

# DESIGN GUIDELINES

SUREGREEN PP40 PERMEABLE PAVER

- GRAVEL FINISH

All of our design guidelines are written with best practice in mind. It is strongly advised that any questions raised from the guidelines are directed to our technical team.

When SUREGREEN PP40 porous pavers are installed correctly to suit site conditions, they should provide source control within SUDS system (Sustainable Urban Drainage Systems). Drainage must be a consideration when designing a construction profile to ensure that flood alleviation and water run-off is properly considered where natural infiltration may not be capable of withstanding all eventualities.

## QUESTIONS TO BE CONSIDERED

- a). Does the proposed installation area drain well already?
  - b). Is there planned to be a slight fall to be built into the design to perhaps aid drainage if aid is needed?
  - c). Is the drainage capability of the soils the same at the surface and at 200mm - 500mm below the surface?
  - d). Have there been previous issues with drainage on site?
  - e). Has disposal of any excess water been considered?
  - f). Are there SuDS requirements to be considered?
- 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 to ensure good shearing/locking.

2). Sub-base particle size ideally should not exceed 60mm, and should be less than 5% fine material of content of the whole. Please ask for technical guidance if unsure.

3). Please refer to tables 1 & 2 for guidelines on the depth of the sub-base for specific design profiles to suit site needs. Please note - if a geogrid is omitted, 50% of the depth of sub-base needs to be added to the calculated depth with a geogrid. For example, 100mm with geogrid would become 150mm without. For detailed guidance, please get in touch and we'll be happy to help.

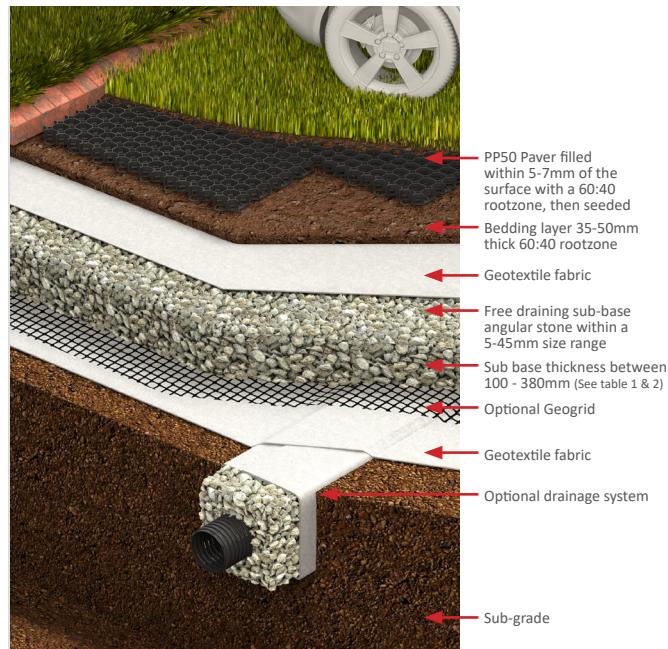
4). It is always good practice to confine PP40 plastic pavers on the site's edges. This could be as strong as 150 x 150mm concrete kerbs or a simple barrier such as treated timber. The type of vehicles, frequency of traffic and circulation routes should all be considered when choosing the confinement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

5). PP40 has been designed to work within stated guidelines to a slope of 5% or less. PP40 can be used on steeper slopes in some cases - please get in touch with our technical team for guidance.

6). Ideally, the sub-base should extend out further than the surface area of PP40 permeable pavers. This is so that lateral pressures caused by the traffic loading does not displace the 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 providing a long-term, very low-maintenance and hard-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 lead to issues and failure. The more rounded and single size the gravel, the sooner problems are likely to happen.

8). When PP40 is filled with aggregate 5mm - 20mm to BS EN13242, it conforms to BS8300:2001 for disabled access. Please note - any sub-base used in the construction profile should be permeable, for example MOT Type 3. It should be predominantly fine material-free and able to compact well without losing integrity, stability and permeability/porosity. MOT type 1 can be used, but drainage channels need to be considered - please see the schematic. For any detail on the design specification not covered in the above, please contact our technical team.



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

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

Consistency	CBR % (Strength of Subgrade Soil)	Sub-Base Thickness
Light Vehicles, Cars, Vans and overflow parking	= 1 < 2	260mm
	= 2 < 4	135mm
	= 4 < 6	100mm
	$\geq 6$	100mm
Coaches, Lorries, Fire Trucks and Occasional HGV areas	= 1 < 2	380mm
	= 2 < 4	190mm
	= 4 < 6	120mm
	$\geq 6$	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	Around 1	Around 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	2-4	40-75
Stiff	Cannot be moulded but can be indented by thumb	Loading construction vehicle ruts by 25mm	15-30	4-6	75-150

