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SUMMER 2013

Street-Smart Sustainability

Specialty Paver Installations

HNA 2013 Preview

volume 20 number 3

PERMEABLE PAVERS 1

POROUS ASPHALT 0

NASHVILLE PROJECT

REPLACES FAILING

POROUS ASPHALT WITH

PERMEABLE PAVERS



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► Cover story:  
Richard  
H. Fulton  
Complex,  
Nashville, TN



Photos Credit: Sanford Myers Photography

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WITH  
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# interlockutor

INDUSTRY SURVEY REVEALS  
ENCOURAGING TRENDS



David R. Smith

## The Numbers Tell the Story

There are just over 100 companies with 170 plants manufacturing concrete unit paving in the U.S. and Canada. Unit paving products (defined in Master Format Section 32 14 00) include interlocking concrete pavers and permeable interlocking concrete pavers that conform to ASTM C 936 Standard Specification for Solid Concrete Interlocking Paving Units or CSA A231.2 Precast Concrete Pavers, the U.S. and Canadian product standards. Unit paving also includes paving slabs and grid units. Interestingly, there has been a paving slab standard in Canada since 1972, CSA A231.1 Precast Concrete Paving Slabs, but no concrete grid product standard there.

Conversely, there is no ASTM paving slab standard for U.S. markets yet, but there is a grid standard, ASTM C1319 Standard Specification for Concrete Grid Paving Units. The reason there is no grid product standard in Canada is that the product isn't specified much there. Regarding an ASTM standard for paving slabs, the good news is that an ASTM committee recently balloted a draft standard for commercial paving slab applications (typically pedestrian and roof plaza decks). The committee is working through revisions and re-balloting for possible approval later this year.

Like many construction product standards, most designers don't memorize the requirements for ASTM and CSA paver and slab product standards. ICPI certifies that paving products have met applicable ASTM and CSA standards. ICPI producer members with current certifications can be found at [www.icpi.org](http://www.icpi.org).

Each year, ICPI conducts a survey of unit paving manufacturers in the U.S. and Canada called the "Industry Sales Profile." The results from 2012 sales were recently received and provide some interesting numbers that suggest certain trends. The final report is for sale at [www.icpi.org](http://www.icpi.org).

OVER  
**100 companies**  
WITH  
**170 plants**  
MANUFACTURING CONCRETE  
UNIT PAVING IN THE U.S.  
AND CANADA

Here are some telling numbers: Paving slabs are seeing significant growth as well as pavers used in permeable applications to reduce stormwater runoff. The 2011 survey indicated just over 16 percent of all sales came from paving slabs. The 2012 survey indicates 34 percent. This speaks to a continuing trend toward larger units, especially in commercial and residential pedestrian applications.

Another interesting statistic is the increase in the portion of paving units for permeable pavement applications. These have consistently risen each year in spite of the recent Great Recession. The increase from 2011 to 2012 was 2.8 percent to 4.8 percent based on survey responses from the U.S. and Canada. Since most permeable paving units conform to ASTM C936 or CSA A231.1, the portion of permeable paving units sold of all units conforming to these standards is around 8.3 percent in 2012, with 75 percent going to commercial and municipal uses. Grouping together pavers and slabs, this portion represents one-sixth to one-fifth of all the concrete paving units sold to commercial and municipal markets. The numbers are telling us a story about the growing acceptance of PICP.

In this issue, we explore the growth in permeable applications with intriguing case studies from Lancaster, PA, and Nashville, TN. The Nashville project replaced dysfunctional porous asphalt with concrete pavers, and Lancaster discovered substantial savings in the processing of combined sanitary and storm flows by developing a green infrastructure plan that includes permeable pavement. The proof is in the numbers: When selecting pavement for green infrastructure projects that provides the best performance, concrete unit paving is gaining recognition as the best choice.

# KNOWLEDGE base

## What's the Buzz at HNA 2013?

**Hardscape North America (HNA) is THE Hardscape show for contractors and distributors/dealers. It brings top-notch education, certification courses, products and technology to contractors and installers who build segmental pavements and retaining walls, and to distributors. With more than 750 exhibits indoors and out, networking opportunities, education and live demonstrations, HNA is the No. 1 trade show for the hardscape industry.**

- New this year at HNA, top hardscape contractors from three countries will compete for the Hardscape North America Installer Championship. Competitors from Canada, the United States and Mexico will test their understanding of industry best practices, safety, quality and craftsmanship in a race against the clock and other top installers. This championship will determine the best of the best in the hardscape industry!



