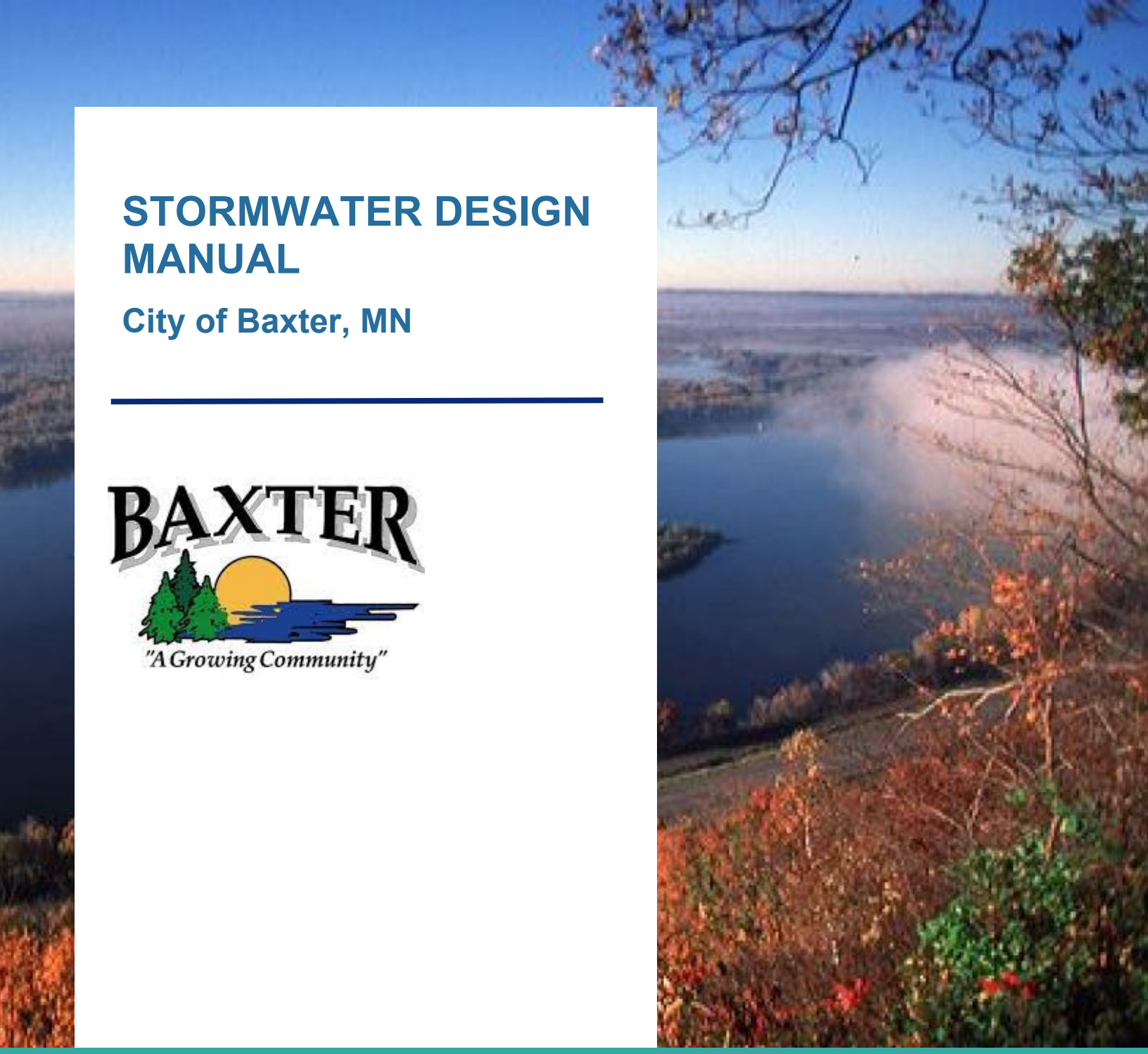

STORMWATER DESIGN MANUAL

City of Baxter, MN

BAXTER

"A Growing Community"

City Council Adoption Date - April 18, 2023

CONTACTS:

Baxter Public Works 218.454.5115

STORMWATER DESIGN MANUAL:

City of Baxter, MN

The City of Baxter, MN (City) finds that uncontrolled stormwater runoff and construction site erosion from land disturbing activity can have significant adverse impacts upon local and regional water resources. They can diminish the quality of public health, safety, public and private property, as well as natural resources of the community in the following ways:

1. Increasing runoff volumes and peak flood flows lead to overburdened storm sewers, drainage ways and other storm drainage systems that threaten public health, safety, property and general welfare.
2. Increasing pollutant loadings of sediment, nutrients, heavy metals, toxics, debris, bacteria, pathogens, biological impairments, thermal stress, and other pollutants diminish the capacity of lakes and streams to support fish, aquatic life, as well as recreational and water supply uses.
3. Increasing bank erosion and stream bed scour degrade physical stream/river habitat by diminishing groundwater recharge and stream base flows and increase stream temperatures.
4. Increasing the occurrence and levels of flooding undermine floodplain management efforts.
5. Changing wetland hydrology and increasing pollutant loads alter wetland communities.
6. Reducing recharge and increasing potential pollutant loading impact groundwater.

Purpose

The City is working to achieve water quality goals by developing stormwater design standards for development that occurs within the City. Consistent with City ordinances, this document serves as the design criteria for public and private development and redevelopment.

Policy

The City shall review all applicable development applications in light of this document to ensure that all proposed development and redevelopment projects contribute to meeting the City's natural resource protection goals.

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https://www.baxtermn.gov/government/departments/public-works

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BAXTER "A Growing Community"		**DATE: 4/18/23** **Revised:**	**Number:**
		City Administrator:	
		For: Engineering and Community Development	
		Subject: Stormwater Design Guidelines	

Contents

SECTION ONE: Ordinances and Special Waters

1.1 Ordinances

Each permitted project in the City must follow all City ordinances, this Stormwater Design Manual, as well as the Minnesota Pollution Control Agency's (MPCA's) National Pollution Discharge Elimination System (NPDES) Construction Stormwater (CSW) General Permit to be in full compliance.

Designers must be familiar with the following City Codes when working within the City of Baxter:

City Code – 7-4: Right of Way

City Code – 8-5: Stormwater Control and Regulations

City Code – 9-1-5: Elevation

City Code – Title 12 Flood Control

The City has developed stormwater ordinances and this supplemental design manual to facilitate the ease of permitting for development and redevelopment within the municipal boundaries. The stormwater ordinance is required under the City's MPCA's Municipal Separate Storm Sewer System (MS4) General Permit and articulates specific performance criteria of stormwater systems. This Stormwater Design Manual was developed to guide developers and designers through the design process to meet the design elements required by the City. A combination of successive practices may be used to achieve the applicable requirements specified.

All permanent stormwater management plans and associated calculations must be submitted to and approved by the City Engineer prior to the start of construction activity. Designers are expected to follow the requirements of this Stormwater Design Manual to meet the rate control, water quality, and volume control requirements of the City. This manual was created in accordance with the MPCA Minnesota Stormwater Manual and the Minnesota Department of Transportation Drainage Manual. Items not explicitly covered by this design manual shall adhere to the design requirements of the MPCA Minnesota Stormwater Manual and the Minnesota Department of Transportation Drainage Manual. Deviations from the recommended guidance will require detailed written explanation with discretion given by the City Engineer. Stormwater facilities included as part of the final design for a permanent development shall be addressed in the design package submitted to the City and shall meet the criteria given in this document.

1.2 Wetlands

Incorporate buffer strips or pretreatment where feasible to preserve wetland quality.

Runoff must not be discharged directly into a wetland without appropriate water quality and volume control, as required by City code, the MPCA, and Minnesota Rules 7050.0186, and 7090.2. This manual, or any City permit, does not authorize discharges to a wetland unless the designer complies with the following requirements:

1. If the project has any discharge with the potential for significant adverse impacts to a wetland, (e.g., conversion of a natural wetland to a stormwater pond) designers must demonstrate that the wetland mitigative sequence has been followed in accordance with Minn. R. 7050.0186.
2. If the potential adverse impact to a wetland on a specific project site are addressed by permits or other approvals from an official statewide program (U.S. Army Corps of Engineers 404 program, Minnesota

Department of Natural Resources, or the State of Minnesota Wetland Conservation Act) that are issued specifically for the project, designers may use them to show the potential adverse impacts are addressed.

3. If there are impacts from the project not addressed in one of the permits or other determinations (e.g., permanent inundation or flooding of the wetland, significant degradation of water quality, excavation, filling, draining), designers must minimize all adverse impacts to wetlands by utilizing appropriate measures. Designers must use measures based on the nature of the wetland, its vegetative community types and the established hydrology. These measures include in order of preference:
    a. Avoid all significant adverse impacts to wetlands from the project and post-project discharge;
    b. Minimize any unavoidable impacts from the project and post-project discharge;
    c. Provide compensatory mitigation when the designers determine(s) that there is no reasonable and practicable alternative to having a significant adverse impact on a wetland. For compensatory mitigation, wetland restoration or creation must be of the same type, size and whenever reasonable and practicable in the same watershed as the impacted wetland. [Minn. R. 7050.0186].

1.3 Requirements for Discharges to Special and Impaired Waters

Best Management Practices (BMPs) are required for projects within one mile (aerial radius measurement) of a special or impaired water and discharge to that special or impaired water during construction. [Minn. R. 7090]. The following figure displays the special and impaired waters in the region at the time this document was created. In addition to City Code and this Engineering Manual, the developer/designer must confirm the special or impaired waters within their project area and follow all guidance within the CSW permit.

INSERT MAP HERE

\\hrgreen.com\HRG\Data\2021\210504\Design\GIS\PDFs\Baxter_Subwatersheds_ImpairedWaters_WLogo.pdf

SECTION TWO: Requirements from Other Organizations

The designer/developer is responsible for obtaining all necessary permits, including but not limited to: Crow Wing County, Minnesota Department of Transportation (MnDOT), Federal Emergency Management Agency (FEMA), Department of Natural Resources (DNR), and United States Army Corps of Engineers (USACE). Prior to issuance of a City permit, approval from all permitting or governing agencies shall be required.

Within the City, the Crow Wing Soil and Water Conservation District administers the Wetland Conservation Act (WCA), in accordance with guidance from the State's Board of Water and Soil Resources (BWSR). Crow Wing Environmental Services administers the WCA in county jurisdictional areas. A current WCA determination shall be included with any land disturbance permit application.

The designer/developer shall be responsible for coordinating and obtaining a Construction Stormwater permit prior to commencement of any site disturbing activities and/or release of the City's Building and/or Grading permit.

SECTION THREE: General Design Guidelines

All stormwater projects requiring stormwater treatment must first determine site applicability for use of infiltration. Though infiltration is the preferred and most effective and affordable solution to achieve high levels of water quality treatment and volume reductions, there are limiting factors each site needs to consider and document before selecting it as the preferred method. Designers must document results of the site investigation to illustrate either site suitability or to prove un-suitable for infiltration. If a site is deemed un-suitable, designers must follow the *MIDS Design Sequence Flow Chart* to determine the appropriate BMP and treatment credit. The MIDS software can be downloaded from the MPCA Minnesota Stormwater Manual Website at the following url:

https://stormwater.pca.state.mn.us/index.php/Calculator

The targeted water quality volume of 1.1-inches of runoff from the project (equating to ~60%-TP reduction) must be achieved for any given infiltration BMPs. For regional infiltration basins with an outlet structure, additional cold climate storage volume is required. See Section Five for more information.

3.1 Infiltration Restrictions

Unless the designer performs an approved higher level of engineering review sufficient to provide a functioning treatment system and to prevent adverse impacts to groundwater, infiltration is restricted if a site is subject to the following conditions:

- In-situ soil saturated hydraulic conductivity is less than 0.20-inches per hour or greater than 8.30 inches per hour. BMP must be shown to either increase or decrease percolation rates through soils to function between these ranges. Soils that drain too slowly increase risks of new mosquito habitat and subsequent runoff storage capacity. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.
- BMP would retain water longer than 48 hours from the end of the design storm event (or longer than 12 hours if draining to a designated trout stream).
- In the City of Baxter's Drinking Water Supply Management Area (DWSMA).
- Outside of an Emergency Response Area but within a DWSMA classified as high or very high vulnerability.

- Within the setback requirements in Table 1 below.
- Shallow groundwater is present at site. A test pit is conducted or detailed soil borings must show ≥3 feet from bottom of BMP to seasonally high groundwater or evidence of mottled soil.
- Areas with contaminated soils or areas that receive hotspot runoff (any portion of a facility where infiltration is prohibited under an NPDES/SDS industrial stormwater permit issued by the MPCA).
- Anywhere adverse hydrologic impacts from infiltration practices would occur (e.g., impacting perched wetland).
- Vehicle fueling or maintenance activities occur.
- Known groundwater contaminants, or groundwater will be mobilized by the construction of infiltration BMPs.

Table 1. Infiltration BMP Setback Requirements.

STRUCTURE		DISTANCE (FEET)	REQUIREMENT OR RECOMMENDATION
Vertical	Saturated Soil	3	Requirement[1]
	Bedrock	3	Requirement[1]
Horizontal	Public Supply Well	100 for sensitive wells; 50 for others[3]	Requirement[1]
	Building/structure/property line[2]	10	Recommended
	Surface water	none	Recommended
	Septic system	35	Recommended
	Contaminated soil/groundwater	Varies[4]	Recommended
	Slope	200	Requirement[1]

[1]Required under the Construction Stormwater General Permit

[2]Minimum with slopes directed away from the building

[3]If treating an average of 10,000 gallons per day; otherwise separation distance is 300 feet

[4]Setback distance depeds on local soil conditions. See Stormwater Manual guidance on Influence Zone determinations.

Where infiltration is prohibited or not feasible:

- Permanent water quality BMPs shall be used to meet water quality and rate control requirements.
- Filtration practices shall be sized according to a 70% credit towards meeting the treatment requirements of a same-sized infiltration basin.

Designers should follow the MIDS Design Sequence Flow Chart (Appendix A) if volume reduction cannot be achieved via infiltration, the designer is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.

SECTION FOUR: Soil Boring Requirements

Prior to infiltration design, soil investigation activities are required to determine depth to groundwater. Mottled soil characteristics approved by the City may be used to indicate groundwater elevations. Percolation tests may be required by the City in addition to soil borings and/or pits. Should the City determine percolation tests are necessary, utilize Table 2 to determine how many tests are required to verify the infiltration rates of the constructed BMPs.

Soil borings are required whenever infiltration/filtration BMPs are proposed. The following table identifies the number and depths of borings required for submittal. Boring locations must be shown on the proposed grading plan.

Table 2. Soil Boring Details.

PURPOSE OF SOIL BORING	SOIL BORING REQUIREMENTS		
	VOLUME MANAGEMENT BMP		
Depth to bedrock and/or groundwater	>2-ac tributary area: 10-feet Below proposed BMP bottom		
	<2-ac tributary area: 5-feet Below proposed BMP bottom		
Infiltration Rate	5-feet below proposed BMP bottom		
Required # borings	BMP Area (ft^2)	Borings/Pits	Percolation Tests
	< 5000	1	5
	5000 to 10000	2	10
	>10000	4[1]	20[2]

[1]An additional soil boring or pit should be completed for each additional 5,000 ft^2 above 10,000 ft^2

[2]An additional five permeameter tests should be completed for each additional 5,000 ft^2 above 15,000 ft^2

At the City's discretion, additional borings and geotechnical reports or investigations may be required in areas where initial borings indicate concern of bedrock, groundwater, or other environmental factors.

SECTION FIVE: Hydrology Modeling, Unified Sizing Criteria, and Detention and Discharge Rate Standards

5.1 Hydrology Modeling

The Natural Resources Conservation Service's Technical Release 55 "Urban Hydrology for Small Watersheds" (commonly referred to as TR-55) should be used for all runoff calculations. Curve numbers (CN) for each land use shall be chosen based on TR-55. Composite curve numbers shall be utilized in calculating runoff. Runoff calculations shall include a MSE III, 24-hr nested rainfall distribution based on Atlas 14 Volume 8 (including subsequent updates). Acceptable modeling software includes HydroCAD and XP-SWMM, unless otherwise approved by the City.

NOAA Atlas 14 precipitation depths resulting from the 1-, 2-, 10- and 100-year, 24-hour storm events shall be modeled for existing and proposed conditions. NOAA Atlas 14 precipitation depths for Baxter are taken from the nearest NOAA station in Brainerd: 2.29-in, 2.65-in, 3.88-in, and 6.27-in for the 1-, 2-, 10- and 100-year, 24-hour storm events, respectively.

5.2 Unified Sizing Criteria

The MPCA *MN Stormwater Manual* provides a unified sizing criteria for calculating various volumes and detention times important to rate control and general stormwater design. Those include recharge, water quality, channel protection, over bank flooding and extreme storm volumes. Refer to the Unified Sizing Criteria section of the MPCA MN Stormwater Manual for design guidance. Compensatory winter storage runoff detention accommodations need to be made above and beyond typical warm weather conditions design in the City.

The designer shall give consideration to reducing the need for stormwater management system facilities by incorporating the use of natural topography and land cover such as wetlands, ponds, natural swales and depressions as they exist before development to the degree that they can accommodate the additional water flow without compromising the integrity or quality of these natural features.

Stormwater storage facilities shall be designed to retain runoff from a 100-year critical duration rainfall event onsite without overtopping. A reduction of the required onsite storage capacity may be granted under the following circumstances:

a. The site or any portion of the site is included as part of a larger City approved regional stormwater management plan.
b. The site is adjacent to a City owned and maintained storm sewer system that drains to a regional stormwater storage facility and the site (or portion of) has been included as part of the contributing area for design of the system.
c. The site contains topographic features that allow stormwater storage outside of the designated stormwater storage facility without inundating wetlands, causing adverse conditions or damage to adjacent properties.
d. Other reasons as determined by the City Engineer.

The designer shall confer with the City Engineer to determine how much, if any, stormwater runoff from the site or any portion of the site has been accounted for in a pre- existing regional stormwater management plan or publicly maintained system.

5.3 Winter Retention Standard

The City has experienced localized flooding and subsequent freezing of city streets and sidewalks in winter as the result of stormwater pipes freezing downstream of rate and volume control structures. As this creates significant risks to the public as well as city infrastructure, designers are required to design additional storage that assumes outlets are non-functional during the winter. As winter conditions prohibit stormwater abstraction through infiltration and accelerates watershed runoff rates, the following method must be used to calculate compensatory storage.

1. Calculate the total new impervious area created by the project.
2. Multiply the 100-yr, 24-hr storm (6.27-in) volume by the new impervious area.
3. The resulting volume must be accommodated either as additional storage above the normal water level (elevation of the normal outlet invert) or upstream of the detention practice. See the MPCA MN Stormwater Manual for additional guidance (*Cold Climate Impact on Runoff Management*).

5.4 Rate Control Standard

Discharge rates for the 1-, 2-, 10-, and 100-year, 24-hour storm events shall not be increased from existing as a result of proposed development, redevelopment, or change in use.

SECTION SIX: Volume and Water Quality Control Design and Construction

Stormwater treatment must be designed to remove eighty percent (80%) of total suspended solids (TSS) on an average annual basis. Stormwater treatment must also be designed to remove forty percent (40%) of total phosphorus (TP) on an average annual basis.

Treatment must be provided in on-site or regional systems and through a combination of BMPs, with highest preference given to green infrastructure techniques and practices (i.e., infiltration, evapotranspiration, reuse/harvesting, conservation design, urban forestry, green roofs, etc.) that will meet this requirement. The stormwater discharges of TSS and TP shall result in no net increase from pre-project conditions for new development projects. Regional or development-scale infiltration BMPs must adhere to the City's Winter Retention Standard.

For projects that create any new and/or fully reconstructed impervious surfaces:

1. New and redevelopment projects: retain on-site a volume of 1.1-inches from impervious surfaces.
2. Linear projects: retain on-site the larger of 1.1-inches from all new, or 0.55-inches from all new and fully reconstructed impervious surfaces (areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/ replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed). For linear projects with lack of right-of-way, easements or other permissions from property owners to install treatment systems that are capable of treating the total water quality volume on site, the project must maximize treatment through other methods or combination of methods before runoff is released to nearby surface waters. Alternative treatment options include: grassed swales, filtration systems, smaller ponds, or grit

chambers. In all circumstances, a reasonable attempt must be made to obtain right-of-way during the project planning and all attempts of infeasibility must be recorded.

All volume control and infiltration BMPs must be designed following the design criteria found in the MN Stormwater Manual.

Projects must provide pre-treatment upstream of the infiltration area. Where pre-treatment is not feasible, justification must be submitted to the City Engineer for review and approval.

All water quality BMPs must use pre-treatment as their first level of treatment to protect the functioning of the main BMP.

Determine appropriate pretreatment options using the Pretreatment Practice Selection Tool provided by the Minnesota Pollution Control Agency (MPCA) or refer to the MPCA MN Stormwater Manual.

Volume and water quality BMPs may be designed either by designing to the specified volume of runoff (as described above) indirectly, or directly via the MIDS Calculator, P8 or WinSLAMM (which calculate pollutant reductions of a BMP design).

Table 3 (Page 10) describes recommended options for Stormwater infiltration BMPs considering their contributing drainage areas.

Table 3. Infiltration Best Management Practice Design Considerations.

Stormwater BMP	Recommended Drainage Area	Notes
Bio infiltration Basin	5 acres or less	Bioinfiltration basins must meet the required 48-hour drawdown time and must be sized in order to allow for adequate maintenance. It is HIGHLY RECOMMENDED that bioinfiltration basins be designed to prevent high levels of bounce as submerging vegetation may inhibit plant growth. A maximum wet storage depth of 1.5 feet is HIGHLY RECOMMENDED.
Dry Swale with Check Dams	5 acres or less	
Dry Well Synonym: Infiltration Tube, French Drain, Soak-Away Pits, Soak Holes	1 acre or less (rooftop only)	
Infiltration Basin	50 acres or less	A natural or constructed impoundment that captures, temporarily stores and infiltrates the design volume of water into the surrounding naturally permeable soil over several days. In the case of a constructed basin, the impoundment is created by excavation or embankment.
Infiltration Trench	5 acres or less	
Permeable Pavement	It is RECOMMENDED that external contributing drainage area not exceed the surface area of the permeable pavement. It is HIGHLY RECOMMENDED that external contributing drainage area not to exceed twice the surface area of the permeable pavement	It is RECOMMENDED that external drainage area be as close to 100% impervious as possible. Field experience has shown that drainage area (pervious or impervious) can contribute particulates to the permeable pavement and lead to clogging. Therefore, sediment source control and/or pretreatment should be used to control sediment run-on to the permeable pavement section.
Tree Trench/Tree Box	Up to 0.25 acres per tree	
Underground Infiltration	10 acres or less	Though feasible, larger underground infiltration systems may cause groundwater contamination as water is not able to infiltrate through a surface cover. In addition, wind flocculation, UV degradation, and bacterial degradation, which provide additional treatment in surface systems, do not occur in underground systems. Because performance research is lacking for larger features, it is HIGHLY RECOMMENDED that the contributing drainage area to a single device not exceed 10-acres.

SECTION SEVEN: Rate Control (Detention) Basin Design and Construction

Discharge rates shall not increase from existing to proposed for the 1-, 2-, 10-, and 100-year, 24-hour storm events for proposed development, redevelopment, or change in use.

Compound outlet devices, restrictors, orifices, weirs, and other methods of reducing discharge rates are acceptable to the City. No orifice having a diameter less than four inches (4") is allowed in the design of rate control structures within the City. If a lower discharge rate is required a weir may be used to meet the requirements.

No clogging factors are to be assumed for the design of rate control structures or devices.

The City requires skimmers or other devices, with the intent to remove floatables, in the construction of new pond outlets and the addition of skimmers to existing systems whenever feasible and practical. The designs shall provide skimmers that extend a minimum of four inches (4") below the water surface. Wood skimmers are not allowed.

SECTION EIGHT: Underground Basin Requirements

The City encourages underground water quality treatment BMPs to attain TSS and TP removal requirements and underground rate and volume control BMPs to meet design standards when above ground BMPs are not feasible. Refer to the MPCA Minnesota Stormwater Manual for underground BMP design criteria. The City requires a 3-foot separation from the seasonally high groundwater as identified in section three.

The City requires underground BMP owners to collect and submit yearly maintenance and inspection reports for each underground BMP installed as a part of a new development, redevelopment, or change in use. See Section Eleven for more information.

SECTION NINE: Inlets, Outlets, Lowest Adjacent Grade (LAG), and Emergency Overflows

9.1 Inlets & Outlets

Inlet pipes of stormwater ponds shall be extended to the pond normal water level whenever possible.

Discharge velocity into a pond at the outlet elevation shall be six (6) fps or less during the design storm, as determined in Section Ten. Riprap protection, or other appropriate energy dissipation practice, is required at all inlet pipes into ponds from the NWL to the pond bottom. Where outlet velocities to ponds exceed six (6) fps during the design storm, the outlet and erosion control design should be based on the unique site conditions present. Submergence of the outlet or installation of a stilling basin approved by the City is required when erosive outlet velocities are experienced.

During the design storm, outfalls with velocities greater than six (6) fps into channels requires energy dissipation or stilling basins. Outfalls with velocities of less than six (6) fps will require riprap protection.

All rip rap aprons shall be designed to the applicable MnDOT standard plate, considering pipe shape and material.

9.2 Lowest Adjacent Grade & Emergency Overflows

The Lowest Adjacent Grade (LAG) is defined as the elevation of the lowest point of any structure, public or private road, gas or liquid above ground storage tank, or other sensitive resource adjacent to or downstream of any inundation area or stormwater BMP. The City Engineer shall have final determination on whether a structure or road shall be considered as the LAG.

The 100-year, 24-hour high water level within any designed stormwater pond, infiltration or filtration basin, or any other stormwater BMP shall be a minimum of 3 vertical feet lower than the LAG.

An Emergency Overflow (emergency outlet) from ponding areas shall be installed a minimum of eighteen inches (1.5’) below the LAG and shall be designed to have a capacity to overflow water at an elevation below the LAG at a rate not less than the anticipated 100-year peak inflow rate to the basin, or three (3) times the 100-year

peak discharge rate from the basin, whichever is greater.

A constructed inundated area, stormwater BMP, or other discharge point that is considered to be landlocked, or with no constructed outlet or emergency overflow, shall maintain a minimum of 3 feet of freeboard above the combination of the 100-year peak HWL and the Winter Retention volume.

SECTION TEN: Storm Sewer Design

Reference State Aid Rules, the MnDOT Drainage Manual, and the MPCA Minnesota Stormwater Manual for all storm sewer design criteria, with the exception of, or in addition to, the following:

1. Trunk, lateral, and collector systems shall be designed for the 10-year rainfall event. The 10-year storm Hydraulic Grade Line shall be kept within the pipe. The 100-year storm Hydraulic Grade Line shall be kept below the surface. Minimum allowable pipe size is 12-inch. Plastic pipe is not allowed within the public right-of-way unless otherwise approved by the City Engineer.
2. The following table shall be used for the calculation of peak rates using the rational method:

Cover Type	Runoff Coefficient
Single-family residential	0.4
Multi-family residential	0.5
Commercial	0.7
Industrial	0.7
Parks, open space	0.2
Impervious Areas, Ponds, wetlands	1.0

3. For collection systems not designed to meet rate control standards (e.g., catch basins) a clogging factor of fifty percent (50%) will be utilized in sizing intake structures.
4. Catch basins shall be located immediately upstream of intersections, bridges, bridge underpasses, sidewalks, and other areas where gutter flow may inhibit traffic or pedestrian use or may cause other safety issues, including freeze-thaw cycle. Designers shall consider snow storage locations and ensure proper snow melt collection can occur during the freeze-thaw cycle.
5. Manhole or catch basin spacing shall not exceed 400 feet unless approved by the City Engineer.

SECTION ELEVEN: Construction Timeline, Inspection and Maintenance Access

A storm water facilities maintenance agreement shall be completed, specifying the owner as the responsible party for long-term maintenance with the construction of any BMP or when applying for zoning approvals if site currently does not have an agreement. Payments will not be accepted in lieu of the construction project meeting the TSS and TP treatment standards.

No private stormwater facilities will be approved unless a maintenance plan is provided that defines how access will be provided, who will conduct the maintenance, the type of maintenance and the maintenance intervals. At a minimum, all private stormwater facilities shall be inspected annually and maintained in proper condition

consistent with the performance goals for which they were originally designed and as executed in the Stormwater Facilities Maintenance Agreement. All maintenance agreements must be approved by the City and recorded at the Crow Wing County Recorder's Office prior to final plan approval. At a minimum, the maintenance agreement will describe the following inspection and maintenance obligations:

a. The party who is permanently responsible for inspections and maintenance of the structural and nonstructural measures. Pass responsibilities for such maintenance to successors in title.

b. Allow the City and its representatives the right of entry for the purposes of inspecting all permanent stormwater management systems.

c. Allow the City the right to repair and maintain the facility, if necessary maintenance is not performed after proper and reasonable notice to the responsible party of the permanent stormwater management system. The cost will be assessed to the owner.

d. Stipulate that if site configuration or structural stormwater BMPs change, causing decreased structural stormwater BMP effectiveness, new or improved BMPs shall be installed.

e. Access to all stormwater facilities must be inspected annually and maintained as necessary. The designer shall obtain all necessary easement or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the City.

New stormwater management BMPs constructed as part of private development may be covered by drainage and utility easements or outlots that are dedicated to the City. Maintenance access paths to stormwater BMPs, where applicable, must be a minimum of 8’ wide.

APPENDIX

MIDS Design Sequence Flow Chart

TR-55 Curve Number Tables