

Aquaflow[®] Permeable Paving

INNOVATORS IN
FORMPAVE
PERMEABLE PAVING

a Forterra brand

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Featured Image: Quality control of Forterra Formpave permeable paving prior to drying.

Cover Image Project: Aylesbury Vale Council Offices
Product Type: Ecogranite Aquaslab - Truro

It all began with Formpave

Innovators in permeable paving for over 20 years

Formpave, a Forterra brand, pioneered what is now commonly referred to as sustainable urban drainage systems (SuDS), utilising permeable paving. From these early beginnings, Formpave have become the market leading innovators in this field, with the Aquaflow Permeable Paving System winning The Queen's Awards for Enterprise: Innovation.

Add value

The Formpave range represents a definitive collection of high quality, permeable and conventional concrete block paving products, designed and manufactured in the UK to enhance and add value to your project.

Add sustainability

As a founding member of the UK Green Building Council, Formpave are at the forefront of 'whole system' design solutions. Innovations including water harvesting, thermal heat transfer, permeable paving and recycled content positions the Formpave range as a truly sustainable option.

Add personality

With a wide selection of colours, block types and finishes, finding the desired look is effortless. Each product in the range has been selected, refined and evolved to give a distinctive and unique personality to suit even the most exacting requirements.

Designing your scheme

Formpave's aim is to provide a quality system and SuDS solution. To assist with this, we have a team of experienced engineers offering a comprehensive free design service which includes technical and professional advice, preparation of draft proposals and validation of the clients own design. All designs are covered by our professional indemnity insurance.

Customer Service

We take pride in our customer service, our trained staff take care of our customers' needs making sure they are happy with the level of service we provide.

Contact us:

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Principles of SuDS

Sustainable Urban Drainage System

A sustainable urban drainage system (SuDS) is an alternative to the traditional pipes, gullies and culverts approach to a development and its drainage strategy. A SuDS system comprises of components and techniques that are deemed to be more sustainable and deal with storm water at source.

Sustainable urban drainage systems (SuDS) mimic natural drainage processes by employing these three key principles; water quality, water quantity and biodiversity/amenity.

The Formpave Aquaflow system provides the means to not only achieve but excel in the three key SuDS principles. Through considerate design, careful selection of techniques and materials, the Aquaflow blocks and the Aquaflow system deliver the following benefits:

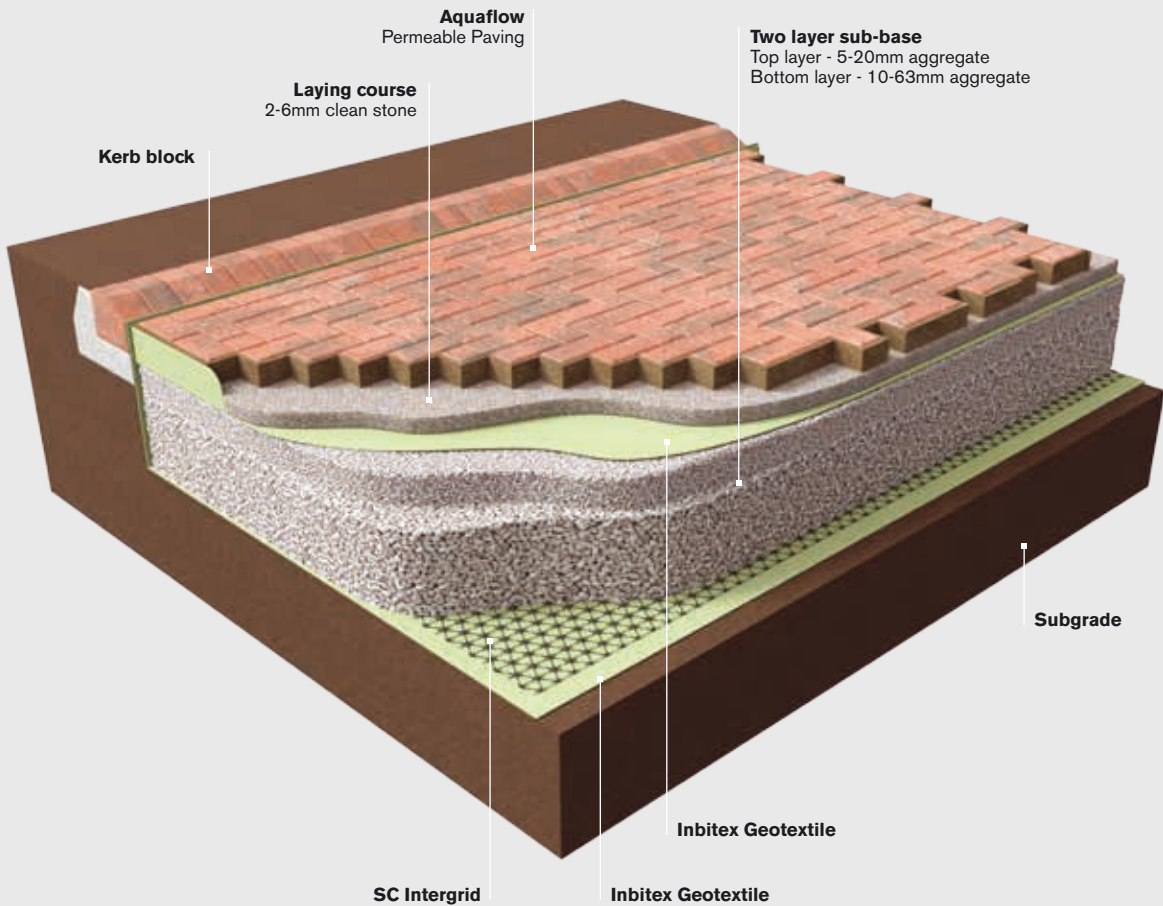
- **Reducing water quantity**
Dealing with surface water at the source reduces the effects of urbanisation and the impact of localised flooding
- **Improving water quality**
Aquaflow provides two levels of storm water treatment; removing harmful pollutants and protecting the environment downstream
- **Contributing to the biodiversity**
Contributing to the biodiversity of development by working in conjunction with other SuDS techniques. Aquaflow allows any hard standings, including roads, to be used as drainage, producing a traditional looking surface with many desirable features.



Featured Project: Kimberley STEM College. Rainwater collected from car park and released into adjoining lake.
Product Type: Aquaflow
Size/Area: 4000m²

Aquaflow[®]

Sustainable Urban Drainage System



Formpave have used research and design to evolve the Aquaflow permeable paving system into one of the most cost effective and functional SuDS within the marketplace. The Aquaflow system has a unique sub-base design incorporating SC Intergrid which reduces construction costs whilst giving superior structural performance. Water quality improvement is realised through the use of our tried and tested Inbitex Geotextile which removes the requirement for downstream pollution control. The patented Aquaflow system fits neatly within any block paving project, where your paving design becomes your drainage design and vice versa.

Formpave Aquaflow SuDS can be designed to as fully attenuation, fully infiltration or as a partial infiltration system. Attenuation (tanked) systems capture storm water to be collected and released in a controlled manner into sewers and downstream watercourses. Infiltration systems allow rainwater to be infiltrated into the ground mimicking a green field environment. Storm water leaving the Aquaflow system is cleaned and filtered through the Inbitex Geotextile layers that promote microbial action. Water quality improvement allows secondary non-potable uses can be carried out such as flushing toilets and watering the garden.

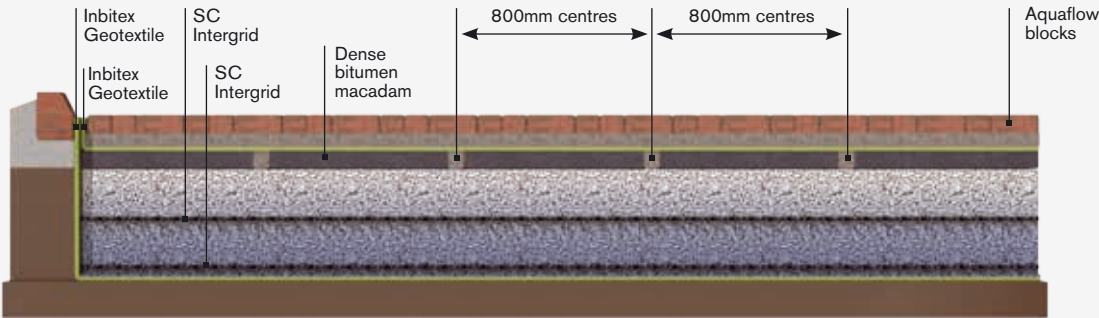
The Aquaflow system can be designed for use in both trafficked and pedestrianised areas, allowing the collection and treatment of storm water from any paved surface.

Advantages of Aquaflow

- Dealing with storm water at source
- Reduces water quantity
- Improves water quality
- Lowers construction costs
- Allows collection of storm water from impermeable surfaces
- Improved maintenance programme.

