



## LOWER MINNESOTA RIVER WATERSHED DISTRICT

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March 2020 Administrator report  
From: Linda Loomis, Administrator  
To: LMRWD Board of Managers

In addition to items on the meeting agenda, work continues on the following District projects and issues:

### Other Work

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#### 2018 Annual Report

The 2018 Annual Report was sent to BWSR, the Commissioner of the DNR and the Director of the DNR Ecological and Water Resource Division. on March 2, 2020. The Report has been posted to the LMRWD website.

#### Minnesota River Elevation

On Wednesday, March 11, 2020 the Minnesota River was at 698.92 feet and was expected to peak on Sunday, March 15 at 704.6 feet. It actually peaked on Friday, March 13th at 702.66 feet and on Sunday was receding and was at 702.2 feet. Commercial navigation activities cease at 702 feet.

#### 2019 Audit

The 2019 financial audit for the LMRWD is scheduled to begin the week of March 16th. Staff has been working to get the auditors all the information they need to complete the audit.

#### Izaak Walton League Clean Water Summit

On Saturday, March 7th, I attended the Clean Water Summit sponsored by the Bush Lake Chapter of the Izaak Walton League. The focus of the morning programs was regenerative agriculture. Regenerative agriculture focuses on building soil health through practices such as no tillage and cover crops.

#### MNDOT TH 13 Nicollet Avenue to TH 169

On Friday, February 21st, the LMRWD was invited to a meeting to discuss potential impacts of this project on Savage Fen.

### Watershed Plan Projects

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**Eden Prairie Area #3 Stabilization** - Staff has collected a list of homeowner in the neighbor impacted by the bluff. A notice will be sent to the homeowners advising them that the LMRWD will be conducting field inspection of the site.

**Riley Creek Cooperative project/Lower Riley Creek restoration** - No new information since last update. Project website: <http://www.rpbcwd.org/whats-happening/projects/lower-riley-creek-ecological-restoration>

**Seminary Fen ravine stabilization project:** - Legislation has been introduced to allow the LMRWD to use money received for dredge management for this project.

Project website: <http://lowermnrriverwd.org/projects/bwsr-clean-water-fund-grant-administration>

**East Chaska Creek: (Carver County Watershed Based Funding):** - LMRWD staff is working with the city to get the project permitted. It looks like we have passed the window to get this project completed until

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this fall when the ground freezes. Project website: <http://lowermnriverwd.org/projects/east-chaska-creek-bank-stabilization>

**Schroeder Acres Park (Scott County Watershed Based Funding):** The City had informed the LMRWD that they were planning to bring approval of the cooperative agreement to the City Council. The LMRWD has not received any further communication from the city. This project has not been on any of the City Council agendas in the past month. Project website: <http://lowermnriverwd.org/projects/schroeder-acres-parkeagle-creek-sub-watershed-stormwater-study>

**Shakopee Downtown BMP Retrofit (Scott County Watershed Based Funding):** The LMRWD received a scope of work for this project from the City. The City has retained Barr Engineering to complete this project. The LMRWD reviewed the scope of work and gave the City permission to go ahead and begin work. Project website: <http://lowermnriverwd.org/projects/targeted-bmps-downtown-shakopee>

**PLOC (Prior Lake Outlet Channel) Restoration (Scott County Watershed Based Funding):** The city is working on this project and has been working on getting wetland permits from the Corps of Engineers. The City extended the deadline for the Notice of Decision because of permitting issues. Project website: <http://lowermnriverwd.org/projects/prior-lake-outlet-channel-realignmentwetland-restoration>

**Dakota County Fen Gap Analysis and Conceptual Model (Dakota County Watershed Based Funding):** Reporting to BWSR on this project has been provided to Dakota County SWCD, who is managing the Watershed Based Funding grant on behalf of the LMRWD. LMRWD staff has met with BWSR staff and Dakota SWCD staff to determine if the scope of work detailed in the grant agreement needs to be modified and if work planned by the LMRWD are eligible costs. Project website: <http://lowermnriverwd.org/projects/dakota-county-fen-study-management-plan>

**Hennepin County Chloride Project (Hennepin County Watershed Based Funding):** This is two projects that the LMRWD has been involved with. The first is a county-wide project that has been looking at what is needed to reduce winter time salt use. A survey was done with winter maintenance contractors to find out about their use of salt for winter property maintenance. Most of the contractors aht participated aid they are aware of the damage salt does to the environment, however, they feel they must provide a level of service demanded by their customers. They try to use as little salt as possible. They said a lot of the issue comes down to public expectation. They do not want to be called back over and over to a site to apply more salt, so they often times use more than would be required, just to avoid a second visit. They felt a public education would help and that part of the problem is what the public expects to be able to do in the winter, i.e. have completely bare pavement in winter in Minnesota.

The second project is the one between the water management organizations in the Minnesota River Watershed of Hennepin County. Riley, Purgatory, Bluff Creek Watershed District, Nine Mile Creek Watershed District, Richfield/Bloomington WMO and the LMRWD pooled funds allocated to them to develop a cost share program for the purchase of equipment that can be used to reduce dependence on salt applications. Parameters for the cost share have been established and the group expects to inform cities and private applicators of the program this spring and early summer.

**Vegetation Management Plan:** No new information since last update.

**Sustainable Lake Management Plan: Trout Lakes:** Staff met with the City of Chaska and Carver County WMO to discuss the information in the report for water resources in Carver County.

**Geomorphic Assessment of Trout Streams:** Staff is preparing to take the next steps on this project. We received comments regarding the reduced flow in Eagle Creek and plan to conduct a field inspection this spring before leaf out. Staff will also begin to prepare a Gaps Analysis on the Trout Streams.

**Spring Creek Cost Share:** No new information to report since last update.

**West Chaska Creek Re-meander:** No new information to report since last update.

**Seminary Fen Ravine Restoration Area C2:** No new information since last update.

## Project Reviews

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**International Outreach Church:** Burnsville - Conditional Use Permit 1512 Woodhill Road. International Outreach Church has applied for a CUP to allow for construction of second building on its property. This project is not in a high value resource area and has not steep slopes. The LMRWD received revised plans on this project March 18, 2020.

**Beech Street Bridge replacement:** Chaska - The City of Chaska is planning to replace the Beech Street Bridge over East Chaska Creek. The LMRWD received from the DNR and offered comments related to the District's Strategic Resource Inventory.

**Summerland Place Residential Development EAW:** Shakopee - The LMRWD received an EAW for a 115 acre residential development in Shakopee. Staff has reviewed the EAW and has no comment on the proposal.

**Pine Ridge Capital, LLC - River Ridge Club house:** Burnsville Conditional Use Permit - 12901 County Road 5 - This is a project in the City of Burnsville to build a clubhouse at an apartment complex. Staff has reviewed the plans provided and has no comments

**Timber Creek Residential Development EAW:** Carver - This is a 161.4 acre residential development proposed in the City of Carver. The project is outside the boundaries of the LMRWD. However, it drains to the LMRWD. Staff reviewed the EAW and offered comments, which are attached.

**MNDOT TH13 Improvement Study:** On Friday, February 21st, the LMRWD was invited to a meeting to discuss potential impacts of this project on Savage Fen.

Project website: <http://www.dot.state.mn.us/metro/projects/hwy13savageburnsville/index.html>

**Historic Fort Snelling Revitalization:** No new information to report since the last update. Project website: <https://www.dnr.state.mn.us/input/environmentalreview/upperpost/index.html>

**HCRRA MN River Bluffs Regional Trail:** Staff has reviewed this and provided comments to all parties. The LMRWD has asked for a maintenance agreement and is waiting for a response from the city.

**MNDOT ADA Trail improvements in Mendota:** No new information since last update.

**MNDOT trail drainage improvements in Lilydale:** No new information since last update.

**MNDOT Trail - 494:** No new information to report since last update.

**MNDOT - TH5:** This project is scheduled to begin shortly.

**City of Chanhassen - Moon Valley Gravel Pit:** No new information to report since last update.

**City of Carver - Hawthorne Ridge:** No new information to report since last update.

**Metropolitan Airport Commission - Environmental Assessment Worksheet for MSP Concourse G Infill -**  
No new information since last update.

**City of Burnsville - Quarry Property, LLC -** No new information on this project since last update. I have asked for an update from the City of Burnsville for all the projects located in Burnsville.

**City of Carver - Levee rehabilitation -** Staff has reviewed the proposal and offered comments. The city has requested a meeting and we are working to schedule one.

**City of Carver - Jonathan Parkway upgrades -** A public information was scheduled for this project, but was cancelled because of the COVID-19 emergency..

**City of Burnsville - CenterPoint Energy Training Facility -** No new information on this project since last update.

**City of Burnsville -5337 Properties, LLC:** No new information on this project since last update.

**City of Burnsville - Freedom Enterprises, LLC:** No new information on this project since last update.

**City of Burnsville - Industrial Equities - 250 River Ridge Circle North:** - No new information on this project since last update.

**City of Burnsville - United Properties - 12400 Dupont Avenue North:** No new information on this project since last update.

**City of Burnsville - Kraemer Mining:** No new information to report since last update.

**Dakota County - MN River Greenway:** No new information to report since last update. Project website: <https://www.co.dakota.mn.us/parks/About/TrailPlanning/Pages/minnesota-river.aspx>

**City of Shakopee - Jackson Township AUAR:** No new information to report since last update.

**City of Burnsville - CenterPoint Energy Lyndale Valve Replacement Project:** No new information to report since last update.

