Permit Application Review Permit No. 2019-09
Received complete: March 29, 2019

Applicant:	Sarah Schweiger; City of Minnetonka
Consultant:	
Project:	Embankment Stabilization – Wing Lake
Location:	Highland Road north of Excelsior Boulevard: Minnetonka
Rule(s):	2,5, 7 and 10
Reviewer:	BCO

General Background & Comments

The proposed project involves maintenance repairs to the roadway embankment of Highland Road north of Excelsior Boulevard in Minnetonka. The roadway embankment forms the eastern shoreline of Wing Lake. Surface runoff from the roadway and surrounding watershed sheet flows toward the lake resulting in five (5) areas of erosion that are in need of repair. The erosion areas are also being to have an effect on the foundation of the roadway. Highland Road is planned to be improved with a mill and overlay project in the summer with the erosion stabilization work scheduled to begin by the end of April.

The stabilization project will result in work below the 100-year flood elevation of Wing Lake – 944.5 M.S.L. At some locations the roadway is less than 10 feet (horizontally) from the lake and at flood stage, portions of Highland Road are inundated to a depth of 2-3 feet by the lakes high water. The work proposes using field stone rip-rap, sand filter and geotextile material for the stabilization to comply with the requirements of District Rule 7.0, Shoreline and Stream Bank Improvements. The stabilization will follow the slope of the existing embankment which ranges from a slope of 2:1 to 3:1.The natural vegetation that has established itself on the embankment slope has not been sufficient to minimize the erosive velocities of the surface water directed to the lake. The cross-section of the stabilization will be 6-feet wide, vary in length from 5 to 11 feet, with the final grade and elevation of the rip-rap being a minimum of one foot below the existing ground surface. The stabilization will include excavation and removal of 31 cubic-yards of material with 26.3 cubic yards of rip-rap and sand filter installed – a net gain of 4.7 cubic yards (127 cubic feet) of flood volume will result from the project. To benefit from the authorization available under Department of Natural Resources General Permit #97-6112 issued for work in the Nine Mile Creek watershed, the city will need to comply with the terms and conditions of General Permit #97-6112.

The applicant has elected not to propose substantial additional fill to reduce the slope of the restoration areas to a maximum 3:1(which also result in additional floodplain impacts) or further disturbance effecting the existing roadway, and is instead requesting a variance from the 3:1 streambank slope standard in subsection 7.3.3. In addition with the slope of both the existing embankment and proposed restoration ranging from 2:1 to 3:1, the rip-rap and sand filter will extend slightly over the 6-foot water ward requirement of Rule 7.3.4. This also is requested to be considered as a variance from the Rule.

The project will disturb more than 50 cubic yards (excavation and fill) but less than 5000 square feet of surface area. The District's Stormwater Rule (4) applies since the project will meet Rule 4.2.1a. However since there are no impermeable areas associated with the project that will be created to generate runoff, no stormwater management facilities are required to meet the requirements of Rules 4.3.1a) volume retention, b) limit peak flow rates for the 2, 10, and 100 year storm events to existing conditions and c) water quality management and there is no impervious surface created or reconstructed to which the 4.3.3 Chloride management requirements would apply. The District's Erosion and Sediment Control Rule (5.2.1a) applies to the project because of the volume of disturbance proposed. The District's Shoreline and Streambank Improvements Rule (7) applies to the project because of the city's plan involves stabilization of a shoreline of a waterbody.

Exhibits

1. Permit Application dated February 19, 2019.
2. Plans dated February 20, 2019 prepared by the City of Minnetonka
3. E-mail correspondence dated March 22, 2019 from the MDNR stating the project will not require a separate permit from the MDNR as long as a NMCWD permit is obtained for the work
4. Project narrative and variance request dated February 20, 2019 and revised March 29, 2019 prepared by the City of Minnetonka.
5. Correspondence dated March 29, 2019 stating that the City of Minnetonka will be responsible for future maintenance of the stabilized areas.

2.0 Floodplain Management and Drainage Alterations

The Atlas 14 100-year frequency flood elevation of Wing Lake is 944.5 M.S.L. – the O.H.W. of the lake is 940.3 M.S.L. The stabilization proposed, using field stone rip-rap, sand filter and geotextile fabric is considered placement of fill below the 100-year flood elevation of the lake, defined by District rule 2.2.1. Rule 2.3.2 requires that the fill placement in the floodplain of the creek must be fully compensated at the same elevation +/1 foot. As previously stated, the stabilization areas will be regraded, over excavated with material removed allowing the rip-rap and filter material to be placed at an elevation that is one (1) foot below existing grade. This will result in an additional 127 cubic feet of floodplain volume for the lake being created. If not stabilized, continued erosion would result in a failure of the roadway embankment.

