



## Pervious Pavement Placed in Dublin

Dublin is one of the first cities in Franklin County to install porous concrete on city property. The site chosen to test this new technology was Indian Run Falls Park. The 8-acre wooded park was chosen for this type of pavement to prevent alteration of the site hydrology and to protect the rare plant life near the falls.

Basically, pervious concrete is a structural concrete pavement with a large volume (15 to 35 percent) of interconnected voids. Pervious concrete is made from a mixture of Portland cement, coarse aggregates, water and admixtures. It contains little or no sand, which results in a porous open-cell structure that water passes through readily. The concrete for this project was supplied by Buckeye Ready-Mix, LLC, of Reynoldsburg with chemical admixtures supplied by Degussa Admixtures, Inc., of Cleveland.

When pervious concrete is used for paving, it can take in stormwater at a rate of 3 to 5 gallons/minute per square foot of surface area. This exceeds the flow rate needed to prevent runoff in most rain events. The rainwater may be stored in a coarse gravel layer underneath the pavement or allowed to percolate into the underlying soil. Since the pavement itself acts as a retention area, it helps to prevent much of the polluted runoff that normally occurs with impervious pavements. Parking lots are a primary source of pollutants in the form of heavy metals and hydrocarbons. According to the EPA, about 90% of the surface pollutants are carried off by the first .5-1-inch of rain. As the water percolates through the open cells of the pavement, aerobic bacteria in

the voids break down harmful pollutants and chemicals. The permeability of the pervious concrete allows the rain to soak into the soil beneath the pavement. The native soil of the site then filters and treats the rainfall just as before the parking lot was built.



In Dublin, the 18-space parking lot was designed by Hull & Associates to function as a small detention basin, holding water that would normally run off the surface of the lot. To create this detention area soil was excavated to a depth of 30 inches then covered with a layer of woven filter fabric. This was then covered with a 24 inch layer of clean No. 2 crushed aggregate. A perforated pipe was placed to act as an overflow outlet for the reservoir. Finally, a 6 inch layer of No. 57 crushed  
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## Single Lots Over An Acre

All building activities that will disturb more than an acre of land are required to submit an NOI to the Ohio EPA. Additionally, before a building permit is issued by the Franklin County Development Department, a stormwater plan must be submitted to the Ohio EPA and Franklin SWCD for review. A pre-construction site visit must also be scheduled. Regular inspections will ensure compliance with the approved plan. Rule of Thumb—on any lot over 1 acre; if a house with a garage, septic system, well, and lawn will be constructed, a permit is generally required.

## Site Inspections and Penalties

Once construction commences, BMPs should be in place and the small MS4 operator's enforcement activities should begin. To ensure that the BMPs are properly installed, the small MS4 operator is required to develop procedures for site inspection and enforcement of control measures to deter infractions. Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, soils characteristics and receiving water quality. Regular site inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties. In early 2002, the EPA's Office of Compliance established a national workgroup to address issues related to the construction industry. The workgroup has developed a construction industry compliance assistance Web site as a tool for builders and developers ([www.cicacenter.org](http://www.cicacenter.org)). Inspectors can use the Web site to find plain language explanations of the major environmental laws affecting the construction industry as well as guidance for distribution to builders, developers and construction site operators.

While the MS4 is responsible for inspecting the site at regular intervals to ensure enforcement of control measures, this does not release the operator listed on the NOI from his responsibility for inspections of his site weekly and within 24 hours of a rainfall event. *From EPA Fact Sheet*

### Mark Your Calendar

On October 11th you will have the opportunity to learn about three **NPDES Phase II Minimum Control Measures** for municipalities. Join us from 8:30 a.m. to noon at the Division of Wildlife on Dublin Road to hear from Paul Wenning of the Franklin County Board of Health as he discusses Illicit Discharge Detection and Elimination and the impacts of new regulations. Franklin SWCD will cover construction plan review and site inspection processes. Mark Waite, Franklin County Engineers Office, will discuss Good Housekeeping. The cost of this seminar is \$45. For more information or to register please visit our web site at [www.franklinswcd.org](http://www.franklinswcd.org).

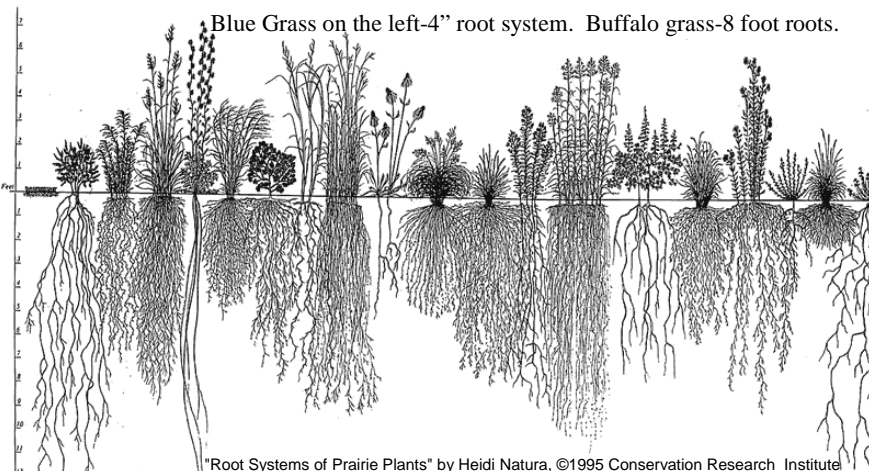
## Native Planting for Water Quality

Native plants are those flowers, grasses, shrubs, and trees indigenous to a geographical region. They are particularly well adapted to the climate and soil types in which they live, and have evolved resistance to many local pests and diseases. The use of native plants is crucial in habitat restoration and is an integral part of the success of natural BMPs. Some examples include practices such as bioswales/vegetated swales, wetland/bioretention basins, riparian buffer strips, infiltration trenches and rain gardens.

They also offer many advantages. Being naturally suited for an area, native plants require minimal maintenance and watering once established. They are also likely to live longer. Native plants offer the additional advantages of natural drought and disease resistance, hardiness, pollutant removal, and superior soil stabilization and restoration. Natural BMPs can save money, too. Bioswales can cost half as much as a pipe and natural infiltration may reduce the need for large retention basins. Developers may earn 25% more for lots that back up to wildflower areas and aesthetically pleasing wetlands and ponds that are used for stormwater treatment. Long-term maintenance costs are reduced.

Prairie plants, in particular, are well suited to use in natural water quality BMPs. Their extensive root systems can reach depths of 10 to 15 feet, holding soil in place more effectively than ornamental, non-native plants. This deep,

dense root system acts like a giant sponge, greatly increasing infiltration of rainwater into the ground water aquifer. This reduces runoff and flooding and recharges ground water reserves. Native plants can thrive even under extreme conditions while reducing pollutants such as nitrates, total suspended solids and phosphorus. Some are well adapted to periodic inundation making them ideal for use in rain gardens, detention basins, and bioretention swales. Natural BMPs are a long-term investment that pays dividends year after year in beauty, habitat and reduced maintenance costs.



"Root Systems of Prairie Plants" by Heidi Natura, ©1995 Conservation Research Institute

# Rain Garden Technical Workshop

In natural areas stormwater can soak into the soil. Impervious surfaces such as rooftops, sidewalks, driveways, and parking lots prevent infiltration and the excess runoff causes serious problems such as flooding, stream bank erosion, water pollution, and even property damage. Rain gardens are simple and aesthetically pleasing solutions to stormwater runoff. While this workshop will address rain gardens on a residential scale the concept can also be applied to larger commercial projects. Please join us for this informational workshop on how to integrate rain gardens into your landscape and community.

Franklin Soil and Water, Columbus Recreation and Parks and URS are sponsoring this all day workshop

on September 27th from 8:30 a.m. to 4:00 p.m. in the ODOT auditorium at 1980 West Broad Street in Columbus. Speakers include Rusty Schmidt, author of *Plants for Stormwater Design*, Geauga County SWCD, David Dods on community outreach and acceptance, and representatives from OSU and ODOT. Franklin SWCD will present an overview of their demonstration rain garden project being installed at the Division of Wildlife building on Dublin Road.

The cost of the workshop is \$25 and includes lunch. Registration information can be found on-line at [www.franklinswcd.org](http://www.franklinswcd.org). The registration deadline for this workshop is September 22nd, 2006. Let's "Make Stormwater Beautiful"!