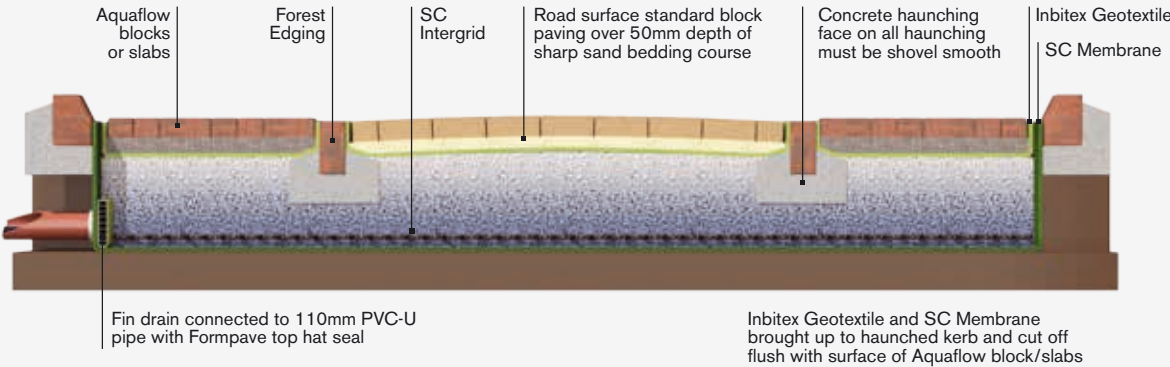
Aquaflow paving with temporary running surfaces

Infiltration system typical adoptable section.



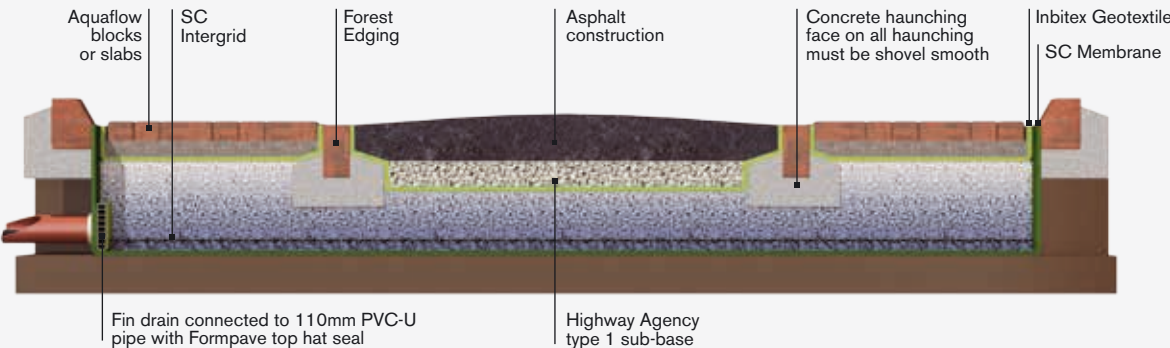
Aquaflow paving in conjunction with standard block paved road surfaces

Tanked system section Aquaflow pavement with undersealing membrane.



Aquaflow paving in conjunction with asphalt road surfaces

Tanked system section Aquaflow pavement with undersealing membrane.



Aquaflow®

Structural & hydraulic research

From the very beginning of permeable paving and the inception of the Aquaflow system, Formpave have invested heavily in research and development. Working closely with a number of universities and educational programmes, Formpave have funded research on the following:

Structural Research

- Formpave Aquaflow System trials at Transport Research Laboratory (TRL)
- TRL validation of system under loading, passing 60,000 'standard axle deformation due to trafficking' test
- Sub-base with SC Intergrid performance undertaken with Tensar.

Hydraulic Research

- Comparisons with traditional drainage
- Water Quantity
- Water Quality
- Testing of Inbitex Geotextile
- Ongoing SuDS research with Ciria.

Research of SC Intergrid and Inbitex Geotextile provided us with two component developments that make the Aquaflow system unique.

SC Intergrid

Proven structural performance with lower construction cost



Inbitex Geotextile

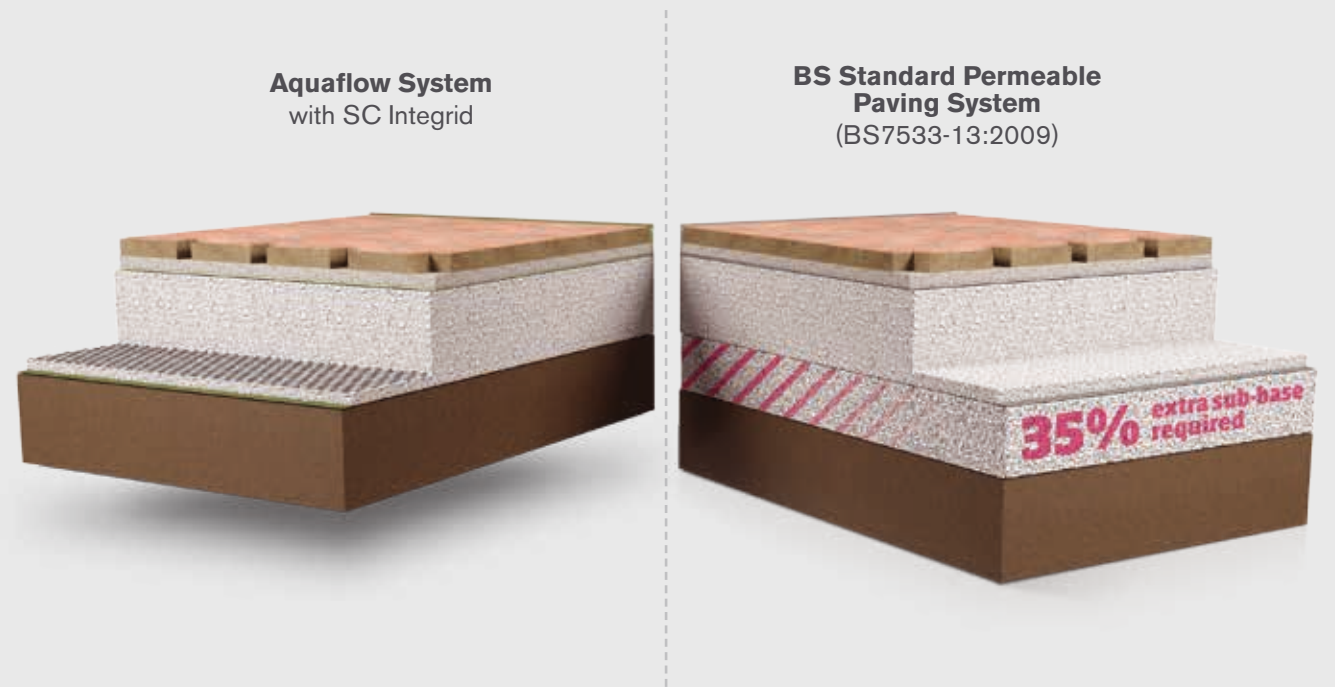
Proven water quality improvement



Aquaflow®

Structural performance

SC Intergrid increases the structural performance of the Aquaflow system whilst reducing the depth of sub-base stone.



Twenty years expertise within the paving industry has enabled Formpave to develop the Aquaflow SuDS and refine its basic elements. Through research we introduced the SC Intergrid into our sub-base design which confines and stabilises the sub-base stone and provides the following benefits.

- **Reduced sub-base thickness - minimum 35% reduction**
- **Increased bearing capacity**
- **Reduced construction costs**
- **Reduce environmental impact.**

SC Intergrid increases the structural performance of the Aquaflow system whilst reducing the depth of sub-base stone. In direct comparison with a British Standard structural permeable paving design there is a difference of 250mm between the systems.

This represents 250mm less excavation and disposal of waste materials, saving not only time and costs on any project but also represents a saving of natural resources.

Through design we have been able to produce a knowledge base and set of construction details to suit almost all structural applications for the Aquaflow system, ranging from domestic driveways to heavily trafficked distribution yards.

For real life design advice please contact Design Services on 01594 836 999

Structural design of a permeable paving system Category B (BS7533-13:2009) Car Parking Bay (3% CBR Minimum Ground Strength)	
Aquaflow System	British Standard
80mm block	80mm block
50mm laying course	50mm laying course
350mm sub-base	350mm sub-base
1 layer of SC Intergrid	250mm capping (ground improvement layer)
480mm total construction depth	730mm total construction depth

Aquaflow®

Hydraulic performance, quality & quantity

The advantages of using the Aquaflow system for collection, treatment and control of storm water is realised on the surface and below ground.



The Aquaflow blocks and system comply with SuDS principles and improve water quality in the following ways:

Water quality

- Researched Inbitex Geotextile has proven pollution control benefits, removing the requirement for petrol interceptors and other filtration or treatment systems
- Sub-base stone provides a second level of storm water treatment; discharge from the system is PH neutral.

Quantity benefits realised

- Aquaflow block surface eliminates surface water run off
- Storm water is dealt with at source
- Removes the first 5mm of any rainfall event
- Delays and reduces storm water discharge
- Allows collection of impermeable surface and roof water.

The Aquaflow system is proven both academically and in real life installations. It has been specified on numerous occasions for these SuDS benefits.

In terms of storm water quality and quantity control, the Aquaflow system is proven to be very efficient and has been selected for these key principles for a number of schemes. These principles were a major consideration when selecting our system for Severn Trent Headquarters in Shrewsbury, where water quality is held in the highest regard (see case study on page 12).



Formpave Aquaflow permeable block paving

Formpave conventional block paving

The patented Formpave permeable block is specially designed, incorporating a slot and chamfer which allows water to permeate through the finished surface at a high rate whilst retaining its visual integrity.

The Formpave Aquaflow block can be incorporated alongside Formpave conventional paving without compromising the visual aesthetics of the scheme.

Case Study

Severn Trent Headquarters

Formpave has supplied Severn Trent Water with a sustainable urban drainage system for the car parking and pedestrian zones of its offices in Shrewsbury, Shropshire.

