Permit Application Review

Permit No. 2019-88
Received complete: July 23, 2019

Applicant:	Julie Long; City of Bloomington
Consultant:	
Project:	Stream Channel Stabilization
Location:	1701 West 100th Street – Harrison Park: Bloomington
Rule(s):	2, 5, 7 and 10
Reviewer:	BCO

General Background & Comments

The proposed project involves maintenance repairs to the southern bank of Nine Mile Creek and replacement of a segment of the pedestrian trail in Harrison Park located in the Lower Valley of the creek in Bloomington. Flooding and debris blockage in the spring of 2019 washed out a 90 foot +/-section of the southern bank of the creek channel and undermined and washed out approximately 80 feet +/- of the existing 7-foot wide bituminous pedestrian trail.. The stabilization is a combination of field stone toe boulders, field stone rip-rap and vegetated natural coir fabric bioengineering to comply with the requirements of District Rule 7.0, Shoreline and Stream Bank Improvements. This method was used to stabilize a 120 foot section of eroded creek bank upstream of Creekridge Circle, Permit #2018-129.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 stabilization project will restore the creek to its location and cross-sectional area that existed prior to the wash-out. The material used for the stabilization (primarily 65 cubic yards of granular filter material) will replace the material that was washed out reestablishing the bank and condition that existed prior to the wash-out thereby resulting in no reduction in floodplain volume from the pre-spring 2019 high water condition. A detailed survey of the entire Lower Valley was completed prior to an after the 1991 stabilization project. A survey grid was developed that enables the meandering of the creek to be monitored on an on-going basis. In addition, City staff inspects the entire creek reach at a minimum annually and after significant rain storm event to determine if problems have developed. When the project was undertaken in 1991 it was with the understanding that the creek would be able to naturally meander within the confines of the valley walls but not allow to encroach or impact the valley walls. It was expected that on-going maintenance would be required if the creek is to be left as natural.

The stabilized bank will range from 5 to 6 feet in height. The bituminous trail that remains in the area of the washout will be removed and replaced to its prior location, and width. Since the 65 cubic yards of fill material will not result in a reduction of flood volume as compared to 2019 high water conditions and that Rule 2.3.2 requires compensatory storage for fill placed below the flood elevation of the creek, a Rule 10.0 exemption from this requirement is requested to be considered.

The project will disturb more than 50 cubic yards of earth 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, 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 4.3.3 Chloride management are not imposed. 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 installation of a streambank improvement.

Exhibits

1. Permit Application dated July 23, 2019.
2. Plans dated June 3, 2019 prepared by the City of Bloomington
3. E-mail correspondence dated August 6, 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.

2.0 Floodplain Management and Drainage Alterations

The creek will bounce approximately 5 feet in this area at flood stage. The stabilization proposed, using the field stone toe boulders and rip-rap involves placement of fill below the 100-year flood elevation of Nine Mile Creek, 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 will repair the existing creek bank wash-out to its pre-spring 2019 location and condition. If not stabilized, continued erosion would result in further failure of the pedestrian trail and continued wash-out of the creek bank causing further sedimentation of the creek and downstream resources.

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 because no new or reconstructed structures are proposed.

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 plan, as stated, is to stabilize the creek in its current location to pre-spring 2019 high water conditions. The 90 foot section along the creek will be stabilized using sixty-five (65) cubic yards of toe boulders and rip-rap and bioengineering. Stabilizing the erosion section will reduce the further introduction of sediment into the creek, will not result in a reduction of the flood volume that was available prior to the wash-out and will reestablish the pedestrian trail in the area of the wash-out.

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 an erosion problem that is introducing sediment into the creek and if not corrected will continue to erode introducing additional sediment into the creek and will likely result in continued failure of the pedestrian trail. The project will not result in a rise of the District's management elevation for the creek since there will be no reduction in the available flood volume compared to the pre-spring 2019 high water condition. The project will not alter the creek channel or the stability of the channel itself but will provide a stable creek bank. The project will not affect the groundwater hydrology or stream base flow conditions. The work is to be completed in the fall, 2019 during low flow conditions in the creek. The project will improve the water quality of the creek by the stabilization of the erosion problem and will restore any aquatic or riparian habitat that may have existed, upon completion of the project.

