Barr Engineering Co.

MEMORANDUM

To: Board of Managers: Nine Mile Creek Watershed District

From: Barr Engineering Company

Subject: Permit #2018-90: Normandale Lake Drawdown: Bloomington

Date: July 16, 2018

Plans and a grading and land alteration permit application were received on July 11, 2018 for the proposed drawdown of Normandale Lake. This is the first phase of the overall Normandale Lake Water Quality Improvement project being undertaken by the City of Bloomington and the Nine Mile Creek Watershed District. The project submittal, attached to this memorandum includes a summary of the project, with a progression through the District's rules, a set of the construction plans (that are referenced in the project summary) and a reference memorandum regarding the modeling analysis completed for the project.

The project is in compliance with the District rules, adopted April 10, 2018 with the exception that fill for the temporary weir to maintain the water surface elevation in the wetland upstream of West 84th Street while the lake is being drawn down and fill (rip rap) to dissipate energy and prevent erosion upstream and downstream of the proposed bypass pipe is below the 100-year frequency flood elevation of the creek and lake, Rule 2.3.2. This will require a variance and is discussed in the attached memorandum. This filling will not have an impact on the flood storage volume provided within the lake since flood volume is determined above the normal elevation of the lake – "live storage". The filling for the weir is below the normal elevation of the lake, 808.1 M.S.L. – referred to as "dead-storage".

A point of clarification needs to be made regarding the modeling results indicating a temporary rise, 0.02 feet, in the 100-year frequency high water elevation from the construction of the temporary embankment to maintain the water levels in the wetland area upstream of West 84th Street. This rise, in the opinion of the District's engineer, is within the accuracy of engineering calculations and compliance with District rules 2.3.2 and 2.3.3 is met. Rule 4.3.3, Low floor elevation states that a minimum separation of 2 feet is required between all new and reconstructed buildings and the flood elevation of a water body. No new structures or stormwater management facilities are being constructed as part of the proposed project. The properties adjacent to Nine Mile Creek in the areas upstream of West 84th Street were developed in 1999 or later. Although the NMCWD policies and rules have changed considerably since 1999, the policies and rules since 1999 have required that low floor elevations of structures be at least two feet above the Nine Mile Creek flood management elevation. Accordingly, the structures of properties adjacent to Nine Mile Creek in the area

upstream of West 84th Street that required a NMCWD permit were to provide at least two feet of freeboard from the 100-year flood elevation.

Findings

The proposed project includes the information necessary, plan sheets and erosion control plan, for review.

- 1. Rules 3, 4, 5, 6 and 7 are met.
- 2. Because the property owner is a public entity, no fees are charged or the District's financial assurance requirements do not apply.
- 3. Rule 2 is met with concurrence of the variance as presented.

Recommendation

Approval, contingent upon:

1. General Conditions



Memorandum

To: Randy Anhorn, NMCWD Administrator **From:** Shanna Braun and Janna Kieffer

Subject: Normandale Lake Drawdown Project- NMCWD Permit Application

Date: July 16, 2018

Nine Mile Creek Watershed District (District), in coordination with the City of Bloomington, is planning a water quality improvement project on Normandale Lake to address concerns associated with a prevalence of curly-leaf pondweed in the lake and release of phosphorus from lake-bottom sediments (internal loading). Improvement approaches include lake-level drawdown, herbicide treatment, alum treatment, possible aquatic plant harvesting, and possible in-lake oxygenation. This permit application is for the lake drawdown portion of the overall water quality improvement project.

Normandale Lake was created as part of the Mount Normandale Lake flood-control project implemented by NMCWD in the mid-1970s, which included construction of a dam across Nine Mile Creek to the west of Normandale Boulevard. The U.S. Army Corp of Engineers (USACE) issued a Section 404 permit in 1979 for construction of the dam.

Drawdown of Normandale Lake will involve using a temporary pump and the existing 18-inch bypass pipe (located on the southeast side of Normandale Lake) to draw the lake down in late-summer while installing a larger (36-inch) bypass outlet to maintain the lake drawdown and decrease potential impacts of rainfall or snowmelt events during the drawdown period. A new 36-inch bypass pipe and stop log structure will be installed on the north side of the existing outlet structure (see attached plans). The pipe will extend into the deepest spot in Normandale Lake and convey water from the lake to Nine Mile Creek downstream of the existing outlet weir. Riprap will be installed to dissipate energy at the downstream outlet location. The existing 18-inch bypass pipe will be utilized during the drawdown and abandoned at the end of the lake drawdown period, prior to refilling of the lake.

This method of lake drawdown will provide permanent infrastructure for potential future drawdowns, while also allowing the drawdown to begin in late-summer (with the temporary pump) to minimize impacts to the lake's resident turtle population. Based on project communications with the Minnesota Department of Natural Resources, (MDNR), the agency prefers that lake drawdown occur prior to September 15 to minimize impacts to the area's turtle community as it prepares for winter hibernation.

In addition, a temporary water control structure (weir) will be installed in Nine Mile Creek between the wetland area north of West 84th Street and the lake to prevent lowering of the water levels in this wetland area during the lake drawdown (see attached plans). The temporary weir will consist of an earthen berm covered by a geosynthetic clay liner (GCL). The temporary weir will be removed in June 2019 following the

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DNR's work restriction time period (March 15-June 15 for non trout streams) and the area will be restored to pre-construction conditions.

The project has been reviewed for consistency with District rules and will require permit coverage under the following rules, as described further in the sections below:

- Rule 2 Floodplain Management and Drainage Alterations
- Rule 4 Stormwater Management
- Rule 5 Erosion and Sediment Control
- Rule 6 Waterbody Crossings and Structures
- Rule 7 Shoreline and Streambank Improvements
- Rule 10 Variances and Exceptions

Rule 2 – Floodplain Management and Drainage Alterations

Temporary Weir

The project includes construction of a temporary weir in Nine Mile Creek just south of West 84th Street to prevent drawdown of the water levels in the wetland area north of West 84th Street during the lake drawdown. The temporary weir will constitute placement of temporary fill within the floodplain of Nine Mile Creek; as such, the District's Floodplain Management and Drainage Alterations rule applies.

Approximately 94 cubic yards of fill (a combination of riprap and earthen fill wrapped in geotextile fabric) will be temporarily placed within the Nine Mile Creek floodplain to construct the temporary weir. The temporary weir will be installed prior to commencement of lake drawdown (mid-August 2018) and will be removed in June 2019 once the drawdown is complete, with the area restored to pre-construction conditions. The control elevation of the weir is designed to be 0.4 feet lower than the normal elevation of the creek and downstream Normandale Lake to ensure upstream water levels are maintained at levels similar to existing conditions, while preventing increases in flood elevations. The placement of fill below the 100-year flood elevation without compensatory storage, even temporary, requires a variance from Rule 2.3.2. The fill will not have an effect on the flood elevation or flood storage required, since the temporary weir will be constructed entirely below the existing normal elevation of this portion of the creek and flood storage is calculated above the normal elevation of a storage area.

Hydrologic and hydraulic modeling was completed to document that 100-year flood elevations upstream of the proposed temporary weir will not increase as a result of the project. Modeling results indicate the minor temporary increases (up to 0.02 feet) in the 100-year flood elevation in several locations upstream of the temporary weir (see Table 1). However, the minor increases can be considered to be within the level of engineering accuracy of the modeling and will only last for the duration of the project (mid-August 2018 through June 2019). The attached memo provides a more detailed summary of the findings of the hydrologic and hydraulic modeling analysis of the proposed temporary weir.

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Table 1. Comparison of 100-year flood elevations for existing and proposed conditions.

XP-SWMM Model Node	Location Description	100-ye	100-year Flood Elevation ¹ (feet)				
		Existing Conditions	Proposed Conditions	Difference	Management Elevation (feet)		
BlmCrk5	Nine Mile Creek upstream of West 84th Street	813.68	813.70	0.02	814.5		
BlmCrk4	South Fork of Nine Mile Creek upstream of American Boulevard/Norman Center Drive	814.43	814.45	0.02	814.5		
WBlmCrk5	South Fork of Nine Mile Creek upstream of East Bush Lake Road	815.18	815.20	0.02	816.0		
WBlmCrk4	South Fork of Nine Mile Creek downstream of Hwy 494	815.90	815.91	0.01	819.5		
BlmCrk3	North Fork of Nine Mile Creek upstream of American Boulevard/Norman Center Drive	815.16	815.18	0.02	816.5		
BlmCrk2	North Fork of Nine Mile Creek downstream of Green Valley Drive	816.87	816.88	0.01	817.0		
¹ Modeled ele	vations in NGVD 29		I	1			

Figure 1 shows the area between I-494 and West 84th Street. Review of LiDAR elevation data indicates that no structures are within the 100-year floodplain in these areas under existing or proposed (i.e. with the temporary weir) conditions. The 100-year flood elevations under proposed conditions are below the District's historic flood management elevations for all locations evaluated.

The properties adjacent to Nine Mile Creek in the area shown in Figure 1 were developed in 1999 or later. Although the NMCWD policies and rules have changed considerably since 1999, the policies and rules since 1999 have required that low floor elevations of structures be at least two feet above the Nine Mile Creek flood management elevation. Accordingly, the structures of properties adjacent to Nine Mile Creek in the area upstream of West 84th Street that required a NMCWD permit were to provide at least two feet of freeboard from the 100-year flood elevation. No new structures, as defined by the current NMCWD rules, or stormwater management facilities are being constructed as part of this proposed project.

The proposed temporary weir will be constructed at or below the normal water level of Normandale Lake and the wetland area upstream of West 84th Street, thus maintaining the amount of flood storage available. Therefore, creation of offsetting storage capacity will not be necessary.

