

NAYLOR
ENVIRONMENTAL

Sustainable Urban Drainage Systems SuDS



Porous Paving for
Grass and Gravel

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Integra

(70mm) Heavy Duty system

AdPave

(40mm) Heavy Duty system

Enviroblock

(50mm) Medium Duty System

HGVGrid

(75mm) HGV Duty System



Integra, AdPave, Enviroblock & HGVGrid Systems

The SuDS Concept

Naylor Integra, AdPave, Enviroblock & HGVGrid are all 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 from 100% recycled polymers, Naylor Integra, AdPave, Enviroblock & HGVGrid 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

Naylor Integra & AdPave are Heavy Duty systems, whereas Naylor Enviroblock is a Medium Duty system for grass and gravel reinforcement and HGVGrid is an HGV Duty System.

Applications

	Integra	AdPave	Enviroblock	HGVGrid
Park & Ride Schemes	✓	✓	✗	✗
Commercial Car Parks	✓	✓	✗	✗
Overflow Car Parks	✓	✓	✓	✗
Helipads	✓	✓	✓	✗
Paths & Bridleways	✓	✓	✓	✗
Light Aircraft Taxiways	✓	✓	✗	✗
Domestic Driveways	✓	✓	✓	✗
Bank Stallisation	✓	✓	✓	✗
Caravan Parks	✓	✓	✗	✗
Emergency Access	✓	✓	✗	✓
Verge Reinforcement	✓	✓	✗	✓
Equestrian	✓	✓	✗	✗
Coach, HGV & Truck Parks	✗	✗	✗	✓
Under Bridges	✗	✓	✓	✗

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

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

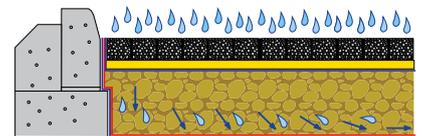
This shows Naylor Integra infilled with grass or natural aggregate, installed on a layer of sand/grit on a Naylor GT geotextile separation/filtration layer. Beneath this is a sub-base which is encapsulated within another Naylor GT geotextile separation/filtration layer.

Collected runoff is allowed to permeate naturally, through the geotextile separation/filtration layer, into the subgrade eliminating the need for a positive discharge facility.

Typical Attenuation System

Rainfall enters porous Integra/Enviroblock surface

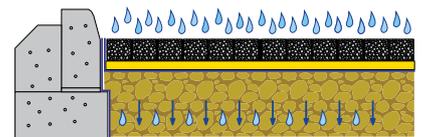
Water passes through porous surface and is directed by the geomembrane to storage or sewer



Typical Infiltration System

Rainfall enters porous Integra/Enviroblock surface

Water passes through porous surface and is allowed to infiltrate into sub grade



Integra

(70mm) Heavy Duty system

Made from 100% recycled plastic, Naylor Integra Heavy Duty system is a modular unit which works in conjunction with its neighbouring units to create an exceptionally durable, permanently porous, high load bearing structure. Infilled with either grass or natural aggregate in completed form, Naylor Integra remains in harmony with current environmental considerations whilst complying with increased governing legislation.

Suitable for

- Park & Rides
- Car Parks
- Emergency Access Roads
- Grass Verges
- Vehicular Hard Standings
- Light Aircraft
- Taxiways
- Helicopter Landing Pads
- Sports & Leisure Facilities
- Holiday Complexes
- Sheltered Accommodation
- Equestrian



AdPave

(40mm) Heavy Duty system



This clip-together cellular paving system can be gravel-filled or alternatively can be filled with a suitable growing media and seeded to create an esthetically pleasing grass surface.

Adpave 40 provides a permanent solution for parking or vehicle access routes. However, it can also be used as a temporary solution on top of existing grassed areas. The system is suitable for both commercial and domestic applications.



