

Appendix C – Development Standards

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I. Introduction

The City of Burnsville has developed specific requirements in this section that apply to development and redevelopment activities. These standards are intended to help achieve the water resource goals of the City's Water Resources Management Plan (WRMP) and help the City maintain compliance with the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program and the related NPDES/SDS General Construction Stormwater Permit. This summary highlights important aspects of the requirements for stormwater volume, water quality, and discharge rate, as well as erosion control, flood control, and wetland management.

To accomplish these goals, it is important to the City to have consistent approaches to evaluating proposed development projects. Therefore, all hydrologic, hydraulic and water quality analyses must be prepared and submitted in a format that will allow for a timely and efficient review by City staff. Project designers and/or developers are encouraged to schedule and complete a pre-design meeting with the City before any data will be accepted. The purpose of the meeting is to specifically address approvals and permits, permanent stormwater management requirements, water quality treatment, erosion control, trunk storm drain analysis, wetland impacts, and discharge to lakes and sensitive wetland resources.

The stormwater management performance standards the City of Burnsville has adopted are similar to the MPCA Minimal Impact Design Standards (MIDS). The MIDS standards enable and promote the implementation of low impact development and other stormwater management techniques. Controlling a post-development runoff volume equivalent to 1.1 inches from the impervious surfaces is utilized as an approach to mimic the site's natural, pre-development hydrology. In addition to the hydrologic and water quality benefits anticipated through adoption of performance standards similar to MIDS, the MIDS performance criteria are being promoted and implemented statewide by many communities and watershed management organizations to standardize and streamline stormwater management regulatory programs for developers and communities. This enables developers to utilize standardized modeling methods and credit calculation tools such as the MIDS calculator.

This summary does not provide a complete listing of the requirements of this Water Resources Management Plan (WRMP) or City Code. Note that other state and local watershed management organization rules and standards may also apply to development and redevelopment activities. The 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 of law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

For a more detailed listing of requirements see the specific policies of the WRMP, the applicable City ordinances and watershed standards, or consult with City staff on your specific project.

II. Regulation

The City of Burnsville has developed these standards to meet the goals of the City's Water Resources Management Plan (WRMP) and maintain compliance with the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program. In addition to the WRMP, the City also maintains a Stormwater Management Policy (Policy 5.155) to maintain compliance with the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program.

The City has several sections of City Code regulating the activities described herein, including:

- City Code Title 10, Chapter 8, Section 10-8-5: Wetlands District Overlay Standards
- City Code Title 10, Chapter 8, Section 10-8-8: Controlling Erosion and Sediment From Land Disturbing Activities
- City Code Title 10, Chapter 8, Section 10-8-11: Stormwater Management Overlay District Standards
- City Code Title 10, Chapter 10: Floodplain Regulations

Local Watershed regulation may also be in place, pursuant to Minnesota Statutes 103D.341. These regulations may require permit coverage prior to commencing development and redevelopment activities.

In addition to City Code and local Watershed regulation, the MPCA's NPDES/SDS General Construction Stormwater Permit requires that construction activity of 1 acre or greater including a common plan of development cannot commence until coverage under the permit is effective, if applicable.

III. Definitions

Buffer Strip – An area of nondisturbed ground cover abutting a wetland or other surface water that may not be mowed, cut, or fertilized, which is left undisturbed to filter sediment, materials, and chemicals.

Impervious Surfaces – A constructed hard surface that either prevents or restricts the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include rooftops, sidewalks, driveways, parking lots, and concrete, asphalt, or gravel roads. Bridges over surface waters are considered impervious surfaces.

Land Disturbance – Activities including clearing, grading, and excavating, including any changes in topography, existing soil cover, both vegetative and nonvegetative, or the existing soil topography that may result in accelerated stormwater runoff that may lead to soil erosion and movement of sediment. The following are not considered land disturbing activities:

- A. All maintenance, repair, resurfacing, and reconditioning activities of existing roadways, bridges, trails, and parking lots that do not involve land-disturbing activities outside of the existing surfaced areas
- B. Annually cultivated land used for agricultural activities

Linear Project – The construction or reconstruction of roads, trails, sidewalks, or rail lines that are not part of a common plan of development or sale. For example, roads being constructed concurrently with a new residential development are not considered linear projects because they are part of a common plan of development or sale.

New Development – Any activity that results in a change or alteration in the existing ground cover and/or the existing topography.

Predevelopment – The condition of the project site prior to the proposed development or redevelopment

Redevelopment – Reconstruction where impervious surfaces have been removed or replaced down to the underlying soils. All maintenance, repair, resurfacing, and reconditioning that does not disturb the underlying soils is not considered redevelopment

Slopes:

Slope - The degree of deviation of a surface from the horizontal, usually, expressed in percent or degrees.

Steep Slopes - Lands having average slopes over 12% and up to 18%, as measured over horizontal distances of 50 feet or more that are not bluffs. Steep slopes include all soils grouped in Dakota County soil survey slope Class C.

Steep Slopes in LMRWD - A natural topographic feature having average slopes of 18% or greater measured over a horizontal distance of 25 feet or more.

Very Steep Slopes – Slopes between 18% and up to 40% as measured over horizontal distances of 50 feet or more, that are not bluffs. Very steep slopes include all soils grouped in Dakota County soil survey slope Classes D, E, F.

Severe Slopes – Slopes having grades exceeding 40% as measured over horizontal distances of 50 feet or more that are not bluffs.

IV. Standards

Development projects must comply with the following standards. See the Development Standards for Stormwater Management Flow Charts attached to this document for a brief review of volume control, water quality and erosion and sediment control.

1. Stormwater Management

A. Volume Control

Stormwater runoff volume must be controlled. The following volume control standards apply:

- i. Projects that create greater than 5,000 square feet of new impervious surfaces or create or redevelop the sum of 1 acre or greater of impervious surfaces shall retain volume onsite equivalent to:
 - 1) Nonlinear projects – 1.1-inch of runoff from new and/or reconstructed impervious surfaces.
 - 2) Linear projects – The larger of the following:
 - a) 0.55-inch of runoff volume from new and reconstructed impervious surfaces
 - b) 1.1-inch of runoff from the net increase in impervious surfaces
- ii. Projects that redevelop greater than or equal to 0.5 acres (but less than 1 acre) of existing impervious surfaces – 0.55-inch of runoff volume from new and reconstructed impervious surfaces
- iii. Infiltration is prohibited in the following areas:
 - 1) Areas that receive discharges from vehicle fueling and maintenance areas
 - 2) Areas where there are high levels of contaminants in soil or groundwater
 - 3) Areas where soil infiltration rates are more than 8.3 inches per hour, unless soils are amended
 - 4) Areas with less than 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
 - 5) Areas of predominately Hydrologic Soil Group D (clay) soils
 - 6) Any areas within any of the following, unless approved by the City (See Figure C-1):
 - a) the City's Drinking Water Protection Overlay District
 - b) Areas in an ERA within a Drinking Water Supply Management Area (DWSMA) of moderate vulnerability, or outside of ERA within a DWSMA of high or very high vulnerability, unless approved by the City
 - 7) Areas within 1,000 feet up-gradient or 100 feet down gradient of active karst features

- 8) Areas that receive industrial stormwater runoff regulated under the NPDES ISW program
- 9) Areas of steep slopes, very steep slopes, or severe slopes, as defined

These areas are considered sites with restrictions. Sites with restrictions should be investigated for potential soil corrections or other volume control treatment locations. If determined infeasible, alternative stormwater compliance such as filtration or wet detention may be pursued. Supporting documentation must be provided to justify infeasibilities. Alternative compliance must be designed to treat the required water quality volume as described herein and using criteria as listed in the most recent version of the MPCA's NPDES/SDS General Construction Stormwater Permit and Minnesota Stormwater Manual.

For non-linear projects, where the water quality volume cannot cost effectively be treated on the site of the original construction activity, mitigation may be allowed by the City in accordance with the Stormwater Management Policy (Policy 5.155).

B. Water Quality

Water quality must be protected. The following post construction water quality standards apply:

- i. Projects that create 1 or more acres of new impervious surfaces shall have no net increase from existing conditions in Total Phosphorus (TP) and Total Suspended Solids (TSS) to receiving water bodies.
- ii. Projects that create greater than 5,000 square feet of new impervious surfaces or redevelop greater than 0.5 acres of existing impervious surfaces shall meet the following requirements:
 - 1) New Development – For new development portions of a site, treatment shall be provided to remove a 75% net decrease in TP and an 80% net decrease in TSS as modeled on an annual basis from existing conditions.
 - 2) Redevelopment – For redevelopment portions of a site, treatment shall be provided to remove a 60% net decrease in TP and TSS as modeled on an annual basis from existing conditions.
 - 3) Wet detention ponds used for stormwater management at sites with restrictions must have a permanent storage volume of not less than 2.5-inch calculated over the contributing drainage area to the pond
- iii. Projects within a Lower Minnesota River Watershed District (LMRWD) High Value Resource Area (HVRA) (<http://lowermnrivewd.org/rules/lmwrdrules>) that create greater than 10,000 square feet of new impervious surfaces shall include the following, in addition to those requirements as described in Section IV.1.B.ii.:
 - 1) An undisturbed buffer strip of 100 linear feet from trout waters shall be maintained at all times, both during construction and as a permanent feature after construction, except where a water crossing, or other encroachment is necessary to complete the project.
 - 2) Permanent stormwater management facilities shall be designed to minimize any

increase in the temperature of receiving trout waters and all tributaries resulting from the 1- and 2-year, 24-hour precipitation events.

- iv. For projects that have met volume control requirements as described in the Section IV.1.A., the water quality requirements are generally considered met without additional documentation.

C. Rate Control

Rate control of stormwater discharge must be managed on site. The following rate control standards apply:

- i. Projects that create greater than 5,000 square feet of new impervious surfaces or redevelop greater than 0.5 acres of existing impervious surfaces shall manage discharge rates leaving the site such that the post construction discharge rates do not exceed the existing discharge rates for the 2-, 10- and 100-year, critical duration (24-hour) storm events, using the updated Atlas 14 rainfall depths and antecedent moisture conditions 2 (AMC-2), for all discharge locations. The storm distribution shall be a NRCS MSE 3 MN distribution or the nested distribution for Atlas 14 based data. Discharge rates leaving the site should be reduced from existing rates where feasible.
 - 1) For projects sites that discharge directly to the state identified fen areas, the 1-year critical duration (24-hour) storm event shall also be managed such that the post construction discharge rate does not exceed the existing discharge rate for all discharge locations.
 - ii. For projects in the Vermillion River Watershed, discharge rates leaving the site must not exceed the predevelopment rates for the 1-year critical duration storm in addition to, the 2-year, 10, and 100-yr, 24-hour events. Predevelopment is defined as the conditions on the project site that existed in 2005.
 - iii. On-site rate controls may not be needed if downstream (regional) facilities can be shown to adequately detain/retain the runoff to existing conditions and in accordance with the rates established in Appendix D of this WRMP. In this case, the developer or design engineer shall submit a technical evaluation completed by a qualified engineer or hydrologist which must be review and approved by the City Engineer.
 - iv. Where a flow rate exceedance involves inter-community issues or significant water bodies, the regulatory jurisdiction shall have a review role. Any deviation shall be reflected in subsequent plan submittals.
 - v. For proposed outlets from landlocked basins, an analysis of the water quality and flooding impacts on intercommunity flows or any downstream strategic waterbodies shall be prior to construction of the outlet. If analyses indicate a potential adverse effect on water quality or increased flood potential, the City must notify the watershed organization prior to approving the outlet.
- D. Projects requiring permanent stormwater management including volume control, water quality, and/or rate control must prepare a Stormwater Management Plan for Development Activities consistent with Section VI of these standards.
- E. The following activities are exempt from stormwater management:

- i. The maintenance of existing impervious surfaces, such that there is no disturbance of the underlying soils or alteration of existing drainage patterns
- ii. Trails, sidewalks, and retaining walls that do not exceed 10 feet in width and are bordered down gradient by a pervious area extending at least half the impervious width are considered self-treated and are not required to include volume management.

2. Erosion and Sediment Control

Erosion and sediment control measures must be in place prior to any land disturbing activities. The following erosion and sediment control standards apply:

- A. Projects that include less than one acre of land disturbance but 50 cubic yards or more of earthwork or that are within a Lower Minnesota River Watershed District (LMRWD) High Value Resource Area (HVRA) or Steep Slopes Overlay District and disturb 5,000 square feet or more of land (<http://lowermnriverwd.org/rules/lmwrd-rules>) shall include the following:
 - i. The preparation of a Grading and Erosion Control Plan consistent with Section VI of these standards.
 - ii. Prior to the start of any excavation or land disturbing activity for the site, the owner or contractor must have in place, and functional, an approved method of erosion control. The contractor must have received a grading permit from the City prior to commencing construction activities.
- B. Projects that disturb 1 acre or more of land shall include the following:
 - i. The project shall be in compliance with the most recent version of the MPCA's NPDES/SDS General Construction Stormwater Permit, including the preparation of a Stormwater Pollution Prevention Plan (SWPPP). Proof of permit coverage shall be submitted to the City prior to any land disturbing activities.
 - ii. Prior to the start of any excavation or land disturbing activity for the site, the owner or contractor must have in place and functional an approved method of erosion control. The contractor must have received a grading permit from the City prior to commencing construction activities.
- C. The following activities are exempt from erosion and sediment control standards:
 - i. All maintenance, repair, resurfacing, and reconditioning activities of existing roadways, bridges, trails, and parking lots that do not involve land-disturbing activities outside of the existing surfaced areas
 - ii. Annually cultivated land used for agricultural activities

3. Flood Control

- A. Unless specified in Table C-1, where an effective Base Flood Elevation (BFE) has been established, the low floor elevation adjacent to a surface water body shall be established in accordance with the City's Floodplain ordinance. The ordinance establishes the Regulatory Flood Protection Elevation (low floor elevation) at not less than 1 foot above the BFE plus any increase due to designation of a floodway. Where an effective Base Flood Elevation (BFE) has not been determined by FEMA, the low floor elevation shall be 2 feet or more above the 100-year, 24-hour event as determined by a technical evaluation by a qualified engineer or hydrologist.

- B. An emergency overflow shall be incorporated into the site design at or above the BFE or modeled high water level to convey discharge in excess of the design event safely away from buildings to the next downstream water body. Existing, natural or man-made emergency overflows shall be analyzed as part of the design process. Where an overflow does not exist, the designer shall consider the possibility of long duration events, such as the potential for an elevated ground water table that may occur due to prolonged wet periods, extreme runoff volume events (e.g., snowmelt based events or back-to-back 100-year precipitation events) when evaluating high water elevations and outlets from landlocked basins.
- C. Fill around a building or structure shall be at or above the BFE and extend a minimum horizontal distance of at least 15 feet in all directions.
- D. For underground parking structures with a low floor elevation below the high water level, the drainage system within the parking structure shall include anti-backflow devices and flood protection to minimize the impacts of both surface and high ground water levels during flood events.
- E. Projects in the Vermillion River Watershed must not result in a net loss in floodplain storage.
- F. For landlocked basins, where additional stormwater volume is proposed to be routed, consideration shall be given to the effects of increased flood levels on trees and vegetation and potential for erosion.

4. Special Waters and Wetlands

- A. Developments shall meet the requirements of the MPCA's NPDES/SDS General Construction Stormwater Permit program for all applicable requirements including, but not limited to the following:
 - i. Sites discharging to Trout Stream #1, #4 or #7 must incorporate temporary and permanent BMPs that address at a minimum the following requirements:
 - 1) Stabilization of exposed slopes that are steeper than 3:1 (H:V) shall be completed within 3 days of the disturbance. All other exposed soils shall be stabilized within 7 days after construction activity has temporarily or permanently ceased.
 - 2) Temporary sediment basins shall be installed for common drainage locations that serve an area with 5 or more acres of disturbed areas at one time
 - 3) An undisturbed buffer strip of at least 100 feet shall be maintained between land disturbance and the trout stream.
 - 4) Permanent stormwater treatment systems must minimize any increase in temperature from the 1- and 2-year, 24-hour precipitation events.
 - ii. Sites discharging to a construction related impaired water or a water with an USEPA approved TMDL for any construction related impairments waters must incorporate temporary and permanent BMPs that address at a minimum the following requirements:
 - 1) Stabilization of exposed soils shall be completed within 7 days after construction activity has temporarily or permanently ceased.
 - 2) Temporary sediment basins shall be installed for common drainage locations that serve an area with 5 or more acres of disturbed areas at one time.

- iii. Sites discharging to the Black Dog Preserve (as described in the Wetland Protection and Management Plan) must incorporate temporary and permanent BMPs that address at a minimum the following requirements:
 - 1) Stabilization of exposed soils shall be completed within 7 days after construction activity has temporarily or permanently ceased.
 - 2) Temporary sediment basins shall be installed for common drainage locations that serve an area with 5 or more acres of disturbed areas at one time
 - 3) An undisturbed buffer strip of at least 100 feet shall be maintained between land disturbance and the Preserve.

- B. A horizontal vegetated buffer strip shall be established and/or maintained around existing wetlands in accordance with the City's Wetland Protection and Management Plan and City Code Title 10, Chapter 8, Section 10-8-5: Wetlands District Overlay Standards.

- C. An average 20-foot horizontal vegetated buffer strip shall be established and/or maintained around the perimeter of permanent stormwater treatment facilities with a permanent pool of water (i.e., wet ponds). The buffer strip extend from the normal water level to the top of the pond slope.

- D. Water level fluctuations in wetlands including any rise (bounce) in elevation shall be managed in accordance with the City's Wetland Protection and Management Plan.

- E. State of Minnesota Buffer Law (Minnesota Statutes 2014, sections 103B.101, subdivision 12; 103E.315, subdivision 8; Minnesota Statutes 2015 Supplement, sections 103B.101, subdivision 12a; 103F.48, subdivisions 1, 3, 4, 7, 8, 10 and CHAPTER 85--S.F. No. 25031 2016 amendments) requires the establishment of either a 50-foot average, 30-foot minimum, continuous buffer of perennial rooted vegetation around all public waters, streams, and public ditches as identified and mapped on a buffer protection map. The buffer protection map is maintained by the Minnesota Department of Natural Resources, through a buffer mapping website (<http://arcgis.dnr.state.mn.us/gis/buffersviewer/>). The buffer law is administered by the Board of Water and Soil Resources (BWSR), with technical support for land owners provided by the Dakota County Soil and Water Conservation District. Resources requiring protection under the buffer law are present in the City of Burnsville, but are limited to ten public waters, and four unnamed streams draining into Black Dog Lake. These aquatic resources currently meet the standards of the buffer law, and no action is required to comply with the recently implemented legislation. The current buffer standards incorporated in the Burnsville Water Resources Water Management Plan exceed the state requirements for the aquatic resources, which protects these resources should adjacent land use change.

V. Design Criteria

Newly constructed or expanded/modified permanent stormwater management systems and storm water conveyance design shall include the following criteria:

1. All hydrologic data shall be completed using NRCS methodology; i.e. HydroCAD or TR20/TR55, XP-SWMM or a comparable, City approved method. Hydraulic calculations will be accepted in the rational method format or in commonly used software packages such as FHWA HY-8, or XP-SWMM or a compatible, City approved method. These computations shall be submitted to the City as outlined in this guideline with additional detail provided upon request.
2. Water quality calculations will be accepted from commonly used software packages such as MIDS calculator, P8 (with a standard NURP 50th percentile particle size distribution), WinSLAMM, or a compatible, City approved method.
3. Rainfall amounts for hydrologic analysis shall be based on Atlas 14 data. Burnsville analyses shall use the values in the following table for 24-hour design events.

Return Frequency	Rainfall Depth (inches)
2-year	2.9
10-year	4.3
100-year	7.5

4. Local storm sewer systems shall be designed for the 10-year storm event. The Rational Method shall be the preferred methodology for the design of local systems. Culvert crossings or storm systems in County or State right-of-way may have a design frequency which differs from the City's 10-year design storm. The designer shall contact each agency/unit of government to determine the appropriate design frequency for hydrologically-connected systems.
5. Energy dissipation shall be provided at culvert and storm sewer outfalls in accordance with the Minnesota Department of Transportation Drainage Manual. If stable vegetation is acceptable, temporary erosion control during and immediately following construction shall be used until vegetation becomes established.
6. High water elevations for landlocked areas (basins where no outlet exists) shall be established by first estimating the normal or initial water surface elevation at the beginning of a rainfall or runoff event using a documented water budget, evidence of mottled soil, and/or an established ordinary high water level. The high water level analysis shall be based on runoff volume resulting from a 100-year/10-day runoff (7.2 inches and saturated or frozen soil conditions [CN=100]) and/or the runoff resulting from a 100-year back-to-back event. The high water elevation shall be the higher of these two conditions.
7. All permanent stormwater management systems and new discharge points to all wetlands and surface waters shall include pretreatment. Examples of pretreatment include, but are not limited to, a mowed grass strip between a curb-cut and a small rain garden, a sump manhole or manufactured sediment trap prior to an infiltration basin and a sediment forebay as the first cell of a two-cell treatment system. Where the system captures only clean runoff (e.g., from a rooftop) pretreatment may not be required.
8. Ponds, swales, infiltration basins or other soil saturation-type systems shall not be constructed in in areas of steep slopes, very steep slopes, or severe slopes, as defined.
9. Infiltration and filtration practices constructed to satisfy stormwater management requirements shall:
 - A. 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 soils

- investigation data taken from the location of proposed infiltration practices on the site or engineered media.
- B. Include a diversion or other method within the construction documents to keep construction site sediment from entering an infiltration and/or filtration system prior to final stabilization of the entire contributing drainage area.
 - C. Include provisions within the construction documents that will prohibit construction equipment from compacting the soils where infiltration and/or filtration practices are proposed.
10. Any stormwater ponds constructed within the prohibited infiltration zones in Figure C-1, must meet the following criteria:
- A. The basin bottom and side walls shall be constructed by compacting at least a 1 foot thickness of soils having at least 20 percent fines (at least 20% passing a #200 sieve). The bottom must have at least a 3 foot vertical separation to the seasonally high groundwater elevation and/or bedrock.
 - B. If a 3 foot separation to bedrock or the seasonally-high groundwater elevation cannot be obtained, the basin bottom and sidewalls shall be constructed of materials and methods that are approved by the City Engineer. Possible liner materials may include compacted cohesive soils, geosynthetic materials, plastic liner, soil additives or other materials.
 - C. The seasonally high groundwater elevation shall be determined by assessing soil mottling or soil coloration that indicates temporary saturation of the soil.
11. All ponds and basins shall:
- A. If the pond will have a permanent pool of water, have an aquatic bench having a 10:1 (H:V) slope for the first 10 feet from the normal water level into the basin.
 - B. Have a 3:1 maximum slope (above the NWL and below the 10:1 bench, if a wet pond).
 - C. Maximize the separation between inlet and outlet points to prevent short-circuiting of storm flows.
 - D. Be made accessible for maintenance and not be entirely surrounded by steep slopes or retaining walls which limit the type of equipment that can be used for maintenance. Vehicle access lane(s) of at least 10 feet shall be provided, at a slope less than 15 percent from the access point on the street or parking area to the pond, to accommodate maintenance vehicles. Maintenance agreements will be required when the pond is not located on City property.
 - E. Have a skimming device designed to remove oils and floatable materials up to a 5-year frequency event. The skimmer shall be set a minimum of 12 inches below the normal surface water elevation shall control the discharge velocity to 0.5 feet per second.
12. For wet ponds, an average 4 feet of permanent pool depth (dead storage depth) shall be provided. This constraint may not be feasible for small ponds (less than about 3 acre-feet in volume or less). In such cases, depths of 3-4 feet may be used. To prevent development of thermal stratification, loss of oxygen, and nutrient recycling from bottom sediments, the maximum depth of the permanent pool should be less than or equal to 10 feet.
13. A stabilized emergency overflow shall be provided for all permanent stormwater management systems to convey events greater than the 100-year design event, consistent with the Flood Control requirements (Section IV.3.) of these standards. Discharge through the emergency overflow shall be routed safely downstream through a dedicated drainage easement, as needed, to ensure that flow paths are not block or altered.
14. Stormwater harvest and reuse practices shall include:

- A. An analysis using a stormwater reuse calculator or equivalent methodology approved by the City
 - B. Documentation of the adequacy of soils, storage capacity, and delivery systems
 - C. Delineation of green space area to be irrigated, if applicable
 - D. A detailed irrigation or usage plan showing compliance with the Stormwater Management Standards.
15. Structural BMPs proposed as a stand-alone device or as part of the overall treatment system, shall be designed in accordance with standard engineering principles and practices.

VI. Submittals

1. Stormwater Management for Development Activities

A stormwater management plan for development projects shall be created for all projects requiring permits indicating conformance with this Water Resources Management Plan (WRMP). The following shall be submitted for review and approval:

- A. A complete and thorough project narrative, including:
 - i. The name, address, and contact information for the project.
 - ii. A description of the project, including a summary of existing and proposed impervious areas.
 - iii. A description and exhibit of on-site and contributing existing and proposed sub watersheds, with flow directions/patterns and discharge points.
 - iv. Computations and data tables for stormwater runoff volume, water quality, and rate analyses for existing and proposed conditions.
 - v. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities. Model summaries must be submitted. The summaries shall include a map that corresponds to the drainage areas in the model and all other information used to develop the model. If regional facilities are used for compliance, computations demonstrating the overall regional function of the facility shall be submitted, including maintenance agreement documentation.
 - vi. Soil and geotechnical information, including soil types, groundwater investigation, soil conditions within five feet from the bottom of any proposed infiltration facilities, and infiltration capacity of soils, as applicable.
 - vii. Other supplemental information.
- B. A completed Volume Control/Infiltration Practice Worksheet
- C. Construction plans or exhibits, showing:
 - i. Project limits and property lines including the location of any existing and proposed utilities and easements.
 - ii. Location, alignment and elevation of proposed and existing stormwater facilities.
 - iii. Delineation of existing on-site wetlands, shoreland and/or floodplain areas. Removal or disturbance of stream bank and shoreland vegetation should be avoided. The plan shall address how unavoidable disturbances to this vegetation will be mitigated.
 - iv. Existing and proposed 100-year high water level elevations on-site.
 - v. Existing and proposed site contour elevations related to NAVD 1988 datum, including directions or flow and all discharge points.
 - vi. Specifications of all proposed stormwater management facilities.
 - vii. Provision of easements for maintenance access to detention basins, constructed wetlands and other stormwater management facilities.
 - viii. Inlets to detention basins, wetlands, etc., shown at or below the outlet elevation.

- ix. Identification of receiving water bodies (lakes, streams, wetlands, etc.).
 - x. Location of all proposed stormwater treatment devices, including, but not limited to, ponds, rain gardens, swales, underground systems, pervious pavement and stormwater conveyance systems. The normal water level and 100-year flood elevations shall be shown for all stormwater treatment devices. Any required buffer strips shall be shown.
 - xi. A Grading and Erosion Control Plan and Stormwater Pollution Prevention Plan (SWPPP), as applicable and prepared by a qualified individual, consistent with Sections IV.2. and VI.2. of these guidelines.
- D. A maintenance agreement in a form provided by the City between developer and City, including a plan for maintenance of the stormwater management that identifies the maintenance activities and frequency of activities for each permanent stormwater management system proposed, including but not limited to sweeping, pond inspection, sediment removal and disposal, etc.
- E. Any additional documentation necessary indicating conformance with this WRMP.

