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 have small openings that allow the water to percolate underneath the pavement. Immediately below the pavement is a layer of crushed rock, and immediatley below that is uncompacted soil. The idea is for the water to reach the soil as it would if there were 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. Additional resources are available online for pervious concrete, permeable interlocking concrete and pervious asphalt. The Federal Highway Administration has a good wepage 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, 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 constucting parking lots. Jefferson County (Section 400.4020), on the other hand, mentions the installation of pervious pavement parking space when there is an increase in "dwelling units, guest rooms, seats or floor area" of a building.

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 Neighorhood Technology published a document that on page 10 has a good summary of the benefits associated with pervious pavement. Some of the unlikely benefits include reduced salt (from salting streets before a snow storm) and improved air quality.

The Metropolitan St. Louis Sewer District (MSD) offers rainscaping grants, which may be able to used for permeable pavers, as well as other projects that manage and filter rainwater.

Measuring Success

ent's impact is water quality, which can be measured by the percentage of es that are polluted. The desired trend is for this percentage to go down.

last more than 20 years while providing an initial high level of infiltration even amounts of sediment. Where applicable, reduced impervious area can result in vater fees based on impervious cover.

Environmental benefits such as alleviating flooding and reducing stormwater runoff can be associated with this Best Management Practice (BMP). LEED credits are also possible for construction using it. According to the Metropolitan St. Louis Sewer District, well-designed permeable pavement projects should remove 80% of total suspended solids and prevent these pollutants from entering streams.

Discover More

o residents in areas with pervious pave e as well. The Metropolitan St. Louis S olbox was enting stormwater management BMPs to successfully navigate the technical struction stormwater BMPs design, installation and maintenance. Planning for nportant to consider drainage areas and area of implementation. MSD's d Construction Details and the WERF SELECT model are two great tools to ing best fit. The WERF SELECT Model is a planning tool that simulates BMP selection for stormwater management.

Case Studies

Ranken Jordan - Pediatric Specialty Hospital - Paver

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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

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Description

by a combined sewer system. Reduction of combined sewer overflows that
ssissippi River is a major effort underway. In 2008, a pilot project was
f 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

water quality improvement in combined sewers. Total Nitrogen, Total Phosphorous, Zinc, Copper, and Total Suspended Solids were the parameter monitored.

Lessons Learned

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.