

grasscrete

the environmental
solution



grassconcrete

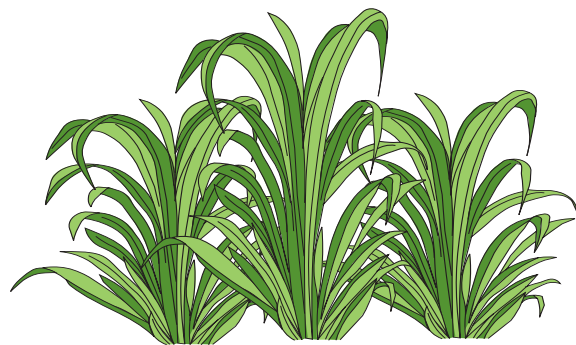
EFFECTIVE SOLUTIONS

Just once in a while, a product is developed which transcends normal comparisons. A product so unique that it becomes a watchword across a whole range of industries and applications.

GRASSCRETE® is one such product, though perhaps “product” is in itself an inadequate description. Indeed GRASSCRETE® is a “system” which for many years has provided effective solutions for **Engineers, Environmentalists and Economists** throughout the world.

So, what’s in a name when today there are many differing types of grass reinforcement available. Can there really be much to choose between them?

As probably the world’s only supplier of the complete range of grass reinforcement products, we are able to say that GRASSCRETE® stands alone in its unique capabilities. Though often thought of as the generic term for grass reinforcement, it is much more than that, and indeed it should not be confused with less capable precast products – ***There is only one GRASSCRETE®!***



EFFECTIVE SOLUTIONS



- VEHICLE PARKING
- ACCESS ROADS
- FIRE PATHS
- HARD STANDINGS
- SLOPE PROTECTION
- STORM CHANNELS
- SPILLWAYS



For the ENGINEER and ARCHITECT

Occasionally perceived as a precast concrete block, in truth it is far from that. GRASSCRETE® is essentially a cast-on-site cellular reinforced concrete system with voids created by plastic formers.

Such a construction offers significant structural advantages over precast concrete and plastic paving systems.

■ RESISTS DIFFERENTIAL SETTLEMENT

A frequent problem with precast components is their low resistance to “elephant tracking”, with regularly used areas being impacted into the sub-base, particularly under waterlogged conditions. By contrast, GRASSCRETE®’s unique reinforced concrete structure resists differential settlement providing a surface of guaranteed load bearing capability.

■ SUB-BASE DEPTH

A block system, whether concrete or plastic, will rely upon its sub-base for support. This essentially “flexible” surface will, therefore, need a deeper sub-base than for the reinforced GRASSCRETE® system.