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.

5.0 Erosion and Sediment Control

The work proposed is to be undertaken mid to late fall typically a low flow period. The City has provided a Water Management section of their specifications that requires the contractor to provide a plan at least 5 days prior to mobilization that describes the proposed methods for the control of surface water and the methods of erosion control to be implemented. A recommendation for consideration is that the plan also be submitted to the District for review and approval prior to the issuance of the permit for the project. The project contact is Steve Segar, City of Bloomington.

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 along 90 feet of Nine Mile Creek streambank. The project will provide stabilization techniques, including field stone toe boulders, rip-rap, vegetated natural coir fabric bioengineering (VRSS, vegetative reinforced soil slopes).

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

The spring 2019 flooding and a debris blockage as resulted in a section of the south bank of the creek and a 70 foot section of the existing pedestrian trail to fail and requiring stabilization.

If not corrected, the creek bank will continue to erode and sections of the trail to fail as the erosion continues.

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 bank is to be stabilized in its current location with field stone toe boulders, rip-rap, and coir fabric wrap geogrid (soil lifts) including live cutting and plugs (harvested on-site if available). The rock stabilization will be at and below the anticipated normal level of the creek with the bioengineering located at elevations above. Structural stabilization as proposed, rock toe protection, is required to minimize the impacts that flows in the creek (10-year (discharge) flow rate - 336 c.f.s.; 100-year (discharge) flow rate - 514 c.f.s.) will have on the creek channel in this area. The base flow in this reach of the creek is approximately 10 c.f.s. Bioengineering alone will not provide the structural component required.

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

The rock stabilization will provided the foundation of the stabilization proposed. The coir fabric geo grid is a form of VRSS – soil pillows being 1 foot thick of top soil material rapped with the fabric.

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 project proposes the use of Class III field stone rip-rap, MnDot 2511 and 3601, having a maximum size of 18-inches, with 8-inches of granular filter material, MnDot 3601.The objective is to maintain the natural characteristics of the creek system yet provide for a stable slope that forms the creek bank.

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

The stabilization will restore the creek bank to its pre-wash location, matching the top and toe of the restore bank with the existing bank both upstream and downstream of the wash-out area. The stabilization will not move, alter or change the location of the channel from its current location. The stabilization will follow the alignment of the existing stream channel.

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.

Filter material used will be 8-inches in depth complying with MnDot 3601. A North American Green C125BN geotextile filter fabric is to be used between the granular filter material and the native soil. The toe boulders are shown to be installed half buried below the normal level of the creek.

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

The rip-rap to be installed will not cover emergent vegetation.

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 thalweg of the creek in this area is approximately 765 M.S.L. The toe boulders and field stone rip-rap will extend to the elevation of the bank on both sides of the stabilization, approximately elevation 770 M.S.L. The bioengineering will continue approximately 2 feet to the top of the creek bank. The 100-year flood elevation of the creek at this location is 770 M.S.L. Stabilization to the top of the creek bank complies with the rule. The bioengineering will continue approximately 2 feet above the creek level to the top of the eroded area. Areas that have not been subject to erosion will remain in its current condition.

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

The plans show the stabilized channel banks at a slope of 3:1.

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 pre-spring 2019 channel cross-sectional area will not be changed by the project. Navigation within this reach of the creek 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 methods have been sized to provide a stable condition with the creek in its current location thereby minimizing further disturbance that would result from the project. Similar stabilization has been required throughout the Lower Valley since 1991 when the original restoration project was undertaken. Ice loading and wave energy is not applicable for stream channel stabilization.