The 2,000m² car park uses Ecogranite Aquasett permeable paving block that works in conjunction with Formpave's patented Aquaflow system. The remaining 2,500m² of pedestrian zones and hard landscaping areas uses Ecogranite Chartres a standard block paver offering similar aesthetics.

The Ecogranite range has strong environmental credentials as it contains up to 77% by-product material, contributing to the overall sustainability of the project.

In addition to discharge restrictions on-site, pollution control was also a key factor for the client Severn Trent, civil and structural engineers, Arup and landscape architects, Capita Symonds, when specifying the paving and SuDS solution. Aquaflow's unrivalled ability to attenuate and produce clean, pH neutral water for discharge, met all the stringent project requirements.

The Aquaflow system removes oils, hydrocarbons and heavy metals, making it a straightforward surfacing solution for car parking zones and vehicular areas. As part of Formpave's research and development programme, research undertaken at Coventry University on microbial growth has shown that the system is capable of degrading at least 400g of oil per square metre each year.

Formpave's in house design service, worked in partnership with Arup, Capita Symonds and main contractors BAM, to produce a SuDS system design.

Product: Ecogranite Aquasett

Size/area: 4,500m²

Location: Shrewsbury, Shropshire

Architect: Capita Symonds

Main contractors: BAM

Civil and structural engineers: Arup





Design Services

From concept to completion

Formpave offer a comprehensive in-house design service to suit individual site requirements. Our team of experienced engineers have designed over 3000 Aquaflow schemes over the past 20 years. All designs carried out by the design team are project specific, each individual design is carefully considered and bespoke to the project in mind.

Our Services:

- A 6 year design warranty and Professional Indemnity Insurance
- Site visits during construction
- Pre-construction design meetings
- Full structural and hydraulic Aquaflow designs complete with layout drawings and construction details
- Validation of Aquaflow designs
- Attendance at meetings
- Free technical advice
- Access to a range of typical details
- Value Engineering Service

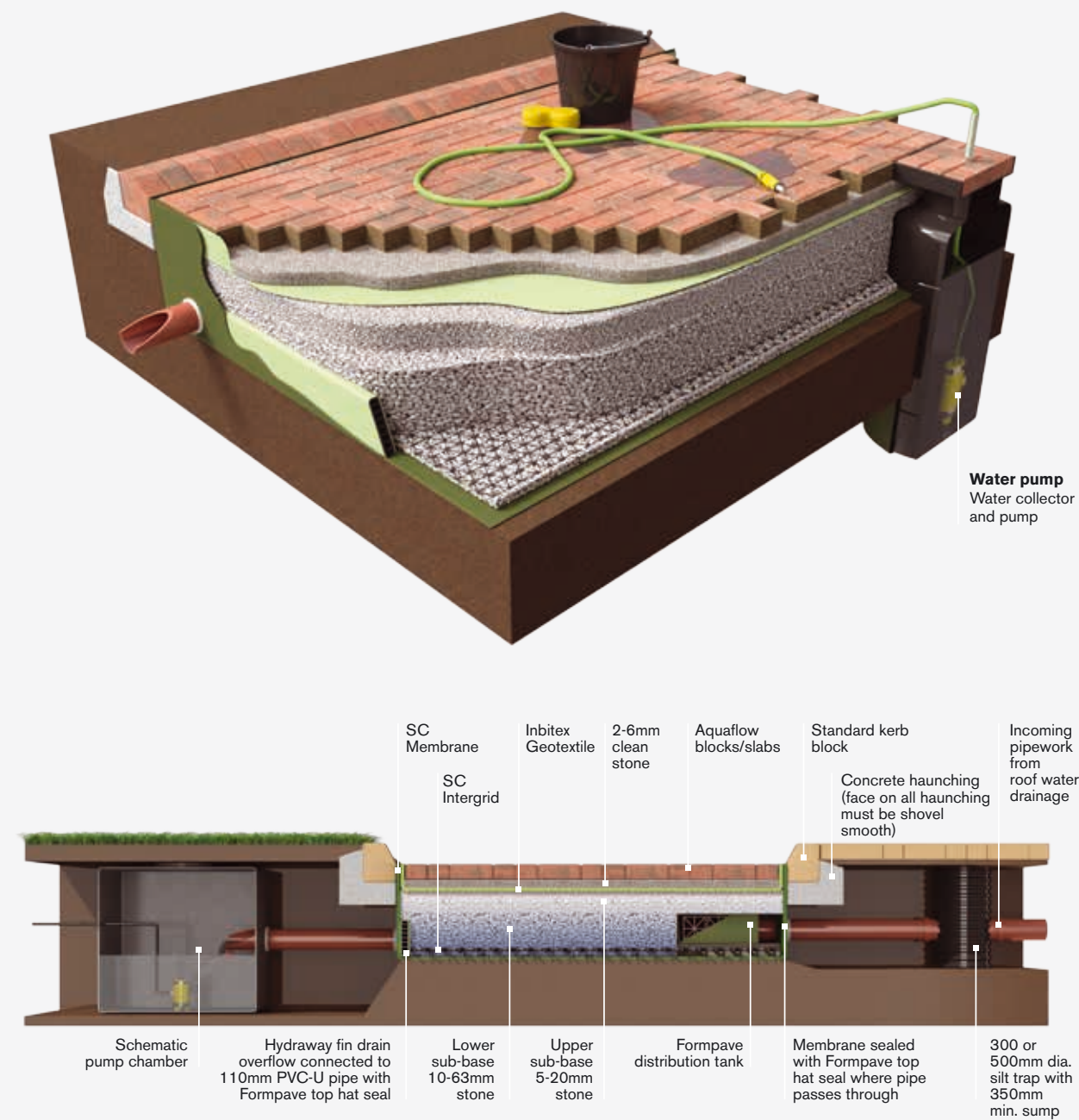
Contact us:

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web formpave.co.uk

email design.services@formpave.co.uk

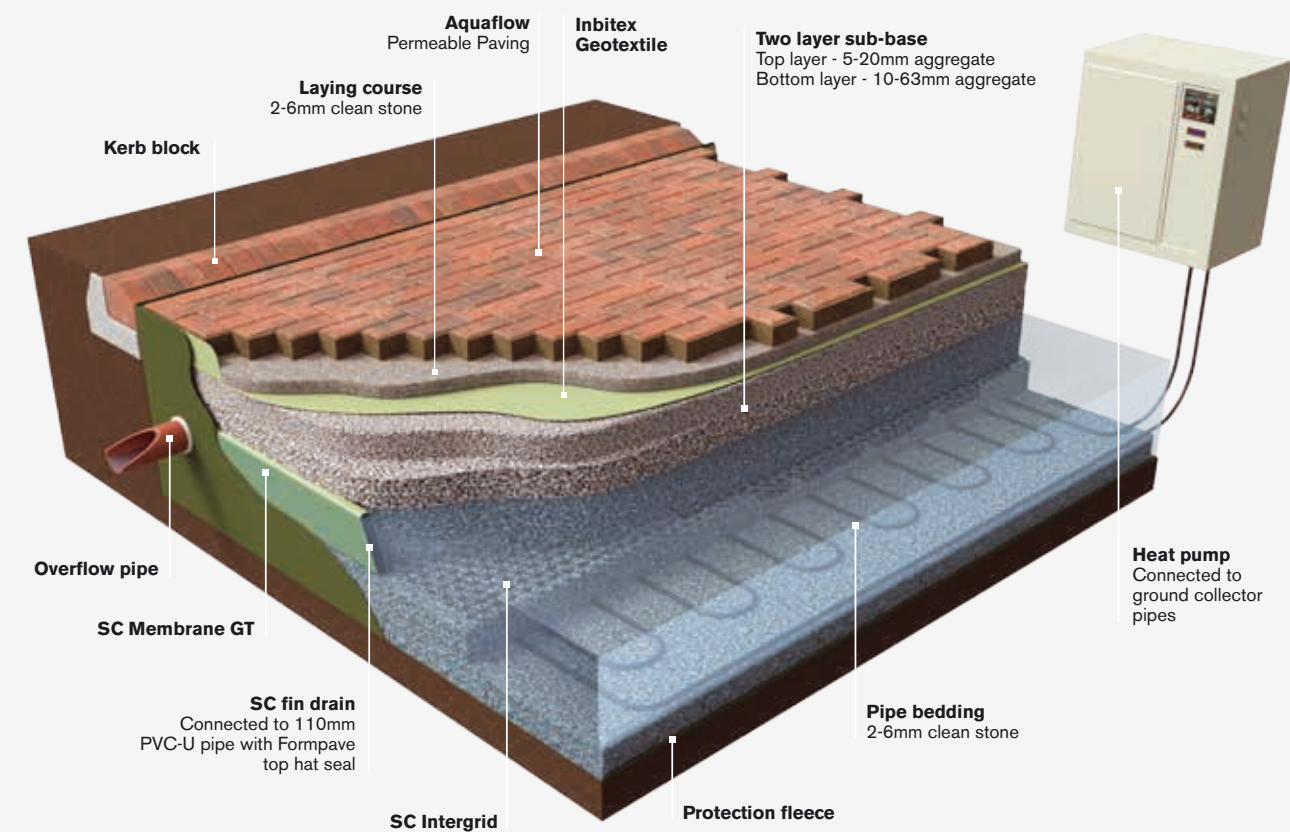
Harvesting water from paved
and roof areas



Benefits of rainwater harvesting:

- Clean PH neutral discharged solution for garden watering
- Maximises water collection from roof and external surfaces
- Provides grey water for flushing toilets and washing machines
- Underground storage not subject to hosepipe ban

Thermapave Renewable
Energy System



Benefits of Thermapave:

- Provides a natural environment which a heat pump collects and amplifies this free and sustainable energy
- Heats and cools a building in an environmentally sensitive manner
- Provides a government revenue stream
- Sustainable energy savings
- High carbon savings
- Reduced maintenance costs
- High BREEAM ratings

For all enquiries email thermapave@formpave.co.uk

Ecogranite

The sustainable solution for permeable paving

Featured Project: Stourhead National Trust
Location: Stourhead
Product Type: Aquasett - Victoria

**UP TO 77%
BY-PRODUCT
MATERIAL**

Ecogranite contains up to 77% by-product material, making it one of the most sustainable paving options currently available.

Ecogranite allows the decision maker to put the environment first. By utilising up to 77% by-product material, Ecogranite is a sustainable and aesthetic solution that decreases the negative environmental impact caused by traditional concrete.

The textured surface exposes the sparkling granite, offering excellent non-slip resistance properties which make it ideal for residential and commercial projects including driveways, access roads and car parks.



Ecogranite Aquaflow
Permeable Block Paving
Pages 20-21



Ecogranite Aquasett
Permeable Block Paving
Pages 22-23



Ecogranite Aquaslab
Permeable Block Paving
Pages 24-25

Colours



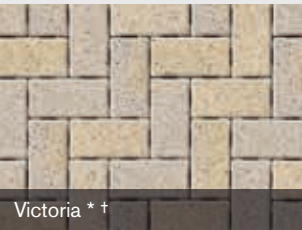
Cornish Silver Grey



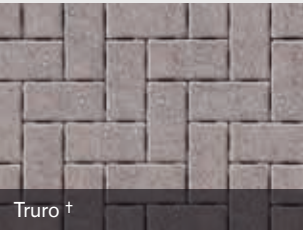
Balmoral



Tintagel *



Victoria * †



Truro †



Braemar * †



Lochnagar * †



Specification

Block sizes (depth)	60mm	80mm
200 x 100mm (blocks per pack)	560	400
Coverage per pack (m²)	11.2	8.0
Weight per pack (tonne)	1.47	1.41
Precast concrete block paving Manufactured to: BS EN 1338:2003 Tensile splitting strength 3.6 Mpa BBA certificate 97/3373	Abrasion 60mm block Class 3 Abrasion 80mm block Class 4 Resistance to weathering Class 3 Slip/skid resistance Extremely low	
Finishes	Bush hammered finish	
Applications	60mm thick for use on footpaths, domestic drives and 80mm thick for use on roads	

The Ecogranite Aquaflow permeable block is best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke site design service to help you minimise your construction costs.

* Colour purposes only † Special order

Ecogranite Aquaflow Permeable Block Paving

Ecogranite Aquaflow permeable blocks are specially designed, incorporating a slot and chamfer, allowing water to permeate through the finished surface at a high rate. Available in 60mm and 80mm rectangular blocks, they sit effortlessly alongside our conventional Ecogranite Royal Forest paving. The textured surface exposes the sparkling granite offering excellent skid/slip resistance. The Ecogranite Aquaflow permeable block can be specified for all sites designed under BS7533-pt13.



Featured Project: Loughborough Innovation Centre
Client: Loughborough University
Sector: Education
Product Type: Aquaflow Ecogranite - Cornish Silver Grey/Balmoral
Size/Area: 56m²/1300m²

UP TO 77% BY-PRODUCT MATERIAL
One of the most sustainable paving options currently available.



Ecogranite Aquasett Permeable Block Paving

Ecogranite Aquasett permeable blocks are specially designed, incorporating a slot and chamfer, allowing water to permeate through the finished surface at a high rate.

Used within residential and commercial projects including driveways, access roads and car parks, Ecogranite Aquasett is available in a wide range of colours, offering an aesthetic appearance for all environments.

Available in mixed packs or large block only. A kerb system is also available to complement the range. The textured surface exposes the sparkling granite offering excellent skid/slip resistance. The Ecogranite Aquasett permeable block can be specified for all sites designed under BS7533-Pt13.



Featured Project: Hurlingham Gate
Client: St James - Berkeley Group
Location: Fulham, London
Sector: Residential Development
Product Type: Ecogranite Aquasett & Ecogranite Standard
Kerb - Cornish Silver Grey/Balmoral
Size/Area: 750m²

UP TO 77% BY-PRODUCT MATERIAL
One of the most sustainable paving options currently available.



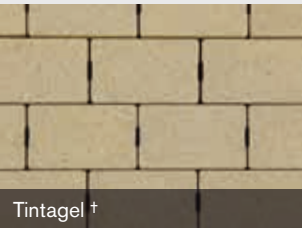
Colours



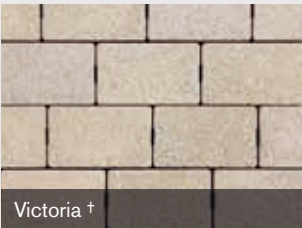
Cornish Silver Grey



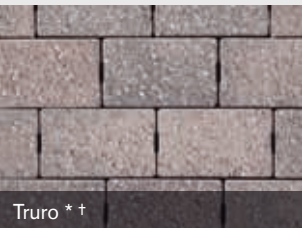
Balmoral †



Tintagel †



Victoria †



Truro * †



Braemar * †



Lochnagar * †

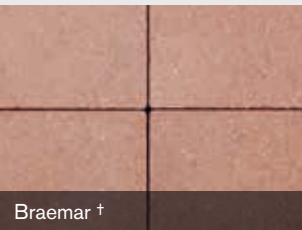
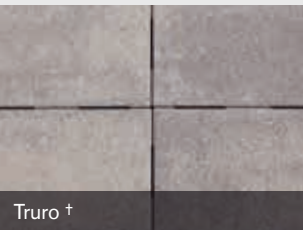
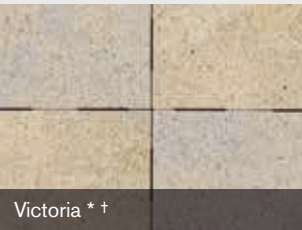
Specification

Combined packs		
Block sizes (depth)	60mm	80mm
Mixed blocks per pack		
Made up of the following sizes:	434	310
250 x 150mm (blocks per pack)	140	100
150 x 150mm (blocks per pack)	196	140
100 x 150mm (blocks per pack)	98	70
Coverage per pack (m²)	11.2	8.0
Weight per pack (tonne)	1.47	1.42
Large block only		
Block sizes (depth)	60mm	80mm
250 x 150mm (blocks per pack)	280	200
Coverage per pack (m²)	10.5	7.5
Weight per pack (tonne)	1.38	1.33
Precast concrete block paving Manufactured to: BS EN 1338:2003 Tensile splitting strength 3.6 Mpa	Abrasion 60mm block Class 3 Abrasion 80mm block Class 4 Resistance to weathering Class 3 Slip/skid resistance Extremely low	
Finishes	Bush hammered finish	
Applications	60mm thick for use on footpaths, domestic drives and 80mm thick for use on roads	

The Ecogranite Aquasett permeable blocks are best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

* Colour purposes only † Special order

Colours



Specification

Block sizes (depth)	60mm
450 x 300mm (blocks per pack)	84
Coverage per pack (m²)	11.34
Weight per pack (tonne)	1.49
Precast concrete block paving Manufactured to: BS EN 1339:2003 Tensile splitting strength 3.6 Mpa	Strength durability Class 1 Slip/skid resistance Extremely low

Finishes	Bush hammered finish
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Applications	For use on pedestrian areas
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The Ecogranite Aquaslab permeable block is best used in combination with the Formpave Aquaflo System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

* Colour purposes only † Special order

Ecogranite
Aquaslab
Permeable
Block Paving

The Ecogranite Aquaslab is specially designed, incorporating a slot and chamfer, allowing water to permeate through the finished surface at a high rate helping to prevent localised flooding.

For use on non-trafficked pedestrian areas, Ecogranite Aquaslab is available in a wide range of colours and finishes with a kerb system to complement the range. The textured surface exposes the sparkling granite offering excellent skid/slip resistance.

The Ecogranite Aquaslab can be specified for all sites designed under BS7533-Pt13.



Featured Project: Aylesbury Vale Council Offices
Client: Aylesbury Vale District Council
Location: Aylesbury, Buckinghamshire
Sector: Local Government
Product Type: Ecogranite Aquaslab - Truro
Size/Area: Over 1000m²

UP TO 77% BY-PRODUCT MATERIAL
One of the most sustainable paving options currently available.



Aquaflow Permeable Block Paving

Aquaflow permeable blocks are specially designed, incorporating a slot and chamfer, allowing water to permeate through the finished surface at a high rate helping to prevent localised flooding.

Available in 60mm and 80mm rectangular blocks they sit effortlessly alongside our conventional Royal Forest paving. The Aquaflow block can be specified for all sites designed under BS7533-Pt13.

