB
125x175mm HB works order
125x205mm HB works order

Channels

150x150mm CS
150x100mm CS

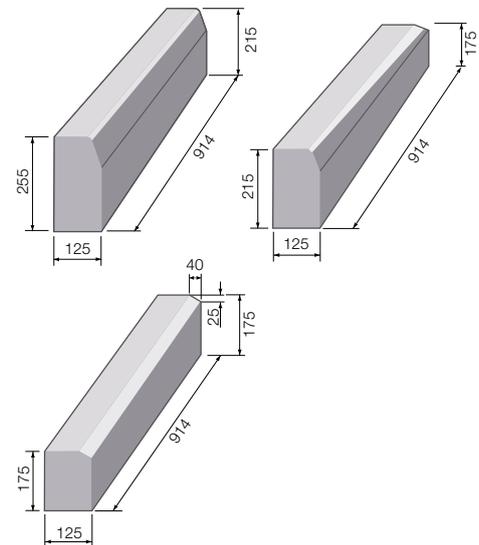
NON-STANDARD DROPPERS AND CROSSING KERB

125x255mm HB – 125x175 SP* (LH) DL
125x255mm HB – 125x175 SP* (RH) DR
125x175mm SP* As Crossing Kerb

Double Pattern

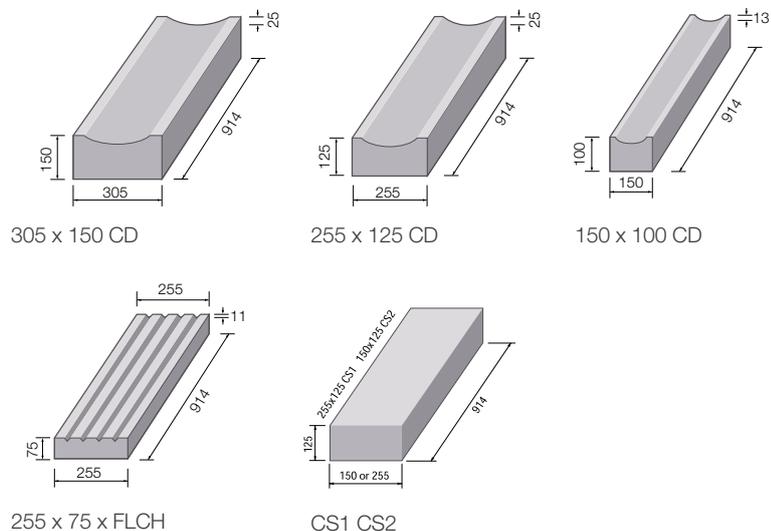
125x255mm HB – 125x215 WRCC (LH)
Order Code WR1
125x215mm HB – 125x175 WRCC (LH)
Order Code WR2
125x215mm HB – 125x175 WRCC (RH)
Order Code WR3
125x255mm HB – 125x215 WRCC (RH)
Order Code WR4

* NB 25mm splay



DISHED, FLUTED AND SQUARE CHANNELS

All units are hydraulically pressed. Dished and square channels as illustrated are normally available from stock. Other channels and dish sizes are available to order in economic quantities.



BRITISH STANDARD KERB, CHANNEL AND EDGING

Pedestrian
TrafficCar & Light
Vehicle
Traffic

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INFO ONLINE

PRODUCT DATA

Unit Type	Flat Top	Flat Top	Flat Top	Bull Nose	Bull Nose	Bull Nose	Round Top	Round Top	Round Top
Length (mm)	914	914	914	914	914	914	914	914	914
Height (mm)	150	205	255	150	205	255	150	205	255
Width (mm)	50	50	50	50	50	50	50	50	75
Weight approx.(kg)	15.00	20.00	27.50	15.00	20.00	27.50	15.00	20.00	40.00
Unit/Pack	40.00	20/40	20.00	40.00	20/40	20.00	60.00	20.00	12.00
Weight Pack (T)	0.60	0.40/0.80	0.55	0.60	0.40/0.80	0.55	0.90	0.40	0.48
Units/LM	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
LM/Pack	36.56	18.28/36.56	18.28	36.56	18.28/36.56	18.28	54.84	18.28	10.97
Shades	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Profile	Flat Top	Flat Top	Flat Top	Bull Nose	Bull Nose	Bull Nose	Round Top	Round Top	Round Top



PRODUCT DATA

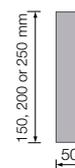
Manufacturing Standard	BS EN 1340
Surface Finish	Cast
Slip Skid	BS EN 1340: USRV >40
Installed To	BS 7533-6



Round top
Edging ER



Flat top
Edging EF



Bullnosed
Edging EBN

1.51 kgCO₂e/m

Up to 23% Recycled content. For more details, see page 158



Manufactured in the UK with locally sourced materials

CO₂ figures are guidelines only, contact CharconTechnical for accurate figures to suit your given application.

ACCESSORIES AND STEPS

Charcon produces a wide range of natural stone and concrete steps to complement our paving and kerb products.

We supply an extensive range of sizes, shades and surface textures, making these paving steps a stylish and practical choice for your project and our technical support team are on hand should you require bespoke sizes, design and installation advice.

All of our steps are easy to install and require little maintenance with excellent durability and toughness. Designed using contrasting materials to maximise visibility and highlight step presence.

Charcon step units and risers are ideal for commercial developments, residential developments, public realm schemes and other pedestrianised areas. We have products that can be selected to use alongside our paving flags to ensure continuity of style, or alternatively they can be used to create an attractive contrasting feature. Whatever the scheme we are confident we have modern and traditional units to meet your project needs.



120-123 PEDESTALS
124 STEP FLAGS
125 STEP UNITS
126-127 CASE STUDY

PEDESTALS NEW PRODUCT



SCAN ME
AND FIND OUT
INFO ONLINE



Pedestrian
Traffic



Life

Pedestrian Traffic

Charcon are dedicated to identifying products that work with our paving to offer the hard landscaping industry complete commercial solutions for all kinds of projects.

Therefore we are delighted that our accessories range now incorporates adjustable pedestal systems for the construction of external terraces (paving and decking) and grating systems.

Our pedestal ranges are seriously strong and are capable of supporting loads of more than 1000kg per pedestal so are the perfect choice of raised floor support system for complex exterior terraces of contrasting materials.

Simple to install with millimetre precision, the PB range can be installed to compensate for up to 5% pitch, or compensate for locally uneven sub-bases up to the same amount. Once pedestals are at the required height, their position can be fixed with unique locking keys from PB4 upwards.

The pedestals and their accessories are equally suited to applications at ground or roof level, from prestigious, highly aesthetic projects to industrial performance orientated applications. We have a team on hand to provide technical expertise and full system design to ensure the installation proceeds on spec, on time and on budget.

PB Pedestals

Adjustable pedestal for any type of terrace or raised floor; the ideal choice for the commercial market.

The PB pedestal is fully adjustable from 18 to 955mm, perfect for creating commercial and residential spaces.

Its ergonomic design makes the PB pedestal easy to adjust and allows quick and reliable installation. The enlarged surface of the head of the PB pedestal is specially adapted for the installation of porcelain tiles and concrete or natural stone pavers of various depths, or timber and composite decking.

The versatility of the system means that they can be used easily for small roof top terraces or large commercial installations.

Key Benefits

- ▶ 80% recycled and 100% recyclable polypropylene, providing a sustainable solution
- ▶ Easy to use and adjust
- ▶ Supports loads in excess of 1000kg per pedestal
- ▶ Extra-large pedestal head is specially designed for high stability
- ▶ Easy access – services running in cavity below can be easily reached, ability to conceal services, such as electrical, plumbing etc.
- ▶ Allows for complete drainage
- ▶ For use at ground level or roof level for many types of paving including natural stone, concrete and porcelain, as well as timber or composite decking

Charcon's Technical Support Team, upon request will provide architects and specifiers with detailed designs and drawings in 2D, and supporting documentation. Product data sheets and technical specifications are available on request.

Charcon can also supply products from the following pedestal ranges:

DPH Series

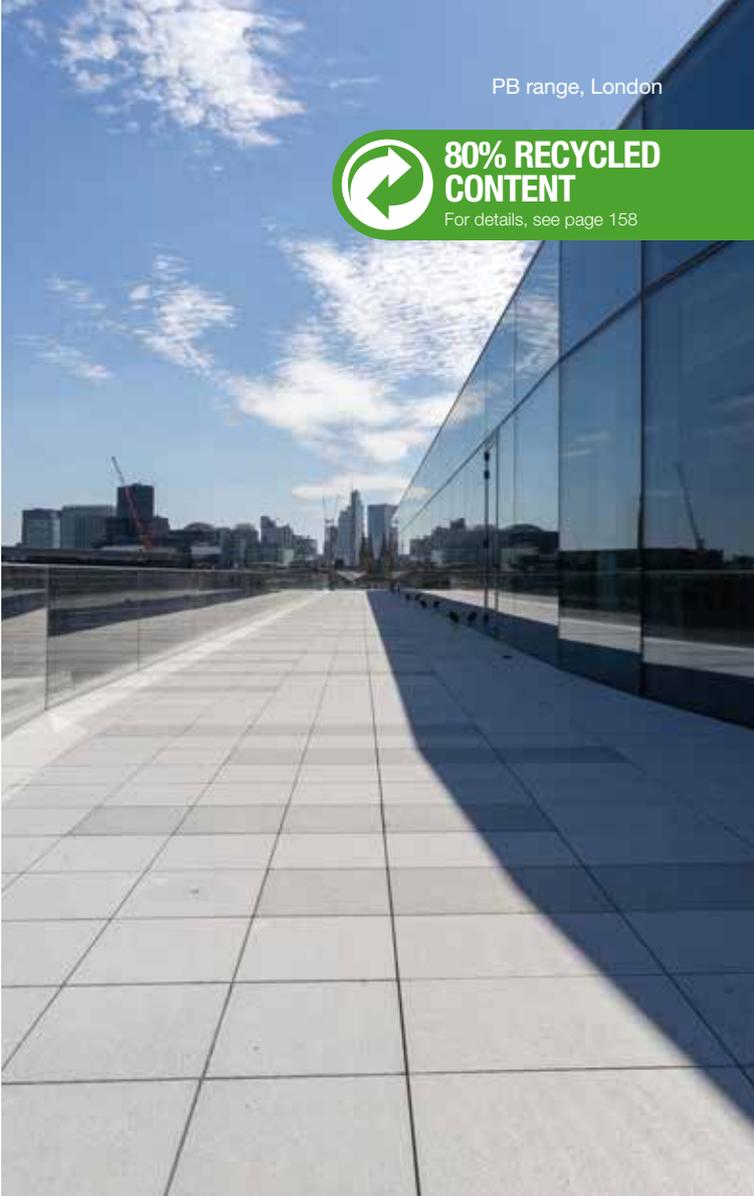
Adjustable support pedestals for floors, walkways and terraces.

The DPH series has integral, easy-to-use slope correction of 5% on every pedestal, which can be increased to 10% with the addition of a base slope corrector. Highly versatile providing multi-application solutions, with easy installation for small roof top terraces or larger commercial installations.

BC FR Series

New class B fire-rated adjustable support pedestals for floors, walkways, terraces and plant room floors. BC pedestal range has an adjustable height of 28 to 1130mm. Please contact our dedicated sales team for technical advice and more information.

 **80% RECYCLED CONTENT**
For details, see page 158



PEDESTALS NEW PRODUCT



SCAN ME
AND FIND OUT
INFO ONLINE



Pedestrian
Traffic



Life

Product Code	Product Description - Pedestals (PB)	Height
CHA PB0	15mm Pedestal without integrated slope corrector (Non-Adjustable Pedestal)	15mm
CHA PB0/S18	18-28mm Pedestal without integrated slope corrector	18-28mm
CHA PB01	28-42mm Pedestal without integrated slope corrector	28-42mm
CHA PB1	42-60mm Pedestal without integrated slope corrector	42-60mm
CHA PB2	60-90mm Pedestal without integrated slope corrector	60-90mm
CHA PB3	90-145mm Pedestal without integrated slope corrector	90-145mm
CHA PB4	145-245mm Pedestal without integrated slope corrector	145-245mm
CHA PB5	230-315mm Pedestal without integrated slope corrector	230-315mm
CHA PB6	285-367mm Pedestal without integrated slope corrector	285-367mm
CHA PB7	365-480mm Pedestal without integrated slope corrector	365-480mm
CHA PB8	480-595mm Pedestal without integrated slope corrector	480-595mm
CHA PB9	560-715mm Pedestal without integrated slope corrector	560-715mm
CHA PB10	675-830mm Pedestal without integrated slope corrector	675-830mm
CHA PB11	755-955mm Pedestal without integrated slope corrector	755-955mm
CHA C1 Coupler	C1 Coupler to extend pedestal for PB5, 6, 8 and 10	Various
CHA C2 Coupler	C2 Coupler to extend pedestal from PB7-11	Various
CHA PB Tabs3	3mmx17mm Spacer Tab PB	17mm
CHA PB Tabs4.5	4.5mmx17mm Spacer Tab PB	17mm

To add slope correction to the PB range use the CHA BU PH5

Product Code	Product Description - Accessories	Height
CHA Buzon Level	Buzon Level (0-5%) setting out tool	
CHA BC-E10	Rubber Shim - 1mm	1mm
CHA BC-E20	Rubber Shim - 2 mm	2mm
CHA RS3	Protector Pad - 3mm	3mm
CHA RS5	Protector Pad - 5mm	5mm
CHA BU-Wall	U-Wall	3mm
CHA BU-Edge	U Edge for cuts from 20-140mm	10mm
CHA BU-E10	Wall U Edging Shim - 1mm	1mm
CHA BU-E20	Wall U Edging Shim - 2mm	2mm
CHA BU-Tabs	Tabs for U Edge 3 or 4.5mm	17mm
CHA BU PH5	Slope Corrector for use with BC, DPH and PB	14mm
CHA PB-shim-4mm	PB 4mm shim stackable up to 3 high	4mm

PEDESTALS NEW PRODUCT

Product Code	Product Description - Pedestals (DPH)	Height
CHA DPH0	17mm Pedestal without integrated slope corrector (Non Adjustable) to add slope correction order the PH5E	17mm
CHA PB0/S18	18-28mm Pedestal without integrated slope corrector	18-28mm
CHA DPH1	28mm Pedestal without integrated slope corrector (Non Adjustable) to add slope correction order the PH5E	28mm
CHA DPH02	25-36mm Pedestal without integrated slope corrector to add slope correction order the PH5E	25-36mm
CHA DPH02/PH5	33-44mm Slope Pedestal	33-44mm
CHA DPH2	35-53mm Pedestal without integrated slope corrector to add slope correction order the PH5E	35-53mm
CHA DPH2/PH5	44-57mm Slope Pedestal	44-57mm
CHA DPH3	50-78mm Pedestal without integrated slope corrector to add slope correction order the PH5E	50-78mm
CHA DPH3/PH5	55-79mm Slope Pedestal	55-79mm
CHA DPH4	77-108mm Slope Pedestal	77-108mm
CHA DPH5	100-175mm Slope Pedestal	100-175mm
CHA DPH6	175-285mm Slope Pedestal	175-285mm
CHA DPH7	285-400mm Slope Pedesta	285-400mm
CHA DPH8	355-515mm Slope Pedestal	355-515mm
CHA DPH9	465-625mm Slope Pedestal	465-625mm
CHA DPH10	545-740mm Slope Pedestal	545-740mm
CHA DPH11	645-850mm Slope Pedestal	645-850mm
CHA DPH12	720-960mm Slope Pedestal	720-960mm
CHA DPH13	830-1070mm Slope Pedestal	830-1070mm
CHA C2 Coupler	C2 Coupler to extend pedestal from DPH6 - DPH13	Various
CHA C5 Coupler	C5 Coupler to extend pedestal from DPH7 - DPH13	Various
CHA DPH Tab3	3mm DPH Spacer Tabs	17mm
CHA DPH Tab4.5	4.5mm DPH Spacer Tabs	17mm
CHA PH5E	Slope Corrector for use with DPH0 & DPH1, and DPH2 & DPH3 without slope correction	9mm

Use a CHA BU PH5 to add a further additional slope correction of up to 5% to the DPH range (not compatible with DPH0 or DPH1).