Benefits

- Park & Rides
- Car Parks
- Emergency Access Roads
- Grass Verges
- Vehicular Hard Standings
- Light Aircraft
- Under Bridge Abutments
- Helicopter Landing Pads
- Sports & Leisure Facilities
- Holiday Complexes
- Sheltered Accommodation
- Equestrian

Enviroblock

(50mm) Medium Duty System

Made from 100% recycled plastic, Naylor Enviroblock is a modular unit which works in conjunction with its neighbouring units to create an exceptionally durable, permanently porous, high load bearing structure. Infilled with either grass or natural aggregate in completed form, Naylor Enviroblock remains in harmony with current environmental considerations whilst complying with increased governing legislation.

Suitable for

- Overflow Car parks
- Pedestrian Areas
- Vehicular Hard Standings
- Cycle Ways
- Helicopter Landing Pads
- Footpaths
- Paths & Bridleways
- Bank Stabilisation
- Sport & Leisure Facilities
- Holiday complexes
- Sheltered Accommodation
- Domestic Driveways



HGVGrid

(75mm) HGV Duty System



Made from 100% recycled plastic, Naylor HGVGrid is very high strength modular system that is able to withstand the vigours of regular HGV traffic movements whilst still providing an exceptionally durable, surface.

Units can be infilled with either grass or natural aggregate to suit local conditions and blend with the local environment, it allows the creation of a SuDs infiltration scheme in the most challenging circumstances.



Suitable for

- Verge Reinforcement
- Motorways
- Coach Parks
- Lorry/Truck Parks
- Docks
- Bus Parks

Product Data	Integra	ADPave	Enviroblock	HGVGrid
Product Code	65104	65101	65102	65130
Nominal Size	0.5m x 0.5m +/-2%	0.5m x 0.5m +/-2%	0.5m x 0.5m +/-2%	0.6m x 0.4m +/-2%
Thickness of Unit	70mm	40mm	50mm	75mm
Locking Method	Pins (16/m ²)	Integral 32/m ²	Integral 32/m ³	T&G Interlock
Unit Weight	1.8Kg	1.6Kg	1.2Kg	8Kg
Colour	Black	Black	Black	Dark Grey
Infiltration Rate	>5,000mm/hr	>5,000mm/hr	>5,000mm/hr	>4,000mm/hr
Lateral Drainage Void Ratio	>20%	>12%	>12%	Nil
Infill Surface Area	>90%	>90%	>90%	>60%
Compressive Strength (Filled)	2,400kN/m ²	3,600kN/m ²	2,240kN/m ²	60t SMWL
Pallet Size	1m x 1m x 1.2m	1m x 1m x 1.2m	1m x 1m x 1.2m	1.2m x 0.9m x 1.6m
Pallet Quantity & Weight	120 No (30m ²), 230Kg	120 No (30m ²), 210Kg	120 No (30m ²), 160Kg	120 No (28.8m ²), 960Kg

Special Applications

Slopes

Naylor INTEGRA ADPAVE & ENVIROBLOCK can be laid on slopes of up to 15 degrees without additional staking. Where Naylor Enviroblock 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:

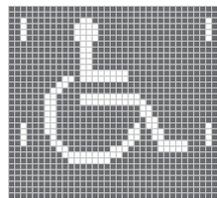
Naylor INTEGRA ADPAVE & ENVIROBLOCK are suitable for installation in disabled access areas. A disabled bay sign can easily be created using 130 of the Demarcation Blocks. (please ask for data sheet).

HGV Areas:

Although the Naylor INTEGRA system is able to withstand slow moving HGV's (roadside lay-bys etc) for areas subject to regular power assisted turning areas and other areas subject to regular HGV traffic the Naylor HGVGrid should be utilised.

Demarcation Blocks

These are available for INTEGRA, ADPAVE and ENVIROBLOCK and 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.



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 if non SuDs. Compact subgrade, using either a vibrating roller or plate, making good any 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 Naylor 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

Naylor INTEGRA 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; grass seeding followed by a top dressing of a good quality fertiliser to the top of the units 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 overflow 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.

Information contained herein is for guidance only and is subject to change without notice. Liability in respect of any statements, conditions, warranties and representations made on behalf of Naylor is limited in accordance with the terms set out in the Standard Conditions of Sale.



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