**City of Eden Prairie - C. H. Robinson:** No new information to report since last update.

**City of Burnsville - Burnsville Sanitary Landfill:** No new information to report since last update.

**City of Eden Prairie - Peterson Wetland Bank:** No new information to report since last update.

**City of Chanhassen - TH 101 Improvements:** The LMRWD received the executed maintenance agreement this week. Project website: <https://www.highway101improvements.com/>

**Cities of Richfield/Bloomington - TH 77 & 77th Street underpass:** No new information to report since last update. There is a bill pending in the legislature asking for funding for this project.

**MPCA - MN River TSS TMDL:** No new information to report since last update.

**MPCA - Watonwan River Watershed Maximum Daily Load Study Draft Report and Watershed Restoration and Protection Strategy:** No new information to report since last update.

**MPCA - Middle Minnesota River Watershed Total Maximum Daily Load Study Draft Report and Watershed Restoration and Protection Strategy:** No new information to report since last update.

**MPCA - Lower Minnesota River Watershed Total Maximum Daily Load Study Draft Report and Watershed Restoration and Protection Strategy:** No new information to report since last update.

**City of Bloomington - MN Valley State Trail:** No new information to report since last update.. Project website: [https://www.dnr.state.mn.us/state\\_trails/minnesota\\_valley/plans.html](https://www.dnr.state.mn.us/state_trails/minnesota_valley/plans.html)

**Hennepin County - CSAH 61/Flying Cloud Drive:** The most recent inspection report is attached.

**MNDOT - I494/TH 5/TH 55 Mill & Overlay project:** No new information to report since last update. Project website: <https://www.dot.state.mn.us/metro/projects/i494invergroveheights/>

**MNDOT - I35W Bridge Replacement:** No new information to report since last update. Project website: <https://www.dot.state.mn.us/metro/projects/i35wbloomington/index.html>

**MNDOT - I494 from TH169 to Minnesota River:** No new information to report since last update.

**Scott County - TH 41/169/78 Interchange:** No new information to report since last update. Project website <https://www.scottcountymn.gov/1778/Highways-1694178-Interchange?PREVIEW=YES&PREVIEW=YES&PREVIEW=YES&PREVIEW=YES>

**City of Shakopee - Amazon Fulfillment Center drainage:** The LMRWD received and reviewed the final plans for this project. Comments that were provided to the city are attached.

**MAC/LMRWD/MCWD boundary realignment:** No new information to report since last update.

**Fort Snelling - Dominion Housing:** No new information since last update. The DNR's website for this project is <http://www.dnr.state.mn.us/input/environmentalreview/upperpost/index.html>.

**USACOE/USFWS - Bass Ponds, Marsh & Wetland:** No new information to report since last update. Project website: <https://www.scottcountymn.gov/1865/Bass-Ponds-EAW>

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### Upcoming meetings/events

- [MAWD Legislative Reception & Day at the Capitol](#) - March 18 & 19, 2020, Doubletree Hotel, St. Paul - **CANCELLED**
- USACE River Resource Forum #116 - April 21-22, National Eagle Center, Wabasha, MN
- Metro MAWD - Tuesday, April 21, 2020, 7:00 - 9:00pm, Capitol Region WD 595 Aldine Street, St. Paul
- Freshwater Society Ice Out/Loon In - **CANCELLED**
- [State of Water Conference](#) - April 30-May 1, 2020, Grand Casino Mille Lacs - **CANCELLED**
- USACE River Resource Forum #117 - August 25-26, Savage City Hall
- USACE River Resource Forum #118 - December 1-2, MN Valley US Fish & Wildlife Service Visitor's Center, Bloomington, MN



### Carver

Vacant

### Dakota

Vacant

### Hennepin

David Raby  
Secretary/Treasurer

Adam Frey  
Vice President

### Scott

Jesse Hartmann  
President

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March 18, 2020

City of Carver  
Erin Smith  
City Planner  
801 Jonathan Carver Parkway  
Carver, MN 55315

Dear Mr. Smith:

The Lower Minnesota River Watershed District (LMRWD) has reviewed the Environmental Assessment Worksheet for the Timber Creek Residential Development. We understand the Development is outside the boundaries of the LMRWD. It is however, upstream of the District in the Minnesota River Watershed. Overall we see no reason to not approve the EAW. However, there are several comments that the Lower Minnesota River Watershed District would like to offer.

Since the Development will require a Storm Water Pollution Prevention Plan, we would appreciate the opportunity to review the SWPPP when it has been prepared. Our reason for this request is to review the SWPPP for flows that may be directed to Spring Creek. The EAW indicates that storm water run-off is expected to be reduced overall and will not be directed toward Spring Creek. The LMRWD is concerned with any increase in the flow of stormwater to Spring Creek. Several downstream properties are experiencing erosion issues because of increases in the volume of the flow.

Given the steep slopes, which are very susceptible to erosion, prevalent in much of the City of Carver, and the desire of many homeowners to use automated irrigation systems, we would like to recommend that the city consider implementing monitoring systems for residential irrigations systems. The City of Woodbury has implemented a program in order to reduce peak demands on its municipal water system. The District feels that monitoring irrigation in Carver may reduce saturation of the steep slopes that can be a significant contributing factor to slope failure.

Lastly, we would like to note a correction that should be addressed. On page 5-29 of the Carver 2040 Comprehensive Plan the LMRWD adopted a revised Watershed Management Plan in October 2018. Under the 2018 Plan the City has 18 months from plan adoption to bring its official controls into conformance with the LMRWD Plan. All cities will be expected to apply for a Municipal Review Permit in accordance with the Rules the LMRWD adopted February 19, 2020. The 2001 Agreement between the City of Carver and the LMRWD is no longer applicable. These changes should be noted by the City.

Please let me know if you have questions.

Linda Loomis  
Administrator  
Lower Minnesota River Watershed District  
763-545-4659  
[naianconsulting@gmail.com](mailto:naianconsulting@gmail.com)



# Memorandum

**DATE:** March 6, 2020 *(Email transmittal)*

**TO:** Linda Loomis – Administrator, LMRWD

**FROM:** Shane Soukup, Water Resources Scientist  
Della Schall Young, PMP, CPESC

**SUBJECT:** Stormwater Visit Summary  
March 2, 2020, 9:15 a.m.–10:00 a.m.  
CSAH 61 – Flying Cloud Drive  
Owner – Hennepin County and Contractor – Ames Construction

**WEATHER:** 31°F, mostly cloudy – per AccuWeather

## **SITE CONDITIONS/PHASE**

The majority of road construction is complete, and the site is now open to all traffic. There was no active construction at the time of inspection.

## **PRESENT**

Shane Soukup – Young Environmental Consulting Group

## **PURPOSE**

To observe stormwater management/erosion control techniques being implemented by Ames Construction on the reconstruction of Flying Cloud Drive/County State Aide Highway (CSAH) 61 from Highway 101 to Charlson Road in the cities of Eden Prairie and Chanhassen and in Carver and Hennepin counties.

## **GENERAL NOTES/OBSERVATIONS**

There were three areas of concern identified during the site visit, which were discussed with Nathan Bren: Area 1 (photo 8), located just west of Erie Lane; Area 2 (photo 17), located near the entrance to the Moon Valley gravel pit; and Area 3 (Photo 21), located just west of Area 2. Nathan and his team are monitoring those areas closely, and a meeting with Hennepin County is planned for March 5, 2020, to review the issue and discuss the path forward. Nathan also mentioned that, under the direction of Hennepin County, some silt fences were removed from the north and south side of the roadway between wall C and the Richard T. Anderson Conservatory in February. Additional observations are as follows:

- Photos show drainage in critical areas throughout the project.
- Erosion was prevalent near the inlet to a box culvert adjacent to Rice Lake (photos 16–21).
- There were signs of erosion on slopes in several areas across the project (photos 1, 3, 8, 9, 33, 36, 42, 48).

## Memorandum *(cont'd)*

Page 2 of 5

- Sediment was tracking into the roadway and catch basin where the inlet protection has failed (photos 54, 56, 57).

### **RECOMMENDATIONS**

- Continue to monitor the sediment levels at the outlets of the various box culverts throughout the site. Maintain the outlets as necessary to ensure the hydraulic features and BMPs function as designed.
- Stabilize slopes (photos 1, 3, 8, 9, 16–21, 33, 36, 42, 48).
- Repair inlet protection on the catch basin near Eden Prairie Road (photos 54, 56, 57).
- Contact Nathan Bren to clarify the path forward, as agreed upon with Hennepin County regarding the three areas (photos 8, 17, and 21)
- Continue monthly inspections throughout the winter and within 48 hours of rainfall or snowmelt. The next scheduled inspection is March 27, 2020.



# Memorandum



Below is a map indicating where the photos were taken. The photos include observations, coordinates, and an arrow indicating north (lower right corner).