STEP FLAGS



SCAN ME
FIND OUT MORE
INFO ONLINE



Pedestrian
Traffic



Charcon produces a wide range of natural stone and concrete steps to complement our paving and kerb products, the offering is across our most popular paving ranges, including StoneMaster®, Andover, Moordale® and Eco Countryside® Kerb. Recycled content is dependent on the paving product used. For more details on bespoke or stock step items, please contact our technical team on **01335 372216** or visit **www.charcon.com**

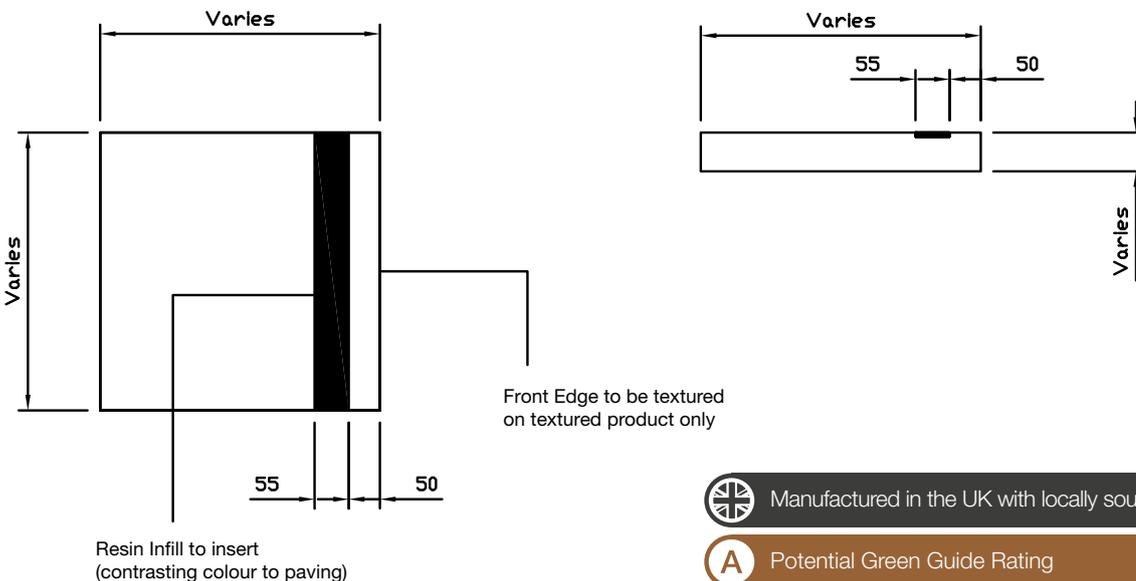
**RECYCLED CONTENT DEPENDENT
ON MATERIAL USED**

For details, see page 158



Moordale® Textured in Grey with Moordale® Textured Step Unit, Southmeads, Bristol

TYPICAL FLAG STEP UNIT



Manufactured in the UK with locally sourced materials



Potential Green Guide Rating

STEP UNITS



SCAN ME
FIND OUT MORE
INFO ONLINE

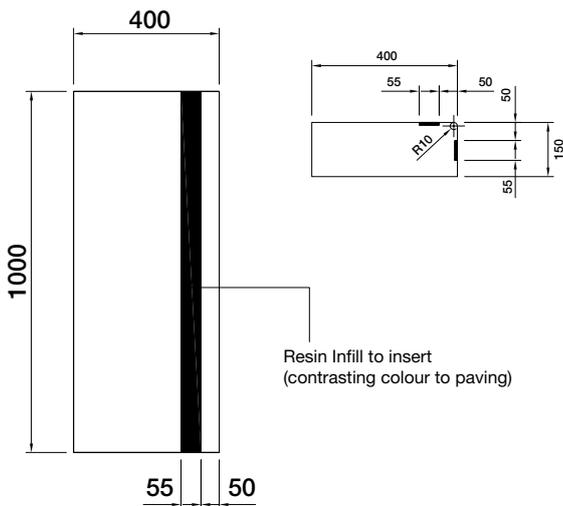


RECYCLED CONTENT DEPENDENT ON MATERIAL USED

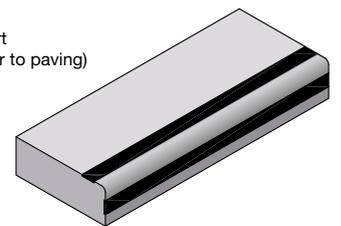
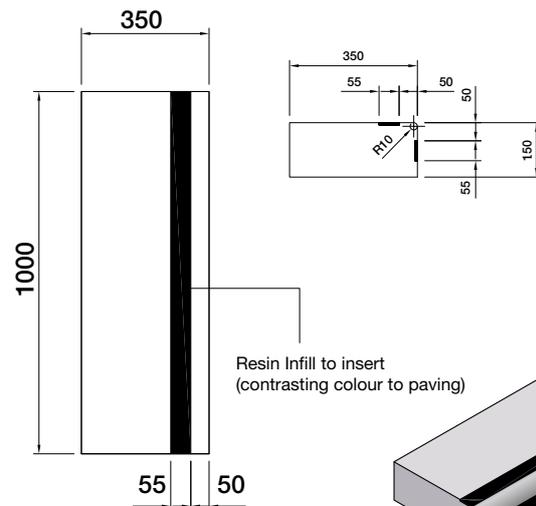
For details, see page 158

Step Unit 400 in Silver Fleck, Birley Fields, Manchester

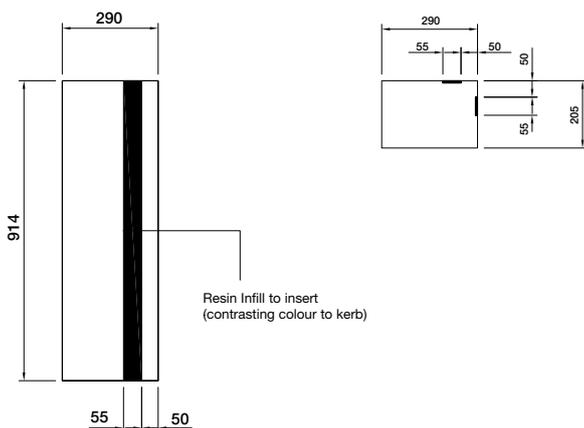
STEP UNIT 400 NEW PRODUCT



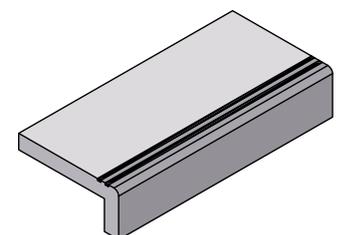
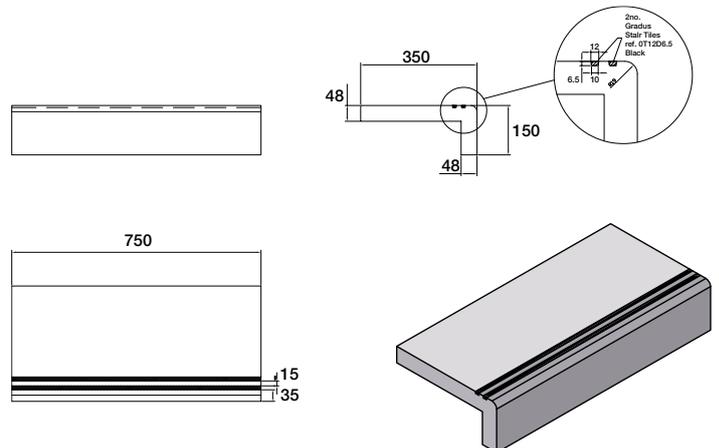
STEP UNIT 350 NEW PRODUCT



STEP UNIT 290



STEP CLADDING UNIT



CASE STUDY

UNIVERSITY OF SUSSEX

EAST SLOPE

The University of Sussex's East Slope development, a mix of new townhouses and flats, is bringing its accommodation up-to-date and in line with the expectations of its students. The new housing, creating a new student village of 2,100 units to replace about 590 outdated student bedrooms built in the 1970s, is part of the University's wider commitment to developing outstanding infrastructure and amenities on campus.

THE BACKGROUND

Some of the buildings have communal space for common rooms and laundry space at ground level, acting as a hub for people to meet and socialise. Bookable study rooms are also provided, together with secure cycle parking.

The contractor started work on site in January 2017. They are building the new accommodation in phases and the first phase opened in September 2018, providing more than 550 bedrooms.

THE CHALLENGE

The topography of the brownfield site suggested a large number of steps to take up the difference in levels but the University did not want to use a standard grey precast concrete step unit, they wanted a product to complement the hard landscaping design.

THE SOLUTION

Charcon's solution was to offer Moordale® Textured paving for hard landscaping and made-to-order step units. Combining textural appeal, durability and economy, Moordale® Textured is a high quality flag paving that contains yorkstone and limestone aggregates to maximise performance and durability.

For further information, visit www.charcon.com
For technical support, please call **01335 372 216**
or email charcon.technical@aggregate.com



INSTALLATION GUIDE

At Charcon we understand that creating a durable, aesthetically appealing paving project not only requires high quality paving materials, it should also deliver longevity with careful consideration given to the installation process.

Careful consideration to the selection of both materials and the installation process is an area where we can give guidance should it be required.

We can supply a range of standard installation details for all of our product range and are able to advise on a wide range of site related installation issues. Drawing on many years of experience, our teams have in depth knowledge of the guidance documents available such as Interpave and BS7533 as these are an invaluable source of information.

We can offer a range of assistance with both the selection of and materials used for installation.



DESIGN CONSIDERATIONS

DESIGN

Laying design can make a significant contribution to the overall appearance of the area to be paved. The options for distinctive end-results, whether from patterning of an individual product, or via combinations of products and shades are almost infinite.

This section is, therefore, necessarily confined to basic principles only, from which designs to suit specific projects may be individually developed.

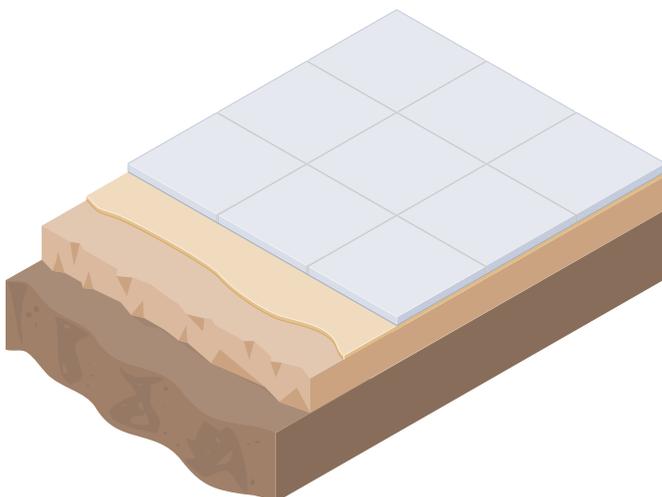
PRELIMINARY CHECKS

Ensuring that the specified paving system is suitable for its intended purpose is a fundamental requirement. Before deciding on laying design, it is advisable to validate product selection against anticipated traffic, loadings etc.

The following checklist may, therefore, be helpful:

- ▶ Is the paving area designated for pedestrian use only – or is any vehicular trafficking likely?
- ▶ Will any vehicular trafficking:
 - ▶ Be occasional overrun only, or regular?
 - ▶ Be limited to cars only?
 - ▶ Include light commercial vehicles?
 - ▶ Emergency vehicular overrun?
 - ▶ Extend to HGV / heavy duty loading?
- ▶ Accordingly, under normal service conditions, does the selected paving meet the necessary criteria in terms of strength, thickness and declared trafficability?

Note: In addition to trafficking principles it is recommended that ground paving should not be used in areas with significant gradients or in internal applications immediately adjacent to an external entrance.