- HNA's Distributor & Dealer Program, "What's The Big Idea?" is set for Wednesday, Oct. 23, 9:30 a.m. – 3 p.m., at the Kentucky Exposition Center. This optional full-day program is dedicated to distributors and dealers who sell hardscape and landscape products to contractors and consumers. The program will cover topics such as marketing, social media, sales strategies, retaining quality employees and more. Following the program, distributors and dealers are invited to an exclusive preview of the trade show and welcome reception. Also new this year, the Distributor & Dealer Program will start Tuesday evening with an optional networking reception where dealers and distributors will have the opportunity to come together for an evening of fun, networking and entertainment.



- Back for a second year, the Hardscape Contractor Executive Workshop will focus on best practices for hardscape contractor owners and executives. Set for Wednesday, Oct. 23, 1:30–5:30 p.m., at the Hyatt Regency in downtown Louisville, this optional program will give seasoned hardscape contractors the opportunity to network with peers from across North

America and share ideas on topics critical to their business.

- The Interlocking Concrete Pavement Institute (ICPI) will host its Hardscape North America Conference Tuesday through Friday. Courses and sessions will take place at the Hyatt Regency (Tues-Wed) and at the Kentucky Exposition Center (Thur-Fri). Attendees can earn up to two years' worth of continuing education credits for ICPI Certified Installers in one central location.

- HNA will announce the winners of the 6th Annual HNA Hardscape Project Awards at a breakfast banquet at the Hyatt Regency Louisville on Friday, Oct. 25th. The awards recognize the contractor's quality construction and craftsmanship in outstanding commercial and residential hardscape projects in North America. Winners will be featured in *Interlock Design* magazine, other trade publications and on the HNA website.



- A big hit last year, the \$10,000 Friday Giveaway will start at 1 p.m. on Friday. Winners must be present to win \$1,000 at 1 p.m., \$2,000 at 2 p.m., \$3,000 at 3 p.m. and \$4,000 at 4 p.m. To be eligible, register for HNA. An entry form will be mailed along with badges and will include instructions for returning it on-site.
- The New Products Showcase will be a launching pad for new products. Attendees can stop here for a glimpse of the latest innovations and make their must-see lists, then stop at the exhibits throughout the show floor to meet with the manufacturers and test the products.



**LEARN MORE**  
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Hardscape North America is produced by the Interlocking Concrete Pavement Institute and endorsed by the National Concrete Masonry Association and the Brick Industry Association. HNA is collocated with GIE+EXPO, and together they are the 9<sup>th</sup> largest trade show in America.

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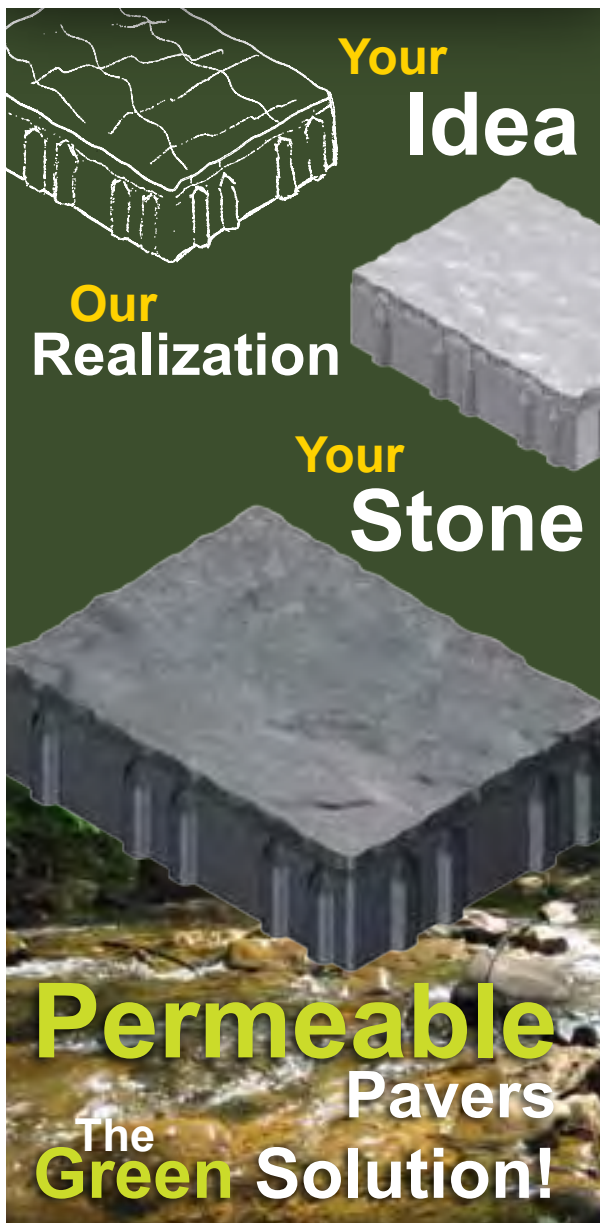
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**WEDNESDAY**