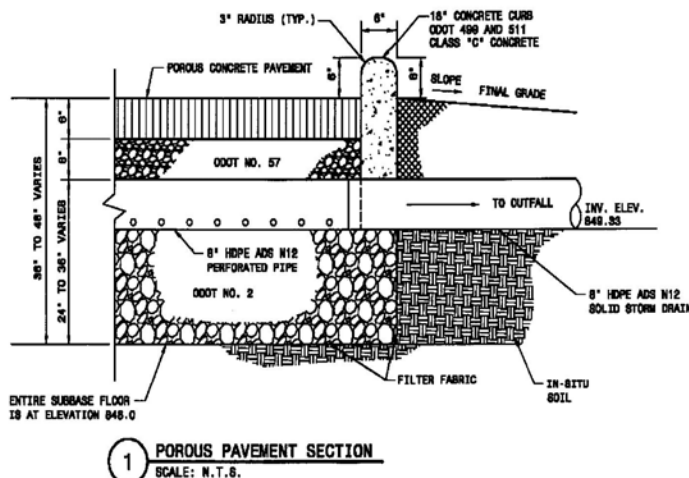
## New and Revised National Menu of BMPs

The Federal EPA has completed a significant revision of the National Menu of Best Management Practices (BMPs). The new menu has been redesigned to make it easier to browse and search. It also cross references many new resources from other organizations involved in stormwater management. The Menu now includes a comment feature so that stormwater practitioners and experts can provide suggestions, new data, and additional references.

To keep pace with the rapidly developing field of stormwater management, the EPA has developed approximately 20 new fact sheets to highlight innovative practices. Look for new fact sheets on outreach and education, illicit discharge detection and elimination, concrete washout, post-construction, smart growth, low impact development, green roofs, municipal operations, and many others. You can now find the new Menu of BMPs on the web site <http://www.epa.gov/npdes/menuofbmps>.

## Pervious Pavement in Dublin (continued from page 1)

aggregate was placed and seated with a vibratory compactor. Over this prepared base forms were set up for the 6 inch layer of pervious concrete.



The concrete was poured in sections, then struck-off and compressed using a hydraulically actuated pipe screed. This efficient method compresses and consolidates the concrete as it moves over the surface without over-compacting. For proper curing polyethylene sheeting was spread over the surface immediately behind the screed, within 5 minutes after placement, and left in place for 7 days. All site work was performed by Nadalin Construction of Plain City, OH.

If the pavement system is designed and installed correctly the pavement will remain dry. This eliminates standing water and problems associated with freeze-thaw situations. In some cases costly stormwater structures, piping, inlets and even retention basins may be reduced or eliminated by the use of pervious concrete pavement.





**FRANKLIN SOIL AND WATER  
CONSERVATION DISTRICT**

1328 Dublin Road, Suite 101  
Columbus, Ohio 43215  
(614) 486-9613 Fax: (614) 486-9614  
www.franklinswcd.org

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## **BMP Review: Mulch for Stabilization**

A good, thick layer of vegetation is the best protection for soil from the erosive effects of stormwater runoff. Mulch can be used in conjunction with seeding to help establish vegetation by holding in moisture and providing better conditions for seed germination. However, under some conditions, it may not be feasible to put down seed or sod. The weather may be too hot and dry, or the ground may be too cold and wet, yet regulations require soil stabilization within a week if no work is planned for 21 days. At times like this the only option may be putting down a layer of mulch, even if it will have to be removed before final seeding or sod installation.

Mulch can consist of hydroseeded

wood cellulose fiber, straw, wood mulch/chips, mulch matting or rolled erosion control products. ODNR's Rainwater Manual gives specifications for coverage but in all cases the entire soil surface must be covered to prevent erosion by shielding the soil from raindrop impact.

Mulch may itself become a problem if it is not held in place. High winds and flowing water may carry straw mulch away requiring additional mulching to cover exposed soil. Loose mulch should be anchored immediately after application by mechanical means such as a disk, crimper, or netting. Or it may be held in place by synthetic binders, tackifiers or wood cellulose fiber. Asphalt emulsions are no longer used. Mulch



is not recommended for areas where high velocity flows are anticipated such as in channels or steep slopes. All mulched areas should be inspected weekly and after heavy rains and repaired if needed to ensure adequate protection is maintained.

*Connecting People with Natural Resources*