GENERAL PRINCIPLES

Design and overall looks may be influenced by choices within one or more of the following:

Laying patterns

The principle patterning styles are as listed and illustrated. However, there are other related choice factors which may be influential on final laying design and contribute attractive visual results. These include:

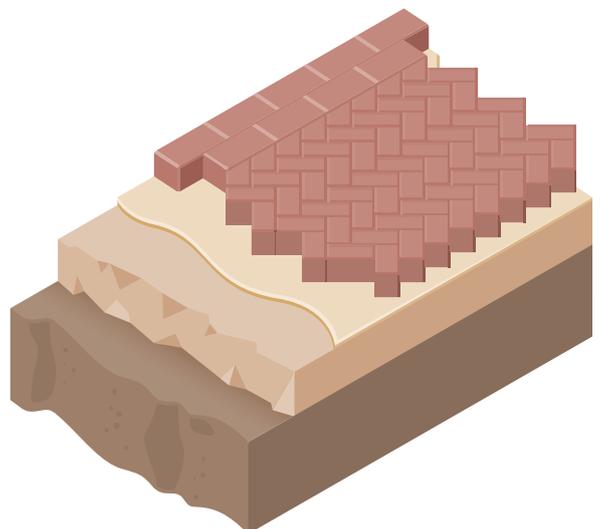
- ▶ Complementary combinations of two or more paving types/products (instead of sole use of just one paving type/product)
- ▶ Combinations of two or more patterns or styles
- ▶ The use of such variations for functional zoning (e.g. to denote designated walkways) as well as decorative effect

Colour contrasts

Differing shades of the same, or a complementary paving product, may similarly be used for zoning purposes or simply to add to the aesthetic appeal of the end-result.

Edge restraints/detailing

All paved areas require strong and stable edge restraints (see Kerb section, pages 136-137). Wherever selected patterning results in an irregular perimeter, edge detailing for the paved area needs to be pre-planned to ensure neat finishing against kerbing, walling or other adjoining areas.



LAYING PATTERNS

Edge details

Edge detailing requirements are largely dependent on the adopted laying style. Certain patterns resulting in irregular edges can be completed by cutting units to fit. In some cases, however, this is difficult or unsatisfactory because only very small cut-pieces would be required to abut kerbs or other edge restraints.

Stretcher courses

Such cases can be resolved by planning perimeter stretcher courses to 'frame' or part-border the main paved area in question. Stretcher courses may also be planned for other laying patterns for purely aesthetic reasons.

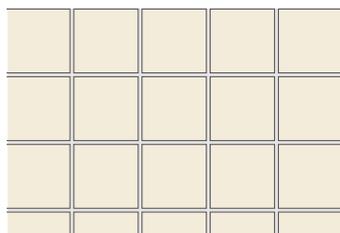


Fig.1 Chequerboard
Suitable for areas where there is no vehicular overrun

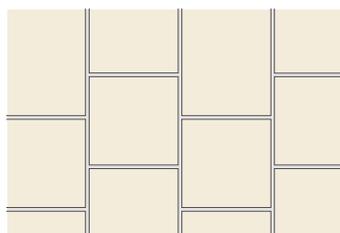


Fig.2 Transverse Stretcher Bond
Suitable for areas where there is occasional overrun

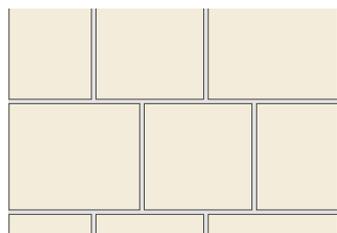


Fig.3 Longitudinal Stretcher Bond
Suitable for areas where there is occasional overrun

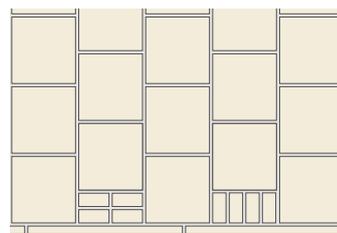


Fig.4 Stretcher Bond with Block Infill
Suitable for areas where there is occasional overrun

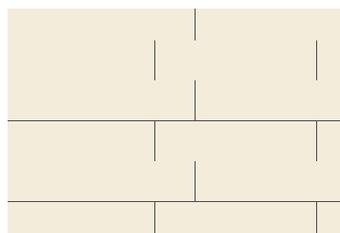


Fig 5: Stretcher Bond
Suitable for pedestrian and very lightly trafficked areas only.

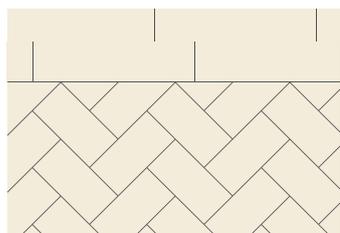


Fig 6: 45° Herringbone
60mm block thickness: Suitable for pedestrian and occasional vehicular overrun (maximum of five commercial vehicles per day)
80mm block thickness: Regular heavy traffic (over five commercial vehicles per day)

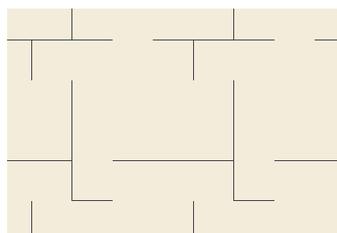


Fig 7: 90° Herringbone
60mm block thickness: Suitable for pedestrian and occasional vehicular overrun (maximum of five commercial vehicles per day)
80mm block thickness: Regular heavy traffic (over five commercial vehicles per day)

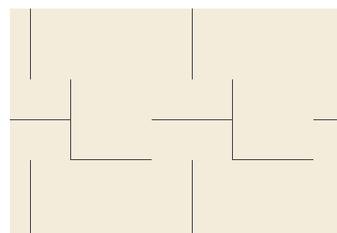


Fig 8: Basket Weave
Suitable for pedestrian traffic only.

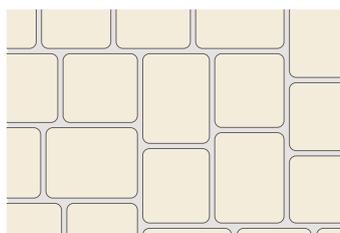


Fig 9: Offset Herringbone (Woburn/Andover/StoneMaster®)
60mm block thickness: Suitable for pedestrian and occasional vehicular overrun (maximum of five commercial vehicles per day)
80mm block thickness: Regular heavy traffic (over five commercial vehicles per day)



Fig 10: Single-sized Herringbone (Woburn/Andover/StoneMaster®)
60mm block thickness: Suitable for pedestrian and occasional vehicular overrun (maximum of five commercial vehicles per day)
80mm block thickness: Regular heavy traffic (over five commercial vehicles per day)



Fig 11: Random Stretcher Bond (Woburn/Andover/StoneMaster®)
Suitable for pedestrian and occasional vehicular overrun (maximum of five commercial vehicles per day)



Fig 12: Stretcher bond shown with inset manhole cover detail

FLAG INSTALLATION

DESIGN STANDARDS

All installations should be detailed and constructed in accordance with the relevant British Standard. This is BS7533: Part 4 for installation. For structural design, please refer to either BS 7533 Part 8 and Part 12 or the Interpave Design Guide.

PREPARATION (ALL FLAGS)

Sub-grade

Clear top-soil: complete sub-grade drainage.
Excavate and back-fill soft spots: compact well throughout.
Protect sub-grade from adverse weather.
Lay geotextile fabric or capping layer (if specified/required).

Sub-base

Prepare in accordance with the Specification for Highway Works.
Lay and compact in layers to a close-textured finish. Open-textured sub-bases may require a binding layer of finer material.

General principles

Lay paving immediately on prepared bedding, do not leave bedding exposed to weather and/or overnight. To avoid bedding layer damage and creep, lay paving units up slopes and/or away from edge restraints.

Stand on previously laid paving when placing next row.

LAYING

Select site category

1. Heavy duty applications of more than 60 commercial vehicles per day (over 1.5T unladen)
2. Medium duty applications of 60 or less commercial vehicles.
3. Medium-light duty applications – 5 or less commercial vehicles per day.
4. Light duty applications – no commercial vehicles.

Select laying method

1. Flags laid rigidly for all categories
2. Flags laid rigidly for category 4 only
3. Flags laid flexibly for categories 2, 3, 4.

LAYING METHOD

1. Flags laid rigidly for all categories

For this category, a hydraulically bound road base should be used and should be designed in accordance with the relevant standard (see above).

The back of the flag and top surface of the roadbase should be primed to ensure a good bond. The laying course material should be a modified mortar as specified in BS 7533: Part 4 and spread to give a depth of 30mm after compaction. Cement sand mortars are not suitable for use in this method.

The flags should be laid with a 6-10mm joint. A minimum of 12 hours after laying, the flags should be thoroughly wetted and the jointing material, as specified in BS 7533: Part 4 in slurry form, is spread over the entire surface. The material should be moved towards the open joints.

Once the joints are full, the flags should be wetted again and a squeegee used to remove excess mortar. The area should not be open to traffic until the bed and joints have reached sufficient strength.

Further guidance on the installation and mixing procedure should be sought from the mortar supplier.

2. Flags laid rigidly for category 4 only

The laying course should consist of a workable mix of 1:3 cement sand mortar, thickness between 15 and 30mm after compaction. The flags should be laid with a 6-10mm joint. These should be filled within 2-3mm of the surface of the flag with a 1:4 cement sand mortar and pointed as work proceeds. The flags should be compacted down using a paviors maul.

3. Flags laid flexibly for categories 2,3,4

The laying course should be fine aggregate to BS EN 12620 Gf 85 0/04(mp). The thickness of the laying course after compaction should be 30mm.

This can be done by either:

1. Screeding the material to give the required depth after compaction. (A small trial area may be required to determine the amount of surcharge). The top 10mm should then be loosened with a rake.
2. 30mm of laying course material should be screeded out and compacted. Then a further 10mm of loose material screeded out on top. The flags should be laid with a 2-5mm joint that is filled with kiln dried silica sand to BS EN 12620 Gf85 0/04 (mp).

Note: the gradings for the laying course material and joint filling material may be found in BS 7533: Part 4.

The flags should be compacted using a vibrating plate compactor fitted with a neoprene sole plate to protect some flags with special finishes in accordance with BS 7533: Part 4. Top up the joints with Kiln Dried Silica sand as necessary and during early life. After laying light coloured paving on site, care should be taken to protect from dirt and detritus while the remaining construction works are completed.

CBP INSTALLATION

DESIGN STANDARDS

All installations should be detailed and constructed in accordance with the relevant British Standard. This is BS7533: Part 3 for installation. For structural design, please refer to either BS 7533 Part 1 & 2 or the Interpave Design Guide.

PREPARATION

Sub-grade

- ▶ Clear top-soil: complete sub-grade drainage
- ▶ Excavate and back-fill soft spots: compact well throughout
- ▶ Protect sub-grade from adverse weather
- ▶ Lay geotextile fabric or capping layer (if specified/required)

Sub-base

- ▶ Prepare in accordance with Specification for Highway Works
- ▶ Lay and compact in layers to a close - textured finish
- ▶ Open-textured sub-bases may require a binding layer of finer material

LAYING

General principles

Lay paving immediately on prepared bedding: do not leave bedding exposed to weather or overnight. To avoid bedding layer damage and creep, lay paving units up slopes and/or away from edge restraints. Stand on previously laid paving when placing next row.

Block and sett paving

Lay fine aggregate laying course (to BS EN 12620 Gf85 0/4mp) to a final compacted thickness of 30mm (in accordance with BS 7533: Part 3).

This can be done by either:

1. Compacting 30mm of fine aggregate and screeding a further 15-20mm of loose fine aggregate. (A small trial area may be required to determine the actual surcharge).

Or

2. 39-44mm loose fine aggregate screeded to accept blocks.

- ▶ Lay blocks hand tight (2-5mm joints)
- ▶ Bed blocks with vibrating plate compactor fitted with a neoprene sole plate to protect some blocks with special finishes
- ▶ Brush-fill joints with kiln dried silica sand to BS EN 12620 Gf85 0/04 (mp)
- ▶ Vibrate surface again to assist joint filling
- ▶ If necessary during early life top up joints with kiln dried silica sand to BS EN 12620 Gf85 0/04 (mp) to within 1mm of working face by brushing surface

FOR COUNTRYSETTS

(PEDESTRIAN):

- ▶ Lay setts in traditional stretcher bond with 6-10mm width joints
- ▶ Ram well into bedding
- ▶ Cut setts as necessary for obstructions etc. (minimum cut lengths: 75mm): dress top arris of cut pieces with a lump hammer to give rounded top edge
- ▶ Fill top joints with limestone dust (approx. 3-4mm down) and ram down. Alternatively, use weak dry sand/cement mix, 1:9 mix)

Note: to prevent mortar staining, keep setts dry during joint filling

- ▶ Sweep clean, then moisten with watering can fitted with a medium rose

FOR COUNTRYSETTS (VEHICULAR):

- ▶ Lay as traditional granite setts on minimum 100mm of ST1 concrete
- ▶ Bed on 25mm Class 1 mortar with 6-10 mm class 1 mortar joints

GRASSGRID DESIGN CONSIDERATIONS

GENERAL PRINCIPLES

Installation design for Grassgrid Ground Reinforcement system varies according to the following factors:

- ▶ Application type
- ▶ Anticipated loadings (if trafficked)
- ▶ Nature of existing sub-grade
- ▶ Degree of gradient (if relevant to application type)

APPLICATION TYPES

Vehicular traffic including:

- ▶ Pedestrians
- ▶ Private cars
- ▶ Light commercial vehicles (including light aircraft)
- ▶ Emergency vehicle access
- ▶ Maintenance vehicles access
- ▶ HGV applications
- ▶ Overspill car parks

Gradients including:

- ▶ Cuttings/slopes
- ▶ Motorway embankments
- ▶ Spillways (for flood control works)

Water courses including:

- ▶ River bed reinforcement
- ▶ Restraining bank construction
- ▶ Existing bank stabilisation

LAYING DESIGN

The recommended laying design of Grassgrid units is influenced by the specific application type and circumstances:

Vehicular traffic

Half-bonded – preferably in a restrained area.

Edge restraints

Edge restraints are recommended wherever possible, especially for heavier loading applications.

Sub-grade

Stability of sub-grade needs to be assessed as this will affect sub-base requirement.

Sub-base

If sub-grade is stable:

- ▶ No sub-base required (for lighter loadings only) (see Fig 1)

If sub-grade is not stable:

- ▶ Material: granular sub-base type 1

For heavier traffic applications: see Fig 2 and refer to our Technical Department for guidance

Laying course

Material: sharp sand and (if available) loam (1:1 mix).

Compacted depth: 20mm.

GRADIENTS

Edge restraints are recommended in all applications.

With edge restraint:

Half-bonded laid up slope, starting from an edge restraint along foot of gradient (see Fig 3).

Sub-grade

Condition of the sub-grade needs to be assessed as this will affect sub-base requirement. It should be stable, compact and rock-free.