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Figure 1. Nine Mile Creek upstream of West 84th Street

Rip rap

The project includes construction of a new 36-inch bypass pipe and stop log structure on the north side of the existing Normandale Lake outlet. The pipe will extend into the deepest spot in Normandale Lake and convey water from the lake to Nine Mile Creek downstream of the existing outlet weir. A small amount of riprap will be installed (approximately 4 cubic yards at the pipe intake and approximately 4 cubic yards at the outfall) to dissipate energy at the upstream and downstream outlet locations. The rip rap will be installed below the normal water level of Normandale Lake and downstream channel, thus maintaining the amount of flood storage available. Therefore, creation of offsetting storage capacity will not be necessary.

Overall

The proposed temporary weir and installation of rip rap upstream and downstream of the proposed bypass pipe will not adversely affect channel stability, groundwater hydrology, or stream base flow. The temporary weir will be constructed with clean sand (versus clay) to prevent water quality impacts to Normandale Lake during construction. In addition, erosion control measure will be installed downstream

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of the temporary weir to further minimize impacts during construction. During the drawdown, it is anticipated that the temporary weir will not harm water quality.

The proposed project will temporarily impact aquatic habitat. Installation of the temporary weir upstream of the lake will temporarily impact fish passage, but will not prevent passage, as fish can still flow over the weir. Drawdown of the lake will also temporarily impact the fish, amphibian, and turtle populations. See the Environmental Assessment Worksheet (EAW) Normandale Lake Water Quality Improvement Project (https://www.ninemilecreek.org/wp-content/uploads/Normandale-Lake-EAW-Submittal-Package signed.pdf) and the Findings of Fact (https://www.ninemilecreek.org/wp-content/uploads/Findings-of-Fact-and-EIS-Needs-Determination-for-the-Normandale-Water-Quality-Improvement-Project.pdf) for additional information on potential impacts and related mitigation measures.

The proposed project will be constructed by NMCWD on land owned by the City of Bloomington. The NMCWD has entered into a cooperative agreement with the City of Bloomington which grants necessary permissions for work within this portion of Nine Mile Creek.

Rule 3 – Wetlands Management

The project includes manipulation of Normandale Lake, which the MDNR classifies as a public waterbody. Impacts to public waters are regulated separate from the Wetland Conservation Act (WCA). The City of Bloomington is the WCA local government unit.

NMCWD Rule 3.4 indicates that any activity for which a permit is required under any District rule(s) must provide buffer on all wetlands disturbed by the activity and on all wetlands downgradient from the activity. Normandale Lake is classified as a public water, versus a public water wetland. Since the project will not result in permanent draining, excavation, or filling of a wetland regulated by the WCA and given that the property is not owned by the NMCWD (applicant), the buffer provisions of the District's Wetlands Management rule are not applicable.

For areas of the shoreline altered by the proposed project, the disturbed areas will be restored in a naturalized condition using a native seed mix to retain the natural resources and ecological value.

Rule 4 – Stormwater Management

The project will disturb approximately 134 cubic yards of earth as summarized in Table 2 below. Construction will also result in disturbance greater than 5,000 square feet, triggering the District's Stormwater Management rule.

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Table 2. Summary of anticipated volume of disturbance below the 812.9 M.S.L. flood elevation of Normandale Lake.

Project Component	Type of Fill	Volume in Cubic Yards
Temporary Weir	Riprap	44
Temporary Weir	Earthen berm wrapped in geotextile fabric	50
36" Bypass Pipe	Riprap	8 (4 in Normandale Lake and 4 in channel at outlet)
36" Bypass Pipe	HDPE	28 (25 in Normandale Lake and 3 in channel at outlet)

Though the project results in levels of disturbance in excess of those listed in Section 4.2.1a and 4.2.1b of the NMCWD Stormwater Management rule, the project will not result in generation of impervious surface. Because no impervious surfaces will be disturbed, created or reconstructed by the proposed work, no storm water management facilities need to be provided to meet the criteria in subsection 4.3.1. District Rule 5, Erosion and Sediment Control also applies to the project.

Rule 5 – Erosion and Sediment Control

As noted above, the project will result in surface disturbance greater than 5,000 square feet (Rule 5.2.1b); as such, the District's Erosion and Sediment Control rule applies. An Erosion Control Plan has been prepared for the project and is enclosed with the attached project plans. The Erosion Control Plan identifies site stabilization measures, as well as inspection and maintenance procedures. The construction specifications require that the contractor will properly manage and dispose of all construction waste.

Rule 6 – Waterbody Crossings and Structures

Construction of the temporary weir constitutes placement of a temporary structure on Nine Mile Creek; as such, the District's Waterbody Crossings and Structures rule applies. The following text describes the project's relationship to criteria set forth in Section 6.3 of the Waterbody Crossings and Structures Rule.

- 6.3.1a Must retain adequate hydraulic capacity and assure no net increase in the flood stage of the pertinent waterbody;
 - Hydraulic capacity will be maintained and potential increases in upstream flood elevations as a result of the temporary weir in Nine Mile Creek just downstream of West 84th Street are minor (0.02 feet) and temporary in nature. See Floodplain Management and Drainage Alterations discussion.
- 6.3.1b Must retain adequate navigational capacity pursuant to any requirements of the waterbody's classification by the District;
 - Navigational capacity will not be permanently altered.

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- 6.3.1c Must not adversely affect water quality, change the existing flowline/gradient, or cause increased scour, erosion, or sedimentation;
 - Water quality and the hydraulic gradient will not be permanently altered. The channel will be restored to pre-construction conditions upon removal of the temporary weir. Design of the temporary weir includes use of clean sand, versus clay, to minimize water quality impacts during construction. Installation of riprap directly upstream and downstream of the temporary weir will minimize erosion.
- 6.3.1d Must preserve existing wildlife passage along each bank and riparian area;
 - The project has been designed to allow for passage of turtles and other small, terrestrial wildlife at crossings below-grade of surrounding roadways. Passage of fish wishing to travel upstream will be temporarily impeded for the duration that the temporary weir is in place. However, this connection will be restored upon weir removal. This has been presented in detail in the permit application to the Minnesota Department of natural Resources.
- 6.3.1e Must represent the "minimal impact" solution to a specific need with respect to all other reasonable alternatives, based on analysis of at least two reasonable alternatives, one of which may be not undertaking the proposed work.
 - Construction of the temporary weir is the only option to satisfy upstream property owners who expressed concern over potential loss of wetland and backwater areas during the lake drawdown period. An alternative temporary weir configuration that included a piped "pass through" was considered. However, this alternative was cost-prohibitive considering the temporary nature and will require use of soil (clay) with greater potential for erosion and water quality impacts during construction.
- 6.3.2 Projects involving directional boring or horizontal drilling must provide for minimum clearance of 3 feet below the bed of a waterbody and a minimum setback of 50 feet from any stream bank for pilot, entrance and exit holes.
 - Not applicable.
- 6.3.3a Removal of structures or other waterway obstructions must maintain the original crosssection and bed conditions to the greatest extent practicable;
 - Upon removal of the temporary weir, creek banks will be revegetated with native species and the bed and banks of the creek will be restored to pre-project conditions.
- 6.3.3b Removal of structures or other waterway obstructions must achieve complete removal of the structure, including any footings or pilings that impede navigation; and
 - The temporary weir will be completely removed in June 2019.
- 6.3.3c Removal of structures or other waterway obstructions must not involve the removal of a water-level control device.
 - Not applicable.
- 6.3.4 No activity affecting the bed of a protected water may be conducted between March 15 and June 15 on watercourses, or between April 1 and June 30 on all other public water waterbodies, to minimize impacts on fish spawning and migration.

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- It is anticipated that the temporary weir in Nine Mile Creek just downstream of West 84th
 Street will be removed after June 15, 2019.
- 6.3.5 A separate permit under District Rule 7.0 is not required for shoreline or streambank stabilization associated with a waterbody crossing or structure, but such stabilization must comply with the criteria 7.3.2d to f.
 - It is noted that the temporary weir will not require a separate permit under District Rule
 7.0; however, construction of the new bypass pipe at the Normandale Lake outlet will
 require a permit under District Rule 7, as described below.

Rule 7 – Shoreline and Streambank Improvements

Installation of the new bypass pipe at the Normandale Lake outlet will require alteration of the Normandale Lake shoreline, which is classified as a public water; as such, the District's Shoreline and Streambank Improvements permit is required.

As shown on the attached plan sheets, the new bypass pipe will be installed north of the existing outlet and will require placement of riprap around the pipe to protect from erosion. In addition, a riprap apron will be constructed downstream of the outlet, where the bypass pipe will discharge to Nine Mile Creek. Riprap will primarily be placed below the ordinary high water level. Areas of disturbed shoreline will be restored with native plant species to match the surrounding vegetation.

The proposed installation of the new bypass pipe and placement of riprap in the channel downstream of the outlet was included in the District's Public Waters Work Permit Application, which was submitted to the MDNR on June 1, 2018.

1.0 Rule 8 – Sediment Removal

The project does not include sediment removal; District Rule 8 is not applicable.

Rule 9 – Appropriation of Surface Waters

Based on project coordination with the MDNR, the drawdown of Normandale Lake does not constitute an appropriation of public surface waters and a MDNR Water Appropriations Permit is not required. It is expected that District Rule 9 will follow the precedent established by MNDNR with respect to surface water appropriation and that District Rule 9 will not be applicable to the project.

Rule 10 – Variances and Exceptions

As stated in the Floodplain Management and Drainage Alteration discussion, a variance from District Rule 2.3.2 is required because 94 cubic yards of material will be placed, on a temporary basis, below the 100-year frequency flood elevation of Nine Mile Creek and Normandale Lake for the construction of the temporary weir downstream of West 84th Street and 8 cubic yards of material (rip rap) will be placed below the 100-year frequency flood elevation of Normandale Lake and Nine Mile Creek to minimize

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erosion from the new 36-inch bypass pipe. To grant a variance, the Board of Managers must find, based on demonstration by the applicant:

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 inconveniences, will result from strict application of the rule:

The filling, 94 cubic yards, as proposed below the flood elevation of Nine Mile Creek is for the construction of a temporary weir downstream of West 84th Street. The weir is for maintaining the water surface level of the wetland during the drawdown of the lake. Flood storage is the volume calculated above the normal elevation of a waterbody for detaining the runoff from the 100-year frequency storm event. Since the temporary weir will be constructed entirely below the existing normal elevation of this portion of the creek (and the lake) and the control elevation of the temporary weir is to be 0.4 feet lower than the normal level of the lake, the amount of available flood storage will not be impacted by the filling.

