

# Resource Center



## Best Management Practices (BMPs) to Meet the New Stormwater Requirements

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New NJDEP stormwater regulations fulfilling USEPA Phase II stormwater requirements are expected to go into effect this summer. These new rules require all municipalities to adopt stormwater management ordinances to control runoff, increase infiltration, and improve water quality. Numerous BMPs can help towns achieve these goals. Of particular interest is the innovative Low Impact Development (LID) ecosystem based approach that seeks to maintain a site's predevelopment hydrology.

### Vegetated Roof Covers

A terrific way to reduce impervious surface and stormwater runoff in urban areas is through vegetative roof covers (VRCs) or "green roofs," which can be installed on top of conventional flat or sloping roofs without additional reinforcement. Europeans have used them successfully for over 25 years. VRCs reduce the volume of runoff through evapotranspiration and can also control the rate of runoff release.

VRCs consist of vegetation, a growth medium, and a drain layer over the roof's waterproofing membrane. The drain layer prevents ponding. A simple design using three inches of growth medium has the highest cost-benefit

ratio and can reduce runoff by more than 50 percent. Green roofs also improve rooftop insulation, help conserve energy and extend the roof's life by protecting the waterproofing membrane.

### Permeable Pavement

Pervious pavement material such as paving blocks, concrete grid pavers, perforated brick pavers, and compacted gravel reduce surface runoff and allow infiltration. They are suitable for low traffic areas like parking lots, sidewalks, driveways, patios, and fire lanes in areas with moderately pervious soil and a depth to seasonal high water table or bedrock of greater than three feet. They are not a good idea where runoff contains significant levels of sediment or dissolved pollutants. These pavements have been used most effectively in coastal areas with sandy soils and flatter slopes. Pervious paving maintenance costs cost less in the end than installing additional BMPs.

### Enhanced Swales

Swales are grassed channels that reduce runoff velocity and allow for filtration and infiltration. Used mainly along residential streets and highways, swales help reduce the sediment levels, stormwater volume and pollutants

discharging into surface or ground water. Shallow swales that detain stormwater for a significant time are the most effective. Along with other BMPs in a "train of treatment," swales can improve water quality.

Enhanced swales are grassed channels with gravel check dams perpendicular to the centerline, and/or a bioretention zone in the subsurface. Check dams slow the water flow. A bioretention filter under the channel's centerline provides for infiltration, filtration, pollutant adsorption, and biological pollutant breakdown. A bioretention filter saves money by reducing the need for other BMP's. The primary maintenance requirements are periodic sediment removal and mowing.

### Bioretention

Bioretention systems can remove a wide range of pollutants, provide infiltration, and help moderate runoff volumes. They typically include

- Grass buffer strips to slow runoff and capture coarser sediments;
- Sand beds to retain finer soil particles and act as an aerobic filter;
- Shallow ponding areas to allow for runoff storage and evaporation and particle settling;
- Organic mulch layers to provide for organic decomposition, microorganism breakdown of runoff pollutants, and filter finer particles;
- Good quality soils for the plants to grow in, store stormwater, and adsorb pollutants;
- Vegetation to take up water, nutrients, and other pollutants and break down some pollutants into less harmful compounds.

Bioretention systems are not appropriate in forested, high water table and carbonate/limestone areas or on slopes over 10 percent.

### For Further Information

- NJDEP manual, *Best Management Practices for Control of Nonpoint Source Pollution from Stormwater* at [www.njstormwater.org](http://www.njstormwater.org); click on the link for the 2000 draft NJ Stormwater BMP Manual
- USEPA on Low Impact Development at [www.epa.gov/nps/lid](http://www.epa.gov/nps/lid)
- Low Impact Development Center at [www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org)
- Center for Watershed Protection at [www.cwp.org](http://www.cwp.org)