Sub-base

If sub-grade is stable:

- ▶ No sub-base required. Grassgrid may be laid directly onto sub-grade

Laying course

Required if laying on sub-base, otherwise optional:

- ▶ Material: sharp sand and (if available) loam (1:1 mix)
- ▶ Compacted depth: 20mm

Without edge restraint:

Staggered vertical jointing plus every 2nd or 3rd row staked with 500mm propriety high pressure impregnated timber pegs of minimum length 500mm or propriety galvanised steel pins to ensure stability.

Edge restraints are required for all gradients unless shore restraint pins are used (see under Laying design and Figs 3 and 4).

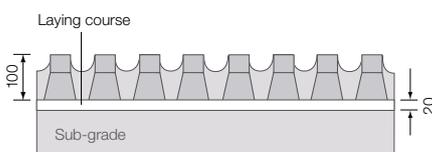


Fig 1. Light vehicular trafficked – no sub-base.

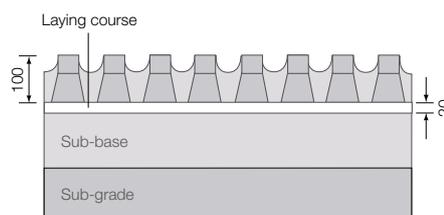


Fig 2. Heavier trafficked – with sub-base.

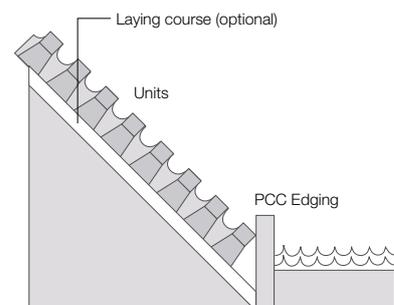


Fig 3. Gradients – with edge restraint.

WATER COURSES FOR RIVER/CANAL BANKS:

Staggered vertical jointing plus every 2nd or 3rd row staked with 500mm wood or metal pins to ensure stability.

Edge restraints

Not normally required (see under Laying design).

Sub-grade

Condition of the sub-grade needs to be assessed with extra care. It must be stable before laying.

Sub-base

Not normally required.

Laying course

Material: geotextile membrane (eg. Terram – see Fig 5).

Perforations: (to allow root penetration/ stem reinforcement during growth of reeds and aquatic plants): 0.2-0.4mm (200-400 microns).

Protects sub-soil and prevents erosion by waterflow.

GRASSGRID GROUND REINFORCEMENT INSTALLATION

Sub-base

- ▶ If ground is unstable, prepare sub-base of granular type 1 material
- ▶ If heavier traffic is envisaged, please refer to our Technical Department for guidance

Bedding/laying

- ▶ Prepare 20mm compacted laying course of sharp sand and (if available) loam: mix 50:50
- ▶ Screed lightly and lay units in rows or half-bonded (preferably in restrained area)
- ▶ Tamp down with paviour's maul
- ▶ Fill cavities with Topsoil to BS 3882 General Purpose or Premium Grade to within 30mm of surface: sow with grass seed* and top up cavities with soil to level of surface

*recommended: British Seed Houses Mixture A7.

GRASSGRID MAINTENANCE

Ideally sow seed in Spring and wait 4 weeks minimum before allowing trafficking.

Water regularly to sustain growth and prevent soil shrinkage, especially after heavy trafficking or prolonged dry weather.

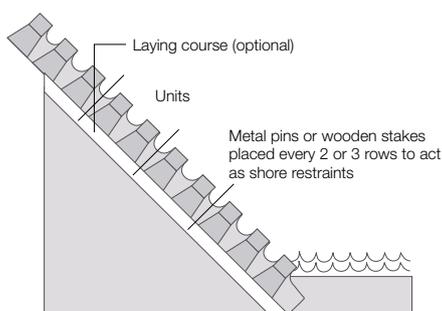


Fig 4. Gradients – with shore restraint pins.

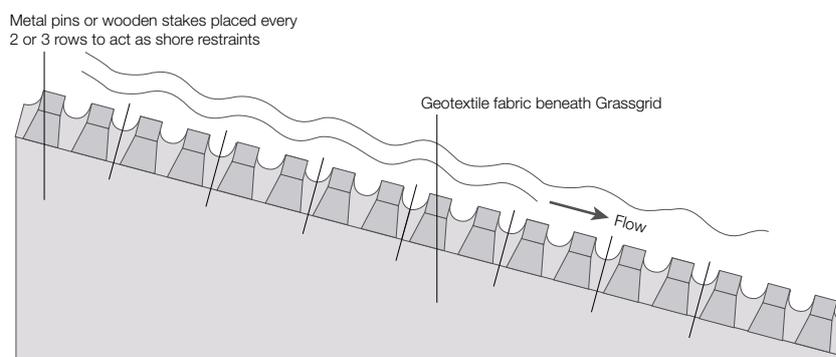


Fig 5. Water courses – with geotextile fabric and shore restraint pins.

KERB INSTALLATION

DESIGN STANDARDS

All installations should be detailed and constructed in accordance with BS 7533: Part 6.

HAUNCHING

All kerbing should normally be haunched with concrete to ensure full stability and support for adjacent paving and to help withstand occasional vehicular impact.

ACCESS KERB

Sub-grade

As for adjoining paved areas.

Sub-base

Material: granular type 1.
Compacted depth: 150mm min to suit application.

Bedding and haunching

Material: concrete (grade ST1).

Minimum dimensions: (see Figs 1a and 1b).

Transitions: use 1 or 2 component transition units as appropriate between Access kerb and standard HB2 kerbing.

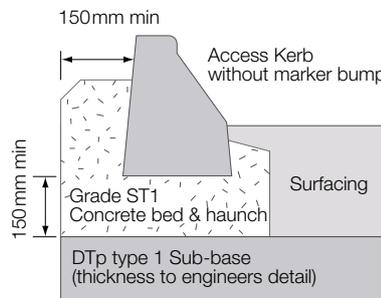


Fig 1a

Note: Excavation width should allow for use of mechanical handling grab on base of Access Kerb (approx. 100mm)

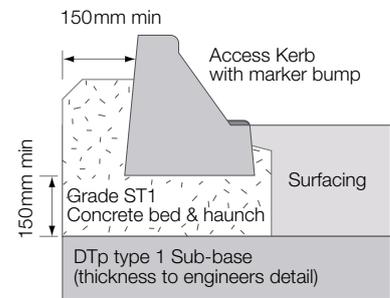


Fig 1b

HGV KERB

Sub-grade

As for adjoining paved areas.

Sub-base

Material: granular sub-base type 1.
Compacted depth: 150mm min to suit application.

Bedding and haunching

Material: concrete (grade ST1)

Minimum dimensions: (see Fig.2).

NOTE: When using HGV with dowel holes, it is necessary to lay the kerbs on a fresh concrete kerb race and hammer the dowel bars into the race after unit is placed. The holes should then be grouted as specified by the engineer (see figs 3 and 4).

Detailing

Radii: Select from 36/12, 11/7, 6/4.5, 3, 2, or 1.5 metre radius units to form required radius kerb-line.

Angles: Select 45°, 60°, or 90° quadrants as required.

Transitions: Use 2-component transitions between HGV kerb and standard HB2 kerbing.

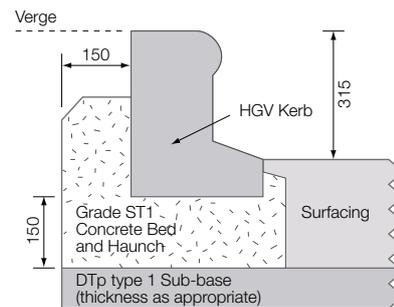


Fig 2. HGV Kerb: bedding/haunching

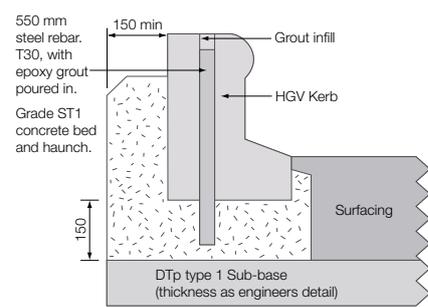


Fig 3. HGV Kerb: HGV with dowel bar detail – typical detail of new installation

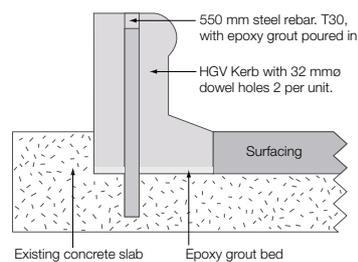


Fig 4. HGV Kerb: HGV with dowel bar – typical detail for use on bridge deck, etc.

K-LITE® TRADITIONAL AND ECO COUNTRYSIDE® CLASSIC KERB

Sub-grade

As for adjoining paved areas.

Sub-base

As for adjoining paved areas.

Material: granular sub base type 1
Compacted depth 150mm min

Bedding and haunching

Material: concrete (grade ST1).

K-Lite® Traditional may be laid to full or half batter: see Fig 6a.

Eco Countryside® Classic minimum dimensions: Bed: 150mm Haunch: 100mm (see Fig 6b).

Detailing

Radii: K-Lite® Traditional: use shorter (290mm or 440mm lengths) units to form radius kerb-line.

Eco Countryside® Classic: Select the radius unit from our table and refer to Technical for installation details

Driveway crossing:

K-Lite® Traditional: (see Fig 7 for unit dimensions).

Eco Countryside® Classic: use left-hand and right-hand droppers with crossing kerb units.

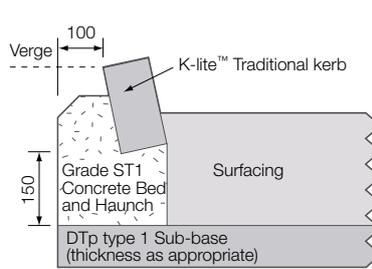


Fig 6a. K-Lite® Traditional kerb: Laid to half batter (can also be laid to full batter or vertically)

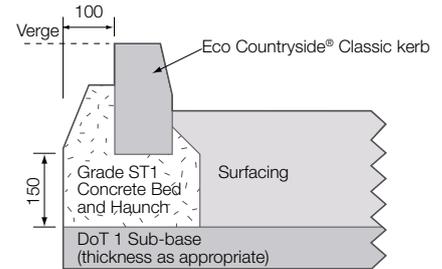


Fig 6b. Eco Countryside® kerb

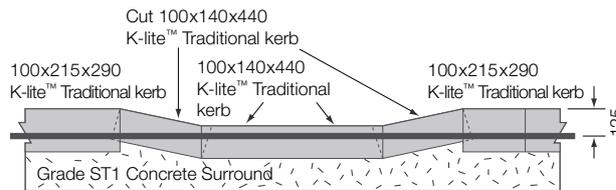


Fig 7. K-Lite® Traditional kerb: crossing detail

Additional design detailing

In addition to those included in this guide, further detailed drawings are available on request from Charcon Hard Landscaping.

Contact Technical Services Department on 01335 372222.

Handling equipment

For appropriate handling and lifting equipment, contact Probst Handling Equipment on 01939 235325

Maintenance

Maintenance requirements are minimal under normal service conditions.

CYCLE KERB

Sub-grade

As for adjoining paved areas.

Sub-base

Material: Granular type 1.
Compacted depth: 150mm min to suit application.

Bedding and haunching

Material: concrete (grade ST1).
Minimum dimensions: to suit application.

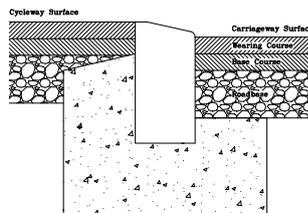


Fig 8. Cycleway Demarcation Kerb

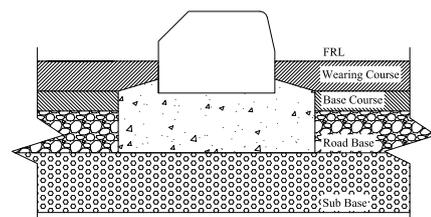


Fig 9. Cycle Segregation Unit 290

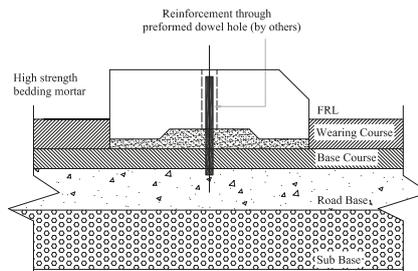


Fig 10. Cycle Segregation Unit 500

DUTCH KERB

Sub-grade

As for adjoining paved areas.

Sub-base

To suit anticipated trafficking.

Bedding and haunching

Minimum material: concrete (grade ST4).
Minimum dimensions: to suit application.

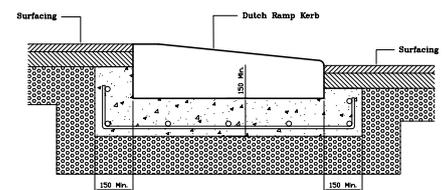


Fig 11. Dutch Kerb

HIGHWAY DESIGN CONSIDERATIONS

GENERAL PRINCIPLES

The aim is to ensure prompt and cost-effective removal of surface water during and immediately after rainfall.

Multiple inlet holes and the continuous u-shaped channel profile enable system design which minimises underground pipework. This can provide a lower-cost solution than traditional gully systems.

SYSTEM CAPACITY

For Highway drainage, identify any flow constraints in advance, including:

- ▶ Vehicular crossings requiring crossing base units
- ▶ Tight radii*
- ▶ Junction units creating turbulent flow*
- ▶ Outlet unit capacity
- ▶ Outfall chamber/pipe capacity
- ▶ Linear grates

Note: *Hydraulic properties given in tables are conservative and so, in most cases, any flow reductions arising from these factors may be ignored in design.

In common with all combined kerb and drainage systems, Highway top and base units will NOT run full due to turbulence from the inlet holes. System flow capacities, given in the table below, are therefore confined to realistic flow levels rather than theoretical/full bore maximum levels. Capacities vary according to type of base unit installed in the system, (standard, shallow, deep or crossing base units – see table below).

Note: Capacity will be reduced over time wherever there is a likelihood of a significant build-up of silt.

Inlet capacity

The capacity of each inlet, maximised when first laid, can be affected by future re-surfacing which may raise carriageway levels above the normal 125mm kerb-face. If so, capacity can be protected by cutting back the surfacing adjacent to each inlet.

Outlet capacity

In practice, capacity requirements can vary according to location of the outlet and the depth of flow within the system. For design purposes, an outlet capacity of 62 litres per second should be adopted. If this capacity is insufficient, more than one outlet unit should be installed to discharge into the outfall chamber.