2.3.1: The low floor elevation of all new and reconstructed structures must be constructed in accordance with the NMCWD Stormwater Rule, subsection 4.3.3

This section of the rule does not apply to the proposed project.

2.3.2: Placement of fill below the 100-year flood elevation is prohibited unless fully compensatory storage is provided within the floodplain and:

a. at the same elevation +/- 1 foot for fill in the floodplain and:

b. at or below the same elevation for fill in the floodplain of a water basin or constructed stormwater facility.

The stabilized erosion section will be 6 feet in width and vary in length from 6 feet to 10 feet. The stabilization areas will be regraded, over excavated with material removed allowing the rip-rap and filter material to be placed at an elevation that is one (1) foot below existing grade. This will result in an additional 127 cubic feet of floodplain volume for the lake being created.

2.3.3. The District will issue a permit to alter surface flows only if it finds that the alteration will not have an adverse impact on any upstream or downstream landowner and will not adversely affect flood risk, basin or channel stability, groundwater hydrology, stream base-flow, water quality or aquatic or riparian habitat.

The project as stated is to correct several localized erosion problems that have introduced sediment into Wing Lake and if not corrected has the potential of a slope failure of Highland Road. In our opinion there is no resultant rise of the management elevation for the lake and does not propose any flood risk. The project will create an additional 4.7 cubic yards (127cubic-feet) of floodplain volume. The project will not affect the groundwater hydrology and will improve the water quality of Wing Lake by the stabilization of the erosion problems however may have a temporary impact on riparian habitat during the construction phase of the project. Once completed any temporary impacts are eliminated, the riparian habitat will be restored. Temporary impacts cannot be avoided with any project that involves construction activities.

2.3.4 No structure may be placed, constructed or reconstructed and no surface may be paved within 50 feet of the centerline of any water course, except that this provision does not apply to:

a. Bridges, culverts, and other structures and associated impervious surface regulated under Rule 6.0;

b. Trails 10 feet wide or less, designed primarily for nonmotorized use.

This section of the rule does not apply to the proposed project.

3.0 Wetlands Management

Wing Lake is a public water, MDNR #91P, as identified by the Minnesota Department of Natural Resources, not a wetland, therefore the District's buffer requirements, Rule 3.4, are not applicable.

5.0 Erosion and Sediment Control

Erosion control measures include floatation silt curtain with restoration of the disturbed areas outside of the rip-rap section with top soil, seed and erosion control blankets. The project contact is Sarah Schweiger, City of Minnetonka.

7.0 Shoreline and Streambank Improvements

Rule 7.0 states that it is the policy of the Board of Managers to prevent erosion of shorelines and streambanks and to foster the use of natural materials and bioengineering for the maintenance and restoration of shorelines.

Rule 7.0 applies, under paragraph 7.2, to the proposed work because it will involve installation of stabilization at five locations along the eastern bank of Wing Lake where surface flow from Highland Road and upstream watershed has developed gullies that have eroded from the

roadway to the lake. The gullies have eroded back far enough to have an impact on the existing bituminous mat of the roadway. The project will provide stabilization techniques, including field stone rip-rap, sand filter and geotextile filter. The natural vegetation has not been able to minimize the velocities of the surface runoff being directed to the lake, ranging from 5 to 10/feet/second, from the upstream watershed. This project is not the typical lake shore stabilization project where erosion has occurred from wave activities, wind, ice and other natural causes. This project is to provide a stable conveyance system for surface water runoff to reach the lake from the upstream watershed area.

Rule 7.3.1 states, *An applicant for a shoreline alteration permit must demonstrate a need to prevent shoreline erosion or restore eroded shoreline:*

Surface runoff from the upstream watershed area to the Wing Lake has resulted in erosion problems at 5 locations between Highland Road and the lake. The erosion has resulted in sediment discharging to the lake and has begun to have an impact on the stability of the Highland Road embankment.

Rule 7.3.2 states, *An applicant must first consider maintenance or restoration of a shoreline using bioengineering. If bioengineering cannot provide a stable shoreline, a combination of rip-rap and bioengineering may be used to restore or maintain shoreline. If a combination of rip-rap and bioengineering cannot provide a stable shoreline within a reasonable period, rip-rap may be used to restore or maintain shoreline*:

As stated, the eroded areas are to be stabilized in their current locations with field stone rip-rap (MnDOT 2511), sand filter MnDOT 3601) and geotextile filter material (MnDOT 3733). The rip-rap and filter materials will continue along the existing embankment slope to a distance that is one foot below the normal elevation of the lake, 939.8 M.S.L. Structural stabilization as proposed, rip-rap, is required to minimize the impacts that flow velocities that range from 5 to 10 feet/second. Natural vegetation or bioengineering alone has and does not provide the structural component required for a stable slope condition with the velocities of the surface water runoff generated with the existing slopes of the lake shoreline. Reference made to NRCS Minnesota Technical Note 2, October, 1997; Slope Protection for Dams and Lakeshores.

