

2.0 STORMWATER MANAGEMENT

2.1 Purposes and Policy. It is the policy of the District to:

2.1.1 Preserve natural infiltration, groundwater recharge and subsurface flows that support groundwater dependent resources including lakes, streams, wetlands, plant communities and drinking water supplies;

2.1.2 Work toward restoration of natural hydrology by preventing transfer of surface water runoff across subwatershed boundaries and by limiting peak off-site stormwater flow to pre-settlement rates;

2.1.3 Limit off-site stormwater volume to prevent flooding and thermal impacts to groundwater dependent resources;

2.1.4 Require management of stormwater to limit the conveyance of sediment, phosphorus, and other pollutants to ground and surface waters and promote water quality; and

2.1.5 Minimize drainage from impervious surfaces to stormwater conveyance systems and preserve the natural hydrology of landlocked basins to minimize basin and downgradient flood risk.

2.2 Applicability. Subject to an exception in section 2.7, the requirements of this Rule apply to:

- (a) Residential subdivision of four or more lots;
- (b) Any project (including linear projects such as road, bikeway, sidewalk, etc.) creating impervious surface that exceeds either one acre or five percent of a site, whichever is less; or
- (c) Land disturbance of 5,000 square feet or more that includes creating impervious surface within 1,000 feet of and tributary to a groundwater-dependent natural resource, public water, or direct conveyance to a groundwater-dependent natural resource or public water. Appendix 2.1 identifies areas within 1,000 feet; direct conveyances shall be determined by the District on a case-by-case basis. The amount of land disturbance shall be estimated as 3 times the amount of impervious surface unless otherwise delineated and calculated by the applicant.
- (d) New or continued mining operations.
- (e) Projects requiring a variance from the applicable shoreland or St. Croix Riverway ordinance relating to structure setback from the property line adjacent to the resource or impervious surface percentage.
- (f) Redevelopment activity. If the proposed activity disturbs more than 50 percent of the existing impervious surface and results in a net increase in impervious surface, the criteria of section 2.4 will apply to all impervious surface on the project site. Otherwise, the criteria will apply only to the new and reconstructed impervious surface. Notwithstanding, for road and other linear projects, only the net increase in impervious surface will be considered.

2.3 Regulation. Before any activity described at section 2.2 commences, a stormwater management plan shall be submitted to the District in conformity with the requirements of this Rule, and a permit shall be secured from the District. The managers will review a stormwater management plan; however, the permit will be issued only after the applicant demonstrates that the project has received preliminary approval from the local land use authority, in accordance with section 1.6 of these Rules, indicating compliance with existing local requirements and completion of the Wetland Conservation Act (WCA) process. The applicant is encouraged to submit a concept plan and supporting documentation for a pre-permit review by the District prior to initiating the formal permit review process.

2.4 Standards.

2.4.1 Management Standards. An applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity:

(a) Will not increase peak stormwater flow rate from the site, as compared with the peak stormwater flow rate calculated in accordance with sub-section 2.5.3, for a 24-hour precipitation event with a return frequency of 2, 10, and 100 years for all points where discharges leave a site.

(b) Will not increase stormwater flow volume from the site, as compared with the stormwater flow volume calculated in accordance with sub-section 2.5.3, for a 24-hour precipitation event with a return frequency of 2 years, or 10 years within a landlocked basin or a subwatershed draining to a landlocked basin.

(c) Will provide water quality Best Management Practices (BMPs) sized to infiltrate and/or retain the runoff volume generated on the site by the 2 year, 24-hour event under the developed condition for all points where discharges leave a site. For that portion of the 2 year, 24-hour event runoff volume that is not required to be infiltrated under paragraph 2.4.1(b), water quality BMPs or additional infiltration will be incorporated. The order of preference for water quality BMPs is biofiltration, filtration, wetland treatment system, extended detention, and wet detention in accordance with NURP standards.

(d) Will not increase the bounce in water level or duration of inundation, for a 24-hour precipitation event with a return frequency of 2, 10, and 100 years in the subwatershed in which the site is located, for any downstream lake or wetland beyond the limit specified in Appendix 2.2.

An applicant for a residential project, including subdivision of less than 4 lots, which creates $\frac{1}{4}$ acre or less of impervious surface may demonstrate alternative compliance with the management standards via completion of the District's *Small Residential Project Stormwater Worksheet*, available from the District office or on the District's website.

2.4.2 Obligation to Ensure Performance. Before work under the permit is deemed complete, the permittee must submit as-built plans and complete the requested assessment consistent with the standards of the *Assessment of*

Stormwater Best Management Practices Manual demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications. At the discretion of the Board, a final inspection by the District may be accepted in lieu of as-built plans. As a specific condition to a permit, the District may impose monitoring, performance evaluation, additional compliance measures or other requirements for the purpose of meeting management standards.

2.4.3 Assurance of Downgradient Capacity. An applicant may be required to demonstrate that downgradient stormwater conveyance structures and features will be adequate to manage proposed increased peak flow or flow volume from the site.

2.4.4 Waste Disposal. No refuse, garbage, or noxious materials shall be dumped in any public waters or where surface runoff could directly carry materials to public waters.

2.5 Management.

2.5.1 Sequence of Management Methods. To meet the standards of section 2.4, site-based stormwater management methods shall be used in the following sequence. A preferred method shall be used to the degree feasible before a less-preferred method is used. Treatment in a regional facility shall be governed not by this sub-section, but by sub-section 2.7.4.

- (a) Better Site Design practices
- (b) On-site infiltration
- (c) Off-site regional infiltration
- (d) Biofiltration
- (e) Filtration
- (f) Wetland treatment system
- (g) Extended detention
- (h) Wet detention in accordance with NURP standards
- (i) Other methods

2.5.2 Better Site Design Practices. Activity creating impervious surface must explicitly address the use of Better Site Design (BSD) techniques as outlined in in the most recent version of the [Minnesota Pollution Control Agency's Minnesota Stormwater Manual v.30 – Wiki](#) or subsequent revisions. Better Site Design involves techniques applied early in the design process to reduce impervious cover, conserve natural areas, and use pervious areas to treat stormwater runoff and promote a sequential treatment or “treatment train” approach to runoff management more effectively. An applicant must show that BSD techniques were evaluated in developing the design of a proposed project and demonstrate the infeasibility or inapplicability of techniques that were rejected.

2.5.3 Stormwater Management Plan Modeling Requirements.

(a) A hydrograph method or computer program based on Natural Resources Conservation Service Technical Release #20 (TR-20) and subsequent guidance must be used to analyze stormwater runoff for the design or analysis of flows, volumes, and water levels within and off the project site.

(b) Curve numbers (CN-values) used to calculate the pre-development rate and volume control standard for the site for upland areas will be as follows:

<u>Hydrologic Soil Group</u>	<u>Curve Number</u>
A	30
B	58
C	71
D	78

A CN-value of 98 may be utilized for the existing impervious surface of public roadways.

(c) All assumptions for CN-values and impervious surface area estimates must be clearly stated. A distributed CN-value approach shall be used to calculate runoff flows.

(d) For modeling of stormwater runoff in the post-development condition, the Hydrologic Soil Group (HSG) and corresponding CN-value of areas within the construction limits is to be shifted down one classification for HSG B & C and ½ classification for HSG A to account for the impacts of grading on soil structure unless the plan specifies a District-approved method to restore soil structure.

(e) The analysis of flood levels, storage volumes, and discharge rates for waterbodies and stormwater management basins must include the NOAA Atlas 14 values, as amended, for the 2-year, 10-year and 100-year return period, 24-hour rainfall events and the 10-day snowmelt event (Curve Number 100), in order to identify the critical duration flood event.

The District Engineer may require analysis of additional precipitation durations to determine the critical duration flood event. Analysis of the 10-day snowmelt event is not required for stormwater management detention basins with a defined outlet elevation at or below the 100-year return period, 24-hour rainfall event elevation.

2.5.4 Acquisition of Property or Contract Rights. An applicant relying upon on- or off-site facilities for complying with the standards of section 2.4 must possess all land access rights necessary for design, construction, and long-term operation and maintenance of the facilities. This sub-section does not apply to treatment in a regional facility pursuant to paragraph 2.7.4(a).

2.5.5 Infiltration Pretreatment. Flows to infiltration facilities must be pretreated for long-term removal of at least 50 percent of sediment loads. In the event an infiltration facility is constructed in the vicinity downstream of a potential Hot Spot, a skimmer shall be installed to facilitate clean-up.

2.5.6 Basin in Contributing Area to Groundwater-Dependent Natural Resource.

A stormwater basin within the surface contributing area to a groundwater-dependent natural resource must contain and infiltrate the volume generated by a 2-year, 24-hour storm event over the disturbed area, if feasible. The basin bottom must be at least three feet above the seasonally high-water table, bedrock or other impeding layer. If this infiltration standard is not met, basin outflow must be non-erosive and routed through a subsurface system, flow spreader or other device that discharges water through or across the ground to lower discharge temperature to that of the ambient soil.

2.5.7 Stormwater Management Facility Maintenance.

All stormwater management structures and facilities constructed in order to meet the requirements of this Rule must be designed for maintenance access and must be properly maintained in perpetuity to assure that they continue to function as designed. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and recorded on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District. The executed maintenance document shall be recorded with the County before permit issuance or immediately after plat approval and filing, if applicable, and prior to the sale of lots.

2.5.8 Form of Recording.

Rights under sub-section 2.5.4, a maintenance instrument under sub-section 2.5.7, and any commitment of indefinite duration that is a condition of a District permit shall be recorded with the County as an easement or declaration in a form acceptable to the District.

2.5.9 Platting or Easement Documents.

Applicant must provide platting or easement documents showing conveyance to the local land use authority of drainage and ponding/flowage easements over all stormwater management facilities, stormwater conveyances, wetlands, and on-site floodplain up to the 100-year event. Said easements must provide for adequate access to maintain stormwater management facilities and stormwater conveyances.

2.5.10 Conformance to Floodplain and Drainage Alteration Requirements.

In addition to all other legal requirements that may apply, all land-altering and related stormwater management activity pursuant to Rule 2.0 shall comply with building elevation requirements of Rule 7.0.

2.5.11 Infiltration Practice Suitability.

Infiltration practices must be designed and sited in accordance with current versions of the MPCA Construction General Permit, Minnesota Stormwater Manual, and Minnesota Department of Health guidance called "Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas."

2.6 Required Exhibits. The following items, submitted in duplicate and certified by a professional engineer registered in the State of Minnesota, registered land surveyor, or other appropriate professional shall accompany all permit applications submitted to the District pursuant to Rule 2.0. Required exhibits may be waived at the discretion of the District Administrator if the exhibit is not needed for the evaluation of a specific project.

- 2.6.1 Property lines and delineation of lands under applicant's ownership and location of the site with respect to known groundwater dependent natural resources;
- 2.6.2 For existing and proposed conditions, topography showing all on- and off-site subwatersheds contributing to surface flows onto or from the site;
- 2.6.3 The location, alignment, and elevation of proposed and existing stormwater facilities;
- 2.6.4 Delineation of existing on-site wetland, shoreland, draitiling and floodplain areas as defined in the current Federal Emergency Management Agency (FEMA) study;
- 2.6.5 Existing and proposed normal and 100-year water elevations on site;
- 2.6.6 Existing and proposed site contour elevations at two-foot intervals, related to NGVD 1929 datum or NAVD 1982 or 1984 datum;
- 2.6.7 Elevation of the OHWL of each public water on the site, if determined by the Minnesota Department of Natural Resources;
- 2.6.8 Construction plans, specifications, and a maintenance schedule for all proposed facilities;
- 2.6.9 Stormwater runoff rate analyses for the 2-, 10-, and 100-year critical events and runoff volume for the 2-year event (or 10-year event for a landlocked basin) under off-site flow and volume standard condition and proposed conditions, using Appendix 2.3 to simulate infiltration losses in designed practices, or the District's *Small Residential Project Stormwater Worksheet*, if applicable per sub-section 2.4.1;
- 2.6.10 All hydrologic, water quality, and hydraulic computations completed to design the proposed facilities, including a demonstration of conformance, in the site aggregate, to water quality requirements of paragraph 2.4.1(c), or the District's *Small Residential Project Stormwater Worksheet*, if applicable per sub-section 2.4.1;
- 2.6.11 Documentation of conformance with an existing local stormwater management plan, or in cases where such a plan does not exist, documentation that the local government has reviewed the project;
- 2.6.12 Delineation of any flowage and drainage easements and other property interests dedicated to stormwater management purposes, including, but not limited to, county or judicial ditches;
- 2.6.13 Documentation as to the status of a National Pollutant Discharge Elimination System stormwater permit for the project from the Minnesota Pollution Control Agency and provide the Storm Water Pollution Prevention Plan (SWPPP) as it becomes available;

2.6.14 Geotechnical information including soil maps, borings, site-specific recommendations, and other information needed to evaluate the proposed stormwater management design;

2.6.15 Thermal impact analysis demonstrating compliance with sub-section 2.5.6, if applicable;

2.6.16 Soil structure restoration plan demonstrating compliance with sub-section 2.5.3, if applicable;

2.6.17 Hydrologic and hydraulic computations completed to determine if a basin is landlocked; and

2.6.18 Delineation and determination of groundwater dependent natural resources present on the site.

2.7 Exceptions.

2.7.1 Infeasibility of On-Site Infiltration. If the District finds that Better Site Design practices and on-site infiltration, applied to the extent feasible, are insufficient to maintain stormwater flow volume off-site at the level specified in paragraph 2.4.1(b), the applicant will be excepted from strict compliance with that paragraph. The use of Better Site Design practices, on-site infiltration and off-site regional infiltration shall be required to the extent feasible to reduce flow volume to the level specified in paragraph 2.4.1(b) before discharge into a receiving water. Compliance with paragraph 2.4.1(c) must be specifically demonstrated. Where infiltration is not feasible, water quality treatment sized for the 2-year, 24-hour event must be provided in accordance with the sequencing standards of sub-section 2.5.1. Infiltration is considered not feasible where documented soil contaminants preclude the use of infiltration practices or there is inadequate separation from the water table, bedrock, or other impeding layer.

2.7.2 Exception to Sequencing. The District may grant an exception to the sequencing requirements of paragraphs 2.5.1(d) through (i) on an applicant's demonstration that an alternative management technology or method would achieve the same levels of performance and reliability as the method specified at paragraph 2.5.1(d).

2.7.3 Large Lot Gravel Drives. The applicability sections 2.2(b) and 2.2(c) and the management standards of sub-section 2.4.1 are waived for private gravel and paved drives on residential lots at least 10 acres in size if the drive is bordered downgradient by vegetated open space or a vegetated filter strip with a minimum width of 5 feet and runoff from the drive does not discharge directly to a wetland, groundwater-dependent natural resource, or public water.

2.7.4 Regional Treatment. Management of site stormwater in a regional facility constitutes compliance with Rule 2.0 in any of the following circumstances:

- (a) Management is pursuant to and in accordance with a local water management plan approved by the District under Minnesota Statutes §103B.235.

(b) An applicant has demonstrated infeasibility of on-site and off-site infiltration under sub-section 2.7.1 and the District, in writing, finds that the proposed method of management would meet all standards of section 2.4 except for paragraph 2.4.1(b).

(c) Management is pursuant to and in accordance with a District-approved Comprehensive Stormwater Management Plan and corresponding memorandum of understanding with the local government that explicitly recognizes alternative compliance with Rule 2.0 under specified conditions.

2.7.5 Basin Outlet. Rule 2.0 does not apply to a capital project in a watershed management or approved local water management plan intended to create an outlet for a landlocked basin that conforms with Rules 7.0 & 8.0, as applicable.

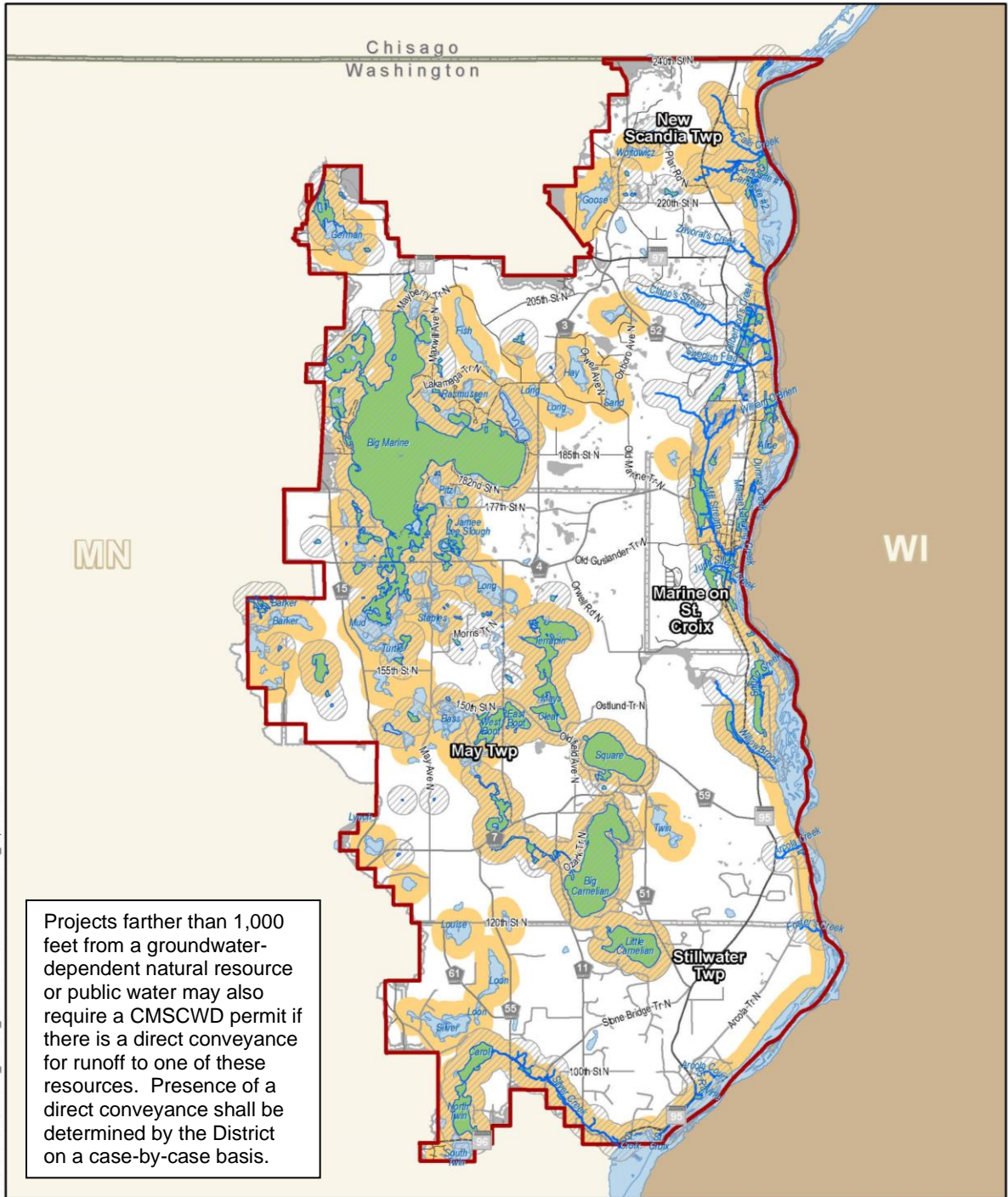
2.7.6 Master Plans. A permit is not required for construction on an individual lot within a residential subdivision if it conforms to a master development plan approved by the District that addresses all standards and conditions of Rule 2.0.

2.7.7 Exception to Platting or Easement Documents. The District may waive the requirements of sub-section 2.5.9 for single-family residential lot improvements provided stormwater facility maintenance responsibility is memorialized in accordance with sub-section 2.5.7.

2.7.8 Variance. The District may grant a variance to any requirement of Rule 2.0 under Rule 9.0.

2.8 Groundwater-Dependent Natural Resource Management Plans. Standards established in District approved management plans for individual groundwater dependent natural resources will supersede other District Rules as indicated in the approved management plan. All applicable District Rules not superseded by the approved management plan will still apply to the proposed project.

APPENDIX 2.1 Groundwater-Dependent Natural Resources & Public Waters Management Zones



Projects farther than 1,000 feet from a groundwater-dependent natural resource or public water may also require a CMSCWD permit if there is a direct conveyance for runoff to one of these resources. Presence of a direct conveyance shall be determined by the District on a case-by-case basis.

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- Legend**
- CMSCWD Jurisdictional Boundary
 - Groundwater Dependent Stream
 - Groundwater Dependent Lake or Wetland
 - Resource Not Groundwater Dependent
 - 1000' Groundwater Dependent Natural Resources Management Zone
 - 1000' Public Waters Management Zone
 - Municipal Boundary



CMSCWD
Groundwater Dependent Natural Resources and Public Waters



APPENDIX 2.2
Bounce and Inundation Period Standards*

Wetland Susceptibility Class	Permitted Storm Bounce	Inundation Period for Two-Year event	Inundation Period for 10-Year or Greater Event
Highly susceptible	Existing	Existing	Existing
Moderately susceptible	Existing plus 0.5 feet	Existing plus 1 day	Existing plus 7 days
Slightly susceptible	Existing plus 1.0 feet	Existing plus 2 days	Existing plus 14 days
Least susceptible	No limit	Existing plus 7 days	Existing plus 21 days

* Adapted from “Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands,” (Minnesota Stormwater Advisory Group, June 1997). Wetland susceptibility classification is determined based on wetland type:

- Highly susceptible wetland types include sedge meadows, bogs, coniferous bogs, open bogs, calcareous fens, low prairies, coniferous swamps, lowland hardwood forests, and seasonally flooded basins.
- Moderately susceptible wetland types include shrub-carrs, alder thickets, fresh (wet) meadows, and shallow & deep marshes.
- Slightly susceptible wetland types include floodplain forests and fresh wet meadows, or shallow marshes dominated by cattail, giant reed, reed canary grass or purple loosestrife.
- Least susceptible wetland includes severely degraded wetlands. Examples of this condition include cultivated hydric soils, dredge/fill disposal sites and gravel pits.

APPENDIX 2.3
Design Infiltration Rates

Hydrologic Soil Group	Soil Textures*	Corresponding Unified Soil Classification**	Infiltration Rate [inches/hour]
A	Gravel, Sandy Gravel, Silty Gravel	GW - Well-graded gravel or well-graded gravel with sand GP - Poorly graded gravel or poorly graded gravel with sand GM - Silty gravel or silty gravel with sand SW - Well-graded sand or well-graded sand with gravel	1.6
	Sand, Loamy Sand, Sandy Loam	SP - Poorly graded sand or poorly graded sand with gravel	0.8
B	Loam, Silt Loam	SM - Silty sand or silty sand with gravel	0.45
		MH - Elastic silt or elastic silt with sand or gravel	0.3
C	Sandy Clay Loam	ML - Silts, very fine sands, silty or clayey fine sands	0.2
D	Clay Loam Silty Clay Loam Sandy Clay Silty Clay Clay	GC - Clayey gravel or clayey gravel with sand SC - Clayey sand or clayey sand with gravel CL - Lean clay or lean clay with sand or gravel or gravelly lean clay OL - Organic silt or organic silt with sand or gravel or gravelly organic silt CH - Fat clay or fat clay with sand or gravel or gravelly fat clay OH - Organic clay or organic clay with sand or gravel or gravelly organic clay	0.06

Source: Adapted from the “Design infiltration rates” table from the Minnesota Stormwater Manual, MPCA, (January 2014).

*U.S. Department of Agriculture, Natural Resources Conservation Service, 2005. National Soil Survey Handbook, title 430-VI. (Online) Available: <http://soils.usda.gov/technical/handbook/>.

**ASTM standard D2487-00 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).