Outfall chamber/pipe capacity

Outfall discharge capacity should be as large as possible to ensure benefits from the Highway system. In large schemes, gully pots used as outfall chambers may be insufficient because turbulence can reduce capacity levels below that which a standard 150mm outfall pipe can sustain. Where possible, purpose-built chambers (brick or precast manhole rings) are recommended instead to help minimise effects of turbulence on capacity. The appropriate outfall pipe can then be selected to suit the specific case (see adjacent table).

Linear grates

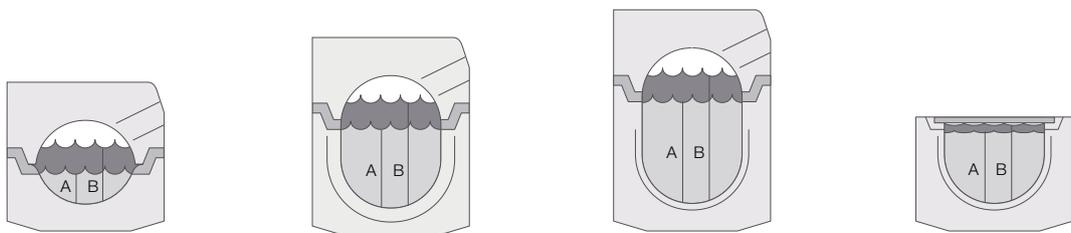
Highway can be used for long runs of linear drainage where high volumes of surface water drainage is required or high wheel loads are imposed.

OUTFALL PIPE CAPACITY

Gradient	Pipe diameter (mm)				
	150	225	300	375	450
1:20 (5%)	42	122	260	468	736
1:40 (2.50%)	29	86	183	330	534
1:60 (1.67%)	24	70	149	268	436
1:80 (1.25%)	20	60	129	233	376
1:100 (1.00%)	19	54	116	208	337



HIGHWAY SYSTEM FLOW CAPACITIES



Gradient	Shallow base unit				Standard base unit				Deep base unit				Crossing base unit			
	To bottom of joint line (A)		To inlet invert inside top unit (B)		To bottom of joint line (A)		To inlet invert inside top unit (B)		To bottom of joint line (A)		To inlet invert inside top unit (B)		To bottom of joint line (A)		To underside of crossing plate (B)	
	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec
1:50 (2.00%)	1.9	39	2.3	97	2.6	171	2.7	236	2.8	244	2.9	310	2.4	115	2.6	178
1:100 (1.00%)	1.3	28	1.6	69	1.9	120	1.9	166	2.0	172	2.0	219	1.7	81	1.8	126
1:200 (0.50%)	0.9	20	1.1	48	1.3	85	1.4	117	1.4	121	1.4	154	1.2	57	1.3	89
1:300 (0.33%)	0.8	16	0.9	39	1.1	69	1.1	95	1.1	99	1.2	126	1.0	46	1.1	72
1:400 (0.25%)	0.6	14	0.8	34	0.9	60	1.0	83	1.0	85	1.0	109	0.8	40	0.9	62
1:500 (0.20%)	0.6	12	0.7	30	0.8	53	0.9	74	0.9	76	0.9	97	0.8	36	0.8	56
1:1000 (0.10%)	0.4	9	0.5	21	0.6	37	0.6	52	0.6	54	0.6	68	0.5	25	0.6	39

Key: vel. = velocity, dis. = discharge

MINI HIGHWAY DESIGN CONSIDERATIONS

GENERAL PRINCIPLES

The aim is to ensure prompt and cost effective removal of surface water during and immediately after rainfall.

Multiple inlet holes and continuous u-shaped channel profile enable system design which minimises underground pipework. This can provide a lower-cost solution than traditional gully systems.

SYSTEM CAPACITY

For Mini Highway drainage, identify any flow constraints in advance, including:

- ▶ Vehicular crossings requiring crossing base units
- ▶ Tight radii*
- ▶ Junction units creating turbulent flow*
- ▶ Outlet unit capacity
- ▶ Outfall chamber/pipe capacity

Note: *Hydraulic properties given in above tables are conservative and so, in most cases, any flow reductions arising from these factors may be ignored in design.

In common with all combined kerb and drainage systems, Mini Highway top and base units will NOT run full due to turbulence from the inlet holes. System flow capacities given in above tables are therefore confined to realistic flow levels rather than theoretical/full bore maximum levels. Capacities vary according to type of base unit installed in the system.

Note: Capacity will be reduced over time wherever there is a likelihood of a significant build-up of silt.

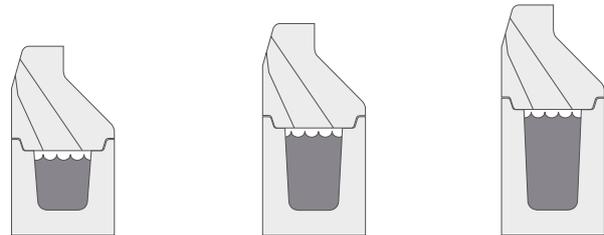
Outlet capacity

In practice, capacity requirements can vary according to location of the outlet and the depth of flow within the system. For design purposes, an outlet capacity of 30 litres per second should be adopted. If this capacity is insufficient, more than one outlet unit should be installed to discharge into the outfall chamber.

Outfall chamber/pipe capacity

Outfall discharge capacity should be as large as possible to ensure benefits from Mini Highway system. In large schemes gully pots used as outfall chambers may be insufficient because turbulence can reduce capacity levels below that which a standard 150mm outfall pipe can sustain. Where possible, purpose-built chambers (brick or precast manhole rings) are recommended instead to help minimise effects of turbulence on capacity. The appropriate outfall pipe can then be selected to suit the specific case (see 'Outfall pipe capacity' table).

MINI HIGHWAY SYSTEM FLOW CAPACITIES



OUTFALL PIPE CAPACITY

Gradient	Pipe diameter (mm)				
	150	225	300	375	450
1:20 (5%)	42	122	260	468	736
1:40 (2.50%)	29	86	183	330	534
1:60 (1.67%)	24	70	149	268	436
1:80 (1.25%)	20	60	129	233	376
1:100 (1.00%)	19	54	116	208	337

Gradient	Base 235		Base 285		Base 335	
	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec	vel. m/sec	dis. l/sec
1:50 (2.00%)	1.7	32	1.8	44	1.8	56
1:100 (1.00%)	1.2	22	1.3	31	1.3	40
1:200 (0.50%)	0.8	16	0.9	22	0.9	28
1:300 (0.33%)	0.7	13	0.7	18	0.7	23
1:400 (0.25%)	0.6	11	0.6	15	0.6	20
1:500 (0.20%)	0.5	10	0.6	14	0.6	18
1:1000 (0.10%)	0.1	2	0.1	3	0.1	4

Key: vel. = velocity, dis. = discharge



Mini Highway

CLEARWAY DESIGN CONSIDERATIONS

GENERAL PRINCIPLES

The aim is to ensure prompt and cost-effective removal of surface water during and immediately after rainfall.

Optimum balance of cost efficiency and performance is achieved by parallel drainage runs at 30-35m intervals across drainage area.

Note: Wider spacing between runs is possible, but (dependent on rainfall intensity) may result in slower removal of surface water and increased costs – for extra outlets and additional underground pipework.

Maximum recommended width of the drained area to any one run is 35 metres.

Choose slot or grid unit options according to type and frequency of anticipated trafficking. While these options do not affect the design of drainage performance, the choice of nominal bore does affect capacity and self-cleansing capability.

SELF-CLEANSING VELOCITY

A flow rate of 0.76 metres per second is normally sufficient to avoid silt settlement in the channel inverts. Longitudinal gradients required to achieve this velocity are: for 150mm bore 0.60% (1:167).

Clearway will operate successfully at slacker gradients, though occasional flushing out may be needed.

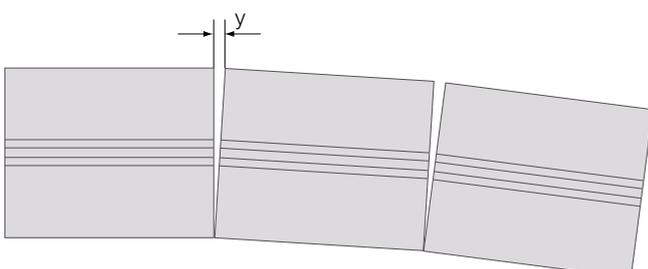
RADII OVER 3.0M

Radius (m)	4	5	6	7	8	10	12	14	16	18	20	25	30
Gap width at surface (mm) Y	30	24	20	17	15	12	10	9	8	7	6	5	4

MAIN UNIT DIMENSIONS

Dimension	(mm)
Length	400
Width (overall)	324
Depth (overall)	257
Nominal bore	150
Inlet options	
Slot drain aperture width	15
Grid aperture width	15
Ductile iron grid width	143

CLEARWAY LAID TO RADII





Clearway drainage within lorry park

SYSTEM DRAINAGE AREAS: GRADIENT AGAINST RAINFALL INTENSITY BY NOMINAL BORE

Gradient	Rainfall intensity (discharge l/s)	Area drained 30mm/hr	Area drained 40mm/hr	Area drained 50mm/hr	Area drained 75mm/hr
Nominal bore (mm)	150	150	150	150	150
1:50 (2.00%)	25.2	3020	2270	1810	1210
1:100 (1.00%)	17.7	2130	1600	1280	850
1:200 (0.50%)	12.5	1500	1120	900	600
1:300 (0.33%)	10.1	1220	910	730	490
1:400 (0.25%)	8.7	1050	790	630	420
1:500 (0.20%)	7.8	940	700	560	370
1:1000 (0.10%)	5.5	650	490	390	260

SAFETICURB® DESIGN CONSIDERATIONS

GENERAL PRINCIPLES

The aim is to ensure prompt and cost-effective removal of surface water during and immediately after rainfall.

Optimum balance of cost efficiency and performance is achieved by parallel drainage runs at 30-35m intervals across drainage area.

Note: Wider spacing between runs is possible, but (dependent on rainfall intensity) may result in slower removal of surface water and increased costs – for extra outlets and additional underground pipework.

Maximum recommended width of the drained area to any one run is 35 metres.

Choose slot or grid unit options according to type and frequency of anticipated trafficking. While these options do not affect the design of drainage performance, the choice of nominal bore does affect capacity and self-cleansing capability.

SELF-CLEANSING VELOCITY

A flow rate of 0.76 metres per second is normally sufficient to avoid silt settlement in the channel inverts. Longitudinal gradients required to achieve this velocity are: for 125mm bore 0.75% (1:133).

Safeticurb® will operate successfully at slacker gradients, though occasional flushing out may be needed.

Safeticurb®, Derby



SYSTEM DRAINAGE AREAS: GRADIENT AGAINST RAINFALL INTENSITY BY NOMINAL BORE

Gradient	Rainfall intensity (discharge l/s)	Area drained 30mm/hr	Area drained 40mm/hr	Area drained 50mm/hr	Area drained 75mm/hr
Nominal bore (mm)	125	125	125	125	125
1:50 (2.00%)	15.1	1860	1400	1120	740
1:100 (1.00%)	10.9	1310	980	790	520
1:200 (0.50%)	7.7	920	690	550	370
1:300 (0.33%)	6.2	750	560	450	300
1:400 (0.25%)	5.4	650	480	390	260
1:500 (0.20%)	4.8	580	430	350	230
1:1000 (0.10%)	3.3	400	300	240	100

Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN	Unit weight (kg)
Main units							
DBA/125	•	•					102
DBM/125	•	•	•	•	•	•	106
DBG/DI/125	•	•	•	•			107
DBK HB2/125	•	•	•	•			129
Accessories							
Type A silt box top	•	•	•				115
Type H silt box top	•	•	•	•	•	•	148
Inspection unit DBG/DI/125	•	•	•	•			107
Inspection unit kerb HB2/125	•	•	•	•			129
Manhole cover kerb HB2/125	•	•	•	•			175
Transition kerb HB2/125	•	•	•	•			109

• indicates suitability

Key to unit abbreviations:

HB half batter, DI ductile iron

BS EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

Class D (400kN): Public highways and general parking areas.

(Note: Grid systems should not be used for fast moving traffic.)

Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.

INSTALLATION DESIGN: RADII, CROSSINGS, JUNCTIONS AND BENDS

RADII

Highway/Mini Highway

- ▶ To form external radii of 25 metres or less (minimum 6 m), special radius units should be used (see table, right). As these do not cover all individual radius dimensions, some slight gaps are required between units as indicated in Highway radii gap widths table, right
- ▶ For external radii greater than 25 metres, lay straight units with open joints
- ▶ To form internal radii (minimum 6m internal radius) use internal radius units

Clearway/Safeticurb®

- ▶ Where necessary, standard (straight) units may be laid to form radii or bends
- ▶ Safeticurb® units: alignment ring within bore acts as a former for infill mortars

CROSSINGS

Highway/Mini Highway

- ▶ Use crossing base units to carry drainage runs under side roads/vehicular crossing points (see Fig 1) Grid units available (see Fig 6)

Safeticurb® (DBK unit only)

- ▶ To continue linear drainage at road junctions, kerb crossing points (pedestrian/vehicular), use transition units to reduce kerb height to road level. These connect with standard grid or slot units as necessary

JUNCTIONS/SHARP BENDS

Clearway/Safeticurb®

- ▶ Use silt box top at outlets or with suitable uPVC pipe fittings (cut to fit) to form junctions or sharp bends (see figs 15a and 15b - page 149.)