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

The project is to provide a stable creek section and is not for cosmetic purposes

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

Rule 10.2 Exceptions states; The Board of Managers may approve an exception from a provision of the rules requiring a particular treatment or management strategy, or setting forth a design specification, if an applicant demonstrates that better natural resource protection or enhancement can be achieved by the project as proposed, with such further conditions as the Board of Managers may impose, than would strict compliance with the provision.

As previously stated, the proposed stabilization will result in 65 cubic yards of boulders and rip-rap, considered fill, placed below the 770 M.S.L., the 100-year frequency flood elevation of the creek. District Rule 2.3.2 as previously described in the floodplain discussion, requires that compensatory storage be provided for the placement of fill within the floodplain. The fill will re-establish the creek to its pre-spring 2019 high water condition and will not result in a reduction in the available flood volume.

The stabilization proposed is necessary to prevent further movement and failure of the creek bank which would result in further sediment loading into the creek and likely further failure of the pedestrian trail. – (The Creek has been recently delisted as being impaired for turbidity by the MPCA.)

Since the benefits of the bank stabilization provide for a better natural resource protection and the filling does not reduce the volume that was available prior to the 2019 high water conditions, the engineer finds that there is ample factual and analytical basis for a determination by the managers that an Exception is warranted from compliance with 2.3.2.

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 7 is met. Rule 5 compliance will be determined on the review of the erosion control plan to be submitted by the city's contractor.
3. The proposed stabilization project provides substantial natural resource protection with no flood-risk created resulting from the placement of toe boulders and rip-rap to be installed with the storage volume being re-established to the pre-2019 spring high water conditions.

Recommendation

Approval, contingent upon:

1. General Conditions
2. A copy of the contractor's plan for the handling of the creek flows and erosion control measures to be implemented must be submitted for review. The permit will not be issued and construction activities within the creek may not commence unless the plan is approved.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. A recorded drawing of the completed restoration submitted to the District's files.
2. No activity affecting the bed of a protected watercourse may be conducted between March 15 and June 15.

Board Action

It was moved by Manager _____, seconded by Manager _____ to approve permit application No. 19-88 with the conditions recommended by staff.

Permit #: 2019-88
Project Name: Creek bank Stabilization in Harrison Park: Bloomington
Approval Date: August 21, 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.2019-88

Is hereby issued to Julie Long, City of Bloomington subject to the conditions specified in the attached form:

For the stabilization of a wash-out of the creek bank in Harrison Park in the Lower Valley of Nine Mile Creek District in Bloomington

Jodi Peterson, Chair
Nine Mile Creek Watershed District

This permit expires on: September 1, 2020

CONSTRUCTION NOTES

STREAM BANK RESTORATION
* FURNISH AND INSTALL 10 SY VEGETATED GEOGRID, STREAMBANK STABILIZATION FROM STA. 0+10 TO STA. 1+00 (SEE DETAIL SHEET 24)

BITUMINOUS SIDEWALK
* REMOVE AND DISPOSE OF BITUMINOUS PATH AS APPROVED
* SALVAGE CLASS 5 AGGREGATE BASE
* REPLACE SURFACE WITH
  2" TYPE SP 9.5 WEARING COARSE MIXTURE (3,B)
  5" AGGREGATE BASE (SALVAGED)
* SAW CUT ALL BITUMINOUS SURFACES PRIOR TO PLACING WEARING COARSE

LANDSCAPE
* FURNISH AND INSTALL LOAM TOPSOIL BORROW AND SEED
* FURNISH AND INSTALL EROSION CONTROL BLANKET, CATEGORY 3N

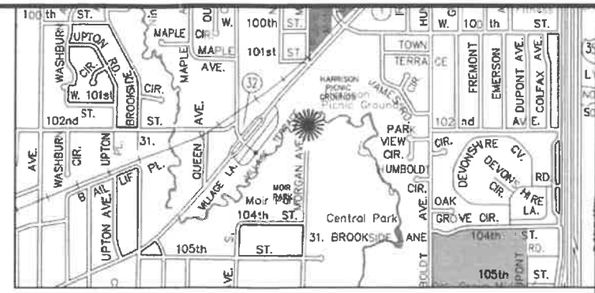
SITE E – 1701 W. 100TH ST.

