

# e:Pave

News from Interpave

July 2009

## Inside:

- » New legislation demands SUDS such as permeable paving on all new developments
- » The contemporary face of precast concrete paving in masterplanning today's communities
- » Green paving – sustainability from a wider view-point

**Interpave**   
THE PRECAST CONCRETE PAVING  
AND KERB ASSOCIATION

[www.paving.org.uk](http://www.paving.org.uk)

the digital magazine from Interpave



# social surfaces

---

## precast concrete sustainable paving

Precast concrete paving and kerbs from Interpave manufacturer members give the reassurance of predictable and consistent performance characteristics for safe surfaces, accessibility for all and long-term durability. And they also satisfy the broadest sustainability criteria including:

- Low environmental impact endorsed by the BRE Green Guide, generally with A or A+ ratings
- Permeable paving options to take care of rainwater and meet government obligations for SUDS
- Localised material sourcing, manufacture and product supply without shipping, benefiting the local economy
- An extensive palette of styles, scales, textures and colours for paving blocks, flags, kerbs and related products

Update your view of precast concrete paving and kerbs. For the full story visit: [www.paving.org.uk/sustainability.php](http://www.paving.org.uk/sustainability.php)

## Editorial

Welcome to e:Pave the new, digital magazine from Interpave for all those involved with the development and construction process – particularly designers, developers, planners and contractors. e:Pave takes over from Interpave's popular hard-copy magazine *Pave-It* and covers a wide range of current topical issues affecting the paved environment.

To make sure you receive future issues of e:Pave via email, register now on [www.paving.org.uk](http://www.paving.org.uk). If you are viewing e:Pave on-line, look out for the live links within the text to take you straight to articles, related documents and web pages. And, of course, back-issues of *Pave-It* can still be viewed via the website with a summary of articles in each issue.

### Page 4

The future is permeable – new draft legislation will make SUDS mandatory within 2 years



### Page 9

Masterplanning in practice – a case study of the award-winning Accordia project in Cambridge



### Page 5

Front garden rules & Wet harvest – permeable paving solutions for domestic driveways



### Page 11

Winning innovation park landscaping & Mainstream permeable paving – case studies



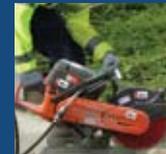
### Page 7

Green Paving – the sustainability implications of precast concrete paving taking a wider view



### Page 12

Cut out cutting – making the most of design to minimise on-site cutting of concrete products



### Page 8

Planning with paving – using the new generation of precast concrete paving products in urban design



### Cover – main image:

A strong, formal precast concrete pavement design at Teesside University, using principles discussed in Planning with paving



### Cover – top left image:

Precast concrete paving at the Accordia housing project in Cambridge



**About Interpave:** Interpave – the Precast Concrete Paving & Kerb Association – represents the leading manufacturers of concrete block paving, flags and kerbs. Its main objective is to expand the use of these materials through education, technical and marketing campaigns. Interpave is a product association of the British Precast Concrete Federation.

Published by Interpave, the Precast Concrete Paving & Kerb Association, 60 Charles Street, Leicester LE1 1FB  
t: 0116 253 6161 f: 0116 251 4568 e: [info@paving.org.uk](mailto:info@paving.org.uk) [www.paving.org.uk](http://www.paving.org.uk) © BPCF Ltd 2009

## The future is permeable

**New draft legislation will make sustainable drainage systems (SUDS) mandatory on all new developments within 2 years, and use of concrete block permeable paving – the most versatile SUDS technique – is set to grow rapidly to satisfy this requirement.**

The *Draft Flood and Water Management Bill*, issued for consultation at the end of April, will apply to new surface water drainage from buildings and roads in England and Wales. It takes on board many of the proposals of the *Pitt Review* into 2007 flooding events and the government's *Water Strategy for England*, and aims to make SUDS happen on the ground, helping to avoid flooding and reduce water borne pollution.

