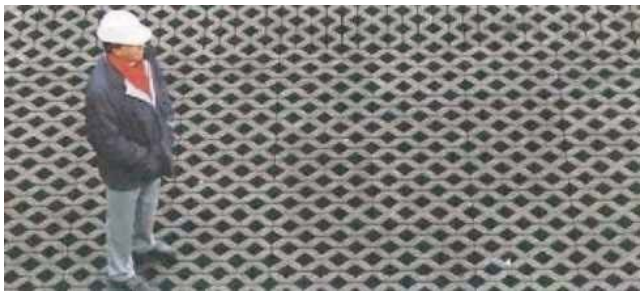
KPC | UK & ROI

Killeshal Precast Concrete

*TRUSTED SINCE 1969*

UK tel: 0800 0393367 - Rep. Irl tel: 057 9353018

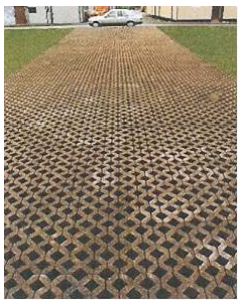
# grass blocks



Environmental awareness now plays a significant part in the modern build environment to meet the needs of architects, engineers and planners, we offer a system that will overcome the problems of soil erosion, soil retention, armouring verges and preserving banks on waterways and road ways in an aesthetic and ecological manner.

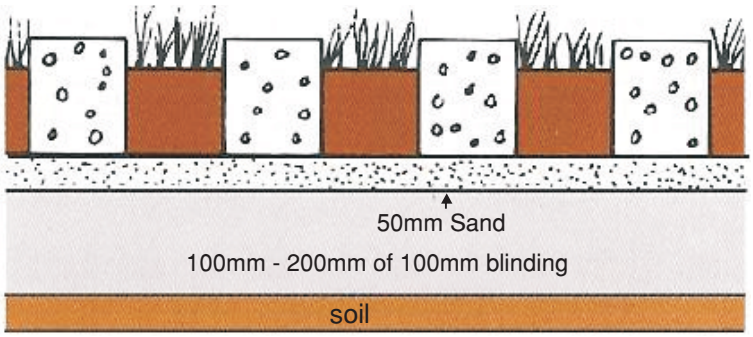
KPC Grass Blocks provide:

- hard standing
- erosion control
- ground armouring
- access paths and parking in environmentally sensitive areas



## INSTALLATION

As with any surfacing system the sub-base is most important in achieving a stable and level finish. The drawing bellow shows typical detail but will vary, naturally, depending on local ground conditions. Roll the sub-base until firm, then screed 50mm layer of sand on top, place units and tamp down. Then fill the grass block cavities to 20-40mm below the surface with good quality soil and seed. Allow 3-6 weeks for grass to take hold.



# standard grass blocks

Turfstone is a ground reinforcement grass paving system ideally suited to projects where a hard surface capable of supporting vehicles is required within a grassed area or other space where a naturalistic appearance is preferred. It functions as a SUDS permeable pavement, controlling surface water at source by directing it to the sub-layers.

Turfstone provides a low cost paving option with minimal visual impact. Its honeycombed cavities are designed to facilitate the growth of grass within a supporting concrete matrix, allowing grass to be cut in the conventional manner.

Each element weighs approximately 35kg and so we recommend machine-aided installation to comply with manual handling regulations. Special lifting aids that can be attached to excavators, tele-handlers and cranes are readily available.

## product specifications

| | |
|---|---|
| **Product type** | Concrete paving block |
| **Manufactured to** | BS EN 1338:2003 |
| **Efflorescence** | Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence |
| **Strength** | > 3.5MPa |
| **Slip/Skid resistance** | Extremely Low (>75 USRV) |
| **Installed to** | BS 7533-3:2005 |
| NSPlus | Q25 800 |
| **Applications** | Residential and Commercial when used in conjunction with the correct sub-base design in accordance with the latest British standard. |
| **Energy used** | 100% renewable energy |
| **Water used** | 100% water used from rainwater harvesting system |
| **Carbon Footprint** (Approved by the Carbon Trust) | 24kg$Co^2e/m^2$ |
| **Recyclable** | 100% of this product can be recycled |
| **Manufacturing location** | Produced in the UK with locally sourced materials |
| breeam **rating** | **A** (In accordance with the Green Guide to Specification, 2nd edition 2009) **A+** (can be achieved when used with recycled sub-base, in accordance with the Green Guide to Specification, 2nd edition 2009) www.bre.co.uk |
| **Complementary kerbs** | Country Kerb, Half Battered |

