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City of Fargo

Policy on Storm Water Discharge and Treatment Requirements

Authority and Purpose

The City of Fargo operates a Municipal Separate Storm Sewer System (MS4) under authority of the North Dakota Department of Health Permit NDR04-0000 (Discharge Permit), and City of Fargo Code of Ordinances, Chapters 17 and 37. In compliance with this authority, Fargo has developed this Storm Water Policy (storm water policy). This policy establishes standards for storm water discharges and quality treatment for all development within City jurisdiction.

Intent of the Policy

The intent of this policy is to provide guidance to those persons working with the City's storm water management ordinance and to establish uniform, simplified standards that work within the framework of the City's storm water infrastructure.

Target Audience

This policy is applicable to all development (ref Code of Ordinances, Chapter 37, Paragraph 37-0102 7.) falling under the jurisdiction of the City of Fargo.

Storm Water Management Plan

All previously undeveloped properties and subdivisions are required to provide a Storm Water Management Plan (plan) for the subject area. Submission and approval of the plan is required prior to plat approval. Plan requirements are discussed in **Appendix A**.

Storm Water Discharge Requirement/Limit

The maximum storm water discharge rate shall be as defined in **Appendix B** and shall fit into the following categories:

1. Newly Platted Ag Conversion
2. Re-plat of current parcel 1 acre in size or greater (Common Development Criteria Enforced)
3. Re-development of existing parcel of 1 acre in size or greater
4. Existing Parking Lot: Maintenance repair or overlay
5. Existing Parking Lot reconstruction
6. Previously Platted Parcels less than one acre that are part of a common development

A Storm Water Management Report, prepared by a Professional Engineer registered in the State of North Dakota, indicating compliance with the discharge rate is required for all developments. Detention/retention volume requirements will be established by the discharge limitation.

Water Quality Treatment

Water quality treatment is required for all new developments or re-plats one (1) acre in size or larger, common developments collectively one acre or larger, and on existing parking lots receiving full re-construction. Requirements are specified in **Appendix C**.

Storm Water Detention, Retention, and Discharge Pond Design

Appendix D outlines the requirements for pond design within developments.

APPENDIX A:

STORM WATER CONCEPTUAL PLAN

1. All newly platted Ag Conversion properties, new lot Subdivisions within a larger common development, and infill projects within a larger platted development equal to or greater than 1.0 acre in size are required to have a storm water management plan that includes those Best Management Practices (BMPs) required for the Addition or Subdivision to meet storm water quality and quantity requirements. Approval of the regional storm water management plan is considered part of the plat approval process.

2. Existing parking lot projects that involve only spot repairs, surface treatments or added surfacing of existing surfaced lots under 1 acre threshold will be exempt from the storm water discharge requirements.

3. Existing parking lot projects that involve reconstruction shall be required to add storm water inlets to convey water into the City storm water system and shall comply with storm water treatment requirements.

4. Previously platted lots less than one acre, that are part of a larger common development, will be required to have a storm water management plan when the lot is developed. This storm water management plan shall analyze the impact the addition of this newly improved lot will have on the overall storm water features of the common development. As a minimum, these lots shall drain to a common inlet that is connected to the City storm water system, while meeting the allowable release rate and water quality requirements.

5. Article 37-0201 of the City of Fargo Code of Ordinances states: “An owner must submit to the City Engineer a plan for storm water management and control including detention and retention facilities. The plan shall be submitted, and approval obtained from the City Engineer prior to the owner (a) obtaining approval of an application for a plat, pursuant to Section 20-0907 of the Land Development Code of the City, or (b) engaging in any land disturbing activity.

   The plan may include “in the discretion of the City Engineer, arrangements for further planning and implementation of permanent facilities for storm water management and control by subsequent owners of the property being platted or by the current owner at a later time.” Delay in producing the storm water plan will be considered when extenuating circumstances dictate but will generally not be allowed.

6. The storm water management plan, at a minimum, shall consist of:

   (1) A Storm Water Management Plan Report prepared using a “Storm Water Modeling System” that provides a modeling report similar in nature to “HydroCad”. The report shall document the assumptions, methodologies, and analysis used in arriving at the

selected storm water management solution. The report must be "global" in that it looks at the entire area to be developed as well as any impacts to the site created by neighboring areas. The report shall be conceptual in nature and include (1) a narrative describing the existing site conditions, proposed site conditions, types and locations of storm water BMPs proposed to be used, as well as (2) the model calculations for the post-development 2, 10, and 100-year storm events as identified under the most current NOAA Atlas 14 release storm event for Fargo.

