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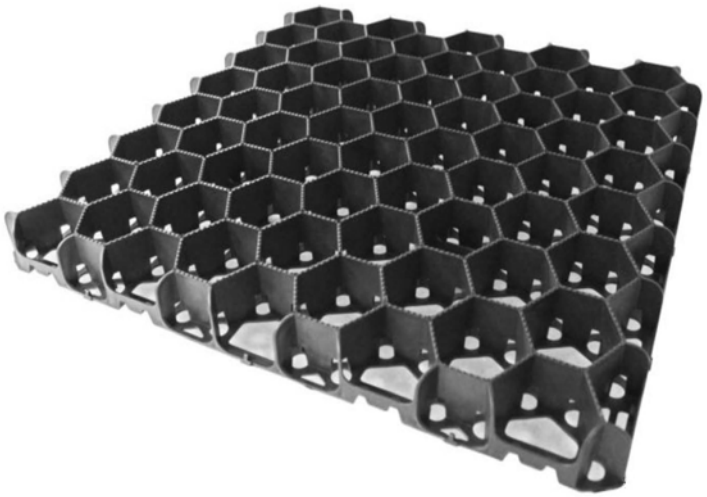
The Professional Choice in Landscaping

PP40 POROUS PAVERS



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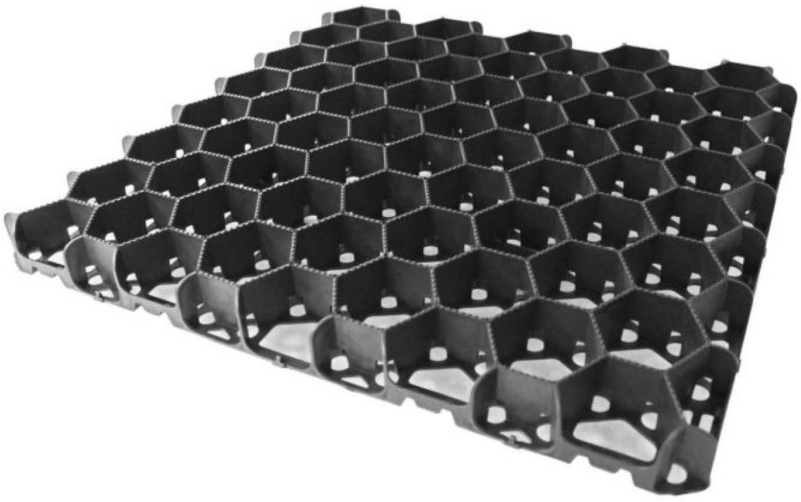
POROUS PAVER GRAVEL FINISH



Description:

Interlocking porous plastic paving grids for ground reinforcement for trafficking applications including car parking, paths, walkways and fire access lanes. PP40 Paving grids provide a stable reinforced permeable load-bearing surface.

Applications:

SUREGREEN PP40 has been manufactured using specially selected 100% recycled plastics that have the qualities that are required for a strong, long-lasting, stable product suitable for the designed traffic load.

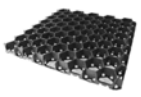
Typical uses include:

- Overflow car parks
- Wheelchair & disabled access paths
- Free draining pedestrian paths
- Fire access roads / lanes
- Cycle paths
- Access routes and roads
- Drives and Driveways
- Lawn Reinforcement

Features and benefits:

- UV stabilisation to stop degradation by sunlight.
- Tested to 350T/m² (when filled) tested to UNI CEI EN ISO/ IEC 17025 Certification, capable of withstanding cars, vans, trucks and lorries.
- Paver profile that allows expansion on warmer days or in direct sunlight when required to stop lifting.
- Plastic selection to allow use in cold temperatures – some plastic will become fragile when cold.
- Open structure to allow unhindered water permeability.
- Paver design to maximum support and stability from a grass root or gravel structure.
- All plastics used are stable, chemically inert and are not toxic so are suitable for normal soil conditions.

Product



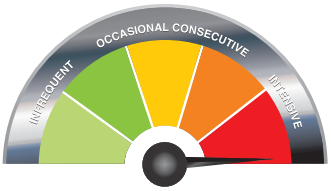
PP40 Porous Paver for Gravel

Plastic paving grid for ground reinforcement and gravel retention.

Typical Applications

Car parks, coach parks, private driveways, access roads, shed bases, fire access lanes, pedestrian walkways.