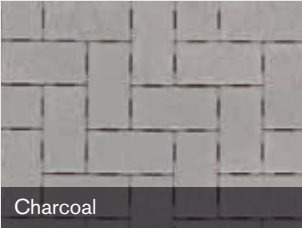


Featured Project: Access Road, Meadowview Homes
Client: Meadowview Homes
Location: Borrowwash, Derbyshire
Sector: Residential
Product Type: Aquaflow 80mm - Charcoal
Size/Area: 750m²

Colours



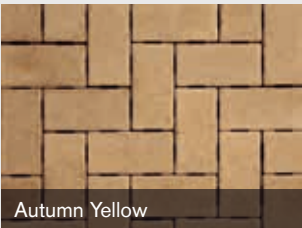
Natural



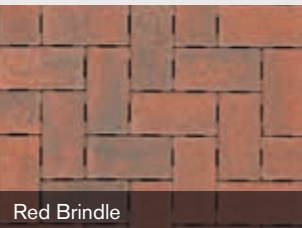
Charcoal



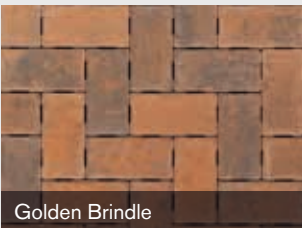
Burnt Red



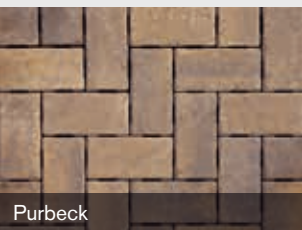
Autumn Yellow



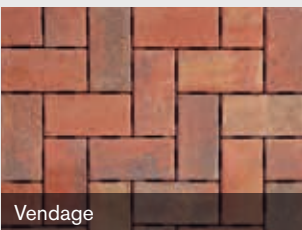
Red Brindle



Golden Brindle



Purbeck



Vendage

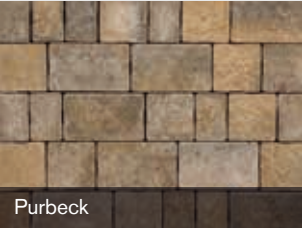
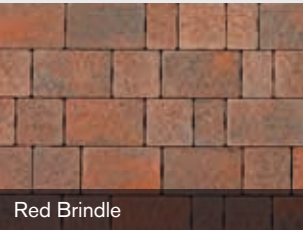
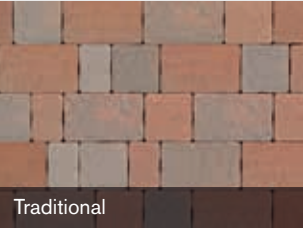


Specification

Block sizes (depth)	60mm	80mm
200 x 100mm (blocks per pack)	424	296
Coverage per pack (m ²)	8.48	5.92
Weight per pack (tonne)	1.1	1.04
Precast concrete block paving Manufactured to: BS EN 1338:2003 Tensile splitting strength 3.6 Mpa BBA certificate 97/3373	Abrasion 60mm block Class 3 Abrasion 80mm block Class 4 Resistance to weathering Class 3 Slip/skid resistance Low	
Finishes	Standard finish	
Finishes (special order)	Bush hammered finish	
Applications	60mm thick for use on footpaths, domestic drives and 80mm thick for use on roads	

The Aquaflow permeable block is best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

Colours



Specification

Combined packs		
Block sizes (depth)	60mm	80mm
Mixed blocks per pack		
Made up of the following sizes:	434	310
250 x 150mm (blocks per pack)	140	100
150 x 150mm (blocks per pack)	196	140
100 x 150mm (blocks per pack)	98	70
Coverage per pack (m²)	11.2	8.0
Weight per pack (tonne)	1.47	1.42
Large block only		
Block sizes (depth)	60mm	80mm
250 x 150mm (blocks per pack)	280	200
Coverage per pack (m²)	10.5	7.5
Weight per pack (tonne)	1.38	1.33
Precast concrete block paving Manufactured to: BS EN 1338:2003 Tensile splitting strength 3.6 Mpa	Abrasion 60mm block Class 3 Abrasion 80mm block Class 4 Resistance to weathering Class 3 Slip/skid resistance Low	
Finishes	Olden finish	
Finishes (special order)	Plain finish, bush hammered finish	
Applications	60mm thick for use on footpaths, domestic drives and 80mm thick for use on roads	

The Aquasett permeable blocks are best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

† Special order

Aquasett Permeable Block Paving

The Aquasett permeable block paving has an attractive olden finish for use within residential and commercial projects, and is fully compatible with the Aquaflow SuDS system. The specially shaped block allows water to permeate through to the lower levels, helping to prevent localised flooding. Available in mixed packs or large block only. The Aquasett block can be specified for all sites designed under BS7533-Pt13.



Featured Project: Warwick Gates Retirement Complex
Location: Warwick
Congtractor: Westpoint Construction
Sector: Local Government
Product Type: Aquasett - Traditional (laid in stretcher bond)/ Pennant (laid in herringbone)
Size/Area: Over 1000m²



Aquaslab Permeable Block Paving

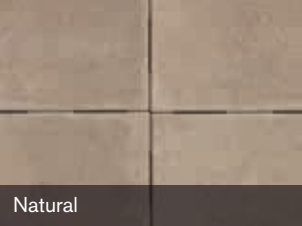
Aquaslab offers a range of contemporary permeable paving slabs for use in pedestrian areas, they are available in 300mm x 450mm dimension and provides a clean, uncluttered design. The specially shaped block allows water to permeate through to the lower levels, helping to prevent localised flooding. The Aquaslab block can be specified for all sites designed under BS7533-Pt13.



Featured Project: The Farmhouse Inn
Location: Adanac Park, Southampton
Sector: Leisure
Product Type: Aquaslab/Forest Edging - Red Brindle
Size/Area: 220m²



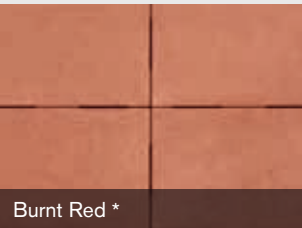
Colours



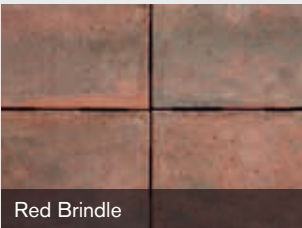
Natural



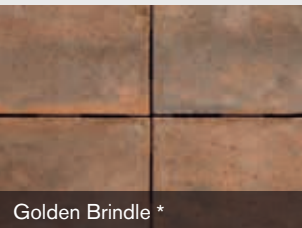
Charcoal



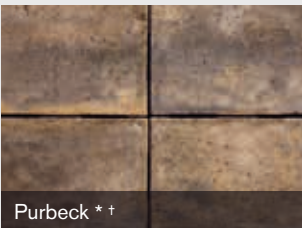
Burnt Red *



Red Brindle



Golden Brindle *



Purbeck * †

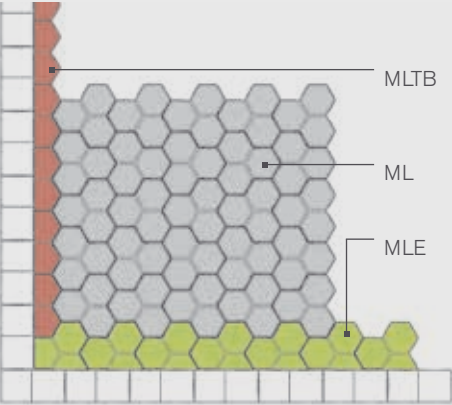
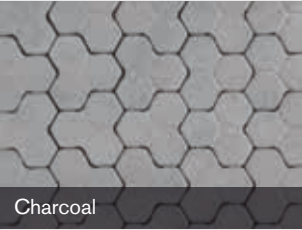
Specification

Block sizes (depth)	60mm
450 x 300mm (blocks per pack)	84
Coverage per pack (m ²)	11.34
Weight per pack (tonne)	1.49
Precast concrete block paving Manufactured to: BS EN 1339:2003 Tensile splitting strength 3.6 Mpa	Strength durability class 1 Slip/skid resistance Satisfactory
Finishes	Standard finish
Finishes (special order)	Bush hammered finish
Applications	For use on pedestrian areas

The Aquaslab permeable block is best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

* Colour purposes only † Special order

Colours



Specification

Block type	ML block 196.7 x 200mm	MLE finishing block 150 x 196.7mm	MLTB finishing block 83.9 x 200mm
Block sizes (depth)	80mm	80mm	80mm
Blocks per pack	250	300	400
Coverage per pack	6.5 (m²)	52 (lm)	80 (lm)
Weight per pack (tonne)	1.15	1.22	1.04
Precast concrete block paving Manufactured to: BS EN 1338:2003 Tensile splitting strength 3.6 Mpa BBA certificate: 97/3373	Abrasion 80mm block Class 4 Resistance to weathering Class 3 Slip/skid resistance Low		
Finishes	Standard finish		
Applications	Machine layable paving For roads and heavy duty use		

The Aquaflow ML permeable block is best used in combination with the Formpave Aquaflow System, a unique patent protected sub base design which utilises geogrids to reduce sub base depth without effecting structural strength. This system has BBA Accreditation and we offer a free bespoke design service to help you minimise your construction costs.