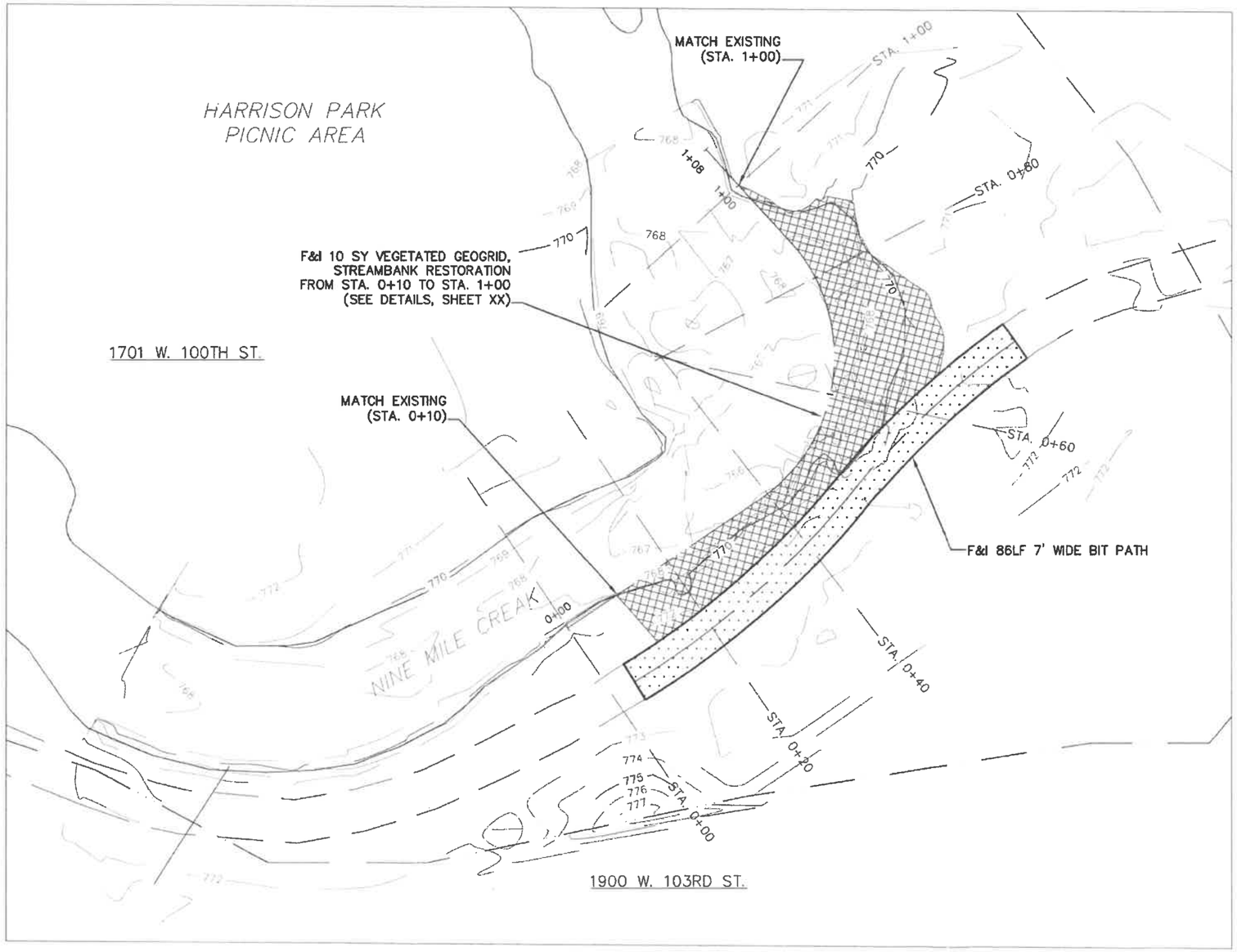
NINE MILE CREEK AT HARRISON PARK

N

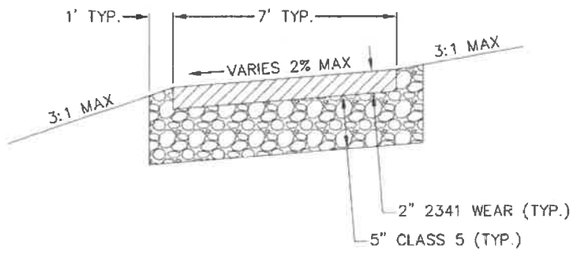
0 5 10

SCALE IN FEET





BIT. PATH EXISTING SECTION (TYP.)



SITE E
1701 W. 100TH ST
(NINE MILE CREEK AT HARRISON PARK)
SITE PLAN

CITY OF BLOOMINGTON MINNESOTA
1700 W 98TH ST.
BLOOMINGTON MN 55431
PHONE (952) 563-8700

ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT
2019–925 NINE MILE CREEK WASHOUT REPAIR PROJECT

REVISIONS

DATE	DESCRIPTION	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Steven W. Segar — LIC. # 25072 — DATE 6/3/19