**OCT 23**

**7:30 P.M. – JAMIE MCLEAN BAND**

**9:00 P.M. – CRAIG MORGAN**



**THURSDAY**

**OCT 24**

**7:30 P.M. – ANGIE JOHNSON**

**9:00 P.M. – THREE DOG NIGHT**



**FRIDAY**

**OCT 25**

**8:00 P.M. – OLIVIA HENKEN**

**9:00 P.M. – HOLLY WILLIAMS**



The unique **Outdoor Demonstration Area**, just outside the indoor exhibits, covers 19 acres and showcases the newest equipment in the industry. The HNA Outdoor Arena gives attendees an exclusive, up-close-and-personal opportunity to learn the latest installation methods and techniques.





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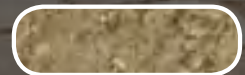
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By Elizabeth Ecker

SUMMER 2013

# permeable pavers 1 porous asphalt 0

**ONE OF NASHVILLE'S MOST VISITED GOVERNMENT BUILDINGS GOT SUSTAINABILITY RIGHT—THE SECOND TIME AROUND.**

**N**ashville's local government thought it had found the best solution to reduce runoff for the heavily-trafficked parking lot of its Richard H.

Fulton Complex back in 2007 with a new pavement system much touted for its low impact benefits—porous asphalt. But just a few years later, it became clear the solution was short-lived. Wear and tear on the surface led the local government to seek alternatives, this time looking to permeable interlocking concrete pavement...

The 52,000 sf (4,800 m<sup>2</sup>) lot serves as parking for hundreds of daily visitors to the city's Richard H. Fulton Complex, which houses the county court clerk, property taxes and assessment department and metro finance offices, among others. The campus receives a constant flow of traffic to the lot's 108 parking spaces. Beginning in 2005, city officials planned for the installation of porous asphalt to handle stormwater runoff, meeting new local stormwater requirements under the Environmental Protection Agency and the Clean Water Act. Despite the fanfare around the low impact design featuring stormwater infiltration instead of runoff, the asphalt eventually began to deteriorate, posing a liability hazard and a maintenance headache for the city.

Over a period of five to six years, the brooms started sweeping the aggregate off, says Majel Carr, project manager in Design and Construction for Metro General Services, Nashville. "We kept sweeping it like we sweep other parking lots. The surface became hard to walk on." The city needed another cost-effective solution for managing stormwater runoff in the same way, but one that wouldn't wear out like the porous asphalt.

"We started looking at the costs, and came up with concrete pavers, which were being used more in this area," Carr says. "We looked at the cost for asphalt again, concrete and permeable pavers, and decided with a three year warranty on the pavers, we'd go with the pavers." The retrofit project was completed within four weeks at a cost of roughly \$200,000 and met the budget goal by using the existing aggregate base reservoir while replacing the original surface with permeable interlocking concrete pavers, aggregate jointing and bedding materials.

Continued on page 12

Photo Credit: Sanford Myers Photography







Originally planned for six weeks, mechanized installation accelerated the timetable and the job was finished two weeks ahead of schedule. The project was executed in two phases: while half of the lot was being resurfaced, the other half remained open for use.



#### ►CROSS SECTION:

- 5 x 10 x 3 1/8 in. pavers
- 2 in. (50 mm) of ASTM No. 7 aggregate
- 9 in. (230 mm) layer of ASTM No. 3 aggregate
- compacted soil subgrade

The 52,000 sf (4,800 m<sup>2</sup>) parking lot of the Richard H. Fulton Complex serves hundreds of daily visitors.