In general terms, the Bill will replace current arrangements for approval, construction and maintenance of conventional piped drainage with similar procedures for SUDS. In particular, it expects that: "In new developments, permeable paving, swales or French drains should take the place of traditional impermeable roads and pavements draining to sewers." Also, highway authority drainage must comply with the same standards – a new requirement that goes beyond the 2008 consultation proposals.

A new role for unitary and county authorities as 'SUDS Approving Bodies' (SABs) will be established and they will be required to adopt – i.e. take over ownership and maintenance of – SUDS schemes. At the same time, developers will be required to demonstrate compliance with National Standards and pay a financial bond to SABs,

just as the current regime for conventional piped drainage. National Standards for construction and maintenance of SUDS systems will be developed with stakeholders by 2011.

But in the case of concrete block permeable paving, detailed guidance from Interpave is already in place, based on decades of experience both here and abroad. So, there is nothing to prevent concrete block permeable paving being used now in place of impermeable surfaces, gulleys and pipes – bearing in mind that current national planning policies already require SUDS and Building Regulations favour them. This initiative also opens up the market for concrete block paving generally on lower speed roads, shared surfaces and other areas where visual appeal, sustainability, accessibility and long-term performance are demanded. Concrete block permeable paving has important attenuation and pollution treatment capabilities, with no additional land-take unlike other SUDS techniques.



“In new developments, permeable paving... should take the place of traditional impermeable roads and pavements draining to sewers.”

## Definitive guidance

**Interpave has published an important new 20-page document, intended to help all those involved with the development process – including designers, developers and planning, building control and adoption officers – understand permeable paving.**

The document *Understanding Permeable Paving* is aimed at a wide audience and intended to give an insight into all aspects of concrete block permeable paving. It deals with legal as well as practical issues and explains the different systems and techniques available, and how they can be used to meet current demands. *Understanding Permeable Paving* considers statutory requirements, the planning process, overall design, long-term performance, costs and adoption issues.

In contrast, its sister publication *Permeable Pavements – Guide to the Design, Construction and Maintenance of Concrete Block Permeable Pavements*, offers far more technical detail and is considered to be the definitive design, construction and maintenance guidance.



## Front garden rules

Originally part of the government's water strategy launched in February 2008, new planning rules apply from 1 October 2008, supported by a Guidance document from Communities and Local Government, and the Environment Agency. They aim to encourage homeowners to use permeable paving, rain gardens and similar sustainable methods when installing new or replacing existing paving in front gardens.

Homeowners are no longer allowed to pave their front gardens without planning permission – unless permeable surfaces such as concrete block permeable paving are used or water is otherwise able to soak into the ground, for example using rain gardens. Otherwise, planning permission will be required for hard surfaces over 5m<sup>2</sup>, involving drawings, application forms, a fee of £150 and around 8 weeks for a decision. And, of course, permission may well not be granted anyway, particularly as sustainable drainage forms part of current planning policy.

## Permeable solutions

These measures form part of the fight against flooding and move towards sustainable drainage systems. Interpave had already recognised the need to address this issue and the new government Guidance on paving front gardens refers extensively to two existing [Interpave documents](#) designed to help homeowners, designers and contractors meet the new planning requirements. The Interpave documents offer

comprehensive guidance on sustainable drainage to avoid water discharge into sewers when using concrete block and flag paving for an attractive, safe and firm surface. It is important to remember that loose materials such as gravel do not meet Building Regulations requirements for safe access of disabled people to homes.

Concrete block permeable paving can be used to allow rainwater to filter through gaps between the blocks, and eventually into the ground or to drains. The same principle applies to conventional concrete block and flag paving which is itself not permeable but installed to channel water into a 'rain garden' where the water has time to soak into the ground. Both methods are covered in the Interpave guidance which aims to provide a straightforward, step-by-step design procedure – based on design calculations using sound engineering principles – together with advice on construction and planting.



