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of Milwaukee
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PaveDrain installation.

PaveDrain

Permeable Articulating Concrete Blocks

Managing stormwater runoff is a significant challenge for municipal water entities. Large areas of impermeable concrete inhibit the absorption of stormwater into the ground, causing water to pool and increasing the potential for flooding. Permeable blocks provide a solution to that problem by allowing water to flow under the surface. The articulated and arched design of PaveDrain bricks allow water to filter into the rock bedding beneath them and eventually back into the water table.

Doug Buch is the president of PaveDrain, LLC, and has spent the past several years growing his business; his company's products are now used in projects across the country. Mr. Buch spoke with Municipal Water Leader's editor-in-chief, Kris Polly, about how he developed the PaveDrain system, the value of the product, and how it is improving the stormwater runoff management of municipalities that have put it to use.

Kris Polly: Please tell us about your upbringing, education, and early professional career.

Doug Buch: I grew up on a farm in eastern Iowa as the eldest of three boys. I was the prototypical farm kid who played sports to get out of doing chores, and I left school in spring and fall to help in the fields. After high school, I received a scholarship to play football for the University of Iowa, where I lettered all 4 years and was able to start in the 1991 Rose Bowl. I graduated with a degree in communications and got into construction and technical sales while working for a distribution company.

After that, I began working on manufacturing, which is what I really wanted to do. I moved to Wisconsin and began working for a manufacturer of wet cast and dry cast concrete products. That job taught me a lot about the simple, yet complicated, processes for making precast

products. I eventually started a division within that company that focused on articulating blocks designed for erosion control. That product line showed so much upside that it grew to a level that my company's franchise was bought out. They liked what we had done, and I became a regional manager and then a national sales manager.

That company was later acquired by a corporate entity, which was not a good fit for me. So I did some consulting before coming up with the PaveDrain idea and starting PaveDrain, LLC.

Kris Polly: Please tell us about your product and its purpose.

Doug Buch: PaveDrain is a permeable articulating concrete block paving system. The blocks themselves are not permeable, but the joints between them are. Our blocks weigh nearly 50 pounds and do not require any material between the joints, which allows for very high and fast infiltration. Therefore, we are able to use less of our product while facilitating more stormwater runoff from a parking lot or other municipal project. PaveDrain is like an LED light bulb; it may be slightly more expensive, but over its life cycle the owner will see savings due to lower maintenance costs.

Kris Polly: What is the history of your company and the services it provides?

Doug Buch: PaveDrain started in 2008, just as the recession started. We initially supplied our product as a mat, which was effective but was only used on a limited scale. We had hoped to bounce up as soon as the larger economy did, but that did not prove to be the case. Our first installation was

in fall 2010, for the city of Bladensburg, Maryland, city hall. Although the civil engineering sector generally is hesitant about adopting something new, Bladensburg viewed being the first to use our product as a badge of honor rather than a risk. That decision helped us break through.

In 2011, we obtained a large contract to install 86,000 square feet for the Ford Motor Company in Louisville, Kentucky. The reviews from Ford have been positive and are helping draw interest from others in the region.

PaveDrain owns the technology and molds that we ship around the country to manufacturing facilities that produce the blocks under contract. PaveDrain sells through its national network of distribution partners.

Kris Polly: How is the product applied?

Doug Buch: In the beginning, it was employed like a giant mat because the general contractors did not want to install PaveDrain by hand. They asked for a way to keep their workers busy, while not become physically drained.

Now, most PaveDrain is installed by hand or by a miniexcavator with a large clamp that holds 11 blocks covering 11 square feet and swings it into place before dropping it in place—the miniexcavator process is completed in a matter of seconds. That work is often subcontracted out to more specialized installers.

Kris Polly: What holds the blocks together once they are in place?

Doug Buch: Once the blocks are installed, we do not do anything to them. The blocks interlock naturally due to their shape. We only put something through the cable slots if we are using the mats or are trying to heat the blocks. In the case of a mat, we use a series of polyester cables wrapped with a nylon sheath. That technology has been in articulating concrete blocks for over 60 years. The tubing allows us to have a heating element close to the surface.

Kris Polly: What is the advantage to having an arch shape cut into the bottom of the blocks?

Doug Buch: There is an Occupational Safety and Health Administration rule that anything weighing more than 50 pounds requires two laborers to install. Our solid block weighs about 65 pounds, but manufacturing the arch shape into it brings the weight down to 49 pounds per block.

The area under the arch creates additional storage space for stormwater that is above the aggregate base that the system is sitting on. Many municipalities have regulations that require the ability to store a level of stormwater runoff equivalent to a 2-inch storm event, and 6 inches of open-graded rock beneath the PaveDrain will store 1 inch of water. Those 6 inches, combined with the space provided by the arches, allow facilities to be in compliance with regulations with a minimal amount of rock.

Kris Polly: How are the bricks molded into their complex shape?

Doug Buch: The molds themselves and the core pullers that create the arch cost a total of \$75,000 and have been shipped all over the country. The mix of materials we use is common throughout the masonry industry—it is called dry mix. Unlike poured cement, these mixes require very little water. We take the dry mix and press it into shape using special machinery. The blocks are relatively hard, but they also go to a kiln and are cooked overnight. This method allows us to make more blocks faster than the wet cast mold methods we had used in the beginning.

The PaveDrain form required a lot of adjustments along the way. But over the course of our 7 years, our manufacturers have improved block fabrication and can produce two blocks every 10–11 seconds.

Kris Polly: How many construction projects have your products been used in?

Doug Buch: We have been involved in over 400 projects so far across the country. This is particularly noteworthy, given that we were not fully underway on a large scale until 2015.

Kris Polly: How did you become affiliated with The Water Council, and what has been your involvement with it?

Doug Buch: My affiliation with The Water Council was based on the need to get my name out there as the owner of a startup. I was looking for any way to market the company and the products, and The Water Council was a good place to start. When I was introduced to Dean Amhaus, the executive director, he had a very impressive vision of what he wanted the council to be, and it has proven to be everything I could have hoped for. Becoming involved with the council was fortuitous. ^M