(2) Conceptual plan drawings and topographic maps noting all items covered in the report.

(3) Conceptual Operations and Maintenance (O&M) plan for the system covering all requirements for keeping the system operating as planned.

(4) The above-noted items shall be stamped and signed by a Professional Engineer registered in the State of North Dakota.

7. A regional storm water plan can use any combinations of BMPs, selected by the owner and their engineer, enabling the property to meet the storm water quantity and quality requirements. The plan may utilize regional or "on-site" detention/retention and water quality facilities however, per the Fargo Comprehensive Plan; the City desires to see storm water facilities constructed as regional amenities whenever possible. If a regional facility is used, the pond shall be located to facilitate capture of as much site storm water as possible prior to discharge into the City storm water system.

8. The submitted conceptual storm water plan will be reviewed by the City's Engineering Department. The Engineering Department will evaluate the storm water plan and communicate change requirements or recommendations to the owner and their engineer. Changes made to the storm water plan prior to plat approval will be considered part of the original plan. If the plan is very complex, it may be brought before the City Commission for discussion and/or public comment prior to approval.

9. If a subdivided property is covered by a previously approved storm water plan, the previously approved plan shall be reviewed to determine if the subdivided property is still in compliance. A letter from a North Dakota Registered Professional Engineer can accomplish this.

10. The approved plan will exist for the life of the subject property including any changes approved by the City Engineering Department. The final approved plan will be included with the amenities plan

11. The plan may require dedication of storm water or access easements or additional right-of-way for the construction of storm water conveyance and/or storage facilities.

12. The plan must ensure the subject area conforms to the site specific performance requirements noted in Appendices B and C of this policy.

APPENDIX B:

SITE DEVELOPMENT - STORM WATER DISCHARGE REQUIREMENTS

1. The discharge rate for storm water discharging from any site, greater than 3 acres in size, into any drain system within City jurisdiction, shall be limited to 1 cfs/acre. For parcels between 1 and 3 acres the maximum discharge shall be per the following table:

Parcel Size (Acres)	Release Rate (cfs)
1.0	2.00
1.1	2.05
1.2	2.10
1.3	2.15
1.4	2.20
1.5	2.25
1.6	2.30
1.7	2.35
1.8	2.40
1.9	2.45
2.0	2.50
2.1	2.55
2.2	2.60
2.3	2.65
2.4	2.70
2.5	2.75
2.6	2.80
2.7	2.85
2.8	2.90
2.9	2.95
3.0	3.00

This table shall apply to all projects covered under this policy except existing parking lots where the parking lot is just receiving maintenance work. However, existing parking lots that are being reconstructed shall include the collection of site storm water into a catch basin that is then connected to the existing City storm sewer system if available and shall meet the water quality requirements. Existing parking lots described here shall not be required to provide storm water detention.

2. A storm water report, prepared using a "Storm water Modeling System" that provides a modeling report similar in nature to "HydroCad", is required for all developments one acre in size or greater or if part of a larger common development that is 1 acre or larger. The report must include hydrographs depicting flows into and out of all detention/retention facilities and note all flows into the City storm sewer system. In addition to the report, all site plans for sites requiring storm water infrastructure must include:
    - a summary table of post-construction flows for the 2, 10, and 100 year storm, as identified under the most current NOAA Atlas 14 release storm event for Fargo
    - a detail drawing of the outlet structure indicating maximum water elevations for the 2, 10, and 100 year storms, and
    - a written description of the proposed water quality treatment method

3. All sites except existing parking are required to comply with the State Water Quality Design Considerations. Water Quality Design Consideration information is included as **Appendix C** to this policy.

4. The discharge rate noted above will drive detention requirements for a particular site. Dry or wet ponds, oversized pipe, underground storm water storage facilities, or other methods can be used to achieve required storage volumes.

   If a "regional" detention system, as opposed to site-specific ponds, is chosen for the development area, all water shall be routed to the regional pond prior to discharge into the City system. The original, storm water conceptual plan (ref Appendix A) must address the conveyance of storm water from all parcels in the development to the regional detention facility.