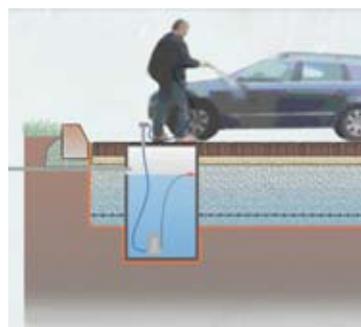
## Case study

### Wet harvest

A modest, domestic project in Nailsea, Bristol makes the most of concrete block permeable paving with a straightforward water harvesting system below a new front driveway. Not only does this project comply with the new rules for front gardens but it also provides a practical demonstration for maximizing the potential of permeable paving.

Rainwater runoff collected from all impermeable surfaces including roofs and paths, together with the 60m<sup>2</sup> permeable drive itself, passes into the tanked System C (no infiltration) permeable pavement which contains a concealed sump. Here, a small pump is used to draw off the harvested water, in this case for non-potable uses, via a tap and hosepipe. Car washing has now become environmentally friendly with most of the water automatically treated for reuse as it passes through the permeable paving.

Systems such as this reduce mains water consumption and cut metered water bills. Of course, they can also be used to deliver water during hosepipe bans, just like water butts. And this practice is recognised by the *Code for Sustainable Homes* with a credit to encourage the recycling of rainwater and to reduce the amount of mains potable water used for external water applications. There is also potential for use of stored water for WCs and washing machines instead of potable water and the Code offers up to 5 credits for savings here.





# green giant

---

## precast concrete sustainable paving

Precast concrete products from Interpave manufacturer members have low environmental impact endorsed by the BRE Green Guide, generally with A or A+ ratings, with a firm commitment for continuing improvements transparent to stakeholders. And they also satisfy the broadest sustainability criteria including:

- Predictable and consistent characteristics for safe surfaces, accessibility for all and long-term durability
- Permeable paving options to take care of rainwater and meet government obligations for SUDS
- Localised material sourcing, manufacture and product supply without shipping, benefiting the local economy
- An extensive palette of styles, scales, textures and colours for paving blocks, flags, kerbs and related products

Update your view of precast concrete paving and kerbs. For the full story visit: [www.paving.org.uk/sustainability.php](http://www.paving.org.uk/sustainability.php)

## Green paving

The recently launched BRE 'Green Guide to Specification' provides independent endorsement of the low environmental impact of precast concrete paving, particularly in comparison with imported materials. But wider sustainability issues are also important – and discussed in detail in a new **SUSTAINABILITY** section of Interpave's website.

The Green Guide rates a wide range of elements from 'A+' for best environmental performance to 'E' for the worst. Three different paving scenarios are considered covering: Pedestrian Areas, including communal spaces, walkways and garden paving; Lightly Trafficked Areas, such as car parking; Heavily Trafficked Areas, for heavier vehicles or repetitive car traffic.

The summary environmental ratings for a range of precast concrete paving specifications – covering blocks, flags and 'grass concrete' units – are generally 'A' or 'A+' across all three scenarios. These ratings reflect the on-going environmental investments and improvements made by Interpave manufacturer members, as well as by the cement industry generally. Local material sourcing and product supply is also important, and equivalent paving products shipped into the country bear a substantial CO<sub>2</sub> emission load. Some imported stone paving products are also included in the Green Guide – generally with much poorer environmental ratings than their precast concrete equivalents and half with the worst 'E' rating.

“Green Guide ratings for precast concrete paving specifications are generally A or A+.”

## Locally based industry

A key principle of sustainability is that a product should be manufactured as close as possible to where it will be used. Interpave manufacturers have production plants located around the UK, offering effective national coverage minimising product transportation. Similarly, production plants have historically been sited to optimise local sourcing of manufacturing materials.

With Interpave manufacturers no trans-world shipping is involved, unlike imported concrete, granite or sandstone products, or plastic-based materials of uncertain origin.

