Formpave

Aquaflow® permeable paving
Sustainable urban drainage systems

Available in Formpave EcoGranite
Formpave

Used on hundreds of contracts worldwide

Tested over 15 years

Water harvesting

Clean and controlled water discharge

Bioremediation of hydrocarbons

Retention of heavy metals

Design service available

BBA certification

Formpave EcoGranite

An Aquaflow surface has the capacity to deal with rainfall intensities approximately 90 times greater than that required by the regulations.* Formpave also manufacture a comprehensive range of pavers, kerbs and fittings.

* New Building Regulations became effective on 1 April 2002

The Aquaslab, Aquasett and Aquaflow block is available in Formpave EcoGranite, an environmental alternative to the use of freshly quarried granite. Formpave’s unique granite mix includes both Stent and Slag by-products of Cornish China Clay and the South Wales steel industry.
The Problem
Increasing urbanisation and rapid run-off have put a tremendous strain on conventional storm water drainage systems. This has resulted in sewers and culverts becoming overloaded during periods of heavy rain and contamination of streams and rivers.

Heavy metals, hydrocarbons, rubber dust, silts and other detritus are all deposited on impermeable surfaces during dry weather. These are scoured off such surfaces during periods of heavy rain and transported at best into expensive treatment works, or directly into rivers and streams where they cause severe environmental damage.

SUDS should be used on all sites to minimise the impact of the development on the environment. In Scotland the use of the SUDS approach is a legal requirement.

The Solution - Source Control
Sustainable Urban Drainage Systems (SUDS) are increasingly being used to prevent run-off and flooding, and as a method of collecting and cleaning storm water.

The Formpave sustainable urban drainage system allows heavy rain to infiltrate through a permeable concrete block paved surface into a unique sub-base before being released in a controlled manner into sewers or water courses.

Discharge rates in accordance with greenfield run-off can be readily achieved if required. Alternatively, if the underlying sub-grade is suitable the water can be infiltrated directly into the sub-grade.

The water leaving the Formpave Aquaflow system is cleaned by filtration and microbial action and can be used for secondary non-potable uses such as flushing toilets and watering soft landscaping.

A further advantage of the system is that roof water can be drained directly into the sub-base via a rodable sump, or if siphonically drained, through a dispersion chamber.

All information contained in this brochure is based on typical schemes. Therefore it is recommended that each site should be designed to suit its individual specific conditions and restrictions.
### Sustainable urban drainage system

#### Infiltration

Used to infiltrate the water directly into a suitable sub-grade.

#### Tanked

Used to attenuate water before release, harvesting for re-use or where difficult or contaminated sub-grades are encountered.

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**There are 3 system designs**

Each design can be tailored for infiltration or tanked and to fulfil the requirements of the project:

1. **For a sub-grade CBR of between 2-5%**
   - Parking areas subject to trafficking by cars and vans only.

2. **For a sub-grade CBR of 5% or greater**
   - Parking areas subject to trafficking by cars and vans only.

3. **For a typical footpath construction**
   - For Aquaflow, Aquaset and Aquaslab paving.

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The diagrams illustrate the three designs applied to a typical infiltration system which uses two pervious Inbitex geotextiles. On Tanked systems the underlaying pervious geotextile is replaced with an impervious SC membrane.

See page 6 for detailed information.
Each of the 3 basic system designs can be tailored for infiltration or tanked to fulfill the specific requirements of the site.

Typical system with a sub-grade CBR of between 2-5%
Parking areas subject to trafficking by cars and vans only

Typical system with a sub-grade CBR of 5% or greater
Parking areas subject to trafficking by cars and vans only

Typical footpath construction
For Aquaflow/Aquasett /Aquaslab paving

Infiltration
The system is underlaid with a pervious geotextile (Inbitex) and is suitable for use where it is proposed to infiltrate the water directly into a suitable sub-grade.

Tanked
The system is underlaid by an impervious membrane (SC membrane) and is suitable for use where it is proposed to attenuate storm water before releasing it in a controlled manner, harvest the water for re-use or where difficult or contaminated sub-grades are encountered.

