



PERMANENT STORM WATER MANAGEMENT PLAN CHECKLIST

Revised April 2014

Key: [ ] = Yes, [x] = No, Blank = Not Applicable. Site: \_\_\_\_\_ Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_ Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

GENERAL

- [ ] Atlas 14, Volume 8 rainfall depths must be used with an SCS Type II, 24 hour distribution. Rainfall Depths are as follows for the listed design events; 2yr: 2.94inches, 10yr: 4.47 inches, 100yr: 7.81 inches
[ ] Size of the drainage area served shown:
• Total project area and total impervious surface areas of project.
• Total estimated impervious surface areas of ultimate development.
[ ] Final plan is signed by a licensed professional
[ ] Submitted Signed Drainage Report per City Template
[ ] Owner name(s), email address, and address(es) listed.
[ ] Plan is 1"=50' or larger scale. North arrow shown.
[ ] Plan is drawn in two-foot contours. All finished contours and adequate existing contours are labeled.
[ ] Existing contours are dashed and proposed are solid.
[ ] Existing public and private utilities are shown.
[ ] Soil types shown (in drainage report).
[ ] Areas not to be disturbed clearly defined.
[ ] ALL receiving waters, including wetlands, within 1 mile shown or identified, including impaired waters.
[ ] Temporary stockpiles include additional sediment control and temporary cover after 14 days (7 days if discharging to and within 1 mile of an impaired water).
[ ] Property limits are shown. Streets are labeled. Lot & block information shown if platted. Street address shown if unplatted.
[ ] Drainage easements are shown and labeled on the plan.
[ ] Storm water management areas are platted as outlots; a facility that will serve only the lot on which it is located may simply be a drainage easement on that lot.
[ ] Schedule of BMP installation shown.

DRAINAGE SWALES & EASEMENTS

- [ ] Drainage and Utility easements are shown and labeled on the plan.
[ ] Control elevations for drainage ways are provided. 100year flow contained in easement
[ ] Minimum slope of drainage swales is 2%.
[ ] Drainage easements are seeded and protected with erosion control blankets or they are sodded where concentrated flow from more than 1 acre or 4 lots is directed. Blanket category specified per Mn/DOT 3885.1. Plan depicts required blanket locations.
[ ] Velocity computations are provided for drainage easements where concentrated flow from more than 2 acres or 8 lots is directed. Where 10-year velocities exceed 5 ft/sec, permanent turf reinforcement mats are installed per City std. plate 7-07. Mats per Mn/DOT 3888.1 or manufacturer and product is specified. Plan depicts blanket locations and cross sections.
[ ] Easement documents are signed and submitted to Public Works with a check for recording if not included in plat.
[ ] Ditches within 200' of surface water on Property line

stabilized in 24 hrs after connection.

STORM DRAIN SYSTEM, INLETS, & OVERFLOWS

- [ ] Atlas 14 Intensity-Duration-Frequency (IDF) curve must be used when designing storm sewer system using the rational method. If storm sewer is designed using SCS methodologies, the 10 year design event rainfall depth must be used.
[ ] In locations where two on-grade catch basins are used, the Neenah curb opening calculator (or approved equal) shall be used to verify that double catch basins are spaced appropriately to maximize capture efficiency.
[ ] All apron elevations (inlets and outlets) are labeled.
[ ] Area inlet, CB, MH, elevations are labeled. Pipe sizes and types are labeled.
[ ] 400' max. manhole spacing for lines 15" diameter or less.
[ ] 500' max. manhole spacing for lines 18" to 30" diameter.
[ ] Flow direction change is <=90 degrees at junctions.
[ ] Apron inlets to the storm sewer include trash racks.
[ ] Trash racks on inlet structures in wooded areas designed assuming a minimum of 50% plugging condition.

OUTLETS & ENERGY DISSIPATION

- [ ] Discharge direction of flow generally 45 degrees or less to the flow direction of receiving ditch or stream.
[ ] Discharges to rear property lines shall generally be piped to at least the rear property line.
[ ] Where discharge pipe velocities are 10 fps or less, riprap and filter volumes are indicated in accordance with Mn/DOT Standard Plate
[ ] Where discharge pipe velocities are greater than 10 fps, energy dissipater is provided along with riprap (or alternative armoring method) and filter media.
[ ] Discharges on slopes steeper than 10% shall not be allowed unless discharge is into existing drainage ditch and volume of water in ditch is not greater than 110% of the pre-developed condition.
[ ] Pipe outlet energy dissipation complete within 24 hours of connection to surface water or outlet.
[ ] Evaluation of downstream adequacy provided (capacity & stability).

TEMPORARY SEDIMENT BASINS

- [ ] Sized to store 2-year, 24-hr storm from the drainage area below the outlet pipe (no smaller than 1800 cf/acre of drainage area), or
[ ] Sized at 3,600 cf/acre of drainage area.
[ ] Designed to minimize short-circuiting.
[ ] Floating debris discharge is prevented.
[ ] Designed for full dewatering.
[ ] Energy dissipation provided at outlet pipe.
[ ] Principal and emergency spillway designed per BMP storm frequency standards.
[ ] Fenced if slopes exceed 4:1 per city detail.

TEMPORARY SEDIMENT BASINS (continued)

- [ ] Plan requires any permanent or temporary sediment ponds to

be constructed before other construction starts.

### **PERMANENT PONDS**

- Entire drainage/service area shown (in drainage report).
- 50 scale or larger grading plan with pond cross section.
- Where possible, provide a forebay at the inlet; locate inlet and outlet at opposite ends of pond; and provide length to width ratio >3.
- Multi-cell design where practical.
- 10:1 bench is provided for first 1 foot of depth below normal water elevation
- 4:1 max slope from normal water elevation to 100-year water elevation.
- 3:1 max slope below normal water elevation.
- Pond depth is 4 to 10 feet based on normal water level.
- Normal Water Level elevation is shown.
- 100-year high water level is shown.
- Inlets are at or below normal water level
- Outlet is designed to prevent short-circuiting and discharge of floating debris.
- Permanent pool volume =1800 cf per acre drained.
- Water quality volume equal to 1 inch runoff from total impervious surface area, at ultimate development.
- Outlet size to discharge no more than 5.66 cfs/acre of pond surface at water quality volume elevation.
- Energy dissipation on outlet piping.
- Areas less than 1 acre not draining to pond managed by:
  - Grassed swales.
  - Small ponds.
  - Grit chambers.
  - Other:
- Emergency overflow spillway is provided to accommodate 100-year event. High point elevation and direction of overflow are marked on plans.
- Emergency overflow spillway is located to protect adjacent property and large fill sections.
- 100-year runoff which is designed to flow to the pond does not bypass the pond; unmodeled 100-year flow does not enter the pond.
- Minimum 10' width at top of dam (if dam is < 15' high).
- 12' wide access and turn-around area for maintenance vehicles is shown on a slope  $\leq$  15%, cross slope  $\leq$  6%.
- Pond access is included in a min. 15' wide portion of the pond outlot. If access is in an easement across private property, a 12' wide paved access road is provided.
- Seed mix Mn/DOT 33-261 for a 10' perimeter around the pond. Seed mix Mn/DOT 35-241 for the remainder of the pond outlot.
- DNR dam safety permit obtained if dam height is > 6' and storage to top of dam is > 15 acre-ft.

### **INFILTRATION DISQUALIFICATION CHECKLIST**

- Infiltration is prohibited when the infiltration system will be constructed in:
  - Areas that receive discharges from vehicle fueling or maintenance.
  - Areas with less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the

- top of the bedrock (impermeable liner required)
- Areas that receive discharges from industrial facilities which are not authorized to infiltrate stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA
- Areas where high levels of contaminants in soil or groundwater will be mobilized by the infiltration stormwater
- Areas of predominately Hydrologic Soil Group D (clay) soils (City approval required in these conditions)

### **INFILTRATION / FILTRATION**

- Infiltration/filtration BMP may be used to retain the 1" water quality volume on site (no discharge to surface water).
- Type(s) used.
  - Infiltration basins
  - Infiltration trenches.
  - Rain gardens.
  - Sand filters.
  - Organic filters.
  - Bioretention.
  - Natural depressions (wetlands not included)
  - Other: \_\_\_\_\_
- Floatables removed before infiltration / filtration system.
- Site sensitivity analysis included .
- Evaluation of hydrologic impact included.
- Infiltration scheduled after full site development and stabilization.
- Runoff routed away from Infiltration system during construction.
- Site controlled to minimize soil compaction.
- Pretreatment sediment removal included.
- Designed for 1 inch of runoff from total impervious surface areas for ultimate development, drains within 48 hours.
- System bypass for flows that cannot be filtered.
- Minimum vertical separation of 3 feet between seasonally saturated soils (or bed rock) and bottom of infiltration/filtration system.
- Soil test results, system capacity calculations, and computer modeling results included.
- Minimum 10' width maintenance access provided.
- Infiltration systems not permitted for vehicle fueling or service areas

### **ALTERNATIVE AND COMBINED PRACTICES**

- Combined practice (narrative in drainage report).
- Alternative practice (narrative in drainage report).
- Full calculations and plans included (narrative in drainage report).

\*As a reference document see

<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/stormwater-management/minnesotas-stormwater-manual.html>

ADDITIONAL NOTES:

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