

Beyond the surface

Permeable pavements are becoming increasingly popular and practical due to their positive impact on the environment.

As green building continues to become more popular, hardscape contractors can look to permeable pavers to serve their customers.

A permeable pavement allows storm water or rainwater through its surface to infiltrate into the earth below. A non-permeable system makes water go through a curb and gutter system, then through a rainwater piping system and eventually getting to a treatment facility or a holding pond.

"The difference between a permeable paver and a non-permeable paver is a permeable paver has a wider joint spacing between each individual paver unit that is filled with a certain type of rock that facilitates that water flowing through

those joints and into the soils below," says Andy Vander Woude, CEO of VAST Enterprises, a material science research and manufacturing company in Minneapolis. "A traditional paver has very, very tight joint lines that are compacted with the sand that does not allow the water to seep into their joints and essentially acts as a solid slab of pavement."

Support system. What truly makes a system permeable is what is underneath the surface. If you put permeable pavers on top of a compacted, non-permeable soil-base, which most pavers are typically placed on, you haven't completed a full, permeable job. "It's going to hit this solid surface underneath the pavers

and just run off just like it would on top of the pavers before," Vander Woude says. "So, you've basically just hidden the water underneath the pavers, but you're still forcing it to run off to the perimeters of your parking lot, for example, to be dealt with elsewhere."

The system below needs to be designed so that water can be transitioned into the ground water system appropriately, Vander Woude says. Typically those systems are designed with an ever increasing rock size.

"Directly under the pavers there will be a 3/8-inch size rock, then go down 6 inches and that turns into an inch-sized rock, and then goes down another 6-8 inches," he says. "Now you've got 2 1/2-inch-sized rock, so that it basically acts as a large rock bathtub that water can slowly infiltrate down and eventually be returned to the storm water system – the aquifer system of the Earth."

Cost. Fred Adams, co-owner of Fred Adams Paving in Raleigh, North Carolina, says you will need more equipment to do a permeable job, which he estimates will cost between \$5,000 and \$6,000. He says you'll need a power roller for pervious concrete and proper jointing equipment so that you cut the proper depth of the control joints.

Even though permeable interlocking concrete pavers may cost more initially to install, contractors can find success by marketing the long-term benefits and savings the systems provide.

"The pavements typically require less maintenance than asphalt and concrete, and by using permeable pavement there will be less need for surface drainage infrastructure, thus reduced cost," Adams

Permeable pavers allow water to seep down into the soil below.



says. "Cost of installation continues to decline, and placing the pavers by machine has drastically reduced cost instead of using hand labor."

Brian Gronski, co-owner of Greenway Pavers in Andover, Minn. says a permeable installation can cost 15 to 20 percent more than a non-permeable. Patrick Day, product manager for Boral Bricks, says the installation's increased cost is based on the aggregate and how many steps each job requires.

"Standard pavers usually call for a compacted aggregate base (crusher run material) and a bedding/joint sand of the proper gradation. Permeable pavers, on the other hand, require more expensive open-graded aggregate in two to three different sizes, which must be layered," Day says.

Benefits. Despite increased costs, more contractors and customers are requesting permeable pavements. Aside from being better for the environment, permeable pavements allow business and homeowners more flexibility with what they can do with their property.

"The reason why there is a huge advantage for business owners is all in this ratio of impermeable surfaces, like your building and your parking lot, to permeable surfaces, like grass areas and retention ponds – business owners want to make the biggest building on the smallest piece of land that's possible," Vander Woude says. "And by managing and using permeable pavements, they can help them do that."

Homeowners will run into the same problem when it comes

to their property and additions they want, for example, say a swimming pool. The homeowner's house might be taking up the allotted amount of impermeable surface permitted by law, which would mean the homeowner couldn't dig up an impermeable surface and add a swimming pool. "So what those customers may do is make a permeable paver driveway, for example, and open up that square footage that is not considered permeable and be able to put in the pool," Vander Woude says.

Maintenance. One hang-up with permeable paver installation is the gaps that allow the water through can clog or have grass grow in them. Adams says homeowners should keep leaves off the pavement. For commercial properties he has a contract with a company that cleans parking lots.

Adams gave the company some tips on how to clean out the gaps, which included turning down the rpm on their machines to avoid sucking the aggregate out of the joints of the pavers.

But even with that inconvenience, Adams continues to see an increase in permeable jobs, growing from \$100,000 in business five years ago to about \$1 million in 2010. Gronski says about 5 to 10 percent of his work is doing permeable jobs, and he expects that to increase. "It's something that's growing as more people learn about it," he says.

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