

Checklist #3

Storm Water Management Plan Requirements

Under Village ordinance, additional impervious surfaces may trigger the need for a storm water management plan and permit. A storm water management plan is designed to protect downstream water resources and property owners from water pollution, flooding and other damage caused by urban runoff after a development is complete. Storm water management plans designed to meet the requirements of the Village ordinance shall adhere to the following guiding principles:

- 1) Preserve natural watershed boundaries and drainage patterns;
- 2) Reserve adequately sized areas for storm water infiltration, detention and treatment early in the planning process;
- 3) Locate storm water BMPs upstream from where runoff leaves the site or enters waters of the state and outside of wetlands, floodplains, primary or secondary environmental corridors or isolated natural areas;
- 4) Minimize soil compaction and maintain pre-development groundwater recharge areas;
- 5) Minimize impervious surfaces and have them drain to vegetated areas for pollutant filtering and infiltration;
- 6) Emphasize vegetated swales, warm season and wetland plantings and low flow velocities for storm water conveyance, treatment and infiltration, especially for transportation related projects;
- 7) Allow for different storm water management strategies for cleaner runoff (i.e. roofs) versus more polluted runoff (i.e. streets and parking lots);
- 8) Provide for emergency overflow in all storm water BMP designs;
- 9) Distribute storm water bioretention and infiltration BMPs throughout the site plan for large developments.

Storm Water Management Plan Must Include:

1. A **site map** in accordance with Checklist #1. Digital submittal required.
2. **Drafting date** and **contact information** for the project engineer, with the engineer's stamp and date. All other mapping elements and scale consistent with the site plan map;
3. Location of **existing and proposed storm water discharge points**;
4. Delineation and labeling of all proposed **impervious areas** and accompanying area computations.
5. Final **design drawings** of all proposed storm water BMPs with unique references to support documentation, prepared in accordance with minimum Village standards and of sufficient clarity for those responsible for site grading, including:
 - a. Plan views showing the **location of proposed BMPs** in combination with the site plan map at a scale of 1 inch equals no more than 100 feet;
 - b. Additional **detail plan view** drawings at a scale of 1 inch equals no more than 40 lineal feet, showing proposed 2 foot contours and all critical design features and elevations;
 - c. One detailed **cross-section** and one profile of each BMP, drawn to scale, with locations shown on the plan view, and showing all critical design features, side slopes, structures, soil profiles and elevations, including seasonal high water table and existing grade;
 - d. Detailed drawings or **material specifications** for inlets or outlets.
6. Type, size, location and cross-sections of all pipes, open channels, grade stabilization structures and other proposed storm water **conveyance systems**, with unique references to support documentation.
7. Location and dimensions of proposed **drainage easements**.

- 8. Location, dimensions and surfacing materials or soils data of proposed **access lanes** and delineations of easements needed to allow future maintenance of storm water BMP's. Minimum width of any access easement shall be 15 feet.
- 9. Location of soil borings and **soil profile evaluations** with surface elevations and unique references to supplemental data sheets, as needed to determine feasibility of any proposed storm water BMP and to comply with applicable technical standards such as basement/groundwater separation requirements.
- 10. Detailed **construction notes** explaining all necessary procedures to be followed to properly implement the plan, including planting and landscaping specifications, timing and sequencing of construction and any temporary measures needed to protect BMPs during the construction phase.
- 11. Detailed **construction inspection plan**, outlining the critical elements in the plan that need to be surveyed or inspected by a representative of the project engineer, the Village, and the timing and notification requirements involved (Identify who is responsible).
- 12. A final **maintenance agreement** in accordance with ordinance requirements.
- 13. Support documentation summarized in accordance with Village standards, must include at least the following:
 - a. A **narrative** summary of the storm water plan. (May combine with erosion control plan).
 - b. **Maps** of existing and proposed **watersheds**, subwatersheds, Tc/Tt flow paths, soil types, hydrologic soil groups, land uses/cover type and runoff curve numbers within the site and draining into the site from adjacent properties, with unique references to hydrology data summaries and the ultimate receiving water body(s) for off-site discharges.
 - c. Pre-development and post-development **hydrology** and pollutant loading (if applicable) **data** for each watershed, such as peak flows and runoff volumes, as needed to meet the requirements of the ordinance. All major assumptions used in developing the input parameters shall be clearly stated and cross-referenced to the maps.
 - d. **Impervious** surface maps and calculations of runoff volumes and effective infiltration areas.
 - e. **Hydraulic & hydrologic data summaries** for all existing and proposed pipes, channels, grade stabilization structures and other runoff conveyance systems, and the necessary documentation to demonstrate compliance with the site drainage requirements (see pg. 4).
 - f. **BMP design data** for each proposed BMP, showing how it complies with applicable technical standards and the requirements of the ordinance, following approved Village format.
 - g. **Soil evaluation reports** with matching references to map features, location and elevations.
 - h. A cover sheet **stamped and signed by a professional engineer** registered in the State of Wisconsin indicating that all plans and supporting documentation have been reviewed and approved by the engineer and certifying that, to the best of their knowledge, the submitted plans comply with the requirements of the ordinance.
 - i. For sites where changes are proposed in storm water flow paths or where proposed storm water discharges may otherwise have a significant negative impact on downstream property owner(s), the Village may require the applicant to submit written authorization or complete other legal arrangements with the affected property owner(s).