Rule 7.3.2a states, *Live plantings incorporated in shoreline bioengineering must be native aquatic vegetation and/or native upland plants:*

The natural vegetation along the slope is not providing sufficient stabilization therefore the use of Class III rip-rap material having a nominal diameter of 9-inches along with the appropriate filter material is proposed.

Rule 7.3.2b states: *Riprap to be used in shoreline erosion protection must be sized appropriately in relation to the erosion potential of the wave or current action of the particular water body, but in no case shall the riprap rock average less than six inches in diameter or more than 30 inches in diameter. Riprap shall be durable, natural stone and of a gradation that will result in a stable shoreline embankment. Stone, granular filter and geotextile material shall conform to standard Minnesota Department of Transportation specifications, except that neither limestone nor dolomite shall be used for shoreline or stream bank riprap, but may be used at stormwater outfalls. All materials used must be free from organic material, soil, clay, debris, trash or any other material that may cause siltation or pollution:*

The rip-rap and filter material proposed is based on computations using the MnDOT Drainage Manual – Section 6.2. The MnDOT specifications for the material to be used are identified in the paragraphs above.

Rule 7.3.2c states: *Riprap shall be placed to conform to the natural alignment of the shoreline.*

The slope of the stabilized areas will follow the slope of the embankment from the edge of the roadway bituminous to one foot below the lakes normal elevation – 939.8 M.S.L.

Rule 7.3.2d states: *A transitional layer consisting of graded gravel, at least six inches deep, and an appropriate geotextile filter fabric shall be placed between the existing shoreline and any riprap. The thickness of riprap layers should be at least 1.25 times the maximum stone diameter. Toe boulders, if used, must be at least 50 percent buried.*

See response to 7.3.2b.

Rule 7.3.2e states: *Riprap must not cover emergent vegetation unless authorized by a Department of Natural Resources permit.*

This is to be observed at each location. Emergent vegetation will be not covered/impacted by the proposed stabilization.

Rule 7.3.2f states: *Riprap shall extend no higher than the top of bank or two feet above the 100-year high water elevation, whichever is lower.*

The rip-rap will extend to the top of the existing bank – to the edge of the existing roadway bituminous mat. As previously stated, the flood elevation of Wing Lake is approximately 2 feet above the existing roadway in the project area.

Rule 7.3.3 states: *The finished slope of any shoreline shall not be steeper than 3:1 (horizontal to vertical).*

Both the existing and proposed stabilized slope in two locations will exceed the 3:1 slope. The maximum slope is 2.5:1 for distances of 5.5 and 5 feet respectively. A variance is requested for compliance with this section of the Rule.

Rule 7.3.4 states: *Horizontal encroachment from a shoreline shall be the minimal amount necessary to permanently stabilize the shoreline and shall not unduly interfere with water flow or navigation. No riprap or filter material shall be placed more than six feet waterward of the OHW. Streambank riprap shall not reduce the cross-sectional area of the channel or result in a stage increase of more than 0.01 feet at or upstream of the treatment.*

The Plan proposed is to extend the slope of the stabilization to a depth of one foot below the normal level of the lake, 939.8 M.S.L. The O.H.W. of the lake is 940.3 M.S.L. At Station 3+97 the stabilized slope will extend 9 feet waterward, at Station 3+45 the stabilized slope will extend 8 feet waterward, at Station 5+18 the stabilized slope will extend 9.5 feet waterward and at Station 10+00 the stabilized slope will extend 6.7 feet waterward. At all five locations, the six foot requirement will be exceed. A variance is requested for compliance with this section of the Rule. Navigation on Wing Lake is not applicable.

Rule 7.3.5 states: *The design of any shoreline erosion protection shall reflect the engineering properties of the underlying soils and any soil corrections or reinforcements necessary. The design shall conform to engineering principles for dispersion of wave energy and resistance to*

deformation from ice pressures and movement, considering prevailing winds, fetch and other factors that induce wave energy.

The stabilization design is for the conveyance of surface flow to the lake rather than shore protection from wave action, ice loading, wind and other natural causes. The design is to accommodate the velocities of the stormwater directed to the lake from the upstream watershed. MnDOT Design Manuals were used for the sizing of the stabilization proposed.