HIGHWAY RADII GAP WIDTHS

Radius (m)	Radius unit reference	Top and base gap
6	7/6	2
7.5	10/8	3
9	10.8	2
10.5	25/11	4
12	25/11	1
15	25/11	2
20	25/11	5
25	25/11	7
26	Straight	7

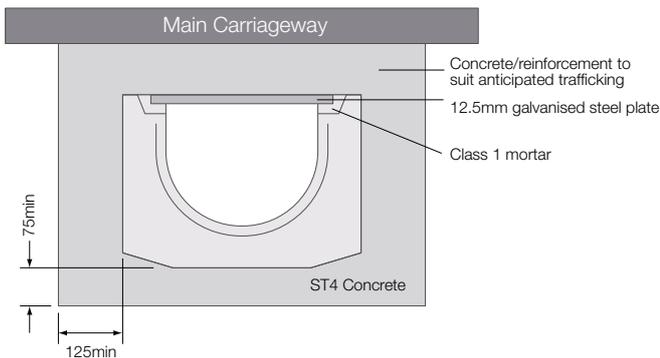


Fig 1. Highway crossing – base unit

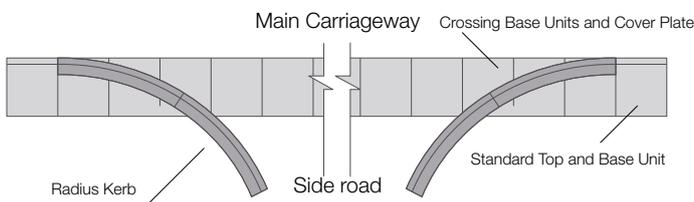


Fig 3. Highway – typical side road (plan view)

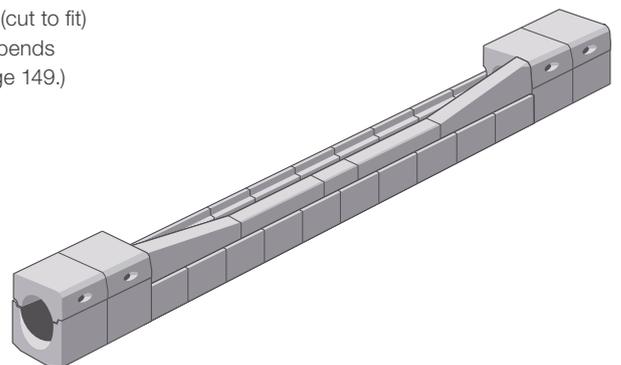


Fig 2. Highway – typical kerb crossing

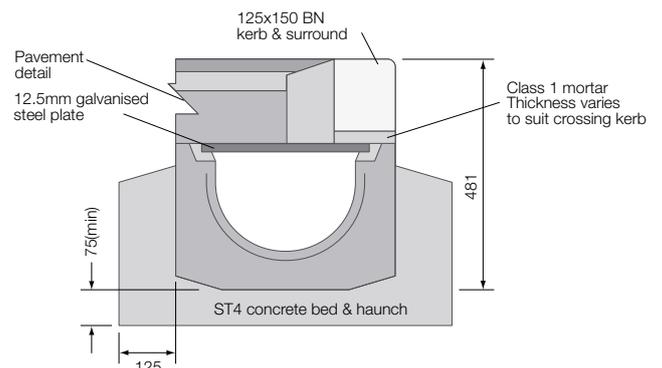


Fig 4. Highway – vehicular crossing

INSTALLATION DESIGN-UNITS

GENERAL PRINCIPLES

All units are unreinforced: protect from stresses caused by thermal expansion of cementitious paving materials. Leave 1mm gap between each unit to prevent damage from thermal expansion of the units themselves.

Expansion joints MUST be installed on each side of drainage runs in concrete pavements or those incorporating a cement bound/lean mix concrete roadbase.

DO NOT place these joints directly adjacent to any trafficked unit as this would allow units to rock under trafficking and may allow water ingress into the base or sub-grade. Recommended position of joints (minimum distances):

- ▶ 600mm from Clearway/Safeticurb® units (see Figs 11-13)
- ▶ 125mm from Highway units (see Figs 5-6)

Note: As Highway units are not regularly trafficked, expansion joints could be placed directly against them. However, 125mm distance is recommended to avoid ingress of water between the unit and carriageway construction.

BASE FOUNDATIONS

Recommended typical foundations are:

For Clearway/Safeticurb®

- ▶ Minimum 150mm depth of ST4 concrete with a 25mm bed of Class 1 mortar (1:3 cement: sand) to allow easy adjustment of units to line and level

For Highway

- ▶ Minimum 75mm of concrete

Note: Strength, overall depth and width of the base may need to be increased when laid on low - strength sub-grades.

For Mini Highway

- ▶ Minimum of 100mm depth of ST4 concrete

HAUNCHING

Recommended typical haunches (to within 100mm of top unit) are:

For Clearway / Safeticurb® / Mini Highway

- ▶ ST4 concrete

For Highway

- ▶ ST1 concrete minimum 125mm width

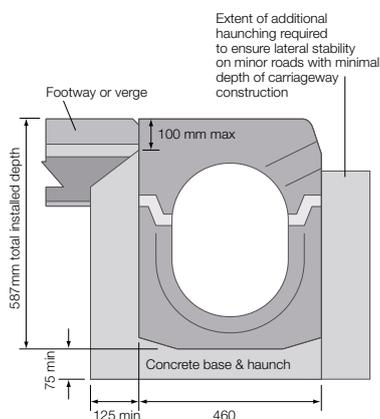


Fig 5. Standard top base unit

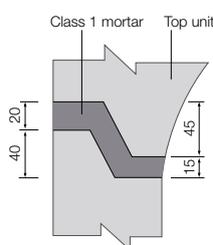


Fig 5a. Highway joint detail

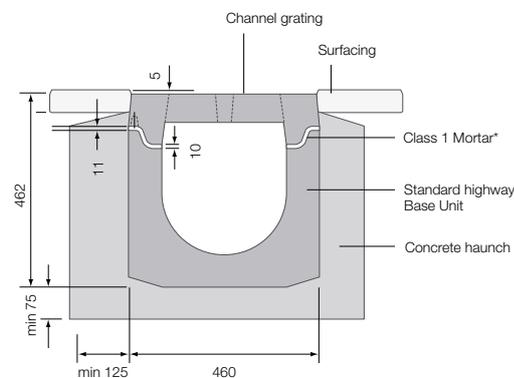


Fig 6. Channel grating/concrete drainage top

INSTALLATION DESIGN-UNITS

MINI HIGHWAY

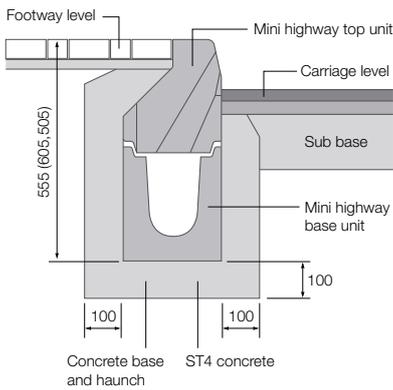


Fig 7. Mini Highway standard installation

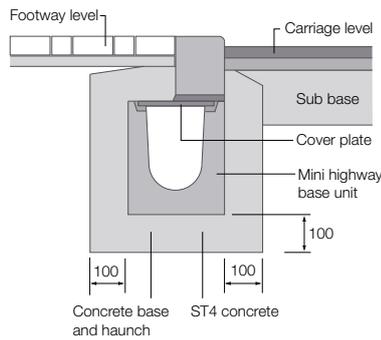


Fig 8. Mini Highway crossing detail

CLEARWAY/SAFETICURB®

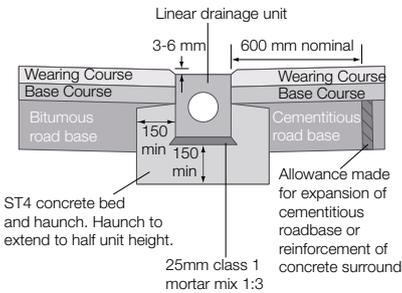


Fig 11. Basic unit – flexible/semi-flexible installation

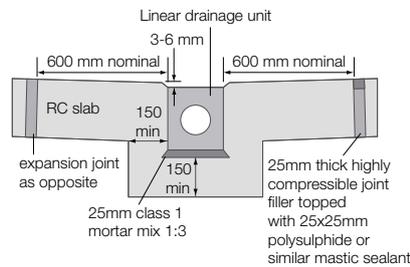


Fig 12. Basic unit – rigid installation

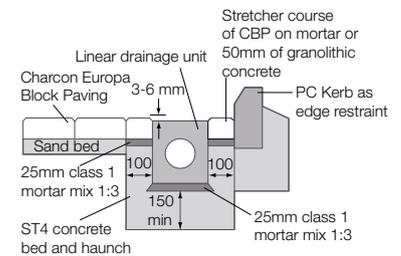


Fig 13. Basic unit – block paved installation

INSTALLATION DESIGN-OUTLETS

GENERAL PRINCIPLES

Details of outlet units and inspection access differ according to which linear drainage system is used.

In any system, silt or detritus should normally be prevented from entering the main drainage sewer. An outfall chamber is required to enable silt collection before onward connection to a sewer.

Types of outfall chamber

- ▶ Trapped precast concrete, clay or plastic gully pots. Gully pot capacity may be insufficient for some larger linear drainage installations
- ▶ Purpose-built brick or concrete inspection chamber
- ▶ Precast concrete manhole rings
- ▶ Dedicated sump unit

Select outfall pipe diameter/gradient

Care should be taken to ensure sufficient capacity.

Highway (see Fig 16)

Standard outlet formed using two base outlet units (in place of standard base units) to give full width rectangular outlet 400x275mm (shallow, crossing and deep base outlet units available). Positioning is not critical, but should allow access for suction pipe from gully emptier.

Discharge capacity may be increased by installing more than one pair of Base Outlet units discharging into the same outfall chamber.

For larger schemes, chambers to be detailed in accordance with The Specification for Highway works, clauses 507 and 508. For larger outfall pipes it may be necessary to incorporate a manhole access at rear of run.

Clearway/Safeticurb® (see Fig 17)

Select outfall chamber, pipe dimension and pipe gradient to suit system capacity.

Position a silt box top on two courses of engineering brickwork over the selected outfall chamber/silt trap to give access (via the silt box lid) for silt removal.

Mini Highway sump unit (see Fig 18)

With hinged, removable lid for inspection access, is placed over inflow unit in place of standard top units.

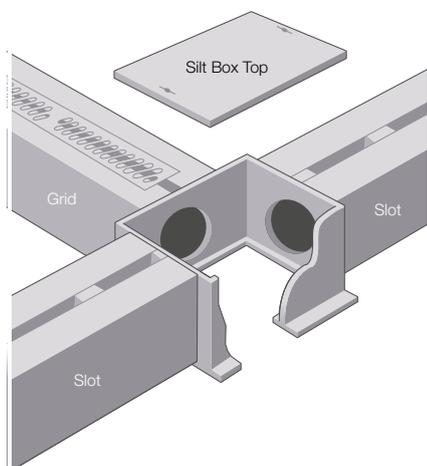


Fig 14. Clearway/Safeticurb® outlet/junction

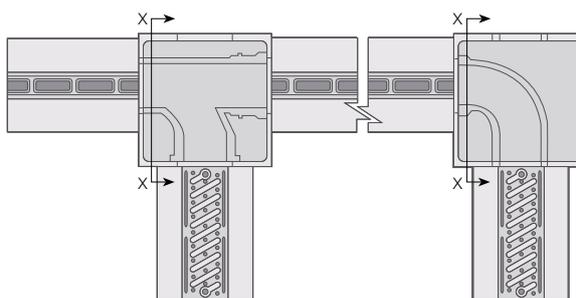


Fig 15a. Clearway/Safeticurb® junction bends

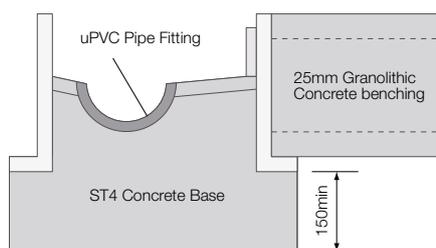


Fig 15b. x-x section (from Fig 15a.)

INSTALLATION DESIGN-OUTLETS

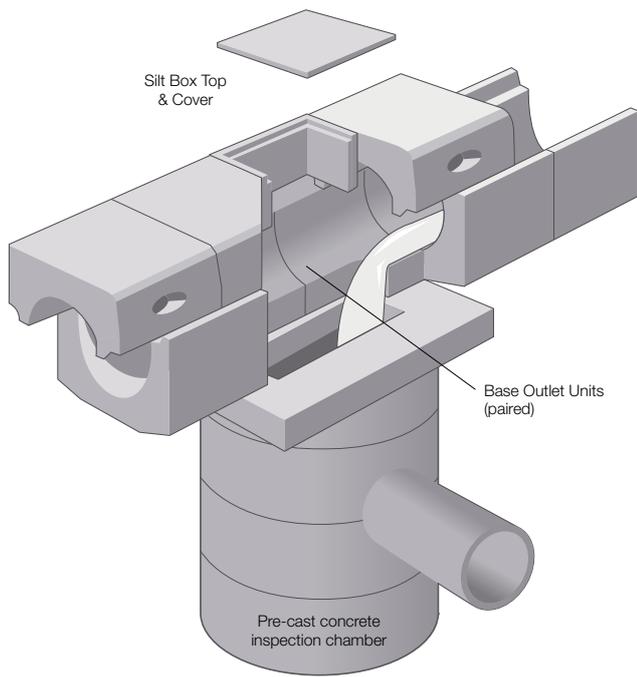


Fig 16. Highway outlet construction

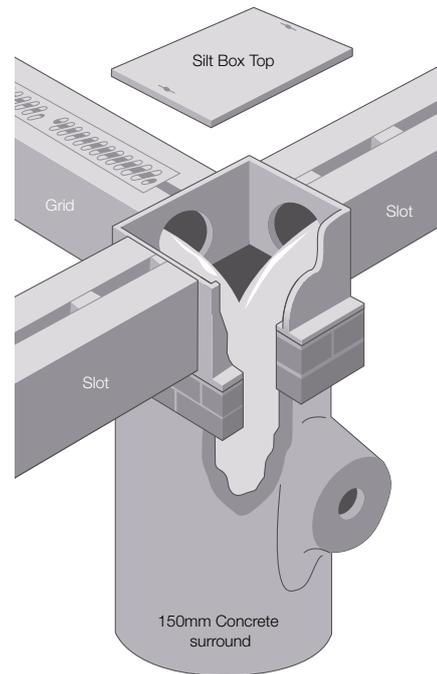


Fig 17. Clearway/Safeticurb® outlet construction

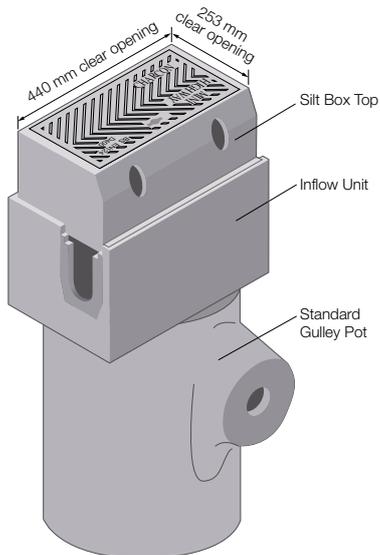


Fig 18. Mini Highway outlet construction

INSTALLATION DESIGN- H₂O LINEAR DRAINAGE

GENERAL PRINCIPLES

Expansion joints should be installed parallel to the H₂O Linear Drainage channels along the trench edge to allow for surface expansion and contraction when the system is installed in concrete. Crack inducers should also be used perpendicular to the channels at least every 2m.