The filling, 8 cubic yards, as proposed below the flood elevation of Normandale Lake and Nine Mile Creek is to dissipate energy and provide erosion protection at the upstream and downstream ends of the new 36-inch bypass pipe on the north side of the existing Normandale Lake outlet. Since the rip rap will be installed below the normal water level of Normandale Lake and downstream channel, the amount of available flood storage will not be impacted by the filling.

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 any reasonable use of the property exists under the terms of the District rules;

As stated above, the purpose of the filling for the weir is for maintaining the water level in the wetland upstream of West 84th Street while the lake is being drawn down. The filling will not have an impact on the flood storage provided.

As stated above the purpose of the filling for the riprap is to dissipate energy and provide erosion protection at the upstream and downstream ends of the new 36-inch bypass pipe. The filling will not have an impact on the flood storage provided.

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:

This has been addressed in the response to 10.1.1 and 10.1.2

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

The alternative would be to excavate a depression somewhere along the shoreline or within the lake below elevation 808 M.S.L. that would provide a compensatory volume of 102 cubic yards.



Technical Memorandum

To: Jason Spiegel, Minnesota Department of Natural Resources

From: Janna Kieffer, Barr Engineering

Subject: Hydraulic Analysis of Proposed Temporary Weir in Nine Mile Creek upstream of

Normandale Lake

Date: June 1, 2018

c: Erica Sniegowski, Nine Mile Creek Watershed District

Randy Anhorn, Nine Mile Creek Watershed District

The Nine Mile Creek Watershed District (NMCWD), in coordination with the City of Bloomington, is planning an improvement project on Normandale Lake to protect and improve the native aquatic plant community and to address water quality concerns associated with a prevalence of curly-leaf pondweed in the lake and release of phosphorus from lake-bottom sediments (internal loading). The proposed improvement project includes a lake-level drawdown to freeze a large portion of the lake bottom and kill the curly-leaf pondweed turions in the sediment.

As part of the project, a temporary water level control structure (weir) will be installed in Nine Mile Creek between West 84th Street and Normandale Lake to prevent lowering of the water levels in the wetland area upstream of West 84th Street during the lake drawdown. The temporary weir would consist of an earthen berm covered with a geosynthetic clay liner (GCL). The temporary weir would be removed in spring 2019 once the drawdown is complete and the area would be restored to pre-construction conditions.

The purpose of this memorandum is to provide a summary of the hydraulic modeling completed to document that the 100-year flood elevations upstream of the proposed temporary water level control structure do not increase as a result of the project. The NMCWD developed detailed XP-SWMM hydrologic and hydraulic models of the watershed in the early-2000s to update the 100-year flood management elevations along Nine Mile Creek. The NMCWD models were submitted to FEMA and served as the basis for the Federal Emergency Management Administration (FEMA) Hennepin County map updates effective in 2016. The NMCWD updated their hydrologic and hydraulic models in 2015 based on the revised National Oceanic and Atmospheric Administration's (NOAA) precipitation frequency estimates ("Atlas 14"). The NMCWD has had flood management elevations in place for decades based on past computations that used future land use development projections. As part of the 2015 Atlas 14 modeling updates, the historic Nine Mile Creek flood management elevations were compared to the updated Atlas 14 flood elevations and the higher of these elevations were adopted (2016) as the revised regulatory flood management elevations.

To: Jason Spiegel, Minnesota Department of Natural Resources

From: Janna Kieffer, Barr Engineering

Subject: Hydraulic Analysis of Proposed Temporary Weir in Nine Mile Creek upstream of Normandale Lake

Date: June 1, 2018

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The NMCWD's 2015 Atlas 14 XP-SWMM model of the creek system was used as a baseline model for the hydraulic analysis of the proposed temporary weir. Modeling of the channel between West 84th Street and Normandale Lake was refined by incorporating additional cross-sections; previously this channel was not explicitly modeled and instead was included as part of the Normandale Lake "storage". The updated "existing conditions" 100-year flood elevations upstream of Normandale Lake as a result of the model refinements are summarized in Table 1.

The proposed temporary weir was incorporated into the "proposed conditions" model based on the design shown on Sheet C-05 of the NMCWD Normandale Lake Drawdown preliminary (60%) design drawings (attached). The proposed weir consists of an earthen berm of approximately 40 feet in length across the channel just upstream of the existing footbridge at elevation 808.1 feet MSL (control elevation of existing Normandale Lake outlet weir), with a 20 foot notch in the weir at 807.7 feet MSL. The "notch" will be centered in accordance with the existing Nine Mile Creek stream centerline, with the intent of channelizing the conveyance of baseflows (approximately 5 cfs) and reducing the potential for downstream erosion.

Table 1 summarizes the "proposed condition" 100-year flood elevations for locations along Nine Mile Creek upstream of Normandale Lake as a result of the proposed temporary weir structure. Note that elevations included in Table 1 are based on the National Geodetic Vertical Datum of 1929 (NGVD 29), whereas elevations shown on Sheet C-05 of the preliminary design drawings are based on North American Vertical Datum of 1988 (NAVD 88). The conversion of elevations from NGVD 29 to NAVD 88 in the project area is approximately 0.2 feet.

As shown in Table 1, model results indicate minor temporary increases in the 100-year flood elevation in several locations upstream of the proposed temporary water level control weir. However, the minor increases will only last for the duration of the project (anticipated fall 2018 through spring 2019). Review of LiDAR elevation data indicates that no structures are within the 100-year floodplain in these areas under existing or proposed conditions. The 100-year flood elevations under proposed conditions are below the NMCWD's historic flood management elevations for all locations identified in Table 1, with exception of BlmCrk2 (North Fork of Nine Mile Creek downstream of Green Valley Drive) which has an existing and proposed flood elevation that is slightly higher than the NMCWD regulatory flood management elevation. The slightly higher flood elevations, as compared with the NMCWD historic flood management elevation, are likely due to the additional refinements made to the model in the channel between West 84th Street and Normandale Lake.

To: Jason Spiegel, Minnesota Department of Natural Resources

From: Janna Kieffer, Barr Engineering

Subject: Hydraulic Analysis of Proposed Temporary Weir in Nine Mile Creek upstream of Normandale Lake

Date: June 1, 2018

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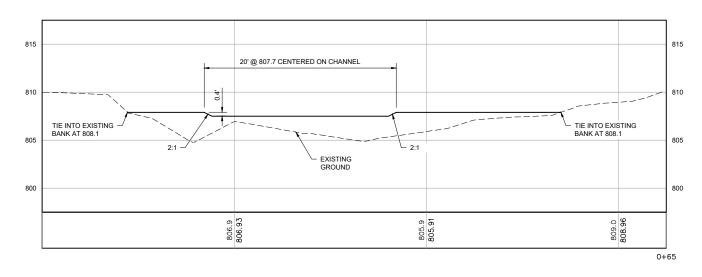
Table 1. Comparison of 100-year flood elevations for existing and proposed conditions.

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BlmCrk4	South Fork of Nine Mile Creek upstream of American Boulevard	814.43	814.45	0.02	814.5		
WBlmCrk5	South Fork of Nine Mile Creek upstream of East Bush Lake Road	815.18	815.20	0.02	816.0		
WBlmCrk4	South Fork of Nine Mile Creek downstream of Hwy 494	815.90	815.91	0.01	819.5		
BlmCrk3	North Fork of Nine Mile Creek upstream of American Boulevard	815.16	815.18	0.02	816.5		
BlmCrk2	North Fork of Nine Mile Creek downstream of Green Valley Drive	816.87	816.88	0.01	816.8		
¹ Modeled elev	vations in NGVD 29	l					

Attachments:

Plan sheet C-05



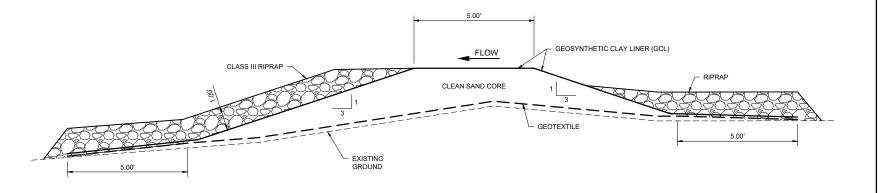


PROFILE: INLET TEMPORARY WEIR

1"=5"









PRELIMINARY DRAFT

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BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435

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IILE CREEK WATERSHED DISTRICT MINNEAPOLIS, MINNESOTA

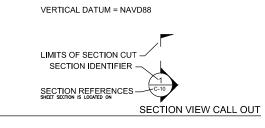
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BLOOMINGTON, MINNESOTA	CLIENT PROJECT No.		
INLET TEMPORARY WEIR			
	DWG. No.	REV. No.	
PLAN AND DETAILS	C-05	Α	

PROJECT LOCATION

NINE MILE CREEK WATERSHED DISTRICT

NORMANDALE LAKE DRAWDOWN BLOOMINGTON, MINNESOTA

LOCATION MAP



SECTION IDENTIFIER SECTION: GRAPHICS STANDARDS SECTION REFERENCES -(TYP.)
SHEET SECTION IS CALLED-OUT ON SECTION VIEW TITLE

DETAIL IDENTIFIER DETAIL REFERENCES DETAIL VIEW CALL OUT

DETAIL IDENTIFIER \ DETAIL: GRAPHICS STANDARDS DETAIL REFERENCES

DETAIL VIEW TITLE

Picture DI Wand St W B3rd St W 84th St ake Rd. PROJECT LOCATION NORMANDALE LAKE

VICINITY MAP 🚯



AS SHOWN

05/23/2018

JAM4 JMK2/JNB

BJS

C-04 C-05 C-06 C-07 C-08	GENERAL PLAN INLET TEMPORARY WEIR, PLAN, PROFILE, AND SECTION OUTLET BYPASS, PLAN AND PROFILE OUTLET BYPASS, DETAILS OUTLET BYPASS STOPLOG STRUCTURE, PLAN AND DETAILS
	I LAN AND DETAILS
	LINETYPE LEGEND
	———— CONSTRUCTION LIMITS
	—···— WATER EDGE
	HIDDEN
	— — CENTERLINE
	ABBREVIATIONS:
	CONC CONCRETE CMP CORRUGATED METAL PIPE DIA DIAMETER DS DOWNSTREAM DTR DECIDUOUS TREE EL ELEVATION GALV GALVANIZED GPM GALLONS PER MINUTE HDPE HIGH DENSITY POLYETHYLENE

INV

TYP

SHEET NO.

