

Pervious Pavement

In a Nutshell

Pervious pavement is a pavement surface that allows rain water and snow melt to seep through the pavement to recharge subgrade water supplies. This type of pavement helps prevent storm water runoff and reduces erosion. There are three types of pervious pavement: pervious concrete, porous asphalt and permeable interlocking pavers.

The “How To”

All three forms of pavement work in similar fashion. The topgrade surface is made of either pervious concrete, asphalt or permeable interlocking pavers. The former two pavements are a slight variation of the traditional pavement which produces gaps in the pavement allowing water to seep down. Interlocking pavers actually have small openings that allow the water to percolate underneath the pavement. Immediately below the pavement is a layer of crushed rock, and immediately below that is uncompacted soil. The idea is for the water to reach the soil as it would if there was no pavement. The layer of crushed rock forms a reservoir to store water as it permeates into the soil.

[The Metropolitan St. Louis Sewer District](#) (MSD) has information on all three forms of pavement. From the link to the left there are links to webpages for each type of pavement. There is a lot of information on there for people who are looking to use any of these pavements. There is plenty of other information available on the web, including pages specifically for [pervious concrete](#), [permeable interlocking concrete](#) and [pervious asphalt](#). [The Federal Highway Administration](#) has a good webpage on pervious concrete as well.

All three pavements are suitable for low traffic areas, such as parking lots, alleys and residential streets. Pervious pavement has not proven effective in high traffic areas. The trade off is that the pavement can be up to a hundred percent permeable.

Planning & Zoning

Pervious pavement is not much different from traditional pavement, and so it does not require a major change to zoning ordinances. Some cities such as [St. Ann](#) (Section 500.480) and [Ellisville](#) (Section 400.490) encourage the use of pervious pavement when constructing parking lots. [Jefferson County](#) (Section 400.4020) on the other hand requires the installation of pervious pavement parking space is being added because of an increase in "dwelling units, guest rooms, seats or floor area" in a residential building.

This document from [Metropolitan Sewer District](#) (MSD), starting on page 10, provides more information on ordinances related to pervious pavement. MSD promotes the use of pervious pavement on parking lots and sidewalks, but not on streets.

Dollars & Cents

If you are looking to install pervious pavement, it is recommended you consult a construction company that specializes in pervious pavement. The Center for Neighborhood published a [document](#) that on page 10 has a good summary of the benefits associated with pervious pavement. Some of the unlikely benefits include reduce salt (from salting streets before a snow storm) and improved air quality.

Measuring Success



ment's impact is water quality which is being measured by the percentage of sites that are polluted. The desired trend is for this percentage to go down.

in last more than 20 years while providing an initial high level of infiltration even in large amounts of sediment. Economical benefits can be realized with lower maintenance, reduced impervious area can result in lower fees for areas with stormwater

Environmental benefits such as alleviating flooding and reducing stormwater runoff can be associated with this Best Management Practices (BMP). LEED credits are also possible for construction using it. Pollutants, including nutrients, metals and sediment removal can be accomplished using pervious pavement. Center for Watershed has a [document](#) that has BMP database information.

Discover More



to residents that will be in areas with high maintenance as well. The Metropolitan St. Louis Sewerage Authority was instrumental in implementing stormwater management BMPs to successfully navigate the technical construction stormwater BMPs design, installation and maintenance. Planning for pervious pavement is important to consider drainage areas and area of implementation. MSD's Site Design Guidance and the WERF SELECT model are two great tools to use for planning and understanding best



MSD Site Design Guidance:

http://www.stlmsd.com/portal/pls/portal!/PORTAL.wwpob_page.show?_docname=474685.PDF

BMP Toolbox - <http://www.stlmsd.com/engineering/planreview/bmptoolbox>

WERF SELECT Model - A planning tool that simulates BMP selection for stormwater management -

<http://www.werf.org/i/c/Tools/SELECT.aspx>

Case Studies

Ranken Jordan - Pediatric Specialty Hospital - Paver

Contact

David Kersten

Maintenance Contact
314-872-6400

Address

11365 Dorsett Road - Maryland Heights, MO 63043

Description

Project increased impervious area greater than 1 acre, with the installation of a parking lot at the hospital. A combination of systems were employed to help spread the need for a BMP. The project included the installation of pervious pavers and a rain garden. Per the owner, permeable pavers had the best track record with the most contractor acceptance and installation knowledge. If system clogged, pavers would be easier to pickup and repair BMP if needed in lieu of permeable concrete or asphalt.

Cost

Permeable Paver Cost - \$180,000

Quarterly inspections. Annual Cost - \$2,000

Vacuum rest of parking lot to reduce debris to pavers. Annual Cost - \$940

Permeable Pavers are vacuumed annually or on an as needed basis to help reduce fine partial infiltration. Trap rock chip is checked and reapplied. Annual Cost - estimate \$1,200 - \$3,600

Lessons Learned

Silt control is critical throughout construction and growing period of project to keep structures clean.

Settling of pavers and up-keep, needs to be considered when designing a maintenance program.

Keeping upstream areas of pavers clean and limiting activities, that that can potentially produce debris that can clog pavers to a minimum, may aid in reducing overall maintenance costs.

Porous concrete and asphalt was dismissed as a viable BMP do to cost, lack of contractors to install, concern for silt clogging thus possibly hard to maintain and poor aesthetic value.

It is expected that the permeable pavers to last 50-70 years but may require maintenance of the joint filler to be removed and reinstalled every 5 years.

St. Louis City Pervious Alleys Pilot Project

Contact

Dr. Jianpeng Zhou P.E. DEE
Associate Professor and Graduate Program Director - Southern Illinois University Edwardsville

Description



by a combined sewer system. Reduction of combined sewer overflows that Mississippi River is a major effort underway. In 2008, a pilot project was of pervious pavement in the St. Louis Area to deter the overloading of the system aimed to evaluate the effectiveness of porous pavement on flow reduction and combined sewers. Total Nitrogen, Total Phosphorous, Zinc, Copper, and Total ameter monitored.

The project consists of three phases: Phase I was to monitor and characterize the flows and water quality under existing conditions; Phase II is to design and construct porous pavement; and Phase III is to monitor and characterize the flows and water quality under improved conditions where LID is implemented. Results of Phase II and Phase III were not available.