Rule 7.3.6 states: *Placement of rip-rap for merely cosmetic purposes is prohibited.*

The project is to correct existing erosion problems that have developed and minimize future problems from developing.

Rule 7.3.7 states: *Retaining walls extending below the OHW of a water body are prohibited except where:*

a. *There is a demonstrable need for a retaining wall in a public improvement project and*
b. *The design of the retaining wall has been certified by a registered engineer.*

This rule does not apply in this instance.

10.0 Variances and Exceptions

A variance request for compliance with Rules 7.3.3 and 7.3.4 (attached) has been prepared by the City of Minnetonka to address Rules 10.1-10.4. The variance request is for compliance with the required maximum 3:1 finished slope (Rule 7.3.3) and no rip-rap or filter material may be placed more than 6 feet waterward of the O.H.W. (rule 7.3.4). The maximum stabilized slope at Station 13+20 will be 2.5:1 for a distance of 5 and at Station 10+85 will be 2.75:1 for a distance of 5.5 feet. The stabilized slopes at all five locations will extend a distance ranging from 6.7 feet to 9.5 feet waterward, exceeding the 6 foot requirement.

The project proposed will provide additional flood storage capacity for the lake. The variance as requested minimizes the additional fill material that would be required to be placed both in the floodplain of the lake and within the lake to comply with the required 3:1 slope. The plan as proposed increase available flood storage, eliminates erosion problems that are impacting the water quality of the lake and will minimize the potential failure of Highland Road should the erosion continue.

11.0 Fees

Because the property owner is a public entity, no fees are charged.

Rules 2.0-6.0 ..... $0

12.0 Sureties

Because the property owner is a public entity, the District's financial assurance requirements do not apply.

Sureties for the project are: $0

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. Rule 2, 3 and 5 are met.

   The applicant is requesting a variance from compliance with Rules 7.3.3 and 7.3.4 – the slope of the stabilization cannot be steeper than 3:1 and that rip-rap and sand filter cannot extend further than 6 feet wardward of the lakes O.H.W. The distances that the slope is greater than 3:1 is in two locations and is minimal (5 and 5.5 feet). The maximum distance that the stabilization will extend into the lake is 9 feet. The distance into the lake is based on the slope of the existing topography.

Recommendation

Approval, contingent upon:

1. General Conditions

Board Action

It was moved by Manager _____, seconded by Manager _____ to approve permit application No. 19-09 with the conditions recommended by staff.

Permit #: 2019-09
Project Name: Highland Road Improvements – north of Excelsior Boulevard: Minnetonka
Approval Date: April 17, 2019

General Provisions

1. All temporary erosion control measures shown on the erosion and sedimentation control plans must be installed prior to commencement of surface or vegetation alteration and be maintained until completion of construction and vegetation is established as determined by NMCWD.

   If silt fence is used, the bottom flap must be buried and the maximum allowable spacing between posts is 4-foot on center. All posts must be either 2-inch x 2-inch pine, hardwood, or steel fence posts. If hay bales are used, all bales must be staked in place and reinforced on the downstream side with snow fence.

2. All areas altered because of construction must be restored with seed and disced mulch, sod, wood fiber blanket, or be hard surfaced within two weeks after completion of land alteration and no later than the end of the permit period.

3. Upon final stabilization, the permit applicant is responsible for the removal of all erosion control measures installed throughout the project site.

4. At the entryway onto the site, a rock filter dike being a minimum of two feet in height and having maximum side slopes of 4:1 must be constructed. This rock filter dike will enable construction traffic to enter the site and also provide an erosion control facility.

5. If dewatering is required and sump pumps are used, all pumped water must be discharged through an erosion control facility prior to leaving the construction site. Proper energy dissipation must be provided at the outlet of the pump system.

6. The NMCWD must be notified a minimum of 48 hours prior to commencement of construction.

7. The NMCWD, its officers, employees and agents review, comment upon, and approve plans and specifications prepared by permit applicants and their consultants for the limited administrative purpose of determining whether there is reasonable assurance that the proposed project will comply with the regulations and criteria of the NMCWD. The determination of the NMCWD that issuance of this permit is appropriate was made in reliance on the information provided by the applicant.

8. The grant of this permit shall not in any way relieve the permittee, its engineer, or other professional consultants of responsibility, nor shall it make the NMCWD responsible for the technical adequacy of the engineer's or consultant's work. The grant of this permit shall not relieve the permittee from complying with all conditions and requirements of the permit which shall be retained by the permittee with the permit.