■ GROUND HEAVE

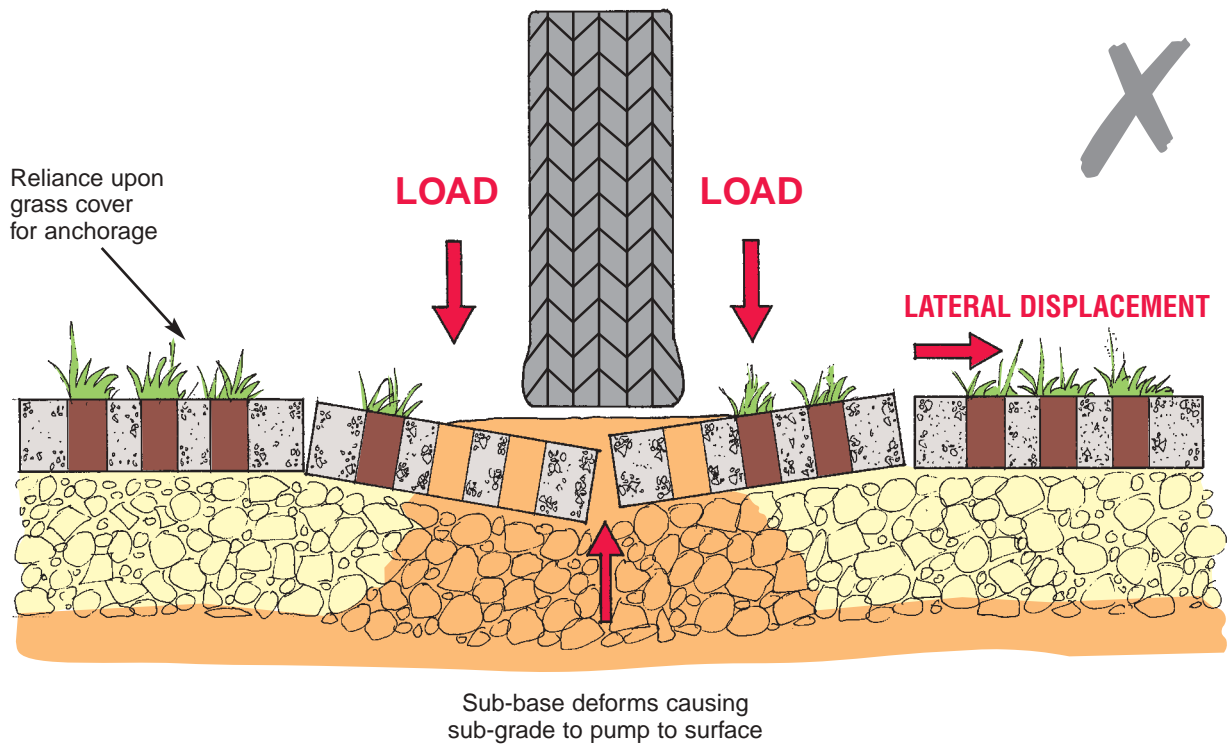
GRASSCRETE®’s unique pocket profile enables the release of frost heave and hydrostatic pressure, with the latter particularly benefiting the design of reservoir embankments, etc, enabling slimmer armouring layers to be used.

■ KERB EDGE RESTRAINTS

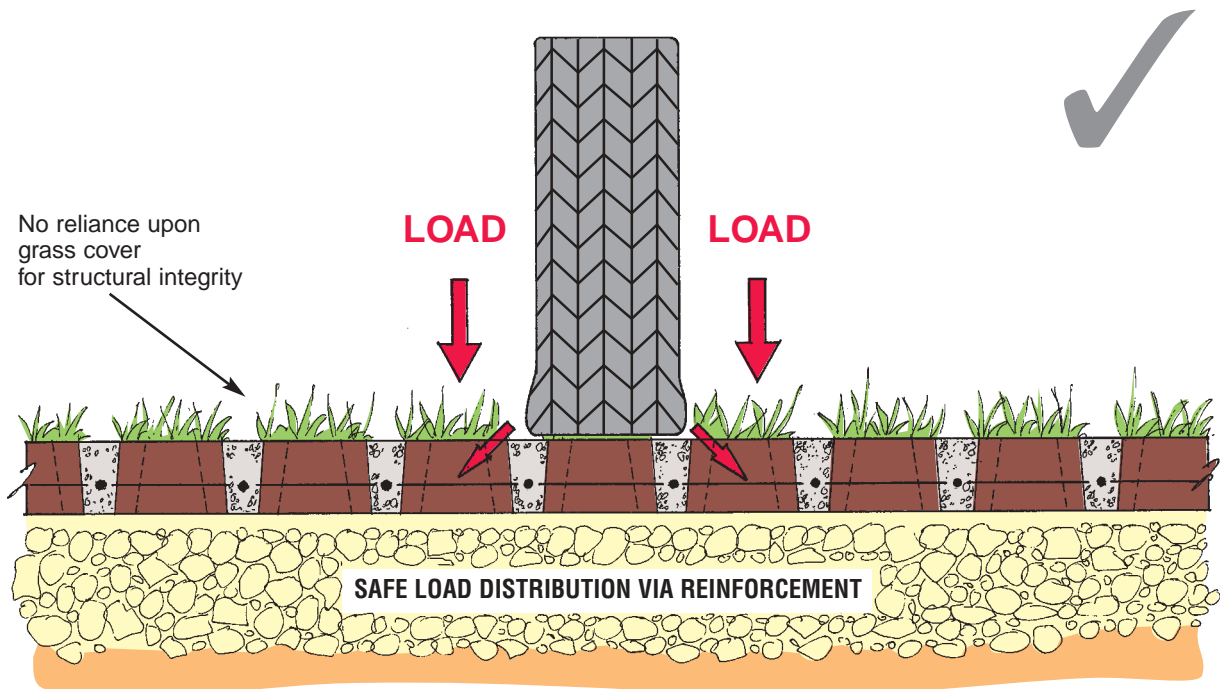
Lateral spread under load is a problem associated with block systems where kerb edge restraints are required to limit movement. With GRASSCRETE® there is no such need.



