



The Green Products Company

"Building A Greener Tomorrow!"

A DIVISION OF ACOUSTICAL SURFACES, INC.

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PermaTURF® Inc.

Technical Reference Guide

Features of Porous Pavers

Commonly we are asked about using *PermaTURF* Porous Pavers in conjunction with turf and/or pea stone for parking or driveway situations. This is how we typically address the application for *PermaTURF*.

PermaTURF Porous Pavers provide: (1) turf reinforcement for all kinds of traffic areas, (2) storm water and erosion control, (3) environmental enhancement, (4) aesthetic appeal, (5) and health benefits.

Using *PermaTURF* to create a secure grass root system, it is imperative that the root system of the indigenous turf is protected within the cells of the panel; thus, traffic does not harm the root structure as vehicles ride on the top of the panel's cells, allowing the roots to penetrate below the panel cells to a natural depth. The entire base and panel structure is not designed to retain water; it allows for natural drainage into the soil while providing a solid foundation.

We cannot specify the type or amount of sub-structure needed as it is totally based on the existing conditions of the climate, turf, and other factors in your area. Generally the sub-base will be constructed the same as needed for driveways paved with asphalt or concrete with consideration of load weight. For specifics see installation instructions.

Materials for Sub-Base

Base Course: Sandy gravel material from local sources commonly used for road construction. Sources of the material can include either "pit run" or "crusher run". To ensure long term porosity, crusher run material will generally require sharp sand to be added to mixture (20-30% by volume). To provide adequate root zone development for turf, selected materials should be nearly neutral in pH (range from 6.5 to 7.2). Alternative materials such as crushed shell, limerock, and/or crushed lava may be considered for a course base provided that it is mixed with sharp sand (20-30%) and brought to proper compaction. (Crushed shell and limerock alone will set up like concrete without sands added.)

Permeability

There are a number of factors to consider when comparing runoff of various surfaces – concrete, asphalt - with the application of *PermaTURF* Porous Pavers. As a rule, *PermaTURF* porous pavers provide a lower runoff coefficient attributable to 90% and greater permeability per square foot of surface area, depending on the sub-base content and depth of base. Using *PermaTURF* over a base content of:

1. Rock and sand will generate minimal surface runoff.
2. Clay soils will vary depending on the depth of the base.

PermaTURF and all similar porous paver companies refer to the method established by the *Technical Release #55, US Department of Agriculture, Soil and Conservation* to access storm water management.

No porous paver can influence runoff or permeability of storm water; general rules apply.



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Permeability		Runoff % - 24 Hr Rainfall Sand to Clay Soils			
		Inches	CN30	CN58	CN71
1.0	+	0.0	0.0	.01	.06
1.2	+	0.0	0.0	.03	.10
1.4	+	0.0	0.0	.05	.14
1.6	+	0.0	0.0	.05	.18
1.8	+	0.0	.01	.11	.21
2.0	+	0.0	.02	.13	.24
2.5	+	0.0	.05	.20	.32
3.3	+	0.0	.09	.25	.38
4.0	+	0.0	.17	.35	.47
5.0	+	0.0	.23	.42	.54
6.0	+	.01	.29	.48	.60
7.0	+	.03	.34	.53	.64
8.0	+	.05	.39	.57	.67
9.0	+	.08	.43	.61	.70
10.	+	.10	.46	.64	.73
11.	+	.12	.49	.66	.75
12.	+	.15	.52	.68	.76

Table 1

Advantage: PermaTURF Porous Pavers are lightweight injection molded units (13" x 13" x 1-1/2"h) made of the highest quality of plastic - 100% recycled polyethylene HDPE/PP. The high premium resins and UV inhibitors guarantee the strength and longevity of the pavers.

Advantage: PermaTURF Porous Pavers have a patented 4-sided interlocking design of honeycomb shaped cells with a 1/2" diameter opening on the bottom to allow maximum grass root penetration and development. The couplings support the connecting panels, forcing the weight to be distributed over a larger area, and making panel separation impossible.

In addition to securing the panels into one solid, contiguous area, the patented interlocking system does not allow the panel units to be pulled apart. The 4-sided panel-to-panel connection securely fastens into one continuous section, which is extremely important when major forces are applied by traffic including pressure from turning, braking, and acceleration.

Advantage: Subtle changes in ground conditions could easily result in panel separation and connection failure with a different type of joint connection i.e. snap on connectors or pegs. The PermaTURF design is differentiated from other types of panels as the connections will actually become stronger as more pressure is applied; thus providing a secure panel locking mechanism. The interlocking design facilitates installation, allowing one person to place over 500 square feet an hour.

Advantage: PermaTURF Porous Pavers have the highest load-bearing capacity due to the wall-to-wall injection molded composition, exceeding that of any flexible pavers including pavers with freestanding cells. Tests performed under the guidelines of DIN EN ISO 604 using only free standing PermaTURF hollow panels established a load force capacity of more than 5038 kN/m² with a maximum force of 15.75 kN. Tests using free standing hollow panels are a vital factor in ascertaining precise strength, durability and quality of the panels. PermaTURF pavers installed, resting on a filled base course, support the equivalent of 500 tons+/m² of total loading magnitude, which exceeds any load-bearing weight conceivable.

Caution: Tests results claiming 'x' amount of PSI [pounds per square inch] are misleading and inaccurate and do not reflect the quality and durability of the product when tests are performed after the product is installed and resting on a filled base course.

Advantage: PermaTURF renders an aesthetic landscaped appearance that is far more attractive than asphalt or concrete, and extends the natural environment while keeping the grounds and air clean.

Environmentally Safe. Ecologically Sound.

MADE IN USA