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Your Single Source For Innovative
Architectural Concrete Solutions

GRASSCRETE PERMEABILITY AND WATER STORAGE CAPACITY: STONE FILLED PARKING LOT APPLICATIONS

The permeability of Grasscrete is not necessarily taken into consideration when designing for a pervious application. At a minimum rate of 3.5 gallons per minute which is equivalent to 340" per hour per square foot, the permeability of Grasscrete far exceeds the infiltration rates of the virgin solids, even if well draining. The limiting factor to a system rather is the capacity for rainfall event combined with the rate percolation of the virgin soils.

Grasscrete has an open void space of 37.5% which when filled with stone with a void space of 40% results in 15% effective porosity plus that of the sub-base. This porosity can be further augmented by the use of underground storage tanks or cisterns or simply the use of a deeper than typical sub-base. Compacted, clean #67 stone used as sub-base has a porosity of about 40%. A conventional road-base graded stone with higher fines content will have a lower porosity of approx 18%. Using a sub-base with a higher porosity increases the water storage capacity of the entire system. Typically for parking applications a 4" to 8" minimum thickness sub-base is utilized –this however is highly dependant upon the compaction of the native soils along with the desired load bearing capacity.

Using the information above the standard 5 ½" Grasscrete with 15% porosity installed over 4" of #67 clean stone, the nominal water storage capacity would be 2.4".

Grasscrete	**+**	**Sub-base**	**=**	**Capacity**
15% of 5.5"	+	40% of 4"	=	2.4"

If the standard 5 ½" Grasscrete with 15% porosity was installed over 8" of #67 clean stone, the nominal water storage capacity would be 4".

Grasscrete	**+**	**Sub-base**	**=**	**Capacity**
15% of 5.5"	+	40% of 8"	=	4"

The selection of the sub-base material is very important when attempting to maximize the water capacity of the Grasscrete system. Other factors such as extensive slope may reduce the capacity while curb height may increase the capacity. These considerations need to be addressed on a case by case basis.

This information refers to the capacity of the system to hold the water from an abnormal rainfall event. Typically the rainfall event will occur over several hours or days. The porosity of the native spoils needs to be taken into consideration when determining the overall capacity for any given installation. A sandy soil with good porosity will contribute to the water storage capacity if the rainfall event occurs over a long period of time. A clay type native soil may contribute very little to the storage capacity – especially if the rainfall event occurs over a brief period of time. Every installation needs to be designed and installed in consideration of native soil type, desired water storage capacity, void fill porosity and load bearing capacity.

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