



1.4 Minimum Stormwater Management Standards

This section presents a set of minimum performance standards for stormwater management for development activities in Knox County. These performance standards provide an integrated approach to address both the water quality and quantity problems associated with stormwater runoff due to urban development. They are designed to assist Knox County government in complying with regulatory and programmatic requirements for various State and Federal programs including the National Pollutant Discharge Elimination System (NPDES), Municipal Separate Storm Sewer System (MS4) permit program and the National Flood Insurance Program (NFIP) under the Federal Emergency Management Agency (FEMA).

These minimum standards are provisions of Knox County's Stormwater Management Ordinance and are implemented and supported by the Stormwater Management Manual and Knox County's plans review process. The goal of these stormwater management requirements for areas of new development and redevelopment is to reduce the impact of post-construction stormwater runoff quality and quantity on the watershed. This can be achieved by:

- Maximizing the use of better site design and nonstructural methods to reduce the generation of runoff and pollutants;
- Managing and treating stormwater runoff through the use of structural stormwater controls; and,
- Implementing pollution prevention practices to limit potential stormwater contaminants.

The minimum stormwater management standards presented here incorporate these concepts and cover the entire cycle of development from site planning through long-term maintenance of stormwater management facilities after construction has been completed.

The following standards are the minimum stormwater management performance requirements for new development or redevelopment sites that must submit a stormwater management plan. A detailed explanation of each minimum standard is presented elsewhere in this manual, as noted in italics at the end of the standard title.

Minimum Standard #1 – Stormwater Quality Treatment (*Volume 2, Chapter 2*)

Stormwater runoff from development and redevelopment shall be treated to remove pollutants prior to discharge from the development or redevelopment site. Stormwater management systems shall be designed to remove 80% of the average annual post-development total suspended solids (TSS) load and be able to meet any other additional watershed or site-specific water quality requirements, as determined by Knox County Engineering. The justification for this standard is presented later in this chapter. Design criteria and equations are presented in Chapter 2. It is presumed that a stormwater management system complies with this performance standard if:

Appropriate structural stormwater controls are selected, designed, constructed, and maintained according to the specific criteria in this manual; and

Runoff from hotspot land uses and activities is adequately treated and addressed through the use of appropriate structural stormwater controls and pollution prevention practices.

Minimum Standard #2 – Use of Better Site Design Practices (*Volume 2, Chapter 5*)

Knox County will give stormwater "credits" for new developments and redevelopments to encourage the use and *Better Site Design* practices, promote the maximum preservation of natural and connected open space within and between developments, and provide additional opportunities for stormwater treatment.

**Minimum Standard #3 – Stream Channel Protection** (*Volume 2, Chapter 2*)

Stream channel protection shall be provided through the capture and extended detention of the runoff volume from the 1-year return frequency, 24-hour duration storm event.

Minimum Standard #4 – Overbank Flood Protection (*Volume 2, Chapter 2*)

Overbank flood protection shall be provided such that the calculated peak discharge of stormwater runoff resulting from the 2-year, 10-year, and 25-year return frequency, 24-hour duration storm events shall be no greater after development or redevelopment of the site than that which would result from the same 2-year, 10-year, and 25-year return frequency, 24-hour duration storms on the same site prior to development or redevelopment. Minimum standard #4 can be modified in the event that a downstream impact analysis indicates that negative downstream flood impacts will result from on-site peak discharge controls.

Minimum Standard #5 – Extreme Flood Protection (*Volume 2, Chapter 2*)

Extreme flood protection shall be provided such that the calculated peak discharge of stormwater runoff resulting from a 100-year frequency, 24-hour duration storm shall be no greater after development or redevelopment of the site than that which would result from a 100-year frequency, 24-hour duration storm on the same site prior to development or redevelopment. Minimum standard #5 can be modified in the event that a downstream impact analysis indicates that negative downstream flood impacts will result from on-site peak discharge controls.

Minimum Standard #6 – Downstream Impact Analysis (*Volume 2, Chapter 2*)

A downstream hydrologic analysis shall be performed to determine if the proposed development or redevelopment causes an increase in peak discharge while meeting Minimum Standards #4 and #5. This analysis shall be performed at the outlet(s) of the site, and downstream at each tributary junction to the point(s) in the conveyance system where the area of the portion of the site draining into the system is less than or equal to 10% of the total drainage area above that point. Downstream flood protection shall be provided where the downstream impact analysis indicates peak discharge increases.

Minimum Standard #7 – Erosion Prevention and Sediment Control (*Volume 2, Chapter 9*)

Erosion prevention and sedimentation control (EPSC) practices shall be utilized during the construction phase or during any land disturbing activities. In general, Knox County requires that owners and operators of construction sites implement EPSC practices in accordance with the regulations and design and maintenance standards stated in the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities (also called the NPDES Construction General Permit), and the *Tennessee Erosion and Sediment Control Handbook*.

Minimum Standard #8 – BMP Operation and Maintenance (*Volume 1, Chapter 4*)

The owner(s) of stormwater management facilities and/or best management practices shall at all times properly operate and maintain all facilities and systems of stormwater treatment and control (and related appurtenances), and all best management practices in such a manner as to maintain the full function of the facilities or best management practices which are installed or used by the property owner(s) to achieve compliance with this ordinance.

Minimum Standard #9 – Pollution Prevention (*Volume 2, Chapter 10*)

New developments and redevelopments shall implement pollution prevention practices during and after development of the site. A Special Pollution Abatement Permit shall be required for land uses that are typically known to have a higher than normal potential for discharge of pollutants.



Minimum Standard #10 – Development In and Around Sinkholes *(Volume 2, Chapter 8)*

Developments and redevelopments that have sinkholes located entirely or partially on-site shall satisfy the design requirements for Minimum Standards #4 and #5. Developments and redevelopments that drain to sinkholes shall implement retention or detention of stormwater runoff such that the post-development peak discharges do not exceed pre-development discharges.

Minimum Standard #11 – Protection Using Water Quality Buffers *(Volume 2, Chapter 6)*

Water quality buffers shall be established, protected and maintained along all community waters, which includes streams, ponds, lakes and wetlands in Knox County.

Minimum Standard #12 – Stormwater Management Plan *(Volume 1, Chapter 4)*

The development project shall prepare a stormwater management plan for review by the Knox County Engineering that presents the methods used to address Minimum Standards #1 through #11 in the proposed development or redevelopment.