Frequency of Use



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SUREGREEN PP40
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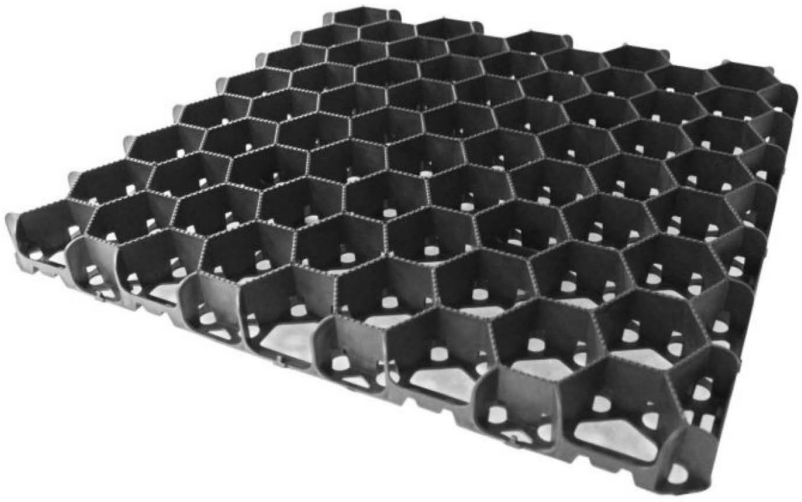
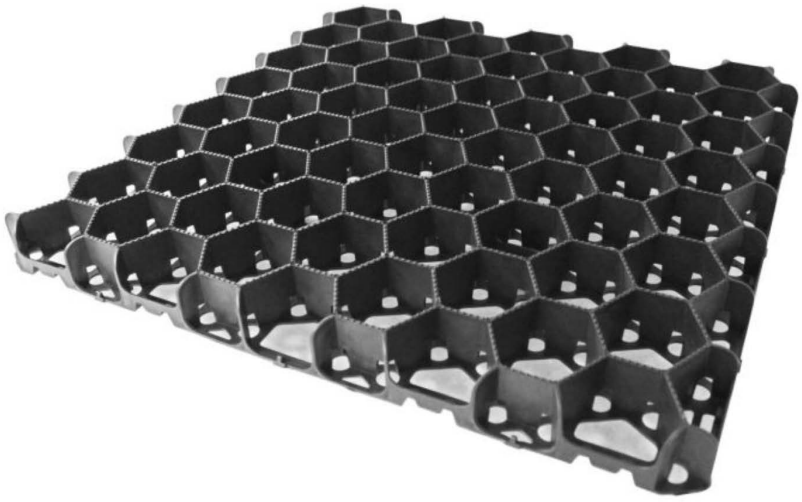
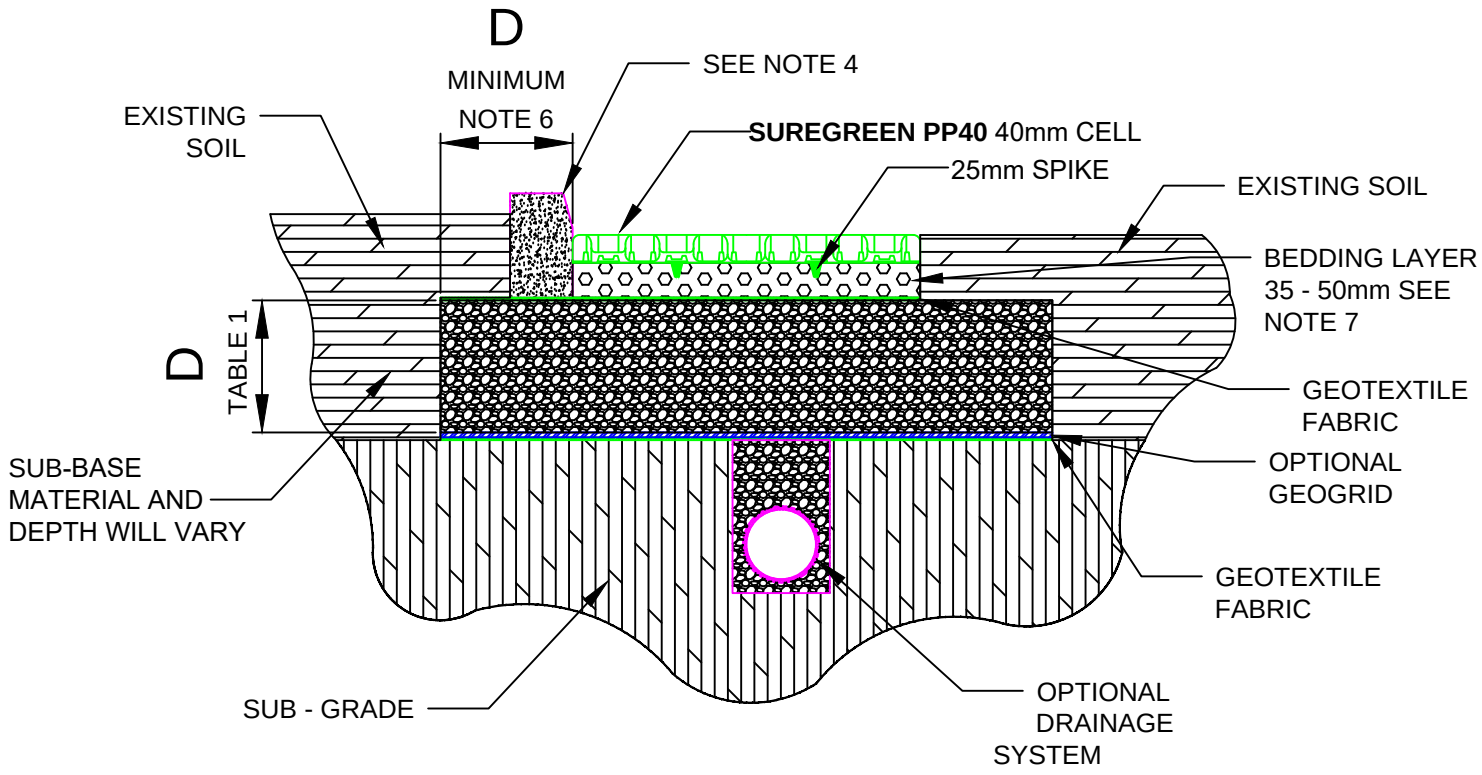


Characteristics	Data
Dimensions	500mm x 500mm wide x 40mm plus 25mm spikes deep
Weight	(+/-2%) Each piece is 1kg – 4g per m^2 (+/-2%)
Nominal cell dimensions	57mm Hexagonal
Base reinforcement / anti	Four 25mm spikes per paver
shear Connection method	Edge spikes and loops
Cell wall thickness	3mm (+/-2%)
Cell Openness %	95% on top and 75% on base
Polymer	Recycled Polyethylene
Colour	Black / Green.
UV stabilised	Yes
Load bearing capacity	150 tonnes per m^2
Production control	17025 Certification Tested to ISO 9000
Traffic Loading	Tested to DIN 1072 (20 tonne wheel load SWL)
Pavers per m^2	Four

All data figures are nominal and are given in good faith. Suregreen Limited reserve the right to amend any data without prior notice. Product variances are provided as a guide and normal production and product characteristics are within these parameters

DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRAVEL FINISH



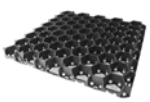


DESIGN GUIDELINES

SUREGREEN PP40 is a porous paver that provide a solution to a wide range of trafficking needs, especially in providing a stable, free draining surface for grassed or gravel areas. The application might be a car park, driveway, or an emergency access route. SUREGREEN PP40 plastic paving grid for ground reinforcement has been designed using carefully selected recycled plastics. This heavy duty polymer and its interlocking nature provides a robust surface able to withstand the dynamic & lateral loads that vehicles impose on it.

