

City of Rice Lake

STORMWATER MANAGEMENT DESIGN STANDARDS

VERSION 2.0
2023

Goals and Purpose:

The general purpose of these standards is to establish regulatory requirements for land disturbing and construction activities to help safeguard persons, protect property, and prevent damage to the environment in the City of Rice Lake. The goal is to establish requirements that will:

1. Assist in meeting the City's NPDES/SDS Municipal Separate Storm Sewer System (MS4) and Construction Stormwater General Permit requirements.
2. Assist in meeting Total Maximum Daily Load (TMDL) plan waste load allocations for impaired waters, if applicable.
3. Protect life and property from dangers associated with flooding.
4. Protect public and private property and natural resources from damage resulting from stormwater runoff and erosion.
5. Provide a single, consistent set of performance goals, which apply to all developments.
6. Establishing erosion and sediment control and pollution control requirements for land disturbance activities within the jurisdiction of the City of Rice Lake.
7. Establishing post-construction stormwater management requirements to prevent or reduce water pollution after land disturbing activity is complete.
8. Promote infiltration and ground water recharge.
9. Protect functional values of all types of natural water bodies.

Compatibility with other Regulations:

That standards set forth in this document are not intended to modify or repeal any other ordinance, rule, regulation, or other provision of law. The standards of this document are in addition to the requirements of any other ordinance, rule, regulation, or other provision of law, and where any provision of these standards imposes restrictions different from those imposed by any other ordinance, rule, regulation, or other provision or law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

Ultimate Responsibility:

The standards are requirements set forth herein and promulgated pursuant to these requirements are minimum standards; therefore these requirements do not intend or imply that compliance by any person will ensure that there will be no contamination, pollution, or unauthorized discharge of pollutants.

Definitions:

Best Management Practices (BMP). Practices to prevent or reduce the pollution of the waters of the state, including schedules of activities, prohibitions or practices, and other management practices, and also

includes treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, sludge, or waste disposal or drainage from raw material storage.

[Better Site Design](#). The control and management of stormwater quantity and quality through the application of Better Site Design Techniques as outlined in the current version of the Minnesota Stormwater Manual: (http://stormwater.pca.state.mn.us/index.php/Main_Page).

[Construction Activity](#). A disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff, leading to soil erosion and movement of sediment into surface waters or drainage systems. This may include clearing, grading, filling, and excavating.

[Common plan of development or sale](#). A contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

[Dewatering](#). The removal of surface or ground water to dry and/or solidify a construction site to enable construction activity. Dewatering may require a Minnesota Department of Natural Resources water appropriation permit and, if dewatering water is contaminated, discharge of such water may require an individual MPCA NPDES/SDS permit.

[Energy Dissipation](#). Methods employed at pipe outlets to prevent erosion caused by the rapid discharge of water scouring soils.

[Erosion Control Measure](#). Measures that prevent soil particles exposure and detachment.

[Green Infrastructure](#). A wide array of practices at multiple scales that manage wet weather and that maintains or restores natural hydrology. On a regional scale, green infrastructure is the preservation or restoration of natural landscape features, such as forests, floodplains, and wetlands, coupled with policies such as infill and redevelopment that reduce overall imperviousness in a watershed. On the local scale, green infrastructure consists of site and neighborhood-specific practices.

[Karst \(active\)](#). A geographic area underlain by carbonate bedrock (or other forms of bedrock that can erode or dissolve) with less than 50 feet of sediment cover.

[Land Disturbance](#). Any project or activity, including removal of vegetation, excavations, clearing, filling, stockpiling, grading, or other earth change that directly or indirectly affects slopes, water bodies, the moving of ground cover or which may result in the movement of sediment.

[Linear Project](#). Construction or reconstruction of roads, trails, sidewalks, and rail lines that are not part of a common plan of development or sale. Mill, overlay and other resurfacing projects are not considered to be reconstruction.

[MPCA NPDES Construction Permit.](#) The current Minnesota Pollution Control Agency General Permit to Discharge Stormwater Associated with Construction Activity Under the National Pollution Discharge Elimination System State Disposal System Program (NPDES/SDS).

[Municipal Separate Storm Sewer System \(MS4\).](#) The conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains owned and operated by the City of Rice Lake.

[New Development.](#) All construction activity that is not defined as redevelopment and areas where new impervious is being created.

[Owner.](#) Includes the plural as well as the singular, and where appropriate shall include a natural person, partnership, firm, association, public, or quasi-public corporation, private corporation, or a combination of any of them, with legal or equitable interest in the parcel of record or as identified on the land disturbance permit.

[Receiving Water.](#) Any lake, river, stream, or wetland that receives stormwater discharges from the MS4.

[Redevelopment.](#) Any construction activity where, prior to the start of construction, the areas to be disturbed have 15 percent or more of existing impervious surface(s).

[Saturated soil.](#) The highest seasonal elevation in the soil that is in a reduced chemical state because of soil voids being filled with water.

[Sediment Control Measure.](#) Measures that prevent eroded sediment from leaving the site.

[Stormwater.](#) Stormwater runoff, snow melt runoff, and surface runoff and drainage.

[Structural Stormwater BMPs.](#) Stationary and permanent BMPs designed, constructed and operated to prevent or reduce the discharge of pollutants in stormwater.

[Steep Slopes.](#) Slopes that are 1:3 (V:H) (33.3 percent) or steeper in grade.

[Stormwater Pollution Prevention Plan \(SWPPP\).](#) A comprehensive plan developed to manage and reduce the discharge of pollutants in stormwater.

[City.](#) The City of Rice Lake.

[Waters of the State.](#) All streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface or

underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Receiving Waters

Amity Creek (Assessment Unit: 04010102-541): Not enough data is available on this waterbody to determine recreation, aquatic life, or fish consumption condition. Amity Creek is a Trout Stream. If runoff from a construction site is expected to discharge to Amity Creek or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Amity Creek East Branch (Assessment Unit: 04010102-557): Not enough data is available on this waterbody to determine recreation, aquatic life, or fish consumption condition. Amity Creek East Branch is a Trout Stream. If runoff from a construction site is expected to discharge to Amity Creek East Branch or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Miller Creek (Assessment Unit: 04010201-512): Impaired for Aquatic Macroinvertebrate Bioassessments; Chloride; Escherichia coli; Lack of coldwater assemblage; Temperature, water. These impairments may not support a thriving community of fish and other aquatic organisms, as indicated by absence of an assemblage of organisms typical of coldwater streams and elevated water temperature and excessive chloride (salt) and macroinvertebrate population assessments. Miller Creek may not be suitable for swimming and wading due to high bacteria levels caused by the presence of human or animal waste in the water. If runoff from a construction site is expected to discharge to Miller Creek or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Tischer Creek Tributary (Assessment Unit: 04010102-B57): Not enough data is available on this waterbody to determine recreation, aquatic life, or fish consumption condition. Tischer Creek is a Trout Stream. If runoff from a construction site is expected to discharge to Tischer Creek or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Wild Rice Lake (Assessment Unit: 69-0371-00): Impaired for Mercury in Fish Tissue. These impairments cause concentrations of mercury in fish tissue exceed the water quality standard. These impairments are not construction activity related.

Lester River Tributary (Assessment Unit: 04010102-949): Not enough data is available on this waterbody to determine recreation, aquatic life, or fish consumption condition. If runoff from a construction site is expected to discharge to Lester River or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Lester River (Assessment Unit: 04010102-549): Impaired for Mercury in Water Column; Turbidity. These impairments may not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids). If runoff from a

construction site is expected to discharge to Lester River or its tributaries, additional BMPs as outlined in Appendix A of the MPCA NPDES Construction Permit are required.

Beaver River (Assessment Unit: 04010202-596):

There are no impairments listed for the Beaver River.

Wetlands: Governed by the Wetland Conservation Act (WCA)

Special Waters

DNR Designated Scientific and Natural Areas (Minn. R. 7050.0180, Subp. 4): None

State Designated Wild River Segments (Minn. R. 7050.0180, Subp. 5): None

Federal or State Designated Scenic or Recreational River Segments (Minn. R. 7050.0180, Subp. 6a):
None

Calcareous Fen (Minn. R. 7050.0180, Subp. 6b): None

Receiving Waters with Prohibited Discharges, Restricted Discharges

Receiving Waters with Prohibited or Restricted Discharges (Minn. R. 7050.0180, Subp. 3, 4, 5 and 6):

Lake Superior – The City of Rice Lake shall not cause or allow a new or expanded discharge of any sewage, industrial waste, or other waste to Lake Superior unless there is not a prudent and feasible alternative to the discharge.

Trout Waters: Amity Creek (Assessment Unit: 04010102-541); Amity Creek East Branch (Assessment Unit: 04010102-557); Miller Creek (Assessment Unit: 04010201-512) Impaired for Aquatic Macroinvertebrate Bioassessments; Chloride; Escherichia coli; Lack of coldwater assemblage; Temperature, water; Tischer Creek Tributary (Assessment Unit: 04010102-B57).

Impacts to Endangered or Threatened Species or Critical Habitats: None

Adversely Affected Historical Properties: None

Drinking Source Water: None; The City of Rice Lake receives their drinking water from the adjacent City of Duluth who has their own drinking water source protection in place.

Related Review and Regulations



Environmental Review Requirements (Minn. R. 4410, Environmental Review): Environmental reviews (EAW & EIS) shall be completed as required by Minnesota Administrative Rules: Chapter 4410, Environmental Review.

MPCA NPDES Construction Permit: <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/construction-stormwater/index.html>

South St. Louis Soil & Water Conservation District: <http://www.southstlouisswcd.org/>

Design Requirements

SUMMARY OF REQUIREMENTS

Disturbed Area 	< 1 acre	≥ 1 acre
Requirement 		
Land Disturbance Permit		X
Stormwater Pollution Prevention Plan (SWPPP)		X
Construction Site Stormwater Runoff Controls	X	X
Post-Construction Stormwater Management Submittal	**	If greater than 1 acre of added impervious**
MPCA NPDES Construction Permit		X

NOTE: DISTURBED AREA INCLUDES ALL LAND DISTURBANCE AND CONSTRUCTION ACTIVITY, INCLUDING LAND AREA THAT IS PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE. WHERE DEEMED NECESSARY BY THE CITY OF RICE LAKE TO SAFEGUARD PERSONS, PROTECT PROPERTY, AND PREVENT DEGRADATION TO THE ENVIRONMENT IN THE CITY OF RICE LAKE, REQUIREMENTS MAY BE ENFORCED FOR DISTURBED AREAS WITH LESS THAN 5,000 SF.

* POST-CONSTRUCTION STORMWATER SHOULD BE CONSIDERED FOR ALL DESIGNS BUT IS NOT REVIEWED UNLESS 1 ACRE OR MORE OF IMPERVIOUS AREA IS ADDED.

Better Site Design

The City encourages the use of Better Site Designs as identified in the current version of the Minnesota Stormwater Manual. Better Site Design involves a series of techniques applied early in the design process to reduce impervious cover, conserve natural areas, use pervious to more effectively treat stormwater runoff, and promote the treatment train approach to runoff management.

Stormwater Pollution Prevention Plan (SWPPP)

A SWPPP shall be submitted with the Land Disturbance Permit Application. The SWPPP shall be consistent with the requirements outlined in this document, City Ordinances, and State and Federal regulations.

SWPPP Plan Content

The SWPPP shall be completed prior to submitting a Land Disturbance Permit Application and prior to conducting any land disturbing activities. SWPPP plan content must include at a minimum the items required and identified in the MPCA NPDES Construction Permit. This includes information to meet the requirements of the Construction Site Stormwater Runoff Control and Post-Construction Stormwater Management sections of this document, where applicable.

Construction Site Stormwater Runoff Control Requirements

The construction site stormwater runoff control requirements shall apply to all land disturbance and construction activity that disturbs land of equal to or greater than 1 acre, or includes the disturbance of less than 1 acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than 1 acre or as deemed necessary by the City of Rice Lake to safeguard persons, protect property, and prevent degradation to the environment in the City of Rice Lake.

Site plans and project documentation must incorporate erosion and sediment controls and pollution controls as required and defined in the MPCA NPDES Construction Permit, including those identified in the MPCA NPDES Construction Permit for discharges to special and impaired waters, when applicable. These requirements are briefly described below.

A. Temporary Sediment Basins

Temporary sediment basin(s) are required to treat runoff where deemed necessary by the MPCA NPDES Construction Permit and where deemed necessary by the City of Rice Lake to safeguard persons, protect property, and prevent degradation to the environment.

B. Erosion Prevention Practices

Erosion Prevention Practices (BMPs) must be planned for, implemented, and maintained to prevent soil particle exposure and detachment in order to minimize site erosion.

C. Sediment Control Practices

Sediment Control Practices (BMPs) must be planned for, implemented, and maintained to prevent eroded sediment from leaving the site and to minimize sediment and other pollutants from entering surface waters, including curb and gutter systems and storm sewer systems.

D. Dewatering Activities

Dewatering or basin draining activities to remove surface or ground water to dry and/or solidify a construction site to enable construction activity must incorporate appropriate BMPs to discharge in a manner that does not cause nuisance conditions. Dewatering may require a Minnesota Department of Natural Resources (DNR) water appropriation permit and, if dewatering water is contaminated, discharge of such water may require an individual MPCA NPDES/SDS permit.

E. Inspections and Maintenance

Construction sites must be inspected on a regular basis to ensure the integrity and effectiveness of all erosion prevention BMPs, sediment control BMPs, and pollution prevention management measures. All non-functional BMPs must be repaired, replaced or supplemented with functional BMPs.

F. Pollution Prevention Management Measures

Construction sites must incorporate pollution prevention management measures to reduce the probability of spills, leaks and discharges of pollutants.

G. Final Stabilization

Upon the completion of construction activity final stabilization must be completed to include perennial vegetative cover on all exposed soils, or other equivalent means necessary to prevent soil failure under erosive conditions.

Post-Construction Site Stormwater Management Requirements

Site plans and project documentation must incorporate post-construction (permanent) stormwater management best management practices/systems to manage stormwater long term once construction activity is complete. Permanent stormwater systems shall be designed consistent with the Minnesota Stormwater Manual and in accordance with the following requirements:

A. Green Infrastructure

Green Infrastructure techniques and practices (including, but not limited to, infiltration, reuse/harvesting, conservation design, urban forestry, green roofs, etc.), shall be given preference as design options consistent with zoning, subdivision and PUD requirements.

A combination of techniques which utilize infiltration, capture and reuse and other types of low impact development techniques are encouraged, rather than relying on a single practice or infiltration alone.

B. Discharges to Trout Waters (Amity Creek, Amity Creek East Branch, Miller Creek, Tischer Creek Tributary)

Permanent stormwater management facilities that discharge to a trout stream must minimize any increase in the temperature of runoff to the trout stream receiving water and/or tributaries. Projects must minimize the impact using one or more of the following measures:

- Minimize new impervious surfaces.
- Minimize the discharge from directly connected impervious surfaces.
- Implement infiltration or other volume reduction practices.
- Incorporate shading, filtration, vegetated discharge practices.
- Other methods proven to reduce/minimize temperature increases.

C. Stormwater Runoff Rate Control

Post-development peak flow rates at each discharge point from the project area shall not exceed pre-development peak flow rates for the 2, 10, and 100-year, 24-hour storm events, unless otherwise approved by the City. The City of Rice Lake may impose a more stringent requirement(s) where downstream conveyance systems are known to have capacity concerns.

D. Storm Sewer Conveyance System

Local storm sewer systems shall be designed for the 10-year storm event, unless otherwise approved by the City of Rice Lake. The City of Rice Lake may impose a more stringent requirement(s) where deemed necessary.

The Rational Method shall be the preferred methodology for design of local systems. Culvert crossings or storm systems in County or State right-of-way may have a design frequency and requirements which differ from the City's requirements. The Designer shall contact each agency/unit of government to determine the appropriate design requirements and frequency for hydrologically-connected systems.

E. Flood Management

1. The low floor elevation shall be set to the higher of the following:
 - a. Where an effective Base Flood Elevation (BFE) has been established the low flood elevation adjacent to a surface water body shall be established in accordance with the City's floodplain management requirements, found in City of Rice Lake Ordinance 20.
 - b. The low floor elevation shall be two (2) feet or more above the 100-year, 24-hour event as determined by a technical evaluation by a qualified engineer or hydrologist.
2. An emergency overflow shall be incorporated into the site design at or above the BFE or modeled high water level to convey a 100-year discharge away from the buildings to the next downstream water body. The lowest opening shall be at least one and a half (1.5) feet above the emergency overflow elevation of the adjacent water body.
3. Existing, natural, or man-made emergency overflows shall be analyzed as part of the design process.
4. Where natural overflow does not exist, the designer shall consider the possibility of long duration and extreme events. High water elevations shall be determined with analysis based on runoff volume resulting from a 100-year/10-day snowmelt (8.1 inches) and saturated or frozen soil conditions where CN=100) and/or the runoff resulting from a 100-year back-to-back rain event.

F. Water Quality Treatment and Volume Control Requirements

Post-Construction stormwater management must meet the Minimal Impact Design Standards (MIDS) outlined and established by the Minnesota Pollution Control Agency (MPCA). These standards can be found within the Minnesota Stormwater Manual and are summarized below:

([http://stormwater.pca.state.mn.us/index.php/Overview_of_Minimal_Impact_Design_Standards_\(MIDS\)](http://stormwater.pca.state.mn.us/index.php/Overview_of_Minimal_Impact_Design_Standards_(MIDS)))

New Development Areas (non-linear)

Nonlinear development projects, on sites without restrictions, shall capture and retain on site 1.1 inches of runoff from all impervious surfaces on the site.

Redevelopment Areas (non-linear)

Nonlinear redevelopment projects, on sites without restrictions, shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

Linear Development

Linear projects, on sites without restrictions, shall capture and retain the larger of the following:

1. 0.55-inches of runoff from the new and fully reconstructed impervious surfaces on the site.
2. 1.1-inches of runoff from the net increase impervious area on the site.

Flexible Treatment Options for Sites with Restrictions

Every attempt to comply with the performance standards identified above shall be made. If full compliance with the performance standards is not possible due to any of the factors identified below, the reasons must be clearly documented. Options should be considered and documented to examine the merits of relocating project elements to address varying soil conditions and other constraints across the site. If site constraints or restrictions limit the full treatment goal, the flexible treatment options identified below shall be used.

1. Infiltration Systems are prohibited in the following areas, regardless of the amount of new and fully reconstructed impervious surface (See "higher level of engineering review" in the Minnesota Stormwater Manual for more information):
 - a. Areas that that receive runoff from vehicle fueling and maintenance areas;
 - b. Areas where infiltrating stormwater may mobilize high levels of contaminants in soil or groundwater;
 - c. Areas where soil infiltration rates are field measured at more than 8.3 inches per hour unless the soils are amended to slow the infiltration rate below 8.3 inches per hour;
 - d. 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 bedrock;
 - e. Areas of predominately Hydrologic Soil Group type D soils (clay);
 - f. Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13, if the system will be located:
 - i. In an Emergency Response Area (ERA) within a DWSMA classified as having high or very high vulnerability as defined by the Minnesota Department of Health; or
 - ii. In an ERA within a DWSMA classified as moderate vulnerability unless a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater has been approved by the City of Rice Lake; or
 - iii. Outside of an ERA within a DWSMA classified as having high or very high vulnerability unless a higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater has been approved by the City of Rice Lake.
 - g. Areas within 1,000 feet upgradient or 100 feet downgradient of active karst features; and
 - h. Areas that receive runoff from the following industrial facilities not authorized to

infiltrate stormwater under the NPDES stormwater permit for industrial activities:

- i. automobile salvage yards;
- ii. scrap recycling and waste recycling facilities;
- iii. hazardous waste treatment, storage, or disposal facilities;
- iv. wood preserving facilities; or
- v. air transportation facilities that conduct deicing activities.

2. Flexible Treatment Options Sequencing

The MIDS Design Sequence Flowchart should be utilized when determining the appropriate flexible treatment option. The Design Sequence Flowchart can be found in Appendix A or on the MN Stormwater Website.

(http://stormwater.pca.state.mn.us/index.php/File:Final_MIDS_Flow_chart.pdf)

Each alternative should be considered in sequence starting with Flexible Treatment Option #1 and progressing to Flexible Treatment Option #3. The specific reasons why each alternative option cannot be met must be documented. When all of the conditions are fulfilled within an option alternative, the sequence is complete.

a. Flexible Treatment Option 1 (FTO #1)

Attempt to comply with the following conditions:

- i. Achieve at least a 0.55 inch volume reduction goal, and;
- ii. Remove 75 percent of the annual total phosphorus load, and;
- iii. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

b. Flexible Treatment Option 2 (FTO #2)

Attempt to comply with the following conditions:

- iv. Achieve volume reduction to the maximum extent practicable (as determined by the City), and;
 - v. Remove 60 percent of the annual total phosphorus load, and;
 - vi. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.
- c. Flexible Treatment Option 3 (FTO #3)
- Off-site treatment / mitigation at an off-site location may be implemented at the City's discretion. The off-site treatment must meet the performance of 1.1 inches of volume reduction for new development or redevelopment standards identified above. The owner and/or operator must provide appropriate documentation to the City as support and the proposed mitigation must meet the following criteria:
- i. Mitigation project areas should be selected in the following order of preference. Proposed mitigation locations must be reviewed and approved by the City:
 1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity
 2. Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity
 3. Locations in the next adjacent DNR catchment area up-stream
 4. Locations within the City
 - ii. Mitigation projects must involve the creation of new structural stormwater BMPs, the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP.
 - iii. Routine maintenance of structural stormwater BMPs cannot be used to meet mitigation requirements.
 - iv. Mitigation projects must be completed within 24 months after the start of the original construction activity.
 - v. If the mitigation project is a private structural BMP and the City is not responsible for long-term maintenance of the project, the City will require written and recorded documentation of maintenance responsibilities.
3. Volume reduction techniques shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the MN Stormwater Manual.
4. Higher priority shall be given to BMPs that include volume reduction, secondary preference is to employ filtration techniques, followed by rate control.

Design Computation Criteria

1. Rainfall amounts and distributions for stormwater management and conveyance system analysis shall utilize the Duluth Int Ap Station (21-2248) located at the Duluth International Airport near the City of Rice Lake, Minnesota, NOAA Atlas 14 data and distributions with antecedent moisture conditions 2 (AMC-2) shall be used.
2. The City may require designers to run additional modeling scenarios with rainfall depth greater than the 100-year event. For example, modeling a 10-inch event or back-to-back 100-year events will allow the designer to require and evaluate the sensitivity of the system response to larger events relative to detention /retention area high water levels and emergency overflow paths. The designer is encouraged to run extreme events scenarios as part of the initial site evaluation and design process.
3. Outlet energy dissipation shall be designed in accordance with MnDot Design Criteria.
4. Permanent stormwater features shall provide adequate maintenance access. Vehicle lanes of not less than 10-feet wide and 15 percent slope shall be provided to access the facilities unless otherwise approved by the City of Rice Lake.
5. Infiltration Practices at a minimum:
 - a. Shall provide for pre-treatment of runoff to trap sediment prior to entering the infiltration system.
 - b. Must be designed to draw down to the bottom elevation of the practice within 48 hours. The maximum ponding depth shall be based on the soil infiltration rate determined from site specific soil investigation data taken from the location of proposed infiltration practice(s) on site.
6. Stormwater Wet Ponds, at a minimum:
 - a. Shall have a minimum 4-foot ponding depth and a maximum 10-foot ponding depth;
 - b. Shall have a minimum 20-foot buffer around the perimeter of the basin. The buffer shall extend from the 100-year high water level;
 - c. Shall have an aquatic bench having 10:1 (H:V) slope for the first 10 feet extending down from the normal water level of the basin;
 - d. Shall have a 3:1 maximum slope;
 - e. Shall be configured to prevent short circuiting;
 - f. Shall have skimming devices designed to remove oils and floatable material; and
 - g. Shall include liner material (compacted cohesive soils, geosynthetic materials, plastic liner, soil additives, or other material) when located in areas with high infiltration rates and/or when located in areas with prohibited infiltration to create a permanent pool and prevent contamination of ground water.

Long Term Maintenance of Stormwater BMPs

The type and interval of maintenance activities for stormwater BMPs are often dependent upon the degree or pollutant loading from a particular drainage basin. BMP maintenance can be broken into three categories: inspection, routine maintenance, and major maintenance.

Private Facilities

1. Maintenance Agreement:

The owner shall enter into a Maintenance Agreement with the City. An example maintenance agreement can be found in the Appendix A.

2. Maintenance Plan:

An inspection and maintenance plan shall be developed, approved, and included as an attachment with the Maintenance Agreement. At a minimum, maintenance plan must include the following information:

a. Inspections

- i. Responsible person(s) for completing inspection(s);
- ii. Frequency of inspections are to be completed. At a minimum, stormwater facilities must be inspected annually; and
- iii. Each BMP type has its own unique characteristics. However, inspections will generally consist of an assessment to assure its functionality and general condition.

b. Routine Maintenance

- i. Responsible person(s) for conducting routine maintenance;
- ii. Frequency of routine maintenance is to be completed. At a minimum, routine maintenance must be completed at a frequency necessary to maintain the performance standard they were designed for; and
- iii. The type of routine maintenance anticipated. Routine maintenance will generally consist of trash and vegetation removal, unclogging of drains, minor sediment removal, and exchange of filter media where applicable.

c. Major Maintenance

- i. Responsible person(s) for conducting major maintenance;
- ii. Anticipated frequency of major maintenance is to be completed. At a minimum, major maintenance must be completed as required from inspection reports and/or when there are BMP failures; and
- iii. The type of major maintenance anticipated. Major maintenance will generally consist of significant reconstruction including dredging, excavation, removal of existing media, replacing fabric, replacing the under-drain, and re-establishment of vegetation.

Public Stormwater Features

1. Prior to final acceptance of the feature, the following must be completed:

- a. Submittal of as-built drawing(s).
- b. Documentation certifying the BMP has been constructed in accordance with design specifications.
- c. Final inspection with City Staff or City Representative.

Appendix A

Example Maintenance Agreement