

Plan On It

A Dutchess County Planning Federation eNewsletter

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Down the Drain? Not So Fast!

What Planning Boards Need to Know About Stormwater

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As a planning board member, you may be used to relying on your engineer to determine whether the stormwater plan for a development project complies with regulations. Well, this was a good approach when pipes, ponds, and catch basins were the primary components of stormwater system design. No longer! Stormwater design and planning have now become tightly intertwined.

As of March 1, 2011, New York State *requires developers to use the revised [2010 NYS Stormwater Management Design Manual](#)* when designing new projects, which *requires the property owner to document how they have considered green infrastructure, low impact development, and better site design* in stormwater plans. Regulated Municipal Separate Storm Sewer ([MS4](#)) municipalities are also required to show how they are using green infrastructure techniques in local planning.

Don't these sound like innovative planning concepts, not engineering terms? They are! Let's explore why this is happening and how you can get involved.



Rain garden located at Vassar College in Poughkeepsie, N.Y.

Photo Credit: Berger Engineering

A Short History of Stormwater Regulations

Stormwater runoff was recognized as a major pollutant source back in the 1980's, resulting in changes to the Federal Clean Water Act. New York State followed the US Environmental Protection Agency's (EPA) directives by adopting stormwater permits for industrial activities, municipal operations, and construction sites in the 1990's. The permits require control of both water quality and quantity for stormwater runoff. Over the last ten years, developers have used stormwater ponds, treatment wetlands, and filtration techniques such as landscaped bioretention areas and grassed infiltration basins, to manage stormwater.

But recent studies have shown that pollutants are not being removed at the rates expected from these end-of-pipe practices. In addition, re-using stormwater to recharge the groundwater supply was recognized as an important goal. Stormwater professionals started to look at ways to re-use treated stormwater, and to treat and infiltrate stormwater “at the source” (near the areas where impervious surfaces, such as roads, driveways, and buildings, generate runoff).

Greener Approaches to Stormwater

Green infrastructure, better site design, low impact development (LID), and light imprint are similar terms that are often used in the world of stormwater design. **Green infrastructure** is the general term referring to practices that infiltrate, evapotranspire, or reuse stormwater using soils and vegetation rather than pipes and ponds that simply collect, convey and store stormwater generated from impervious surfaces.

Better site design means approaches to development that protect natural areas, reduce impervious surfaces, and better integrate stormwater treatment in development projects. Municipal codes are an important component of this approach.

Low impact development, a term originating from the engineering community, means innovative stormwater management approaches that manage rainfall at the source using the natural hydrology of a site. This includes practices that infiltrate runoff such as swales, rain gardens, permeable pavement, bioretention, and green roofs.



Permeable concrete and pavers installed at the NYS Parks Taconic Region Headquarters in Staatsburg, N.Y.

Photo Credit: Barbara Kendall

Light imprint combines natural and lower-cost drainage techniques within a neighborhood and regional context that emphasizes compact, walkable communities. Urban and compact development patterns have been shown to produce far less impervious surfaces and stormwater runoff per person or residential unit than spread-out, suburban development.

Implementing Green Infrastructure: Site Plans & Subdivisions

The benefits of green infrastructure include absorbing stormwater pollutants and reducing the volume of stormwater runoff. These practices also absorb carbon dioxide, reduce the urban heat island effect, add to the aesthetics of a project, and increase marketability.

Green infrastructure practices can be divided into two categories:

1. Planning Practices for runoff reduction — A developer is now required to document how they have considered planning practices including preservation of undisturbed buffers, reduction of clearing and grading, locating sites in less sensitive areas, conservation design, and soil restoration. They are also required to show how they have minimized

impervious area through compact design and reduction of roadways, driveways, cul-de-sacs, building footprints, and parking lots.