PRECAST SYSTEM



GRASSCRETE®



For the ENVIRONMENTALIST

Much has been written about the environmental impact of creeping urbanisation. Not only its effect on the ozone layer, but the loss of indigenous plants and wildlife and the increase in downstream flooding. Each, in part, conspires to collectively harm the quality of life, particularly in heavily concentrated areas of population.

The threat may be newly perceived. However, some solutions have been around for many years. GRASSCRETE® is one such solution. For the Environmentalist it offers key benefits.

■ SELF DRAINING

Capable of draining at rates up to 90% that of normal grass land, GRASSCRETE® maintains the natural equilibrium of groundwater re-charge. This serves to reduce the incidence of clay sub-soil shrinkage and the attending instability in local building foundations.

The residual surface water is held within GRASSCRETE®'s natural drainage head, the conical soil pocket providing a unique reservoir, thereby controlling the rate of re-charge. This fundamentally influences the downstream effect, introducing a lag time between rainfall and final discharge into the natural drainage environment, minimising the risk of downstream flooding.

■ CLEANER AIR

Quite apart from the visual benefit of a grassed environment, the introduction of CO₂-absorbing vegetation is a major ecological benefit. Many of the world's major conurbations are moving towards the development of Garden Cities as a good housekeeping policy for the emissions which they produce. GRASSCRETE® ideally serves this need.

■ RECYCLING

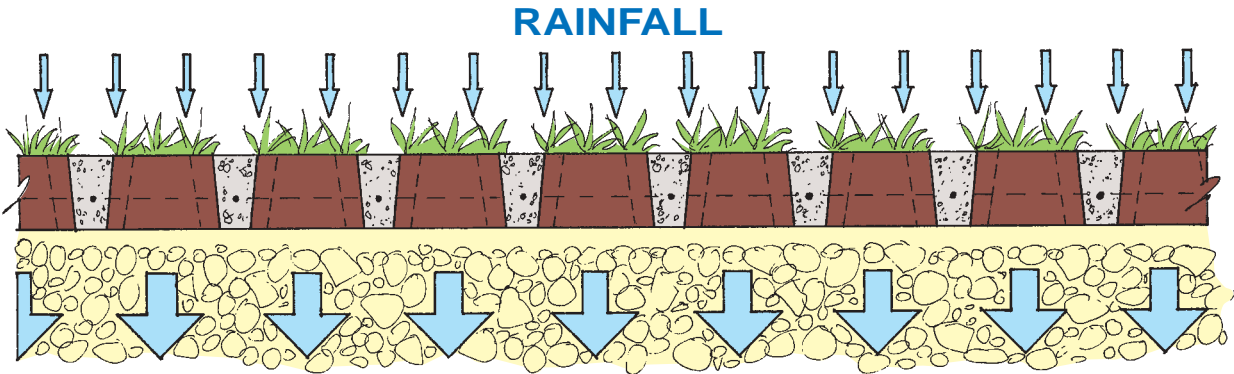
At one time, the use of re-cycled materials conjured up the thought of second-hand products. Now, it is viewed as a fundamental step in establishing a sustainable eco-system.

