GREEN PRACTICES for GREEN THUMBS

Milwaukee farmers market employs permeable pavers for storm water storage

By Chuck Taylor

Organized and operated by volunteers, the Garden District Farmers' Market is located on Milwaukee's south side at the northern entrance of the Milwaukee Green Corridor project. The district has designated the Green Corridor area as a space to showcase a variety of sustainable projects that ultimately seek to improve environmental performance, attract business development, raise public awareness and support regional growth. When it came time to construct a new parking lot in the fall of 2014, the farmers market seemed like an ideal place to incorporate green technology. However, lack of funding for the volunteer-run nonprofit proved to be a sizable barrier.

The parking lot's permeable pavement system includes a water harvesting system that overflows into a storage reservoir for irrigation of the orchard and hoop houses.

The Technology

Bryan Simon, owner of Simon Landscape Co. and chair of the Milwaukee Green Corridor project, had a vision to utilize a Belgard Permeable Interlocking Concrete Pavement (PICP) system in the construction of a 15,000-sq-ft parking lot adjacent to the farmers market.

"Our mission is to educate and engage the public on how to be better stewards of the environment," Simon said. "Using the Belgard PICP would allow us to not only build a quality parking lot, but also capture rainwater, which would filter downward into a storage reservoir to be used to irrigate portions of the farmers market."

Water harvesting with this system utilizes a free resource to reduce municipal water supply costs while complying with regional storm water management guidelines. The water can be held in a long-term storage reservoir or flow into a rain garden, and ultimately be used for irrigation, washing or other non-potable applications.

The Challenge

In the past, Simon explained, landscape designers developed plans for shedding water from sites so it would not soak into the soil. The property owners then bought water for their lawns, trees and gardens. However, rain is optimal if it stays where it falls, seeping into the ground and watering the grass, plants and trees in that area. Impervious surfaces like buildings, parking lots and roads prevent rain from infiltrating back into the ground.

In contrast, the PICP system is fundamentally a large-scale infiltration gallery with a drivable surface course over top. The open graded base and subbase aggregates have approximately 32% and 40% open space, respectively, providing for temporary water storage. Because these are the same aggregates used for railway tracks, they are more than capable of supporting vehicular loads.

While Simon was confident that his idea of utilizing PICP was ideal for the parking lot and would ultimately save the organization money, the up front cost of the project was more than the organization could afford. In addition, multiple municipal groups were involved, and the permeable pavers were a new concept to Milwaukee.

The parking lot land is owned by Milwaukee County and leased to the

nonprofit Energy Exchange. The project was awarded a Milwaukee Metropolitan Sewer District (MMSD) Green Infrastructure Grant. Because the grant funds are not received until the project is completed, the city of Milwaukee's department of public works provided gap funding to pay for the materials and labor that were not donated. This funding was crucial in allowing the project to move forward on schedule.

"There were a number of moving parts and pieces and quite a few entities involved," Simon said. "However, all of the groups came together and worked fluidly. In addition, a number of organizations also made material and in-kind donations. Local nurseries supplied plants, Simon Landscape provided labor and Belgard donated a portion of the pavers, which was crucial. The project would have never happened otherwise."

Simon singled out a number of individuals who helped make the project a reality. Local Alderman Terry Witkowski was integral in designating the Green Corridor and opening the door to this project. Mayor Tom Barrett and his office embraced the PICP technology, not only in the Green Corridor, but also throughout the city and the district. Commissioner of Public Works Ghassan Korban approved the temporary funding, and the MMSD provided the major grant. Matt Howard, director of sustainability for the Office of Environmental Sustainability, and Jason Haas, county supervisor, also played key roles in the project.

The Project

After funding was secured, the project team chose graphite-colored Aqualine Series L-shaped multi-cobble permeable pavers. Economically sound and surpassing all U.S. Environmental Protection Agency storm water requirements, the pavers offer both cost-effectiveness and long-term durability in harsh climates, particularly those with extreme freeze/thaw cycles. Under the pavers, a 2-ft-deep storm water storage unit was installed to capture the water and pipe it to a 10,000-gal aqua block system. The water overflows into a storage reservoir to be used to irrigate the orchard and hoop houses adjacent to the farmers market. The harvested rainwater also feeds the most popular feature of the grounds—a babbling stream.

"Overall, Belgard was proud to play an integral part in making this project happen—helping to educate the municipal players on the benefits of our product and ultimately donating some of the materials to facilitate the infusion of grant money," said Nate Gish, Belgard Commercial Hardscapes sales specialist. "The project has had a positive effect, as more developments in the region are using PICP materials." SWS

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