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FROM THE DRAFTING TABLE



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Steckbeck Engineering & Surveying, Inc. (SESI) presents the latest edition of our quarterly newsletter, titled “From The Drafting Table.” The purpose of the newsletter is to share services that we can provide and to convey relevant information which may affect our clients as they consider and begin new projects. This can include anything from changing regulations and new design concepts, to our experiences and lessons learned. It is our goal at SESI to provide our clients with the best service and up-to-date engineering practices that are cost effective solutions for your needs.

[Options for controlling stormwater runoff from a development site \(Part 2\)](#)

As a result of the recently updated Pennsylvania Department of Environmental Protection (PADEP) Chapter 102 regulations as well as the anticipation of more stringent regulations in the future it is becoming more and more important to develop creative solutions for dealing with stormwater runoff from a project site. These methods, referred to as Best Management Practices (BMPs), aim to reduce the volume and rate of stormwater leaving a site and at the same time increase the quality of the runoff that does leave the site.

PADEP has divided these methods into **Non-Structural BMPs** and **Structural BMPs**. Non-Structural BMPs are often referred to as the first step in stormwater management design. Non-structural BMPs can be described as planning and development techniques which when utilized correctly can greatly limit the impact of stormwater on a development site. Structural BMPs, the second step in stormwater management design, can be defined as those which are tangible features that can be installed on a project site to detain, retain, infiltrate, and/or treat the stormwater runoff from a project site. This article focuses on Non-Structural BMPs, see our previous newsletter (Winter 2011) for information on Structural BMPs.

Non-Structural BMPs encompass a multitude of design standards and practices which help to reduce the amount of stormwater runoff before construction even begins. This approach aims to protect a site’s natural features such as streams, wetlands, or woodlands, while creating a functional and environmentally friendly project. Much to the delight of a developer, utilizing some of these Non-Structural BMP practices can aid in reducing site construction costs by limiting development to certain areas of the site and avoiding potentially expensive development areas. Not only do these design standards reduce the amount of stormwater runoff from a site in the short term, the long term benefits of infiltration, evaporation, and transpiration are equally important.

There are many Non-Structural BMPs, often referred to as “Conservation Design” techniques or “Low Impact Development” techniques, which can be utilized. The following are some potential Non-Structural BMP options to consider when developing a site plan for a subdivision or land development project:

Protect Sensitive and Special Value Features – Existing areas such as woodlands, wetlands, riparian areas, floodplains, etc. naturally reduce the volume of stormwater runoff from a site and increase the quality of that runoff.

Protect/Conserve/Enhance Riparian Areas – Riparian areas are vegetated locations along a body of water which help to enhance the quality of the adjacent body of water and the associated wildlife. This is accomplished through treatment of stormwater runoff before it reaches the body of water, providing food & cover for wildlife, and preventing erosion along the body of water.

Protect/Utilize Natural Flow Pathways– Utilizing a site’s natural drainage features in the design of a project can help increase the quality of runoff leaving the site, reduce the volume of runoff leaving the site, and reduce the construction costs which could include piping or relocating the natural drainage feature.

Cluster Uses/Minimize Disturbed Area – Through concentrating development to one area of the site the amount of disturbed area can be reduced and the amount of open space increased. One method of accomplishing this BMP would be to provide smaller lot areas. This BMP could also result in cost savings during construction.

Minimize Soil Compaction – If soil can remain uncompacted it will maintain its natural infiltration qualities which can aid in reducing the amount of stormwater runoff leaving a site.



Figure 1 – Wetlands



Re-Vegetate and Re-Forest Disturbed Areas Using Native Species – Vegetation is beneficial to a landscape for many reasons including aesthetics, soil stability, stormwater absorption, etc. Native species are desirable as they will flourish without the need for chemical fertilizers and pesticides.

Reduce Street Imperviousness – By reducing the width and length of streets the impervious area will be decreased which results in less stormwater runoff from the project site.

Reduce Parking Imperviousness – Parking areas should be designed for the anticipated peak demand for the specific use in order to limit imperviousness. Another option for reducing parking imperviousness is through the use of permeable pavement, permeable pavers, and smaller parking stalls.

Rooftop Disconnection – Rather than connecting downspouts directly to a storm sewer pipe conveyance system, rooftop downspouts can be directed to vegetated areas where the stormwater runoff can be infiltrated and treated.

Storm Sewer Disconnection – Many new streets contain storm sewer pipe conveyance systems to capture and carry stormwater runoff to a management facility. This BMP suggests infiltrating and treating the stormwater runoff near the street in a swale or bioretention area, potentially in a grass strip between the curb and sidewalk.

Street sweeping – Many potential pollutants such as sediment, salts, oils, garbage, etc. originate and/or accumulate in a street. By removing these potential pollutants before they are captured by stormwater runoff the quality of the runoff is enhanced significantly.

As you may be aware, many of the design regulations to which a developer is required to adhere are set forth by the local municipality or county in the form of Zoning Ordinances and Subdivision & Land Development Ordinances. These Ordinances regulate things such as development density, minimum lot size, minimum number of required parking spaces, and road widths to name a few. In order for developers to implement some of the Non-Structural BMPs identified above it is necessary for the local municipalities and counties to be informed of these concepts and cooperative in granting waivers and modifications to design standards which are sometimes contradictory to the goal of creating environmentally friendly and environmentally responsible projects. Please contact Steckbeck Engineering & Surveying Inc. with any questions or to learn more about these and other stormwater management best management practices.

Storm Water Management & Understanding the MS4 Program

What is the MS4 Program?