9. The issue of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

10. This permit is permissive only. No liability shall be imposed upon the NMCWD or any of its officers, agents or employees, officially or personally, on account of the granting of this permit or on account of any damage to any person or property resulting from any act or omission of the permittee or any of its agents, employees, or contractors.

11. In all cases where the doing by the permittee of anything authorized by this permit shall involve the taking, using, or damaging of any property, rights or interests of any other person or persons, or of any publicly-owned lands or improvements or interests, the permittee, before proceeding therewith, shall obtain the written consent of all persons, agencies, or authorities concerned, and shall acquire all necessary property, rights, and interest.

12. The permit is transferable only with the approval of the NMCWD (see NMCWD Rule 1.0). The permittee shall make no changes, without written permission previously obtained from the NMCWD, in the dimensions, capacity, or location of any items of work authorized by this permit.

13. The permittee shall grant access to the site at all reasonable times during and after construction to authorized representatives of the NMCWD for inspection of the work authorized by this permit.

14. This permit may be terminated by the NMCWD at any time deemed necessary in the interest of public health and welfare, or for violation of any of the provisions of this permit.

15. Construction work authorized under this permit shall be completed on or before date specified above. The permittee may, in writing, request that the NMCWD extend the time to complete the project in accordance with NMCWD Rule 1.0.

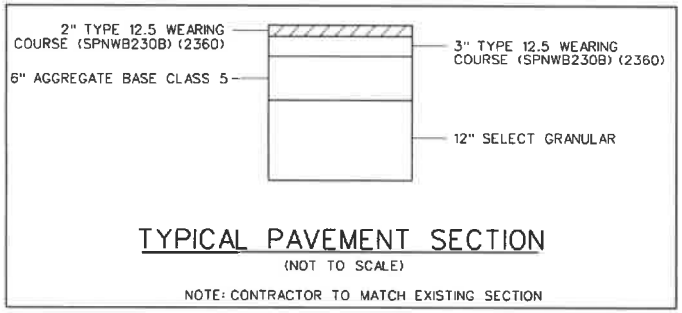
Permit No.2019-09

Is hereby issued to Sarah Schweiger, City of Minnetonka, subject to the conditions specified in the attached form:

For drainage improvements along the west side of Highland Road (the east bank of Wing Lake) to stabilize erosion problems that have resulted from surface water runoff from the upstream watershed area in Minnetonka.

Jodi Peterson, Chair
Nine Mile Creek Watershed District

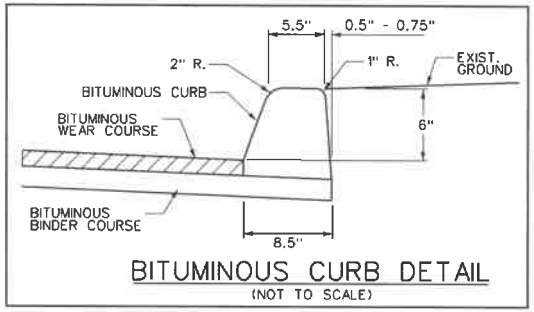
This permit expires on: May 1, 2020



TYPICAL PAVEMENT SECTION

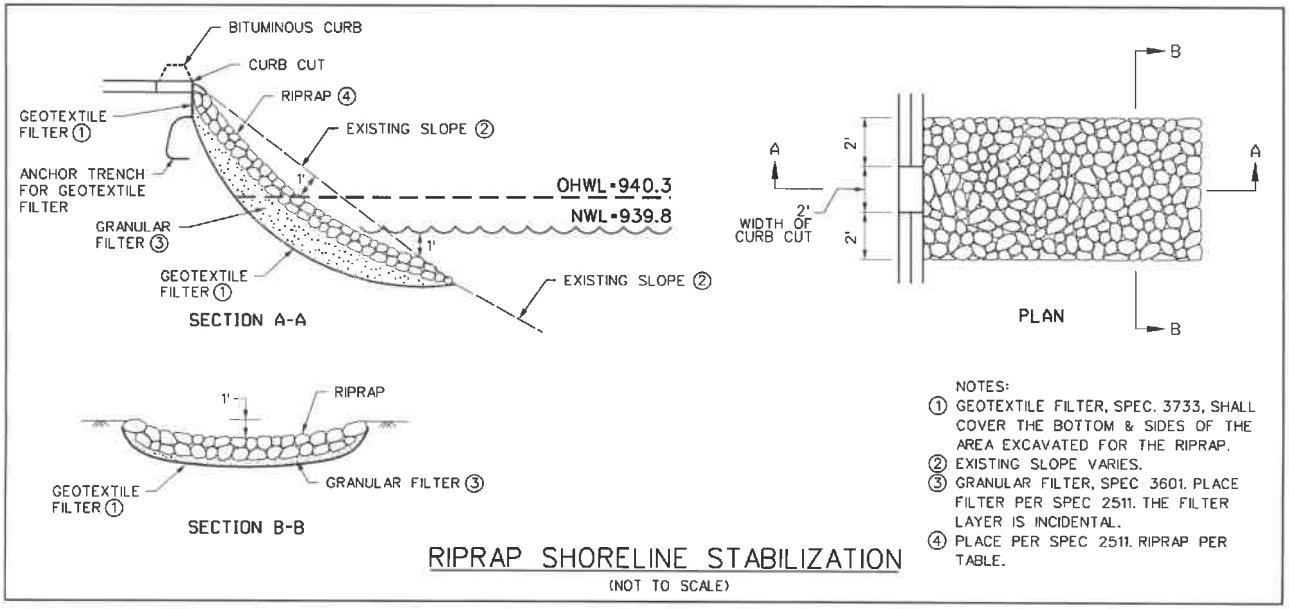
(NOT TO SCALE)