On a broader scale, the location of a project is just as important as the engineered details, thus the smart growth framework of compact, walkable, and mixed use development patterns should also be considered a technique to better managing stormwater. Each situation will dictate the appropriate green infrastructure techniques, so if the setting is a compact and walkable village, then stormwater management can be accomplished through stormwater street trees, stormwater planters, green roofs, and at-grade bioswales instead of raised landscaped islands. If the proposed development is in a rural setting, then preservation of open space, riparian buffers, and vegetated filter strips may be the most important techniques to manage stormwater naturally.



Steps to create a conservation subdivision – map the open space, prepare conventional layout to determine maximum lot count, then redesign layout to fit homes into the landscape while preserving a large portion of open space.

Source: Dutchess County [Greenway Connections](#), Greenway Guide [A1 Fitting Into the Landscape](#)

Looking at this list, it is clear that these “stormwater” planning practices are also site planning concepts that may be regulated by local zoning laws, subdivision regulations, and highway specifications. It is very important that planning board members get involved by looking closely at the proposed stormwater plan and advising on local regulations that can enhance the use of these practices.

2. Treatment Practices for runoff reduction — Specific engineered techniques for implementing green infrastructure include:

- Rain gardens
- Green roofs
- Vegetated swales
- Stormwater planters
- Disconnection of rooftop runoff
- Sheet flow to riparian buffers or filter strips
- Porous pavement
- Rain barrels or cisterns

While these involve more traditional engineering calculations and design, planning board members can advise on the placement of the practices to enhance landscaping and encourage use of native plants. The NYS Stormwater Management Design Manual has a list of native plants for stormwater management in [Appendix H](#).

Updating Our Local Codes

The goal of this new approach to stormwater management is to reduce the impacts of runoff on our communities. However, in many cases our local codes do not support the use of green infrastructure practices. For example, conservation subdivisions reduce stormwater runoff by protecting natural areas, reducing the length of roads and driveways, and promoting treatment of stormwater through natural sheet flow. But many municipalities do not have local laws that support this type of development. Reducing road widths is also a goal, but many local highway specifications date back to the 1970's and 80's, when wide roads and cul-de-sacs were the standard practice.

To address these local code issues, a municipality can review its local code with a "Code and Ordinance Worksheet" that asks specific questions about 28 better site design principles. Once the code review is completed, municipal leaders can convene local stakeholders to participate in a Better Site Design Roundtable, where local code changes are discussed and proposed amendments agreed on. This process was conducted in the Towns of [Clinton](#) and [Wappinger](#) — Wappinger has adopted a majority of the recommendations, and Clinton is considering them as part of a larger Comprehensive Plan and Zoning Code update.

Communities and professionals can also consult the EPA's "[Protecting Water Resources with Higher Density Development](#)" and "[Using Smart Growth Techniques as Stormwater Best Management Practices](#)" for more information.

Be Part of the Solution

Planning boards can play an important role in improving development projects and our communities through use of green infrastructure. To find out more about these techniques and the Roundtable process, come to the Dutchess County Planning Federation's Short Course on March 29, 2011.

Join Us!

The Dutchess County Planning Federation will be hosting Barbara Kendall for a Short Course on stormwater:

When: Tuesday March 29th, 6–8pm
(a light supper will be served at 5:30)

Where: DC Farm & Home Center,
Route 44, Millbrook NY

Cost: \$5.⁰⁰

[Click Here to register online](#) or call
845-486-3600.

MORE INFORMATION

[2010 NYS Stormwater Design Manual](#)

[NYS DEC Stormwater Information](#)

[2010 NYS SPDES General Permit Information](#)

Fact Sheet on [MS4 in Dutchess County](#)

[Center for Watershed Protection](#)

US EPAs [Protecting Water Resources with Higher Density Development](#)

US EPAs [Using Smart Growth Techniques as Stormwater Best Management Practices](#)

[Light Imprint: Integrating Sustainability with New Urbanism](#),
CNU Green Council Report, Congress for New Urbanism

[Town of Wappinger Recommended Model Development Principles](#)

[Town of Clinton Recommended Model Development Principles](#)

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This newsletter was developed by the Dutchess County Department of Planning and Development, in conjunction with the Dutchess County Planning Federation.

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