project profile

Target certification
LEED Silver

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Stormwater management

Taxing situation

When pursuing LEED points, address the area surrounding your building to reduce stormwater runoff–and sewer taxes

BY NIKI SWANK

The new 29,900-sf, two-story Nordson headquarters building in Westlake opened in October 2010 with a parking lot serving as a heavy vehicle traffic parking area. It featured the largest Eco-OptiLoc interlocking permeable paver system, manufactured by Unilock, in Cuyahoga County. Clark and Post Architects designed the project for a silver LEED certification, and the pavers provide two of the points needed to qualify. The first point: the pavers contribute to the rate and quality control of the runoff itself. The second: the quality of the water. The pavers also help achieve the points needed to meet locally manufactured materials requirements.

Other LEED elements incorporated during the design stage, which took place from March 2009 to October 2009, included daylight harvesting, water conserving plumbing fixtures, a partial live green roof, site conservation measures that preserved much of the existing wooded site, low-VOC finishes, a high percentage of recycled construction waste, and high-efficiency, low-energy consumption HVAC systems. Clark and Post designed the new building.

The paved area adds to site aesthetics.

All Photos Courtesy of Unilock

Installation was easily accomplished.

Pavers count

"Permeable pavers, with their light color, were an alternative response to Environmental Protection Agency's storm water management requirements and LEED site preservation guidelines, particularly reduction of 'heat islands' and water conservation practices. Nordson's decision to design their parking area in this manner was driven by their corporate sustainability practices that are being integrated into their workplace and facilities," says Rob Cocco of Clark and Post Architects.

During the construction process, which started in December 2009 and was led by general contractor Ozanne Construction, Gator Construction installed the 40,000-sf paver area in nine days using a specialized machine that installed an average of 5,200-sf per day. "It had a dramatic effect on installation costs," says Drew Snoply of Unilock. This technique helped both from a labor standpoint and with overall costs.

> "Once the design team was comfortable with their performance and their benefits, it was clear sailing."
>
> *– Drew Snopley, of Unilock*

Unilock met with the engineer and architect during the design development phase. The designers were initially going to use giant underground plastic vaults for the wastewater collection system, but after the project was designed to include the pavers, they determined that the storm water system was not needed. "The implementation of this type of permeable paver allows the design team to move away from massive detention/ retention basins and their associated infrastructure allowing for a more conservative footprint for the community, " says Snoply.

Clarence Watkins of Bramhall Engineering & Surveying Company says it was a challenge to design a project that would meet the City of Westlake's storm water management and Ohio EPA storm water quality requirements. The engineering firm also had to make sure the pavers complemented the project goal of LEED certification. This included the permeable paver park-

ing lot with underground storm water detention, a pair of wet enhanced swales and outlet control structures, a modular concrete Strong Stone retaining wall and a site plan that avoided existing jurisdictional wetlands.

Serving cities

That the pavers provide water runoff protection to the nearby wetlands was an important consideration during the design. "They had to be sure they could control the runoff," says Snoply. He added that it was a feat to get everyone on board with the implementation, but now the city, county and soil and water departments are thrilled with the outcome. "Once the design team was comfortable with their performance and their benefits, it was clear sailing," Snoply says.

"The biggest challenge to installation was achieving a suitable subgrade compaction due to poor soils," says Cocco. He added that the initial cost savings for this project due to the use of these pavers was approximately 2%. But the bigger consideration was the reduction of storm water run-off and the burden on the city's storm water sewer system. The city says this was the first permeable paver project it had looked at.

Snoply explains the cost of the permeable pavers came out to be less than poured concrete because the traditional storm water management methodologies were not needed. "In the end, the owner has received a system that is aesthetically more appealing, is more durable than traditional pavements, is sustainable and has a much lower operating/maintenance cost than traditional systems," he says. The owner will also benefit as the project matures because of the low costs for short- and long-term maintenance the pavers provide if properly installed versus asphalt and concrete.

The permeable pavers also benefit the surrounding community because of the way they treat and handle the stormwater. The gaps created by the interlocking permeable pavers are filled with a specific type of gravel that filters out suspended contaminates from the water and removes the typical suspended petroleum particles normally found in a parking lot. "By trapping nearly 100% of these harmful particles in the top of these gravel openings we can clean the water as it begins its vertical travel into the rest of the system," Snoply says. The water also travels through many layers of the stone, cooling the water that is returned into the soil to recharge local water sources within the community.

"Permeable and decorative interlocking concrete pavers have gained a substantial amount of momentum with designers and owners due to their competitive installation costs, long term maintenance savings, LEED credit, as well as their stormwater management benefits," says Snoply.

Adds Cocco, "The completed project gives a unique and distinctively pleasing look to the parking area." **BXM**

Niki Swank is a BX researcher.

Stormwater can easily drain through the paver system to reduce runoff and resultant flow to the sewer system.

Project specs:

Nordson HQ Lot

Owner: Nordson
Architect: Clark & Post
GC: Ozanne Construction
Engineer: Bramhall Engineering & Surveying Co.
Installer: Gator Construction
Paver vendor: Unilock
Vendors:

- Art Window & Coverings, Inc.