



# Permeable Pavement and Stormwater Credits

Proposed Changes to the NCDENR Stormwater Best Management Practices Manual



***A Division of Water Quality initiative to provide more options and greater flexibility to developers and builders while increasing water quality protection.***

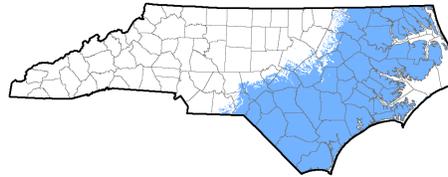
## What is permeable pavement?

Permeable pavement is an alternative to traditional paving materials that allows stormwater to infiltrate through its surface layer, thereby reducing runoff pollutants, volume and discharge rates. Permeable pavement materials include pervious concrete, permeable interlocking concrete pavers, concrete grid pavers, porous asphalt and any other material with similar characteristics. Compacted gravel is not considered permeable pavement.

## Why are changes in the manual being proposed?

Due to concerns about the ability of permeable pavements to provide long-term stormwater treatment, the Division of Water Quality (DWQ) stormwater program has limited the use of permeable pavement as a stormwater treatment device to those areas of the state with high soil infiltration rates. In most cases, this has meant that permeable pavements could receive stormwater treatment credit only in the Coastal Plain and Sandhills areas.

However, in recent years, research by N.C. State University and other groups has shown that permeable pavement can successfully infiltrate stormwater in nearly all soils if the systems are properly designed and constructed. In addition, the pavement industry has come a long way with improvements to permeable pavement design and installation. In light of these advances, DWQ now proposes a program change to allow stormwater treat-



Current area for credits

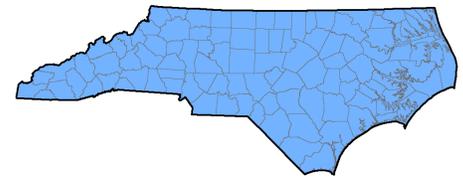
ment and built-upon area (BUA) reduction credits if a permeable pavement system provides equal or better water quality protection than traditional stormwater best management practices (BMPs).

## What are the proposed changes?

- **Stormwater treatment credit statewide**
- **Increased BUA reduction credit**
- **More projects will be considered low density**
- **Flood control during large storm events**

The proposed changes would offer more options for the use of permeable pavements statewide over a wide array of soil types.

Currently, in the Coastal Plain and Sandhills areas, permeable pavement systems may receive up to 60% reduction credit in BUA. For example, one acre of permeable pavement is equivalent to 0.6 acres of vegetated area and 0.4 acre of pavement. With the proposed changes, in soils classified as hydrologic soil groups A or B, the built-upon area reduction credit would be expanded from 60% to 75%. In the remainder of the state where hydrologic soil groups C and D soils prevail, a 50% BUA reduction credit would be provided. This would allow some develop-

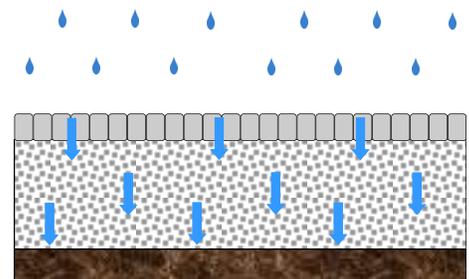


Proposed area for credits

ments that are currently considered high density to be permitted as low density.

The proposed changes would consider permeable pavement as being able to treat the rain falling on it, as well as treating additional stormwater if designed correctly. With sufficient capacity, permeable pavement would be given credit as a stormwater treatment device with an 85% total suspended solids removal rate. This would eliminate the need for additional treatment for the surface of the permeable pavement and any other impervious area the pavement system is designed to store and treat. Permeable pavement would also qualify for nutrient and stormwater volume reduction credit.

Proposed revisions to the manual also include allowing permeable pavement to meet flood control requirements for larger storms.



**Stormwater easily infiltrates through permeable pavers instead of flowing to a detention pond or stream.**

## What are the environmental benefits?

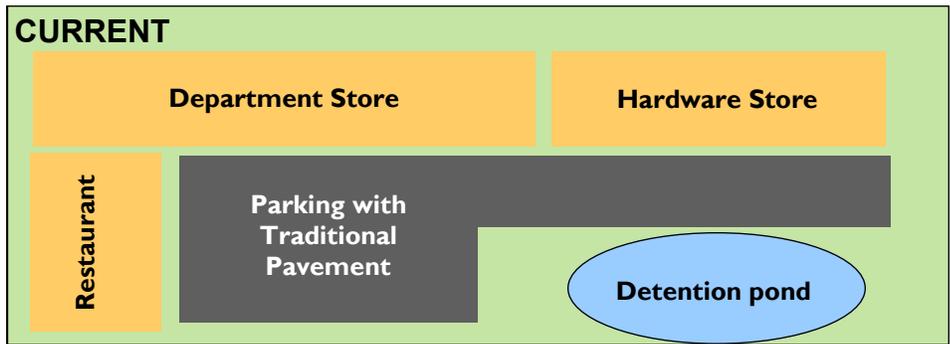
- Reduction in volume of stormwater discharged
- Higher level of pollutant removal than most BMPs
- Recharge to groundwater
- Provides year-round water for base flow of streams

Traditionally, our state and local programs have relied on detention ponds and other devices to reduce stormwater impacts. This approach has served a valuable role in pollution reduction, but there are drawbacks. In addition to problems with insects and liability, these devices ultimately discharge nearly all collected stormwater to streams that cannot handle large volumes of flow. The result is stream bank erosion, sediment in streams and loss of aquatic insects that are critical to the food chain.

The EPA has recently begun encouraging practices that infiltrate stormwater, which allows the water to recharge aquifers and support the base flow of streams. Studies have shown that permeable pavement can reduce the discharge of stormwater by up to 90%. When designed correctly, permeable pavement systems can also result in greater removal of nitrogen, phosphorus, pathogens and other pollutants.

## How will these changes affect development?

- Allow additional land for development
- Allow higher density (with reduced runoff)
- Cost-saving option to address stormwater



### • Can eliminate the need for traditional stormwater ponds

The use of permeable pavement will often allow projects to have more buildings or parking while still meeting water quality regulations. In some cases, the need for additional treatment devices will be eliminated if a portion of the stormwater volume is being infiltrated by permeable pavement. These changes will provide cost savings and more profitable use of the property.

The initial expense of permeable pavement may be higher than traditional pavement, but its use could reduce or eliminate the need for costly stormwater treatment devices such as detention ponds or stormwater piping. In addition, some studies have shown the long-term cost of permeable pavement can be less than that of conventional pavement.

### Could local governments implement these new provisions?

If the proposed changes are approved, local governments that administer delegated stormwater programs will be able to allow the new built-upon area reduction credits and treat properly designed and constructed pavements as best management practices. Qualifying programs include: Water Supply Watershed Protection, Jordan Lake Rules, Falls Lake Rules, Tar-Pamlico Nutrient Strategy, Neuse Nutrient Strategy, Randleman Lake Rules, NPDES Phase I and Phase II, Universal Stormwater Management Program and Goose Creek Watershed Rules. Local governments must assure that their stormwater programs include capabilities to review and implement the minimum provisions set forth in Chapter 18 of the Stormwater BMP Manual.

## We'd like to hear from you

The Division of Water Quality is seeking public comment on these proposed changes to the Stormwater Best Management Practices Manual until **Sept. 1, 2012**. Please send comments and feedback to [Annette.Lucas@ncdenr.gov](mailto:Annette.Lucas@ncdenr.gov) or call 919-807-6381. For more information and to submit comments online, visit [www.ncwaterquality.org](http://www.ncwaterquality.org) and click on the "Permeable Pavement" link on the left side.