* Colour purposes only



Product Type: Aquaflow ML/MLE/MLTB - Charcoal



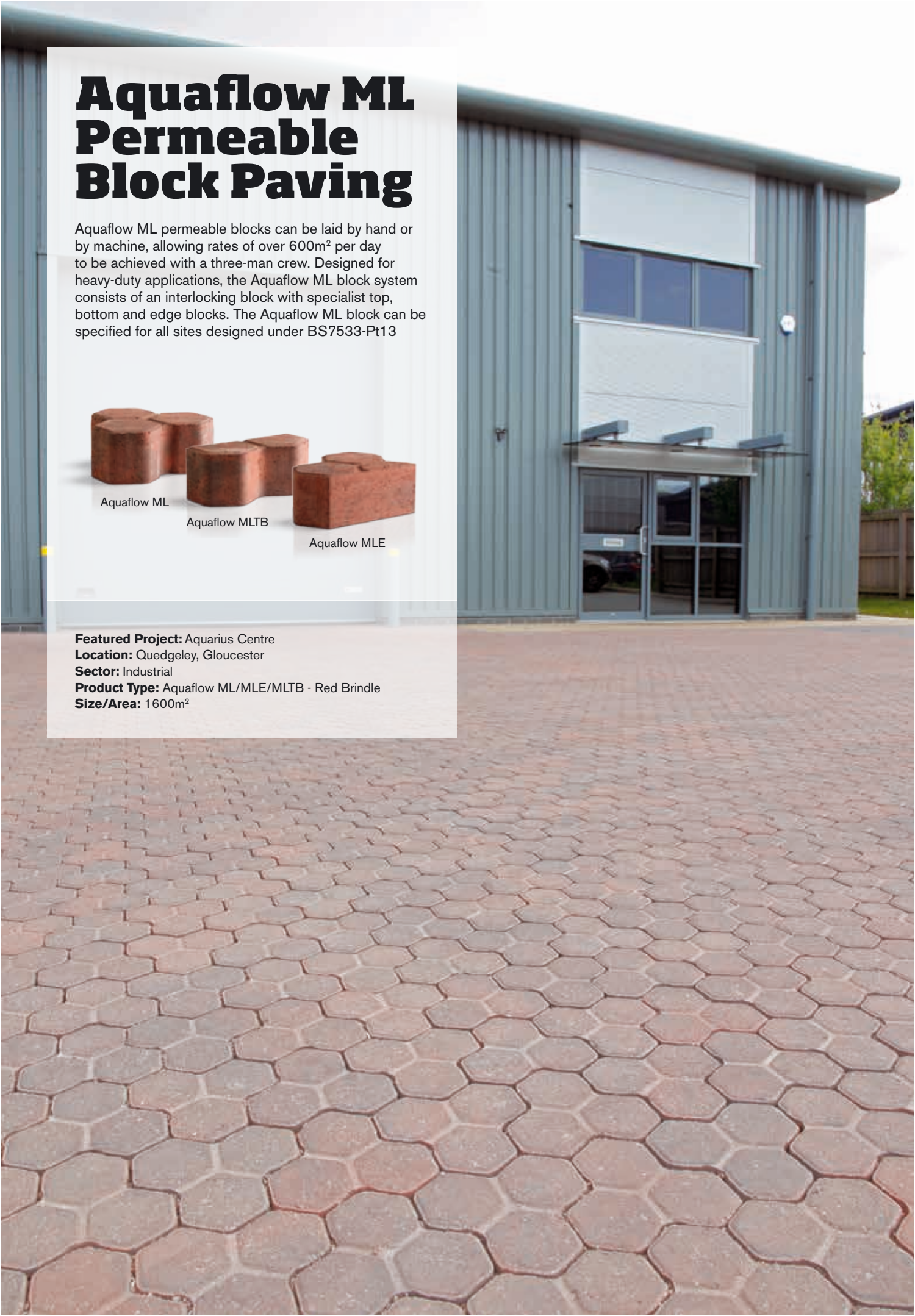
Product Type: Aquaflow ML/MLE/MLTB - Charcoal

Aquaflow ML Permeable Block Paving

Aquaflow ML permeable blocks can be laid by hand or by machine, allowing rates of over 600m² per day to be achieved with a three-man crew. Designed for heavy-duty applications, the Aquaflow ML block system consists of an interlocking block with specialist top, bottom and edge blocks. The Aquaflow ML block can be specified for all sites designed under BS7533-Pt13



Featured Project: Aquarius Centre
Location: Quedgeley, Gloucester
Sector: Industrial
Product Type: Aquaflow ML/MLE/MLTB - Red Brindle
Size/Area: 1600m²



Q24 Sustainable Urban Drainage System Specifications

Types(s) of Paving

Formpave Aquaflow permeable concrete block paving.

Reference

Aquaflow, Aquaflow ML, MLE, MLTB, Aquasett or Aquaslab.

Size

As per manufacturer's specification.

Colours

Various colours and finishes available.

Setting Out

Aquaslab Staggered stretcher bond.

Aquasett Staggered stretcher bond or 90° herringbone.

Aquasett combined Staggered stretcher bond.

Aquaflow block
90° herringbone

Aquaflow ML Include stretcher course around edge in conjunction with MLE and MLTB.

Kerbs

Standard kerb system or Forest Edging: both to be haunched with concrete.

Laying course

50mm depth of 2-6mm. single size clean crushed stone to BS EN 13242: 2002. The crushed stone used for the laying course must have a minimum LA Coefficient of 25.

Inbitex Geotextile

As specification.

Depth of Sub-base

It is recommended that a sub-base depth of 350mm should be used. The depth of sub-base may be varied at the discretion of the engineer.

Alternative Sub-base Materials

Recycled sub-base materials such as concrete and treated rail ballast can be used but must meet similar grading and strength specification as the natural aggregates specification. This material should be sourced within 30km of the site to gain maximum BREEAM points.

Sub-base Specification

All granular sub-base material shall comprise crushed rock or concrete possessing well defined edges. It must be sound, clean, non-friable and free from clay or other deleterious matter.

The material must be non-plastic when tested in accordance with BS1377 Test No.4

The crushed stone used for the sub-base must have a minimum LA Coefficient of 25.

The selected test samples shall not be oven dried and should be soaked in water at room temperature for 48 hours before the test. The 100mm deep upper layer of sub-base material should be graded 5mm-20mm to BS EN 13242: 2002.

Intergrid(s)

SC Intergrid Geogrid.

DBM Running Course

To be 20mm dense base binder course manufactured with 100/150 grade bitumen to BS4987. The DBM shall conform with the Requirements of BS 4987

SC Membrane Geomembrane

Generally a taped membrane will be suitable for most applications of the tanked system. If a guaranteed watertight system is required a fully welded system should be installed.

Examples of this type of application would be sites with a high water table, methane contamination, areas above basements or retaining walls. Further advice should be sought from the Formpave design team.

Findrain

150/300mm Findrain to BBA Number 95/85.

Formpave Top Hat Seal

Formpave top hat seal.

NOTE:

For construction details please contact Design Services on 01594 836 999 design.services@formpave.co.uk

Maintenance

Operation & maintenance requirements

Maintenance schedule	Action	Frequency
Regular maintenance	Sweeping surface to remove debris and contamination	1-2 times a year, typically Spring and after leaf fall in Autumn
Occasional maintenance	Removal of leaves	As required
Remedial actions	Remediate areas of rutting and depressions	As required
	Replace broken/damaged blocks	As required
	Rehabilitate surface with sweeping and reapplication of 2-4mm clean gritstone	As required
Monitoring	Initial inspection	Within 3 months of installation
	Inspection for poor performance and silting	Annually
	Inspect ancillary drainage components i.e. gullies, outfall pipes etc	Annually

For more information please see Ciria SuDS Manual table 20.15

Stone Specifications



Lower sub-base layer

10-63mm clean crushed stone	
Sieve sizes	% passing
80mm	100
63mm	90-100
40mm	60-80
20mm	15-30
10mm	0-5
Reference specification	BS EN 13242:2002
Material specification	Material supplied shall be referred to as 10-63mm clean crushed stone and conform to the above sieve analysis and aggregate testing.



Upper sub-base layer

5-20mm clean crushed stone	
Sieve sizes	% passing
40mm	100
20mm	90-100
10mm	25-75*
4mm	0-15
2mm	0-5
Reference specification	BS EN 13242:2002
Material specification	Material supplied shall be referred to as 5-20mm clean crushed stone and conform to the above sieve analysis and aggregate testing.

Aggregate Testing
Los Angeles Coefficient (LA) - Determination of resistance to fragmentation = 20 BS EN 13242:2002. Note: Lower values than those specified signifies better resistance to fragmentation and abrasion and is therefore acceptable.



Laying course

2-6mm clean crushed stone	
Sieve sizes	% passing
10mm	98-100
6.3mm	80-100
2mm	0-20
1mm	0-5
Reference specification	BS EN 13242:2002
Material specification	Material supplied shall be referred to as 2-6mm clean crushed stone, typically limestone or granite, gravel is not permitted. This material is to conform to the above sieve analysis and aggregate testing.



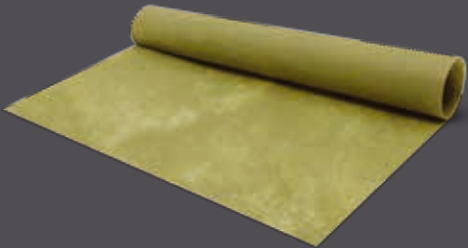
Surface dressing

2-4mm Quartzite gritstone	
Sieve sizes	% passing
6.3mm	100
5mm	95-100
3.35mm	66-90
1.18mm	0-20
600 microns	0-8
63 microns	0-1.5
Reference specification	BS EN 1097-2:1998 BS EN 1091-8:2000 Annex A
Material specification	Material supplied shall be referred to as 2-4mm clean Quartzite and conform to the above sieve analysis and aggregate testing. This defines the 2-4mm surface dressing to be applied to the surface of Aquaflow pavers and subsequently brushed/vibrated between pavers.

Aquaflow® Components

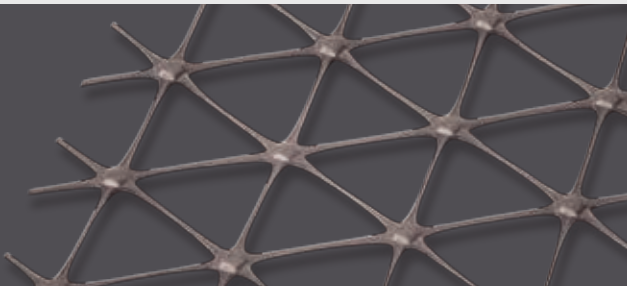
Inbitex Geotextile

Exclusive to Formpave Aquaflow system, this non-woven geotextile is used for separation, filtration and pollution control.



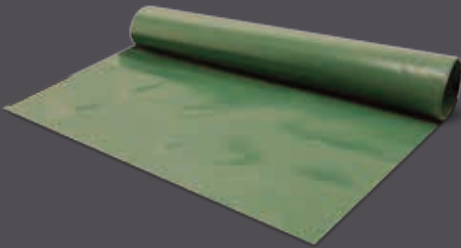
SC Intergrid

Exclusive to Formpave and the Aquaflow system this sub-base stabilisation grid improves structural strength, increases design life and reduces construction costs.



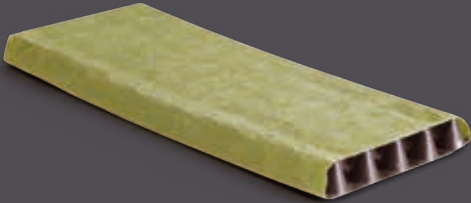
SC Membrane

Exclusive to Formpave and the Aquaflow system this impermeable membrane allows the storage of collecting storm water. Used for the Aquaflow attenuation system it can be welded or taped dependent on the application. A higher grade SC Membrane GT can be specified when contamination is present.



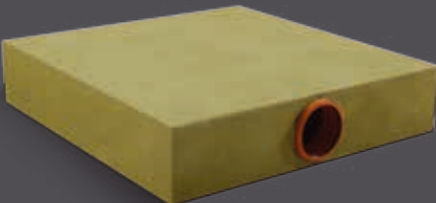
SC Findrain

This drainage component allows efficient and high flow removal of storm water from the Aquaflow system. Wrapped in Inbitex Geotextile which provides further filtration and cleansing.



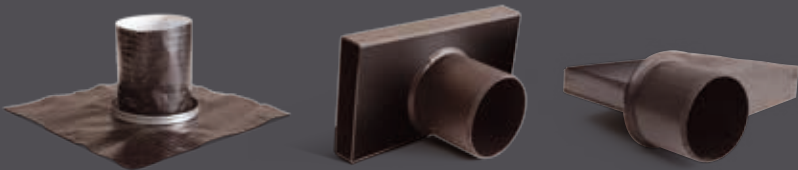
Aquaflow Distribution Tanks

Voided crates that are extremely strong structurally and are wrapped in Inbitex Geotextile, which provides filtration and cleansing. Allows the collection of impermeable surface water catchment, such as roofs to the Aquaflow system.



Top Hats, Tape and Fittings

Aquaflow system components.





Case Study

The Buttercross

Formpave's Aquaflow Sustainable Urban Drainage System (SuDS) was the natural choice for an award-winning development of new homes in Witney, Oxfordshire.

Project: The Buttercross	Location: Oxfordshire
Product: Aquaflow/ Royal Forest	Developer: Bower Mapson
Size/area: 9,500m ²	Sector: Residential

The Buttercross has provided 106 homes designed to reflect the historic character found in the market town's conservation areas, while incorporating the latest building and energy efficiency technologies.

Developers Bower Mapson specified Aquaflow for the site, which is next to the Emma's Dyke waterway, to simplify surface water drainage and resolve any concerns regarding the quality of discharged water.

Formpave's experienced in-house design team designed an Aquaflow SuDS infiltration system. The scheme was designed to adoption standards and is soon to be adopted by Oxfordshire County Council.

The sub-base stone was created from the demolition of a former factory. The Formpave team worked very closely with Bower Mapson to ensure a high quality and well-graded material was achieved.

The use of recycled material within the Aquaflow SuDS System provided a Building Research Establishment Environmental Assessment Methodology (BREEAM) rating of A+.

Peter Mapson, Managing Director of Bower Mapson:

"I designed a dense urban scheme for the site, with the highway filling the space between the buildings, so Aquaflow paving was the perfect answer.

It simplified the surface water drainage, particularly where private front garden areas were limited. Because we used the Aquaflow design service from the outset, all parties understood the benefits of re-charging groundwater, plus we saved separate roof storm drainage by some discharging under the highway.

Put simply, choosing Aquaflow fits our philosophy of developing environments which all parties can be proud of."

Aquaflow and Royal Forest paving in Charcoal, Burnt Red and Vendage were used on the development which was commended in the Sunday Times British Homes Awards.



Case Study

National Trust

Over 1,000m² of Formpave's Ecogranite Aquasett paving has been used by the National Trust at its historic Stourhead estate to alleviate the risk of flooding in the large visitor reception area.

Project: National Trust Stourhead	Location: Mere, Wiltshire
Product: Ecogranite Aquasett	Engineers: Nicholas Pearson Associates
Size/area: 1000m ²	Sector: Commercial

It was important that the Ecogranite edging was seamless to the original 18th century cobbles and the paving was selected in 'Victoria', a warm, rustic cream colour ideal for the chalky tones of the downs.

The National Trust's Stourhead estate is a Palladian mansion set within 2,650-acres of parkland in Wiltshire. The partially-bound gravel surface at the large visitor reception area presented problems throughout the year including flooding, which caused the existing gravel and topsoil surface to be washed away, exposing raised tree roots and creating potential trip hazards.

A hard surfacing solution that was self-draining, accessible and aesthetically pleasing was needed.

Formpave offered the perfect solution, combining the environmental credentials of its Ecogranite paver, which contains up to 77% by-product content, with the benefits of the SuDS and permeable paving system, Aquaflow.

Karl Papierz, National Trust's project manager for Stourhead:

"The Trust, as well as its partners and stakeholders have a vested interest in the entrance and courtyard areas as they have a direct impact on a number of businesses.

"All parties are extremely happy with the appearance and performance of the paving; it has eliminated the risk of potential flooding into the shops and Inn, and has facilitated ease of movement around Stourhead. The rainwater run-off onto public highways has also been eradicated which in turn has eased erosion of the adjoining gravel pathways."

Kerbing & Highways

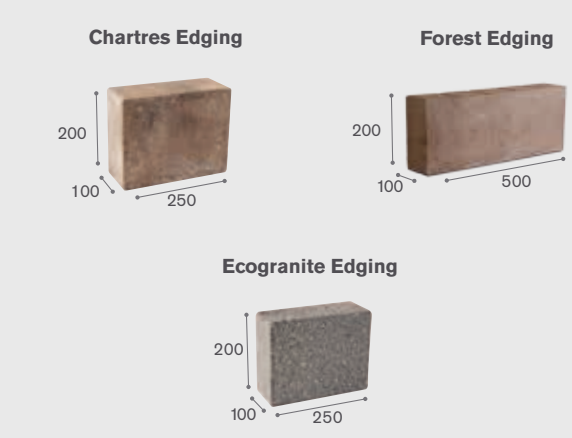
Kerbs, Demarcation & Tactile Paving

Ecogranite Kerb & Centre Stone

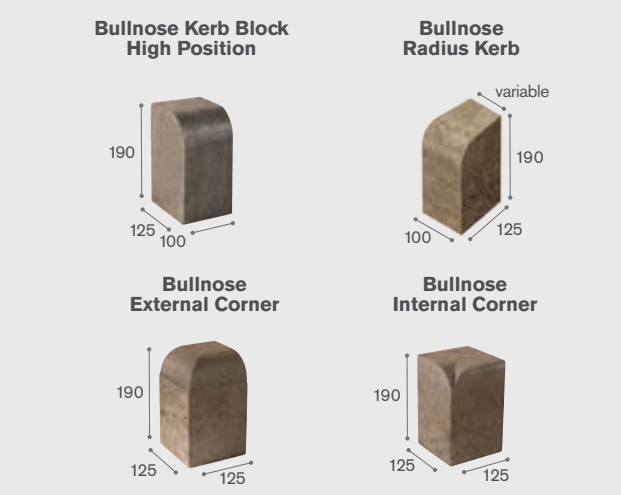


This image is made up of quadrant, Ecogranite kerb, dropper (4 in set) and centre stone.

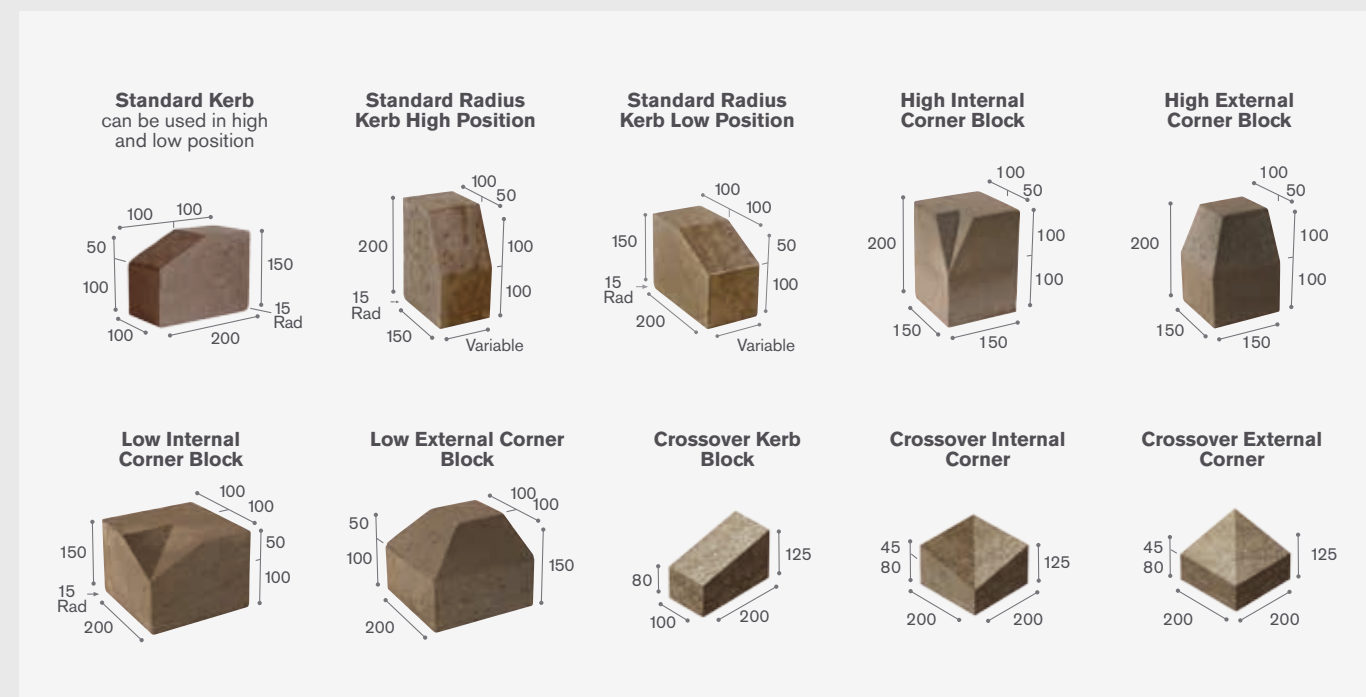
Edgings in Standard, Ecogranite & Chartres colours



Bullnose Kerbs in Standard & Ecogranite colours



Standard Kerbs & Accessories in Standard & Ecogranite colours



Kerb and Edging Colours

For an accurate colour match please request a sample.

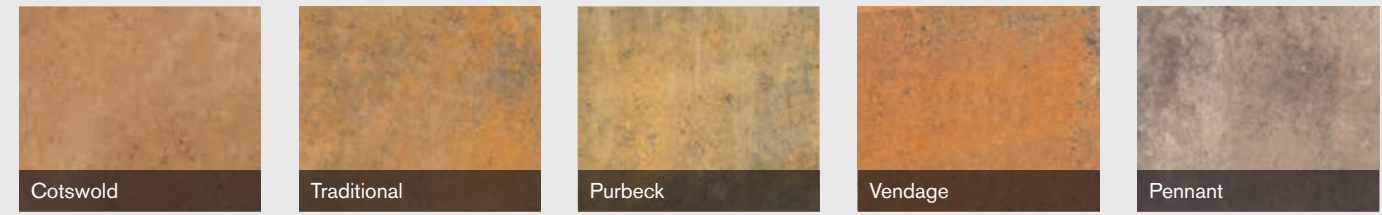
Standard



Ecogranite[†]



Chartres



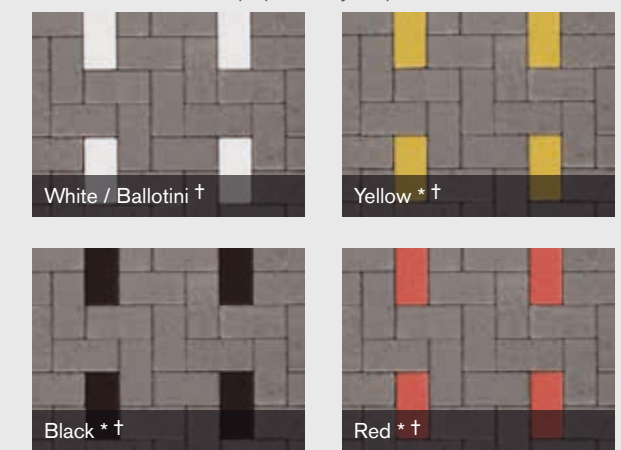
Note: Transition kerbs are available to complement the Standard Kerbs. All dimensions are in mm. Although every effort is made to ensure consistency of product colour, variations between production batches can occur. Formpave recommend that all products are thoroughly mixed on site by drawing from a minimum of three packs. [†] Other Ecogranite colours available by special order. For transitions to suit standard and bullnose kerbs, please see conventional brochure or visit formpave.co.uk

Demarcation Block Paving

Demarcation block paving is faced with a coloured non-reflective epoxy paint, available both in the Royal Forest and Aquaflow range, and is suitable for car parks and loading bays. When enhanced visibility is required, Ballotini glass beads are added.

Colours

* Colour purposes only † Special order



Tactile Block Paving

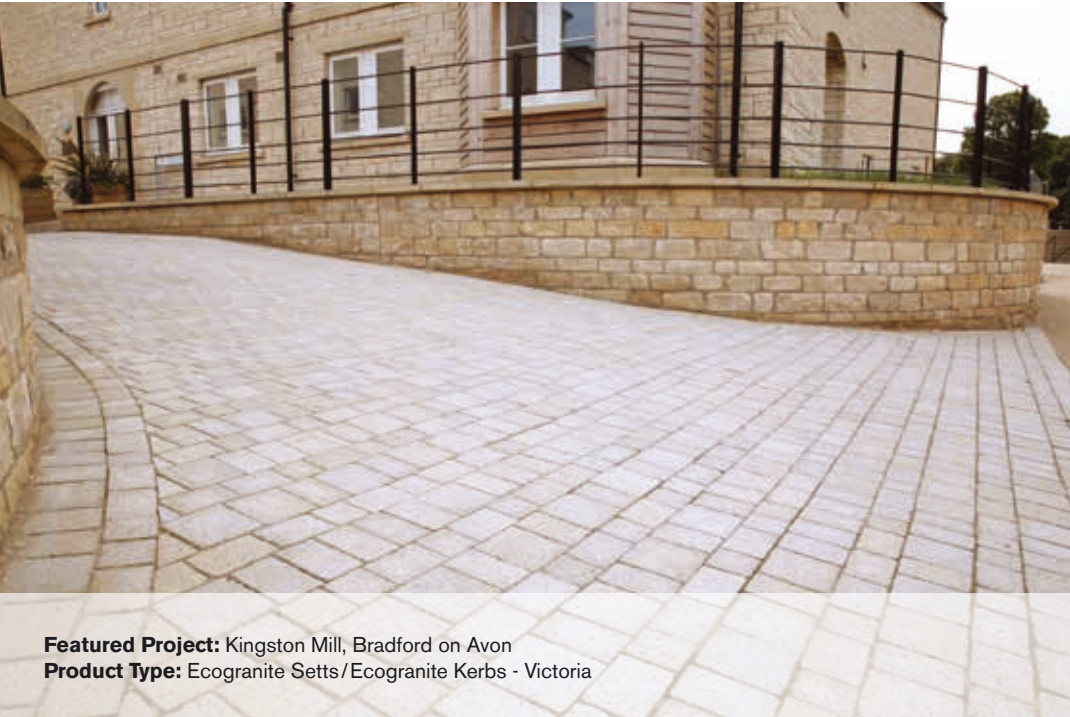
Tactile paving provides a warning to visually impaired pedestrians, to differentiate between where the footway ends and the carriageway begins. Our unique sized, high strength tactile pavers have been specially designed to overcome the breakage problems caused by accidental overrun, experienced by local authorities with larger element tactile paving.

Colours





Featured Project: Blackford Industrial Units
Product Type: Ecogranite Boulevard - Cornish Silver Grey



Featured Project: Kingston Mill, Bradford on Avon
Product Type: Ecogranite Setts/Ecogranite Kerbs - Victoria



Conventional non-permeable Block Paving Range for driveways, car parks and paths

For more information, pick up the
Formpave Conventional block paving
brochure at your local stockist or
visit **formpave.co.uk**

Featured Project: Sustainable Construction Academy (SusCom)
Location: Dartford, Kent
Product Type: Ecogranite Chartres - Cornish Silver Grey/Balmoral
Size/Area: 56m²/2000m²

Ecogranite Boulevard



Ecogranite Longsetts



Ecogranite Chartres



Ecogranite Cobbles



Ecogranite Setts



Ecogranite Slab



Ecogranite Royal Forest



Chartres



Chartres Cobbles



Chartres Boulevard



Royal Forest



Chartres Linear



Clifton Setts



Fineline



Tactile



Demarcation





Forterra is a leading manufacturer of a diverse range of clay and concrete building products, used extensively within the construction sector, and employs over 1,600 people across 17 facilities in the UK.

It is the second largest brick and aircrete block manufacturer in the country, and the only producer of the iconic London Brick. Other trusted brands from Forterra include Thermalite, Conbloc, Ecostock, Butterley, Cradley, Red Bank, Jetfloor and Formpave.
forterra.co.uk

Your local stockist:

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Tufthorn Avenue
Coleford
Gloucestershire
GL16 8PR

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Fax: +44 (0) 1594 810 577
Email: sales@formpave.co.uk

formpave.co.uk