Undoubtedly, one of the most important environmental benefits is concrete block permeable paving as part of sustainable drainage systems (SUDS). BREEM (Building Research Establishment's Environmental Assessment Method) and the Code for Sustainable Homes (which will, inevitably, play a major role in the eco-towns currently proposed by government) recognise the benefits of SUDS and its most flexible technique concrete block permeable paving.

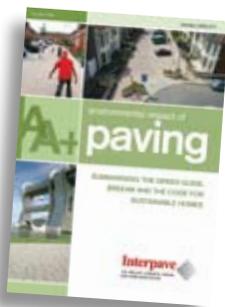


Photo: Denis Jones

Code Level 6 Barratt Green House (shown here) and the adjacent Level 4 Hanson EcoHouse at the BRE Innovation Park use concrete block permeable paving for rainwater harvesting.

## Reflective implications

Precast concrete paving differs substantially from asphalt in terms of luminance, or the amount of light reflected off the paving. For asphalt, luminance is only about 7% whereas block paving achieves between 15% and 30%. This often-overlooked area has implications for street lighting design and reducing energy requirements, as well as safety in terms of contrasting pedestrians against paving at night. Precast concrete paving also has a higher diffuse solar reflectance (known as albedo) than asphalt, reducing the urban heat island effect generally and therefore the energy needed for cooling buildings.



## Planning with paving

**New planning policies, fleshed out in guidelines, such as the *Manual for Streets*, are changing the way urban designers are selecting hard surfacing materials. Interpave's new *Planning with Paving* guide explains these changes in approach to planning policy, urban design and 'place shaping', encouraged by government and other influential organisations.**

Essentially, a restrained palette of attractive paving products is now called for to provide a real sense of local character whilst also delivering other key benefits such as sustainability and safe accessibility for all.

So, how is precast concrete paving able to satisfy all these requirements? With precast concrete paving blocks, flags and kerbs, distinct modular units and designed variations in colour, texture and shape break up areas giving visual interest, 'grain' and a human scale not possible with monotonous, formless materials such as asphalt. In recent years, Interpave manufacturer members have transformed this concept, moving away from the simple, regular patterns and colours of the 1970s and 1980s. They continue to expand an extensive choice of styles, shapes, colours and textures to meet current demands in urban design, matching – and often exceeding – the visual qualities of materials such as stone.

## Enhancing the paved environment

The latest manufacturing processes allow creation of different textures, some exposing the inherent aggregates. Surfaces can be honed for a flat finish or polished, or

“Precast concrete paving offers an extensive palette of styles, shapes, colours and textures matching – and often exceeding – the visual qualities of materials such as stone.”

## Accessibility for all

The *Manual for Streets* and other guidance documents stress the importance of inclusivity and accessibility for all. Interpave's document *Accessible Paving* provides detailed guidance on meeting this requirement in detail. All the accessibility guidance documents agree that paving surfaces must be:

- Firm, stable and even (not loose materials such as gravel)
- Durable
- Slip-resistant
- Non-reflective

Precast concrete flags and paving blocks, used in conjunction with concrete kerbs, easily meet all these criteria, as fully engineered products manufactured under controlled conditions to give consistent performance. They deliver consistency, safety and accessibility for all users across the whole surface – whichever combinations of products, colours and finishes are used.

products shot blasted to look weathered or tumbled for a more rugged, natural appearance. Combining these attributes with the variety of shapes and sizes available enables designers to select paving styles ranging from traditional to contemporary, enhancing any environments from historic conservation areas to brand new urban spaces. In particular, Interpave manufacturers work in partnership with major developers and planning authorities to develop specific products and finishes to provide distinctive local character for particular areas, which can then form part of local design codes. This is a valid and sustainable interpretation of the adopted planning guidelines.