   If the City of Fargo storm water utility system provides conveyance to the regional facility, the 1.0 CFS/acre criteria shall be used unless otherwise planned for - if the owner requires larger flows to the regional facility, this must be considered/negotiated during the development of the regional storm water plan.

5. Discharge or overland flow of storm water onto a neighboring property shall not be allowed unless included in the regional plan (see Appendix A) and facilitated through the designation of required easements, dedications, or other methods allowing such conveyance.

6. For those properties lying within the limits of, and meeting the design criteria for, a previously approved Regional Storm Water Plan (Appendix A), and approved regional site plan, no additional measures are required. The satisfaction of storm water requirements shall be noted on the site plan for the subject property. This verification of compliance shall cite the plan under which the subject property was previously approved and include as notes any pertinent storm water information applicable to the site plan. A revised/updated storm water report may be required to verify compliance.

7. Construction of “rain gardens”, “grassy swales”, and other methods of achieving water quality are encouraged and will be evaluated on a case-by-case basis.

8. Criteria for construction of regional detention facilities is discussed in **Appendix D**.

9. Each plan set submittal requiring retention/detention shall include a storm system table identifying:

    - Lot size (acreage and square feet)
    - % impervious area
    - Required retention/detention volume (100 year storm event)
    - Supplied retention/detention volume (100 year storm event)
    - Water quality method being proposed including manufacturers data
    - Release rate allowable (cfs)
    - Release rate actual (cfs)

APPENDIX C:

MS4 REQUIREMENTS

The following information is taken directly from page 21 of the current North Dakota NDR04-0000 MS4 Permit, dated April 1, 2016.

Water Quality

A water quality treatment system is required in developments as defined under Appendix B Storm Water Discharge Requirements. The system at a minimum must meet the standards specified below.

The post-construction controls for managing water quality for reducing pollutants carried in the first flush of storm water runoff are outlined below.

The design considerations for treating a water quality volume for common post-construction controls are as follows:

Control	Water Quality Design Consideration
Wet Detention Ponds	Water Quality Volume (Vwq) = 1800 cu-ft per impervious acre draining to the pond. The drawdown time for the Vwq should be a minimum of 12 hours.
Dry Detention Ponds (w/Extended Detention)	Extended Detention / Water Quality Volume (Vwqed) = 1800 cu-ft per impervious acre draining to pond. The drawdown time for the Vwqed should be a minimum of 24 hours and not more than 72 hours.
Infiltration	Water Quality Volume (Vwq) = 0.5 inches from impervious area. The volume captured in rain gardens, or passed through biofilters with under drains, would be grouped with infiltration for water quality treatment.
Flow-Through Treatment Devices	Size devices to treat the first 0.5 inches of runoff from impervious area.
Redevelopment / Retrofit	Incorporate water quality criteria by reducing impervious surface area and implementing controls to treat the first 0.5 inches of runoff from impervious areas.

The water quality criteria apply to on-site or regional systems for post-construction storm water management. The water quality considerations do not replace or substitute for water quantity or floodplain management for development. The water quality features may be incorporated into the design of structures for flow control; or water quality control may be achieved with separate

features. Flow-Through Treatment devices such as "Defenders ™" shall provide as a minimum 80 percent removal of sediment with a particle size distribution equivalent to the standard OK-110 at a feed concentration of 300 mg/L.

If it is impractical to meet the water quality criteria, alternative practices may be used (e.g., grassed swales, smaller ponds, or grit chambers). If a combination of practices is used, the water quality volume is accounted for on a percentage basis. Low impact development and/or green infrastructure practices may be used as an alternative to post-construction controls.

The selection and design of post-construction controls must consider clogging or obstructions, freeze- thaw cycles, effects on slope stability and groundwater, and the ability to effectively maintain the control. Design post-construction controls for ease of inspection and maintenance access (e.g., a stabilized access that allows equipment to enter a pond).

Recommended resources for planning and designing controls for urban storm water runoff are:
"North Dakota Storm Water Criteria Manual"
https://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm

The property owner is responsible to operate and maintain the water quality device in accordance with the manufacturer's recommendations. The property owner shall maintain records of maintenance of the water quality device and shall prepare an annual inspection report. These records are to be maintained with the property owner and shall be made available to City if requested.

