Stormwater Updates: Design & Permitting

NYS Stormwater Management Design Manual

GP 0-10-001

EFFECTS OF GREEN INFRASTRUCTURE PRACTICES ON THE TOWN OF LYSANDER

Stormwater Management Planning – GI Approach

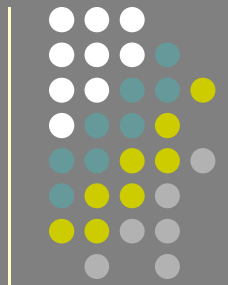
Green infrastructure can:

- Reduce runoff volume, peak flow, and flow duration
- Slow down the flow
  - increases T_c & promotes infiltration and evapotranspiration
- Improve groundwater recharge
- Protect downstream water resources
- Reduce downstream flooding and property damage.
- Reduce incidence of combined sewer overflow (CSO)
- Reduce treatment costs
- Reduce thermal pollution
- Improve wildlife habitat

Preserve Natural Features to Reduce Water Quality Volume And Runoff Reduction Volume Requirement With GI Practices

Preservation of Undisturbed Areas	• Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.
Preservation of Buffers	• Define, delineate, and preserve naturally vegetated buffers along perennial streams, rivers, shorelines, and wetlands
Reduction of Clearing and Grading	• Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities, and stormwater management facilities
Locating development in less sensitive areas	• Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests, and critical habitats by locating development to fit the terrain in areas that will create the least impact
Open Space Design	• Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.
Soil Restoration	• Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post-construction practices.

Reduce Impervious Cover To Reduce Water Quality Volume And Runoff Reduction Volume Requirements With GI Practices



Roadway Reduction	•Minimize roadway widths and lengths to reduce site impervious area
Sidewalk Reduction	•Minimize sidewalk widths and lengths to reduce site impervious area
Driveway Reduction	•Minimize driveway widths and lengths to reduce site impervious area
Cul-de-sac Reduction	•Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
Building Footprint Reduction	•Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.
Parking Reduction	•Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multiple stories.

Reduction in Impervious Area Practices Are Subject to Town Approval

- The Current MS4 SPDES Permit Does Not Require The Town To Adopt New Highway Standards If The Town Does Not Desire To

Runoff Reduction Volume...Why should *I* care?

- The purpose of runoff reduction is to formally recognize the water quality benefits of certain site design practices AND to address flow as a pollutant of concern
- Incorporating one or more runoff reduction practices in site design may reduce the required volume of post construction stormwater practices
- If RRv is not met, the developer will not obtain a general SPDES Permit

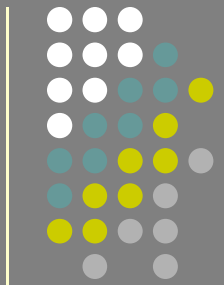
Runoff Reduction Volume... Sizing

- New GI Practices And Traditional Stormwater Management Practices Are Used To Meet This New SPDES Design Requirement

Runoff Reduction – Green Infrastructure Practices That Can Be Used With Town Approval

Conservation of Natural Areas	• Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas, stream and wetland buffers by restoring and/or permanently conserving these areas onsite
Sheetflow to Riparian Buffers or Filter Strips	• Undisturbed natural can be used to treat and control stormwater runoff from some areas of a development project
Vegetated Swale	• The natural drainage paths, or properly designed vegetated channels, can be used to increas Tc, reduce Qp, and provide infiltration.
Tree Planting/Tree Pit	• Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization
Disconnection of Rooftop Runoff	• Direct runoff from residential rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates
Stream Daylighting	• Stream daylight previously culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads
Rain Gardens	• Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression
Green Roofs	• Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. Allows evaporation and evapotranspiration processes to reduce volume and discharge rate
Stormwater Planters	• Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters decrease stormwater quantity and improve water quality
Rain Barrels & Cisterns	• Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities
Porous Pavement	• Pervious pavements provide an alternative to conventional paved surfaces. Water infiltrates through the surface, reducing runoff from a site and providing pollutant uptake in the underlying soils.

Runoff Reduction – Standard SMPs without RRv Capacity



- Ponds
- Wetlands

These practices can only be used for quantity and quality control

The Town may start to see smaller ponds / wetlands on new development sites as a result of the new GI practices

G.I. Sign Requirements

Here a sign. There a sign.

EVERYWHERE A SIGN SIGN.

Not just any sign…

- Not less than 18” x 24” or 10” x 12” for footprints smaller than 400 sf
- Must bear the following information:
  - STORMWATER MANAGEMENT PRACTICE - (name of the practice)
  - Project Identification - (SPDES Construction Permit #, other)
  - Must Be Maintained In Accordance With O&M Plan
  - DO NOT REMOVE OR ALTER

The Town May Need To Revise The Town Code To Address The New G.I. Sign Requirements

Redevelopment Projects Including Maintenance of Existing Town Infrastructure

WITH NO INCREASE IN IMPERVIOUS AREA THE RUN OFF REDUCTION VOLUME REQUIREMENT IS WAIVED

ALL OTHER SPDES REQUIREMENTS REMAIN UNCHANGED

The take-away

Given that GI techniques are *site planning techniques*, they MUST be evaluated VERY early on in the site design process

GI techniques must all be evaluated and a justification must be provided in the SWPPP

More onsite treatment practices are available to designers

Don’t forget the signs…