Summary of Storm Water Management Plan Technical Requirements

Listed below is a brief summary of the specific storm water management planning requirements and performance standards that must be met on all sites. It is highly recommended that the applicant meet with the Village prior to preparing a site plan to determine the applicability of these requirements early in the planning process. Please note that this is only a summary. It is intended to be a general guide for the project engineer. For details on any of the items listed, see the ordinance.

1. Peak Discharge. The calculated post-development peak storm water discharge rate for the 100 year design storm shall not exceed the calculated pre-development discharge rates for the 10-year design storm and the calculated post-development peak storm water discharge rate for the 1, 2 and 10 year design storms shall not exceed the calculated pre-development discharge rates for the 1, 2-year design storm.

2. Total Suspended Solids. By design, each storm water management plan must meet the following post-development total suspended solids (TSS) reduction targets, based on average annual rainfalls, as compared to no runoff management controls:
 - A. For new land development and in-fill development, 80% TSS reduction;
 - B. For redevelopment, 40% TSS reduction from parking areas and roads;

3. Infiltration.

Post-Development Infiltration Volumes (%)

| Percent Connected Impervious Surface | <u>Description / Example Land Uses</u> | Post-Development Infiltration Volume | Maximum Effective Infiltration Area |
|--------------------------------------|--|--------------------------------------|-------------------------------------|
| Up to 40% | Description: Low Imperviousness Example land uses: low density residential, parks, cemeteries | 90% of pre-development | 1% of Site |
| >40% up to 80% | Description: Medium Imperviousness Example Land Uses: medium and high density residential, multi-family residential, industrial, institutional, office park | 75% of pre-development | 2% of Site |
| >80% | Description: High Imperviousness Example Land Uses: commercial strip malls, shopping centers, commercial downtowns | 60% of pre-development | 2% of Site |

***Note:** For details on definitions, pretreatment requirements, exclusions, exemptions, alternative uses of storm water, well setbacks, soil filtering requirements, groundwater protection, etc. - see the ordinance.

4. Protective Areas. A “protective area” is a vegetative buffer that must be maintained between a proposed impervious surface and the nearest water resource, measured from the “top of channel”. Storm water BMPs may be located in the area, but cannot encroach on wetlands, floodplains or environmental corridors. Minimum widths of protective areas are shown in the table below:

| Site Description | Protective Area Min. Width |
|------------------|----------------------------|
| | |

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|--|-------------------------------|
| All Lakes and Streams (See County GIS System) | 50 Lineal Feet |
| "Outstanding" and "Exceptional Resource Waters" Wetlands: | 75 Lineal Feet |
| ▪ Highly Susceptible. | 75 Lineal Feet |
| ▪ Less Susceptible. | 10 % of Average Wetland Width |
| Concentrated Flow Channels (>130 Acre Drainage) | 10 Lineal Feet |

5. Fueling and Vehicle Maintenance Areas. Must have BMPs designed, installed and maintained to reduce petroleum within runoff, such that the runoff that enters waters of the state contains no visible petroleum sheen.

6. Site Drainage.
 - A. *Drainage easements* must be recorded to preserve major storm water flow paths, specify maintenance responsibilities, restrict buildings/structures and prevent any grading, filling or other activities that obstruct flows.
 - B. *Site grading* must ensure positive flows away from all buildings, roads, driveways/septic systems, coordinate with general drainage patterns for the area, and minimize adverse impacts on adjacent properties.
 - C. *Street drainage* must prevent concentrated flows from crossing the traffic lanes. Design flow depths at the road centerline must not exceed 6 inches during the 100-year, 24-hour design storm (planned land use).
 - D. *Bridges and cross-culverts* must facilitate fish passage and prevent increased flooding or channel erosion upstream or downstream from the structure. All bridges and cross culverts on collector and arterial roadways shall be designed to convey the 100-year, 24-hour design storm. All bridges and cross culverts on local roadways shall be designed to convey the 10-year, 24-hour design storm while providing an overland flow path for the 100-year, 24-hour design storm. A floodplain analysis is required for all projects impacting a navigable waterway.
 - E. *Basement floor* surfaces must be built at least 1 foot above the seasonal high water table elevation and avoid all hydric soils.
 - F. *Open channels* must carry flows from a 100-year, 24-hour design storm. Side slopes shall be no steeper than 3h:1v and the longitudinal slope shall be no flatter than 1 percent.
 - G. *Storm sewers* shall be designed to convey the 10-year, 24-hour design storm while providing an overland flow path which does not impact structures for the 100-year, 24-hour design storm.
 - H. *changes to Storm Water Discharges* that cause significant changes to downstream property owners may need an easement or other agreements prior to permit issuance.
 - I. *Buildings* must be protected from 100-year, 24-hour design flows for all drainage systems. For homes and businesses (human occupancy), the following additional requirements shall apply (by deed restriction):
 - The lowest elevation of the structure that is exposed to the ground surface must be at least 2 feet above the 100-year flow elevation.
 - Must be setback at least 50 feet from the 100-year flow line.

Note: The Village may establish more stringent requirements than those listed based on unique site conditions, such as sensitive water resources or downstream landowner impacts.

The Village requires map items listed above to be submitted in digital form, if available.