NOTE: CONTRACTOR TO MATCH EXISTING SECTION



BITUMINOUS CURB DETAIL

(NOT TO SCALE)



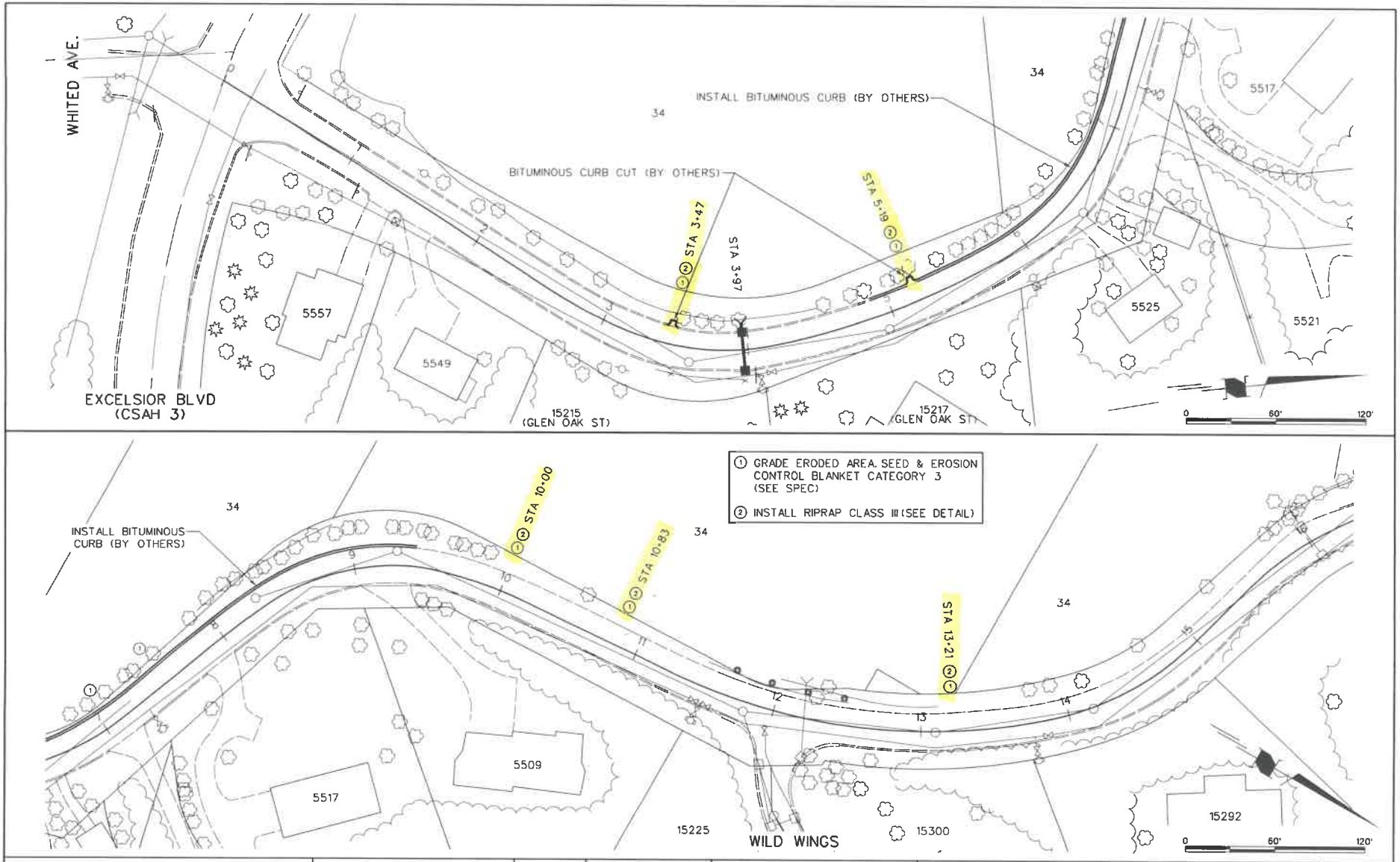
RIPRAP SHORELINE STABILIZATION

(NOT TO SCALE)