Many years ago we embraced the merits of re-cycling, and our GRASSCRETE® plastic void formers have since that time been manufactured from re-sourced waste plastic.



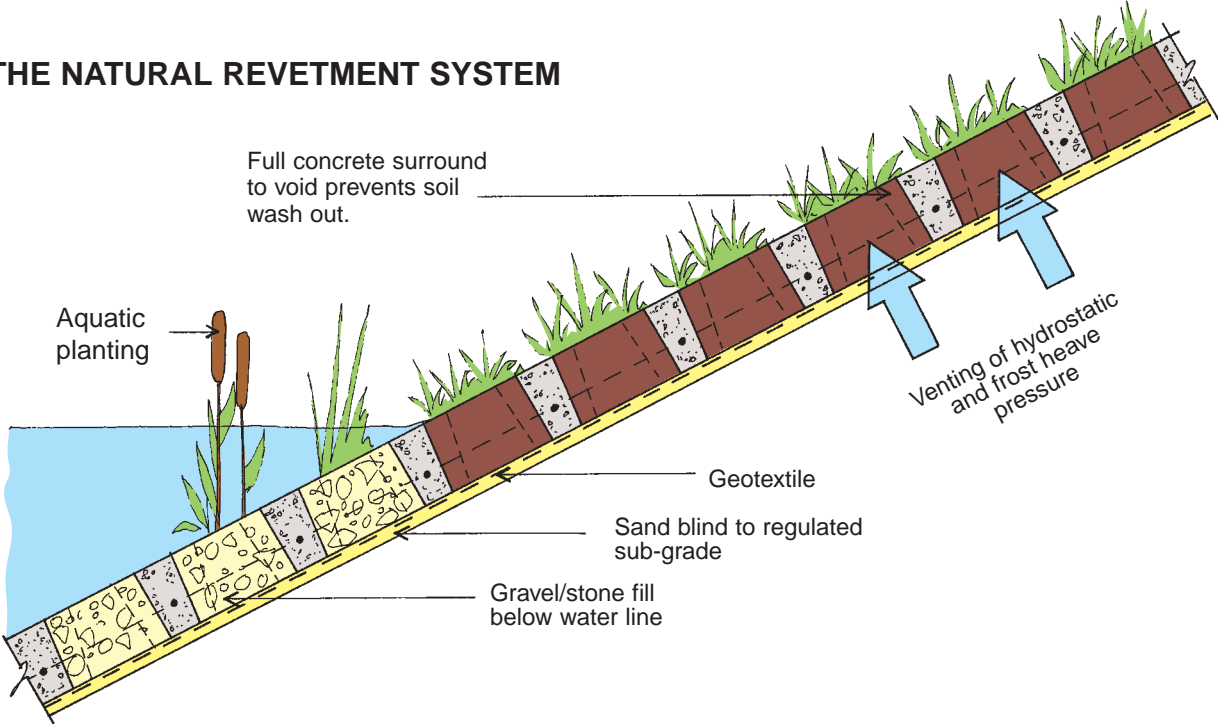
The GRASSCRETE® ECO-SYSTEM

THE SELF DRAINING SURFACE



NATURAL FILTRATION TO SUB-GRADE

THE NATURAL REVETMENT SYSTEM



For the ECONOMIST

Critical cost comparisons between widely differing types of paving systems are never easy to achieve.

They tend to start with the perception that increased benefit, whether structural or aesthetic, means increased cost. Often, without analysing the “whole” cost of a paving layer, a simplistic A + B comparison will result in a distorted viewpoint.

As an example, we can compare the whole cost elements of **two alternative 1,000 m² car parks** – one constructed in tarmacadam and one in GRASSCRETE®.