## RETROFITTING FOR RUNOFF

The 2007 installation featured 1½ in. (38 mm) of hot mix porous asphalt over 3½ in. (90 mm) of asphalt-treated permeable base course. Under the layers of asphalt, the system included 2 in. (50 mm) of ASTM No. 7 aggregate, followed by a 9 in. (230 mm) layer of ASTM No. 3 aggregate over a compacted soil subgrade.

When the surface began to fail, it presented hazardous conditions. Rather than install an entirely new system, the inlay of the permeable concrete pavers could be done after removal of the asphalt. However, the design team had little idea what they would find until the demolition started. The project managers were pleasantly surprised with what they found. The base was in excellent condition. The layer of No. 7 stone required some re-leveling before installing the permeable pavers, but without disturbing the existing base. With only about the top 5 in. (125 mm) of asphalt replaced, project costs averaged about \$1,843 per parking space. This was considered a bargain because it saved time and money due to this discovery. In addition, existing bioswales were not damaged and the original storage capacity of the base was maintained as designed.

## BUSINESS AS USUAL

The project team kept the parking lot open during renovation, which involved a two-part process: Demolish the existing surface on half of the lot during the first part of the project while keeping the other half open for parking, then open the completed half to drivers and pedestrians while completing work on the remainder. This project is one of several permeable interlocking concrete pavements that enable use of a facility during reconstruction.

Installing the concrete pavers manually wasn't an option due to time and budget constraints, so the team contracted with an installer that mechanically placed the permeable pavers in 12 sf (1.2 m<sup>2</sup>) layers in the final laying pattern. The project began Aug. 13, 2012, with the area blocked off initially for six weeks, but it ultimately reopened two weeks early thanks to mechanized installation. Once an area of pavers was installed, it could be opened for parking almost immediately because interlocking concrete pavers require no curing time.

## TRENDSETTING

Nashville currently has several projects underway, including another city center as well as a school where concrete pavers are the pavement. The solution has been touted for its efficacy, durability and the ability to repair the surface as needed rather than removing and installing entire areas, as was the case with the Richard H. Fulton parking lot. The permeable interlocking concrete pavement surface has been in place for a year with regular surface cleaning to maintain infiltration while subject to daily high-volume traffic.

For Nashville and many other cities, permeable pavement is considered a novelty. In 2005 the city had to overcome a hurdle in finding a porous asphalt installation contractor. Seven years provided the city with the opportunity to identify a permeable interlocking concrete pavement contractor adept with mechanical installation. Today, the Richard H. Fulton Center provides a case study for future city and county projects. ●



## SEEING IS BELIEVING

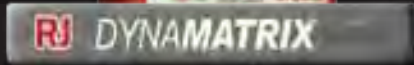
To demonstrate surface permeability, the local fire department was enlisted to show how quickly water can run through the joints between interlocking concrete paving units. This demonstration was considered essential given the failure of the porous asphalt. The ribbon cutting was held with the mayor present and before local media. The Nashville Fire Department drove a truck onto the permeable surface and showered 10,000 gallons (40,000 L) of water onto the surface in three minutes. "None of it ran off," says Majel Carr, Nashville project manager who worked on the installation of the pavers. "It all went through."



**VIDEO** To see a similar fire truck demo from HNA 2012, visit [interlockdesign.org](http://interlockdesign.org).



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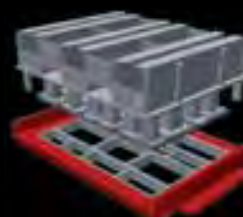


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By Alicia Lasek

SUMMER 2013

**INCORPORATING  
PERMEABLE  
SURFACES IN  
THE CITY'S  
STORMWATER  
MANAGEMENT  
PLAN PROVES  
HIGHLY  
COST-EFFECTIVE  
FOR URBAN  
LANCASTER, PA.**

# street-smart sustainability

In 1795, the city of Lancaster, PA, had the good fortune to be the terminus of the first long-distance gravel-surfaced road in the United States, the 62-mile Philadelphia and Lancaster Turnpike. At the time, road engineering in the U.S. was at its most basic level, and this simple stone surface was a boon to local travelers, ensuring that the road remained passable, versus muddy and rutted, during the spring thaw. More than 200 years later, this city of 60,000 is again a public works pioneer. Since implementing a long-term, integrated green infrastructure plan in 2011, including about 210 acres of planned permeable paving, the city has become a showcase for how an urban municipality can cost-effectively tackle required stormwater management upgrades.

In 2009, Lancaster officials faced an estimated \$330 million-plus for required gray infrastructure upgrades to the city's stormwater management system, including new underground storage tanks. According to the Environmental Protection Agency (EPA), the city is one of about 770 U.S. cities that employ a combined sewer system, designed to capture city sanitary sewage, industrial wastewater, and rainwater runoff and funnel it to wastewater treatment facilities before discharge into nearby waterways. Today, severe rainstorms and heavy snowmelts routinely overwhelm these aging systems. In Lancaster's case, combined sewer overflows (CSOs) can amount to about one billion gallons of untreated combined sewage flowing into the Conestoga River yearly, says Lancaster Director of Public Works Charlotte Katzenmoyer.

Under EPA rules, Lancaster, with other municipalities in the area, is on a timetable to greatly reduce the incidence of CSOs, meet groundwater pollutant caps and reduce nutrient and sediment runoff as part of a larger cleanup effort of the region's rivers flowing into the Chesapeake Bay.

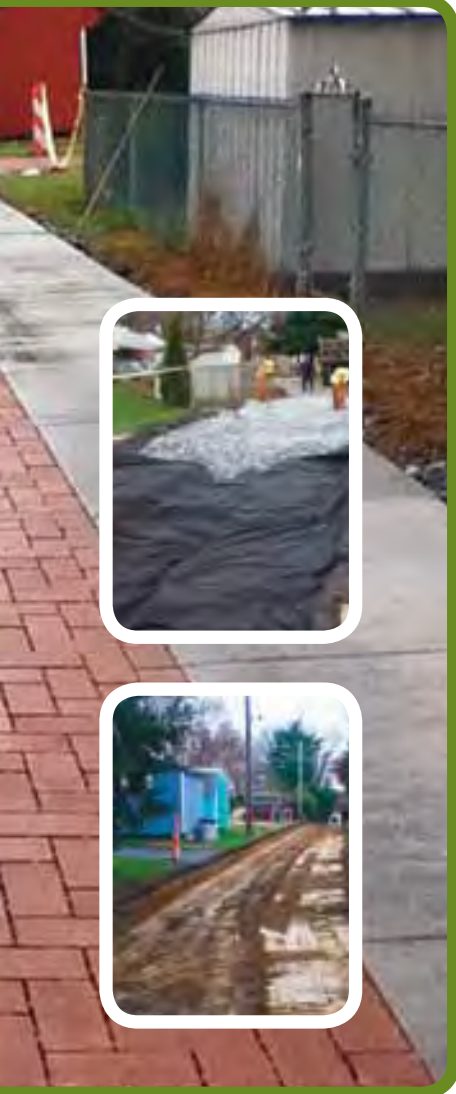
In response, Lancaster commissioned a study of the long-term efficiencies of green infrastructure in capturing and filtering stormwater, including permeable pavement systems in alleys, parking lots, sidewalks and streets; infiltration and bio-retention areas; green roofs and rain barrels. Using a customized calculator, the city estimated that it could reduce average annual runoff by one billion gallons for a total cost of approximately \$141 million over 25 years. When considered as a marginal or increased cost of incorporating green infrastructure into other public works projects and private redevelopment, the estimate dropped to \$77 million.

Alley 148, a City of Lancaster showcase project using permeable interlocking concrete pavers, is expected to capture 200,000 gallons of stormwater per year.



Photo Credits: Photos courtesy of the CH2M HILL





With those numbers in hand, in 2011 Lancaster officially adopted an integrated Green Infrastructure Plan that has become a springboard for green projects throughout the city.

"The plan envisions a long-term strategy to green the city and use that as a primary mechanism to reduce combined sewer overflows as well as address pollution in the separate sewer areas," says Andrew Potts, senior watershed services technologist at CH2M Hill, the city's strategic consultant. Guided by the plan, Lancaster examines each project in the concept stage, comparing green and gray infrastructure costs on a per-gallon basis, says Katzenmoyer. "Then we make a case, based on a self-imposed threshold, that [green infrastructure] will cut that cost at least in half," she explains. "If we can do that, we are spending the limited resources that we have wisely."