The type of membrane used and the method of sealing will depend upon the application. In some circumstances the membrane will require additional protection from puncturing and specialist advice should be obtained.

The impervious membrane restricts water entering the sub-grade, and preserves sub-grade structural integrity. This is very important where clay sub-grades are encountered.

Where a completely watertight system is required a welded membrane should be used at formation level.

Laying course material and sub-base
Both the Tanked and Infiltration systems utilise the same laying course and sub-base materials.

Depth of sub-base can be varied to suit requirements of the engineer.

The sub-base stone must be crushed, possess well defined edges and be in accordance with the Los Angeles coefficient carried out to the requirements of EN 1097-2 1998 clause 5.

Grading of lower sub-base stone

<table>
<thead>
<tr>
<th>BS Sieve size</th>
<th>% passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>100mm</td>
<td>100</td>
</tr>
<tr>
<td>63mm</td>
<td>80-100</td>
</tr>
<tr>
<td>37.5mm</td>
<td>60-80</td>
</tr>
<tr>
<td>20mm</td>
<td>15-30</td>
</tr>
<tr>
<td>10mm</td>
<td>0-5</td>
</tr>
</tbody>
</table>

* See specification on pages 20-22

The diagrams illustrate the three designs applied to a typical infiltration system which uses two pervious Inbitex geotextiles. On tanked systems the underlying pervious geotextile is replaced with an impervious SC membrane.

Inbitex® - thermally bonded non-woven geotextile
Inbitex has been specifically developed to optimise the cleansing of water entering the system. The unique combination of materials used creates a geotextile that aids the development of the naturally occurring microbes, and offers them refuge during periods of drought.

For further information see page 21.
The Aquaflow® range of permeable paving

Aquaflow®
For use on car parks, drives and moderately trafficked areas
Size 100 x 200 x 60/80mm
Laying pattern Must be laid in 90° herringbone
Colours* Natural, Burnt Red, Red Brindle, Golden Brindle and Charcoal
Finish Standard
Bush hammered to special order

Aquaflow ML block®
For Roads and heavy duty use
Size 80mm
Laying pattern Include stretcher course around edge in conjunction with MLE and MLTB
Colours* Natural, Burnt Red, Red Brindle, Golden Brindle and Charcoal
Finish Standard
Not available in EcoGranite

Aquaflow MLE® top drawing
End block
For use with Aquaflow ML blocks

Aquaflow MLE® bottom drawing
Top and bottom block
For use with Aquaflow ML blocks

Formpave have designed a range of Aquaflow paving blocks to be used in conjunction with either tanked or infiltration systems. The range consists of six blocks manufactured from concrete with a tensile splitting strength in accordance with BS EN 1338:2003. Included within the range is the Aquaslab which has been designed for use on non-trafficked pedestrian areas.

All of the blocks and slabs provide drainage through vertical channels and will allow water through the surface at a rate of approximately 9000mm per hour (9000 litres per m² per hour). The Inbitex geotextile beneath the laying course will allow approximately 4500 litres per m² per hour through and this figure should be used for design purposes.

The Aquaslab which has been designed for use on non-trafficked pedestrian areas.

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System details - principal benefits

Lower construction costs  Control of run-off  Aquaflow hydraulic performance  Quality of discharge water  Water harvesting and re-use  Geothermal heating and cooling  Roof water  Maintenance and performance  Heavy duty use  Design criteria  Design service

Lower construction costs

From experience it has been shown that total construction costs are lower than conventionally drained surfaces.

When using the Formpave Aquaflow system it is not necessary to incorporate the gullies, drainage pipes, drain runs, oil and silt traps and flow control mechanisms that are needed for traditional drainage.

When comparing relative costs it is important that all costs associated with traditional drainage are incorporated e.g. gullies, channels, hydraulic controls, detention ponds, petrol interceptors, culverts etc.

It should be noted that the Formpave sub-base is open textured and therefore has a greater rate of spread than Highways Agency Type 1 sub-base.

Formpave specified sub-base stone weighs approximately 1.8 tonnes per m².

Type 1 sub-base stone weighs approximately 2.2 tonnes per m².

(based on carboniferous limestone).

Control of run-off

Run off during periods of heavy rain is eliminated. Aquaflow products allow water to infiltrate through the surface of the system at a rate of approximately 9000mm per m² per hour.

Aquaflow hydraulic performance

For rainfall events with small rainfall depths (5mm and below) there is no effective run off from a permeable pavement.

The results show that for short duration events there is significant attenuation of the peak discharge.

The peak discharge from the pavement is less than the flow rate falling onto the pavement and for long duration rainfall events, equilibrium conditions are achieved - the outflow matches the inflow rate.

One can expect a variability in the response to a given rainfall event depending upon antecedent rainfall. The overall performance is not significantly affected by the antecedent conditions if the event is significant.

The results of the study show that permeable pavements empty rapidly and easily satisfy the requirements on the time to half empty to avoid potential flooding from multiple storms.

For short duration events, of the order of 30 minutes or less, the peak discharge appears to be relatively insensitive to the length of the pavement, up to realistic lengths. This emphasises the effectiveness of permeable pavements in attenuating peak discharges for short duration events.

The model analysis indicated that under most conditions within the laying course. Heavy metals have an affinity to particulates; adhering to the surface of the organic matter and silt. They are therefore stabilised and retained within the sub-base.

Hydrocarbons are digested by a population of naturally occurring microbes. Research undertaken at Coventry University on microbial growth has shown that the system is capable of degrading at least 400g of oil per m² per annum.

The Environment Agencies have confirmed that silt traps and oil interceptors are not required as the system catches silts and degrades oils.

An additional advantage is that water exiting the system has a pH of approximately 7.5. (UK rainfall has a pH of approximately 4.5).

Discharge rates in accordance with greenfield run-off can be readily achieved if required. Where the underlying sub-grade is suitable, water can be infiltrated directly into the ground. Infiltration can be considered even where the sub-grade would not be suitable under BERE Digest 365 criteria. The reservoir capacity of the sub-base allows water to be stored before slowly infiltrating over a period of time.

Approximately 30% of water entering the system is lost through evaporation and does not leave in the form of exit water.

Quality of discharge water

Analysis of exit water from the system has shown it to be as clean as the water discharged from a modern sewage works.

The layers of stone and geotextile act as a type of trickle filter. Organic matter, silt and loam is caught in the geotextile and held within the laying course. Heavy metals have an affinity to particulates; adhering to the surface of the organic matter and silt. They are therefore stabilised and retained within the sub-base.

Balancing factors are also available in the form of exit water. It is essential to take account of the outputs of the sub-base and to ensure that the system is designed to incorporate the gullies, drainage pipes, drain runs, oil and silt traps and flow control manholes that are needed for traditional drainage.

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An additional advantage is that water exiting the system has a pH of approximately 7.5. (UK rainfall has a pH of approximately 4.5).
Water harvesting and re-use
A number of sites are harvesting and re-using water directly from the system.

Youth hostels and schools are using the water for non-potable purposes such as flushing lavatories and a large garden centre is using this resource to water plants and soft landscapes. It has been found that water from the Formpave Aquaflow system is kinder to plants than tap water.

The Hanson-Formpave water recycling system collects rainfall in the base of a tanked permeable pavement. Water falling onto the pavement surface and that coming from adjacent roofs is collected and this water is cleaned by the Inbitex geotextile layer before storage. The recommended uses for this water are toilet flushing, garden watering and car washing. Together, these uses can reduce by 50% or more the household requirement for mains water.

A driveway of 40m$^2$ when full of rainwater can provide enough water for around 1 month use even with no extra rainfall.

Geothermal heating and cooling
Hanson-Formpave presents a pavement-based system capable of reducing a building’s reliance on gas or electricity for heating and cooling by up to 80%. A patented system for heat capture from stored water can be used to generate 6 kilowatts of energy for indoor climate control. A heat pump moves the heated or cooled water through either underfloor heating or radiators. The payback period on the system is typically between 3 and 6 years after which, other than the cost of running the heat pump, heating and air cooling costs are completely removed.

Roof water
Roof water can be discharged into the sub-base. See page 17 for design details.

With gravity fed drainage it is recommended that the water is introduced into the sub-base by means of a sump with a manhole cover adjacent to the paved area. Any debris can be easily caught and cleared. The water is then dispersed within the system via a distribution tank.

Where siphonic drainage is proposed it is recommended that you contact the Hanson Formpave design team 01594 836999.

Maintenance and performance
The surface has a design life equivalent to standard block paving. The surface blocks require simple routine maintenance - see page 24: maintenance specification.

Professor John Argue of the Urban Water Resources Centre at the University of South Australia has undertaken extensive research on the siltation of blocks and laying course. His research assumed rainfall of 580mm per annum with a loading of 200 parts per million of silts. This is similar to the annual rainfall in Newark, Nottinghamshire, and the silt loading is what would be found in an established urban catchment.

He concluded that after 35 years, surface permeability is approximately 20% of the ‘as new’ value.

Assuming a ‘worse case scenario’ where after say twenty five years, 90% of the surface permeability has been lost through silting. The permeability of the surface is still 9000mm x 10% or 900mm of water per hour per m$^2$ (900 litres per m$^2$). This would indicate that the surface permeability is still eighteen times what is required to deal with 50mm of rain in an hour.
Paving systems at a number of academic and independent institutions including Coventry University, Edinburgh University, Abertay University, Delft University, HR Wallingford, University of Cantabria and TRL at Crowthorne. Formpave have always shared (and continue to share) the results of this research with the construction industry, and it is this approach that has established the Company as the world leader in permeable paving solutions.

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The following information can be provided by contacting the Hanson Formpave design team: Standard detail in ‘AutoCAD’ format also specifications for laying, reinstatement and maintenance as shown on pages 20-24.

Heavy duty use

Trials undertaken at the Transport Research Laboratory validated the sub-base design for heavy duty use. It is recommended that this sub-base design is used wherever there is a possibility of over-run by heavy vehicles.

The heavy duty sub-base design comprises two separately graded layers of stone with an SC intergrid at the interface between the two layers (a further optional second SC intergrid may be installed lower down the sub-base at the engineers discretion).

The standard details show a base layer of 250mm of 10-63 stone overlaid by a SC intergrid and a 100mm depth layer of 5-20 stone. The depth of the sub-base may be varied at the engineers discretion. In certain circumstances it may be necessary to include a Dense Bitumen Macadam (DBM) layer beneath the laying course, this should be punctured at 800mm centres.

Design criteria

The sub-base has a reservoir capacity of approximately 30%.

As a quick rule of thumb - 10m² of Formpave Aquaflow system with a depth of 350mm of sub-base will accommodate 1 cubic metre of water.

Where it is proposed to drain impermeable surfaces onto areas of Aquaflow it is recommended that a maximum ratio of 2:1 impermeable: Aquaflow is used.

Excessive run-off from an impermeable surface onto an Aquaflow area could result in siltation occurring and increase the requirement for regular maintenance.

Design service

Formpave offer a comprehensive free design service to suit individual site requirements.

The service offered by Formpave’s team of engineers includes technical and professional advice, preparation of draft proposals, and validation of client’s own designs.

All designs that have been provided or approved by Hanson Formpave are covered by Formpave’s professional indemnity insurance and benefit from the company’s 15 years experience in designing permeable paving systems.

Every aspect of Formpave’s permeable paving system has been independently tested and verified - both in terms of pollution control properties and hydraulic and structural performance. During the past 15 years the Company has sponsored an ongoing programme of research and development into permeable paving systems at a number of academic and independent institutions including Coventry University, Edinburgh University, Abertay University, Delft University, HR Wallingford, University of Cantabria and TRL at Crowthorne.
Construction Drawings

Aquaflow paving in conjunction with standard block paved road surfaces

Tanked system section Aquaflow pavement with undersealing membrane

- Inbitex
- SC membrane
- Kerb block
- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids
- Inbitex
- SC membrane

- Inbitex and SC membrane brought up to haunched Kerb and cut off flush with surface of Aquaflow blocks/slabs

- 110mm PVC-U pipe with Formpave top hat seal
- HVAC blocks or slabs
- 10-63mm stone
- Lower sub-base
- Upper sub-base

- Optional SC intergrid
- Air voids
- Inbitex
- SC membrane

- Inbitex
- SC membrane
- Kerb block
- 2-6mm clean stone
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Construction running surface - adoptable design

Tanked system section Aquaflow pavement with undersealing membrane

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- SC membrane
- Kerb block
- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids

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- Inbitex
- SC membrane
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- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids

- Inbitex
- SC membrane

Down pipe drainage into tanked system

Aquaflow pavement with undersealing membrane

- Inbitex
- SC membrane
- Kerb block
- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids

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- SC membrane

- Inbitex
- SC membrane
- Kerb block
- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids

- Inbitex
- SC membrane

Aquaflow paving in conjunction with water harvesting drainage system

Shown with the Standard Tanked system

- Inbitex
- SC membrane
- Kerb block
- 2-6mm clean stone
- Standard kerb block
- 5-20mm sub-base
- Lower sub-base
- SC intergrid
- Optional SC intergrid
- Air voids

- Inbitex
- SC membrane

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- Inbitex
- SC membrane

Hanson Formpave design team: 01594 836999 or designservices@formpave.co.uk

- See specifications
Sloping sites tanked system
Aquaflow pavement with underscoring membrane also see plan

Illustrations on this page feature the tanked system for infiltration replace SC membrane with Inbitex.

For further information contact the Hanson Formpave design team.

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Sloping sites tanked system
Aquaflow pavement with underscoring membrane also see plan

Illustrations on this page feature the tanked system for infiltration replace SC membrane with Inbitex.

For further information contact the Hanson Formpave design team.
Q24 Sustainable urban drainage system

Aquaflow paving

Typical of Paving

Permeable concrete block paving

Manufacturer:
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Reference
Aquaflow, Aquaflow ML, MLA, MITB, Aquasett or Aquasilab.

Size
As per manufacturer’s specification

Colours
Red brindle, Golden brindle, Natural, Charcoal, Burnt red.

Aquaflow ML: Include stretcher course around edge in conjunction with MLA and MITB.

Kerbs
Standard kerb system or Forest Edging, both to be backfilled with concrete.

Laying course
60mm depth of 2-6mm, single size clean crushed stone to BS EN 13242: 2002.

Inbitex
As specification

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

The material must be non-plastic when tested in accordance with BS 1323 Test No 4.

The crushed stone used for the laying course and sub-base must have a minimum 10% fines value of 150kN when tested in accordance with BS812 Part 111.

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 grinded 3mm-20mm to BS EN 13242: 2002.

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. Alternatively 270mm of sub-base overlaid with 80mm of dense bitumen base course to Clause 503 of the Highways Agency Specification may be used.

Intergrid(s)® SC Intergrid.

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.

Membrane
Generally a tarmac 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 Hanson Formpave design team.

Fin drain
300mm Hydraway Fin Drain to BBA Number 95/65.

Inbitex® and Distribution Tanks

Sub-base
Thermally bonded nonwoven geotextile to optimise the cleansing of water entering the system. The various characteristics have been combined to create a unique geotextile that aids the development of the naturally occurring microbes, and offers them refuge during periods of drought.

Mechanical properties
Wide width strip tensile EN ISO 10919
Mean peak strength 8.50 N/m
Elongation at peak strength 20%

CBR puncture resistance EN ISO 12236
Mean peak strength 157kN

Topsoil/crushed stone resistance BS 4453
Mean peak strength 32kN

Hydraulic properties
Pure size EN ISO 12236
Mean AOS = 0.14mm
Water flow EN ISO 11998
Mean flow 3.20 m³/s
Water Absorption BS 6926: Part 3
Mean head 50mm
Air permeability ISO 9237
Mean flow 995 l/m²

Typical physical properties
Mass EN 485 130 g/m²
Roll weight 4.5 ± 1.5 g/m²
Roll length 100m

Distribution Tanks
For use in association with down pipe drainage into a tanked system

Material Polypropylene, Polyethylene, PVC (connector)

Volume: (void 92%)

Underground perforated pipe

Effective perforated surface area 92.2%

Inbitex® (inftop) Enflor® (inftop) (135mm core)

Nominal size 854 x 708 x 150mm

Nominal volume 5037 litres

Weight 35kg

Inbitex® and Distribution Tanks

Contraction/Expansion

Installation
All construction work on pavements should be carried out following completion of general site works and after topsoiling or heavy duty vibrating plate to the requirements of Clause 802 of the Highways Agency specification.