OPERATION	TARMACADAM	GRASSCRETE®
Reduced level excavation	385m ³	275m ³
Disposal of excavated material	385m ³	220m ³ (topsoil re-used)
Sub-base depth	150mm	150 + 20mm sand
Road base depth	150mm	Nil
Surface laid to falls	Yes	Optional
Drainage – pipework	say 110 m	Nil
Gullies	say 9 no.	Nil
127 x 254 kerbs and foundations	115 m	Nil
Paving depth	85mm	100mm
White lining	390 m	Nil

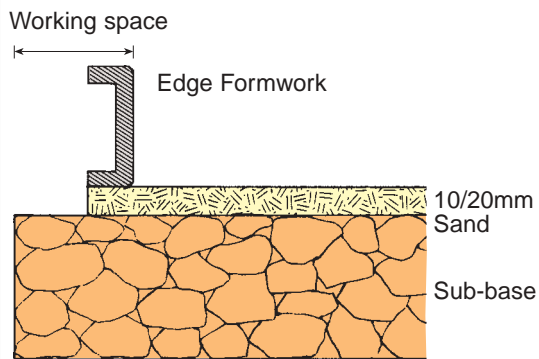
The true comparison does not end there, however. By introducing a “positive” drainage system into a tarmacadam car park, there will inevitably be a “downstream” implication.

For the smaller project, this may simply involve a main drainage connection. With larger schemes, however, this may call for a more radical solution, such as main sewer upgrade or surface storage lagoons.

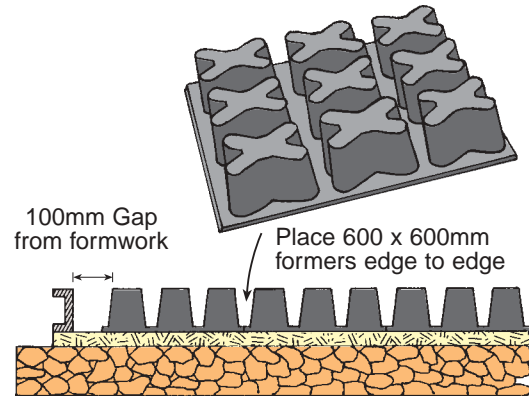
A further advantage of GRASSCRETE® is that, with no requirement for falls or drainage, car parks can be extended at a later date with minimal infrastructure implications.