The current demand for SUDS further drives the choice of concrete block permeable paving. It generally has the same visual characteristics as other precast concrete paving and is available in a growing range of styles, colours and textures – in some cases matching impermeable products. As a result of all these benefits, there is a compelling case for precast concrete paving to play a central role today as a modern, flexible and sustainable material to meet these demands.



## Masterplanning in practice

Interpave has just published a new **case study** of the award winning **Accordia housing project in Cambridge**, focusing on external surfaces. It explores the practical application of current approaches to master-planning, urban design and 'place shaping', discussed in *Planning with Paving*.

Accordia is a major new housing scheme comprising 378 homes on an important site close to the centre of Cambridge. Although designed before publication of the *Manual for Streets*, the masterplan, designed by Feilden Clegg Bradley Studios working with landscape architects Grant Associates, reflects many of its principles, with a variety of street spaces including shared surface mews and access roads with table-top junctions, as well as pedestrian and cycle routes.

The scheme has been recognised for its integration of landscape with housing, creating quality green streets and squares, distinctive mews, play areas and useful open space. Accordia received the Royal Institute of British Architects (RIBA) Stirling Prize in 2008, the first housing project to do so. The judges commented: "The values of Accordia are those British cities need more of: a subtly controlling masterplan, a collaborative approach and an eye for both the detail and the big picture in the landscape and the architecture."

As part of the masterplan, a limited palette of external surfacing materials was developed to reflect the local civic character, including precast concrete block paving, flags and kerbs.

Peter Chmiel of Grant Associates said: "Concrete block paving is used in a straightforward way to provide 'grain' and help develop a sense of place. Sustainability is also important and products of UK origin – the more local the better – are used throughout, avoiding imported materials."



As with all aspects of the project, the paving at Accordia succeeds through a considered application of a limited palette of materials with straightforward layouts and patterns. But, essentially, the paving has been carefully detailed and executed on site with nothing left to chance – an approach that points the way for urban design generally.

“Sustainability is also important and products of UK origin – the more local the better – are used throughout, avoiding imported materials.”





# local hero

---

## precast concrete sustainable paving

Precast concrete products from Interpave manufacturer members are produced locally on modern, automated manufacturing plant working as an essential part of the local economy and community, while giving effective national coverage. And they also satisfy the broadest sustainability criteria including:

- Low environmental impact endorsed by the BRE Green Guide, generally with A or A+ ratings
- Predictable and consistent characteristics for safe surfaces, accessibility for all and long-term durability
- Permeable paving options to take care of rainwater and meet government obligations for SUDS
- An extensive palette of styles, scales, textures and colours for paving blocks, flags, kerbs and related products

Update your view of precast concrete paving and kerbs. For the full story visit: [www.paving.org.uk/sustainability.php](http://www.paving.org.uk/sustainability.php)

