

Permegrid PG40 Gravel Design Guidelines

All the 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 Permegrid PG40 is installed correctly to suit site conditions, they should provide source control within 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 filtration may be incapable of withstanding all eventualities.

When installing Permegrid PG40 the following should be considered:

1. 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 200 to 500mm below the surface?
d) Has 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?
- 2) If Permegrid 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 locking.
- 3) Sub-base particle size should not ideally exceed 60mm and should be less than 5% fines material of content of the whole. Please ask for technical guidance if unsure.
- 4) Please refer to tables 1 and 2 for guidelines to depth of sub-base for specific design profile to suit site needs. Please note if Permegrid is omitted 50% of the depth of sub-base needs to be added to calculated depth with Permegrid. For example, 100mm with Permegrid would become 150mm without. For detailed guidance please contact our technical team.
- 5) It is always good practice to confine Permegrid PG40 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 Permegrid PG40 in the design.
- 6) Permegrid PG40 has been designed to work within stated guidelines to a slope of 5% or less. The Permegrid PG40 can be used on steeper slopes in some cases

7) Ideally the sub-base should extend out further than the surface area of Permegrid PG40. This is so lateral pressure caused by the traffic loading does not displace the Permegrid PG40 on the edge. The extension of sub-base outwards should be the same as the depth of the sub-base.

8) The aggregate for the bedding layer should ideally be a 5-10mm angular clean aggregate laid to a maximum depth of 20mm. For the finishing layer, the filling of the cells should ideally be specified as 10mm to 14mm sharp angular gravel to BS EN13242. This gives the best results for providing a long term, very low maintenance wearing surface. The gravel pieces interlock with each other and, more importantly with the specially designed PG40 plastic paver. Smaller angular gravel/particles fill the voids providing a secure, stable and sustainable finish. Rounded gravel/pea shingle is not recommended.

Note on drainage

Any sub-base used in the construction profile should be permeable – for example MOT Type 3 or MOT Type X. It should be predominantly fines free material 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 schematic.

For any detail on specification for design not covered in above please contact our technical team.

Table 1 – Guidance for estimating sub-grade strengths

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

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 %).

Table 2 – Typical sub-base thickness using Permegrid PG40

Consistency	CBR % (Strength of Subgrade Soil)	Sub Base Thickness
Light Vehicles, Cars, Vans And Overflow Parking	= 1 < 2	260 mm
	= 2 < 4	135 mm
	= 4 < 6	100 mm
	≤ 6	100 mm
Coaches, Lorries, Fire Trucks And Occasional HGV Areas	= 1 < 2	380 mm
	= 2 < 4	190 mm
	= 4 < 6	120 mm
	≤ 6	100 mm