APPENDIX D:

STORM WATER DETENTION, RETENTION, AND DISCHARGE POND DESIGN

The following information shall apply to Standard Regional Pond Design. The City may take ownership of a storm water pond that is designed according to the following criteria.

Design Requirements:

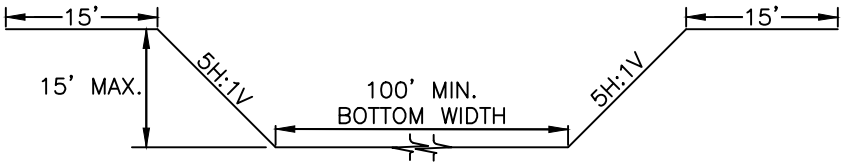
- Pond design shall be in conformance with the Current NDPDES permit.
- Minimum pond design shall be a 100-year rain event based upon the then current NOAA Atlas 14 published data for Fargo and shall include one (1) foot free board. All design modeling shall be done using HydroCad or equal commercially available modeling software. The proposer shall provide to the City a hardcopy Drainage Report signed by a ND Professional Engineer and shall provide an electronic copy of the complete design drainage model.
- Drainage and pond modeling shall include 2 year, 10 year, and 100 year 24 hour rainfall events as part of the analysis model.
- To qualify as a "Regional Pond" for purposes of City ownership and maintenance the minimum pond size for a **"Dry Pond" shall be 7.5 acre-feet** with a minimum bottom width of 100' and the minimum pond size for a **"Wet Pond" shall be 15 acre-feet** with an average bottom width of 100'. However, the City will review on a case-by-case basis whether a pond qualifies as a "Regional Pond" for purposes of City maintenance if its size is smaller than the minimum size identified.
- Pond design shall include 15 feet minimum of level ground from the top of back slope of the pond to the property line.
- Dry Pond-slopes shall be 5:1 or flatter up to 15 foot of vertical depth, 6:1 or flatter if 15 foot of vertical depth or greater, 1.5% grade in pond bottom to low flow channel and 0.4% grade from pond inlet to pond outlet with channel liner and 1% grade from pond inlet to pond outlet without channel liner. Dry ponds do not require a safety bench and slope protection armoring if less than or equal to 10 feet deep. Dry ponds do require a safety bench and slope protection armoring if greater than 10 feet deep. Dry ponds do require a sloped pond bottom and an underdrain system sufficient to maintain a "dry" state.
- Wet Pond-slopes shall be 6:1 or flatter up to 15 foot depth. If the designer wishes, the pond to be deeper than 15 foot a geotechnical evaluation of the pond slope stability is required. If the pond backs up to residential homes or legal drains, a geotechnical evaluation of the pond slope stability is also required. The pond shall be designed with safety features such as edge plantings to deter entrance to ponds and a safety ledge or bench at

pond perimeter 1 foot to 2 foot below normal water level and extend out 10 feet before continuing on slope.