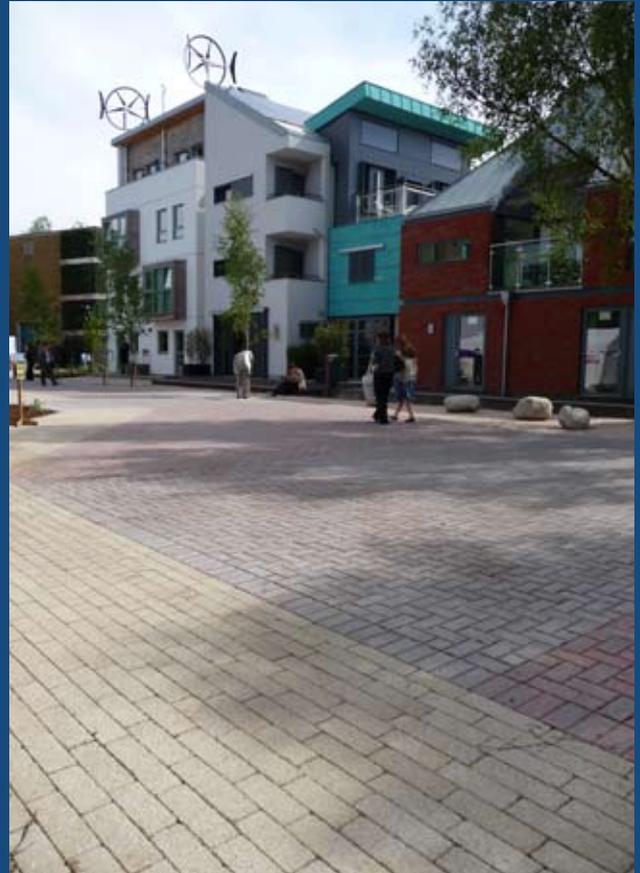
## Case study

# Winning innovation park landscaping

Precast concrete paving is at the heart of PRP Landscape Architects' winning design for a sustainable landscape project at the BRE Innovation Park near Watford. The project follows a competition earlier in 2009 run by the British Homes Awards, BRE and the Landscape Institute, and was opened during the INSITE09 event in June this year.

Three Interpave members donated products to the landscape project, intended to bring together the very different individual houses on the Innovation Park as a sustainable community. A limited palette of subtle colours helps to unite the diversity of architectural styles and to develop a sense of place with coordinated themes. Visually, the designers consider that the different manufacturers' products work particularly well together. Although designed effectively as a Home Zone, the new paved area also has to accommodate some very non-domestic traffic – including 23m long vehicles – as it remains a central artery of the BRE research site.

Precast concrete permeable paving is used throughout the new Home Zone and is already installed in other, earlier areas of the Innovation Park. Of particular interest, an innovative geothermal paving system – which captures enough heat from within a 50m<sup>2</sup> area of concrete block permeable paving to heat a house – is being monitored by BRE.



## Case study

# Mainstream permeable paving

**The largest concrete block permeable paving project started in Europe during 2005 is today performing well on a major Northampton development.**

The Northampton Brownfield Initiative, a collaboration between English Partnerships and Northampton Borough Council, is transforming various sites to create new homes and leisure facilities. At Sixfields, some 52,000m<sup>2</sup> of concrete block permeable paving – comprising a 2,235 car and coach park with access roads – forms an essential part of this development. It was constructed over old gravel pits previously filled with household waste and capped off with a clay capping layer many metres thick. In order to minimise future settlement it was necessary to reduce the clay capping layer to half a metre thick and apply high-energy ground compaction techniques.

One of the strengths of concrete block permeable paving is its ability to accommodate differential settlement anticipated in situations such as this. Because the capping layer had been reduced the paving could not allow any water to infiltrate into the existing ground. Concrete block permeable paving used for parking areas and roads allows for the

complete capture of all water, as well as its attenuation and treatment within the pavement, before discharge into drainage ditches or directly into the River Nene. Due to the pollution removal characteristics of the permeable paving, it was not necessary to provide oil separators.

The concrete block permeable paving roads are now being adopted by the local authority. This project and others featuring concrete block permeable paving are included as case studies in Interpave's [Understanding Permeable Paving](#).



Aerial view of extensive concrete block permeable paving discharging attenuated and treated water into swales, ditches and ponds, as well as the River Nene.

## Cut out cutting

**A Health and Safety Executive campaign, to prevent health problems resulting from silica dust, highlights Interpave's good practice guidance for the use of precast concrete paving and kerb products on site.**

Crystalline silica is a natural compound found in sand, sandstone, granite and products such as concrete. Health hazards can result from breathing in the fine dust of respirable crystalline silica (RCS). The HSE's 'Clear The Air!' multimedia campaign was produced in collaboration with the construction industry to address this problem. It includes a DVD, leaflets and online forums to show construction workers how to protect themselves from inhaling RCS. More than 240,000 leaflets and 3,000 copies of the DVD have been requested by industry so far. Interpave understands that HSE construction inspectors are being instructed to look at kerb, paving and block cutting as a priority when inspecting sites.