#### COVERING THE COSTS

The Green Infrastructure Plan helped the city kick-start a quick succession of demonstration projects on public and private land. And with a new green infrastructure showcase, Lancaster was able to successfully pursue grants and other funding. In January 2013, the city was awarded \$7 million in low-interest loans from the Pennsylvania Infrastructure and Investment Authority (PENNVEST). With private land accounting for the majority of the city's impervious surfaces besides roadways, PENNVEST funds allow the city to incentivize owners by offering 90 percent coverage of construction costs for installing city-approved green stormwater capture elements.

To date, the plan and completed projects have shown that Lancaster can construct enough green infrastructure to eliminate the need for a \$70 million storage tank that would have addressed one of the city's CSO basins.

"We've found that the incremental cost of green infrastructure is much less when you incorporate it into another project," says Katzenmoyer. Buoyed by this success, city officials are negotiating with the EPA under the agency's new integrated planning framework to continue to meet stormwater management requirements with green infrastructure, and not involve gray infrastructure at all, she says.

#### WORD ON THE STREET: PERMEABLE PAVERS

By June of 2013, Lancaster had about 140 green infrastructure projects in planning, design or development with permeable paving making a strong showing in the plans. According to Katzenmoyer, Lancaster predicts it will have runoff from about 24 acres (9.7 ha) managed or 20 million gal. (75,700 L) of stormwater captured by the end of 2014. "This includes gray infrastructure, rain gardens and other green infrastructure, and permeable paving systems play a significant role," she says.

The city identified streets and alleys needing complete reconstruction that are good candidates for green infrastructure. Since 2011, four out of 14 completed green ground projects (excluding green roofs) have used about 8,000 sf (740 m<sup>2</sup>) of permeable pavers, according to Potts. In addition, the city plans to repave all 20 mi. (32,000 m) of its alleys with a combination of conventional pavement and permeable interlocking pavers. In 2011, it unveiled Alley 148, a green demonstration project that used permeable interlocking concrete pavers in a center strip over an infiltration trench, flanked by concrete paving designed to handle city service vehicles.

Concrete pavers were chosen for their cost-effectiveness, says project contractor Doug Lamb of Doug Lamb Construction in Elizabethtown, PA. Lamb says he began to notice an uptick in bids involving interlocking concrete

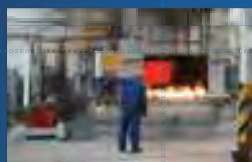
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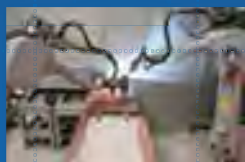




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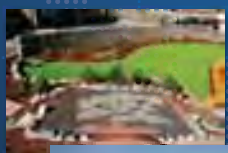


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## street-smart sustainability

pavers right around the time stricter CSO reduction rules kicked in, in 2009. "About four or five years ago we started seeing more requests for them," he says.

The city estimates that the project's costs amounted to 10 percent more than if it had reconstructed the alley with 8-in (200-mm) reinforced concrete. Yet this and the cost of future maintenance are offset by the green alley's ability to capture and naturally filter pollutants in an estimated 200,000 gal. (750,000 L) of stormwater per year, says Katzenmoyer.

The city has also found that, beyond replacing a mechanical sweeper with a \$300,000 vacuum sweeper, there is no further maintenance cost for the necessary cleaning of the permeable pavers in public ways, Katzenmoyer notes. Vacuum sweeping duties are assigned to city crews as part of their routine maintenance schedule.

### EMBRACING GREEN

In Lancaster, the use of permeable paving systems has proven to be an important tool for reducing runoff pollutants and CSO overflows, and for protecting public and environmental health, says Katzenmoyer. She suggests that those considering green solutions to EPA stormwater requirements can begin by encouraging their local, state and national contacts to look beyond the traditional stormwater engineering mindset and more closely at green solutions.

"They need to first work to dispel the perception that green infrastructure costs so much more; we have learned that it does not," Katzenmoyer says. In the case of permeable paving systems, for instance, the construction and maintenance is not as daunting as they might think. Over their lifespan they are more cost effective and have multiple benefits compared to single-purpose solutions such as an underground storage tank, including aesthetics, which benefits the property owners, and the alleviation of [damage from] the winter freeze-thaw cycle.

"In addition, continuing to add piping and storage to handle storm water overflows and runoff is not only very costly, it simply increases the velocity of the stormwater, making it more erosive," says Katzenmoyer. "U.S. municipalities and the EPA are starting to get away from the traditional gray engineering model and are looking at more natural systems to clean storm water." ○

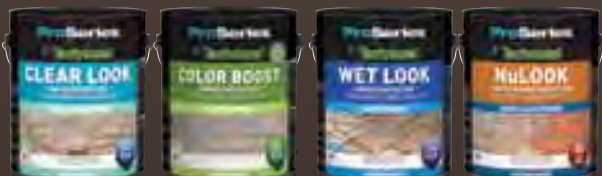


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# CONTRACTOR focus

By Kimberly Alters

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"It takes [your business] from 'everybody does it' to 'only a few select people can do it,'" says Aaron Wolfe, vice president and CEO of Wickenburg Landscape in Arizona. "It sets you apart, makes your company the leader."

### WHAT'S IN STOCK

What exactly can you sell to a potential customer? One unique specialty application is down-lighting, Wolfe says, which is lighting installed into trees that casts shadows over the branches and leaves, creating a pattern on the pavers below. "It takes [the design] to another stratosphere," Wolfe says.

Because the lights are installed and positioned during the day, when the expected shadow design isn't visible, Wolfe says you must start the project knowing roughly what you're going to do. "We don't run the lights until the entire project is complete," Wolfe says.

An added advantage of down-lighting is that it can be applied at any time, so the service can be marketed to people with existing installations as well as new. Plus, the extra lighting can even improve safety.

Custom paver designs are another specialty option to consider. Wickenburg Landscape recently installed a Cadillac logo measuring 10 ft (3 m) in diameter using pavers in a residential driveway. Wolfe says the company has also installed horse-shoes, flowers, inlaid circles and mosaic patterns.

### MAKE THE SALE

Added services mean extra costs to customers that they may not initially be willing to pay. To effectively market specialty applications, Wolfe says there is a good amount of customer research that needs to be done.

"You need to understand the history of your client as much as possible. A lot of people don't get anywhere because they're recommending the wrong thing to the wrong person," Wolfe says. "Matching the customer with the specialty product is one of the big keys that contractors miss."

This includes being realistic about budgeting — if the client clearly cannot afford an add-on, don't try to sell one. However, if you think your customer may be willing to spring for extras but hasn't mentioned them, consider upselling, says Bill Gardocki, president of Interstate Landscape Company, Inc., in New Hampshire.

"I include upsell items in every quote, even if the customer doesn't ask for it," Gardocki says. "Most people aren't aware of what's available, so you have to show them." Gardocki's secret is getting customers to the showroom, where they

Photo Credit: Courtesy of Wickenburg Landscape



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can actually see what a sitting wall or custom paver art looks like. After that, he says, 18 percent decide to purchase upsell items—despite having no initial interest in them. Another approach is presenting examples of lighting design, custom paver designs, or other unique options using high quality photos in your project portfolio and company website. The portfolio can be used to show design capabilities on sales calls and the website examples can be referenced anytime.


#### BE THE EXPERT

While the extra revenue gained from offering specialty applications is tempting, extra legwork is required to successfully sell them.

"It's a landscaper's responsibility to learn about the industry, the technology [and] the new advances and then take those ideas and find ways to incorporate them," says Wolfe, who uses trade shows to

get ideas from manufacturers or distributors and make contacts with creative people.

If you've done the proper research, you can have confidence in your product—and that attracts customers, Wolfe says. "If you have a passion to do this, it comes out. It makes it easy for me to sell this stuff because I talk to somebody and they can hear that I love everything I do."

Wolfe's enthusiasm and creativity sets the context for presenting design ideas to potential clients. As an existing condition to upselling projects, attitude and the 'vibe' you bring to future clients is probably the strongest selling tool, next to showing actual project examples. It's easy to ask a client for business and then upsell when you energetically provide design ideas that delight them as well as provide useful features. 

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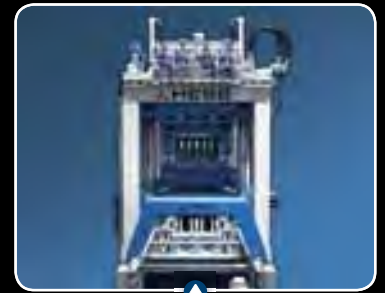
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