# Memorandum (cont'd)

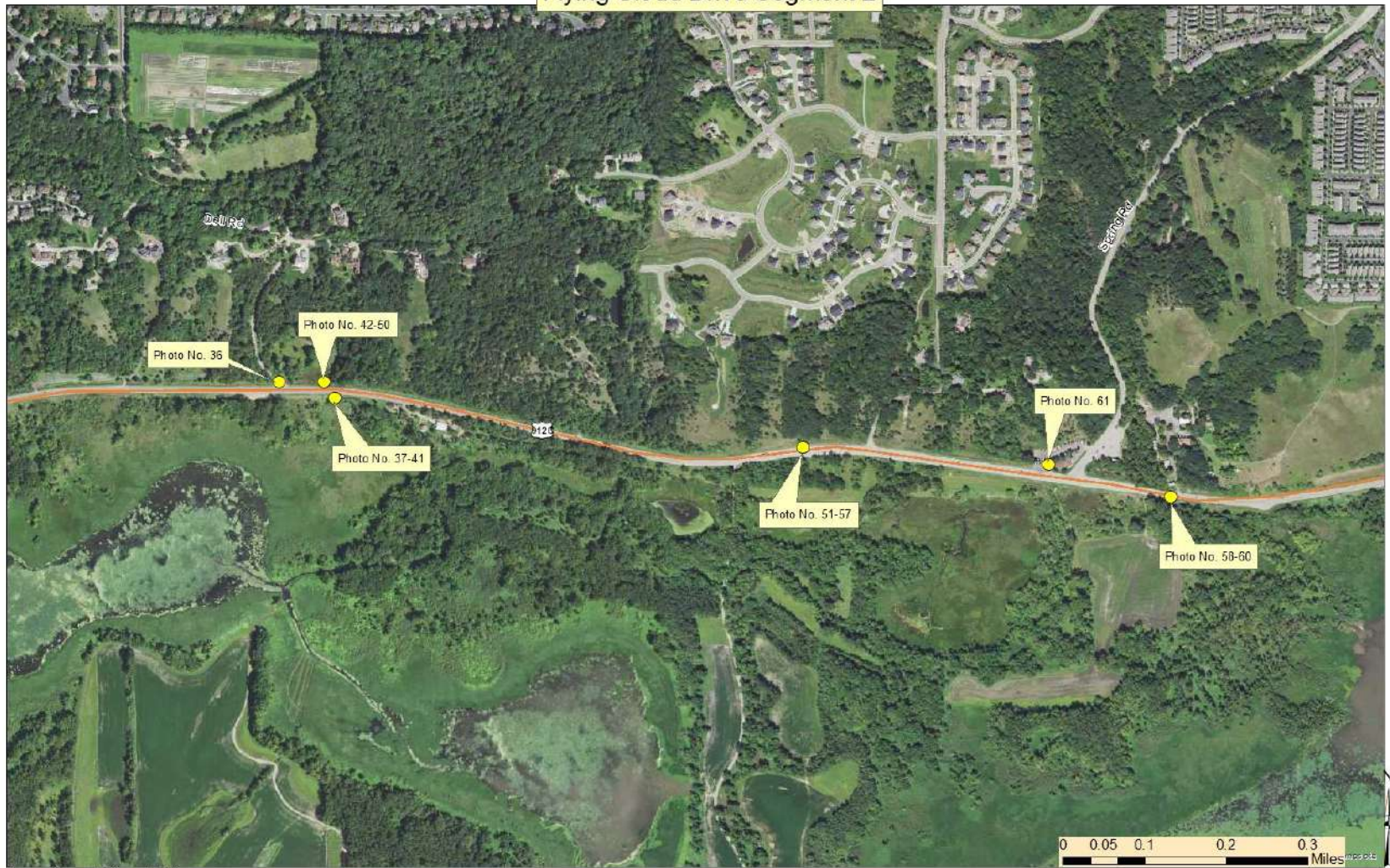
Flying Cloud Drive Segment 1



Source: Minnesota Geospatial Commons

# Memorandum (cont'd)

## Flying Cloud Drive Segment 2



Source: Minnesota Geospatial Commons



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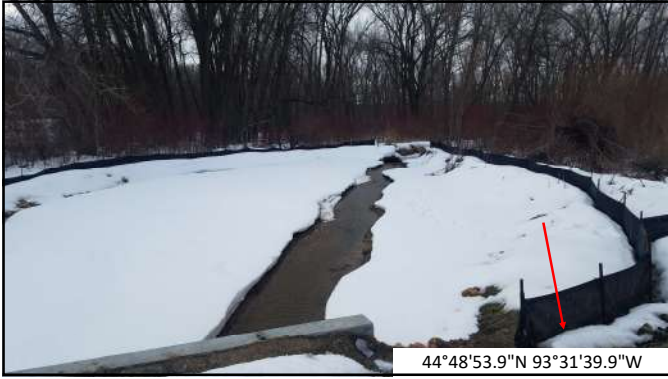
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# Technical Memorandum

**To:** Linda Loomis, Administrator  
Lower Minnesota River Watershed District

**From:** Katy Thompson, PE, CFM  
Della Schall Young, CPESC, PMP

**Date:** March 6, 2020

**Re:** Amazon Center Stormwater Reroute Project—City of Shakopee Funding  
Review Request #2

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The Lower Minnesota River Watershed District (District), through its technical consultant, Young Environmental Consulting Group, LLC (Young Environmental), has been working with the City of Shakopee (City) to help fund a portion of the Amazon Center Stormwater Reroute Project (the Project) to stabilize an existing head cut and spring in the proposed stormwater outfall of the Project since early 2019.

On February 19, 2020, the City's consultant, WSB & Associates, Inc. (WSB), provided the 90% design plans for review. Young Environmental reviewed the 90% plans and found that the information generally follows the 2019 selected option for rerouting Amazon Center stormwater to avoid culturally significant sites. Comments on the plans are provided in the attached documents and summarized in the following sections.

## **Background**

The City of Shakopee provided a feasibility study dated February 2019, prepared by WSB, for options to reroute stormwater around culturally significant sites. The preferred option was Option 3, which rerouted stormwater from the Amazon site east through the Highway 101 center median, then north at the east end of the Three River Parks District's property through a small ravine to the Minnesota River. The report provided peak runoff rates and volumes in the feasibility study but had several inconsistencies between the modeling results provided in Appendix C and the report text.

On May 23, 2019, the District, Young Environmental, and Barr Engineering Company (Barr) performed a site survey of the ravine to identify existing conditions, concerns, and potential solutions for routing stormwater through this area. The observations from the report are summarized in a June 2019 memorandum to the District and below:

- The ravine is narrow, well vegetated, intermittent, and stable with current hydrology.
- A head cut and active spring are located approximately 100 feet upstream of the Minnesota River banks.
- Additional flows through the ravine will exacerbate erosion and may cause new erosion areas to develop.
- Install a grade control structure at or just downstream of the head cut to stabilize the head cut. Barr recommended the use of a constructed riffle to stabilize the head cut itself, combined with a granular filter, rather than a geotextile filter, which could become clogged with soil materials mobilized by the spring.

On August 1, 2019, the District provided the City with a Funding Review Request on the proposed Amazon Center Stormwater Reroute Project. The Funding Review Request made the following recommendations:

- Barr recommended stabilizing the head cut by installing a grade control structure at or just downstream of the head cut.
- Barr recommended the use of a constructed riffle that would be contoured to keep flows in the center of the channel as well as allow spring water to exit unimpeded.
- The Funding Review Request recommended contributing \$35,000 to the City's project contingent on the City providing the following information with the District:
  1. Final option selected, designed, and constructed
  2. Funding contributors
  3. Final plans

## **Findings**

The provided 90% plans generally follow the alignment and description of the 2019 feasibility study Option 3. Based on the information provided and against the previous recommendations stated above, the following items are outstanding and required to complete the funding request:

1. Final Option Selected
  - a. The City must provide updated hydrology and hydraulic modeling to demonstrate no increased flows or erosion would occur in the ravine from the rerouting of the Amazon Center stormwater.
  - b. Please provide a justification for the proposed ravine stabilization design;



in particular, please justify the location of the proposed cross vane and the amount and extent of the proposed riprap being specified.

- c. Please provide justification for the use of Type 7 geotextile fabric and address how it will allow for the free and unimpeded movement of spring water through the restoration site.
  - d. Please refer to the attached annotated plans for detailed comments on the final design.
2. Project Funding
    - a. Please identify funding contributors.
    - b. Please provide an exhibit demonstrating the extent of the ravine stabilization required to stabilize the channel for the Project versus the District-funded head cut and spring stabilization.
3. Final Plans
    - a. Clearly show where the existing head cut and spring are located on the plans.
    - b. See attached annotated plans for further comments.

## **Recommendation**

We recommend the project be funded up to \$35,000, as was previously recommended, pending the receipt of the above outstanding items.

Enclosures:

Annotated 90% Plans  
June 18, 2019, Highway 101 Ravine Memo to District  
August 1, 2019, Funding Request Memo to District

NO.	DATE	DESCRIPTION

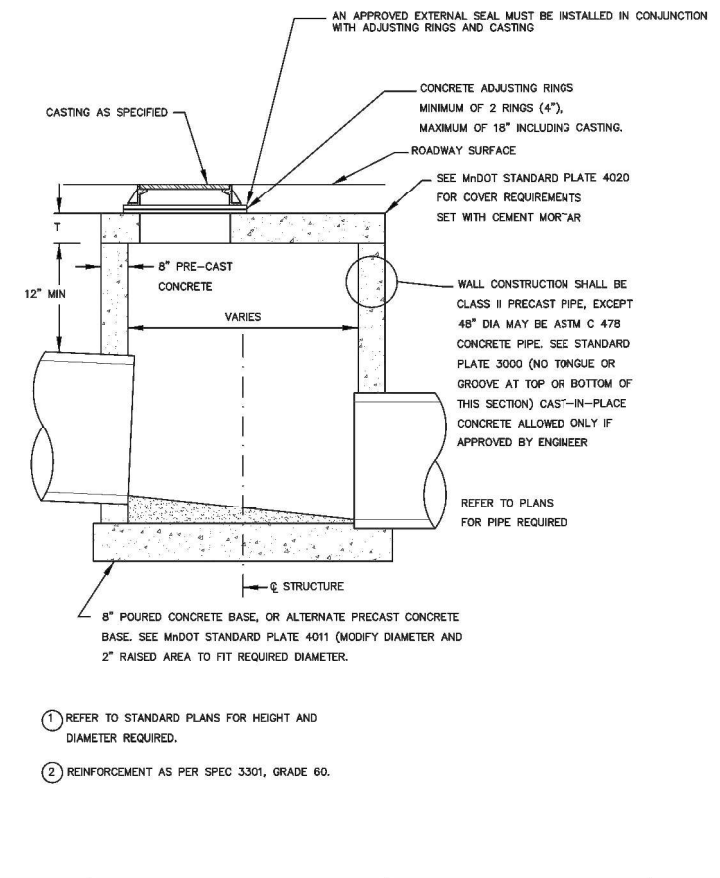
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.


JEFFREY S. SANDBERG, P.E.  
DATE: XX/XX/2020 LIC. NO.: 25393

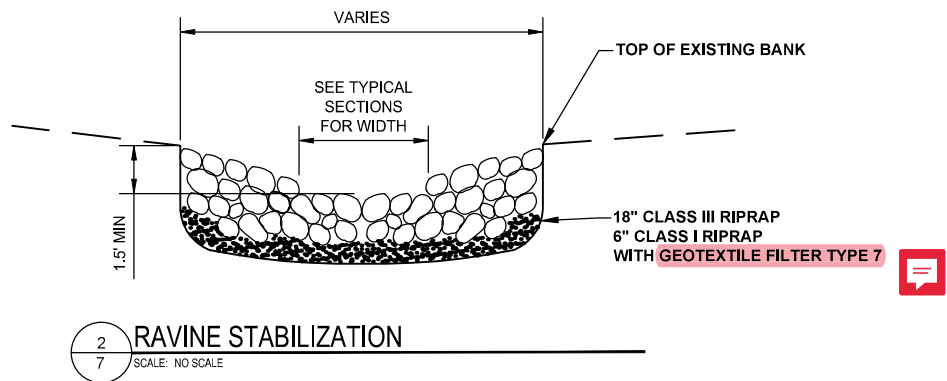
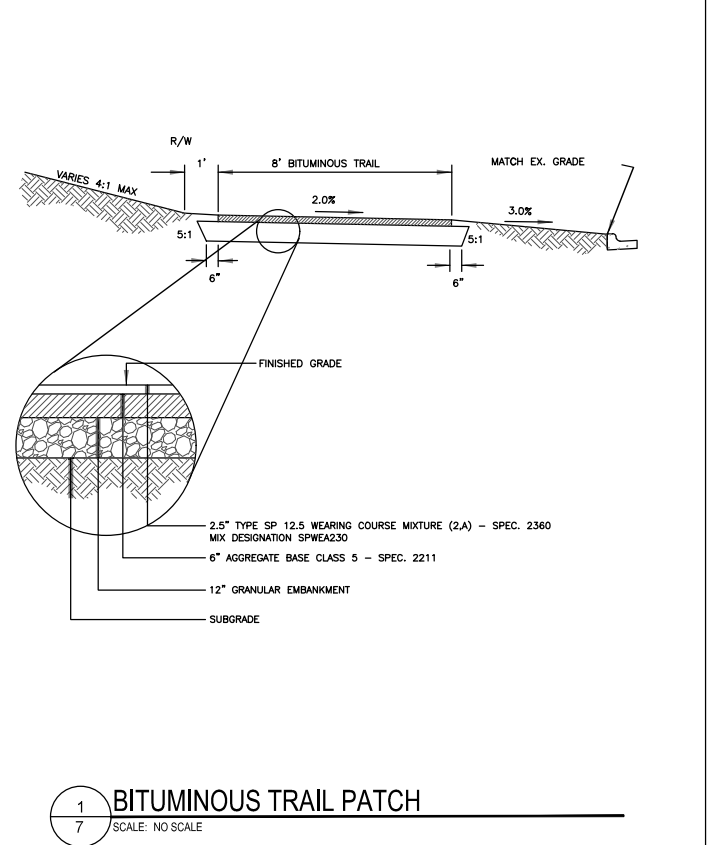
REROUTE STORMWATER TO  
PROTECT HISTORIC SITES

CITY OF SHAKOPEE

MISCELLANEOUS  
DETAILS



	STANDARD MANHOLE FOR STORM SEWER	APPROVED:	DETAIL NO.:
		REVISION DATE: AUGUST 2018	4001
		SHAKOPEE ENGINEERING DEPARTMENT	



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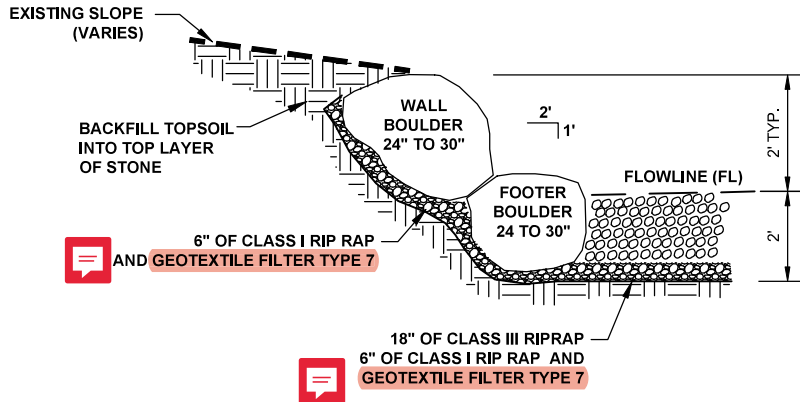
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JEFFREY S. SANDBERG, P.E.  
DATE: XX/XX/2020 LIC. NO.: 25393

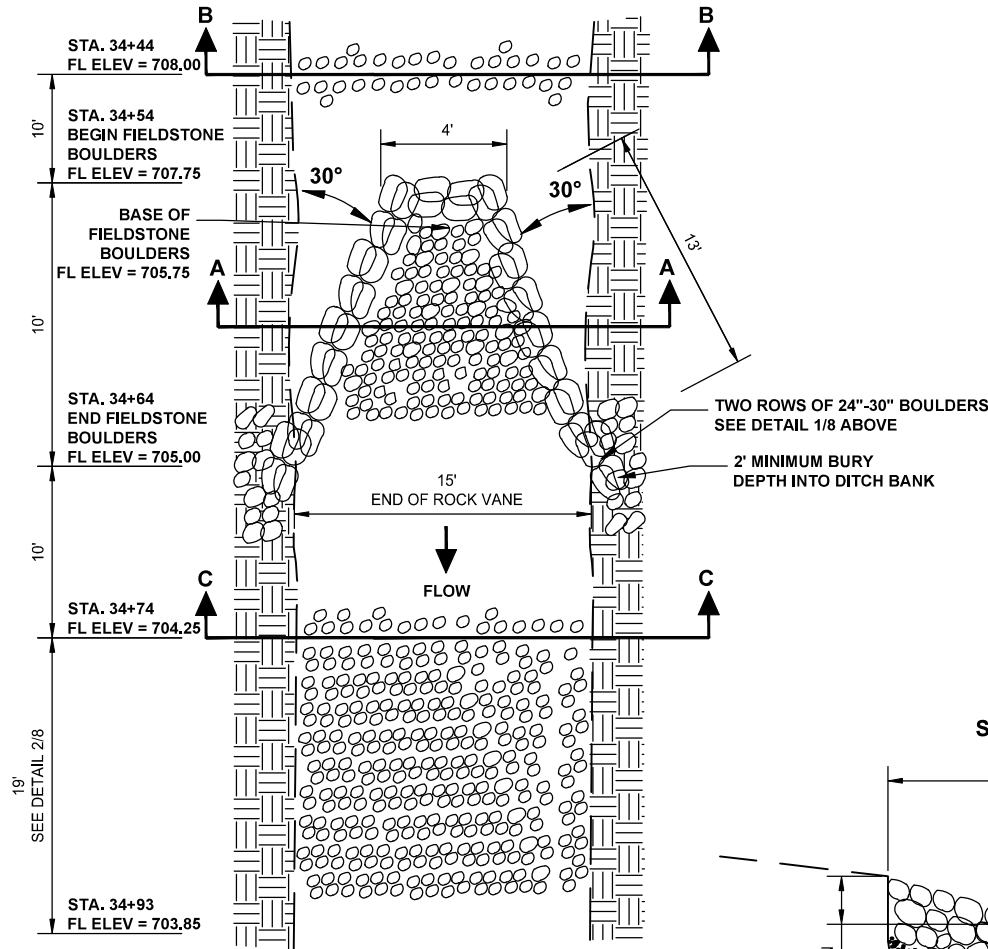
REROUTE STORMWATER TO PROTECT HISTORIC SITES  
CITY OF SHAKOPEE

MISCELLANEOUS DETAILS

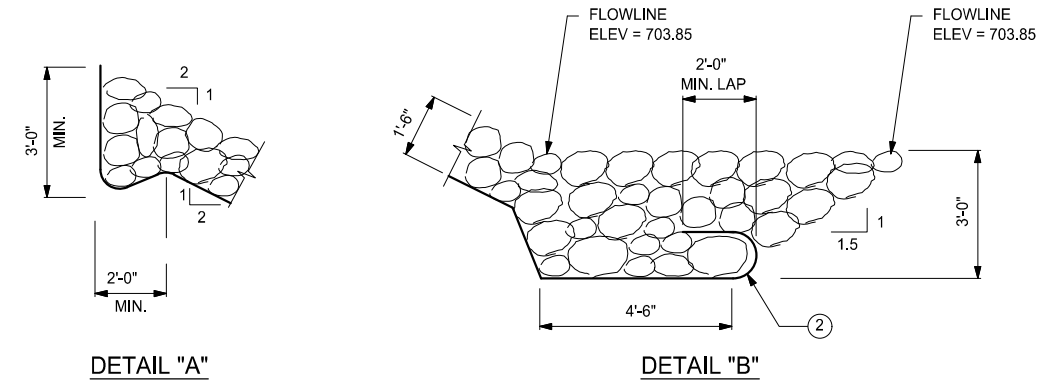
**GENERAL NOTES**  
FIELDSTONE BOULDERS SHALL BE PAID FOR AS "HAND-PLACED RIPRAP" (CU YD).



1 FIELDSTONE BOULDER STABILIZATION  
SCALE: NO SCALE



3 CROSS VANE  
SCALE: NO SCALE



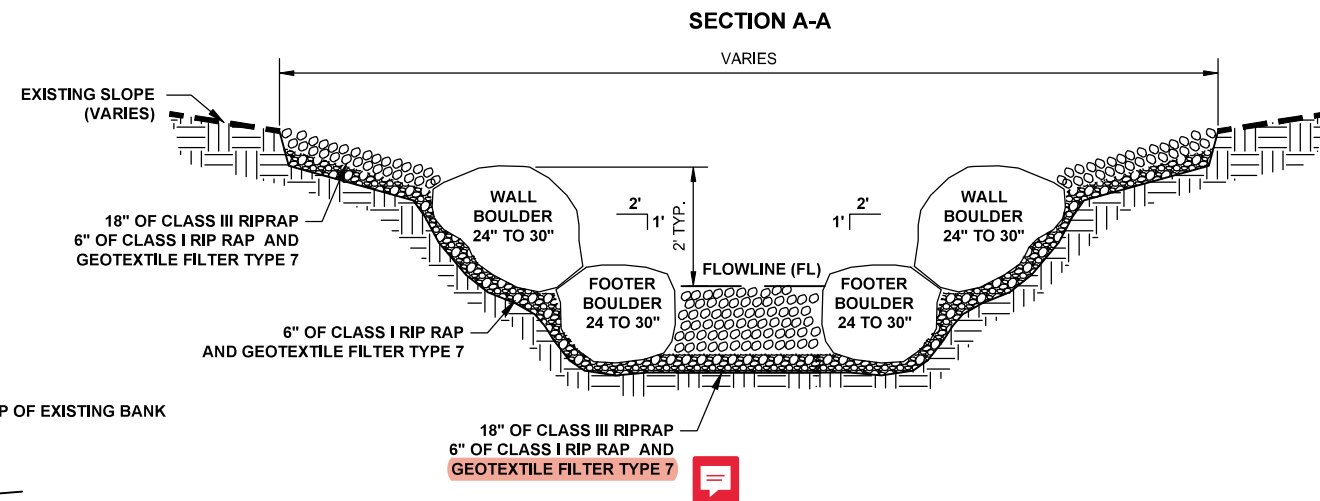
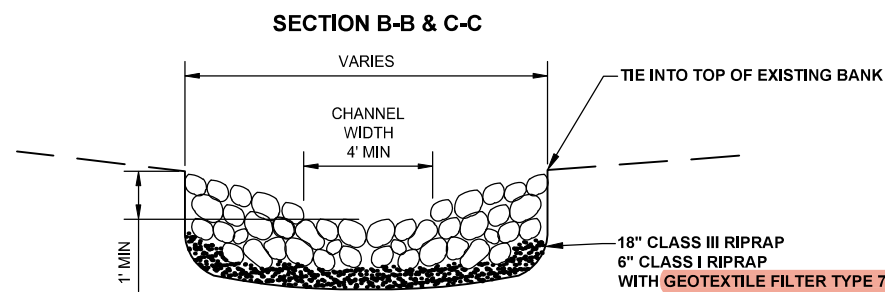
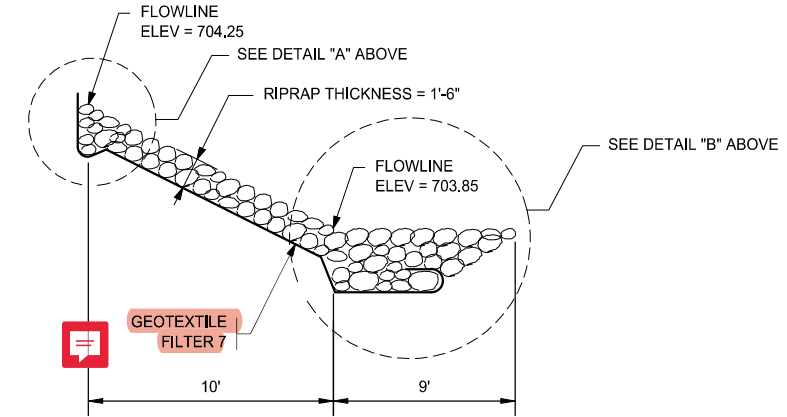
**GENERAL NOTES**  
GEOTEXTILE FILTER TYPE 7 PER SPEC. 3733, BY THE SQ. YD.

RIPRAP PER SPEC. 2511, RANDOM RIPRAP CLASS I AND III (FIELDSTONE) BY THE CU. YD.

SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE : HORIZONTAL DISTANCE.

- PLACE RIPRAP STARTING FROM THE BOTTOM OF THE SLOPE. DO NOT PLACE RIP RAP IN TRENCH UNTIL RIPRAP HAS BEEN PLACED ON ENTIRE SLOPE BENEATH THE TRENCH.
- OVERLAP GEOTEXTILE FILTER 2'-0" MINIMUM.

2 RIPRAP SLOPE WITH GEOTEXTILE FILTER (SLOPES 1:2 AND FLATTER)  
SCALE: NO SCALE

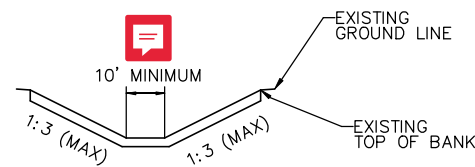
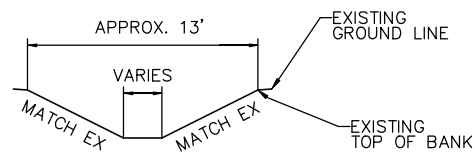
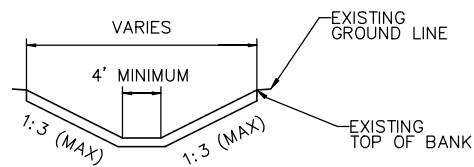
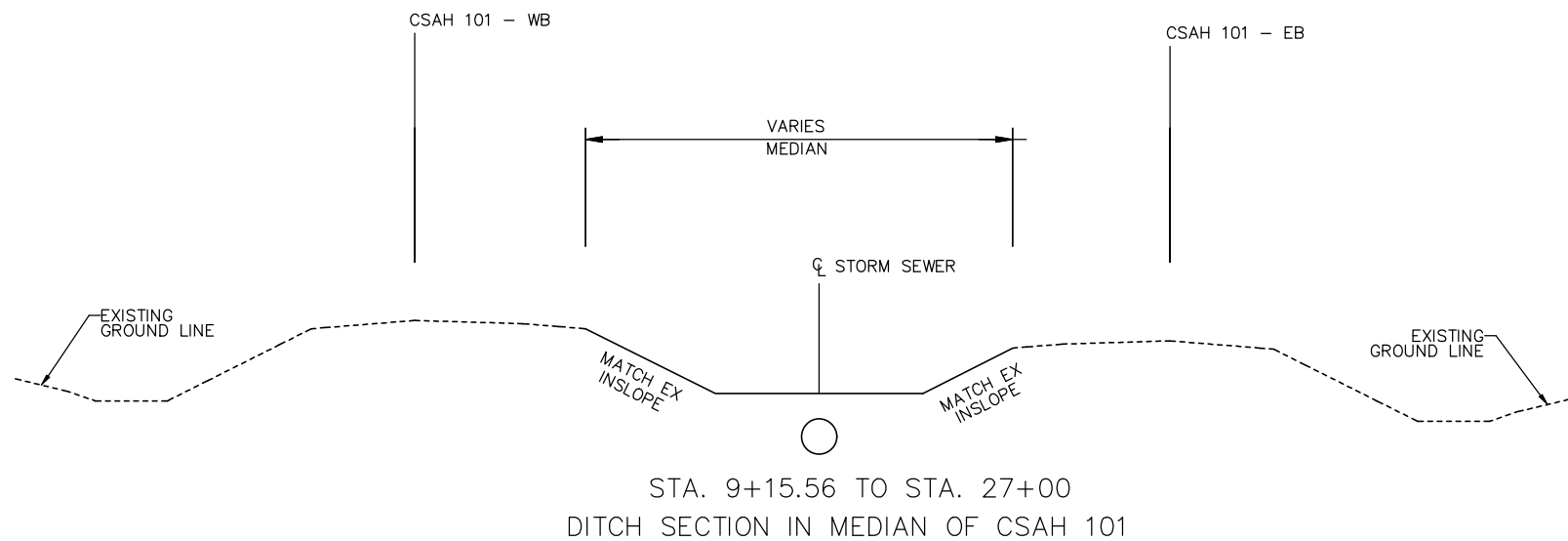
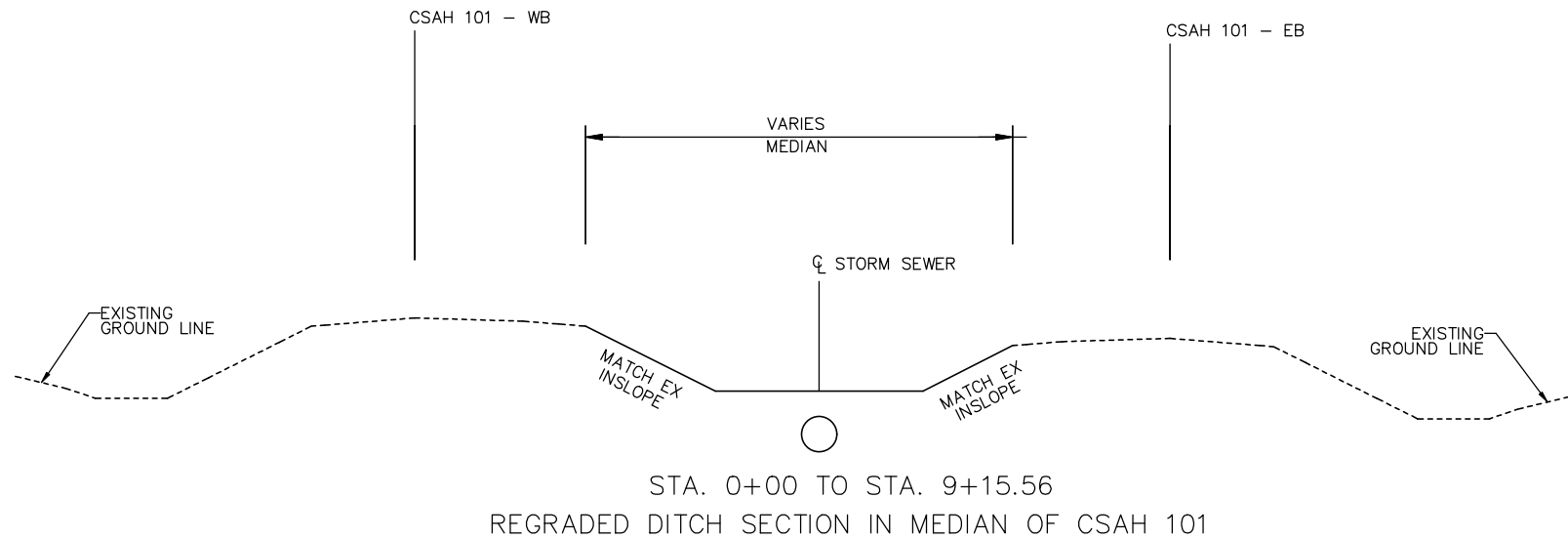


NO.	DATE	DESCRIPTION

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

JEFFREY S. SANDBERG, P.E.  
DATE: XX/XX/2020 LIC. NO.: 25393

**REROUTE STORMWATER TO PROTECT HISTORIC SITES**  
**CITY OF SHAKOPEE**



**GENERAL NOTES:**

- I. ALL CROSS SLOPES ARE EXPRESSED IN FT./FT.
- II. UNLESS OTHERWISE SPECIFIED, THE GRADING GRADE CROSS SLOPES WILL BE THE SAME AS THE PROPOSED PAVEMENT SURFACE.
- III. SEE CONSTRUCTION PLAN AND PROFILE FOR DITCH GRADES AND STORM SEWER INFORMATION.
- IV. SEE DETAIL 2/7 ON SHEET 7 FOR CLASS AND DEPTH OF RIPRAP IN STABILIZED RAVINE.
- V. ADD 6 INCHES OF SLOPE DRESSING TO THE FINISHED GRADE IN ALL GRADED AREAS.

**TYPICAL SECTIONS**

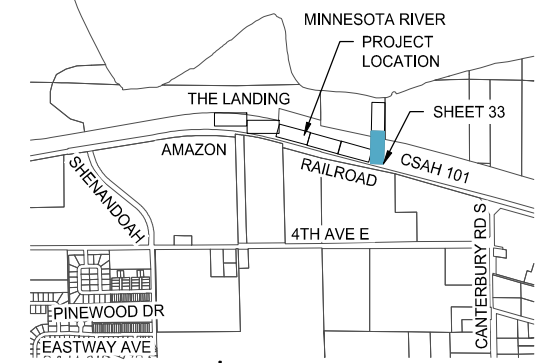
NO.	DATE	DESCRIPTION

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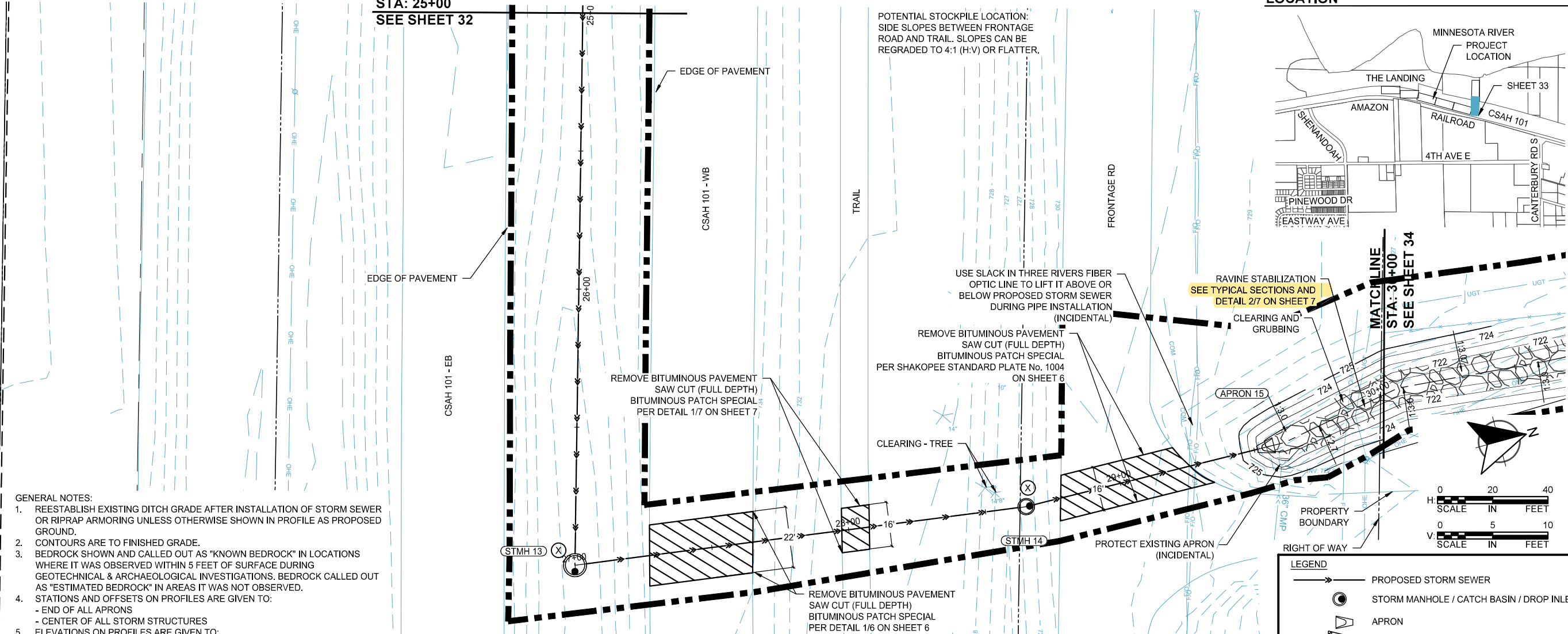
JEFFREY S. SANDBERG, P.E.  
DATE: XX/XX/2020 LIC. NO.: 25393

MATCHLINE  
STA: 25+00  
SEE SHEET 32

LOCATION



POTENTIAL STOCKPILE LOCATION:  
SIDE SLOPES BETWEEN FRONTAGE ROAD AND TRAIL. SLOPES CAN BE REGRADED TO 4:1 (H:V) OR FLATTER.

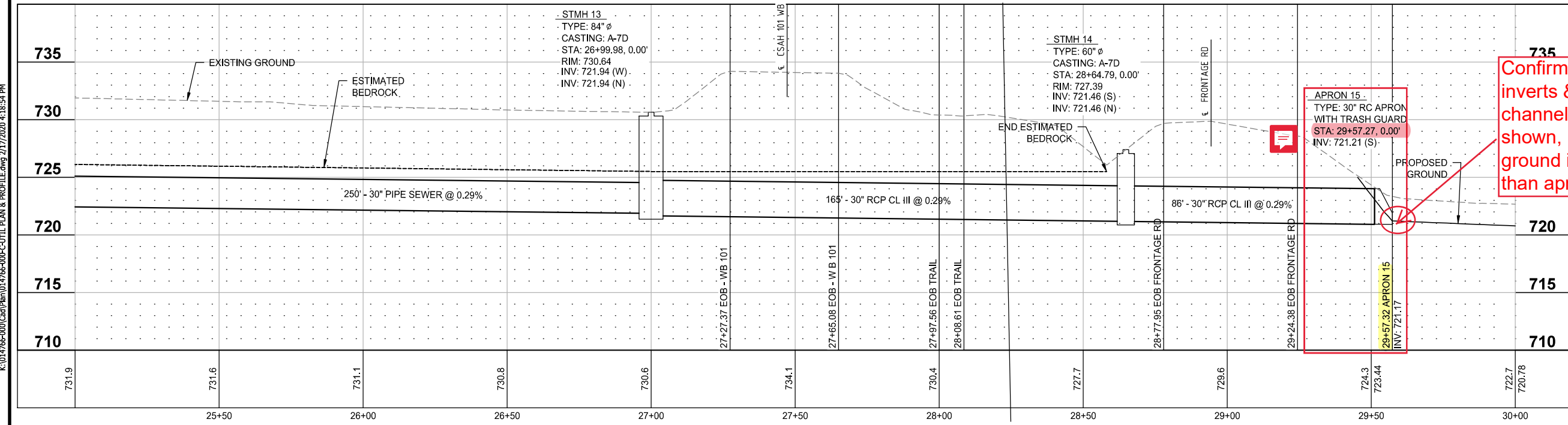
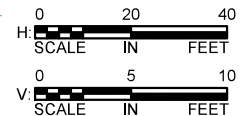


GENERAL NOTES:

1. REESTABLISH EXISTING DITCH GRADE AFTER INSTALLATION OF STORM SEWER OR RIPRAP ARMORING UNLESS OTHERWISE SHOWN IN PROFILE AS PROPOSED GROUND.
2. CONTOURS ARE TO FINISHED GRADE.
3. BEDROCK SHOWN AND CALLED OUT AS "KNOWN BEDROCK" IN LOCATIONS WHERE IT WAS OBSERVED WITHIN 5 FEET OF SURFACE DURING GEOTECHNICAL & ARCHAEOLOGICAL INVESTIGATIONS. BEDROCK CALLED OUT AS "ESTIMATED BEDROCK" IN AREAS IT WAS NOT OBSERVED.
4. STATIONS AND OFFSETS ON PROFILES ARE GIVEN TO:
  - END OF ALL APRONS
  - CENTER OF ALL STORM STRUCTURES
5. ELEVATIONS ON PROFILES ARE GIVEN TO:
  - INVERT AT CENTER OF STRUCTURE
  - END OF ALL APRONS
  - CENTER OF CASTING
6. ROTATE CASTINGS TO ALIGN WITH OUTLET PIPE OF DRAINAGE STRUCTURES.
7. STEPS ARE REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4.5'.
8. ALL PIPE LENGTHS EXCLUDE APRONS.

LEGEND

- PROPOSED STORM SEWER
- ⊙ STORM MANHOLE / CATCH BASIN / DROP INLET
- ▽ APRON
- ▨ RIPRAP
- ⊗ GUIDE POST TYPE B
- XX.XX STRUCTURE ID
- CONSTRUCTION LIMITS



Confirm pipe inverts & final channel grade. As shown, proposed ground is higher than apron outfall.

K:\014766-000\Cad\Plan\014766-000-C-UTIL PLAN & PROFILE.dwg 2/17/2020 4:18:54 PM

REROUTE STORMWATER TO PROTECT HISTORIC SITES  
CITY OF SHAKOPEE

CONSTRUCTION PLAN & PROFILE

NO.	DATE	DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT 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.

JEFFREY S. SANDBERG, P.E.  
DATE: XX/XX/2020 LIC. NO.: 25393

REROUTE STORMWATER TO PROTECT HISTORIC SITES

CITY OF SHAKOPEE

CONSTRUCTION PLAN & PROFILE

LOCATION



POTENTIAL CONSTRUCTION ACCESS THROUGH THREE RIVERS PARK MAINTENANCE AREA.

Location inset map is obscuring the proposed grade tie-ins & construction limits.

Check ditch grading extents - appears to extend onto private property/driveway.

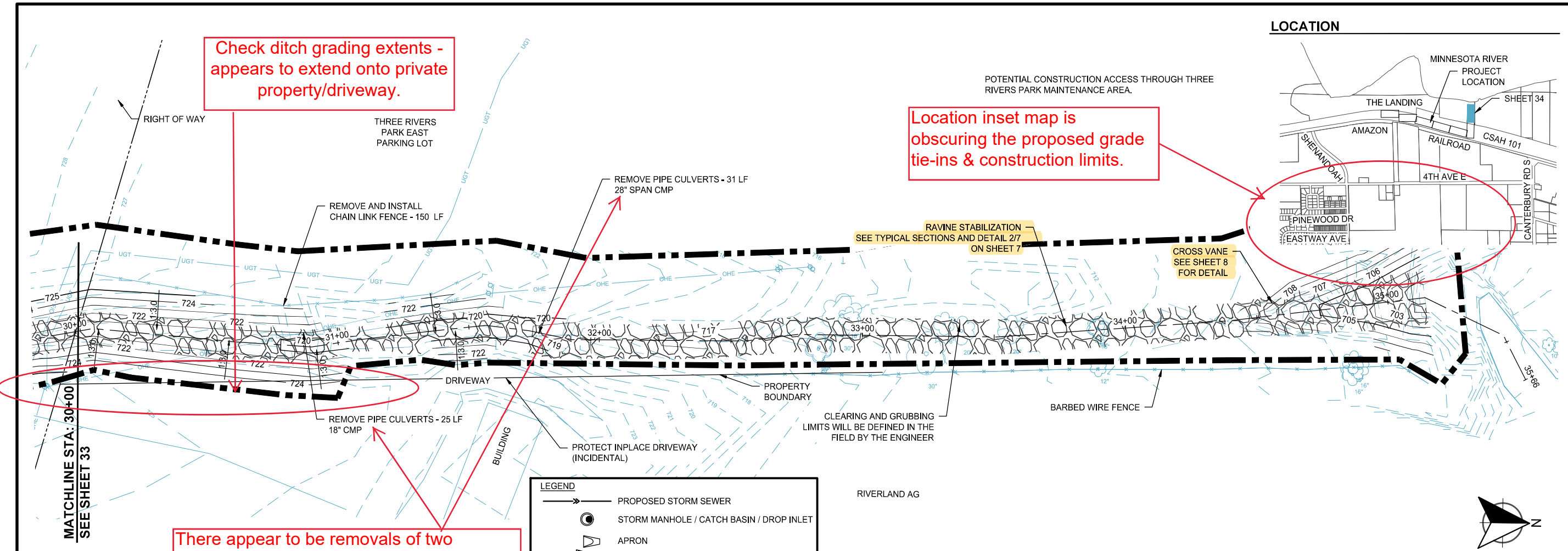
There appear to be removals of two significant ditch checks/culverts - please confirm flow rates are not increased as a result.

Consider extending grading to avoid creating sharp drop in grade.

Existing headcut & spring?

Confirm proposed grades - not tying into existing profile

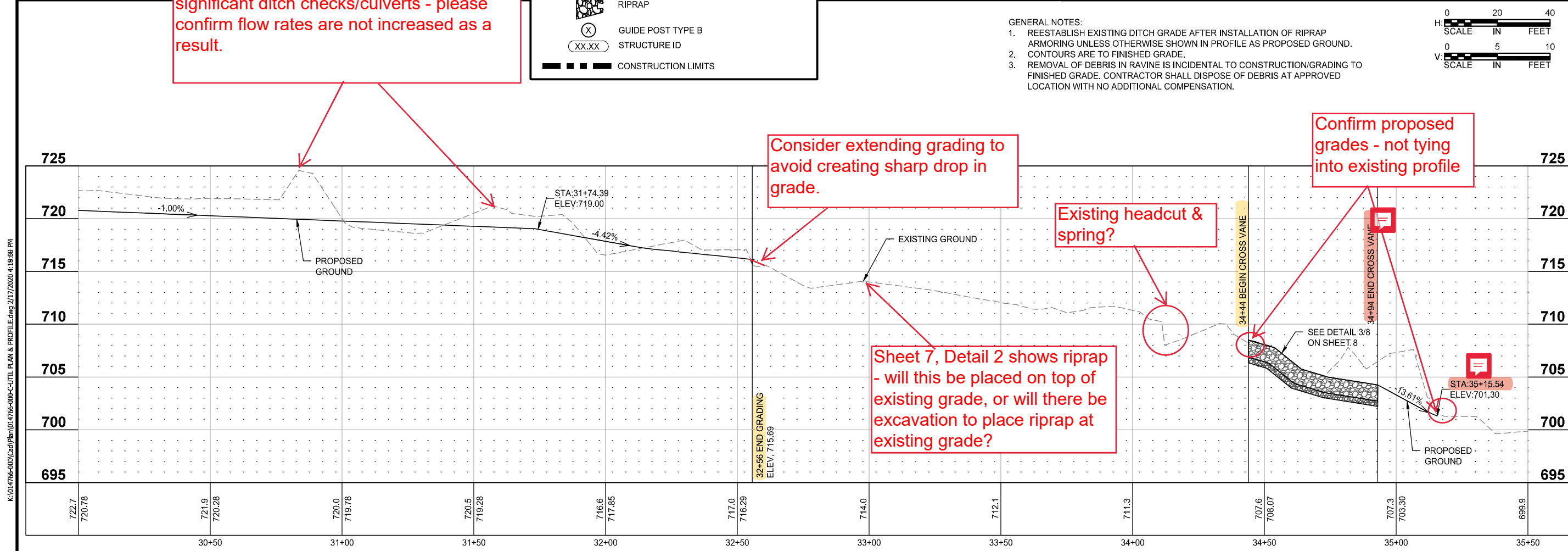
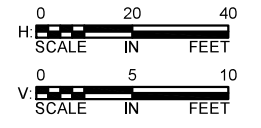
Sheet 7, Detail 2 shows riprap - will this be placed on top of existing grade, or will there be excavation to place riprap at existing grade?



**LEGEND**

- PROPOSED STORM SEWER
- STORM MANHOLE / CATCH BASIN / DROP INLET
- APRON
- RIPRAP
- GUIDE POST TYPE B
- STRUCTURE ID
- CONSTRUCTION LIMITS

- GENERAL NOTES:**
- REESTABLISH EXISTING DITCH GRADE AFTER INSTALLATION OF RIPRAP ARMORING UNLESS OTHERWISE SHOWN IN PROFILE AS PROPOSED GROUND.
  - CONTOURS ARE TO FINISHED GRADE.
  - REMOVAL OF DEBRIS IN RAVINE IS INCIDENTAL TO CONSTRUCTION/GRADING TO FINISHED GRADE. CONTRACTOR SHALL DISPOSE OF DEBRIS AT APPROVED LOCATION WITH NO ADDITIONAL COMPENSATION.



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## Technical Memorandum

**To:** Della Schall Young, Young Environmental Consulting Group  
**From:** Jeff Weiss, Barr Engineering  
**Subject:** Highway 101 Ravine Erosion  
**Date:** June 18, 2019  
**Project:** 23101028.04

### Background

The city of Shakopee is considering different options to improve stormwater management at an Amazon facility along Trunk Highway 101 (TH 101). One of the options includes routing additional stormwater through a ravine on the east edge of the parking lot for The Landing (Figure 1). If additional stormwater is to be routed to this ravine, there is concern that it could create or exacerbate existing erosion problems. The main goal of the assessment was to develop an understanding of the existing state of the ravine and determine what stabilization measures may be necessary to mitigate existing erosion issues.

### Observations

A site visit was completed on May 23, 2019. Those in attendance included Della Schall Young (Young Environmental Consulting Group), Linda Loomis (Lower Minnesota River Watershed District), Kirby Templin (City of Shakopee), and Jeff Weiss (Barr Engineering). A summer intern with the City of Shakopee was also in attendance.

The ravine is located on the east end of the parking lot for The Landing, which is an historical heritage park run by the Three Rivers Park District. The land on the east side of the ravine is owned by Riverland Ag Corporation.

The ravine is narrow and well-vegetated. Buckthorn is growing on the banks in the upper half of the ravine, and in more than one location it was observed growing within the main channel. At the upstream end, the ravine is relatively shallow, with the bottom of the channel being approximately three feet deep relative to the adjacent overbank areas. The width of the channel at the bottom varies, but it was approximately one to two feet wide in most locations. The bottom of the channel was primarily gravel.

There are also two small culverts in the ravine, where former crossings of the ravine were located. The crossings were full of buckthorn so they have not been used for some time.

**To:** Della Schall Young, Young Environmental Consulting Group  
**From:** Jeff Weiss, Barr Engineering  
**Subject:** Highway 101 Ravine Erosion  
**Date:** June 18, 2019  
**Page:** 2

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Towards the bottom half of the ravine, the gradient appears to change and become less steep. The channel become wider and shows evidence of braiding. The vegetation also changed and buckthorn was no longer the dominant species on the banks.

Remnant garbage and debris was observed in several locations along the ravine.

A headcut and spring were observed approximately 100 feet upstream of the banks of the Minnesota River. At the time of the site visit, the Minnesota River was at flood stage, and the edge of the river was approximately 30 feet away from the headcut. A spring was observed bubbling out of the ravine bed at the location of the headcut. The ravine bed dropped approximately three to four feet at the headcut and spring, and the banks downstream of this location were near vertical. The flow rates was not estimated, but it was a relatively small trickle of flow from the spring. The water downstream of the spring was approximately three to four inches wide and approximately one inch deep.

### **Assessment**

The only notable erosion within the ravine was observed at the headcut and spring. The erosion present was likely caused by a combination of the spring and intermittent flows within the ravine. Springs naturally saturate the ground immediately around them and the saturated soil is easily mobilized by flowing water. Springs often naturally create a channel away from the spring, so some of the erosion that has occurred between the spring and the main channel of the river is likely caused by natural processes.

The creation of the spring's channel to the river also creates a headcut in the ravine. A headcut is a feature in a channel that indicates that the channel bed is dropping in elevation. Downstream of headcuts, the channel becomes deeper and contains more flow, which also contains erosive pressures within the channel. Erosion at the headcut causes the headcut to migrate upstream.

Since this spring is located within a drainageway, the intermittent flows in the ravine have likely helped the headcut migrate upstream; however since ongoing monitoring of this ravine has not been completed, it is not possible to accurately determine how much the headcut has migrated in recent years.

Aside from the headcut, the ravine appears to be stable with the current hydrology.

Photos from the site visit are included at the end of this memorandum.

### **Potential impacts of altered hydrology**

Altering the hydrology to any system has the potential to create instability or exacerbate existing instabilities. Given that the headcut area is the only notable erosion area, that is the location of greatest risk for additional erosion. Increased flow to the ravine will likely accelerate the migration of the headcut upstream. This will result in eroding banks and an increased sediment load to the Minnesota River.



The existing ravine has a relatively small capacity for flow. Increasing the flows could cause new head cuts to develop and/or cause the channel to become enlarged. The risk for new erosion will likely be reduced if the increased flow is attenuated to the greatest extent possible because a steady, low flow rate has less erosive pressure than a flashy high flow rate. The feasibility study completed by the city of Shakopee did not include a detailed summary of the potential increase in flows, so it is difficult to estimate more detailed impacts. Regardless, if flows to the ravine are increased, then preventative measures should be installed to minimize the potential for additional erosion.

### Concept and Cost Estimate

The concept described below and shown in Figure 2 describes a means to stabilize the existing headcut with the existing hydrology. Additional measures that may be needed to prevent erosion in the ravine due to altered hydrology are not part of this concept.

The best way to stabilize headcuts and prevent them from moving upstream is to install a grade control structure at or just downstream of the head cut. In perennial stream systems, a cross vane or a constructed riffle is often used as such a grade control structure. A cross vane can adequately address head cuts of one foot or less. Given the drop in elevation at the spring, a constructed riffle will provide better grade control option. Constructed riffles typically use a granular filter below larger riprap. The riprap is then contoured to keep flows in the center of the channel. The granular filter and riprap will also allow spring water to continue to exit the spring unimpeded. A different filter, such as a geotextile filter, could become clogged with soil materials mobilized by the spring.

A cost estimate for this concept is provided in the following table.

**Table 1. Concept level cost estimate**

Item	Description	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS	\$ 3,133	\$ 3,133
2	Clearing	1	LS	\$ 5,000	\$ 5,000
3	Granular filter	8	Ton	\$ 80	\$ 640
4	Riprap	20	Ton	\$ 100	\$ 2,000
5	Grading	125	CY	\$ 15	\$ 1,875
6	Cross vane	1	Each	\$ 2,500	\$ 2,500
7	Seed	0.2	Acre	\$ 2,500	\$ 500
8	Erosion control blanket	900	SY	\$ 4	\$ 3,150
	Construction Subtotal				\$18,798.00
	Contingency (30%)				\$5,639.40
	<b>Construction Total</b>				<b>\$24,437.40</b>
	Engineering				\$10,000.00
	<b>Project Total</b>				<b>\$34,437.40</b>

**To:** Della Schall Young, Young Environmental Consulting Group  
**From:** Jeff Weiss, Barr Engineering  
**Subject:** Highway 101 Ravine Erosion  
**Date:** June 18, 2019  
**Page:** 4

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## **Conclusion and Recommendation**

The ravine between The Landing and Riverland Ag Corp. is a mostly stable ravine with its current hydrology. One erosion location was found toward the downstream portion of the ravine. The erosion is likely caused by the spring itself and flows through the ravine.

Additional flows through the ravine will exacerbate the erosion in the ravine and may cause new erosion areas to develop.

We recommend stabilizing the existing erosion area to prevent erosion from migrating upstream. We recommend using a constructed riffle to stabilize the head cut itself. The banks between the headcut and the river should be graded to a 2:1 slope and revegetated.

Minnesota River






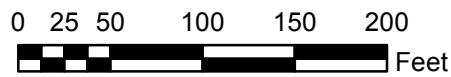
The Landing

Riverland Ag Corporation

TH 101

**Legend**

-  Culvert
-  Headcut
-  TH 101 Ravine



EXISTING CONDITIONS  
TH 101 Ravine Assessment  
Lower Minnesota River  
Watershed District

FIGURE 1

# Minnesota River



Grade banks to 3:1 slope between headcut and river

Install Constructed Riffle at Headcut

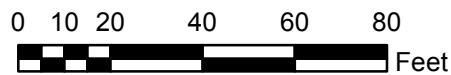
The Landing

Riverland Ag Corporation



## Legend

- Headcut
- TH 101 Ravine



STABILIZATION CONCEPT  
TH 101 Ravine Assessment  
Lower Minnesota River  
Watershed District

FIGURE 2

## Photos



Photo 1. Looking downstream in the lower half of the ravine



Photo 2. Headcut area



Photo 3. Zoom in of headcut. