

MIDDLE-SNAKE-TAMARAC RIVERS WATERSHED DISTRICT

Amended Rules

Adopted: , 2021

THESE RULES INCLUDE PERMIT AND DRAINAGE GUIDANCE

The Board of Managers of the Middle-Snake-Tamarac Rivers Watershed District reviews and takes action on Permit applications at regular meetings and special meeting convened for the purpose of reviewing applications.

PERMIT APPLICATIONS MUST BE FILED WITH THE MSTRWD BY NOON, WEDNESDAY PRIOR TO THE BOARD MEETING AT WHICH THE APPLICATION IS TO BE CONSIDERED.

If you have questions, please call 218-745-4741, or email info@mstrwd.org.

If you experience or are experiencing a drainage or flooding **EMERGENCY**, call the District administrator at 218-230-5703.

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Introduction

The Middle-Snake-Tamarac Rivers Watershed District (MSTRWD) was established by order of the Minnesota Water Resources Board on August 28th, 1970. The MSTRWD encompasses portions of Marshall, Polk, Pennington, Kittson, and Roseau Counties in Minnesota.

Purpose

The purpose of these Rules are to implement the purposes of the Minnesota Watershed Act, more fully set forth in Minnesota Statutes Chapter (M.S.) 103D, to implement the powers of the Managers and to implement the goals, objectives, policies and standards contained in the MSTRWD's approved Watershed Management Plan (WMP). These Rules are adopted pursuant to the provisions of M.S. 103D.341 and are deemed to be necessary, proper and desirable to implement the provisions of M.S. 103D in any and all purposes for which the MSTRWD was established.

Adoption of Rules

The MSTRWD Board of Managers shall comply with the following procedure in adopting Rules.

- A. A copy of the proposed Rules or amendments shall be submitted to each Manager of the MSTRWD at least 30 days prior to its adoption by the Board.
- B. Any proposed rule or amendment shall be adopted by majority vote of the Board after a public hearing has been held on said proposed rule or amendment as required by M.S. 103D.341. The public hearing shall be at a date, time, and place set by the Board and notice of said hearing shall be given as required by M.S. 103D.341.
- C. The original copy of the Rules shall be kept in the files of the MSTRWD and in addition, copies shall be prepared for distribution to the County Auditors and County Commissioners of each affected county in the MSTRWD, and to the Township Board Supervisors of each township being wholly or partially in the confines of the MSTRWD. Copies shall also be distributed to all cities within the confines of the MSTRWD and to the appropriate regional development commissions, Commissioner of the Minnesota Pollution Control Agency, the Commissioner of the Department of Natural Resources of the State of Minnesota, the Minnesota State Department of Health, the Minnesota Environmental Quality Board, the Minnesota Department of Transportation and the Minnesota Board of Water & Soil Resources.
- D. Each rule adopted by the Board shall have the full force and effect of law.

Rules

The Board shall be empowered to amend the Rules of the MSTRWD. Any interested person may petition the Board for an amendment to the Rules.

Inconsistent Provisions

If any Rule herein is inconsistent with the provisions of M.S. 103D, or other applicable laws of the State of Minnesota, the provisions of M.S. 103D or other applicable law shall govern.

Severability

In the event that any section, phrase, clause, or condition of these Rules is declared to be invalid by a court of competent jurisdiction, the same shall not affect the validity of these Rules as a whole and only the part so declared to be invalid shall be affected.

Rights of Appeal

Any person believed to be adversely affected by the adoption or enforcement of these Rules, or by any action of the Board rising out of the pursuant to the adoption or enforcement of these Rules may appeal in accordance with appellate procedure under M.S. 103D.

Policy Statement

General Policy

The MSTRWD Board of Managers accepts the responsibilities with which it is charged as a governing body by Minnesota Statutes. The Board, in the conduct of the duties and responsibilities conferred upon it, does not intend to usurp the authority or responsibilities of other agencies or governing bodies, however, it will not avoid its responsibilities and obligations. It is the stated intent of the Board that no person shall be deprived or divested of any previously established beneficial use or right, by any Rule of the MSTRWD, without due process of law. All Rules of this District shall be construed according to this intention. Further, it is the intention of the Board to promote the use of the waters and related resources within the MSTRWD in a reasonable and orderly manner so as to improve the general welfare and public health for the benefit of the residents of the MSTRWD.

Interrelation with Other Units of Government

It is the stated intention of the Board to cooperate with all federal, state, and local units of government and their respective agents in the conservation of the natural water resources for the common good of the public, and also to act as a coordinating agency for said governmental units and agencies in the development and implementation of policies, procedures and regulations concerning water and related resources within the MSTRWD.

Related Ordinances

In the interest of public health and to prevent pollution of the waters within the MSTRWD, applicable county ordinances and state agency rules regarding the disposal of wastes, are by reference hereby adopted as Rules of the MSTRWD within the limits of the statutory authority granted to the Board.

Review of Local Ordinances Before Passage

Copies of proposed county, municipal and township ordinances relating to surface water drainage, flood plain, and shoreland uses within the District shall be submitted to the Board thirty (30) days prior to the first public hearing for review and comment.

Submission of Local Ordinances After Passage

Ordinances relating to surface water drainage, flood plain, and shoreland uses shall be submitted to the MSTRWD Board within thirty (30) days after passage.

Permits

The Permit requirements are not intended to delay or inhibit development. Rather, Permits are necessary so that the Board is kept informed of planned work, can advise Permit applicants and, in some cases, provide assistance, and to ensure that land disturbing work and development occurs in an orderly manner and in accordance with the WMP.

Watershed District Permits

These Rules apply to all owners of property within the jurisdictional boundary of the MSTRWD; to all municipalities and Road authorities within the jurisdictional boundary of the MSTRWD; to all installers performing work, subject to permitting requirements under these Rules; and to the State of Minnesota and its agencies – to the extent the State has subjected itself to the jurisdiction of the MSTRWD.

○ Works Not Requiring Permits

No Permit from the MSTRWD is required:

- A. To perform maintenance on an existing drainageway that is not under the authority of the MSTRWD. A landowner or public entity performing maintenance is responsible for ensuring the work constitutes maintenance as defined on Page 28 in these Rules. If a landowner is unsure whether proposed work constitutes maintenance, they may seek technical assistance from the MSTRWD.
- B. To maintain, repair or replace damaged subsurface tile drainage or subsurface tile drainage pump within a private drainageway without altering the original permitted design of the system.
- C. To install in-field drainage improvements where the outlet for such improvements is not a public drainage system and the immediate downstream outlet control (i.e. a culvert or other restriction) is not improved.
- D. To perform maintenance or repair on levees and dikes which does not alter the original works permitted by the MSTRWD.
- E. To install, extend or alter a dike, if the final dike (taken as a whole) does not have a cumulative effect of altering the drainage of more than ten (10) acres of land.
- F. Nothing herein shall relieve the applicant of the responsibilities of obtaining any other authorization required by law or regulation, or alter the applicant's responsibility or liability under statutory or common law.

○ Works Requiring Permits

A Permit shall be obtained from the MSTRWD prior to any work being commenced for:

- A. Waste disposed of directly or indirectly into any drainageway, including public drainage systems.
- B. Any in-field drainage, including installation of surface and subsurface drains which create new or improved existing downstream outlet control on a public drainage system.
- C. Any installation of a new or improvement to an existing subsurface tile drainage system which increases drainage coefficient.
- D. Any new diking, excavating or levee construction or improvement to an existing bridge, dike, levee or culvert in or adjacent to any drainageway that will change the hydraulic efficiency of the drainageway or restrict flows adjacent to the drainageway.
- E. Any work causing the flow or drainage of surface water to cross a sub-watershed boundary and thereby deliver water into another sub-watershed.
- F. Any diversion or acceleration of water into any public drainage system from any land not assessed to that drainage system.
- G. Any construction, installation or alteration of a road or utility crossing beneath a public drainage system.
- H. Any pumping of water, including the use of temporary or portable pumps, into a public drainage system or other drainageway. In emergency situations such pumping may be subject to an after-the-fact permit as provided in these Rules.
- I. Any installation, extension or alteration of a dike, if the final dike (taken as a whole) has a cumulative effect of altering the drainage of more than ten (10) acres of land.

As a condition of a Permit, the Board may require monitoring of the work proposed by a Permit applicant. The Board may require the applicant to be responsible for some or all monitoring costs and expenses incurred as a condition of the permit.

A Permit granted by the MSTRWD does not relieve the applicant of the responsibilities of obtaining any other authorization required by law or regulation, or alter the applicant's responsibility or liability under statutory or common law.

○ Works Administratively Approved

The MSTRWD Administrator is authorized to approve the following Permit applications without Board consideration or approval:

- A. Emergency repairs requested by a governmental agency concerning public safety.
- B. Lengthening of an in-place culvert.
- C. To maintain or replace culverts or crossings, so long as the replacement or maintenance does not increase or change the hydraulic capacity, size, elevation or location of the culvert or crossing.
- D. Requests from other governmental agencies (township, city, county, state) that include hydraulic analysis performed by a Licensed Professional Engineer.
- E. Culverts installed in drainageways that conform to the MSTRWD's Culvert Size Chart contained in Appendix II.
- F. Relocation of crossings that do not alter the hydrology of a drainageway.
- G. Improvements to culverts of less than eighteen (18) inches to a culvert size of eighteen (18) inches or less, provided the elevation and location of the culvert remains the same.

In addition to the other guidelines and standards outlined herein, when considering the types of Permit applications described under Works Administratively Approved paragraphs A, B, C, D, E, F, G the following Rules shall apply:

- H. The MSTRWD Administrator shall not approve Permit applications which propose to change the elevation or grade of a drainageway.
- I. The MSTRWD Administrator may add reasonable conditions to the approval of a Permit to address site-specific or work-specific concerns. Conditions requiring performance prior to the initiation of work shall be met before the applicant can begin work. All conditions of the Permit, to the extent possible, shall be met before the Permit installation can be deemed complete.
- J. If a Permit application meets the administrative approval requirements (under Works Administratively Approved paragraphs A, B, C, D, E, F, G but the MSTRWD Administrator determines that administrative approval is inappropriate due to unusual circumstances or additional information is required, the Permit application shall be brought before the Board for their review and approval.
- K. The MSTRWD Administrator shall report all administratively approved Permits to the Board.
- L. The MSTRWD Administrator is not authorized to deny a permit but may provide the Board with a recommendation for denial of the Permit application, including reasons for denial.

All Permit Requirements

- A. Permit applications must be submitted on the form provided by the MSTRWD and must include all exhibits as set forth in these Rules. Permit Application Forms are available on the MSTRWD's website at: <http://mstrwd.org/drainage-permits/> or at the MSTRWD office.
- B. All applicants using a commercial installer of any kind (whether in whole or just part) must list on the permit application the name(s) of the installer(s), the name of the installer's contact person, and the contact person's cell phone number and email address.
- C. The Board reviews and takes action on Permit applications at regular meetings and special meeting convened for the purpose of reviewing applications.
- D. **ONLY PERMIT APPLICATIONS WHICH ARE FILED WITH THE MSTRWD BY NOON, WEDNESDAY PRIOR TO THE BOARD MEETING ARE ELIGIBLE FOR CONSIDERATION AT THE BOARD MEETING.** The earlier an application is filed, the more likely it is to be reviewed by staff and placed on the agenda of the next Board meeting.
- E. No land-disturbing or other work that requires a Permit shall commence prior to receiving authority from the Board or the MSTRWD administrator. If land-disturbing or other works occurs before a Permit is granted, the landowner will be required to apply for an after-the-fact Permit (see page 11 After-The-Fact Permits). Once a permit is granted, the applicant or their installer must notify the District office AT LEAST ONE DAY PRIOR TO COMMENCING WORK that work is about to commence and must provide an estimated starting date and an estimated completion date.
- F. **NO PERMIT IS VALID UNTIL THE APPLICANT'S INSTALLER PROVIDES THE DISTRICT OFFICE WITH A WRITTEN ACKNOWLEDGMENT OF RECEIPT OF THE PERMIT AND ITS CONDITIONS.**
- G. A Permit is valid for one year from the date of approval, unless specified otherwise or the Permit is suspended or revoked.

- H. The MSTRWD may suspend or revoke a Permit issued under these Rules wherever the Permit is issued on the basis of incorrect information supplied to the MSTRWD by the applicant or when the permittee is in violation of the terms or conditions of the Permit.
- I. A Permit is permissive, meaning that the works permitted are allowed but not obligatory. Obtaining a Permit from the MSTRWD does not relieve the applicant from the responsibility to comply with any procedures or approvals that may be required by other law rule, regulation, requirement or standard of any applicable federal, state, county, township, local government or subdivision, or local agency.
- J. By submitting a Permit application, the Permit applicant consents to entry and inspection of the subject property by the MSTRWD and its authorized agents. Said inspection shall occur at reasonable times and as necessary to evaluate the Permit application and the proposed work. Whenever possible, the MSTRWD shall contact the landowner prior to entry for inspection.
- K. If the nature of a Permitted activity involves increased expenses to be incurred by the MSTRWD, the applicant shall pay an inspection fee as determined by the Board in accordance with M.S. 103D.345.
 - M.S. 103D.345, Subd 1 and 2, states that a watershed district may charge a permit application fee not to exceed \$10 and an inspection fee of at least \$35. The inspection fee may include the cost of investigating the permit application and the area affected by the proposed activity, analysis of the proposed activity, services of a consultant, and any required subsequent monitoring or inspection of the proposed activity for compliance with the Permit terms or conditions. Costs of monitoring an activity authorized by a permit may be charged and collected as necessary after issuance of the permit or a security may be required as a condition of the permit.
- L. The MSTRWD's permitting program is subject to the timeline and automatic approval provisions of M.S. 15.99. Failure of the MSTRWD to meet an approval deadline under M.S. 15.99 shall not authorize any work which is otherwise prohibited or illegal under applicable law.
- M. The applicant and the landowner or authorized agent(s) must sign the application form.
- N. The responsible party must contact the MSTRWD office at least one business day prior to beginning work on site. If the responsible party fails to do so, additional inspection fees may be assessed against the landowner, the applicant, or both.
- O. If a Permit application will involve a culvert, please refer to the Culvert Size Chart in Appendix 2. These sizing guidelines are considered by MSTRWD staff and the Board when reviewing Permit applications.
- P. Drawings or plans that adequately depict the work sought to be permitted must accompany the Permit Application Form. Drawings or plans are not required to be prepared by an engineer but must include sufficient detail (locations, elevations, sizes, etc.) to allow for effective review of the application. Applications containing insufficient information may be returned as incomplete. Surface drainage, flood mitigation, and subsurface tile drainage works should contain the specific types of information outlined below.
 - I. **Surface drainage and flood mitigation:** The following exhibits may be requested with the Permit application for surface draining and flood mitigation.
 - A. Map showing location of work area.

- B. Plans and specifications for the work.
- C. Existing and proposed cross sections and profile of affected area.
- D. Description of bridges or culverts required.
- E. Descriptions of erosion controls.
- F. Written consent of owners affected by the proposed work.
- G. Such other submittals as the MSTRWD reasonably may require to evaluate.

II. **Subsurface tile drainage:** The following exhibits must accompany the Permit application for subsurface tile drainage.

- A. Site map of the location of all surface water inlets, outlet(s), lift stations, pumps, and flow control structures.
- B. Plan of system estimated drainage coefficient.
- C. If included in design, description of surface water inlet design, provision for diking of flow to inlets.
- D. Descriptions of erosion controls.
- E. Subsurface tile drainage system operating plan (see Page 15).
- F. The maximum and minimum theoretical discharge volume of the proposed system.

Q. **INSTALLER RESPONSIBILITY.** Notwithstanding any other provision of these Rules, a commercial installer whose installation(s) are repeatedly found to be in violation of (or out of compliance with) the terms of the permit as granted are subject to the following restrictions:

1. **Probation.** Installers who, after notice and hearing, are found by the Board to have repeatedly performed installations in violation of the permit as granted may be placed on one year probation, during which time their work ~~will~~ may be subject to pre-approval, inspection, or any other reasonable requirement the Board may determine is prudent to assure conformance with the specifications of permits.

2. **Suspension.** Installers who, after reasonable notice of violation and hearing, fail to bring their past project(s) into compliance, will not be granted permits to begin new drainage work within the District.

Permit Procedures

- A. Prior to the submission of any application, an applicant is encouraged to contact and meet with MSTRWD staff to discuss the details of the proposed action and Permit or to determine whether a Permit is required.
- B. If the MSTRWD receives a Permit application that does not contain sufficient or required information the MSTRWD may return the application as incomplete by sending a letter informing the applicant what information is needed.
- C. If the MSTRWD employee is not familiar with the area of a Permit application, the MSTRWD may require a site inspection. A Permit application that requires a site inspection is not deemed complete until a site inspection is performed by MSTRWD staff. When weather, or other uncontrollable conditions, make a site inspection temporarily impossible, then the timeline for decision suspended until conditions allow the site inspection to occur. If a site

- inspection is necessary, the MSTRWD will notify the Permit applicant within fifteen (15) business days of receiving an application. The cost of the site inspection may be included in the inspection fee, if any, required for the Permit.
- D. The Board shall review the staff recommendations for all Permit applications that are not Administratively approved.
 - I. When the Board considers a Permit application, the Permit applicant, or a representative of the applicant, may attend the meeting in order to address any questions or concerns.
 - E. The Board will take one of the following actions upon receiving a Permit application:
 - I. Approve the application,
 - II. Approve the application with conditions,
 - III. Deny the application, or
 - IV. Table the application pending additional information.
 - F. If a Permit application is approved, the MSTRWD Administrator will issue the Permit.
 - G. A Permit may be approved subject to reasonable conditions necessary to ensure compliance with the requirements and intent of these Rules. All conditions of the Permit required prior to commencement of work must be satisfied before the Permit is deemed to be issued. All conditions required during or after the work must be implemented for the Permit to remain valid. All conditions of the Permit must be met before the Permit can be deemed complete.
 - I. The Board shall consider erosion and sedimentation issues as part of its review of a Permit application. If necessary, erosion and sedimentation control measures may be made a condition of a Permit approval.
 - II. As a condition of a Permit, the Board may require monitoring of the work proposed by a Permit applicant. If the Board determines that the monitoring of a Permit applicant's works is appropriate, the Permit applicant shall be responsible for all monitoring costs and expenses incurred. Notwithstanding the foregoing, the Board may, and has a right to, determine that it is in the interest of the MSTRWD to cover part or all of the expense of monitoring a Permit applicant's works.
 - H. If the Board denies an application, written reasons for the denial will be provided.
 - I. If the Board tables an application, a written request for additional information will be provided to the applicant.
 - J. In addition to providing to the District notice of intent to proceed (as required above), a Permit applicant or their agent who receives a Permit shall notify the District once the applicant has completed the work subject to the Permit and is available for inspection. The Board may require an as-built inspection to be performed by MSTRWD staff. The Permit applicant or their agent must complete the Completion Form and submit said form to the District office. **NO ADDITIONAL PERMITS SHALL BE GRANTED BY THE BOARD OR ADMINISTRATOR TO THE APPLICANT UNTIL ALL OUTSTANDING COMPLETION FORMS FOR THAT APPLICANT ARE RECEIVED BY THE DISTRICT.**
 - K. Obtaining a Permit from the MSTRWD does not relieve an applicant from the responsibility of obtaining any other authorization required by law, or regulation or alter the applicant's responsibility or liability under statutory or common law. The MSTRWD will endeavor to inform the applicant of permits which may be required. The MSTRWD, however, will not be responsible if the applicant fails to obtain any required permits.

- L. IF A PERMIT APPLICANT IS DETERMINED BY THE BOARD TO BE IN VIOLATION OF ONE OR MORE OF THEIR PERMITS, NO ADDITIONAL PERMIT APPLICATIONS WILL BE CONSIDERED UNTIL ALL OUTSTANDING VIOLATIONS HAVE BEEN CORRECTED AND ANY OUTSTANDING FEES HAVE BEEN PAID UP IN FULL.

Permit Extension

Permit extensions may be granted by the MSTRWD Administrator and/or the Board. Extension requests must be made in writing at least 30 days before the expiration of the Permit. Additional conditions may be added to the Permit when an extension is requested. To request an extension of a Permit, the permittee shall provide an explanation for the extension request.

An applicant wishing to continue to pursue work for which Permit approval has expired shall reapply for a Permit from the MSTRWD and pay fees, if applicable.

Permit Transfer

A permittee may transfer or assign a Permit to another party only upon approval of the MSTRWD. A request to transfer or assign a Permit must be made in writing by the Permit holder and contain an explanation for the transfer or assignment. No assignment or transfer of a Permit is allowed that changes or alters previously approved plans or designs. Any change to approved plans requires a new Permit application. If a Permit is allowed to transfer, the responsibilities and obligations of the Permit automatically extend to the transferee, unless authorized by the MSTRWD or the Permit works are currently in violation.

A Permit transfer shall be approved if the following conditions are met:

- A. The proposed transferee agrees in writing to assume responsibility for compliance with all terms, conditions and obligations of the Permit as issued.
- B. There are no pending violations of the Permit or conditions of approval.
- C. The proposed transferee has provided any required financial assurance necessary to secure performance of the Permit.

The MSTRWD may impose different or additional conditions on the transfer of a Permit or deny the transfer if it finds that the proposed transferee has not demonstrated the ability to perform the work under the terms of the Permit as issued. The transfer of a Permit transfer does not extend the Permit term. The MSTRWD may suspend or revoke transfer or assignment whenever the transfer or assignment is granted on the basis of incorrect information supplied to the MSTRWD by the applicant.

Permit Reconsideration

A Permit decision becomes final unless appealed or unless a **REQUEST FOR RECONSIDERATION** is filed with the MSTRWD within 30 days of the Permit decision. A request for reconsideration will toll any un-run portion of the 30-day appeal period until a decision is made on the reconsideration. To make a request for reconsideration, a Permit applicant shall submit in writing a Request for Reconsideration to the MSTRWD. The Permit applicant must submit a Request for Reconsideration

within thirty (30) days of the date of the Permit decision. An applicant requesting reconsideration should include the specific findings or conditions for which reconsideration is requested, along with any additional submittals or argument supporting the Permit applicant's request. The request for reconsideration must include a waiver of decision timelines required by M.S. 15.99.

The MSTRWD shall give the Permit applicant due notice of when the Board will reconsider the Permit decision. The Board shall decide the Permit issue on reconsideration within one-hundred twenty (120) days of the request for reconsideration. The appeal period for a Permit decision under reconsideration is deemed tolled during the reconsideration period and shall resume the first calendar day following a decision on reconsideration.

Portable Pumping

Persons engaging in the pumping of water using portable pumps shall be liable to any ditch or road authorities for any erosion caused to in slopes, backslopes, ditch bottoms, or infrastructure.

Portable pumping during an emergency as defined under these rules shall be allowed. Absent an emergency, portable pumping shall only be allowed if the pumping does not adversely affect the downstream landowner.

After-the-Fact Permits

Any work requiring a permit that is performed without a permit is subject to enforcement and restoration under M.S. 103D. The MSTRWD may grant an "after-the-fact" Permit in certain situations. The work sought to be permitted by an "after-the-fact" Permit must have been capable of receiving a Permit prior to performance of the work or must be capable of correction. Because an after-the-fact permit will require increased investigation of the conditions of the unauthorized work, an increased inspection fee may be required prior to processing the after-the-fact permit. In no case will the increased inspection fee exceed \$500.

If, after inspection, the unauthorized work is found to be in compliance with these Rules or the performance standards herein, the after-the-fact permit shall issue without further cost to the applicant. If, after inspection, the unauthorized work is found to not be in compliance with these Rules, herein-further inspection and permit processing may be required, including addition inspection fees. An after-the-fact permit may require correction work and be subject to additional conditions.

An after-the-fact-permit may be required after emergency work. If the work is deemed an emergency and otherwise performed in compliance with these Rules, the after-the-fact permit shall issue without cost to the applicant. If the work is deemed an emergency but not otherwise performed in compliance with these Rules, the after-the-fact permit shall be issued without any increased inspection fees when compared to permit requests submitted to the MSTRWD Board. If the work is not deemed an emergency, the standard after-the-fact permit requirements will apply. In all cases, an after-the-fact permit may include conditions to correct any damage caused by the emergency work.

If the work does not qualify for a Permit, no "after-the-fact" Permit shall be issued and corrective actions may be sought pursuant to M.S. 103D.545 and M.S. 103D.551.

Before considering an after-the-fact Permit application, the MSTRWD may require that the property be returned to the condition that existed before the unpermitted work was performed.

Surface Drainage and Flood Mitigation

It is the policy of the Board to promote the use of the waters and related resources within the MSTRWD in a provident and orderly manner in order to benefit the general welfare and public health of residents within the MSTRWD. The Board also regulates new construction, improvements, repairs and maintenance of public and private drainageways for the following purposes:

- A. To preserve the capacities of drainage systems to accommodate future needs.
- B. To improve water quality and minimize localized flooding.
- C. To minimize the loss of drainage capacity.
- D. To avoid drainage conditions that cause or aggravate erosion or sedimentation of downstream drainageways or waterbodies.
- E. To hold responsible parties accountable for accumulation of pollution, debris, soil, and sediment in drainageways.

Surface Drainage

The following criteria apply to applications under this rule other than those for the construction, alteration or removal of a dike:

- A. An applicant shall not dispose of or alter the flow of surface water so as to unreasonably burden another landowner.
- B. Surface water shall not be artificially directed from upper land to and across lower land without adequate provision on the lower land for its passage.
- C. Surface water shall not be artificially directed into a public drainage system from land not assessed to that system unless express authority from the drainage authority is obtained as required under M.S. 103E.401.
- D. Temporary storage and retention basins on any parcel or parcels proposed to be drained shall be used to the extent feasible for upstream storage and to maintain peak flows, prevent erosion and avoid increased demand on public systems.
- E. To control and alleviate soil erosion and the siltation of the drainageways in the MSTRWD, the Board requires the adoption of proper land use practices and other methods as outlined in the MSTRWD's Watershed Management Plan. Erosion and downstream siltation shall be controlled by the following means:
 - I. All work involving exposed or stockpiled soil or materials subject to erosion will conform to an erosion and sediment control plan approved by the MSTRWD.
 - II. Open drainageways shall be stabilized with vegetation above the low water mark or other best management practices to reduce channel erosion.
 - III. Side slopes, above the low water mark, shall be planted with permanent grasses and no agricultural works, other than those required for maintenance of permanent growth of grass, shall be permitted. The area to be planted to grass, as herein provided, is a minimum requirement and may be enlarged in any work of improvement or new construction. All works or repairs on any public drainage

system will require the foregoing practice. Property owners have a right to harvest grass in any manner that is not harmful to the grass or the drainageway.

- IV. Drainageways shall be constructed with side slopes designed in accordance with proper engineering practice to minimize erosion, giving due consideration to the intended capacity of the drainageway; its depth, width and elevation; and the character of the soils to be drained.
 - V. Water inlets, culvert openings, bridge approaches, sloping lands, abutting drainage systems, lakes, ponds, wetlands or reservoirs shall have adequate shoulder and bank protection to minimize land and soil erosion.
 - VI. The height of field outlets is subject to MSTRWD staff review. A minimum height of one and one-half feet (1.5'), measured from the bottom of the drainageway, is generally considered an acceptable height.
 - VII. Channels and outlets shall be designed to be stable.
 - VIII. No one shall destroy all or any portion of the required sixteen and one-half foot (16.5') grass strip on drainage systems where such grass strips have previously been established under M.S. 103E. Where grass strips have been partially or completely destroyed, landowners shall be required to restore the destroyed area at their own expense. If the area is not restored, within a reasonable period of time after the provision of notice by the MSTRWD, the necessary work shall be performed by the MSTRWD and the costs subsequently collected with the landowner's real estate taxes in the following year.
- F. No proposed work shall negatively affect downstream water quality or quantity.
 - G. Any soils not incorporated or reincorporated into the work will be spread over the landowner's property. Soils shall not be added to the spoil bank without MSTRWD permission.
 - H. Obtaining a Permit from the MSTRWD does not relieve the Permit applicant from responsibility to comply with any procedures or approvals that may be required by M.S. 103E or any other Rules, regulations, requirements or standards of any applicable federal, state, county, township, local government or subdivision thereof, or local agency.

Dikes

The following criteria apply to the construction, alteration or removal of a dike:

- A. A dike shall not unreasonably restrict flow onto downgradient property.
- B. The dike shall not be constructed or maintained within the 100-year floodplain unless plans and specifications, signed by a licensed professional engineer, are submitted showing that: The work will not impede 100-year flood flows outside of the delineated retention area, or raise the 100-year flood level or increase flood peak downstream; and overflow sections are designed to handle overtopping during major floods without significant erosion or risk of failure and without sandbagging or other manual measures before or during a flood.
- C. The dike shall remain one (1) foot lower than any roadway, unless otherwise permitted by the MSTRWD and/or Road Authority.
- D. Outlet drainage shall be sized accordingly to drainage area and culvert sizes upstream and downstream of the outlet. The Culvert Size Chart (see page 19) provides a list of recommended flow areas for selected frequencies.

- E. A Permit to construct or maintain a dike shall be conditioned on the applicant's granting the MSTRWD the right in perpetuity to install and maintain traps and/or gates to restrict or eliminate outflow from the diked area during and after overtopping flood events.
- F. All work involving exposed or stockpiled soil or materials subject to erosion shall be covered and/or reseeded and if vegetation has not returned, the area shall be reseeded.
- G. No one shall destroy all or any portion of the required sixteen and one-half foot (16.5') grass strip on drainage systems where such grass strips have previously been established under M.S. 103E. Where grass strips have been partially or completely destroyed, landowners shall be required to restore the destroyed area at their own expense. If the area is not restored, within a reasonable period of time after the provision of notice by the MSTRWD, the necessary work shall be performed by the MSTRWD and the costs subsequently collected with the landowner's real estate taxes in the following year.
- H. Obtaining a Permit from the MSTRWD does not relieve the applicant from responsibility to comply with any procedures or approvals that may be required by M.S. 103E or any other rules, regulations, requirements or standards of any applicable federal, state, county, township, local government or subdivision thereof, or local agency.

Subsurface Tile Drainage

Application

An application for a subsurface tile drainage or lift station Permit must meet the following requirements:

- A. Written consent of owners affected by the proposed work must be obtained and be indicated in the application.
- B. Accompanying the subsurface tile drainage Permit application will be an 8 ½ inch by 11-inch map of the area(s) proposed to be tiled. This map must show the number of acres proposed to be tiled.
- C. Applicants employing commercial installers must attach a copy of their written installation agreement to the permit application.
- D. MSTRWD staff and/or the MSTRWD Engineer shall review the subsurface tile drainage plan and/or lift station to see if the proposed work will overburden the capacity of the downstream drainageway or culverts.
- E. The Permit application must identify the estimated drainage coefficient together with the maximum and minimum theoretical discharge of the proposed system.
- F. All subsurface tile outlets, including pumps, shall be located outside of a public drainage system and governmental right-of-way, unless approved by the MSTRWD or other appropriate government entity. All outlets and pumps must be visibly marked.
- G. All systems using pumps shall have either a Board-approved gap design or an alternative method that will be reviewed for approval by the Board.
- H. If a proposed system will use a pump, the Permit applicant shall provide the horsepower and capacity (expressed in gallons per minute) of the pump.
- I. The height of subsurface tile outlets are subject to MSTRWD staff review. A minimum height of one and one-half feet (1.5'), measured from the bottom of the drainageway, is generally considered an acceptable height.

- J. A Permit applicant shall describe a plan to minimize erosion at the system's outlet. The Watershed requires geotextile fabric and riprap to minimize erosion. For guidance, see the Erosion Control: Rip rap and Geotextile charts on pages 23, 24, 25.
- K. All subsurface drain tile works permitted by the MSTRWD prior to the adoption of the MSTRWD Amended Rules, dated _____, 2021, will not be required to alter from their originally permitted design. Therefore, all subsurface drain tile works permitted by the MSTRWD prior to the adoption of the MSTRWD Amended Rules, _____, 2021, will be considered Grandfathered Works.
- L. Obtaining a Permit from the Board does not relieve the applicant from the responsibility of obtaining any other additional authorization or permits required by law. (EX. NRCS, SWCD, Township, County, State, etc.)

Operating Plan

An operating plan shall be signed and submitted along with the Permit application. The Operating Plan describes how the pump will be managed and who is to be contacted in the event of problems or emergencies. An Operating Plan Template is available at the District office and on the District website.

The operating plan must include:

- A. Detailed pump installation specifications which indicate: whether remote on/off/rate control technology will be employed, whether remote discharge ditch monitoring will be employed, the system's gap design, and the use of any new drain tile technology.
- B. Which persons should be called when the pump needs to be managed, and in what order.
- C. Installer's information.
- D. Whether the tile installer has been granted authority from the applicant to operate the pump system if the applicant or operator cannot be reached.

Procedures/Guidance

- A. As used in this specific Section, reducing the speed of a variable speed pump (VFD) to its lowest setting or to the "idle" setting shall be deemed equivalent to "no pumping."
- B. If none of the persons listed in the plan can be reached, Watershed staff or a Watershed designated third party may be contacted to shut off pump or reduce the pump's rate of discharge. Landowner will be charged costs.
- C. Landowner shall be responsible for monitoring weather conditions.
- D. No pumping is allowed during freezing conditions or when the downstream culverts could be plugged with snow or ice. Freezing conditions are defined as when the drainageways, culverts, bridges, etc. have ice building up. Subsurface tile drainage that close in the winter shall remain closed until spring floodwater conditions recede below Flood Stage at the closest downstream Prediction Site.
- E. The land owner shall be responsible to monitor National Weather Service Flood Probability for the Red River for the closest downstream Prediction Sites to their property at: <http://water.weather.gov//ahps2/index.php?wfo=fgf>
- F. **No tile pumping during flooding conditions** Flooding conditions shall be defined as a condition in which the immediate downstream tile outlet is at full its capacity or has exceeded its full capacity. In addition, flooding conditions include:

- i. When the downstream system or the outlet of a system is experiencing flooding.
- ii. When the National Weather Service Flood Probability Prediction reaches **Major Flood Stage** at the closest downstream-Prediction Site.
- iii. When the National Weather Service Flood Probability Prediction reaches **Moderate Flood Stage** at the closest downstream-Prediction Site.
- iv. In Table 1, the prediction sites that are of importance to the MSTRWD are listed along with their **Moderate Flood Stage** and **Major Flood Stage** measurements. Landowners should be aware of the closest downstream prediction site and operate pumps accordingly to decrease impacts on the Red River.

NATIONAL WEATHER SERVICE FLOOD PROBABILITY

PREDICTION SITE	“Moderate” Flood Stage (ft)	“Major Flood Stage” (ft)
@ EAST GRAND FORKS	40.0	46.0
@ OSLO	30.0	36.0
@ DRAYTON	38.0	42.0

Table 1 National Weather Service Prediction Site Flood Probability

- G. It is recommended that after harvest, tile outlet controls, including pumps, be opened or turned on to remove water from the system except when flooding or freezing conditions exist or are likely. This is to create storage capacity for spring melt and rain events.
- H. Consideration shall be made for turning off pumps for short period of times during the summer so maintenance can be performed on public drainage systems and other drainageways.
- I. By signing the Operating Plan, the landowner is acknowledging that he/she understands the procedures, Rules, and guidance for drain tile systems.

Enforcement and Financial Assurance

Manner of Enforcement

In the event of a violation or threatened violation of a MSTRWD Rule, Permit, order, stipulation, or a provision of M.S. 103D, the MSTRWD may take action to prevent, correct, or remedy the violation or any harm to water resources resulting from it. Enforcement action includes but is not limited to injunction; action to compel performance, abatement or restoration; and prosecution as a criminal misdemeanor in accordance with M.S. 103D.545 and M.S. 103 D. 551.

No additional Permit shall be issued to any applicant who is in violation of MSTRWD Rules or a previously issued Permit until such violation has been remedied to the satisfaction of the Board.

Investigation of Noncompliance

Minnesota Statute section 103D.335, subd. 14 allows the MSTRWD’s authorized representative to enter and inspect a property inside or outside the watershed district to make surveys and investigations to determine the existence of a violation or threatened violation. In all cases the MSTRWD will attempt to contact the landowner prior to entry. The MSTRWD is liable for actual damages resulting from entry.

Administrative Compliance Order

The MSTRWD may issue orders directing correction of violations of these Rules or directing a property owner or entity to show cause why the MSTRWD should not initiate enforcement actions. If a show cause order is issued, a landowner or entity shall be given an opportunity to be heard by the Board at its next regular meeting. If a violation or threatened violation of these Rules presents a serious threat of adverse effect on water resources, the MSTRWD may proceed directly to the District Court for an injunction to stop or correct the violation.

Board Hearing

After due notice and a show cause hearing at which evidence may be presented, the Board shall make findings. If the Board finds a violation exists and no good cause is shown to prevent the initiation of enforcement actions, it shall issue an order: requiring that the property owner, entity or responsible installer to cease the violating work, apply for an after-the-fact Permit, or take corrective or restorative action; authorizing the initiate of enforcement actions in the District Court; or directing other action to compel compliance with these Rules.

Liability for Enforcement Costs

In any civil action arising from or related to a rule, order, or stipulation agreement made or a Permit issued or denied by the Board under this chapter, the court may award the prevailing party reasonable attorney fees and costs.

Installer Liability

Any individual, firm, corporation, partnership, association or other entity contracting to perform work subject to one or more MSTRWD Rules, shall be responsible to ascertain that the necessary Permit has been obtained and that the work being performed complies with the Permit conditions, Rules, Statutes and any applicable MSTRWD orders or stipulations. An installer that, itself or through a subcontractor, engages in work constituting a violation or threatened violation shall be the responsible installer for purposes of this rule.

Financial Surety

In accordance with Minnesota Statute 103D.345 Subd. 4, the MSTRWD may require a performance surety, such as an approved escrow deposit, a bond, or an irrevocable letter of credit, to secure performance of permit conditions and compliance with these Rules. The federal government, State, and political subdivisions are exempt from the requirements of this subdivision.

- A. When required a performance surety, it shall be for an amount sufficient to cover inspection fees and the potential costs of restoration that may result from a violation of the permit. The MSTRWD's engineer and staff shall assist in determining this amount.
- B. The performance surety must be in a form acceptable to the MSTRWD and from a surety company licensed to do business in Minnesota.
- C. The performance surety must be in favor of the District and be conditioned on the applicant's compliance with the terms of the permit. The performance surety must allow the District to claim the performance surety if the conditions are not met and use

the forfeited funds to complete the work, if necessary. If the surety funds are insufficient to complete the work, the applicant may be assessed for the balance. Upon satisfactory completion of the permitted work the surety shall be released and unused funds shall be returned to the applicant.

EFFECTIVE DATE AND REPEAL OF EXISTING RULES

These rules and regulations shall become effective upon the passage by the Board of Managers and publication and hearings as required by law. These rules were hereby adopted pursuant to Minnesota Statutes, 103D.341, on day of , **2021**.

MSTRWD Secretary

Appendix

Other Permitting Bodies Contact Information

Agency	Position	Address	Phone
MN DNR	DNR Waters Area Hydrologist Marshall County	246 125 th Ave NE Thief River Falls, MN 56701	(218)-681-0947
	DNR Aquatic Plant Management - Marshall County	2115 Birchmont Beach Rd NE Bemidji, MN 56601	(218)-308-2623
	DNR Lands and Minerals Marshall County	2115 Birchmont Beach Rd NE Bemidji, MN 56601	(218)-308-2627
USACE	Bemidji Field Office	4111 Technology Drive, Ste 295 Bemidji, MN 56601	(218)-444-6381
MPCA	MPCA Detroit Lakes	714 Lake Ave, Suite 220 Detroit Lakes, MN 56501	(218)-847-1519
NRCS	Marshall County Warren Field Office	105 S Division St Warren, MN 56762	(218) 745-4351
	Polk County Crookston Field Office	528 Strander Ave Crookston, MN 56716	(218) 281-1445
	Pennington County Thief River Falls Field Office	201 Sherwood Ave S Thief River Falls, MN 56701	(218) 683-7075

	Roseau County Roseau Field Office	502 7 th St SW #8 Roseau, MN 56751	(218) 463-1862
	Kittson County Hallock Field Office:	410 S 5 th St, Suite 106 Hallock, MN 56728	(218) 843-2619
MNDOT	Engineering Specialist	1320 Sunflower St Crookston, MN 56716	(218)-277-7965
Marshall County	County Engineer	208 E Colvin Avenue, Suite 13 Warren, MN 56762	(218)-745-4381
Polk County	County Engineer	820 Old Highway 75 South Crookston, MN 56716	(218)-470-8253
Pennington County	County Engineer	250 125th Ave NE Thief River Falls, MN 56701	(218)-683-7017
Roseau County	County Engineer	407 5 th Ave NW Roseau, MN 56751	(218) 463-2063
Kittson County	County Engineer	401 2 nd Street SW Hallock, MN 56728	(218) 843-2686

Local City, Township, County Officials		Website
Marshall		http://www.co.marshall.mn.us
Polk		http://www.co.polk.mn.us
Pennington		http://www.co.pennington.mn.us
Roseau		http://www.co.roseau.mn.us
Kittson		https://www.co.kittson.mn.us

Culvert Size Chart

Recommended Flow Areas for Selected Frequencies (assumes an average velocity 3.5 feet per second)									
	12A ^{5/6}	(Ft ³ /sec)/3.5		23A ^{5/6}	(Ft ³ /sec)/3.5		32A ^{5/6}	(Ft ³ /sec)/3.5	
DA (sq mi)	2 Yr	Rec. Area (sq ft)	Culvert Diameter (inches)	5 Yr	Rec. Area (sq ft)	Culvert Diameter (inches)	10 Yr	Rec. Area (sq ft)	Culvert Diameter (inches)
0.10	1.8	0.5	18	3.4	1.0	18	4.7	1.3	18
0.20	3.1	0.9	18	6.0	1.7	18	8.4	2.4	24
0.30	4.4	1.3	18	8.4	2.4	24	11.7	3.4	24
0.40	5.6	1.6	18	10.7	3.1	24	14.9	4.3	30
0.50	6.7	1.9	24	12.9	3.7	24	18.0	5.1	30
0.60	7.8	2.2	24	15.0	4.3	30	20.9	6.0	36
0.70	8.9	2.5	24	17.1	4.9	30	23.8	6.8	36
0.80	10.0	2.8	24	19.1	5.5	30	26.6	7.6	42
0.90	11.0	3.1	24	21.1	6.0	36	29.3	8.4	42
1.00	12.0	3.4	30	23.0	6.6	36	32.0	9.1	42
1.10	13.0	3.7	30	24.9	7.1	36	34.6	9.9	42
1.20	14.0	4.0	30	26.8	7.6	42	37.3	10.6	48
1.30	14.9	4.3	30	28.6	8.2	42	39.8	11.4	48
1.40	15.9	4.5	30	30.4	8.7	42	42.4	12.1	48
1.50	16.8	4.8	30	32.2	9.2	42	44.9	12.8	48

1.60	17.8	5.1	30	34.0	9.7	42	47.3	13.5	54
1.70	18.7	5.3	36	35.8	10.2	48	49.8	14.2	54
1.80	19.6	5.6	36	37.5	10.7	48	52.2	14.9	54
1.90	20.5	5.9	36	39.3	11.2	48	54.6	15.6	54
2.00	21.4	6.1	36	41.0	11.7	48	57.0	16.3	54
2.10	22.3	6.4	36	42.7	12.2	48	59.4	17.0	60
2.20	23.1	6.6	36	44.4	12.7	48	61.7	17.6	60
2.30	24.0	6.9	36	46.0	13.2	48	64.1	18.3	60
2.40	24.9	7.1	36	47.7	13.6	54	66.4	19.0	60
2.50	25.8	7.4	42	49.4	14.1	54	68.7	19.6	60
2.60	26.6	7.6	42	51.0	14.6	54	71.0	20.3	60
2.70	27.5	7.8	42	52.6	15.0	54	73.2	20.9	66
2.80	28.3	8.1	42	54.2	15.5	54	75.5	21.6	66
2.90	2.90	8.3	42	55.9	16.0	54	77.7	22.2	66
3.00	30.0	8.6	42	57.5	16.4	60	79.9	22.8	66
3.10	30.8	8.8	42	59.0	16.9	60	82.2	23.5	66
3.20	31.6	9.0	42	60.6	17.3	60	84.4	24.1	66
3.30	32.5	9.3	42	62.2	17.8	60	86.5	24.7	72
3.40	33.3	9.5	42	63.8	18.2	60	88.7	25.4	72
3.50	34.1	9.7	42	65.3	18.7	60	90.9	26.0	72
3.60	34.9	10.0	48	66.9	19.1	60	93.1	26.6	72
3.70	35.7	10.2	48	68.4	19.6	60	95.2	27.2	72
3.80	36.5	10.4	48	70.0	20.0	60	97.3	27.8	72
3.90	37.3	10.7	48	71.5	20.4	66	99.5	28.4	72
4.00	38.1	10.9	48	73.0	20.9	66	101.6	29.0	72
4.10	38.9	11.1	48	74.5	21.3	66	103.7	29.6	78
4.20	39.7	11.3	48	76.1	21.7	66	105.8	30.2	78
4.30	40.5	11.6	48	77.6	22.2	66	107.9	30.8	78
4.40	41.2	11.8	48	79.1	22.6	66	110.0	31.4	78
4.50	42.0	12.0	48	80.6	23.0	66	112.1	32.0	78
4.60	42.8	12.2	48	82.0	23.4	66	114.1	32.6	78
4.70	43.6	12.5	48	83.5	23.9	66	116.2	33.2	78
4.80	44.3	12.7	48	85.0	24.3	66	118.3	33.8	78
4.90	45.1	12.9	48	86.5	24.7	72	120.3	34.4	84
5.00	45.9	13.1	48	87.9	25.1	72	122.4	35.0	84
5.20	47.4	13.5	54	90.9	26.0	72	126.4	36.1	84
5.40	48.9	14.0	54	93.8	26.8	72	130.5	37.3	84
5.60	50.4	14.4	54	96.7	27.6	72	134.5	38.4	84
5.80	51.9	14.8	54	99.5	28.4	72	138.5	39.6	84
6.00	53.4	15.3	54	102.4	29.2	72	142.4	40.7	
6.20	54.9	15.7	54	105.2	30.1	78	146.4	41.8	
6.40	56.4	16.1	54	108.0	30.9	78	150.3	42.9	
6.60	57.8	16.5	54	110.8	31.7	78	154.2	44.1	
6.80	59.3	16.9	60	113.6	32.5	78	158.1	45.2	
7.00	60.7	17.4	60	116.4	33.3	78	162.0	46.3	
7.20	62.2	17.8	60	119.2	34.0	78	165.8	47.4	
7.40	63.6	18.2	60	121.9	34.8	84	169.6	48.5	
7.60	65.0	18.6	60	124.7	35.6	84	173.4	49.6	
7.80	66.5	19.0	60	127.4	36.4	84	177.2	50.6	
8.00	67.9	19.4	60	130.1	37.2	84	181.0	51.7	
8.20	69.3	19.8	60	132.8	37.9	84	184.4	52.8	
8.40	70.7	20.2	60	135.5	38.7	84	188.5	53.9	
8.60	72.1	20.3	66	138.2	39.5	84	192.3	54.9	
8.80	73.5	21.0	66	140.9	40.2		196.0	56.0	
9.00	74.9	21.4	66	143.5	41.0		199.7	57.1	
9.20	76.3	21.8	66	146.2	41.8		203.4	58.1	
9.40	77.6	22.2	66	148.8	42.5		207.1	59.2	

9.60	79.0	22.6	66	151.5	43.3	210.7	60.2
9.80	80.4	23.0	66	154.1	44.0	214.4	61.2
10.00	81.8	23.4	66	156.7	44.8	218.0	62.3
10.50	85.1	24.3	66	163.2	46.6	227.1	64.9
11.00	8.5	25.3	72	169.7	48.5	236.0	67.4
11.50	91.9	26.2	72	176.1	50.3	244.9	70.0
12.00	95.2	27.2	72	182.4	52.1	253.8	72.5
12.50	98.5	28.1	72	188.7	53.9	262.6	75.0
13.00	101.7	29.1	72	195.0	55.7	271.3	77.5
13.50	105.0	30.0	78	201.2	57.5	280.0	80.0
14.00	108.2	30.9	78	207.4	59.3	288.6	82.4
14.50	111.4	31.8	78	213.6	61.0	297.1	84.9
15.00	114.6	32.7	78	219.7	62.8	305.7	87.3
15.50	117.8	33.7	78	225.8	64.5	314.1	89.7
16.00	121.0	34.6	78	231.8	66.2	322.5	92.2
16.50	124.1	35.5	78	237.8	68.0	330.9	94.5
17.00	127.2	36.3	78	243.8	69.7	339.3	96.9
17.50	130.3	37.2	78	249.8	71.4	347.5	99.3
18.00	133.4	38.1	78	255.7	73.1	355.8	101.7
18.50	136.5	39.0	78	261.6	74.8	364.0	104.0
19.00	139.6	39.9	78	267.5	76.4	372.2	106.3
19.50	142.6	40.8	84	273.4	78.1	380.3	108.7
20.00	145.7	41.6	84	279.1	79.8	388.5	111.0

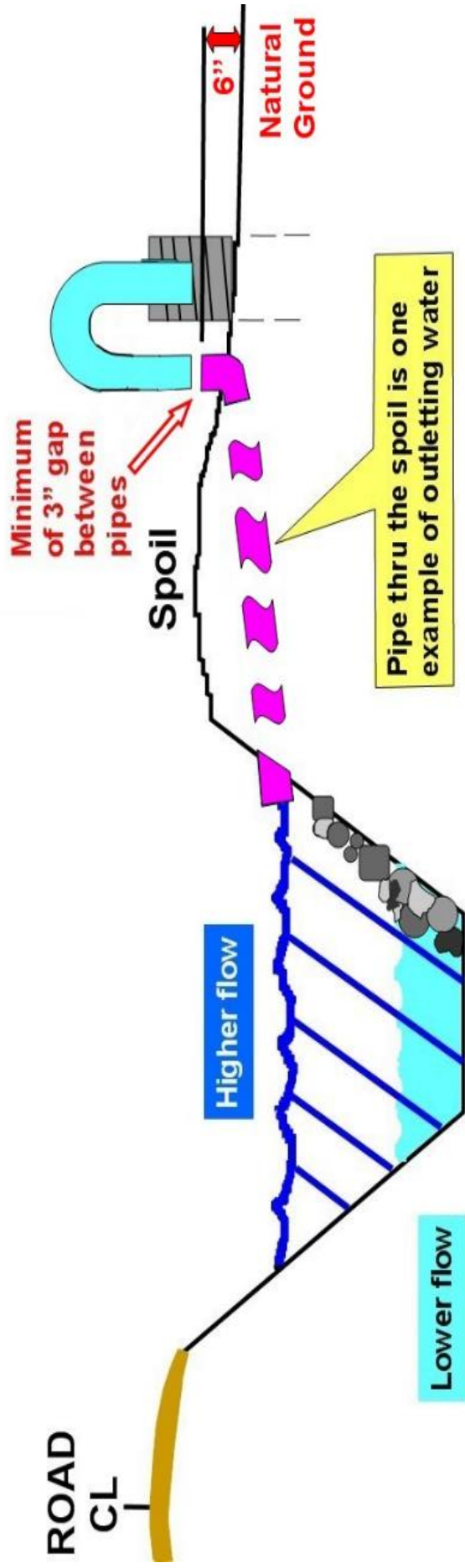
English & Estimated Metric Dimensions Selected Circular & Arch Culverts									
Circular Diameter (inches)	Area (sq-ft)	Reinforced Concrete Arch			Circular Diameter (mm)	Area (sq-m)	Reinforced Concrete Arch		
		Rise (inches)	Span (inches)	Area (sq-ft)			Rise (mm)	Span (mm)	Area (sq-m)
12	0.79				300	0.073			
15	1.23	11.00	18.00	1.10	380	0.114	280	450	0.102
18	1.77	13.50	22.00	1.65	460	0.164	340	550	0.153
21	2.40	15.50	26.00	2.20	530	0.223	390	660	0.204
24	3.14	18.00	28.50	2.80	610	0.292	460	720	0.260
30	4.91	22.50	36.25	4.40	760	0.456	570	920	0.409
36	7.07	26.38	43.75	6.40	910	0.656	670	1110	0.595
42	9.62	31.31	51.13	8.80	1070	0.893	800	1290	0.818
48	12.56	36.00	58.50	11.40	1220	1.17	910	1480	1.059
54	15.90	40.00	65.00	14.30	1370	1.48	1020	1650	1.329
60	19.63	45.00	73.00	17.70	1520	1.82	1140	1850	1.644
72	28.26	54.00	88.00	25.60	1830	2.63	1370	2230	2.378
84	38.47	62.00	102.00	34.60	2130	3.57	1570	2590	3.214
90	44.16	72.00	115.00	44.50	2290	4.10	1830	2920	4.134
96	50.24	77.25	122.00	51.70	2440	4.67	1960	3090	4.803
108	63.59	87.13	138.00	66.00	2740	5.91	2210	3500	6.132
120	78.50	97.88	154.00	81.80	3050	7.29	2490	3910	7.599
132	94.99	106.50	168.75	99.10	3350	8.82	2710	4280	9.207

		Corrugated Steel Pipe Arch					Corrugated Steel Pipe Arch		
Circular Diameter (inches)	Area (sq-ft)	Rise (inches)	Span (inches)	Area (sq-ft)	Circular Diameter (mm)	Area (sq-m)	Rise (mm)	Span (mm)	Area (sq-m)
12	0.79				300	0.07			
15	1.23	13.00	17.00	1.10	380	0.11	330	430	0.102
18	1.77	15.00	21.00	1.65	460	0.16	380	530	0.153
21	2.40	18.00	24.00	2.20	530	0.22	460	610	0.204
24	3.14	20.00	28.00	2.80	610	0.29	510	710	0.260
30	4.91	24.00	35.00	4.40	760	0.46	610	880	0.409
36	7.07	29.00	42.00	6.40	910	0.66	740	1060	0.595
42	9.62	33.00	49.00	8.80	1070	0.89	840	1240	0.818
48	12.56	38.00	57.00	11.40	1220	1.17	970	1440	1.059
54	15.90	43.00	64.00	14.30	1370	1.48	1090	1620	1.329
60	19.63	47.00	71.00	17.70	1520	1.82	1190	1800	1.644
66	23.75	52.00	77.00	21.90	1680	2.21	1320	1950	2.035
72	28.26	57.00	83.00	25.60	1830	2.63	1450	2100	2.378
3x1 Corrugations									
54	15.90	48.50	58.50	15.60	1370	1.48	1230	1480	1.449
60	19.63	54.00	65.00	19.30	1520	1.82	1370	1650	1.793
66	23.75	58.25	72.50	23.20	1680	2.21	1480	1840	2.155
72	28.26	62.50	79.00	26.50	1830	2.63	1590	2000	2.506
78	33.17	67.25	86.50	32.10	1980	3.08	1710	2190	2.982
84	38.47	71.75	93.50	37.00	2130	3.57	1820	2370	3.437
90	44.16	76.00	101.50	42.40	2290	4.10	1930	2570	3.939
96	50.24	80.50	108.50	48.00	2440	4.67	2040	2750	4.459
102	56.72	84.75	116.50	54.20	2590	5.27	2150	2950	5.035
108	63.59	89.25	123.50	60.50	2740	5.91	2270	3130	5.621
114	70.85	93.75	131.00	67.75	2900	6.58	2380	3320	6.210
120	78.50	98.00	138.50	74.50	3050	7.29	2490	3510	6.921

Suggested Sub-Surface Tile Drainage Diagram

- When implementing a tile outlet pipe thru a road or spoilbank into a ditch there must be a gap of 3" between the pipe that comes from the sump hole (BLUE) and the pipe that goes thru the road or spoil (PINK).
- The inlet end of the pipe that goes thru the road or spoil cannot project higher than 6" from the natural ground in the vicinity.
- The diameter of the pipe that goes thru the road or spoil (PINK) must be larger than the diameter of the pipe that comes from the sump hole (BLUE)

Doing so will prevent water from entering the ditch during higher flows when the ditch has reached its capacity.



Erosion Control: Riprap and Geotextile Charts

Table 3601-1 Random Riprap Gradation Requirements						
Weight, lb [kg]	Size, in [mm]*	Approximate Percent of Total Weight Smaller than Given Weight				
		Class of Riprap				
		I	II	III	IV	V
2,000 [900]	30 [750]	--	--	--	--	100
1,000 [450]	24 [600]	--	--	--	100	--
650 [300]	21 [525]	--	--	--	--	75
400 [180]	18 [450]	--	--	100	--	--
250 [113]	15 [375]	--	--	--	75	50
120 [55]	12 [300]	--	100	75	50	--
50 [22]	9 [225]	--	75	50	--	--
15 [7]	6 [150]	100	50	--	--	10
5 [2]	4 [100]	--	--	--	10	--
2 [1]	3 [75]	50	--	10	--	--
--	2 [50]	--	10	--	--	--
--	1 [25]	10	--	--	--	--

* Weight to size conversion based on a specific gravity of 2.60 and a volume average between a sphere and cube

Note: Areas boxed in by a red line indicate the typical requirement used in the District.

Table 3733-1 Geotextile Properties								
Geotextile Property	Test Method (ASTM)	Type (a)						
		Units	1		3	4	5	6
	Fabric		Knit sock (b)					
B1 Grab Tensile Strength minimum, each principal direction	D4632 lb. [kN]	100 [0.45]	--	100 [0.45]	200 [0.90]	200 [0.90]	(d)	300 [1.3]
B2 Elongation minimum, each principal direction	D4632 percent	--	--	50	50	--	(d)	50
B3 Seam Breaking Strength minimum (e)	D4632 lb. [kN]	90 [0.40]	--	90 [0.40]	180 [0.80]	180 [0.80]	(d)	270 [1.2]
B4 Apparent Opening Size (AOS) maximum (f)	D4751 U.S. Std. sieve size [mm]	40 [0.425]	40 [0.425] as applied	50 [0.30]	50 [0.30]	30 [0.60]	20 [0.85]	50 [0.30]
B5 Permittivity minimum (g)	D4491 falling head sec ⁻¹	0.7	2.75 relaxed	0.5	0.5	0.05	0.05	0.5
B6 Puncture strength minimum	D6241 Lb [N]	--	180 [800]	--	--	--	--	--
B7 Wide Width Strip Tensile Strength minimum each principal direction	D4595 lb/ft [kN/m]	--	--	--	--	--	(d)	--

- (a) Minimum Average Roll Values (MARV) based on average of at least three tests per swatch.
- (b) Provide socks made of knit polymeric materials and meeting the requirements of ASTM D6707-06, for Type H: fabric. Ensure the sock exhibits minimum snag or run potential, is factory-applied to maintain uniform installed mass, and conforms to the outside diameters of the tubing with a snug fit.
- (c) Needle-punched nonwoven. Do not use thermally bonded (heat-set) fabric.
- (d) Requirements are site-specific and will be as specified in the contract. The property values for B1 and B3 may not be less than shown for Type 5. If the contract does not specify either B1 or B7, use default value of 300 lb [1.3 kN] for B1. If the contract does not specify seam strength, use a default value of 270 lbf [1.2 kN] for B3.
- (e) Adhere to this requirement if the contract requires or allows seams. Strength specifications apply to factory and field seams. Use thread for sewing that has strength of at least 25 lb. [110 N]. Sew seams with a Federal Type 401 stitch using a two-spool sewing machine, and install seams facing upward. For seaming with adhesives, see the Approved/Qualified Products List available at the Department's website.
- (f) For U.S. sieve sizes, the AOS Number must be equal to or greater than the number specified.
- (g) Permittivity: $P = K/L$, where K = fabric permeability and L = fabric thickness.

Note: Areas boxed in by a red line indicate the typical requirement used in the District.

3733 Geotextiles
3733.1 SCOPE
Provide geotextiles (permeable fabrics) for the typical uses classified as follows:
(1) Type I for wrapping subsurface drain pipe, joints of concrete pipe culvert, or other drainage applications;
(2) Type II. The Department no longer uses this classification. If the contract specifies Type II, use Type III propriety requirements;
(3) Type III for use under Class I and Class II random riprap, gabions, and revet mattresses;
(4) Type IV for use under Class III and Class IV random riprap and hand-placed riprap on slopes no steeper than 3:1, horizontal to vertical;
(5) Type V for separating materials for stabilization;
(6) Type VI for earth reinforcement;
(7) Type VII for use under Class III and Class IV random riprap on slopes steeper than 3:1, horizontal to vertical, and under Class V random riprap.

Note: Areas boxed in by a red line indicate the typical requirement used in the District.

Definitions

For the purpose of these regulations, certain words and phrases shall be defined as follows:

Administrative Compliance Order shall be an order by the MSTRWD Administrator, pending a Board hearing to determine if there is a violation in which a compliance order of indefinite duration will be ordered and the property owner will then have to apply for an after-the-fact Permit and take corrective or restorative action.

After-The-Fact Permit shall mean a permit that is given to a land-owner when work requiring a permit occurs before the landowner receives authority to commence the work.

Artificial Drainageway shall mean a watercourse artificially constructed by human beings where a natural watercourse was not previously located.

As-Built shall mean the original design drawings revised to reflect any changes made in the field.

Board shall mean Board of Managers of the Middle Snake Tamarac Rivers Watershed District.

Control Structure shall mean structure that is placed in a drainage conduit (ditch, tile or culvert) which provides control of the stage or discharge of surface and/or subsurface drainage.

Compliance shall mean the action or fact of complying with a wish or command.

District shall mean the Middle-Snake-Tamarac Rivers Watershed District.

Dike shall mean any embankment or structure above natural ground for controlling or holding back water.

DNR shall mean the Department of Natural Resources.

Drainage Authority shall mean the Board or joint county drainage authority having jurisdiction over a public drainage system or project.

Drainage Capacity shall mean the maximum amount of the water that a drainage system can contain.

Drainage Coefficient shall mean the design capacity of the drainage system and is typically expressed as a depth of water removed in 24 hours (inches/day).

Drainageway shall mean a route or course along which water moves or may move to drain a region, such as a ditch.

Dredging shall mean to clean out the bed of by scooping out mud, weeds, and rubbish with a dredge.

Emergency shall mean circumstances posing an imminent threat to human life, dwellings, roads, or other structures, or the interruption of use of home septic systems due to flooding. **Emergency** may also include other circumstances as may be determined by the Board of Managers of MSTRWD in his or her its discretion.

Flooding Conditions shall mean when ditches immediately downstream of works or outlets reach full capacity or culverts are running full and /or local river has hit moderate flood stage.

Flood Mitigation shall mean the act of alleviating the effects of floods and flooding by moderating or reducing the severe damages resulting from floods through structural and nonstructural flood management measures.

Freezing Conditions shall mean when water conveyed by a drainageway, culvert, bridge, etc. begins to form ice.

General Welfare shall include any act or thing, tending to improve, benefit or contribute to the safety or wellbeing of the general public or benefit the inhabitants of the District.

Grandfather is a provision in which a previous rule continues to apply to some existing situations while a new rule will apply to all future activity.

Groundwater shall mean water held underground in the soil or in pores and crevices in rock.

Hydraulics shall mean the branch of science and technology concerned with the conveyance of liquids through pipes and channels.

Hydrology shall mean the science that encompasses the occurrence, distribution, movement and properties of the waters of the earth and their relationship with the environment.

Improve as the term relates to a public drainage system shall mean tiling, enlarging, extending, straightening, or deepening of an established and constructed public drainage system. As the term relates to other facilities, "improve" shall mean the expansion or enlargement of the facility or facility's capacity beyond that which was originally constructed.

Installer shall mean a person or company that undertakes a contract to provide materials, labor, a service or to do a job.

Integrated on/off shall mean technology that allows a tile drainage pump to be remotely or automatically controlled based on flood or high water conditions in the outlet

Landowner shall mean an individual or entity that is not prohibited from owning agricultural land under section 500.24 and either owns eligible land or is purchasing eligible land under a contract for deed.

Lateral shall mean any drainage construction by branch or extension, or a system of branches and extensions, or a drain that connects or provides an outlet to property with an established public drainage system.

Legal Drainageway shall mean a route or course along which water moves or may move to drain a region established under M.S. 103D or M.S. 103E.

Levee shall mean a bank or mound of earth that is built or placed in a manner to keep the flow of water in the continual direction it hydraulically flows to, to protect an area from flooding.

Licensed Professional Engineer (PE) shall mean an engineering professional possessing a state licensure in good standing in the State of Minnesota.

Maintenance shall mean to restore a structure, drainageway or other facility to its originally constructed configuration or condition. In the case of a natural drainageway, maintenance may include the removal of accumulated sediment, vegetation and debris.

May shall mean permissive.

M.S. shall mean Minnesota Statute.

Misdemeanor shall have the meaning given in Minnesota's Criminal Code.

MPCA shall mean the Minnesota Pollution Control Agency.

Natural Drainageway shall mean a natural channel that has definable beds and banks capable of conducting confined runoff from adjacent land.

NPDES shall mean National Pollutant Discharge Elimination System.

NRCS shall mean the Natural Resource Conservation Service.

Operating Plan shall mean a document that describes how a pump will be managed and who is to be contacted for problems.

Permissive shall mean allowed but not obligatory; optional.

Permit shall mean an official authorization from MSTRWD for work subject to the administrative rules of the MSTRWD.

Permit Application Form shall mean a document which an applicant must completely fill out to begin the process of obtaining a permit from MSTRWD.

Permittee shall mean the person to which a permit is issued.

Person shall mean an individual, firm, partnership, association or corporation, but does not include public or political subdivisions.

Political Subdivision shall mean a county, town, school district or a political division or subdivision of the State.

Power of Attorney shall mean the authority to act for another person in specified or all legal or financial matters.

Private Drainageway shall mean a drainage way other than a public drainage system or natural drainageway constructed on private property.

Public Drainage System shall mean a watershed, county, judicial or other drainage system established under M.S. 103D or M.S. 103E.

Public Health shall mean an act or thing that tends to improve the general sanitary condition of the community by drainage, relieving low wetland or stagnant and unhealthful conditions, or preventing the overflow of any property that produces or tends to produce unhealthful conditions.

Public Corporation shall mean a County, Town, School District or political subdivision or agency of the state. Public Corporation except where the context clearly indicates otherwise does not include the District.

Reservoir shall mean a large natural or artificial lake used as a source of water supply.

Right-of-way/Public Right-of-way shall mean the legal right to pass along a specific route through grounds or property belonging to another.

Runoff shall mean the draining away of water (or substances carried in it) from the surface of an area of land, a building, or structure, etc.

Shall is mandatory, not permissive.

Siltation shall mean the process by which water becomes dirty because of fine mineral particles in the water.

Subsidence shall mean the gradual caving in or sinking of an area of land.

Subwatershed shall mean a hydrologic area less than the entire area under the jurisdiction of a drainage authority.

Surface Water shall mean water that collects on the surface of the ground.

SWCD shall mean the Soil and Water Conservation District.

Tables shall mean to postpone consideration of permit until the following Board meeting.

Transferee shall mean a person to which a permit is transferred.

Top-of-Bank shall mean the first major change in the slope of the incline from the ordinary high water level of a water body.

Subsurface tile drainage shall mean an agriculture practice that removes excess water from soil subsurface.

Surface drainage shall mean the removal of surface water by development of the slope of the land utilizing systems of drains to carry away the surplus water.

USACE shall mean U.S. Army Corps of Engineers.

Waste shall mean garbage, municipal refuse, sewage sludge, chemical, agricultural wastes or other substances which may or tends to cause pollution of the waters of the District. Waste does not include animal manure when used as a fertilizer, earthen fill, rocks, boulders or other material normally used in construction operations.

Waterway shall mean a route for travel by water

Wetlands shall mean a lowland covered with shallow and sometimes temporary or intermittent water. This includes wetlands as described in U.S. Fish and Wildlife Circular No. 39 including Types 1 thru Type 8.

Work or Works shall mean any construction, maintenance, repairs or improvements.

100-year Floodplain shall mean the area within and adjacent to a watercourse or water basin, as those terms are defined in M.S. 103G that is inundated during the 24-hour precipitation event with a recurrence interval of 100 years.