



Lea Radick/Medill

A fireman from the Chicago Fire Department sprays water at the rate of 920 inches per minute onto the permeable pavement parking lot at U.S. Cellular Field on April 8 to demonstrate the pavement's water absorbency.

Where green hits beyond the baseball field

by Lea Radick

Apr 17, 2008 - ©2001-2007 Medill Reports - Chicago, Northwestern University. A publication of the Medill School.

U.S. Cellular Field, home to the Chicago White Sox, joins the ranks of green sports facilities with the largest permeable pavement parking lot in the country.

Cellular Field's new eco-friendly parking lot, which spans the equivalent area of four and a half football fields, is the first Major League sports facility to use permeable pavement.

It is not, however, the only sports stadium going green. Citi Field, future home of the New York Mets, is installing 75,000 sq ft of permeable paving for an access road, said Brad Swanson, a product representative for Unilock, manufacturer of the permeable paving stones used by U.S. Cellular. Unilock's New York location is supplying the pavement for the Mets' new stadium, scheduled to open by 2009. "I think you're going to see a trend," Swanson said. "This is going to pick up momentum."

The 265,000 square-foot section of U. S. Cellular's interlocking, notched pavement in parking lot L allows surface water to seep back into the earth after being filtered of many pollutants. The renovation reduces flooding stormwater runoff as well, according to the Illinois Sports Facilities Authority, the developer, owner and operator of the stadium.

Illinois has several permeable paving projects to boast of, including 220,000 sq ft of paving at Elfstrom Stadium in Geneva, 206,000 sq ft in the parking lot of the Morton Arboretum in Lisle, 205,000 sq ft at Dominican University in River Forest and 1,600 sq ft at the Lincoln Park Zoo's West Gate in Chicago.

Chicago's Green Alleys program and Illinois corporations are paving with permeables as well. "We're changing the ways we're building cities," said Bruce Ferguson, a national expert and professor of landscape architecture at the University of Georgia. "It is a restoration of a natural process and environmental quality in urban watersheds," he said. This process allows pollutants such as oil and other car fluids to be filtered and even destroyed, he said.

The plentiful benefits of permeable paving

The ISFA, a government organization that constructs and renovates sports stadiums for professional teams in Illinois, decided to implement the permeable pavement in parking lot L when it needed to be repaved, said ISFA spokesman Matthew Royse. The organization decided to use permeable paving because of the many benefits it offers and because it meets the new 2008 Chicago Stormwater Management Ordinance, he said.

Permeable pavement also meets Low Impact Development and Leadership in Energy and Environmental Design, or LEED guidelines from the U.S. Green Building Council. In addition to reducing or even eliminating runoff and improving water quality, permeable pavement reduces the "urban heat island" effect of conventional dark pavement and uses recycled materials. Lighter colors, such as granite, one of the two colors selected for the parking lot, reflect sunlight, Swanson said. Charcoal is the other color selected for the 527,616 permeable paving units, which were installed at a rate of 20,000 sq. feet a day over 6.1 acres.

The White Sox funded the \$3.5-million project, which broke ground in October 2007, according to ISFA. The ISFA achieved a \$400,000 cost savings compared with what it would have cost to install and maintain traditional asphalt paving, Royse said. Not only does installation and maintenance of permeable pavement typically cost less than it would for poured-in-place concrete and bituminous asphalt, but it is highly durable and stronger than those materials and it lasts twice as long as traditional paving, according to an ISFA press statement. "It saves direct costs to ISFA, costs in installation, in terms of money for the city and taxpayers' money, in terms of runoff going into the municipal system," Swanson said. "They'd save by not processing that water."

Permeable pavement is appearing everywhere

While permeable pavement still represents a small percentage of the paving industry, the Interlocking Concrete Pavement Institute, the North American trade association representing the industry, saw a 3.2 percent increase in the use of interlocking concrete pavement in 2006. "We've seen an increase each year for [the use of interlocking concrete pavement] because municipalities are looking at ways to mitigate their stormwater runoff and become more environmentally friendly," said Gretchen Spear, director of marketing and communications with the institute, based in Washington, D.C.

"Chicago has really been a leader [with] the green alleys and in their commercial sector as well," Spear said. The alleys Spear referred to are part of the Chicago Department of Transportation's Green Alley program, which aims to address issues such as flooding in the city's existing alley infrastructure through the use of sustainable solutions, such as permeable paving.

Interlocking concrete pavement is just one type of permeable pavement available, but the functionality is the same across the different types of materials, Spear said. Some variations of permeable pavement include permeable asphalt, permeable concrete, permeable interlocking concrete pavers, concrete grid pavers and plastic grid pavers, wrote William Hunt. Hunt is the assistant professor and extension specialist in biological and agricultural engineering and urban stormwater management at North Carolina State University.