The following applications and frequency of use are guides only as this does not take in to consideration the existing ground conditions. Please refer to the full Suregreen range if product specified does not meet requirements. If you require further assistance please contact our sales team for further guidance on product suitability and installation instructions.

Product



PP40 Porous Paver for Gravel – plastic paving grid for ground reinforcement and gravel retention.

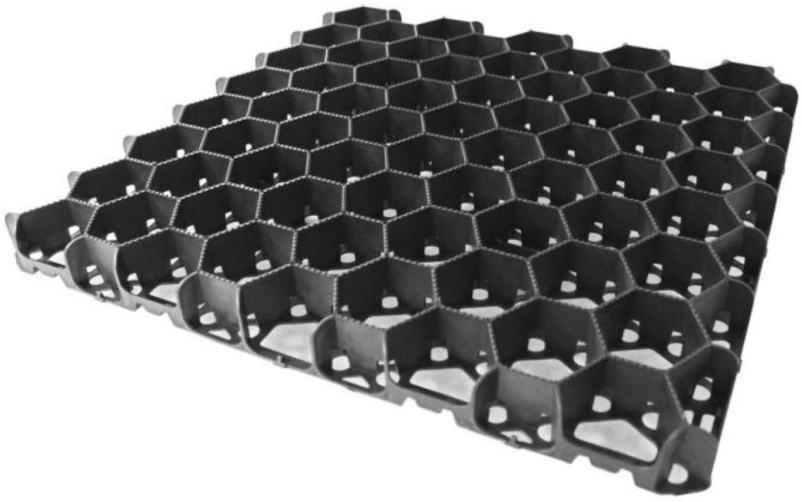
Typical Applications

Car parks, coach parks, private driveways, access roads, shed bases, fire access lanes, pedestrian walkways, wheelchair access.

Frequency of Use

Loading

DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRAVEL FINISH



Prior to any work on site, it is highly advisable a site survey, even if only a rudimentary one, is done. Questions to ask may be:

Does the proposed installation area drain well already?
Is there planned to be a slight fall to be built into the design to perhaps aid drainage if aid is needed?
Is the drainage capability of the soils the same at the surface and at 200 to 500mm below the surface?
Has there been previous issues with drainage on site?
Has disposal of any excess water been considered?
Are there SUDS requirements to be considered?

DESIGN NOTES:

1) If a geogrid is being considered as part of the construction profile please ensure that at least 25% of the particle size of the sub-base is bigger than the mesh size used to ensure good shearing / locking.

2) Sub-base particle size should not ideally exceed 60mm and should be less than 5% fine material of content of the whole.

3) Please refer to tables 1 & 2 for guidelines to depth of sub-base for specific design profile to suit site needs. Please note if a geogrid is omitted 50% of the depth of sub-base needs to be added to calculated depth with a geogrid. For example 100mm with geogrid would become 150mm without.

4) It is always good practice to confine SUREGREEN PP40 plastic pavers on the site edges. This could be as strong as 150 x 150mm concrete kerbs or a simple barrier like treated timber. The type of vehicles, frequency of traffic and circulation routes should all be considered when choosing the confinement method for SUREGREEN PP40 in the design.

5) SUREGREEN PP40 has been designed to work within stated guidelines to a slope of 5% or less. The SUREGREEN PP40 can be used on steeper slopes in some cases.

6) Ideally the sub-base should extend out further than the surface area of SUREGREEN PP40. This is so lateral pressures caused by the traffic loading does not displace the SUREGREEN PP40 on the edge. The extension of sub-base outwards should be the same as the depth of the sub-base.

7) The aggregate for the bedding and the filling of the cells should ideally be specified as 5mm to 20mm sharp angular gravel to BS EN13242. This gives the best results for provid-ing a long term, very low maintenance wearing surface. The gravel pieces interlock / shear with each other and, more importantly with the specially designed PP40 plastic paver. Smaller angular gravel / particles fill the voids providing a secure, stable and sustainable finish. Single size gravel or rounded gravel / pea shingle will in due course lead to issues and failure. The more rounded and single size the gravel, the quicker problems are likely to happen.

8) SUREGREEN PP40 when filled to aggregate 5mm to 20mm to BS EN13242 conforms to BS8300:2001 for disabled access.

Note on drainage:

Any sub-base used in the construction profile should be permeable – for example DOT Type 3. It should be predominantly fine material free and able to compact well without losing integrity, stability and permeability/porosity. DOT type 1 can be used but drainage channels need to be con-sidered –please see schematic.

Sub-base thickness:

Use the following charts to confirm the sub-base thickness that is required, based on vehicle load, frequency of use and Soil Strength (CBR %).

DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRAVEL FINISH

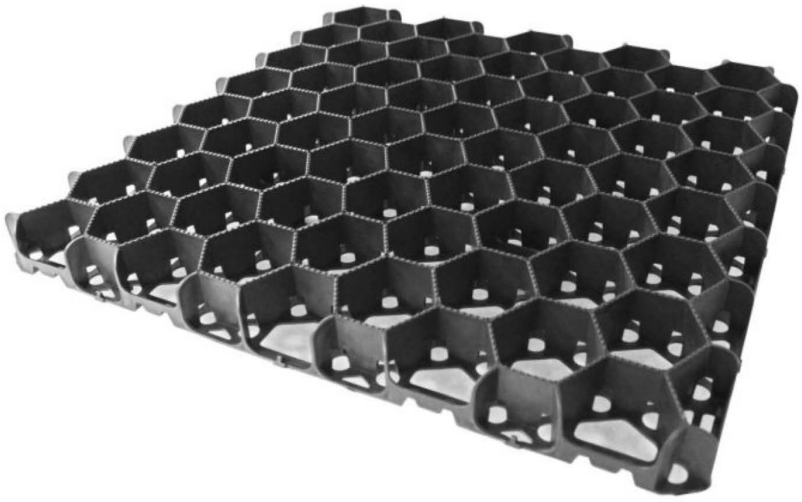


Table 1 - Typical Sub-Base Thickness using a Geogrid*

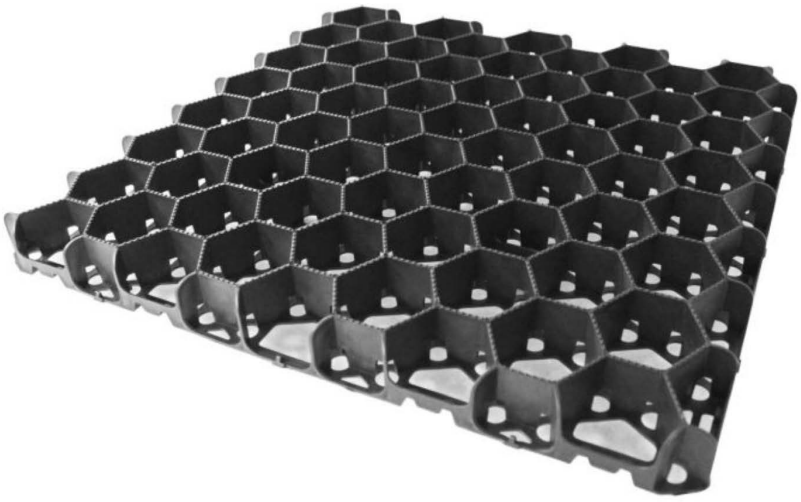
Consistency	CBR % (Strength of Subgrade Soil)	Sub-Base Thickness
Light Vehicles, Cars, Vans & overflow parking	= 1 < 2	260mm
	= 2 < 4	135mm
	= 4 < 6	100mm
	≥ 6	100mm
Coaches, Lorries, Fire Trucks & Occasional HGV areas	= 1 < 2	380mm
	= 2 < 4	190mm
	= 4 < 6	120mm
	≥ 6	100mm

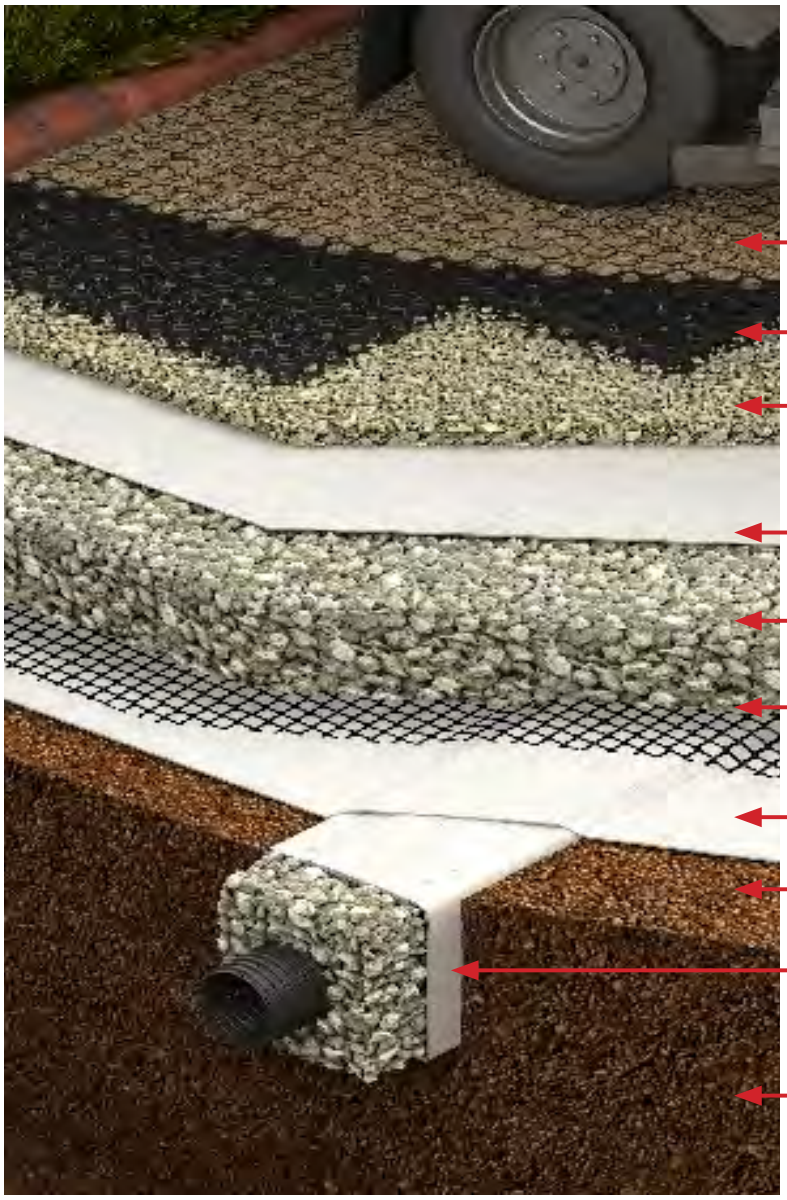
*If a geogrid is not used, sub-base thickness should be increased by 50%

Table 2 - Guidance for estimating sub-grade strengths

Consistency	Indicator			Product	
	Tactile (feel)	Visual (observation)	Mechanical (test)	CBR	CU
			SPT	%	kN/sqm
Very Soft	Hand sample squeezes through fingers	Man standing will sink >75mm	< 2	< 1	< 25
Soft	Easily moulded by finger pressure	Man walking sinks 50-70mm	2-4	~ 1	~ 25
Medium	Moulded by moderate finger pressure	Man walking sinks 25mm	4-8	1-2	25-40
Firm	Moulded by strong finger pressure	Utility truck ruts 10-25mm	8-15	1-4	40-75
Stiff	Cannot be moulded but can be indented by thumb	Loading construction vehicle ruts by 25mm	15-30	4-6	75-100

INSTALLATION GUIDE
SUREGREEN PP40
POROUS PAVER GRAVEL FINISH





Prior to any work on site, it is highly advisable a site survey, even if only a rudimentary one, is done.

Installation notes:

- It will need to be considered that SUREGREEN PP40 porous plastic pavers will require an edge retention system / kerb of some kind. This should be as substantial as 150mm x 150mm concrete road kerbs, steel, plastic or treated timber.
- It may be prudent to check if the type of soil on the surface is the same 200 to 400mm under the surface.

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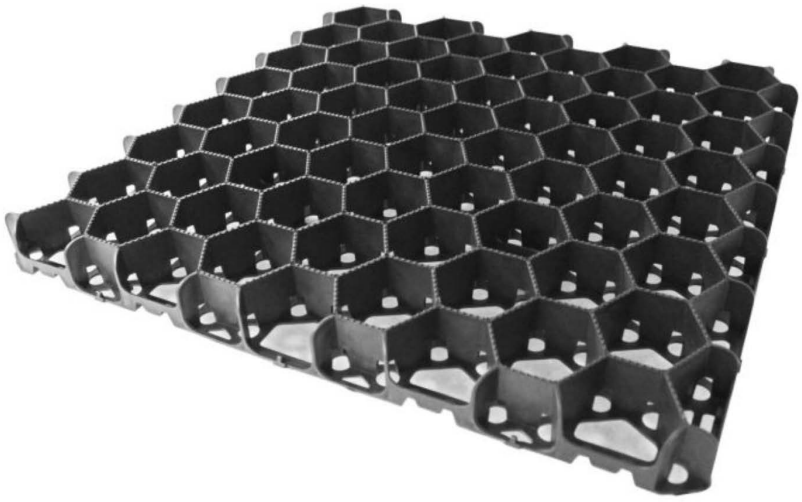
SUREGREEN PP40
POROUS PAVER GRAVEL FINISH



1) The sub-grade: Excavate ground to create a sub-grade at the bottom of the profile. This layer will required depth and formation based on the type and frequency of traffic using the soil after installation and the ability of the existing soils to handle imposed loadings. The sub-grade could finish could be as little as 100mm or as much as 500mm below the existing surface. It is advisable that the sub-grade is compacted. On top of the bottom layer, unroll and place a geotextile onto the prepared subgrade. A geo-grid can also be applied to reduce the depth of sub-base used and also reduce the amount of spill caused by works.

2) The sub-base layer: On top of the sub-grade a sub-base layer needs to be installed. The depth of this layer would have been pre-determined at an earlier date. The sub-base needs to be composed of a free draining sharp angular fill material (angular stone /aggregate), 95% of which the particle size is of a mixed nature between 5mm to 45mm (DOT type3 or similar) with reduced fine content which would produce a stable and porous sub-base / hard-core after compaction. The sub-base needs to be compacted to the required depth. At the top of the sub-base a second geotextile separation layer needs to be installed.

3) The Bedding layer: For a gravel finish, the bedding layer needs to be a free draining, sharp angular 5 to 20mm gravel laid to a depth of approximately 40mm on top of the top layer of geotextile that has been installed above the sub-base. This bedding layer may require compaction using a vibrator plate or roller. The bedding layer will be required to be smooth and level to allow an even surface for the SUREGREEN PP40 porous pavers to be laid onto.

4) Laying SUREGREEN PP40: SUREGREEN PP40 should be laid from above onto the prepared gravel bedding layer, working from one corner laying adjacent paving grids into their connectors. SUREGREEN PP40 plastic paving grids can be cut on-site using a handsaw, jig-saw or other mechanical saw to match site / client requirements, shapes and obstacles.

5) Filling the pavers: SUREGREEN PP40 needs then to be filled with the same 5 to 20mm sharp angular gravel. With the spikes and the shearing action of the gravel SUREGREEN PP40 becomes locked within the gravel and so is able to resist the dynamic loadings imposed by the surface traffic. A light whacker plate after filling may be applied to 'settle' the gravel and then a small top up to refill the cells if necessary.

Notes on Gravel:
Experience has shown a 5mm to 20mm sharp angular gravel gives the best results for providing a long term, very low maintenance wearing surface. The gravel interlocks / shears with each other and, more importantly with the specially designed SUREGREEN PP40 pavers. The smaller particles fill the smaller voids and working with the PP40, this gives a secure, locked sustainable finish.

Single size gravel or even worse rounded gravel like pea shingle will in due course lead to issues and failure. The more rounded and single size the gravel, the quicker problems are likely to happen.

PRODUCT DATA SHEET
SUREGREEN PP40
POROUS PAVER GRASS FINISH

Description:

Interlocking porous plastic paving grids for ground reinforcement for trafficking applications including car parking, paths, walkways and fire access lanes. PP40 Paving grids provide a stable reinforced permeable load-bearing surface.

Applications:

SUREGREEN PP40 has been manufactured using specially selected 100% recycled plastics that have the qualities that are required for a strong, long-lasting, stable product suitable for the designed traffic load.

Typical uses include:

- Overflow car parks
- Wheelchair & disabled access paths
- Free draining pedestrian paths
- Fire access roads / lanes
- Cycle paths
- Access routes and roads
- Drives and Driveways
- Lawn Reinforcement

Features and benefits:

- UV stabilisation to stop degradation by sunlight.
- Tested to 350T/m² (when filled) tested to UNI CEI EN ISO/ IEC 17025 Certification, capable of withstanding cars, vans, trucks and lorries.
- Paver profile that allows expansion on warmer days or in direct sunlight when required to stop lifting.
- Plastic selection to allow use in cold temperatures – some plastic will become fragile when cold.
- Open structure to allow unhindered water permeability.
- Paver design to maximum support and stability from a grass root or gravel structure.
- All plastics used are stable, chemically inert and are not toxic so are suitable for normal soil conditions.