DRAWN: DAC
CHECKED: SWS
APPROVED: SWS

SHEET: 23 OF 31

Drawing name: H:\PROJECTS\2019\2019-901 Storm Sewer Maintenance\CAD Files\Plan (Derek) RECOVER.dwg -- Printed: Jun 17, 2019 - 2:55pm

#2019-88

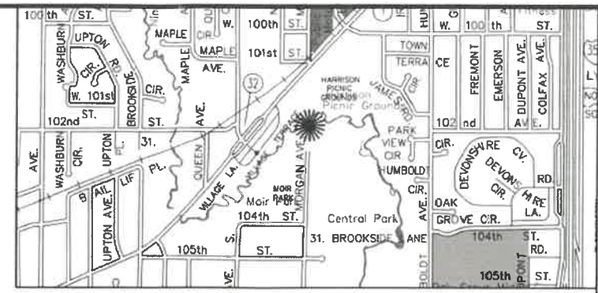
CONSTRUCTION NOTES

STREAM BANK RESTORATION

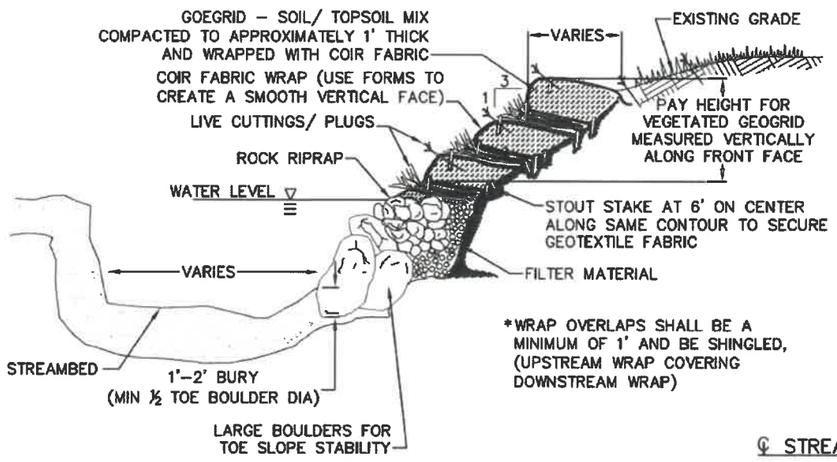
* FURNISH AND INSTALL 10 SY VEGETATED GEOGRID, STREAMBANK STABILIZATION FROM STA. 0+10 TO STA. 1+00 (SEE DETAIL)

SITE E – 1701 W. 100TH ST.

NINE MILE CREEK AT HARRISON PARK



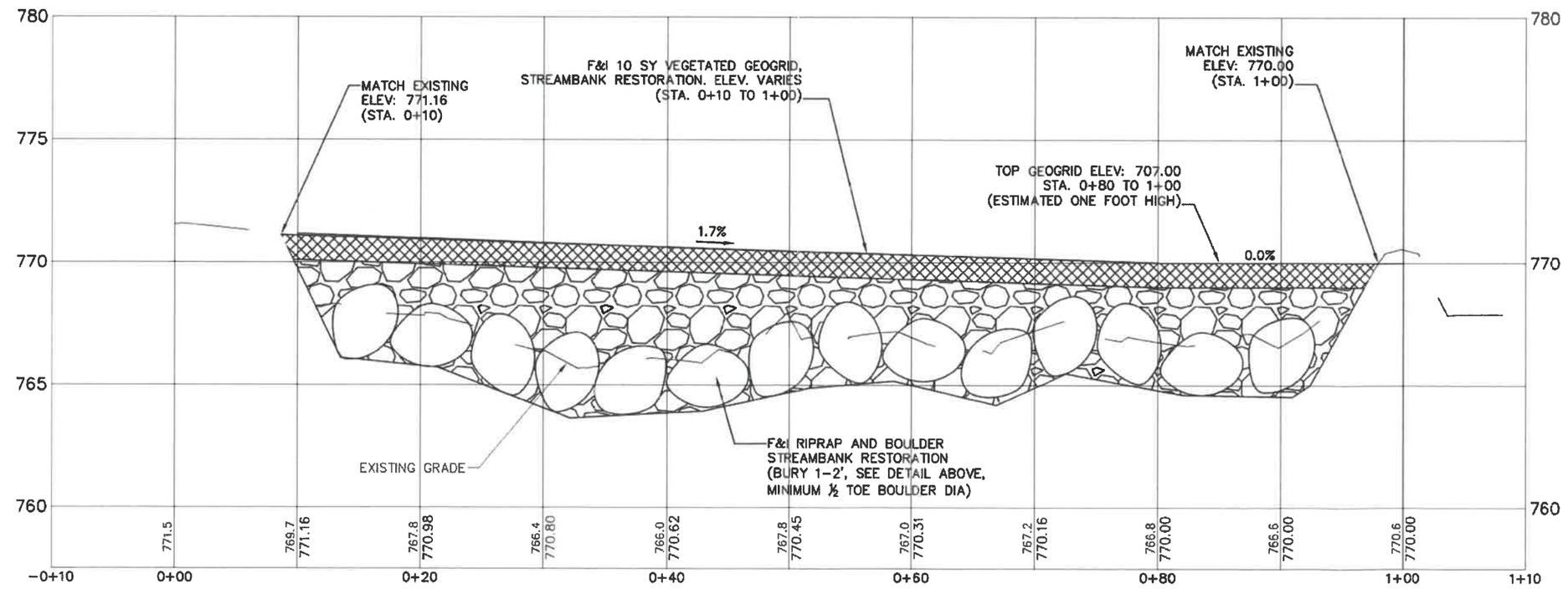
RIPRAP BANK STABILIZATION PROFILE VIEW



*WRAP OVERLAPS SHALL BE A MINIMUM OF 1' AND BE SHINGLED, (UPSTREAM WRAP COVERING DOWNSTREAM WRAP)

EXAMPLE BANK STABILIZATION (2018–902)

℄ STREAMBANK RESTORATION PROFILE



SITE E
1701 W. 100TH ST
(NINE MILE CREEK AT HARRISON PARK)
SITE PLAN

CITY OF BLOOMINGTON MINNESOTA
1700 W 98TH ST.
BLOOMINGTON MN 55431
PHONE (952) 563-8700

ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT
2019–925 NINE MILE CREEK
WASHOUT REPAIR PROJECT

REVISIONS

DATE	DESCRIPTION	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Steven W. Segar — 25072 — 6/3/19
LIC. # — DATE

DRAWN: DAC
CHECKED: SWS
APPROVED: SWS

SHEET:
24 OF 31

#2019-88

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