When using asphalt or block paving expansion joints and crack inducers are not required.

F900kN INSTALLATIONS

For F900kN installations, the trench for the system to be installed in should be 200mm wider than the chosen channel and 150mm deeper. For larger sizes such as 450 and 600mm, a reinforcement mesh may be required to achieve the desired loading.

Please refer to the installation drawings provided or the reinforcement detail for larger channels.

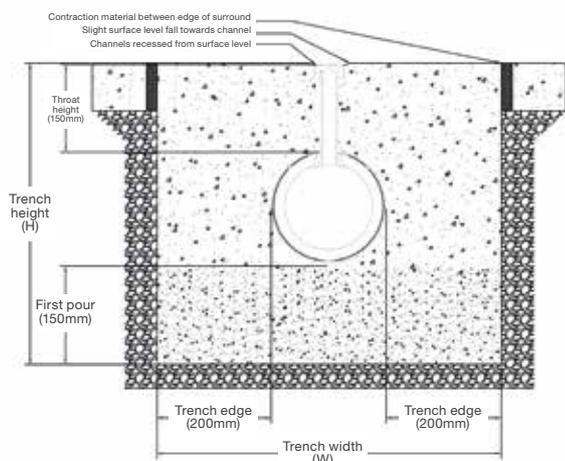
D400kN INSTALLATIONS

When installed in asphalt or paving, a maximum loading of D400kN can be achieved with the H₂O Linear Drainage system. Reinforcement is required for only the largest channel sizes to meet this loading factor.

In asphalt, concrete is required up to the ductile iron top and a wearing course is used to finished surface level. For paving installations the first row alongside the channel should be permanently affixed.

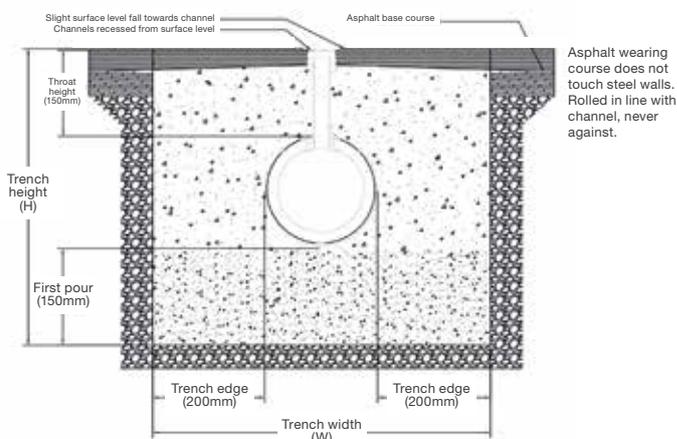
H₂O LINEAR DRAINAGE F900kN

Installed in a full concrete surround



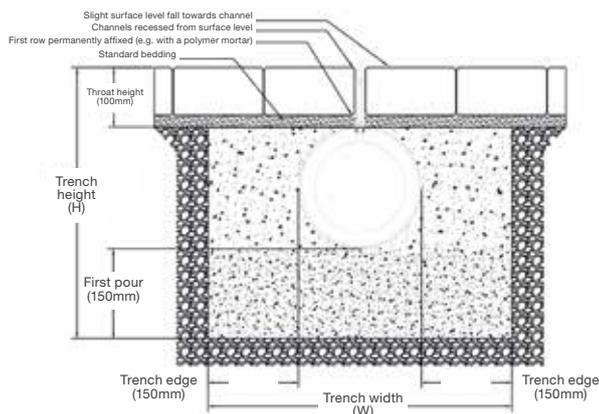
H₂O LINEAR DRAINAGE

Installed in an asphalt surface finish



H₂O LINEAR DRAINAGE

Installed in block paving



GENERAL NOTES

The first concrete pour should affix the stabilisers attached to the H₂O Linear Drainage channels to the base of the trench, stopping at the base of the channel itself.

The minimum concrete grade should be 32/40.

The contractor is responsible at all times for ensuring adequate temporary works are provided as well as the structural integrity of the system.

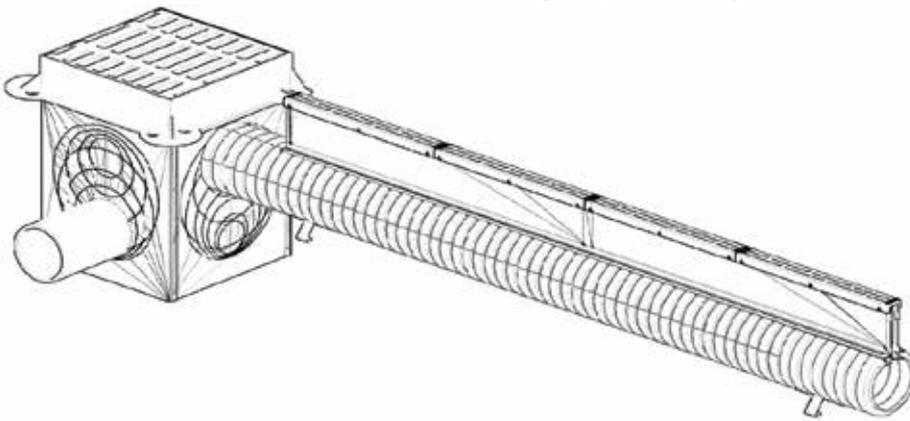
As site conditions may vary, the concrete surround, surface finish and reinforcement profile is ultimately the responsibility of the project engineer.

Load classes are in accordance with BS EN1433.

INSTALLATION DESIGN- H₂O LINEAR DRAINAGE JUNCTIONS & ACCESSORIES

CHANGES IN DIRECTION

When a change in direction is required, if it is at a 90 degree angle to the previous unit then standard perforations are provided on the boxes supplied with the system to achieve these corners. If the angle is less than 90 degrees then the box can be modified on site with a small angle grinder, or a chamber can be formed on-site to suit.



LANDSCAPE CONNECTIONS

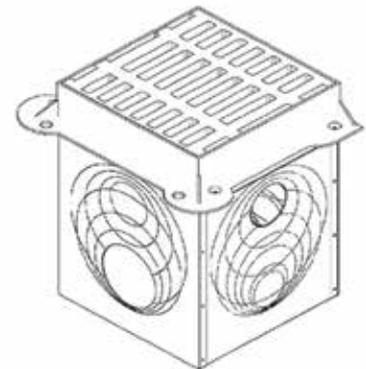
When there is a break in the drainage channel for example when there is a landscaped island between drainage units, standard twinwall pipe can be run underground to connect H₂O Linear Drainage channels together, thus achieving a continuous drainage channel without having to separate drainage runs.

UNIVERSAL ACCESSORIES

End caps, chamber connectors and transition pieces for use in graduated fall systems are universal across all of the H₂O Linear Drainage systems.

For the H₂O Linear Drainage for Paving system a recessed cover for paving infill can be supplied with the combined boxes.

When using H₂O Linear Drainage with an iron top, an iron grating is supplied with the combined boxes.



CONNECTING CHANNELS TO BOXES

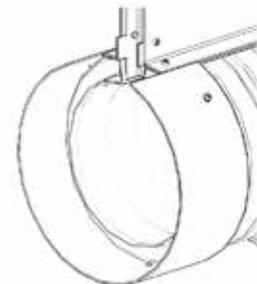
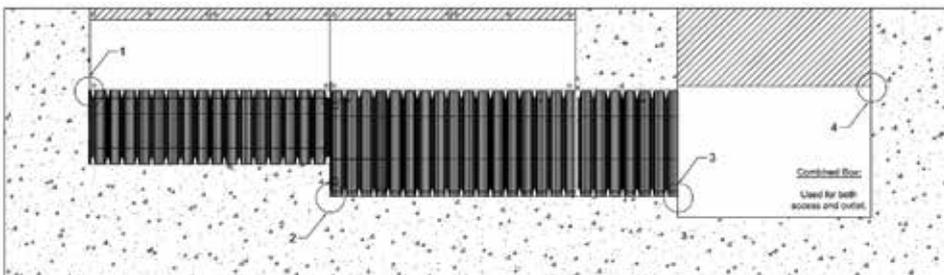
The combined boxes have perforations for easy removal with a small grinding disc. These perforations allow connection to the H₂O Linear Drainage system and also create outlets for connections to external drainage systems.

END CAPS & TRANSITION PIECES

End caps and transition pieces are flat steel units designed to cap a channel end where access or outlets are not required. Transition pieces connect differing sized channels together to form a graduated fall over the length of a drainage run.

MALE & FEMALE CHANNEL ENDS

H₂O Linear Drainage channels have a steel collar fixed to crate female end. This is used to connect the plastic channel sections together creating a positive connection between units. Castellations in the steel section help to achieve a straight drainage run.



SITework

GENERAL PRINCIPLES

Plan for laying to start from an outfall at the lowest point of the system. This ensures self-draining if wet weather occurs during installation.

Use level pins and string lines to ensure correct level and alignment.

Clearway/Safetecurb®

The surface of these systems' drainage units should be 3-6mm below the level of the surrounding pavement surface.

After completing base foundations, lay units onto a Class 1 mortar (1:3 cement: sand) bed, adjusting to line and level using a pavior's maul.

Leave 1mm gap between units to allow for thermal expansion.

If a watertight joint is required, a gun-applied sealant may be applied to the end of each unit.

Clearway grid units

Grid fixing bolts should be tightened to a torque of 20Nm after installation and whenever grids have been removed for maintenance.

Safetecurb® DBA and DBM slot units

Protect slots from stones during construction. Slot units without iron inserts can be damaged when stones are impacted by vehicle traffic.

Safetecurb® DBG grid units

Grid fixing bolts should be tightened a minimum of 5 turns after clamping plate has made contact with the soffit of the bore.

Highway/Mini Highway

Specially designed lifting tools available to enable units to be placed accurately in position.

Lay units onto a fresh concrete base (see installation design, page 147-150), adjusting to line and level using a pavior's maul.

Apply gun-applied sealant to the ends of the base outlet unit prior to laying.

Apply gun-applied sealant to the sealant recess in the end of the first standard base unit – lay the unit against the base outlet unit with the sealant recess away from the outlet.

Lay subsequent base units, applying sealant to the sealant recess in each, preferably before laying each unit in position.

When a crossfall is required across the top of Highway units, the base units should be laid to this crossfall. Do NOT rely on varying the thickness of mortar in the joints between top and base units.

Use Class 1 mortar (1:3 cement:sand) to fill joints between top and base units (see Fig 5a, page 147). The joint reduces from 20mm outside to 15mm inside the unit to ensure complete filling and compaction inside the bore and to avoid cavitation from the water flow.

While laying, the vertical joints between top and bases are unlikely to be maintained over the full length of the run because of minor manufacturing and jointing tolerances. A full top unit cut to suit may be required to complete the run.

Use the specially designed lifting tool to place top units in position, ensuring that the inlet holes at the ends of each unit are correctly aligned. Adjust using a pavior's maul.

Remove excess mortar from inside bore as each unit is laid.

Seal the pipe bore at each end of the run, either by extending the base and haunch concrete (of the Highway units or any adjacent kerbline), or with engineering bricks surrounded with concrete.

HANDLING EQUIPMENT

Suitable handling and lifting equipment should be used when installing concrete products.

MAINTENANCE

SURFACE WATER DRAINAGE

MAINTENANCE

General

With correct design and installation, maintenance needs for all linear drainage systems should be minimal. However, it is essential to continued efficient drainage performance that all channels, inlets and outlets are kept free from blockage or accumulations of silt and debris. To that end, regular inspection is recommended.

Frequency of inspection and maintenance is dependent on local conditions, the surrounding environment, and on the actual gradient within the installed system.

Any temporary blockages can be successfully eliminated provided that:

- ▶ Sufficient inspection/access points are designed into the system
- ▶ No hardened material is allowed to choke the bore

Commissioning and handover

On completion of installation:

- ▶ Flush all excess mortar and building debris from the bore
- ▶ Empty silt traps
- ▶ Clean out/clear all inlet holes (including slots or grid apertures)

For Safeticurb® units DBA

Slot apertures without cast iron inserts can be damaged when stones are impacted into the slot by vehicles. Clear all loose stones. (Slots should also be protected during construction when stones are present).

For Safeticurb® units DBA/DBK

Ensure slot apertures are cleared of all loose stones. (This is especially important when adjacent soft landscaping works are undertaken). Further advice is available from the Technical Services Department, tel 01335 372222.

Routine maintenance procedures

Inspect system regularly for obstructions, or heavy detritus build-up. Empty gully pots/inspection chambers to remove all silt.

Where necessary, cleaning or unblocking can be achieved by:

- ▶ High pressure water jetting
- ▶ Hand rodding

For Highway/Mini Highway

If necessary, cut back road surfacing adjacent to inlet holes in order to ensure unimpeded access for surface water.

Routine maintenance procedures

Inspect system regularly for obstructions, or heavy detritus build-up. Empty gully pots/inspection chambers to remove all silt.

Where necessary, cleaning or unblocking can be achieved by:

- ▶ High pressure water jetting
- ▶ Hand rodding

GOOD PRACTICE

The following are general principles of good site practice which will contribute to successful installations:

Handling

Handle all products with care on site. Avoid damage to edges and faces.

On-site storage

Prior to installation, stack materials bed on bed on a hard level surface: protect from rain.

Sitework

Protect channels and gratings from concrete droppings and mortar splashes during installation. This may be achieved by temporary covering of openings with hardboard or plywood sheeting.

Protect slot apertures (especially if no iron insert is included) from stone damage during construction, particularly where site vehicle trafficking is likely after system installation.

Do not begin construction of adjacent footways and/or surfacing of carriageways until base and haunch concrete have achieved adequate strength.

