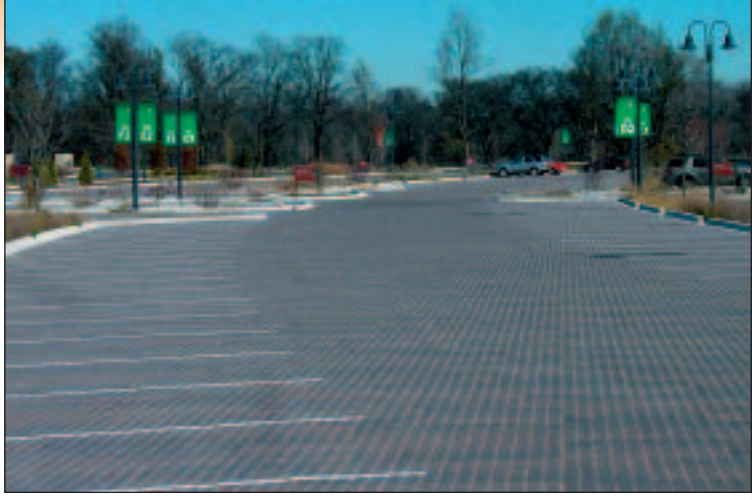
By Rick Yelton



The new parking lot at The Morton Arboretum in Lisle, Ill., proves pervious interlocking pavement is gaining acceptance. The portion of the lot in the bottom-left-hand side of the photo at right is ADA-compliant; the top-right portion is not.

THE MORTON ARBORETUM

Chuck Taylor lives for rain. Sure, he's heard the comments about not having enough sense about his habit of standing outside during a downpour. His preference for rain isn't that this contractor enjoys the smell of wet clothing. Taylor's fascination with inclement weather comes from the satisfaction while seeing his company's workmanship perform.

Evidence is today's shower at The Morton Arboretum. Even after this heavy day-long rain in late fall, the parking lot constructed in late 2003 looks dry. Every puddle-free parking space is testimony to the important, increasing acceptance of pervious interlocking pavement. This is especially true when the venue is an influential ecological setting.

The Morton Arboretum, located in Lisle, Ill., 35 miles west of Chicago, is a 1700-acre expanse of carefully designed landscaped projects. Nature conservators and landscape architects worldwide come to view trees and plants in carefully sculptured settings. About three years ago, the director decided to use a planned parking lot expansion as a test of pervious systems he had seen in Germany.

The paving project has been a watershed for Advanced Pavement Technology (APT), Taylor's recently formed pervious pavement design/build firm in Oswego, Ill. An APT-certified contractor was the installer on this high-profile project. Pervious pavers were selected for their ecological advantages. Late last year, the nature conservators, the paver manufacturer, installer, and others, hosted a symposium to acquaint architects and city and building officials with the system.

Taylor believes this market has much growth potential. And the industry seems positioned for more growth even with a strong overall paver market. The Interlocking Concrete Pavement Institute (ICPI) recently reported their annual concrete paver sales in North America for 2003. (See graph on page 32.)

Paver sales in North America totaled 615 million square feet in 2003, with the United States accounting for 530 million square feet. The market is growing at more than an 8% annually.

"This growth shows the continued strength of the segmental concrete pavement market in North America, especially in the residential and municipal markets,"

▶ Ecological paving systems can grow green profits for producers.

Paving Success with Stormwater

says Steve Berry, ICPI's chairman. The residential market continues to account for almost 75% of total paver sales, with commercial at 18%, and municipal at 3%. Unfortunately, ICPI was not able to supply any current information on the size of the pervious pavement market.

Green lights ahead

Land developers, architectural engineers, and building owners are recognizing ecological paving systems as important elements to their new projects, according to Taylor. They find these systems ecological, as they improve a site's water quality because they allow rainwater infiltration and natural groundwater recharge.

Property owners are finding flexible pervious paving systems to be economical. Since these systems often comply with the EPA's Phase II Rule, zoning officials who are aware of the benefits may waive the requirement for retention or detention ponds. For less than the additional cost of a flexible pervious paved parking lot, developers quite often discover they can reduce

UNI-GROUP U.S.A

The city of Wilton Manors, Fla., used UNI Eco-Stone pavers for more than 30,000 square feet of a parking lot. "We use them in all parking and driveway areas where drainage calculations are hard to meet," says David Archacki, the city's director of public services.

construction costs by eliminating or reducing the size of drainage and retention systems. "But most owners focus on the benefit they receive from the greater efficiency in land-use," says Taylor.

Another factor in the increasing focus on flexible pervious paving systems is its inclusion in the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system for new commercial construction. The committee responsible for overseeing the nation's fastest-growing building ecological rating system has made stormwater containment a high priority when assessing a site's environmental performance.

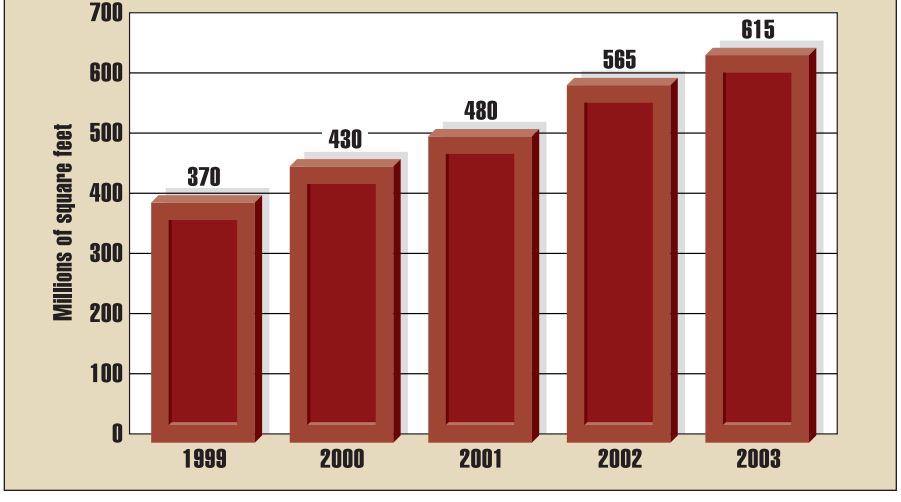
Designers usually can receive LEED credits for selecting pervious paving systems in several categories. Reviewers can award credits for using pervious paving systems in stormwater management if it reduces runoff (SS credit 6.2). Designers also can be rewarded when they use a pervious system to help treat water before release (SS credit 6.2). In some cases, using a pervious paver system can earn a credit because some pervious service designs also help reduce potential soil loss and contain the release of suspended solids.

Public work officials also are recognizing the ecological benefits, as reported in the December 2004 issue of PUBLIC WORKS, THE CONCRETE PRODUCER's sister magazine. The movement is spreading from large communities to small towns.

"The use of permeable pavers is increasing all across the United States," said Donna DeNinno, director of marketing for UNI-GROUP U.S.A., an association of UNI Paver manufacturers. "Areas such as the Chesapeake Bay, Minnesota Lakes region, Pacific Northwest, New England, Florida, and California are at the forefront, as they have increasingly restrictive guidelines regarding construction and pollution impact on surrounding surface waters." In 1995, the city of Wilton Manors, Fla., installed UNI-GROUP's UNI Eco-Stone concrete pavers on more than 30,000 square feet of a parking lot serving a recreational facility.

While Taylor has been encouraged by his odyssey in promoting flexible pervious paving systems, he's concerned with industry unity. He believes fully developing the pervious surface market may be more of an effort than many producers are willing to make. He's concerned many paver producers are too busy to deal with the complex marketing. Developing the residential market and selling to large home center stores have hurt the ability to develop the commercial market. But soon they'll find a silver lining, he says.

Total North American Paver Sales



INTERLOCKING CONCRETE PAVEMENT INSTITUTE

Subsurface marketing

Taylor says for the industry to profit from the commercial demand for ecological paving systems, paver producers should turn their attention to marketing and promoting to the large contractor. His boss agrees.

Bill Schneider, owner of Decorative Paving Co., of Franklin, Ohio, and LPS Pavement, of Oswego, has specialized in the interlocking pavement contracting business for 30 years. Schneider was involved in pavers before there was an ICPI. Schneider had been part owner of a paver production plant. Now, he backs Taylor's quest to grow the pervious pavement market.

Schneider first wants to reconnect with contractors who are capable of performing the type of work needed for a successful pervious pavement operation. Producers need to recognize that contractors involved in pervious designs should focus on this highly technical paving process. "A pervious paver project requires greater skill than installing a driveway or patio," says Taylor.

With Schneider's backing, Taylor began APT two years ago. The consulting company helps producers by acting as an intermediary between the owner/designer and the contractor.

Taylor believes pervious paver installers need more design options. There currently

RICK YELTON

Chuck Taylor, of Advanced Pavement Technology, has been at the forefront of the pervious pavement systems movement in the United States.

are predominately two pervious flexible pavement systems with their own marketing efforts in the United States. Both have a common German-based design history and a well-established and successful set of licensees across North America. But Taylor believes the success of these systems also has been a limiting factor in growing the ecco-paver market.

There needs to be more research on designs suitable for North American installations. "Most of the support research for design of pervious flexible pavements has a strong European bias," says Schneider. He believes it's time to refocus research to North American soil conditions, designs, and construction practices.

APT has helped by developing the Bio-Aquifer Storm System (BASS), a flexible, segmental paver system. Project engineers can use the BASS method of construction to expand the base design and to integrate specifically designed pavers into an engineered system that allows for collecting stormwater runoff and supporting heavy axle loads for roads and parking lots.

In addition, due to the types of aggregate used, a natural filtration process will occur, and pollutants that are removed from the runoff will be broken down by bacteria contained in the aggregates. The system complies with the EPA's National Pollution Discharge Elimination System, Phase II stormwater program.

Taylor's firm can help installers move to that next level. APT has aligned itself with properly trained paver installers across the country, and has helped complete municipal, commercial, and industrial segmental installations. These include manual and mechanical projects such as the Port of Oakland and the Marshalling Yard at Port of New Orleans.

Shape counts

A paver's shape is key to any flexible pervious pavement's success. Taylor believes pervious paver contractors need more options in shapes. "Producers need to refocus

Looking for Help

Entering a new market can be difficult. Here's a list of resources that can be helpful in developing the market.

Design manual

Permeable Interlocking Concrete Pavements, 2nd Edition, published by the Interlocking Concrete Pavement Institute (ICPI), offers readers a guide for design specification, construction, and maintenance of pervious paver surfaces. The book contains information on best management practices for stormwater and other useful information. To order, visit ICPI's bookstore at www.icpi.org. The book costs $20.

Downloadable Specs

ICPI's Web site also has information on design issues. Located in the Designer Professional section, there are three detailed drawings on permeable interlocking concrete pavements showing full exfiltration, partial exfiltration, and no exfiltration. In addition, they have a guide specification for both U.S. and Canadian projects.

The Low Impact Development Center, Beltsville, Md., has posted a commonly used specification that producers can pass on to designers interested in using pavers as part of stormwater mitigation. The nonprofit organization's goal is to help encourage designers to use land planning and engineering design approaches with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.

The specification provides public works agencies with a foundation to develop their own LID standards and specifications. The specifications are written using AASHTO and/or ASTM criteria wherever possible to allow communities to prepare consistent bid packages with commonly available materials. Standard drawings have also been provided in AutoCAD and PDF format. Contact LID at 301-982-5559 or visit www.lowimpactdevelopment.org.

New CSI Number

The Construction Specifications Institute has released the 2004 edition of Masterformat. In its reformatted sequence of numbers and titles for the construction industry, porous unit paving has been assigned 32 14 43.

Absorbing Stormwater

There are other engineering options producers can use to help market pervious pavers. Total Stormwater Management by Invisible Structures Inc. offers a set of products that aid in absorbing stormwater in the soil, preventing erosion and migration of soils, and increasing the subsoil's ability to filter water trough percolation.

Their Gravelpave product is designed to help create a porous pavement surface for most traffic and loading conditions. These photos show installations where the plastic containment sheets have provided support for flexible paver systems.

To learn more about Gravelpave, contact Invisible Structures Inc. at 800-233-1510, or visit www.invisiblestructures.com.

VICKI BOHNHOFF

Gravelpave units for stabilization were used outside the Harris County Civil Courts Building in Houston.

their efforts to produce mechanically-installed, contractor-friendly pavers," says Schneider. Tolerances suitable for hand-installed operation are not tight enough for mechanized placement.

For example, several manufacturers now market a mold that has a slight vertical taper. The shape is designed to help quicken the demolding process. But to mechanized installers, this seemingly tiny taper is a major problem. When a mechanical placer picks a layer of pavers from the shipping pallet, the taper allows the pavers to bend inward. "If an operator is not careful, the deflection can cause a loss of supporting friction; the layer will cave in on itself," says Taylor.

Another driving force in new shapes is the hunt for a smoother surface. The Americans With Disabilities Act has caused the paver industry to pay closer attention to surface features and elevations. The new pervious paver shapes must encompass not only smoother surfaces, but also smaller diameter entry holes. And once installed, pavers need to stay in position better.

One way Taylor's firm helps recondition the contractor-friendly market has been to develop two new paver shapes, plus continue to develop aditional shapes in the future. These shapes are available to producers who want to create pervious paver molds for projects using APT's system.

"Our goal is to expand our design/build business, resulting in more extensive use of interlocking permeable pavers," Taylor explains. TCP

To learn more about the surfaces Advanced Pavement Technology can offer producers, telephone 877-551-4200, or visit www.advancedpavement.com.