NOTES:

1. (1) GEOTEXTILE FILTER, SPEC. 3733, SHALL COVER THE BOTTOM & SIDES OF THE AREA EXCAVATED FOR THE RIPRAP.
2. (2) EXISTING SLOPE VARIES.
3. (3) GRANULAR FILTER, SPEC 3601. PLACE FILTER PER SPEC 2511. THE FILTER LAYER IS INCIDENTAL.
4. (4) PLACE PER SPEC 2511. RIPRAP PER TABLE.

REVISIONS			PROJECT NO(S)	SCALE: N/A		CITY OF MINNETONKA	DETAILS	SHEET
DATE	BY	REMARKS		DRAWN BY SAO	DESIGNED BY SS	14600 Minnetonka Blvd, Mtka, Mn. 55345 952-939-8200 / www.eminnetonka.com	2019 MISCELLANEOUS DRAINAGE HIGHLAND RD.	3 OF 4
			BID NO.	CHECKED BY	DATE 2/14/2019			



REVISIONS		
DATE	BY	DESCRIPTION

PROJECT NO(S)	SCALE: HORIZ. 1" = 60'	
	DRAWN BY SAO	DESIGNED BY SS
BID NO.	CHECKED BY ---	DATE 2/20/2019

CITY OF MINNETONKA
14600 Minnetonka Blvd, Mtka, Mn. 55345
952-939-8200 / www.eminnetonka.com

SHORELINE STABILIZATION PLAN
2019 MISCELLANEOUS DRAINAGE
HIGHLAND RD. / STA. 0+00 TO 16+00

SHEET 2 OF 3

CITY OF MINNETONKA
14600 Minnetonka Blvd. | Minnetonka, MN 55345 | 952-939-8200 | eminnetonka.com

March 29, 2019

Mr. Randy Anhorn
Nine Mile Creek Watershed District
12800 Gerard Drive
Eden Prairie, Minnesota 55346

RE: NMCWD Permit Application – City of Minnetonka Wing Lake Shoreline Maintenance

Dear Mr. Anhorn:

Enclosed for your review are two copies of the plans for maintenance to the shoreline of Wing Lake along with the Nine Mile Creek Watershed District (NMCWD) permit application.

Proposed Work

The City of Minnetonka is planning to complete a mill and overlay project of Highland Road from State Highway 7 to Excelsior Boulevard in Minnetonka in 2019 (NMCWD Permit 2019-04). A portion of Highland Road includes a bituminous curb section while other portions have a more rural road section without any form of curb. In coordination with that project, the city is proposing to move forward with a miscellaneous drainage improvement project along the east shore of Wing Lake. This project will include the replacement of one existing catch basin, storm sewer pipe and flared end structure (located at Station 3+97 on the plans). Additionally, this project will include the stabilization of existing eroded areas along the vegated but steep shoreline of Wing Lake. In some areas, this erosion is causing minor failure of the adjacent roadway. The city proposes to grade the eroded areas and place riprap to prevent future erosion. Approximately 24 CY of Class III riprap would be placed at six designated locations, consisting of 9" nominal diameter, clean, natural stone placed below the existing slope grade.

The proposed maintenance work is regulated by several NMCWD rules as follows:

2.0 Floodplain Management and Drainage Alterations

The estimated Atlas 14 100-year floodplain elevation on Wing Lake is 944.5 ft MSL. This elevation is based on preliminary Atlas 14 modeling of the Holiday-Wing-Rose watershed for the City of Minnetonka which utilized the XP-SWMM model originally developed for the NMCWD. The riprap will be placed at an elevation of 942.6 and below, so all of the riprap placement is below the 100-year floodplain. The riprap will be placed approximately one foot below the existing grade of the shoreline (see detail in plans for Riprap Shoreline Stabilization). As a result, this placement will result in no fill within the floodplain from the current conditions and will not increase the flood elevation to any property around Wing Lake.