Product

PP40 Porous Grass Paver – Plastic paving grid for ground reinforcement.

Typical Applications

Overflow car parking, fire access lanes, caravan/ holiday home parking, residential parking.

Frequency of Use

Loading

PRODUCT DATA SHEET
SUREGREEN PP40
POROUS PAVER GRASS FINISH

Characteristics	Data
Dimensions	500mm x 500mm wide x 40mm plus 25mm spikes deep
Weight	(+/-2%) Each piece is 1kg – 4g per m^2 (+/-2%)
Nominal cell dimensions Base	57mm Hexagonal
reinforcement / anti shear	Four 25mm spikes per paver
Connection method Cell wall	Edge spikes and loops
thickness	3mm (+/-2%)
Cell Openness %	95% on top and 75% on base
Polymer	Recycled Polyethylene
Colour	Green
UV stabilised	Yes
Load bearing capacity	150 tonnes per m^2
Production control	17025 Certification Tested to ISO 9000
Traffic Loading	Tested to DIN 1072 (20 tonne wheel load SWL)
Pavers per m2	Four

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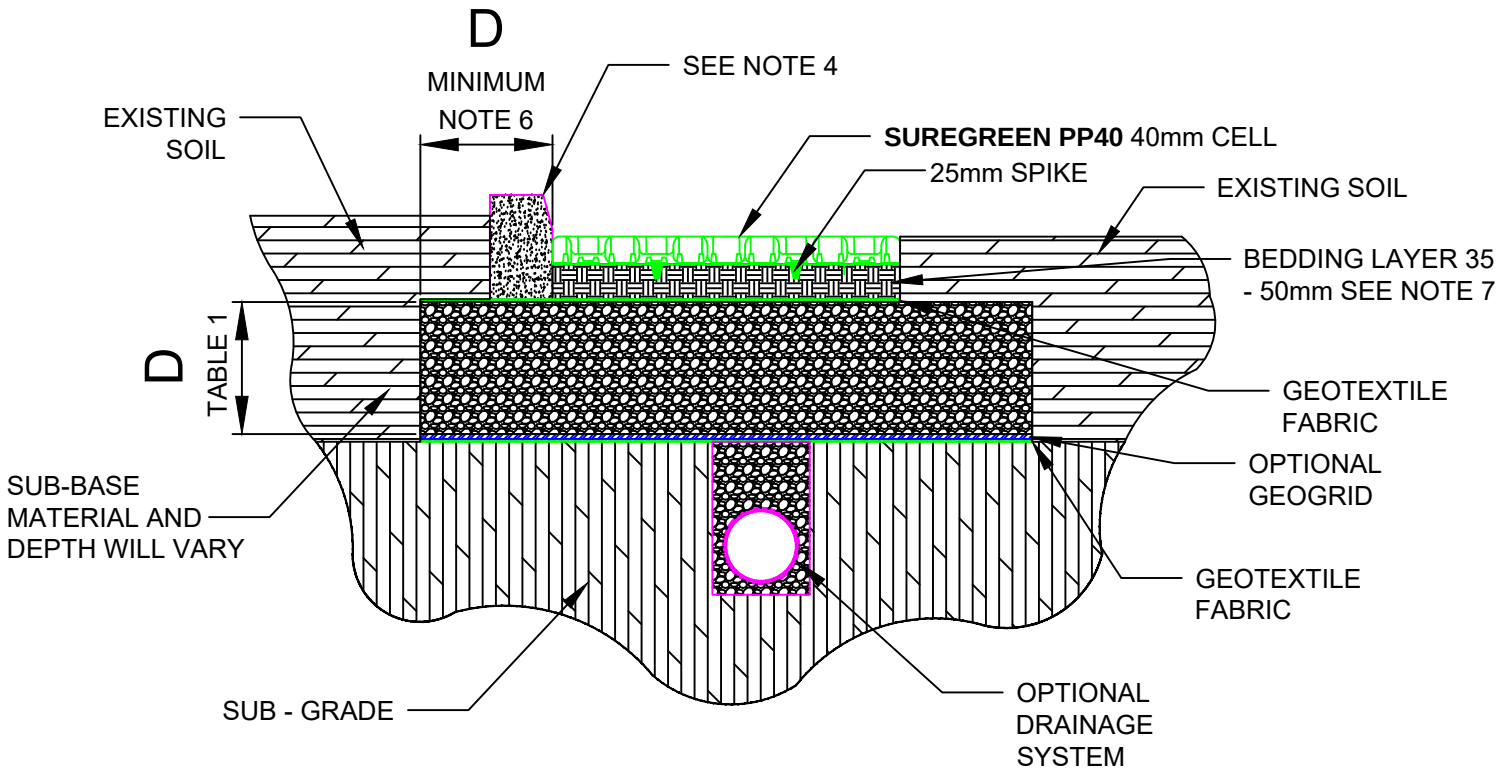
DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRASS FINISH



DESIGN GUIDELINES

SUREGREEN PP40 is a porous paver that provide a solution to a wide range of trafficking needs, especially in providing a stable, free draining surface for grassed or gravel areas. The application might be a car park, driveway, or an emergency access route. SUREGREEN PP40 plastic paving grid for ground reinforcement has been designed using carefully selected recycled plastics. This heavy duty polymer and its interlocking nature provides a robust surface able to withstand the dynamic & lateral loads that vehicles impose on it.

The following applications and frequency of use are guides only as this does not take in to consideration the existing ground conditions. Please refer to the full Suregreen range if product specified does not meet requirements. If you require further assistance please contact our sales team for further guidance on product suitability and installation instructions.

Product	PP40 Porous Grass Paver	Typical Applications	Frequency of Use	Loading
	Plastic paving grid for ground reinforcement.	Overflow car parking, fire access lanes, caravan/ holiday home parking, residential parking.		

DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRASS FINISH

Prior to any work on site, it is highly advisable a site survey, even if only a rudimentary one, is done. Questions to ask may be:

Does the proposed installation area drain well already?
Is there planned to be a slight fall to be built into the design to perhaps aid drainage if aid is needed?
Is the drainage capability of the soils the same at the surface and at 200 to 500mm below the surface?
Has there been previous issues with drainage on site?
Has disposal of any excess water been considered?
Are there SUDS requirements to be considered?

DESIGN NOTES:

1) If a geogrid is being considered as part of the construction profile please ensure that at least 25% of the particle size of the sub-base is bigger than the mesh size used to ensure good shearing / locking.

2) Sub-base particle size should not ideally exceed 60mm and should be less than 5% fine material of content of the whole.

3) Please refer to tables 1 & 2 for guidelines to depth of sub-base for specific design profile to suit site needs. Please note if a geogrid is omitted 50% of the depth of sub-base needs to be added to calculated depth with a geogrid. For example 100mm with geogrid would become 150mm without.

4) It is always good practice to confine SUREGREEN PP40 plastic pavers on the site edges. This could be as strong as 150 x 150mm concrete kerbs or a simple barrier like treated timber. The type of vehicles, frequency of traffic and circulation routes should all be considered when choosing the confinement method for SUREGREEN PP40 in the design.

5) SUREGREEN PP40 has been designed to work within stated guidelines to a slope of 5% or less. The SUREGREEN PP40 can be used on steeper slopes in some cases.

6) Ideally the sub-base should extend out further than the surface area of SUREGREEN PP40. This is so lateral pressures caused by the traffic loading does not displace the SUREGREEN PP40 on the edge. The extension of sub-base outwards should be the same as the depth of the sub-base.

7) Root zone 60/40 should be used for the bedding and filling of the cells of the SUREGREEN PP40 grass pavers.
(Please see Installation document for further details regarding the rootzone specification). Using soils won on site /reused for excavation are very likely NOT to have any medium to long term success due to poor nutrition and drainage properties. Mixing soils on site is also not advised.

Note on drainage:

Any sub-base used in the construction profile should be perme-able – for example DOT Type 3. It should predominantly fine material free and able to compact well without losing integrity, stability and permeability/porosity. DOT type 1 can be used but drainage channels need to be con-sidered – please see schematic.

Sub-base thickness:

Use the following charts to confirm the sub-base thickness that is required, based on vehicle load, frequency of use and Soil Strength (CBR %)

DESIGN GUIDELINES
SUREGREEN PP40
POROUS PAVER GRASS FINISH

Table 1 - Typical Sub-Base Thickness using a Geogrid*

Consistency	CBR % (Strength of Subgrade Soil)	Sub-Base Thickness
Light Vehicles, Cars, Vans & overflow parking	= 1 < 2	260mm
	= 2 < 4	135mm
	= 4 < 6	100mm
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Coaches, Lorries, Fire Trucks & Occasional HGV areas	= 1 < 2	380mm
	= 2 < 4	190mm
	= 4 < 6	120mm
	≥ 6	100mm

*If a geogrid is not used, sub-base thickness should be increased by 50%

Table 2 - Guidance for estimating sub-grade strengths

Consistency	Indicator			Product	
	Tactile (feel)	Visual (observation)	Mechanical (test)	CBR	CU
			SPT	%	kN/sqm
Very Soft	Hand sample squeezes through fingers	Man standing will sink >75mm	< 2	< 1	< 25
Soft	Easily moulded by finger pressure	Man walking sinks 50-70mm	2-4	~ 1	~ 25
Medium	Moulded by moderate finger pressure	Man walking sinks 25mm	4-8	1-2	25-40
Firm	Moulded by strong finger pressure	Utility truck ruts 10-25mm	8-15	1-4	40-75
Stiff	Cannot be moulded but can be indented by thumb	Loading construction vehicle ruts by 25mm	15-30	4-6	75-100

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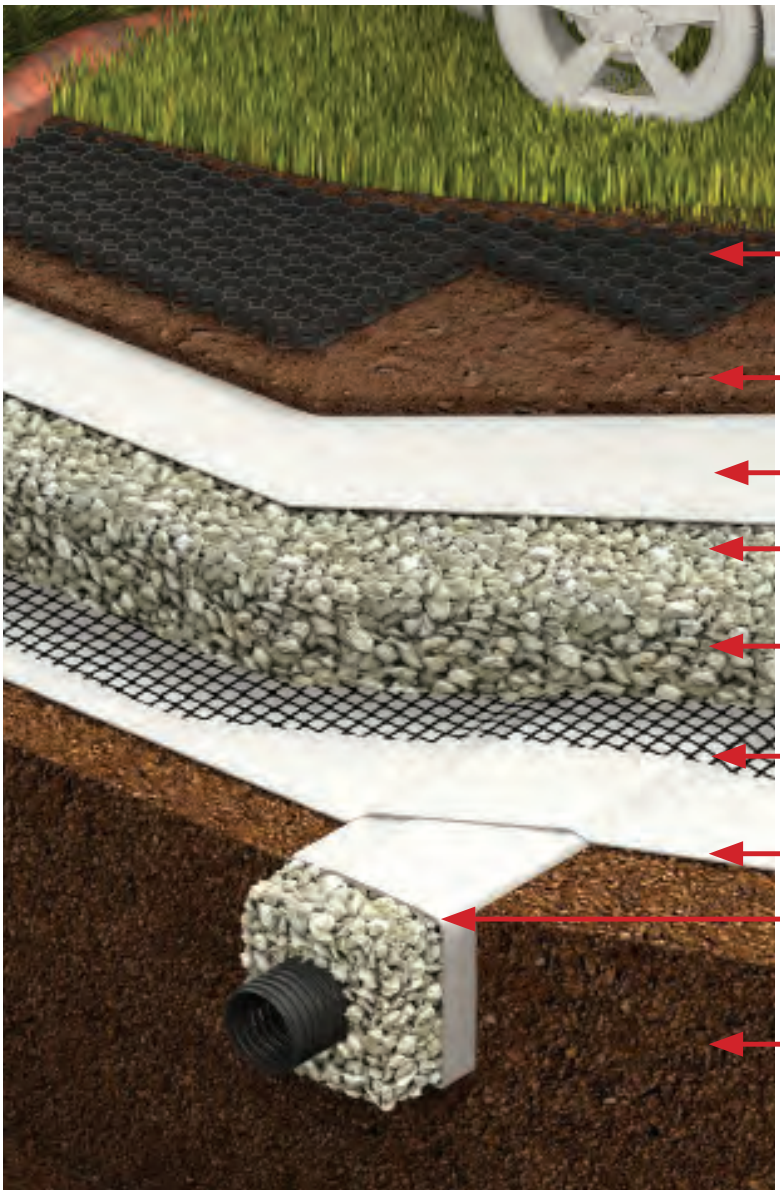

PP40 Paver filled within 5-7mm of the surface with a 60:40 rootzone, then seeded

Bedding layer 35-50mm thick 60:40 rootzone

Geotextile fabric

Free draining sub-base angular stone within a 5-45mm size range

Sub base thickness between 100-380mm

Optional Geogrid

Geotextile fabric

Optional drainage system

Sub-grade

Prior to any work on site, it is highly advisable a site survey, even if only a rudimentary one, is done.

Installation notes:

- If there is a slope of more than 5%, where there is a grass finish requirement, it is advisable to enquire for technical advice.
- It will need to be considered that SUREGREEN PP40 porous plastic pavers will require an edge retention system / kerb of some kind. This should be as substantial as 150mm x 150mm concrete road kerbs, steel, plastic or treated timber.
- It may be prudent to check if the type of soil on the surface is the same 200 to 400mm under the surface.

INSTALLATION GUIDE
SUREGREEN PP40
POROUS PAVER GRASS FINISH

1) The sub-grade: Excavate ground to create a sub-grade at the bottom of the profile. This layer will be the required depth and formation based on the type and frequency of traffic using the soil after installation and the ability of the existing soils to handle imposed loadings. The sub-grade could finish could be as little as 100mm or as much as 500mm below the existing surface.
It is advisable that the sub-grade is compacted. On top of the bottom layer, unroll and place a geotextile onto the prepared subgrade. A geo-grid can also be applied to reduce the depth of sub-base used and also reduce the amount of spill caused by works.

2) The sub-base layer: On top of the sub-grade a sub-base layer needs to be installed. The depth of this layer would have been pre-determined at an earlier date. The sub-base needs to be composed of a free draining sharp angular fill material (angular stone / aggregate), 95% of which the particle size is of a mixed nature between 5mm to 45mm (DOT type3 or similar) with reduced fine content which would produce a stable and porous sub-base / hard-core after compaction. The sub base needs to be compacted to the required depth. At the top of the sub-base a second geotextile separation layer needs to be installed.

3) The Bedding layer: On top of the of the geotextile covering the angular stone sub-base construction, a layer of approximately 40mm of 60/40 root-zone sandy soil should be placed and compacted. This bedding layer should been no less than 35mm deep to allow good grass root structure to grow and no more than 50mm deep after compaction to avoid possibly compromising the structural integrity of the construction profile. The root-zone layer will need to be levelled off to provide an even surface for the SUREGREEN PP40 plastic pavers to be laid.

4) Laying SUREGREEN PP40: SUREGREEN PP40 should be laid from above onto the prepared rootzone bedding layer, working from one corner laying adjacent paving grids into their connectors. SUREGREEN PP40 plastic paving grids can be cut on-site using a handsaw, jig-saw or other mechanical saw to match site / client requirements, shapes and obstacles.

5) Filling the pavers: SUREGREEN PP40 should be filled nearly to the top with the root-zone leaving a gap of approximately 5mm off the top. This layer can be brushed in and not compacted. Overfilling is likely to cause unnecessary compaction of the root-zone when trafficked leading to bad retention of the grass layer. SUREGREEN PP40 grass paver filled surface can then be seeded, fertilized and watered in if necessary. Rolling in turf is not
advised.

Notes on Rootzone:

Experience has shown to achieve the best long term results and optimum working conditions for SUREGREEN PP40 grass pavers when a grass finish is required the soil fill should be 60/40 Root-zone. Root zone is a blend of semi-rounded sands of a selected grain size mix and sandy soils. Root-zone is used on most good sports pitches, golf courses and for horticultural uses. Root-zone has good drainage, encourages good and rapid grass growth and has a good bearing capacity.

Notes on grass:

It is recommended a hard wearing amenity grass seed mix – mini ryes and fescue's for example – is used for seeding. The grass – when established – will need to cope with trafficking, wet and dry conditions. There needs to be care as to the time scales when the SUREGREEN PP40 grass paver surface is used for the intended trafficking. The area should only be used for critical movements at first. There are two main reasons for this; Firstly, if trafficked too fast the tender young shoots will be easily damaged and the grass stunted or even killed off. Secondly, SUREGREEN PP40 plastic pavers have been designed to allow the grass root structure to entangle with the pavers open structure providing strength and stability to resist the loadings imposed by the trafficking. It must also be considered, when sowing the grass, what time of year it is and the prevailing weather conditions. A strong vibrant grass growth is needed and will generally take approximately 6 to 8 weeks in the growing season to become viable for trafficking. The best times of the year to seed is spring and autumn and away from the extremes of heat and cold. Please contact for further advice if unsure.