Untreated or uncontrolled storm water runoff is the number one cause of impairment in our local waterways. Polluted runoff is often transported through municipal drainage systems until it eventually discharges into streams, lakes, and rivers untreated. An MS4, or Municipal Separate Storm Sewer System, is comprised of drainage systems, including streets, catch basins, curbs, gutters, ditches, man-made channels and storm pipes, owned by a state, county, city, town, township, borough or other public entity. The National Pollutant Discharge Elimination System (NPDES) storm water Phase II regulations require permit coverage for storm water discharges from MS4s, mainly those located in urbanized areas. Therefore, most Townships and Boroughs are required to comply with the MS4 Program.

MS4 Programs are intended to improve our Nation's surface waters by reducing the quantities of pollutants that are picked up by runoff and transported into the storm sewer systems during rainfall events. As part of the MS4 Program, municipalities hold a permit to discharge storm water into local waterways. This permit requires the municipalities to implement and maintain a storm water management program that (1) reduces pollutant discharge to the maximum extent possible; (2) protects water quality; and (3) satisfies the water quality requirements of the federal Clean Water Act. In Pennsylvania, the MS4 program is administered by the Department of Environmental Protection (DEP).

The MS4 program has six elements termed "minimum control measures" that when implemented should result in significant reduction in pollutants discharged into receiving waters. The six minimum control measures and the actions required include the following:

1. **Public Education and Outreach**
Distribute educational materials and conduct outreach to inform citizens about the impacts of storm water runoff on water quality.
2. **Public Participation/Involvement**
Provide opportunities for citizens to participate in storm water management programs or other programs which improve water quality
3. **Illicit Discharge Detection and Elimination**
Develop and implement a plan to detect and eliminate non storm water discharges into the storm water system.
4. **Construction Site Runoff Control**
Develop, implement and enforce an erosion & sediment control program for construction site activities that disturb one acre or greater.
5. **Post-Construction Runoff Control**
Develop, implement and enforce a program to address discharges of post-construction storm water runoff from new development or redevelopment areas.
6. **Pollution Prevention/Good Housekeeping**
Develop and implement a program that reduces or prevents pollutant runoff from municipal operations.



All municipalities should be committed to improving water quality through better management of stormwater runoff. Every resident and business owner can participate in their municipal stormwater program by reducing or preventing pollutant runoff from their own property and by reporting any non storm water discharges into the municipality's drainage system.

What can we do to help keep stormwater clean?

There are numerous things we can all do on a daily basis to keep pollution out of our waterways. The following are just a few things we can all do to help improve water quality in our streams, rivers and lakes:

1. Never dump anything into storm drains, swales or streams.
2. Pick up litter from the street before it gets into storm drains.
3. Use limited amounts of fertilizer.
4. If you must use pesticides, search for an environment-friendly brand.
5. Recycle motor oil, paint, and other hazardous chemicals. Never dump such materials down the drain or into the storm system.
6. Recycle glass, plastic, and aluminum.
7. Always pick up your pet's waste or harmful bacteria can get into our water!

There is a great deal of information to be shared regarding the MS4 Program. In this Newsletter, we have presented a brief explanation of what the MS4 Program is and how to help keep stormwater clean. In our next Newsletter, we will follow up with additional information explaining "What is an illicit discharge, and what kind of discharges are allowed?". Please call Steckbeck Engineering & Surveying, Inc. should you have any questions regarding the MS4 program.



Figure 2 – Paint dumped into storm drains

PennDOT Permitting and Maintenance of Drainage Facilities

One of the quietest changes that occurred in permitting for land development approvals was the issuance by PennDOT of Strike-Off Letter 470-10-3 on June 24, 2010. The purpose of this article is to alert you to the changes in the permitting requirements and provide some common examples where this applies in processing a land development plan. As taken directly from the memorandum, this policy "is intended to provide a consistent approach in identifying maintenance responsibility for the installation of new drainage facilities and/or modifications to existing drainage facilities under various scenarios that are encountered during the highway occupancy permitting (HOP) process. This policy will facilitate PennDOT reviews by providing guidance on who shall apply for modifications to existing drainage facilities or newly proposed drainage facilities within the State highway right-of-way." In essence the policy requires that either the local government be the sole applicant or the local government and private applicant be co-applicants for subsurface stormwater facilities connecting to highway drainage facilities within the State right-of-way. This ultimately means the responsibility to own and maintain the facilities. If you are a private applicant, this means that you will now need the local municipality involved with your application to PennDOT if you are proposing subsurface facilities that will connect to a PennDOT facility. If you are a municipality, you will likely need to have an agreement with the private applicant regarding ongoing maintenance costs and responsibility.

The following are some specific examples of how the permitting changes could impact a project. Keep in mind these are examples based upon our interpretation of the policy and published Q&A responses. It is always best to verify your specific situation with PennDOT before beginning any project.

1. Pipe culvert under a driveway –Property Owner Permittee and responsible party.
2. Surface stormwater facilities (i.e. swales) - Property Owner Permittee and responsible party.
3. Subsurface facilities (inlets and pipe) draining a new driveway or local road and connecting to facilities located within the PennDOT right-of-way. – Local government permittee or co-permittee with private applicant. Permittee's are responsible parties.
4. Proposed Detention Basin outfall pipe connected to facilities located within the PennDOT right-of-way. – Local government permittee or co-permittee with private applicant. Permittee's are responsible parties.
5. Proposed inlet within a swale located within the PennDOT right-of-way - Local government permittee or co-permittee with private applicant. Permittee's are responsible parties.
6. Proposed inlet and pipe (subsurface) along curbing connected to the PennDOT right-of-way - Local government permittee or co-permittee with private applicant. Permittee's are responsible parties.
7. Proposed Pipe culvert under and across PennDOT right-of-way - Local government permittee or co-permittee with private applicant. Permittee's are responsible parties.

Please contact Steckbeck Engineering and Surveying, Inc. with any questions or to learn more about any of the topics discussed in this newsletter.