A recent HSE press statement on the campaign said: *"Interpave... has also produced excellent guidance on good practice including alternatives to cutting. One of their case studies also recommends that cutting offsite should be an option"*. Interpave's [Cutting Paving](#) document highlights the correct hierarchical approach when planning work:

1. Avoid cutting
2. Minimise cutting
3. Control dust generation during cutting.

It offers advice on avoiding or minimising the need for cutting block and flag paving by designing with modular dimensions and combining standard products. In the case of precast concrete kerbs, additional options are also available from Interpave manufacturer members. This is illustrated by a [case study](#) which provides just one example of an Interpave member working to reduce risks on site by using efficient design.

Here, heavy duty kerbs were required at a new Distribution Warehouse at Redhouse Business Park near Doncaster to contain a substantial flow of large delivery vehicles: because of their durability and resistance to impact loading, precast concrete kerbs offered the ideal solution. The brief from main contractor Kiernan Construction Ltd., was to eliminate on-site cutting of the kerbs, despite complex layout requirements. The Interpave manufacturer for this project worked closely with the contractor and applied three approaches to achieving the brief. Firstly, use of current standard kerb units was optimised in the design: unlike other kerb materials, an extensive range of precast concrete kerb designs is readily available to simplify this task. Then, additional special units were developed and manufactured – a straightforward and cost-effective process with precast concrete. Finally, where necessary, kerb units were cut and drilled in the factory under safe, controlled conditions.

This approach provided clear benefits for all involved. The designers gained from early involvement of the manufacturer's dedicated expertise, straightforward and cost-effective solutions, and satisfaction of their responsibilities under CDM Regulations. The builders merchant had a straightforward procurement route with



single point technical expertise, while the contractor enjoyed the benefits of step-by-step installation drawings for efficient working, straightforward programming of work and effective management and minimisation of risk. And, of course, the health risks from incorrect site-cutting were eliminated for site workers.



# raining champion

---

## precast concrete sustainable paving

Precast concrete permeable paving is a unique SUDS technique used, with no additional land-take, to minimise, slow down and clean up rainwater runoff – an essential part of the fight against flooding. And products from Interpave manufacturer members also satisfy the broadest sustainability criteria including:

- Low environmental impact endorsed by the BRE Green Guide, generally with A or A+ ratings
- Localised material sourcing, manufacture and product supply without shipping, benefiting the local economy
- Predictable and consistent characteristics for safe surfaces, accessibility for all and long-term durability
- An extensive palette of styles, scales, textures and colours for paving blocks, flags, kerbs and related products

Update your view of precast concrete paving and kerbs. For the full story visit: [www.paving.org.uk/sustainability.php](http://www.paving.org.uk/sustainability.php)



**Marshalls**



**TOWNSCAPE**  
Products Limited



[www.paving.org.uk](http://www.paving.org.uk)

60 Charles Street, Leicester LE1 1FB United Kingdom  
e: [info@paving.org.uk](mailto:info@paving.org.uk) t: 0116 253 6161 f: 0116 251 4568

INTERPAVE IS A PRODUCT ASSOCIATION OF THE BRITISH PRECAST CONCRETE FEDERATION LTD



t: 0116 253 6161 f: 0116 251 4568  
e: [info@britishprecast.org](mailto:info@britishprecast.org) [www.britishprecast.org](http://www.britishprecast.org)



t: 0116 222 9840 f: 0116 251 4568 e: [info@interlay.org.uk](mailto:info@interlay.org.uk) [www.interlay.org.uk](http://www.interlay.org.uk)

PUBLISHED WITH THE  
SUPPORT OF THE CONCRETE  
CENTRE



**The Concrete Centre™**  
PART OF THE MINERAL PRODUCTS ASSOCIATION

t: 0700 4 822 822  
e: [info@concretecentre.com](mailto:info@concretecentre.com)  
[www.concretecentre.com](http://www.concretecentre.com)