POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN DESIGN TIPS

Department of Environmental Protection (DEP)
Southcentral Region

The purpose of this document is to help project owners understand the stormwater design process and common problems that DEP sees in permit applications. This document is also intended to help the plan designer develop a sound and successful post-construction stormwater management plan that meets DEP's NPDES permitting requirements for stormwater discharges associated with construction activities. Project owners are encouraged to work with their designers prior to submitting an application to ensure that these common problems do not slow down the application review process.

Overall Stormwater Management Plan Design Concept:

An essential objective in the development of a successful stormwater management plan is to maximize stormwater "prevention" through use of **non-structural best management practices (BMPs)**. Once prevention has been maximized, some amount of stormwater peaking and volume control will likely remain and can be managed through use of **structural BMPs**.

Non-structural and structural BMPs are described in Chapters 5 and 6, respectively, of Pennsylvania's Stormwater Management Manual.

Common mistakes and deficiencies that can be avoided in the NPDES permit application development phase:

- Only one Worksheet 3, Worksheet 4, Worksheet 5, and Worksheet 10 provided for a project with multiple drainage areas. Individual Worksheets should be provided for each drainage area to accurately calculate the increased runoff volume at each point of interest.

- Use of weighted curve numbers in calculating runoff volumes on Worksheet 4. The use of a weighted curve number for volume calculations is not acceptable. The runoff volume must be calculated for EACH land use type/condition and hydrologic soil group.

- Runoff volume credits claimed on Worksheet 5 for extended detention. Extended detention treats the runoff rate but does not treat the increased runoff volume; therefore, runoff volume credits from extended detention cannot be given.

- Infiltration loading ratios exceeding the maximum recommended ratios outlined in Appendix C of Pennsylvania's Stormwater Management Manual. See page 21 of Appendix C of Pennsylvania's Stormwater Management Manual for the infiltration loading ratio guidance. Avoid infiltration in detention basins because detention basins usually have very high loading ratios.

- Proposed infiltration in compacted fill. Infiltration in compacted fill is not feasible and should be avoided. Infiltration in fill slopes should be avoided to prevent slope stability problems and failures.

- Infiltration testing provided at the existing ground surface elevation and not at the elevation of the proposed infiltration system.

- Inadequate number of infiltration test pits. See page 4 of Appendix C of Pennsylvania's Stormwater Management Manual for guidance on required number and locations of test pits.

- The hydraulic head or depth of water on the proposed infiltration system is too excessive. The total effective depth of water should generally not be greater than two feet to avoid excessive pressure and potential sealing of the bed bottom.

- Plans that are labeled "NOT FOR CONSTRUCTION". Construction drawings are required.

- Missing Worksheets 12 and 13 when Volume Control Guidance (CG 1) is not being met. Refer to the permit application (NOI) checklist.

- Proposed excavated basins adjacent to wetland areas without first investigating groundwater conditions or elevations. Intercepting the ground water table during construction of an excavated detention basin adjacent to existing wetlands could drain these wetlands.

- Claiming stormwater runoff volume credit from non-structural BMPs greater than 25% of the increased 2-year/24-hour stormwater runoff volume calculated on Worksheet 4. No more than 25% of the volume reduction may be met through non-structural BMP credits.

- Lack of language on the construction plans prohibiting soil compaction and heavy equipment traffic at locations of proposed infiltration systems. Soil compaction will prevent the infiltration system from functioning properly.

- Proposed offsite discharge to non-surface waters on a neighboring property not owned by the permit applicant and without first obtaining the owner's permission for the discharge and without providing supporting calculations for the flow path. The plan designer should demonstrate how the discharge will be safely conveyed through the downstream properties to surface waters* or a stable natural or manmade stormwater channel without causing accelerated erosion or damage. The flow path size and stability calculations should be based on the proposed volume and rate discharging to the flow path in the 100-year storm event. Treating the net increase in the 2-year/24-hour runoff volume onsite (CG 1) is not an adequate measure to address an off-site discharge problem.

**Surface Waters:* Perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries, excluding water at facilities approved for wastewater treatment such as wastewater treatment impoundments, cooling water ponds and constructed wetlands used as part of a wastewater treatment process.