G-01

G-02

C-01

C-02

C-03

TITLE

GENERAL DRAWINGS

CIVIL DRAWINGS

EROSION CONTROL, PLAN

EROSION CONTROL, DETAILS

EROSION CONTROL, DETAILS

TITLE SHEET AND DRAWING INDEX

STORMWATER POLLUTION PREVENTION PLAN

0	JAM4	BJS	JMK2	7/12/2018	ISSUED FOR BID
В	JAM4	BJS	JMK2	7/3/2018	DRAFT FOR CLIENT REVIEW
Α	JAM4	BJS	JMK2	6/1/2018	DRAFT FOR AGENCY REVIEW
٧٥.	BY	снк.	APP.	DATE	REVISION DESCRIPTION



BARR ENGINEERING CO. MINNEAPOLIS, MN 55435

9 MILE CREEK WATERSHED DISTRICT EDEN PRAIRIE, MINNESOTA

NORMANDALE LAKE DRAWDOWN BLOOMINGTON, MINNESOTA TITLE SHEET

AND DRAWING INDEX

REINFORCED CONCRETE PIPE

HIGH WATER LEVEL

IDENTIFIER

INVERT

TYPICAL UPSTREAM

> 23271645.00 G-01

ISSUED FOR BID

GENERAL CONSTRUCTION ACTIVITY INFORMATION:
The Stormwater Pollution Prevention Plan (SWPPP) is required for the General Permit Authorization to Discharge Stormwater Associated with Construction Activity (NPDES Permit) as required by the Minnesota Pollution Control Agency (MPCA) under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS).

This project is a Nine Mile Creek Watershed District Project to improve the water quality of Normandale Lake in Bloomington, Minnesota. The project will consist of constructing a temporary weir to control upstream water levels, pumping to lower water levels, and adding piping and control structure to drain Normandale Lake. The purpose of draining the lake in the fall is to allow for freezing the lake bottom which will kill off the Curly—Leaf Pondweed and aide in improving the The project is within the Nine Mile Creek Watershed within Hennepin County in the City of Bloomington, Minnesota. Proposed construction will take place within the sites listed below:

- 1) Injet of Nine Mile Creek to Normandale Lake: South of West 84th Street 600 feet east of the intersection of West 84th Street and Chalet Road; Located in the NE $\frac{1}{4}$ of Section 17, T116N, R21W Latitude: 44.8537, Longitude: -93.3606.
- 2) Outlet of Nine Mile Creek from Normandale Lake; west of Normandale Blvd. between West 84th Street and Normandale Drive in the SE $\frac{1}{4}$ of Section 16, T116N, R21W Latitude: 44.8482, Longitude: -93.3514.

The project Work includes mobilization and demobilization; control of water and or dewatering to perform work; temporary pumping to draw the lake down; construction of temporary weir to control upstream water levels, construction of coffer dam for inlet of lake drain piping, excavation for installation of discharge piping and control structure for draining lake, earthwork and grading; ripray and filter installation at drain pipe outlet; site restoration with native seed mixes; repairs to existing trails used for site access that may be necessary due to damage from construction activities, temporary and permanent erosion controls. The project proposed has a total disturbance area of less than five (5) acres. Erosion prevention measures are required to prevent sediment from being transported off site or to nearby surface waters. Refer to project drawings for further details.

The anticipated total area of disturbance is approximately 0.12 acres.

The total area of pre-construction impervious area is approximately 0.00 acres. The total area of post-construction impervious area is approximately 0.00 acres

DATES OF CONSTRUCTION: Begin Construction August 15, 2018, Completion June 30, 2019.

- Below is a list of people responsible for this project who are knowledgeable and experienced in the application of erosion prevention and sediment control BMPs. They shall oversee the implementation of the SWPPP, inspection, and maintenance of erosion prevention, and sediment control BMPs before and during construction.

RESPONSIBLE PERSONS:

OWNER: Nine Mile	Creek Watershed District	CONTRACTOR:	TBD
MAILING ADDRESS:	12800 Gerard Dr. Eden Prairie, MN 55346	MAILING ADDRESS:	TBD TBD
CONTACT PERSON:	Randy Anhorn District Administrator	CONTACT PERSON:	TBD Owner
PHONE: MOBILE PHONE:	952-835-2078	PHONE: MOBILE PHONE:	TBD TBD
EMAIL:	ranhorn@ninemilecreek.org	EMAIL:	TBD

ENGINEER Barr Engineering Co.

4300 MarketPointe Dr., Suite 200 Bloomington, MN 55435-4803 Janna Kieffer, PE MAILING ADDRESS:

CONTACT PERSON:

MOBILE PHONE:

ikieffer@barr.com EMAIL:

E TRAINING TRAINING DOCUMENTATION ATTACHED?
Construction SWPPPs
M-4
April 10000 TRAINED INDIVIDUAL
Jacob N. Burggraff
Barr Engineering Co.
4300 MarketPointe D RESPONSIBILITY APPLICABLE TRAINING SWPPP Design of Construction II of MN, April 2008, Updated Nov. 2010, March 2014, May 2017 Bloomington, MN 55435 Expires May 31, 2020 952-832-2743

Construction Site Management

Greg Nelson Barr Engineering Co. 4300 MarketPointe D Oversight of SWPPP

oversight complements.

JOU MarketPointe Drive Amendment
Bloomington, MN 55435
952-832-2770
612-599-8825

Contractor Employee? Supervision of Installation Maintenance, and Repair of BMPs. Performance of

Performance of Construction Site Management Expires 3

RECEIVING WATERS:

<u>Water Body Name:</u> Nine Mile Creek Special Water? Impaired Water? Normandale Lake

Project Area Soil Type: Rural Land, hydrologic soil groups Ta, Sb, HaB, HaB2, Lf, Df.

REGULATORY CONTEXT:

Special or Impaired Waters: This project discharges to impaired waters within one mile of the sites and the project i required to follow the requirements for discharging to an impaired water in Appendix A Part C.1 & C.2 of the permit

This project stormwater discharge is not anticipated to impact any of the following: Outstanding resource value waters, trout waters, wetlands, calcareous fens, properties listed by the National Register of Historic Places or archaeological sites and is not subject to additional regulations due to any formal environmental reviews, endangered or threatened species.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR CLIENT

PROJECT PLANS AND SPECIFICATIONS:

Required Feature
Site Locations and Sheet Index
Erosion Control Details Sheet No. G-01 C-02 AND C-03 Construction Limits C-05 AND C-06 Existing and Final Grades with Flow Direction
Potential Pollution generating activities
Temporary and Permanent erosion and sediment control BMPs C = 0.4C-04 THROUGH C-08 C-02 AND C-03 Standard Details for erosion and sediment control Estimated Preliminary BMP Quantities Bid Documents, Bid Form

TEMPORARY EROSION CONTROL PRACTICES

- <u>Timing:</u>
 1. Delineate areas of the site not to be disturbed (with flags, stakes, signs, silt fence, etc.) before work begins.
- Construction phasing will be used when possible to minimize concurrent soil exposure; stabilizing areas as soon as work is completed; and restoring access paths when they are no longer needed.

 Initiate stabilization immediately whenever any construction activity has permanently or temporarily ceased on any
- portion of the site and will not resume for a period exceeding 7 calendar days.

 Complete stabilization no later than 7 calendar days after the construction activity in any portion of the site has

- Erosion control and stabilization practices to be installed are depicted on the Drawings No. C-01, C-02 and C-03, and include: silt fence, sediment control logs, riprap outfall, inlet drain protection, erosion control blanket, turf reinforcement mat (TRM), rock construction entrance, flotation silt curtain, and vegetation (through seeding).
- Soils stockpiles shall be stabilized with fast—growing cover crop and hydro mulch and silt fence or sediment log shall be placed around the perimeter of the stock piles.
- Erosion control blanket shall be used to cover all disturbed slopes.
- Direct construction site discharges to vegetated areas where feasible.

 Install all BMPs in accordance with relevant manufacturer specifications and accepted engineering practices.

TEMPORARY SEDIMENT CONTROL PRACTICES

- Establish sediment control practices on all downgradient perimeters prior to commencing any upgradient land-disturbing
- activities.

 If sediment control practices must be adjusted or removed to accommodate short-term activities, complete the activity as quickly as possible and re-install immediately after the activity has been completed or before the next precipitation event (even if the activity is not yet complete).

 Maintain downgradient sediment control practices until final stabilization has been achieved for upgradient areas.

- BMPs:

 1. Minimize soil compaction where feasible.

 2. Preserve topsoil where feasible; if topsoil must be removed, store in a segregated stockpile for reuse in site restoration.

 3. Sediment control practices to be installed are depicted on Sheets C-01, C-02 and C-03 and include: rock construction entrance, storm sewer pipe rip rap outlet, floatation silt curtain, turf reinforcement mat (TRM), silt fence, siltation logs, inlet
- entrance, storm sewer pipe rip rap outlet, floatation silt curtain, turf reinforcement mat (IRM), silt fence, siltation logs, inlet protection, rock construction entrance.

 Install silt fence or siltation logs around the perimeter of temporary soil stockpiles.

 Any dewatering of site construction areas that have turbid or sediment laden water must be discharged into a filtering device such as containment bin or filter bag for treatment. Any dewatering discharge cannot adversely affect the receiving waters downstream of the construction site.
- advinstream of the construction site.

 Install rock construction entrances as a vehicle tracking BMP to minimize the track out of sediment from the construction site.

 Monitor adjacent paved surfaces for track out of sediment from construction site and remove sediment via street sweeping if
- necessary.

 8. Install all BMPs in accordance with relevant manufacturer specifications and accepted engineering practices.

- Expected amount, frequency, intensity, and duration of precipitation: Approximately 2.4 inches of precipitation from the 1—year, 24—hour storm event (Atlas 14).
- Nature of stormwater runoff and run-on at the sites, including factors such as expected flow from impervious
- surfaces, slopes, and site drainage features:

 If any stormwater flow will be channelized at the site, design BMPs to control both peak flow rates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion: Peak flow rates and total stormwater volume should not be increased during this project. Stormwater channelization i
- anticipated. Channelized flow will be routed to vegetated areas where appropriate.

 Range of soil particle sizes expected to be present on the site and surrounding area: clay, sandy clay, sandy silt, silty

PERMANENT STORMWATER MANAGEMENT SYSTEM

This project will not generate greater than one acre of new impervious surface and will not require a stormwater

INSPECTION AND MAINTENANCE ACTIVITIES

- Inspect the entire construction site at least once every 7 days during active construction and within 24 hours after a
- rainfall event greater than 0.5 inches in 24 hours.
 Contractor must keep inspection log and copies of the log must be submitted to Engineer.
 Where parts of the site have permanent cover, but work remains on other parts of the site, inspection frequency may be reduced to once per month in areas with permanent cover.
- Inspect all erosion prevention and sediment control BMPs and pollution prevention management measures for integrity Inspect surface waters for evidence of erosion and sediment deposition.

 Inspect construction site vehicle exit locations for evidence of off-site sediment tracking onto paved surfaces and

- inspect streets and other areas adjacent to the project for evidence of off-site accumulations of sediment.

 Inspections must be conducted by an appropriately trained individual in accordance with the Construction Stormwater (CSW) Permit.

- Repair, replace, or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery or as soon as field conditions allow access.
- replace or supplement all perimeter control devices when they become nonfunctional or the sediment reaches Remove all deltas and sediment deposited in surface waters and re-stabilize the greas where sediment removal results
- nemove all details and scenarior deposited in soluble waters and re-stabilize the dreas where seament removal rest in exposed soil within 7 days of discovery.

 Remove tracked sediment from all paved surfaces both on and off site within 24 hours of discovery.

 Remove off-site accumulations of sediment in a manner and at a frequency sufficient to minimize off-site impacts. Maintain all BMPs accordance with relevant manufacturer specifications and accepted engineering practices.

All inspections and maintenance must be recorded within 24 hours in writing and records must be retained with the SWPPP.

Records of each inspection and maintenance activity shall include:
 a. Date and time of inspections

b. Name of person(s) conducting inspections

b. Name of person(s) conducting inspections

c. Findings of inspections, including the specific location where corrective actions are needed.

d. Corrective actions taken (including dates, times, and party completing maintenance activities).

e. Date and amount of all rainfall events greater than 0.5 inches in 24 hours; rainfall amounts will be obtained from a properly maintained rain gauge installed onsite, a weather station that is within 1 mile of the site, or a weather reporting system that provides site specific rainfall data from radar summaries.

f. If any discharge is observed to be occurring during the inspection, a record of all points of the property from which there is a discharge must be made, and the discharge should be described (i.e., color, odor, floating settled, or suspended solids, foam, oil sheen, and other obvious indicators of pollutants) and photographed. g. Any amendments to the SWPPP proposed as a result of the inspection must be incorporated within 7 calendar

RECORD RETENTION

This SWPPP including, all changes to it, and inspections and maintenance records must be kept at the site during construction in either the field office or in an on-site vehicle during normal working hours

Upon request make this SWPPP (including all certificates, reports, records, or other information required by the CSW Permit) available to federal, state, and local officials within 72 hours for the duration of the permit and for 3 years following the

POLLUTION PREVENTION MANAGEMENT MEASURES

- 1. Minimize exposure to stormwater of the following products, materials, or wastes: building products that have potential to leach pollutants are not expected to be present on site, but if present exposure to stormwater will be minimized through coverage with plastic sheeting; pesticides, herbicides, insecticides, fertilizers, treatment chemicals, and landscape materials through coverage with plastic sheeting; hazardous materials and toxic waste (including oil, diesel fuel, gasoline, hydraulic fluids, paint solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids) through proper storage in sealed containers in restricted access storage areas and in compliance with Minn. R. ch. 7045 including secondary containment as applicable; solid waste through proper storage, collection, and disposal in compliance with Minn. R. ch. 7035.
- Position portable toilets so that they are secure and will not be tipped or knocked over.
- Properly dispose of sanitary waste in accordance with Minn. R. 6. 7041.

 Spill Prevention and Response: Take reasonable steps to prevent the discharge of spilled or leaked chemicals, ensure adequate supplies of absorbent and other dry clean-up materials are available at all times to clean up discharged materials and that an appropriate disposal method is available for recovered spilled materials, report and clean up spills immediately as required by Minn. Stat. §115.061.
- Fueling and maintenance of equipment and/or vehicles will not occur on-site, with the exception of temporary bypass
- Washing of vehicles and/or equipment will not occur on-site.
- Washout of concrete and/or other similar wastes (such as stucco, paint, form release oils, curing compounds and other construction materials) will not occur on-site.

FINAL STABILIZATION

Ensure final stabilization of the site.

- For final stabilization to be considered complete, the following must occur:

 o Complete all soil disturbing activities at the site.
 o Stabilize all soils with permanent cover, 70% or greater vegetation cover of disturbed areas. Remove all temporary synthetic and structural erosion prevention and sediment control BMPs.
- Permanent Cover will consist of seeding, erosion control blanket on slopes and diturbed areas, and seeding and
- mulching in all other disturbed areas.

 Storm sewer culverts shall have flared sections and riprap to eliminate erosion.
- Within 30 days after all activities for final stabilization have been completed, submit a Notice of Termination (NOT)

SWPPP AMENDEMENTS OR CHANGES

See Contractor's Inspection Log Records



CALL BEFORE YOU DIG.

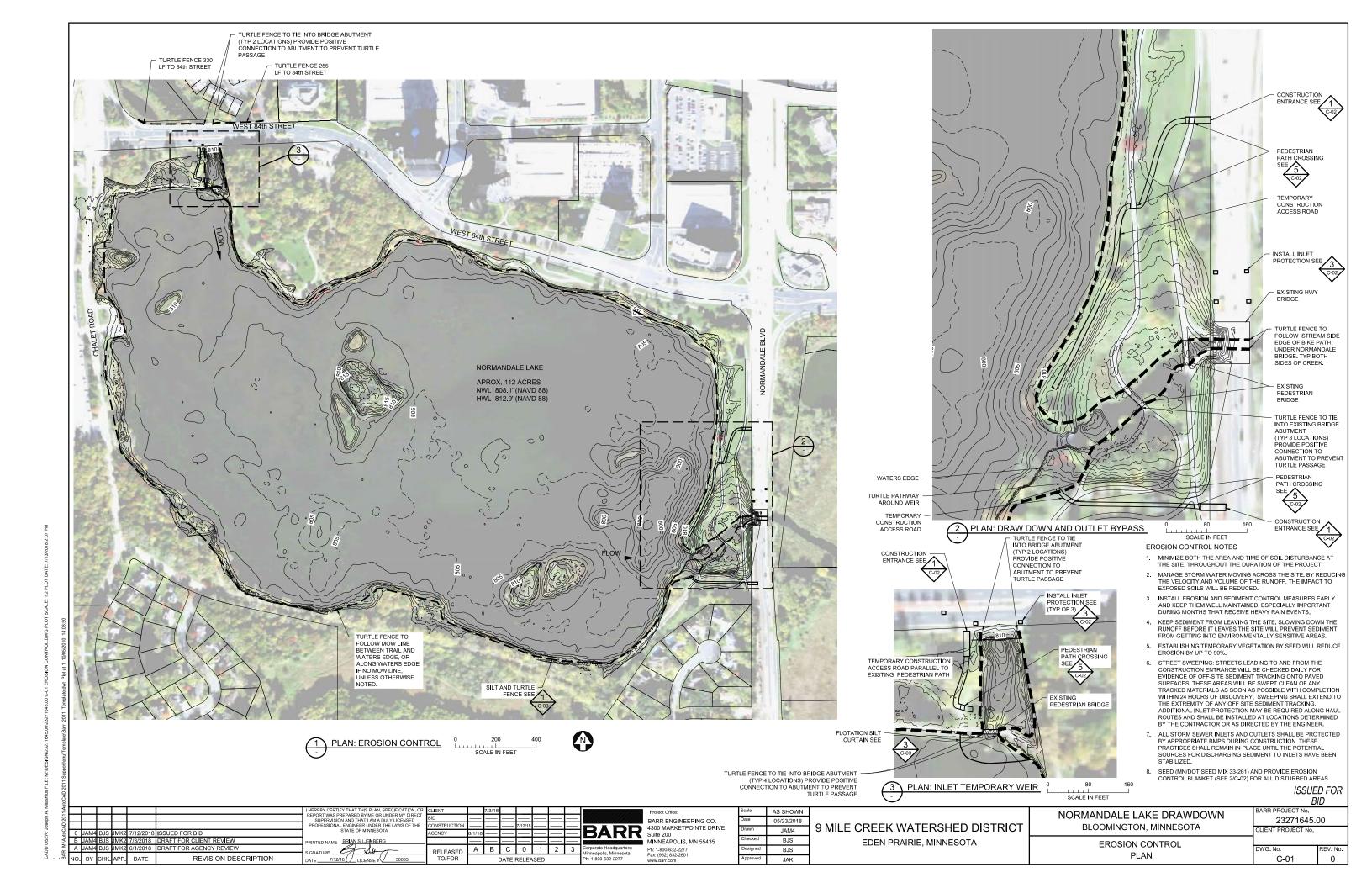
CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE

AND PUBLIC. PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE ANY LITH ITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY

ISSUED FOR BID

DADD DDO IECT No

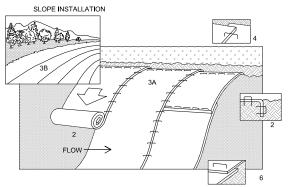
D 2011	\Box	_			REPORT WAS PREPARED BY ME OR UNDER MY DIRE SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER LINDER THE LAWS OF THE	BID CONSTRUCTIO	N	7/42/49			BARR ENGINEERING CO.	Date	05/23/2018	O MILE ODEEK WATEROUER DIOTRIOT	NORMANDALE LAKE DRAWDOWN	23271645	
ToCA	JAM4 B	BJS JMK	2 7/12/2018	ISSUED FOR BID	STATE OF MINNESOTA.	AGENCY	6/1/18 7/3/18	- 1/12/10		BARR	4300 MARKETPOINTE DRIVE Suite 200	Drawn	JAM4	9 MILE CREEK WATERSHED DISTRICT [BLOOMINGTON, MINNESOTA	CLIENT PROJECT No.	•
€ 🗀	JAM4 B	3JS JMK	(2 7/3/2018	DRAFT FOR CLIENT REVIEW	PRINTED NAME BRIAN SILJENBERG						MINNEAPOLIS, MN 55435	Checked	JMK2/JNB	EDEN PRAIRIE, MINNESOTA	STORMWATER POLLUTION		
¥ A	JAM4 B	BJS JMK	(2 6/1/2018	DRAFT FOR AGENCY REVIEW	SIGNATURE SIGNATURE	RELEASED	AB	C 0 1	2 3	Corporate Headquarters: Minneapolis, Minnesota	Ph: 1-800-632-2277 Fax: (952) 832-2601	Designed	BJS	,	PREVENTION PLAN	DWG. No.	REV. No.
MC	. BY C	HK. API	P. DATE	REVISION DESCRIPTION	DATE 7/12/18 / LICENSE # 50033	TO/FOR	1	DATE RELEASED	D	Ph: 1-800-632-2277	www.barr.com	Approved	BJS		FREVENTION FLAN	G-02	0



NOTES:

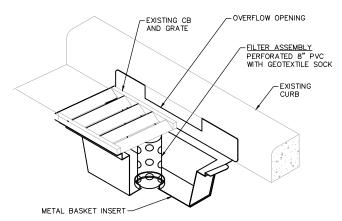
- MAINTAIN ENTRANCE THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACE AS REQUIRED TO PREVENT TRACKING OFFSITE.
- 2. REMOVE ENTRANCE IN CONJUNCTION WITH FINAL GRADING AND SITE STABILIZATION.
- 3. REMOVAL OF MATERIAL TRACKED ON TO STREET IS REQUIRED AT THE END OF EACH DAY, OR WITHIN HOUR DIRECTED BY THE ENGINEER



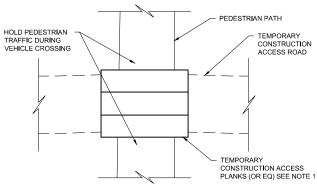


- 1. REFER TO MANUFACTURER RECOMMENDATIONS FOR STAPLE PATTERNS FOR SLOPE INSTALLATIONS.
- PREPARE SOIL BY LOOSENING TOP 1-2 INCHES AND APPLY SEED (AND FERTILIZER WHERE REQUIRED)
 PRIOR TO INSTALLING BLANKETS. GROUND SHOULD BE SMOOTH AND FREE OF DEBRIS.
- 3. BEGIN (A) AT THE TOP OF THE SLOPE AND ROLL THE BLANKETS DOWN OR (B) AT ONE END OF THE SLOPE AND ROLL THE BLANKETS HORIZONTALLY ACROSS THE SLOPE.
- 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6° OVERLAP, WITH THE UPHILL BLANKET ON TOP.
- 5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
- 6. BLANKET MATERIALS SHALL BE AS SPECIFIED OR AS APPROVED BY ENGINEER.





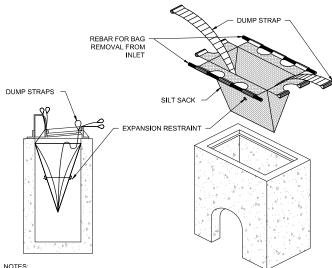




NOTES:

- ALL DAMAGE TO EXISTING PATH TO BE REPAIRED AT CONTRACTORS EXPENSE
 REMOVE PLANKS WITHIN ONE HOUR OF USE TO MINIMIZE IMPACT





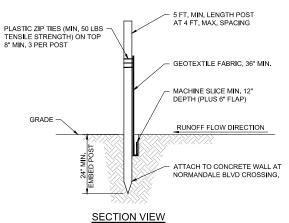
NOTES:

- 1. INSTALL INLET PROTECTION PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED OR IMMEDIATELY FOLLOWING ANY CATCHBASIN INSTALLATION AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD.
- MATERIALS SHALL BE SUFFICIENT TO ALLOW FLOW WHILE BLOCKING SEDIMENT. NO HOLES OR GAPS SHALL BE PRESENT IN/AROUND FILTER SACK.
- 3. CLEAN FILTER SACK AND REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO ALLOW FLOW INTO THE CATCHBASIN AND PREVENT SEDIMENT FROM LEAVING THE DEVICE.
- 4. REMOVE DEVICE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
- 5. USE 4/C-02 AT CONTRACTORS OPTION.

DETAIL: INLET PROTECTION - FILTER SACK

ISSUED FOR BID

AS SHOWN NORMANDALE LAKE DRAWDOWN 23271645.00 05/23/2018 BARR ENGINEERING CO. 9 MILE CREEK WATERSHED DISTRICT BLOOMINGTON, MINNESOTA 4300 MARKETPOINTE DRIVE BARR CLIENT PROJECT No. JAM4 JMK2/JNB INTED NAME BRIAN SILJENBERG EDEN PRAIRIE, MINNESOTA MINNEAPOLIS, MN 55435 **EROSION CONTROL** JMK2 6/1/2018 DRAFT FOR AGENCY REVIEW NATURE Sui BJS DETAILS REVISION DESCRIPTION C-02 7/12/18 (LICENSE # 50033



DOWNSTREAM VIEW

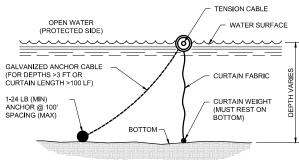
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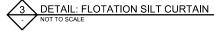
- 1. INSTALL SILT FENCE PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD. REMOVE SILT FENCE / TURTLE FENCE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE PROJECT COMPLETION.
- 2. SILT FENCE MATERIALS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
- 3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS. PROVIDE POSITIVE CONNECTION USING ZIP TIES OR OTHER TO PREVENT TURTLE PASSAGE.
- 4. REMOVE ACCUMULATED SEDIMENT WHEN BUILD UP REACHES 1/3 OF FENCE HEIGHT. OR INSTALL A SECOND SILT FENCE DOWNSTREAM OF THE ORIGINAL FENCE AT A SUITABLE
- 5. WHEN SPLICES ARE NECESSARY MAKE SPLICE AT POST ACCORDING TO SPLICE DETAIL, PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP, THEN DRIVE BOTH POSTS AND BURY THE FLAP AND COMPACT BACKFILL.
- 6. TURTLE FENCE TO BE PLACED ALONG MOW LINE BETWEEN TRAIL AND WATERS EDGE, OR ALONG WATERS EDGE IF NO MOW LINE, PRIOR TO THE BEGINNING OF THE DEWATERING.
- 7. SEE SUMMARY OF WORK FOR INSTALL AND REMOVAL DATES.
- 8. TURTLE FENCE SERVES AS EROSION CONTROL. ADDITIONAL EROSION CONTROL MAY BE REQUIRED.
- 9. OPENINGS IN TURTLE FENCING AS REQUIRED FOR CONSTRUCTION ACTIVITY SHALL BE CLOSED WHEN SITE IS NOT OCCUPIED TO PREVENT TURTLE PASSAGE.



NOTES:

- 1. INSTALL SILT CURTAIN PRIOR TO ANY CONSTRUCTION ACTIVITIES IN AREAS DRAINING TO OPEN WATER OR WORK IN WATER.
- ANCHOR TENSION CABLE AT SHORE AT BOTH END WITH STEEL POSTS OF DIAMETER AND LENGTH SUFFICIENT TO PREVENT BENDING AND PULL-OUT.
- 3. ELIMINATE ANCHOR AND CABLE FOR WATER DEPTHS LESS THAN 3'-0" OR DISTANCE BETWEEN SHORE ANCHORS FOR TENSION CABLE OF LESS THAN 100'
- 4. CURTAIN WEIGHT SHALL BE HEAVY ENOUGH TO HOLD CURTAIN VERTICAL IN CURRENT AND WAVES TYPICAL FOR THE SITE.
- 5. SILT CURTAIN MATERIALS SHALL CONFORM TO MN/DOT SPECIFICATION 3887.
- 6. MAINTAIN SILT CURTAIN AND REPAIR OR REPLACE AS REQUIRED TO PREVENT DISCHARGE OF SEDIMENT TO PROTECTED WATER BODY.
- 7. REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO REMOVAL OF SILT CURTAIN.
- 8. REMOVE SILT CURTAIN FOLLOWING SITE STABILIZATION OR AS DIRECTED BY ENGINEER





RELEASED

REBY CERTIFY THAT THIS PLAN, SPECIFICATION, ORT WAS PREPARED BY ME OR UNDER MY DIRE

INTED NAME BRIAN SILJENBERG

NATURE SUIT

7/12/18 (/_ LICENSE # (



BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE MINNEAPOLIS, MN 55435



9 MILE CREEK WATERSHED DISTRICT EDEN PRAIRIE, MINNESOTA

NORMANDALE LAKE DRAWDOWN BLOOMINGTON, MINNESOTA

CLIENT PROJECT No

EROSION CONTROL DETAILS

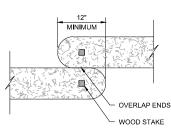
JMK2 6/1/2018 DRAFT FOR AGENCY REVIEW

REVISION DESCRIPTION

ISSUED FOR BID

SEDIMENT LOG WOOD STAKE TO ONLY PENETRATE NETTING **FRONT VIEW**

SIDE VIEW ON SLOPE



TOP VIEW

SIDE VIEW FLAT

WOOD STAKE

WOOD STAKE TO ONLY

PENETRATE NETTING.

NOTES:

SEDIMENT LOG

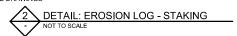
FLOW

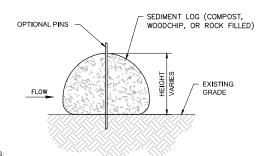
SEDIMENT LOG

INSTALL SEDIMENT LOG ALONG CONTOURS (CONSTANT ELEVATION).

WOOD STAKE TO ONLY PENETRATE NETTING.

- 2. NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
- 3. REMOVE ACCUMULATED SEDIMENT WHEN REACHING 1/3 OF LOG HEIGHT.
- 4. MAINTAIN SEDIMENT LOG THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACED AS REQUIRED.
- 5. USE FOR EROSION CONTROL AT CONTRACTOR'S OPTION UNLESS SILT FENCE IS REQUIRED IN THE DRAWINGS





- STAKE FREE SEDIMENT LOG TO BE USED IN AREAS THAT ARE RELATIVELY FLAT AND SHOULD BE INSTALLED ALONG CONTOURS (CONSTANT ELEVATION).
- NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
- 3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN REACHING 1/2 OF LOG HEIGHT.
- 4. SEDIMENT LOG SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED.
- 5. USE FOR EROSION CONTROL AT CONTRACTOR'S OPTION UNLESS SILT FENCE IS REQUIRED IN THE DRAWINGS.



23271645.00

C-03



JAM4 JMK2/JNB BJS

BJS

EDEN PRAIRIE, MINNESOTA

GENERAL PLAN

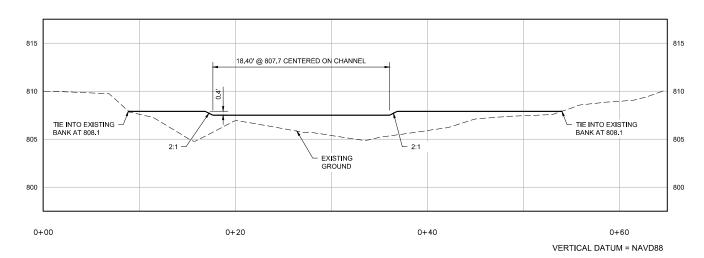
C-04

CADD USER: Joseph A. Milashius FILE: M:/DESIGN/23271645.00/23271645.00 C-04 GENERAL PLAN.DWG PLOT SC.

-

1/2018 DRAFT FOR AGENCY REVIEW

REVISION DESCRIPTION



PROFILE: INLET TEMPORARY WEIR

1°=5'

LINETYPE LEGEND

— — TURTLE FENCE — — — — 5 FOOT MAJOR CONTOUR LINES 2 FOOT MINOR CONTOUR LINES CONSTRUCTION LIMITS --- TEMPORARY WEIR

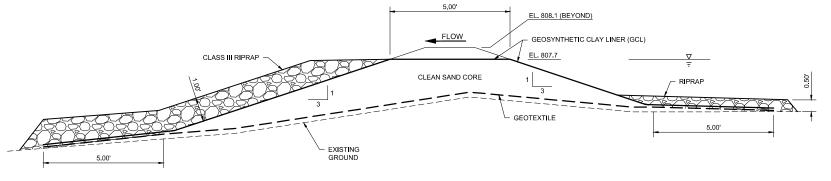
— - — WEIR CENTERLINE

PLAN NOTE:

1. USE MN/DOT 25-131 SEED MIX FOR SITE
RESTORATION AT INLET STAGING AREA AND
TEMPORARY ACCESS ROAD. USE MN/DOT 33-261
SEED MIX FOR RESTORATION OF UNMOWED
AREAS.







VERTICAL DATUM = NAVD88



ISSUED FOR BID

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Ĭ	В	JAM4	BJS	JMK2	7/3/2018	DRAFT FOR CLIENT REVIEW	F
	Α	JAM4	BJS	JMK2	6/1/2018	DRAFT FOR AGENCY REVIEW	١.
BAR	NO.	BY	снк.	APP.	DATE	REVISION DESCRIPTION	0

	CLIENT
REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT LAM A DULY LICENSED	BID
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE	CONSTRUCT
STATE OF MINNESOTA.	AGENCY
PRINTED NAME BRIAN SILJENBERG	
SIGNATURE SUM T	RELEAS
DATE 7/12/18 LICENSE # 50033	TO/FO

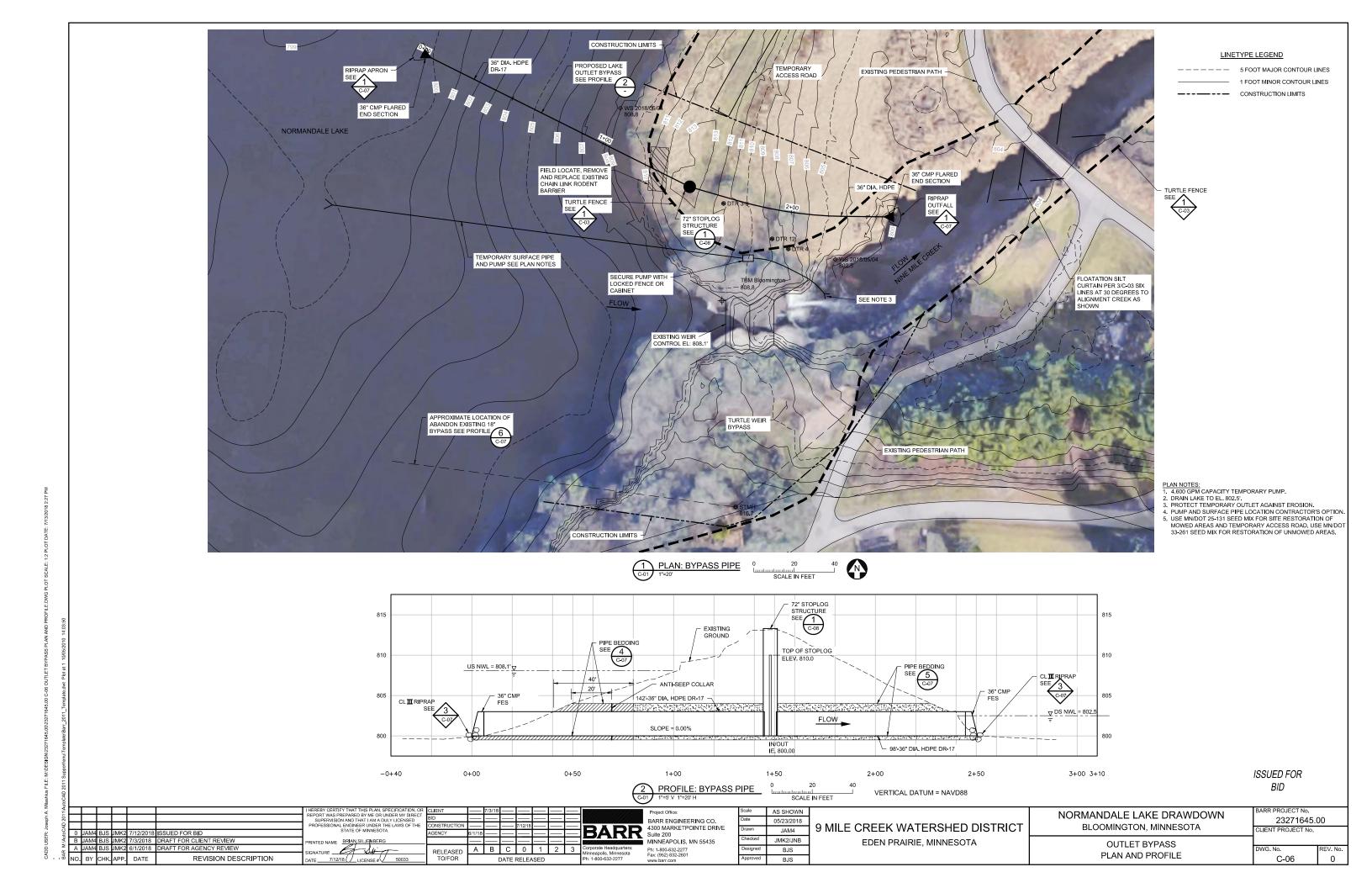


	Project Office:
	BARR ENGINEERING CO.
	4300 MARKETPOINTE DRIN
\mathbf{x}	Suite 200
	MINNEAPOLIS, MN 55435
:	Ph: 1-800-632-2277 Fax: (952) 832-2601

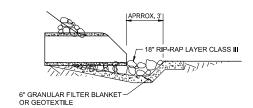
	710 0110 1111	
Date	05/23/2018	
Drawn	JAM4	9 MIL
Checked	JMK2/JNB	
Designed	BJS	
Approved	D IC	

9 MILE CREEK WATERSHED DISTRICT
EDEN PRAIRIE, MINNESOTA

NORMANDALE LAKE DRAWDOWN BARR PROJECT No.	BARR PROJECT No. 23271645.00			
23271645.00				
BLOOMINGTON, MINNESOTA CLIENT PROJECT No.				
INLET TEMPORARY WEIR				
DWG. No. REV	'. No.			
PLAN, PROFILE, AND SECTION C-05	0			

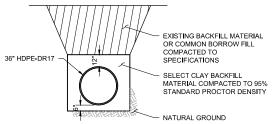








- 1. THE CONTRACTOR, AT HIS OPTION, MAY SUBSTITUTE A GEOTEXTILE FABRIC, SPEC, 3733, FOR THE GRANULAR FILTER BLANKET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THE FABRIC SHOULD COVER THE AREA OF THE RIP-RAP AND EXTEND UNDER THE PIPE 3'.
- 2. REFERENCE Mn/DOT STANDARD PLATE NO. 3133D.

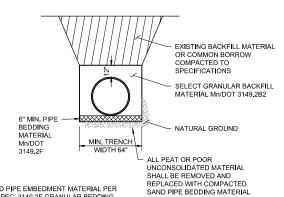


ALL PEAT OR POOR UNCONSOLIDATED MATERIAL SHALL BE REMOVED AND REPLACED WITH COMPACTED SAND PIPE BEDDING MATERIAL Mn/DOT 3149.2F

<u>NOTES:</u> 1. SELECT CLAY BACKFILL MATERIAL SHALL BE A MINERAL PRODUCT CONSISTING OF SOUND DURABLE PARTICLES WHICH MAY BE CLAY/SILT MATERIAL HAVING ONE HUNDRED PERCENT (100%) FINER THAN ONE (1) INCH IN DIAMETER AND FIFTY PERCENT (50%) PASSING A #200 SIEVE.
2. CLAY MATERIAL SHALL HAVE A LIQUID LIMIT

NOT EXCEEDING THIRTY FIVE (35) AND A PLASTICITY INDEX GREATER THEN NINE (9).

4 DETAIL: PIPE BEDDING SEAL ON PIPE INLET END

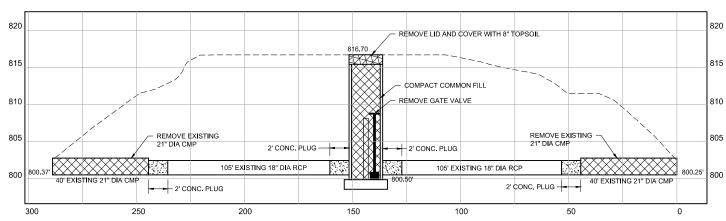


NOTES:

1. IMPORTED PIPE EMBEDMENT MATERIAL PER Mn/DOT SPEC. 3149.2F GRANULAR BEDDING, 100% PASSING 1" SIEVE AND AND NOT MORE THAN 10.5% PASSING THE #200 SIEVE.

2. IMPORTED PIPE EMBEDMENT MATERIAL SHALL BE COMPACTED IN UNIFORM LIFTS, 8" OR LESS IN DEPTH, LOOSE MATERIAL MEASURE, TO 95% STANDARD PROCTOR DENSITY FROM THE BEDDING TO A MINIMUN DEPTH OF AT LEAST 12"
ABOVE THE CROWN OF THE PIPE.

5 DETAIL: STANDARD PIPE BEDDING FOR HDPE PIPE
NOT TO SCALE



PROFILE NOTES:

1. REMOVE EXISTING GATE AND CLEAR PIPE TO ASSIST IN INITIAL DE-WATERING.

ABANDON ONLY AFTER NEW 36" ø BYPASS IS IN SERVICE.

2. STATIONING AND ELEVATION ARE APPROXIMATE AND BASED ON EXISTING RECORD DRAWINGS. EXACT LOCATION UNKNOWN. 6 PROFILE: EXISTING ABANDONMENT NOT TO SCALE

VERTICAL DATUM = NAVD88

ISSUED FOR BID

JS JMK2 6/1/2018 DRAFT FOR AGENCY REVIEW REVISION DESCRIPTION

REBY CERTIFY THAT THIS PLAN, SPECIFICATION, PORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED INTED NAME BRIAN SILJENBERG GNATURE SUB-RELEASED TO/FOR 7/12/18 (LICENSE # 50033

BARR

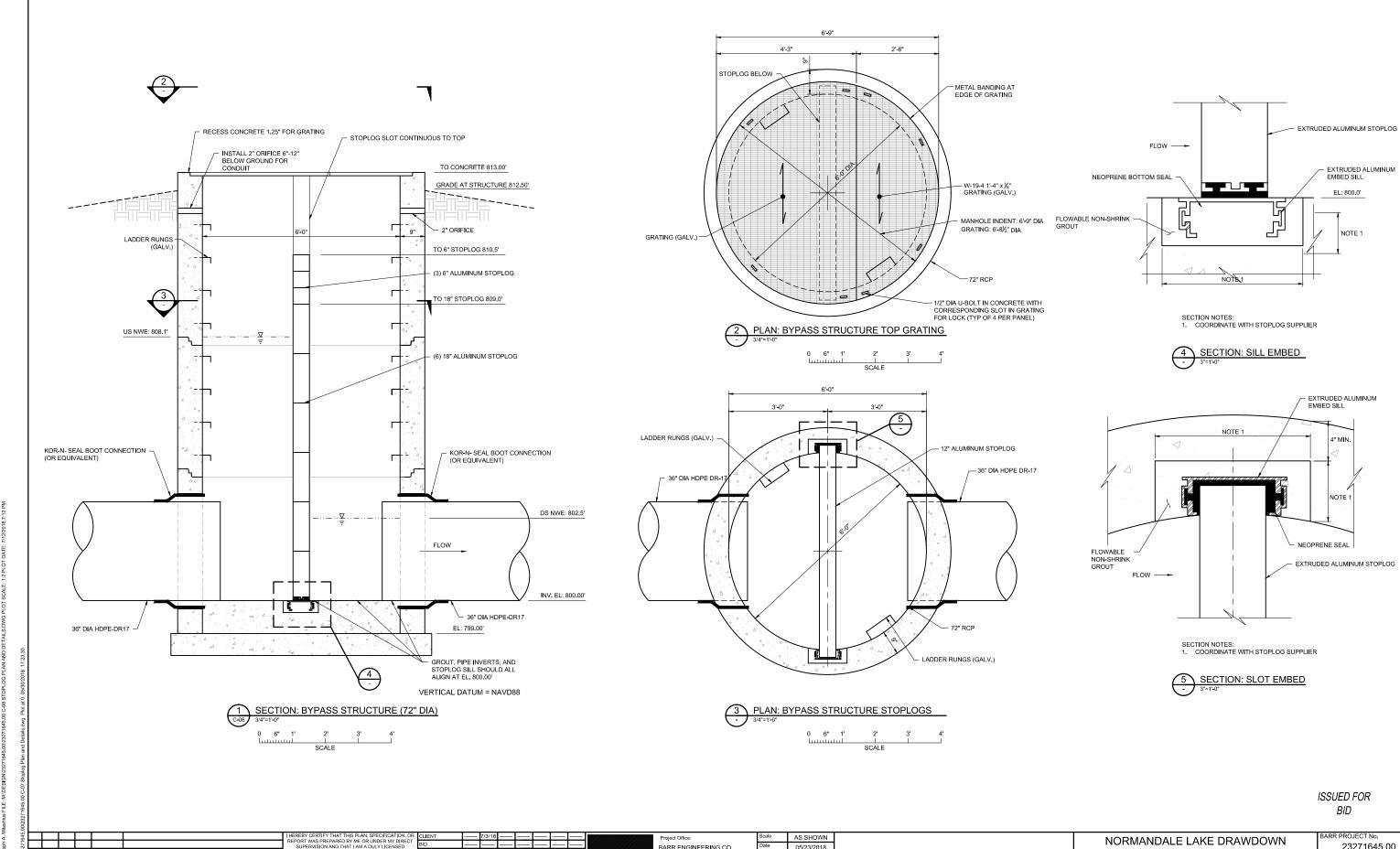
BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE MINNEAPOLIS, MN 55435

AS SHOWN 05/23/2018 JAM4 JMK2/JNB BJS BJS

9 MILE CREEK WATERSHED DISTRICT EDEN PRAIRIE, MINNESOTA

NORMANDALE LAKE DRAWDOWN 23271645.00 BLOOMINGTON, MINNESOTA CLIENT PROJECT No. **OUTLET BYPASS** DETAILS

C-07



seph A					REPORT WAS PRE SUPERVISION PROFESSIONAL	EPARED BY ME OR UNDER MY DIRE N AND THAT I AM A DULY LICENSED ENGINEER LINDER THE LAWS OF TH	BID CONSTRUCTION	N =		7/13/10			BARR ENGINEERING CO.	Date	05/23/2018	O MILE CREEK WATERSHED DISTRICT	NORMANDALE LAKE DRAWDOWN	23271645.	.00
2	0 JA	14 BJS JMI	2 7/12/2018	ISSUED FOR BID	S	STATE OF MINNESOTA.	AGENCY	6/1/18		712/10		BARR	4300 MARKETPOINTE DRIVE Suite 200	Drawn	JAM4	9 MILE CREEK WATERSHED DISTRICT	BLOOMINGTON, MINNESOTA	CLIENT PROJECT No.	
NS.	B JA	14 BJS JMI	2 7/3/2018	DRAFT FOR CLIENT REVIEW	PRINTED NAME	BRIAN SILJENBERG							MINNEAPOLIS, MN 55435	Checked	JMK2/JDB	EDEN PRAIRIE. MINNESOTA	OUTLET BYPASS STOPLOG STRUCTURE		
9	A JA	14 BJS JMI	2 6/1/2018	DRAFT FOR AGENCY REVIEW	SIGNATURE	Stime -	RELEASE		3 C	0 1	2 3	Corporate Headquarters: Minneapolis, Minnesota	Ph: 1-800-632-2277 Fax: (952) 832-2601	Designed	BJS	,	PLAN AND DETAILS	DWG. No.	REV. No.
ŏ	NO. B	CHK. AP	DATE	REVISION DESCRIPTION	DATE7/12/18	8 / LICENSE # / 50033	TO/FOR		DATE R	ELEASED		Ph: 1-800-632-2277	www.barr.com	Approved	BJS		PLAN AND DETAILS	C-08	0
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