5.0 Erosion and Sediment Control

The proposed work will include grading of the existing slopes at locations where erosion has already occurred. Floating silt curtain will be installed along all disturbed shoreline in coordination with the Highland Road mill and overlay project. Any disturbance that occurs

outside the limits of riprap placement will be seeded and stabilized with category 3 erosion control blanket. Additionally, there are two existing eroded areas where there is no existing curb; however, as part of the mill and overlay project, the bituminous curb will be extended to protect these areas. These locations will be graded and then stabilized with seeding and placement of category 3 erosion control blanket.

7.0 Shoreline and Streambank Improvements

To determine the method of stabilization to be used, an analysis was performed using the Rational Method to determine the peak flows and Manning's equation to estimate velocities of the discharge at each eroded location for the 50-year event (per the MnDOT drainage manual). Please see the included spreadsheet for details and assumptions made in that analysis. The MnDOT Drainage manual section 6.2.2 was used to determine riprap specifications based on the discharge velocities. As proposed, the rip rap will extend into Wing Lake to a depth of one foot below the lake's normal water level. Due to the limited fetch, size, orientation and topography surrounding Wing Lake, impact of wave action is anticipated to be minimal compared to the velocity of the runoff and the riprap was sized based on the estimated runoff velocities.

In three locations, the velocity calculation specifies the use of Class III riprap, which has a nominal diameter of 9". In the three remaining locations, including at the propsed flared end section outfall, the calculated velocity would not trigger the use of riprap. However, because natural vegetation on this slope is not providing enough stabilization in existing conditions, we are proposing the placement of Class III riprap in these locations as well.

10.0 Variances and Exceptions

A variance is required from Rule 7.3.3 that states: *The finished slope of any shoreline shall not be steeper than 3:1 (horizontal to vertical) and Rule 7.3.4 that states: No rip-rap or filter material may be placed more than 6 feet wardward of the OHW.*

Two of the proposed stabilized sections will exceed the maximum slope of 3:1; Station 10+85 having a stabilized slope of 2.75:1 for a distance of 5.5 feet and Station 13+20 having a stabilized slope of 2.5:1 for a distance of 5 feet.

With the stabilized slopes provided, four sections will exceed the requirement that the placement of rip-rap or filter material can be no more than 6 feet waterward of the lakes O.H.W (940.3 M.S.L.); the outlet for the proposed catch basin at Station 3+97– 9 feet, Station 3+45 – 8 feet, Station 5+18 - 9.5 feet and Station 10+00 – 6.7 feet.

10.1.1 *That because of unique conditions inherent to the subject property, which do not apply generally to other land or structures in the District, undue hardship on the applicant, not mere inconvenience, will result from strict compliance of the rule.*

At both locations, the stabilized slope would follow the slope of the existing roadway embankment. Flattening the slope would result in additional fill within the floodplain of the lake requiring additional compensatory storage to comply with Rule 2.3.2b and/or would result in an impact with the existing roadway. Additionally, the area of stabilization would extend further into the lake, if flattened, in conflict with Rule 7.3.4 that states no rip-rap of filter material may be placed more than 6 feet waterward of the ordinary high water (O.H.W.) of the lake.

10.1.2 *That the hardship was not created by the landowner. The landowner's agent or representative, or a contractor, and is unique to the property. Economic hardship alone may not serve as grounds for issuing a variance if reasonable use of the property exists under the terms of the District rules.*

The hardship is created by the slope of the existing embankment between the roadway and the lake and the minimal area available for complying with the requirements of both rules.

10.1.3 *That the activity for which the variance is sought will not materially adversely affect water resources, flood levels, drainage or the general welfare in the District.*

The request for variance will aid in the stabilization of areas that are currently introducing sediment into the lake, which is creating an adverse impact on the water quality of the lake. The project will result in additional volume (100 cubic feet) created for flood storage, will improve the drainage characteristics of the watershed draining to the lake and will not diminish the general welfare of the District.

10.1.4 *That there is no feasible or prudent alternative to the proposed activity requiring a variance.*

The alternatives to comply with both Rule 7.3.3 and 7.3.6 would result in further impacts to the lake – increasing the amount of fill material being placed in the lake and extending the distance of the stabilization into the lake. If nothing is done, erosion and sediment deposition into the lake would continue as well as the erosion that is causing minor failures of the adjacent roadway.

The City of Minnetonka requests that the Nine Mile Creek Watershed Board of Managers consider this permit application at their regular meeting on April 17, 2019.

The proposed maintenance work is planned to be completed in coordination with the Highland Road Mill and Overlay Project (NMCWD Permit 2019-04) in April and May 2019.

If you have any questions or require additional information, please contact me at 952-939-8233.

Sincerely,

Sarah Schweiger, P.E.
Water Resources Engineering Coordinator
City of Minnetonka