

Porous Concrete: Frequently Asked Questions

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How do you make concrete porous?

We add a special admixture into the material and we withhold water so that the cement does not form a slurry, like regular concrete. We want the cement to form a paste and use that to stick the rocks together. The admixture allows the cement to bind to very fine aggregate (sand) in a paste form.

Is it expensive? How expensive?

The concrete cost is about 3 times the cost of regular concrete. (\$200/CY vs. \$60/CY). The placing and finishing cost is about the same. There are additional costs for an under drain storage system. We are saving money by not having to buy land and build stormwater ponds to mitigate the additional runoff. On sidewalk projects and small projects, this can result in cost savings. On a large-scale project, costs can come out about the same depending on land costs.

Why use porous concrete or porous materials?

For the health of our streams, groundwater supplies, and ultimately Puget Sound, we would like to infiltrate as much rain water as possible in its natural conditions. Maintaining natural infiltration amounts and locations reduces the stormwater volume and peak discharged to our creeks and streams. If we can maintain natural flows to our creeks and streams then we can preserve the health of our streams. Our drinking water in Olympia comes from groundwater. Allowing more water to infiltrate means more water will be available for future use.

Is it as durable as regular concrete?

Generally, porous concrete is weaker than regular concrete. While it can be strong enough for roadway traffic loadings, currently we are working on sidewalk and parking lots (lighter traffic load locations). It has the potential to be used for limited roadway applications.

What about freezing?

Water expands when it freezes. This can cause some materials to break. Under natural and normal installations of porous concrete, it is not possible to fill all of the air voids in the material with water, or to freeze it solid. This means there is always air space in the porous concrete for ice crystals to expand, thus freezing temperatures have no effect on porous concrete.

Have other people used porous concrete in the past?

Yes, porous concrete has been used in parking lots and those applications are still in use. Portland has performed trials in roadways and parking areas. Its use has not grown significantly due to its higher installation cost. (It did not pencil out) The economics is starting to shift with new (more restrictive) stormwater regulations. There is currently a great deal of interest and trial projects going on right now.

What are the current problems?

Concrete mix quality control continues to be difficult. Porous concrete is very sensitive to water and thus difficult to mix correctly. Also, very few contractors know how to install it correctly. We are still working on how and how often to clean the porous concrete. The solutions to most of these problems will come with working with the material. Some initial sites may fail or have lower than expected performance, but ultimately experience will solve most of these problems. The economics of porous pavement now makes this material a viable alternative to stormwater ponds. Thus, we will see more applications and our expertise with porous materials will grow.