**Typical uses include:**

- Off-street residential parking
- Vehicular access for occasional usage i.e. ?re lanes, utility access
- Overspill commercial or retail parking
- Occasional parking for cricket clubs, schools, churches, caravan parks, cemetries etc.
- Nature reserves, sensitive heritage sites and country parks
- Environmental erosion control areas such as riverbanks and waterways
- Road verges
- Field entrances and farm tracks
- SUDS schemes

## product information

| size (mm) | colours available | in stock | $m^2$ per bale | $m^2$ per slice | no. per $m^2$ | no. per bale | weight (kg) per bale |
|---|---|---|---|---|---|---|---|
| 600 x 400 x 100 | Natural | YES | 7.68 | 3.84 | 4.17 | 32 | 1070 |

# scs integra and agrablock

## The SUDS Concept

SCS INTEGRA & AGRABLOCK are both key products within a sustainable urban drainage system (SUDS). The porous paving allows the efficient attenuation, infiltration and treatment of stormwater runoff at or near its source, in accordance with current Best Management Practices (BMPs). They are ideal products for grass and gravel reinforcement.

### The Products

Made in the EU from 100% recycled polymers, SCS INTEGRA & AGRABLOCK are modular units which work in conjunction with neighbouring units to create an exceptionally durable, permanently porous, high load bearing structure when infilled with either grass or natural aggregate.

### Applications

SCS INTEGRA is a Heavy Duty system, whereas SCS AGRABLOCK is a Medium Duty system for grass and gravel reinforcement. These systems are ideal for the following typical applications:

## Special Applications

### Slopes

SCS INTEGRA and AGRABLOCK can be laid on slopes of up to 15 degrees without additional staking. Where SCS Agrablock is used on the underside of a bridge abutment (e.g. to comply with the HSE recommended limits) every unit should be staked and the sand bed stabilised with a 12:1 cement mix on the 40 - 45 degree slope.

### Disabled Parking Bays:

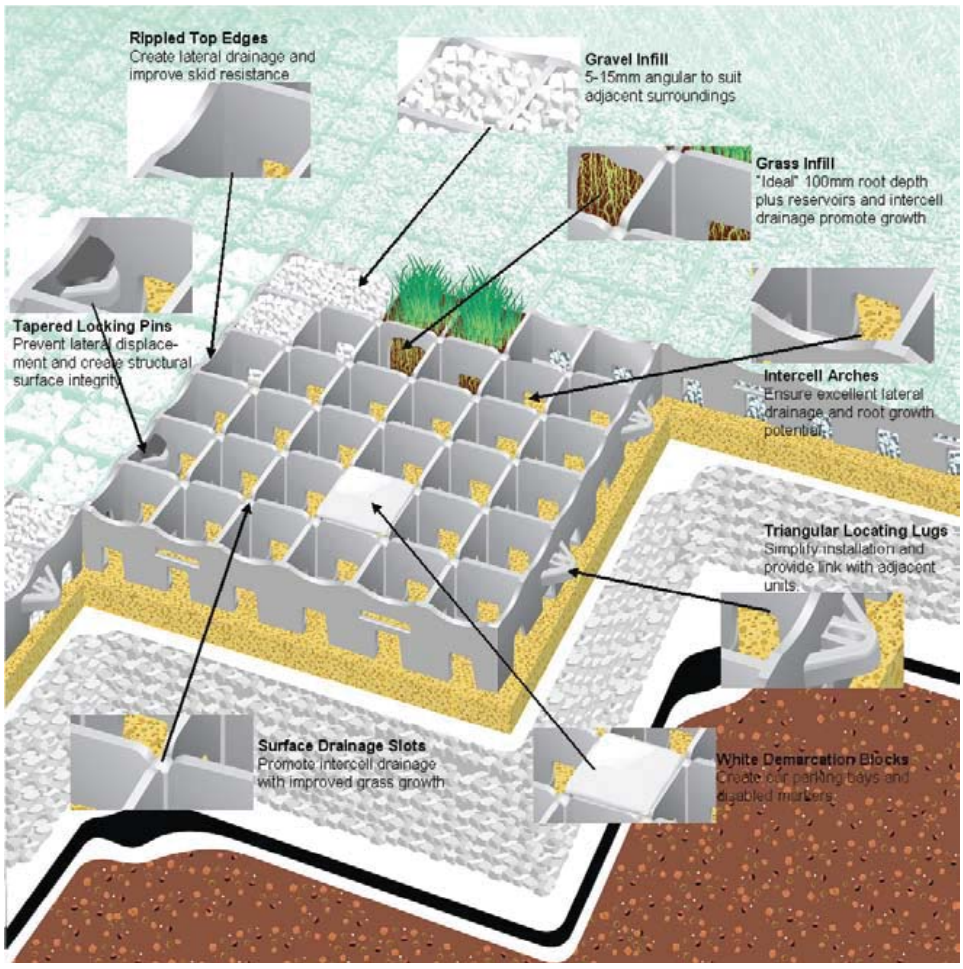
SCS INTEGRA and SCS AGRABLOCK are suitable for installation in disabled access areas. A disabled bay sign can easily be created using the Demarcation Blocks (please ask for data sheet).

### HGV Areas:

The SCS INTEGRA system is able to withstand slow moving HGV's (roadside lay-bys etc) but in common with most plastic grid systems should NOT be used in turning areas or where HGV's will scrub the product by the use of power steering.

## Demarcation Blocks

These are used to delineate parking spaces within car parking areas. Four individual blocks are used to form a simple "T" or alternatively this "T" can be extended to create a series of dotted lines running the length of the parking bay (see photo) requiring eighteen blocks per bay.



# scs integra and agrablock

## SUDS - The Principle

SUDS are physical structures built to receive surface water runoff, normally in the form of infiltration or attenuation solutions. They also provide treatment of surface water by sedimentation, filtration, absorption and bio-degradation. Research shows that up to 80% of sediment; 60% of phosphorous and; 80% of nitrogen can be removed from rainwater through porous paving, together with substantial levels of heavy metals and hydrocarbons.

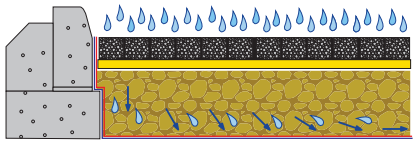
## Design Details - SUDS Associated with porous paving:

### Attenuation Used when direct infiltration is not appropriate and when water storage is required.

This shows SCS INTEGRA, infilled with grass or natural aggregate, installed on a layer of sand/grit on an SCS GT geotextile separation/filtration layer. Beneath this is a voided sub-base wrapped in an SCS GM Geomembrane. Collected runoff is discharged via an appropriate SCS storage device (SCS Aquavoid) positioned within or below the sub-base and sealed where it exits the geomembrane storage reservoir.

**TYPICAL ATTENUATION SYSTEM**

Rainfall enters porous Integra/Agrablock surface



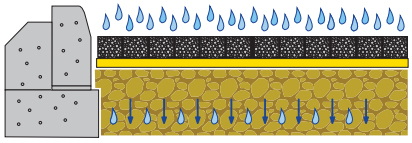
Water passes through porous surface and is directed by the geomembrane to storage or sewer

### Infiltration Used whenever possible, subject to appropriate soil conditions and environmental considerations.

This shows SCS INTEGRA infilled with grass or natural aggregate, installed on a layer of sand/grit on an SCS GT geotextile separation/filtration layer. Beneath this is a sub-base which is encapsulated within another SCS GT geotextile separation/filtration layer. Collected runoff is allowed to permeate naturally, through the geotextile separation/filtration layer, into the sub-grade eliminating the need for a positive discharge facility.

