

I n v i s i b l e

S t r u c t u r e s , I n c .

*Paving Choices That Protect and Enhance the Environment*

I n v i s i b l e M E M O

Via:

Date: 4/1/99

To:

From: Bill Bohnhoff, ASLA, VP

Re: Grasspave<sup>2</sup> vs Geoblock Pavers

Message: In response to your most recent request, we are including our comparison sheet that compares our Grasspave<sup>2</sup> product to other grass paving products. After reviewing this I would like to point out the notable differences of our Grasspave<sup>2</sup> and Geoblock (manufactured by Presto Products).

A truly unique benefit of our porous pavement systems is that they are "flexible". Our porous pavement systems do not share a common wall and are connected by a flexible support grid. This makes our porous pavement systems distinctly different from our competition. Our competitors plastic porous pavement systems all share a common wall or cell. This makes those systems very rigid and less likely to undulate with a natural land forms or be able to flex with expansive soils or freeze/thaw conditions. Rigid paver manufacturers usually specify a leveling layer of sand between the base course and paver, which not only adds to the expense and time of installation, but can actually create structural problems by allowing an unstable layer to receive loads - with potential for generating ruts above a properly compacted base.

I'd like to also make you aware that Invisible Structures Inc. collects and processes recycled plastic, and then manufactures our porous pavement products in our facility in Aurora, Colorado. The 100% recycled post consumer plastic that is used to manufacture our product is derived from products such as #2 high density polyethylene including 55 gal. drums, buckets and pails, plastic crates, bread trays, film canisters etc... Instead of adding to our landfills, our products help to create aesthetic "paved" areas.

Another difference between our products is Geoblock specifies topsoil in their design section whereas we do not. Organic materials are subject to compaction from traffic pressures - even within the confines of the protective paving structure, and they will biodegrade. Over time this will decrease access air and water access to roots (causing stress or death to turf), or expose the grass paving structure to damaging sunlight. Our Grasspave<sup>2</sup> system does not permit organic material in it's cross section.

A few of the additional benefits that our Grasspave<sup>2</sup> product offers you are:

- Grasspave<sup>2</sup> is lighter than Geoblock (4.5 lbs vs. 26.5 lbs/m<sup>2</sup>) making it easier to install.
- Our product can be cut with pruning shears whereas Geoblock requires either hand or electrical sawing making again, making Grasspave<sup>2</sup> easier to install.
- Grasspave<sup>2</sup> offers the most available root area for turf (92%), making it more permeable.
- We are the only grass pave manufacturer to offer rolls of our product. Our new 100 Meter Rolls improve installation speed and ease for large projects. See Roll Size Chart.

## **Product Specifications vs Performance Specifications**

All manufacturers prefer to have construction specifications written to describe the physical appearance of their product to make it distinctive from competition. The more important specifications to be considered are the performance requirements of the project - usually written as minimum performance criteria to be met.

Porous paving performance criteria should focus upon:

**Compressive Load Strength** - equal to the equivalent tire pressure of expected loads, expressed in "psi" or "psf" (psf = psi x 144). For example, golf cart tire pressure is usually around 20 psi, while truck tires might range from 90 - 120 psi. Empty product strength should have approximately a 2x safety factor minimum. However, in actual use all of the reinforcement structures will be filled with soil medium (sand to topsoil) which helps to strengthen load resistance of the structure. After filling with sand, Grasspave2 increases load strength from about 220 psi empty to 5700 psi filled - far beyond the load demands of the heaviest design criteria.

**Minimum Section Open Area** - essentially the percentage of open area existing at the most solid portion of the structure. Described another way, how much open area is left after structural needs for roots to pass down through the structure and establish a mature and stable network.

**Cell Size** - relates directly to the contact area generated by the design load and ability to receive and transmit that load through the structure while minimizing compaction and lateral movement of the fill sand/soil. For example, the ball area of a child's foot/shoe is approximately 2" x 2", while a truck tire contact area is approximately 6.5" x 7". The frequent question of stability for high heels (1/4" "spike") is not really an issue for grass paving as women transfer their weight to the ball of the foot to avoid getting the heel dirty, and not many women will ever be required to walk over grass in dress shoes. 1" heels, wheel chair tires, crutches and canes are well supported by cell sizes less than 2" square.

**Unit Depth** - should be at least 1" deep, based upon research conducted by the National Park Service, to determine the effective depth of compaction to turf areas under various pedestrian and vehicular traffic conditions. Structure depths greater than 1" offer little real benefit to compaction resistance, but can increase structural load resistance (if needed) and will increase material volume and cost (plastic sells by the pound).

**Flexibility and Joints** - porous pavements are designed to percolate and hold moisture, unlike impervious asphalt and concrete surfaces which are designed to keep water away from their section. In freezing climates and sites with expansive soils, this means that porous pavements are subject to freeze/thaw or soil expansion forces which can cause vertical surface movement. Product flexibility and joint connections should be able to withstand these often frequent movements.

## **Product Specifications**

Width, Length, Weight, Color, Packaging, etc. are all variables specific to each individual product with little impact upon product performance, once minimum criteria discussed above are met.

Invisible Structures, Inc. certifies that our Grasspave2 grass reinforcement product will meet every important performance criteria required, and is equal or better than any competitive product available.

I hope the enclosed information helps and please feel free to contact us if you have any additional questions or comments.