The final pass should be undertaken with no vibration. Compaction should continue until 97% of the compacted bulk density achievable under laboratory conditions has been reached. This can be measured with a nuclear density gauge. The specified 350mm depth of sub-base may be varied by the Engineer to suit site requirements.

SC Intergrid
Where required the Intergrid should be incorporated at the interface between the two layers of sub-base. The Intergrid should be laid on the sub-base and joints should be overlapped by 300mm. The upper sub-base layer (5-20mm) should then be laid on top of the Intergrid and compacted as before.

A second intergrid can be incorporated underneath or within the sub-base at the Engineer’s discretion. This should be laid in the same way as the first intergrid.

Inbitex® Lay geotextile on top of the sub-base overlapped joints by 300mm. Inbitex should be brought up to the haunched kerb/edging and cut-off flush with the surface of the paving.

Laying course
Lay and screed to level approximately 50mm depth of 0-6mm single sized crushed stone to BS EN 13242: 2002. It is important that the final level of the 2-6mm stone is accurate as the stone will compact down much less than sand when the surface blocks are vibrated. The particle shape of...
the 2-6mm stone will also affect the degree of compaction.

It is recommended that a small trial area should be laid prior to construction to determine the accuracy of final levels.

Block laying

It is advisable to pre-set the block level by 6mm to allow for the effects of settlement when laid against fixed edgings. The blocks and slabs must be tightly butt jointed ensuring that a good fit is achieved.

A single or double stretcher course of Aquawall blocks must be used around the periphery of the paved areas and also at the edges of any separately restrained areas, such as tree pits.

It is recommended that lateral restraints (such as forest edging) should be installed in areas where vehicles turn and/or brake, such as bends and junctions and on large areas of paving. The lateral restraints should be properly constructed and haunched with concrete.

Where blocks need cutting, they should be cut to a tight fit and none are to be smaller than 30% of the unit block size with three machined edges. Where Aquawall blocks are cut they must be cut across the 100mm and not the 200mm dimension. Blocks should be cut vertically and not under-scored.

All block cutting should be carried out with a disc cutter.

Surface Finish

The blocks should be vibrated with a vibrating plate. Type DVP75/22" or similar. Following the first pass with a vibrating plate, 2-4mm clean quartzite or gritstone should be applied to the surface and brushed in. (Available from Formpave in 25 kg bags). The layers and sides between the blocks should be fully filled. Blocks should again be vibrated and any debris brushed off.

General

It is important that access to services in or underneath the Formpave Sustainable urban drainage system is undertaken in a disciplined and progressive way.

Procedure

Uplift Aquawall blocks 1m either side of the line of relevant underground services.

Take up the laying course stone and cut the underlying geotextile membrane along either side of the line of services and parallel with them. Dispose of the laying course stone and geotextile.

Excavate sub-base stone and place adjacent to the excavation on plastic membrane. The sub-base stone can be re-used.

Cut intergrid(s) in the same way as the geotextile and dispose of it.

Cut layer of geotextile or waterproof membrane at reduced level along the line of the services in the same way as the higher layer of geotextile and dispose of it.

Excavate material over and around services and put on plastic membrane ready for re-use.

Carrt out repair on services.

Once repairs have been completed replace and fully compact the excavated material around the services.

Cut fresh geotextile or waterproof membrane to size allowing additional 200mm extra width either side of the remaining geotextile membrane. Tape new geotextile/membrane in place.

If a heavy duty welded waterproof membrane is installed due to a high water table or the presence of methene the replacement membrane will need to be re-welded to the existing membrane.

Replace the first 250mm depth of sub-base and thoroughly compact, cut and install fresh intergrid(s), allowing 300mm of extra width either side.

Spread and compact final 100mm depth of sub-base.

Cut fresh geotextile membrane to size again allowing 300mm overlap using double sided tape. Lay and loose screed to level approximately 50mm depth of 2-6mm crushed stone to BS EN 13242: 2002.

Replace surface blocks, vibrate surface blocks to level and dress the surface with 2-4mm clean gritstone and vibrate again.

Brush off and dispose of any debris before final vibration.

Colours and finishes

Hanson Formpave products are manufactured from naturally occurring materials and consequently may show slight variations in finish and colour.

It is strongly recommended that products are taken from two or more packs and mixed during laying to minimise any colour variations.

All concrete products may suffer from efflorescence. This occurs naturally and will disappear with use. It is in no way detrimental to the performance of the product. No responsibility can be accepted for this natural reaction.

Alternative colours & finishes

Special colours and finishes are available to order. Please consult sales office details.

Samples

Sample blocks are available from your nearest Hanson Formpave Stockist upon request.
All packs are palletised and shrink-wrapped with the exception of the Aquaflow block which is Void packed.

60mm AquaSlab 11.34m² per pack, 84 blocks in 14 layers. Weight approximately 1.49 tonnes per pack.

60mm AquaSett 10.5m² per pack, 280 blocks in 14 layers. Weight approximately 1.38 tonnes per pack.

80mm AquaSett 7.50m² per pack, 200 blocks in 10 layers. Weight approximately 1.33 tonnes per pack.

60mm AquaSett combined 11.2m² per pack, 434 blocks in 14 layers. Weight approximately 1.47 tonnes per pack.

80mm AquaSett combined 9.0m² per pack, 280 blocks in 10 layers. Weight approximately 1.42 tonnes per pack.

60mm Aquaflow block 8.48m² per pack, 424 blocks in 14 layers. Weight approximately 1.10 tonnes per pack.

80mm Aquaflow block 5.92m² per pack, 296 blocks in 10 layers. Weight approximately 1.04 tonnes per pack.

80mm Aquaflow EcoGranite block 8.0m² per pack, 400 blocks in 10 layers. Weight approximately 1.42 tonnes per pack.

80mm Aquaflow ML block 5.14m² per pack, 250 blocks in 10 layers. Weight approximately 1.15 tonnes per pack.

80mm Aquaflow MLE block 5.14m² per pack, 300 blocks in 10 layers. Weight approximately 1.22 tonnes per pack.

80mm Aquaflow MLTB block 8.0m² per pack, 400 blocks in 10 layers. Weight approximately 1.04 tonnes per pack.

The range of kerb options together with the full range of Formpave concrete paving products are illustrated in greater detail in the standard Formpave manual available on request.

Standard kerb system The range consists of fifteen blocks to facilitate edge restraint, cornering, cross-over and transition.

EcoGranite kerb Bush hammered finish.

Forest edging A substantial edge restraint also used for lateral strength in pavement design.

The surface blocks have a design life equivalent to standard block paving. All paved surfaces will require occasional cleaning. In normal circumstances, regular sweeping will be sufficient.

It is recommended that this should be carried out in the spring and after leaf fall in autumn. It should be noted that lighter coloured blocks may exhibit tyre marks and will therefore require more cleaning and maintenance when used in certain situations. Following routine maintenance it may be necessary to re-dress the surface with 2-4mm clean gritstone.

Ultimately, perhaps after 25 years or more, areas of the laying course may become filled with silts and toxins. If this occurs the surface blocks should be uplifted and the affected areas of laying course material and geotextile disposed of. The existing sub-base can be left in situ. Fresh geotextile and laying course stone should be installed and the existing surface blocks re-used.

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Hanson Plc, a Global Business

Hanson is one of the world’s largest suppliers of heavy building materials to the construction industry with Hanson in 2006 of not. Our products fall into two categories: Aggregates (crushed rock, sand and gravel, ready-mix concrete, asphalt and cement related products) and Building Materials (concrete blocks, precast products and concrete paving, blocks, tiles and pipes). We employ 26,000 people, operating primarily in North America, the UK and Australia with further operations in Asia Pacific and Continental Europe. Hanson Building Products UK incorporates London Brick, Thermolite, Red Bank, Cradley and Formpave.