**TYPICAL INFILTRATION SYSTEM**

Rainfall enters porous Integra/Agrablock surface



Water passes through porous surface and is directed by the geomembrane to storage or sewer

| APPLICATIONS | INTEGRA | AGRABLOCK |
|---|---|---|
| Park & Ride Schemes | ✓ | ✗ |
| Commercial Car Parks | ✓ | ✗ |
| Overflow Car Parks | ✓ | ✓ |
| Helipads | ✓ | ✓ |
| Paths & Bridleways | ✓ | ✓ |
| Light Aircraft Taxiways | ✓ | ✗ |
| Domestic Driveways | ✓ | ✓ |
| Golf Buggy Paths | ✓ | ✓ |
| Caravan Parks | ✓ | ✓ |
| Emergency Access | ✓ | ✗ |
| Verge Reinforcement | ✓ | ✗ |
| Stables | ✓ | ✓ |
| Bank Stabilisation | ✓ | ✓ |
| Under Bridges | ✗ | ✓ |

| PRODUCT DATA | SCS INTEGRA | SCS AGRABLOCK |
|---|---|---|
| Nominal Size | 500mm x 500mm +0/-2% | 500mm x 500mm +0/-2% |
| Thickness of Unit | 70mm | 40mm |
| Unit Weight | 1.8Kg | 1.1Kg |
| Colour | Black | Black |
| Infiltration Rate | >5,000mm/hr | >5,000mm/hr |
| Run Off Coefficient | 0.05 - 0.25 | 0.05 - 0.25 |
| Lateral Drainage Void Ratio | >20% | >12% |
| Infill Surface Area | >90% | >90% |
| Compressive Strength (Filled) | 2,400kN/m$^2$ | 1,780kN/m$^2$ |
| Pallet Size | 1m x 1m x 1.2m | 1m x 1m x 1.2m |
| Pallet Weight | 210Kg | 130Kg |

# KPC - Killeshal Precast Concrete - UK & RoI

building into the future since 1969 - find us online - UK: www.killeshalprecast.co.uk - RoI: www.killeshal.com

*Helipads & Aircraft Taxiways*

*Emergency*

*Equestrian Areas & Stables*

## Paving Surfaces - Installation

### Subgrade

Excavate to formation level as indicated on the drawing, providing a minimal (1:30 - 1:100) fall to the drainage system. Compact subgrade, using either a vibrating roller or plate, making good soft spots with suitable material.

### Sub-base For Infiltration Surfaces

Use granular material (crushed gravel, rock or concrete) as specified - for SUDs schemes this must be free draining. Install the designed depth of sub-base as specified, in 200mm layers compacting each layer (vibratory plate, type DVP 75/22"). Overlay the sub-base with the specified SCS GT 1900 geotextile (essential to prevent migration), overlapping joints by 200mm.

### Bedding Layer

Lay, screed and compact to a 30mm depth of appropriate bedding layer material (sharp sand or 5mm grit). Selection of the bedding layer material is dependant upon the application. For grass reinforcement mix the bedding layer 4:1 with a good quality top soil to ensure good root growth.

### Wearing Course

SCS INTEGRA & AGRABLOCK should be laid on a 45 degree face such that each modular unit abuts its neighbouring units, with the triangular locating lugs fitting within the corresponding slots. As laying progresses each unit should be pinned (4 per unit) together with the pins supplied and the specified root zone/grass seed infill material or natural aggregate should be used to infill each cell such that a continuous, permanently porous, high load bearing structure is created.

### Infill Materials (sand and soil mix/aggregate)

The selected infill material should be specified on a project specific basis based on the application and design, but the following could act as a guide:

For Sand Bed: A good quality compacted silica sharp sand should be used, of approximately 30mm thickness after compaction; alternatively a 5mm grit is also suitable if required.

For Gravel Fill: Aggregate size should be 5 - 15mm angular gravel and if adjacent to schools should ideally be 10mm single sized crushed rock. The use of an angular gravel rather than a river washed gravel will aid compaction and prevent migration from the units.

For Grass Fill: A good quality topsoil should be used to infill the units to the top and allowed to settle (5 - 7mm); grass seeding followed by a top dressing of a good quality fertiliser should ensure adequate grass growth. Seeded areas must be watered regularly for a period of 6 weeks following installation and traffic kept off the area until grass growth is established.

Maintenance: For gravel areas; an occasional sweeping of any overfill back into the units. If gravel appears to be sinking check for the installation of the geotextile.

For grass areas; once grass is established the area can be trafficked and a normal mowing regime resumed. If infill appears to be sinking top up with loam mix and check for presence of geotextile.

*Overflow & Temporary Parking*

*Driveways and Gravel Areas*

*Park & Rides & General Parking*

UK site

RoI site

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