For the PRACTICAL

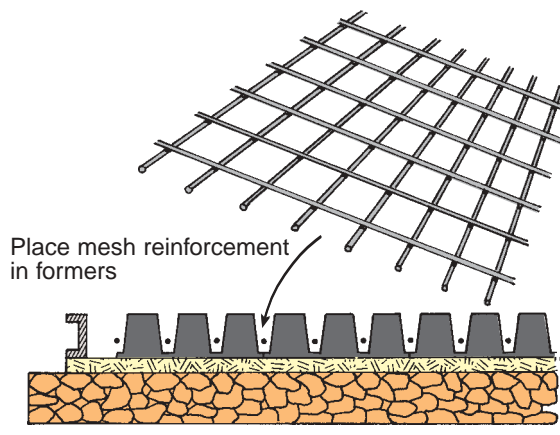
1. PREPARATION



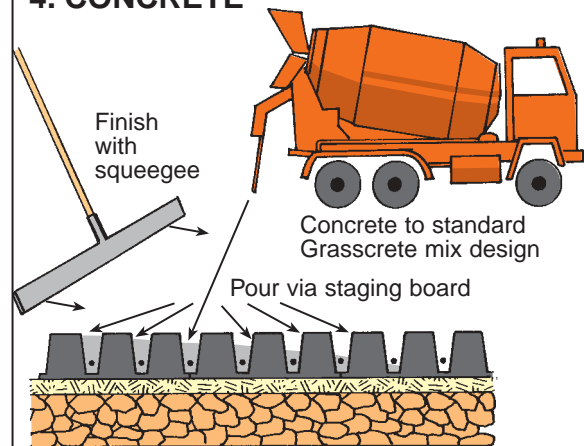
2. LAY FORMERS



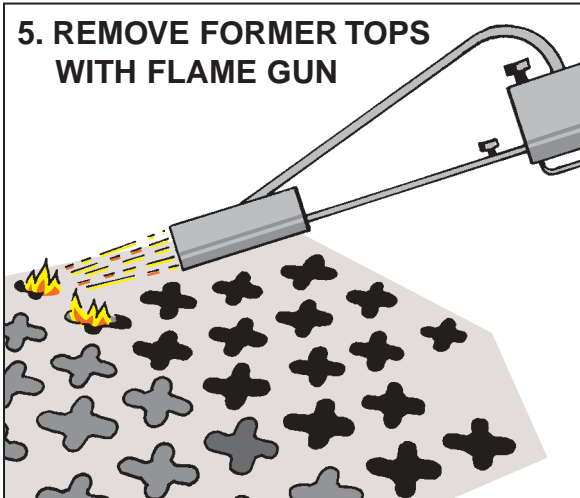
3. MESH REINFORCEMENT



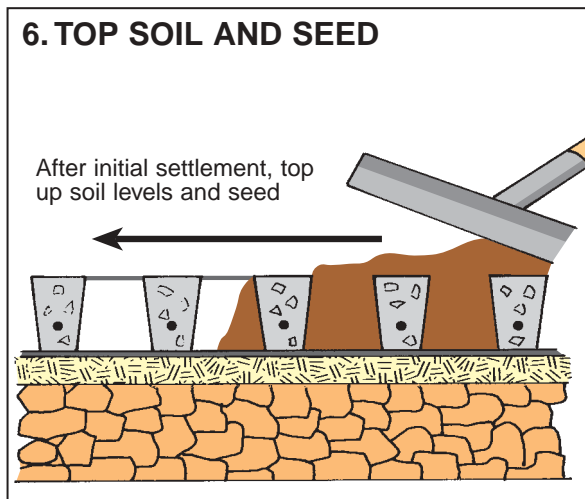
4. CONCRETE



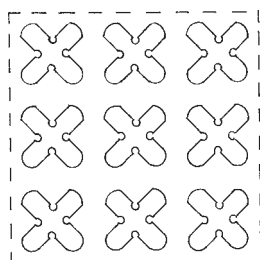
5. REMOVE FORMER TOPS WITH FLAME GUN



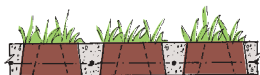
6. TOP SOIL AND SEED



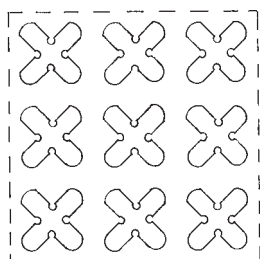
GRASSCRETE® TYPES



GC3



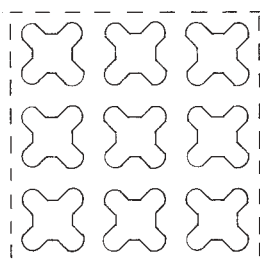
<i>Void former size:</i>	600 x 600 x 76mm
<i>Paving depth:</i>	76mm
<i>Reinforcement:</i>	A142 or A193
<i>Concrete coverage:</i>	22m ² /m ³
<i>Topsoil coverage:</i>	24m ² /m ³



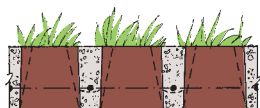
GC1



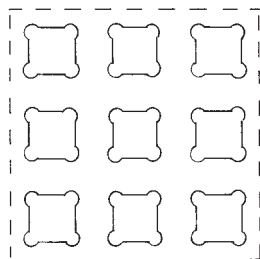
<i>Void former size:</i>	600 x 600 x 100mm
<i>Paving depth:</i>	100mm
<i>Reinforcement:</i>	A193 or A252
<i>Concrete coverage:</i>	15.50m ² /m ³
<i>Topsoil coverage:</i>	18m ² /m ³