2. Grading and Erosion Control Plan

The preparation of a Grading and Erosion Control Plan, consistent the most recent regulations of the MPCA's NPDES/SDS General Construction Stormwater Permit, shall include a site plan showing at a minimum and as applicable:

- A. Project limits and property lines including the location of any existing and proposed utilities and easements.
- B. The proposed development and redevelopment activities, including land cover and a summary of pre and post project impervious areas.
- C. Existing and final grades, including drainage area boundaries, directions of flow and all discharge points where stormwater is leaving the site or entering a surface water.
- D. Location of steep, very steep and severe slopes.
- E. Areas of potential pollutant generating activities, such as concrete washout, material storage, stockpiles etc.
- F. Staging areas, as applicable
- G. Identification of all natural and artificial water features, including, but not limited to, lakes, ponds, streams, wetlands, detention areas and stormwater conveyance systems. The normal water level and 100-year flood elevations shall be shown for all water features. Any required buffer strips shall be shown.
- H. Temporary Best Management Practices (BMPs), including:
 - i. BMPs to minimize erosion
 - ii. BMPs to minimize the discharge of sediment and other pollutants
 - iii. BMPs for dewatering activities
 - iv. Maintenance of BMPs shall be addressed
- I. Temporary and final stabilization methods including the use of perennial vegetation and/or other

methods on all exposed soils

- J. A schedule indicating the time of the construction activities, implementation, maintenance, and removal of erosion and sediment control measures, and permanent site stabilization measures.
- K. Inspection schedules and timeframes
- L. Identification of the property owner, operator, and individuals responsible for the implementation of the Grading and Erosion Control Plan, including name, phone number, and email address. The property owner shall sign and certify the Grading and Erosion Control Plan.
- M. Performance Standards: The erosion and sediment control measures and information included in the Grading and Erosion Control Plan and SWPPP shall conform to the practices as contained in the most recent version of the MPCA's "Protecting Water Quality In Urban Areas" and the Minnesota Stormwater Manual and shall comply with the most recent regulations of the MPCA's NPDES/SDS General Construction Stormwater Permit, where applicable, unless otherwise indicated. In addition, the following minimum standards and criteria shall apply:
 - i. Construction Scheduling: Construction activities shall be scheduled to lessen the impact on erosion and sediment creation and minimize the amount of exposed soil at any one time. Sediment control measures must be in place and inspected prior to issuance of permits.
 - ii. Protection Of Adjacent Property: Soil shall be prevented from being deposited onto adjacent properties, rights of way, public storm drainage systems, wetlands and nondisturbed portions of the construction site. Existing hydrology and drainage patterns shall be preserved to the maximum extent practicable.
 - iii. Soil Stabilization: Measures must be taken as soon as practicable to stabilize the soil in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after construction activity in that portion of the site has temporarily or permanently ceased.
 - iv. Soil Compaction: Pervious surfaces that are compacted during construction must be decompacted following construction completion. Decompaction is to occur prior to final stabilization and can be achieved through soil amendment and/or soil scarification.
 - v. Slopes: Slopes shall not be steeper than 3:1 per City Code section 10-8-8.C.2.d. No new discharge points shall be introduced on steep slopes, very steep slopes, severe slopes or along a bluff.
 - vi. Off Site Sediment Tracking And Dust Control: Measures must be taken to minimize off site vehicle tracking of sediment onto paved surfaces and the generation of dust. Sediment that is tracked off site must be removed at the end of each day or more frequently as determined by the City. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area.
 - vii. Soil Stockpiles: Soil stockpiles must be a minimum of 25 feet from all roads, water features, drainage channels, or stormwater inlets. Stockpiles must also be stabilized and protected with erosion and sediment control measures to prevent soil loss.
 - viii. Storm Sewer Inlet Protection: All storm drainage inlets receiving runoff from the construction site shall be protected with sediment control measures. The inlet protection

shall remain in place until final stabilization of the site has been achieved.

- ix. Storm Sewer Outlet Protection: All required energy dissipation measures must be installed within 24 hours of connection to a surface water.
- x. Inspection and Maintenance: The applicant shall be responsible for the inspection and maintenance of the site. All inspection and maintenance practices shall comply with the most recent regulations of the MPCA's NPDES/SDS General Construction Stormwater Permit.

N. The Grading and Erosion Plan and SWPPP may be amended as necessary upon submittal of a written application to the City and written approval from the City.

Attachments

Development Standards for Stormwater Management Flow Charts

Figure C-1

Table C-1