PAVING

MAINTENANCE AND CLEANING

Maintenance, Cleaning And Sealing of Interlocking Concrete Pavements

When properly installed, precast concrete pavements have very low maintenance and provide an attractive surface for decades. Under foot and tyre traffic, concrete pavements often become exposed to dirt, stains and wear. This is common to all pavements.

During the initial life of the pavement the joints between the pavers will be relatively porous. The ingress of water will consolidate the jointing sand and it is important that the joints are regularly filled with jointing sand to replace the sand consolidated by rainwater.

The joints will soon become semi-impervious due to detritus tending to seal the joints. Until this has occurred the paving should only be brushed by hand. Mechanical sweepers and in particular sweepers with high suction forces should not be used. If they are used there is a real risk of loss of jointing sand from between the pavers.

A liquid substance which stabilises joint filling sand, impedes its unwanted removal by suction cleaners and at the same time helps to prevent the ingress of water during the early life of the pavement may be used. If any form of surface sealing is used on the pavers it must be applied in strict accordance with the manufacturers instructions and it must be accepted that it may have an effect on the colour of the paving, its skid slip resistance and may require on-going maintenance.

GENERAL GUIDELINES FOR THE REMOVAL OF STAINS AND GROWTHS

These notes are intended for general guidance and are not intended to be exhaustive. Some of the cleaning methods described involve the use of chemicals which could be dangerous if not used correctly. It is important that any safety warnings issued by the chemical suppliers should be read carefully and strictly adhered to.

In general the following precautions should be taken:

- ▶ When using chemicals, protective clothing such as gloves, goggles, boots and overalls should be worn
- ▶ Adequate ventilation is required in confined spaces when using chemicals
- ▶ When using flammable materials; cigarettes, naked flames and other sources of ignition should be carefully controlled
- ▶ When diluting acids ALWAYS, add acid to water and not water to acid
- ▶ Any clothing, which is contaminated with chemicals should be disposed of safely
- ▶ When using any chemicals care must be taken not to damage, contaminate or stain any adjoining material
- ▶ Care must be taken to protect personnel operating in the area of the cleaning from any injury or hazard created by the cleaning

It is particularly important with all cleaning methods that trials should be carried out on a small, preferably inconspicuous area, to determine the effect of the chemicals before treating a large area.

GENERAL CLEANING

Light stains can often be removed without markedly affecting the texture and appearance of the surface. Proprietary cleaning materials may be used in accordance with the manufacturers instructions. Please contact technical department for information.

Efflorescence

Efflorescence or lime bloom is a transient phenomenon of Portland cement. Its effect is to lighten the colour of the concrete. Efflorescence, also known as lime bloom, appears as a white deposit covering part or all of the surface of cement containing products. The result of light deposits is the lightening of the surface colour, the heavier the deposit, the lighter the colour. Except in very severe cases, the phenomenon disappears completely when the blocks are wet and reappears as the blocks dry out.

Occurrence

Efflorescence is a temporary, naturally occurring phenomenon that occurs to a varying extent on all items containing cementitious binders. Mortar is particularly prone to efflorescence and this can contaminate other products. It is formed by soluble salts from the cement migrating to the surface where they react with the atmosphere to produce the white powder (Calcium Carbonate) known as efflorescence. Individual crystals are very small and are not firmly fixed to the surface. The smallest of the crystals linked with their optical properties causes them to become invisible when wet. As they dry out they become visible and are unchanged. Products are most susceptible to efflorescence under damp conditions as this aids the movement of the soluble salts. Efflorescence in no way affects the structural integrity of the items.

Treatment

The phenomenon is temporary and will, with time disappear as a result of normal weathering; the length of time depending on many factors such as rainfall, atmospheric pollution etc. Efflorescence can, however, be removed chemically by using proprietary cleaners. Please contact our Technical Department for information.

GENERAL DIRT AND DETRITUS

To remove general dirt and detritus, scrubbing with soap and water is normally sufficient. This can be done either by hand or by using an industrial cleaner.

If a power hose is used then care must be taken to avoid the removal of the jointing material (sand or mortar).

Ensure soap has been thoroughly washed from the surface on completion of the cleaning and the resulting run-off is carefully channelled to either drainage or containers where it can be safely disposed of.

Please contact our Technical Department for more information.

MAINTENANCE

MAINTENANCE PROCEDURES FOR SUSTAINABLE DRAINAGE SYSTEM

Overview of system

The drainage system on the site is known as a sustainable drainage system (SUDS) and is designed to manage and treat rainfall that runs off the roofs, access roads and car parking surfaces. The run-off may contain pollution arising from sources such as dust, car exhausts and oil leaks.

The drainage system consists of areas of permeable surfacing, constructed from proprietary interlocking concrete paving blocks (Charcon Infilta). The permeable block surfacing is separated from an underlying highly voided sub-base (stone) layer by a heavy duty geotextile filter fabric. If applicable roof rainwater down pipes can be drained to the sub base via proprietary diffuser units, roof drainage pipes should pass through small gully pots before connection to the diffuser units and to stop debris passing into the system.

How does the system work

The permeable surfaces to the hard standing areas allow rainfall to directly pass through it. The heavy-duty geotextile filter fabric prevents any silt (small sized soil particles) from passing through into the underlying layers. The permeable surfacing materials, together with the geotextile also trap deposits of oil or similar contaminants that may drip from vehicles. The contaminated droplets are treated within the pavement layer by natural biological processes, which reduce the contamination to acceptable levels before it can enter the rest of the underlying drainage layers.

After passing through the pavement surface, the treated water enters a layer of aggregate which is designed to slowly convey the surface water and to store the water during and after storms.

Avoiding damage to the system

The main cause of damage to the system is likely to be due to litter, excessive silt accumulation or physical damage to the filter system.

Litter should be regularly removed from the site and the access chambers should be routinely inspected for blockages (see below). To avoid excessive silt build up the car park surfaces should be swept at least every six months.

in or around the permeable paving areas. If modifications to the site are proposed then the presence of the SUDS should be highlighted to the designers and contractors so that due regard can be given to the system and damage avoided.

MAINTENANCE PLAN

Routine maintenance

The following routine inspections and maintenance are required:

- ▶ Monthly inspection of car park surfaces
- ▶ Remove litter/leaves or other large debris as required
- ▶ Every 6 months inspect all chambers and rwp gullies for silt build up
- ▶ Every 6 months vacuum sweep pervious surfaces with mechanical sweeper and replace grit within joints, if required
- ▶ Remove silt if discovered

Records of inspections and maintenance undertaken should be kept by the client.

H₂O LINEAR DRAINAGE

HANDLING EQUIPMENT

Deliveries of H₂O Linear Drainage channels may be made on pallets and as such mechanical offloading may be required.

MAINTENANCE

General

With correct design and installation, H₂O Linear Drainage channels are self cleaning at a flow velocity of over 0.6l/s. However best practice dictates that in order for the system to remain efficient a regular maintenance and inspection schedule should be observed. This should include removal of silt and debris from the intake slots as well as regular rodding and cleaning of outlets via inspection points within the system.

- ▶ Maximum every 50m or
- ▶ At a change in direction or
- ▶ At an outlet

Commissioning and handover

On completion of installation:

- ▶ Flush all debris from the channel
- ▶ Check and empty inspection units
- ▶ Clean along the slot and ensure intake is clear

When installed in concrete

Ensure that the ductile iron top of the unit is clear from debris and cleaned of excess concrete or mortar prior to handover.

Routine maintenance procedures

Maintenance on H₂O Linear Drainage channels should be carried out in a threefold method:

- ▶ Removal of debris or blockages from the intake slot
- ▶ Clear outlets via the connected box
- ▶ Rod channels via inspection locations

If using a high pressure jet, the maximum pressure that can safely be applied to H₂O Linear Drainage channels is 180Bar or 2500psi.

GOOD PRACTICE

The following are general principles of good site practice which will contribute to a successful installation and handover.

Handling

Handle all products with care on site to avoid damage to edges and faces. Where H₂O Linear Drainage channels are bundles together it is important to remove one unit at a time when ready to install the system.

H₂O Linear Drainage channels can be heavy, as such it is important to observe all relevant site health and safety guidelines and regulations and use mechanical lifting methods where necessary.

On-site storage

When storing H₂O Linear Drainage channels on-site for a prolonged period of time, they should be kept in their original packaging and stored in a location away from trafficked areas in order to prevent damage on-site.

Sitework

Once installed has started, if it is necessary for site equipment to traverse the trench a protective bridge should be formed to protect the system from unnecessary damage. It is important that the system is never trafficked prior to the final stage of it's installation, as the strength of the drainage channel is dependent on the concrete surround and any unnecessary loading will cause deformation and may affect the quality or length of the channel's lifespan.

ADDITIONAL INFORMATION

We are constantly striving to improve our product range and therefore we advise that you always check that you have the latest product information available either online or request from our sales office and or stockist.

The photographs and product swatches in our literature are only representative and we would advise that you request samples of the product and lay a sample area for approval (1.2m x 1.2m) Some samples may be chargeable for example made to order items and or Natural Stone.

Efflorescence is a natural phenomenon that can occur in all concrete products. Efflorescence sits on the surface and hides the true colour of the product and weathering over a period of time will generally remove the issue.

Concrete continues to cure for months after manufacturing which may affect the porosity of an individual product resulting in some products appearing "damp". This does not affect the performance of the product and will disappear over time as the product cures.

On occasion products can be affected by contaminated aggregates, Lignite or Iron Pyrites which may result in discolouration of the surface of an individual product this will not affect the performance of the product.

We manufacture our paving products in batches and while great care is taken to control shade variation between production batches we cannot guarantee colour consistency between batches and we would advise that you take this into consideration.

We would advise that you work from as many packs as practicable during laying (minimum 3 for single colours, 5 or more for multi colour mixes and specifier paving). We advise that you lay blocks from vertical leaves of the packs not horizontal layers of the packs.

We produce some products that are textured and the process can sometimes result in some variation in texture which will not affect the product performance.

Woburn Rumbled is designed to have an aged distressed look; the process will give a wide ranging level of distress and will be very dusty as a result of the rumbling process however this dust will disappear after a short time.

Products should be thoroughly inspected upon delivery and in the unlikely event that you are not totally satisfied with the product you should inform our sales office immediately. Please quote the quantities of product affected, and the batch details from the label on the packaging.

Product (s) deemed not in compliance with the relevant manufacturing standards or customer expectations must result in a formal complaint being raised with the Sales Office or representative within 48 hours of delivery and product should not be installed. Any uplift and relaying costs will be the responsibility of the installer should the defect have been apparent before installation.

Products should be installed in accordance with the relevant section of BS 7533, which covers the correct installation process for Paving, Kerbs and Setts.

With exception of Infilta products where spacer nibs ensure joint widths are maintained, nibs where present on products, are for protection of the product during packaging, delivery and handling and not for creating a joint gap.

All products contained within this document will benefit from some maintenance to maintain their performance and or aesthetic appeal. For questions on specific maintenance requirements please contact our Technical department.

Product dimensions are subject to tolerances as specified in the current European standards. These need to be taken into account when planning your installation process as laying times and or materials required may vary.

British Standard Flag, Kerb and Edgings and our 'Natural' and 'Grey' colours are 'NON' Pigmented and the aggregates and cement determine the final colour of the products. Aggregates and cement may vary in shade which will affect the final product colour.

All of our Made to order (MTO) products require a signed agreement to be received by us before we will send an order acknowledgement. All MTO products will be invoiced so take care when measuring/ ordering and allow for wastage/snagging as small production runs will be charged for accordingly.

The use of proprietary spacers to create a joint gap in accordance with BS 7533 is acceptable.

Product swatches contained in our literature are for colour representation purposes only.

HEALTH AND SAFETY

Due to the nature of our products we always recommend suitable lifting equipment be used. We recommend the use of lifting equipment such as a vacuum lift.

- ▶ Always wear gloves and safety footwear when handling the product
- ▶ Always wear safety goggles, safety footwear, gloves, ear protection and appropriate regulatory protection when using cutting equipment
- ▶ Ensure the products are on level ground and retained in some way before removing any packaging
- ▶ Always handle with care as breakage and chipping may result from mishandling

PRODUCT RECYCLED CONTENT GUIDE

Category	Product name	% Recycled content
Concrete Paving & CBP		
	StoneMaster® Infilta - All Grey shades	21
	StoneMaster® Infilta - All Buff shades	5
	Andover Textured	21
	Andover Textured - Fleck shades	13
	Andover Textured - Heather Porphyry	12
	Andover Textured - Tuscan Porphyry	12
	Andover Textured - Pink Granite	12
	Andover Ground - Black fleck	88
	Andover Ground - Grey, Charcoal, Leemoor	63
	Andover Reinforced - Witherford, Dark grey	57
	Andover Reinforced - Silver grey	75
	Andover Reinforced - Standard grey	20
	Vianova	10
	Moordale® Textured	4
	Moordale® Ground	67
	Elite Deterrent	3
	Woburn Original	4
	Woburn Rumbled	4
	Countrysetts	86
	Europa	4
Natural Stone		
	Yorkstone	N/A
	Porphyry	N/A
Sustainable Drainage Systems		
	StoneMaster® Infilta - All Buff shades	5
	Andover Textured Infilta	21
	Andover Textured Infilta - Fleck shades	13
	Andover Textured Infilta - Heather Porphyry	12

Category	Product name	% Recycled content
	Andover Textured Infilta - Tuscan Porphyry	12
	Andover Textured Infilta - Pink Granite	12
	Woburn Rumbled Infilta	4
	Europa Infilta	4
	Grassgrid	26
Surface Water Drainage		
	H ₂ O Linear Drainage	99% Pipe / 75-99% Ductile Iron
	Highway	5
	Mini Highway	5
	Clearway	3
	Safeticurb®	5
Kerbs and Edging		
	Eco Countryside® Kerb	65
	K-Lite® Traditional Kerb	60
	Block Kerb	4
	Access Kerb	5
	HGV Kerb	5
	Cycle Kerb - Black Fleck	65
	Cycle Kerb - Grey	5
	Dutch Entrance Kerb - Black Fleck	65
	Dutch Entrance Kerb - Grey	5
British Standard		
	Paving	20
	Tactile	20
	Kerb	22
	Channel	22
	Edging	23
Accessories and Steps		
	Pedestals	80
	Step Flags	Dependent on material used
	Step Units	Dependent on material used

This table has been created to provide you with a full breakdown of recycled content by product. All figures in this brochure are correct at the time of production (2022). For further information on our recycled content or product data, please contact our technical team on 01335 372216.

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