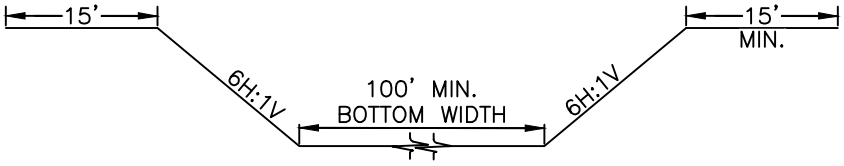
- Slope protection on wet ponds shall be installed to one foot below safety bench or 1 foot above and 1 foot below normal water level whichever is greater. The slope protection shall be riprap or turf reinforcement with seeding. The remainder of exposed slopes shall be turf reinforcement and seeded. Rip Rap shall meet City of Fargo standards and NDDOT standards.
- No fountains or bubblers shall be allowed within City owned regional wet ponds. All pond aesthetic features such as shape, side slopes, and vegetation that are proposed shall be identified on the plans and match the land area requirements identified in the Zoning Ordinance and project development master plan.
- A City owned "Regional Pond" should have sufficient right of way access for routine and special maintenance as determined by the City Engineer.
- The pond drawdown time criteria is outlined in Appendix C.
- The pond design shall include a control outlet structure with emergency over flow design. The over flow structure shall include provisions to prevent overflows from affecting adjoining properties. The out flow and over flow structure shall be designed to prevent plugging, be easily accessible to maintenance personnel, and shall require minimal maintenance. Maximum out flow to a City storm sewer shall be as defined in Appendix B. The release rate may be less depending on meeting water quality standards as defined in Appendix C. However, the minimum outlet orifice size shall be 3 inches and shall have a screen ahead of the orifice to prevent plugging.
- For ponds to be accepted by the City for maintenance and operation as a "Regional Pond" the features in general shall not result in unusual and/or costly future operation and maintenance as determined by the City Engineer. Bridges and box culverts if required shall meet the design criteria of the regulating authority and shall meet State and Federal safety standards.
- Ditches, swales, and channels may be designed for a variety of capacities depending on the protection required. When ditches serve as a primary water surface collector in the upper part of a drainage basin, they shall be designed per NDCC 89-14-01 except that as a minimum, shall convey the 10-year storm event without ponding in the roadway or adjacent private property. The City Engineer will ultimately decide if ditches, swales, or channels are allowed in lieu of conventional underground piping.
- The City of Fargo Storm Water Service Charge policy identifies credits that may be achieved through building of detention or retention ponds larger than as determined by this policy. Developers and designers are encouraged to familiarize themselves with the current Storm Water "Determination and Review Policy" for storm water fees.
- The following details shall provide minimum standards for pond design.

NOTES:

- 15’ MAX. VERTICAL DEPTH
- MIN. POND SIZE = 7.5 ACRE/FEET
- MIN. 100’ BOTTOM WIDTH
- MIN. 1’ FREE BOARD FOR 100 YEAR EVENT
- NO BENCH REQUIRED



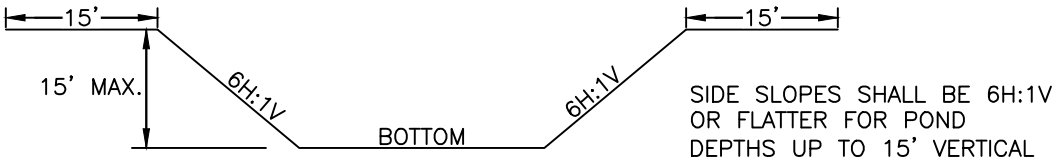
DRY POND
(15' MAX. VERTICAL DEPTH)



DRY POND
(GREATER THAN 15' VERTICAL DEPTH)

NOTE:
SIDE SLOPES DISPLAYED WITH 5X VERTICAL EXAGGERATION

THE CITY OF Fargo FAR MORE ENGINEERING DEPARTMENT	ORIGINAL: 2019	
	TYPICAL DRY STORM WATER POND DETAIL	
	APPROVED:	DATE:



WET POND
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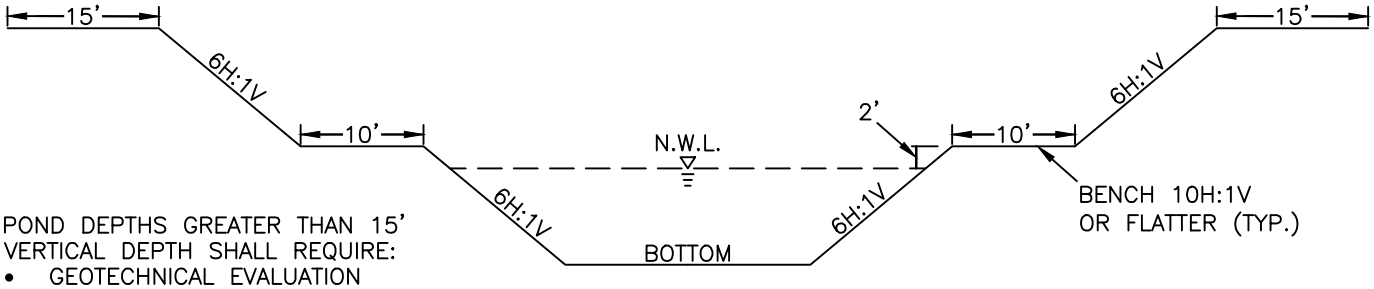