Are there drawbacks?

Just as the economic and environmental benefits of permeable paving seem to be many, its shortcomings appear to be few. Issues with durability, cost and maintenance are among the few complaints it has received. "So far most types [of permeable pavement] are comparably durable to their impermeable counterparts," Hunt wrote in an e-mail. "Some of the pavements do tend to crumble a bit when they receive a tire's turning action," he said.

"The ICPI recommends that [permeable pavement is] swept at least once a year," Spear said. "If it's not cleaned once or twice a year it'll still work, but not as well, depending on [the] amount of dirt," she added.

The voids in the permeable parking lot at U.S. Cellular Field must occasionally be vacuumed to prevent it from clogging over its estimated lifetime of 40 years, Swanson said.

Spear indicated that some people may think permeable pavement cannot be used in cold climates like the Chicago area. This is not true, she said, as long as sand is not used on ice and snow, since it could clog the system.

Ferguson said bureaucracy is the principle obstacle in allowing the use of permeable pavement to grow even faster. "The bureaucrats are not used to it and the decades are going by while we educate them," he said.

Soldiering on in the fight for the environment

Chicago sports facilities are making other efforts to be more environmentally friendly too. The Chicago Bears' Soldier Field is seeking LEED accreditation for existing buildings through the many environmental initiatives they have in place, said Ellen Sargent, deputy director of natural resources for the Chicago Parks District, owner of Soldier Field. Soldier Field, like U.S. Cellular Field, sought to manage stormwater runoff during its 2003 renovation. The facility decreased the amount of impervious spaces and increased the amount of parkland surrounding the stadium. It also installed a green roof over one of the parking lots, Sargent said. "It's really just opened up that area to patrons of Soldier Field," she said.

In addition to the facility's recycling program and its use of green cleaning equipment and recycled products, such as toilet paper and paper towels, Soldier Field also installed low-flow toilets, urinals and sinks in all public areas, Sargent said.

Wrigley Field, historic home to Chicago's other baseball team, the Cubs, is going green by recycling and promoting public transportation as the best way to travel to the ball park, wrote Peter Chase, Cubs spokesman, in an e-mail. "We have a free bicycle check that we promote extensively," he said. "Last year, for example, we parked more than 9,400 bikes at Wrigley Field."

Other environmental initiatives practiced at U.S. Cellular Field include recycling, energy conservation through a computerized "motherboard" that regulates lighting in the stadium by a need-based distribution system and the provision and monitoring of bike racks to fans who bicycle to games.

Saving the water supply one parking lot at a time

If the testimony supporting the success of permeable paving is an indication of its future, it is likely to become a widely used mechanism to help the environment at the very source of pollution, if not a mandatory mechanism. "The amount of interest that I have seen across the U.S. is phenomenal," Hunt wrote in an e-mail. "In some places, such as the state of North Carolina, permeable pavement is considered to be a requirement for all parking areas." "Somewhere along the line, water will become number one as far as a need for our nation," said John Spatz, commissioner of Chicago's Department of Water Management, during the inauguration of the permeable pavement parking lot at U.S. Cellular Field earlier this month.



Lea Radick/Medill

Ernest C. Wong, principal, Site Design Group, Ltd., speaks at the inauguration of a new eco-friendly parking lot at U.S. Cellular Field on April 8. Standing behind him are John Spatz (left), commissioner, Chicago's Department of Water Management; James Balcer, Ald., 11th Ward; Terrence O'Brien, president, Metropolitan Water Reclamation of Greater Chicago and Debra Shore, commissioner, Metropolitan Water Reclamation District of Greater Chicago.



Lea Radick/Medill

Officials cut the green ribbon during the unveiling of the new eco-friendly parking lot at U.S. Cellular Field on April 8. Cutting the ribbon are Janet Attarian (left), project director/sustainability coordinator, Chicago Department of Transportation; Debra Shore, commissioner, Metropolitan Water Reclamation District of Greater Chicago; Terrence O'Brien, president, Metropolitan Water Reclamation District; Alderman James Balcer, 11th Ward; Howard Pizer, executive vice president, Chicago White Sox; Perri Imer, CEO, Illinois Sports Facilities Authority; John Spatz, commissioner, Chicago's Department of Water Management and Ernest C. Wong, principal, Site Design Group, Ltd.



Lea Radick/Medill

Workers demonstrate the installation process of the 527,616 permeable paver blocks in parking lot L of U.S. Cellular Field on April 8.