ENVIRONMENT, HEALTH & SAFETY
UNIVERSITY OF MICHIGAN

Storm Water Management - Post-Construction Requirements (EP3-001)

Guideline

Issue Date: 07/28/2009
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Applies To: As required by the National Pollutant Discharge Elimination System (NPDES) permit for University of Michigan (U-M), the scope of this Guideline includes all construction and renovation projects on U-M properties that involve either:

a. earth disturbance of one (1) acre or greater,

OR

b. earth disturbance of less than one (1) acre, but which are part of a larger common plan of development or sale that would disturb one (1) acre or more.

NOTE: "Regulated site" in this guideline refers to projects meeting a. or b. above.

Post-Construction Requirements Policy Statement

U-M construction and redevelopment projects on U-M property are regulated under and **must** comply with the U-M NPDES permit for storm water discharges, as issued by the Michigan Department of Environmental Quality (MDEQ). The Storm Water Management Post-Construction Requirements Guideline has been developed to provide guidance regarding responsibilities and actions to meet the NPDES permit conditions for construction and renovation projects on U-M properties, which include but are not limited to, the Ann Arbor, Dearborn and Flint campuses.

Post-Construction Plan for Storm Water Management

The post-construction plan for storm water management on regulated sites **must** include:

- A minimum treatment volume standard to address water quality impacts.
- Channel protection criteria to address resource impairment resulting from flow volumes and rates.
- Drawings showing the location of storm water control measures (SCMs) and the storm system.
- Details on the proposed SCMs.
- Operation & Maintenance (O&M) requirements.
- Supporting information
  - Calculations used for designing all components of the storm water management systems.
  - Total suspended Solids (TSS) design removal rates and supporting manufacturer documentation, if applicable.
  - Geotechnical report including soil boring and infiltration test data.

Refer to U-M Storm Water Management Program Plan and the Post-Construction Storm Water Worksheet for additional details on these requirements.

The project team [Architecture, Engineering & Construction (AEC), Other Project Manager, Project Developer and/or Contractors] shall develop the post-construction storm water management plan in accordance with this guideline and the NPDES permit. Preferred design elements are identified in the Post-Construction Storm Water Worksheet.

Minimum Treatment Volume Standard

The minimum treatment volume standard **must** be either:

a. One (1) inch of runoff from the entire site.

OR

b. The calculated runoff for the entire site from the 90 Percent Annual Non-Exceedance Storm, as summarized in MDEQ's memo dated March 24, 2006.

Total Suspended Solids Removal

The treatment methods **must** be designed on a site-specific basis to achieve the following:

a. A minimum of 80 percent removal of TSS, as compared with uncontrolled runoff.

OR

b. Discharge concentrations of TSS not to exceed 80 milligrams per liter (mg/l).

NOTE: A minimum treatment volume standard is not required where site conditions are such that TSS concentrations in storm water discharges will not exceed 80 mg/l.

Channel Protection Criteria

The channel protection criteria **must** maintain post-development site runoff volume and peak flow rate at or below existing levels for all storms up to the 2-year, 24-hour event. "Existing levels" means the runoff volume and peak flow rate for the last land use prior to the planned new development or redevelopment. More restrictive channel protection criteria may be utilized by U-M on a case-by-case basis, as appropriate.

Rainfall data

The rainfall data for calculating runoff volume and peak flow rate shall be the Rainfall Frequency Atlas of the Midwest, 1992 [National Oceanic & Atmospheric Administration (NOAA) - Huff & Angel].

Methods for estimating pre- and post-development runoff

The methods used for estimating pre- and post-development runoff shall follow curve number evaluations as described in MDEQ's Computing Flood Discharges for Small Ungaged Watersheds, June 2010. Section 6.1 of this referenced document indicates to see TR-55 Tables 2-2a through 2-2d for the complete list of curve numbers. Utilize this more comprehensive list of curve numbers for completing the channel protection calculations.

Operation & Maintenance Plans

All structural and vegetative SCMs installed as a requirement under this section of the permit shall include a plan for maintaining maximum design performance through long-term operation and maintenance.

Environment, Health & Safety-Ann Arbor campus (EHS-AA), Environmental, Health and Safety-Dearborn campus (EHS-D), and Environment, Health, and Safety-Flint campus (EHS-F) will oversee annual inspections of the SCMs, and report the findings to the facility manager(s) for remedy.

More frequent inspections of SCMs may be required, based on the O&M plan. All inspections, other than the annual inspection, shall be the responsibility of the facility manager. A copy of all inspection reports shall be forwarded to EHS-AA, EHS-D, and EHS-F, as applicable, for recordkeeping.

Project Submittals

Development of the Post-Construction Plan for Storm Water Management is part of the formal U-M project review process. For each of the major phases of design (i.e. Schematic Phase, Design Development Phase, and Construction Document Phase), the Project Team (AEC, developer, and/or contractor) shall follow the storm water management procedures as indicated in the Design Deliverables document and Storm Water Management Procedure document. The Project Team, with assistance by the Storm Water Management Team (representatives from EHS and AEC), sets the storm water management requirements and goals at the pre-design phase to ensure that storm water management is incorporated early into the planning process.

The Project Team shall submit the Post-Construction Plan for Storm Water Management to EHS-AA for review and comment and ensure that the plan and all supporting information are deemed acceptable by EHS-AA prior to beginning any earth disturbance.

It is required that a Professional Engineer familiar with the project certifies that the design meets the minimum treatment volume standard and channel protection criteria required by the NPDES permit.

A second certification from the engineer is required after construction has been completed, stating that the as-built conditions meet the minimum treatment volume standard and channel protection criteria required by the NPDES permit.

Enforcement

EHS-AA will administer and enforce the storm water management program for U-M, including developing and maintaining procedures, guidance, information, etc. to aid U-M staff and contractors in complying with the post-construction requirements for storm water management on regulated sites. Enforcement may include, but is not limited to, letters of warning, stop work orders, withholding Soil Erosion and Sedimentation Control permits, withholding payment to the contractor, etc. and shall be implemented with the participation of respective EHS departments, AEC, and other Project Managers at U-M.

Appendix A: Referenced Documents

U-M, EP3

- U-M Storm Water Discharge Permit (NPDES)
- 90 Percent Annual Non-Exceedance Storms, March 2006 – MDEQ
- Rainfall Atlas of the Midwest, 1992 – NOAA
- Computing Flood Discharges for Small Ungaged Watersheds, June 2010 - MDEQ
- Post-Construction Storm Water Worksheet
- TR-55 CN Tables 2-2a through 2-2d

U-M, AEC

- Design Deliverables
- Storm Water Management Procedure

Federal Regulations

- Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.)

Michigan Regulations

- Michigan Act 451, Public Acts 1994, as amended, Part 31.
- Michigan Executive Orders 1991-31, 1995-4, and 1995-18.

Revision History

REVISION #	DATE	REVISION #	DATE	REVISION #	DATE	REVISION #	DATE
1	1/5/2014						
2	5/16/18						