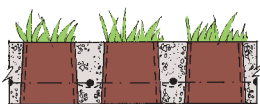
GC2



<i>Void former size:</i>	600 x 600 x 150mm
<i>Paving depth:</i>	150mm
<i>Reinforcement:</i>	A252
<i>Concrete coverage:</i>	11.50m ² /m ³
<i>Topsoil coverage:</i>	12m ² /m ³



GC2sc



<i>Void former size:</i>	600 x 600 x 150mm
<i>Paving depth:</i>	150mm
<i>Reinforcement:</i>	A393
<i>Concrete coverage:</i>	10.50m ² /m ³
<i>Topsoil coverage:</i>	14m ² /m ³

SPECIFICATION

GRASSCRETE® cast on site reinforced cellular paving

GRASSCRETE® formers type GC.....*,*mm deep laid on a consolidated sub-base with a 10/20mm blinding layer of sand. Steel mesh reinforcement to BS4483 reference*, weighing*kg/m². Concrete 30MN/m² at 28 days with air entrainment of 3%. 10mm maximum aggregate and a*mm slump placed around formers and mesh and levelled to tops of formers. After 48 hours melt exposed tops of formers and fill with soil. Following settlement sow GRASSMIX No.....* at a rate of 50g/m² and top up with fine friable topsoil, apply fertiliser as necessary.

Expansion joints shall be incorporated at 10 x 10m centres and shall consist of 25mm wide pre-soaked softwood filler (for GC3, GC1, GC2 and GC2sc).

or

Expansion joints shall be incorporated at 10 x 10m centres and shall consist of 25mm wide foamboard filler with 20mm diameter x 300mm long sawn dowels at 400mm centres with cap and debond to one side. Joint shall be sealed with cold applied sealant (for GC2sc – load transference slabs).

* Refer to data in GRASSCRETE® Types table and Specification Guide for items to be completed.

GRASSCRETE® SPECIFICATION GUIDE

VEHICULAR USE

Maximum vehicle weight	Grasscrete® type	Depth	Reinforcement	Minimum Sub-base depth*	Sub-base type
0 - 3.4 tonnes	GC3	76mm	A142	100mm	Specification for highway works Clause 803 Type 1 sub-base
3.4 - 4.3 tonnes	GC3	76mm	A193	150mm	
4.3 - 10.8 tonnes	GC1	100mm	A193	150mm	
10.8 - 13.3 tonnes	GC1	100mm	A252	150mm	
13.3 - 30 tonnes	GC2	150mm	A252	150mm	
30 - 40 tonnes	GC2sc	150mm	A393	200mm	

* Assumes a free draining allowable ground bearing of 45kN/m² which should also be sufficient to enable construction plant/delivery access.

WATER ENVIRONMENT

Water flow rate	Grasscrete® type	Depth	Reinforcement	Preparation (all types)
Up to 4.5 metres/second	GC3	76mm	A142	Trimmed earth sub-grade Sand blind Suitable geotextile Fine protective cover of sand
4.5 to 6 metres/second	GC1	100mm	A193	
6 to 9 metres/second	GC2	150mm	A252	

SEED SPECIFICATION

Mix	Sowing rate	Specification	Application
No. 1	50gms/m ²	45% creeping red fescue 5% browntop bent 50% perennial ryegrass	Vehicular parking Amenity areas
No. 2	50gms/m ²	20% chewings fescue 45% creeping red fescue 5% browntop bent 30% hard fescue	Fire paths, shaded low maintenance areas
No. 3	50gms/m ²	52% creeping red fescue 5% smooth stalked meadow grass 3% browntop bent 40% perennial ryegrass	Embankments

We have a policy of continuous development. Information given in this publication is, therefore, subject to change without prior notice.