WET POND
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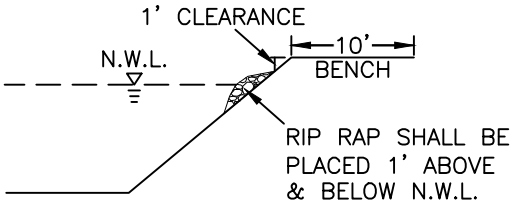


TYPICAL RIP RAP
PLACEMENT

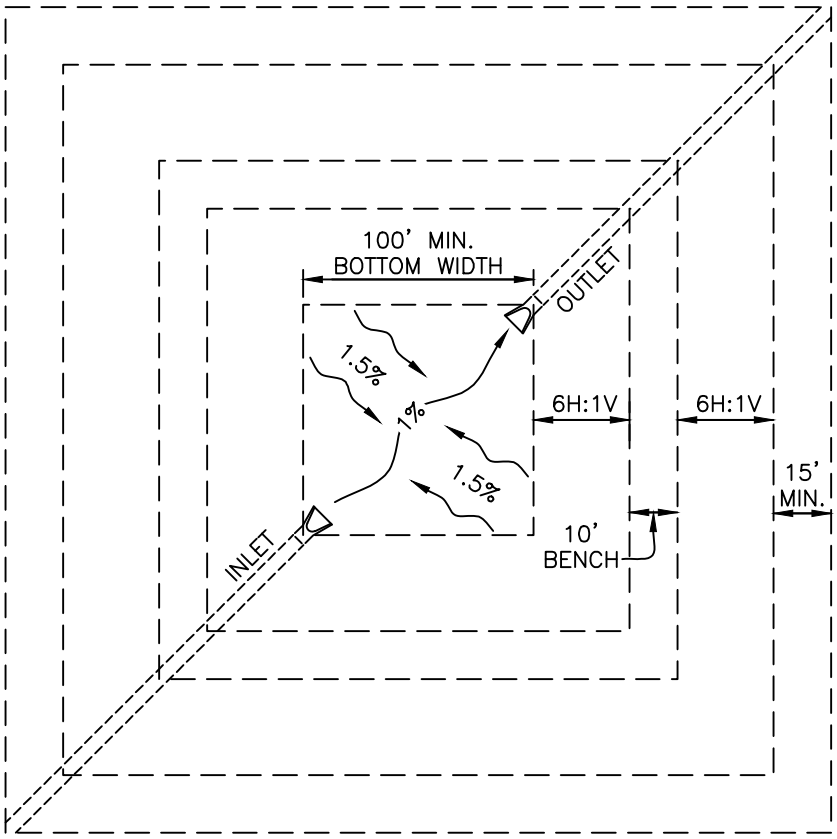
NOTE:
SIDE SLOPES DISPLAYED WITH 5X
VERTICAL EXAGGERATION

THE CITY OF Fargo FAR MORE
ENGINEERING DEPARTMENT

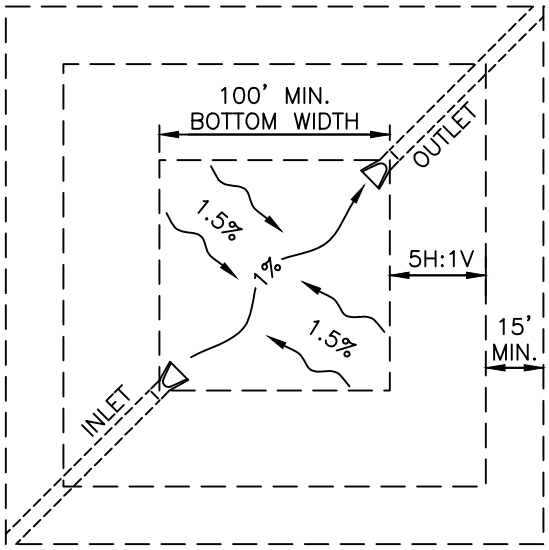
ORIGINAL: 2019

TYPICAL WET STORM WATER POND DETAILS

APPROVED: | DATE:



POND BOTTOM PLAN VIEW
(GREATER THAN 15' VERTICAL DEPTH)



POND BOTTOM PLAN VIEW
(15' MAX. VERTICAL DEPTH)

THE CITY OF Fargo
FAR MORE
ENGINEERING DEPARTMENT

ORIGINAL: 2019

TYPICAL POND BOTTOM DETAIL

APPROVED: | DATE: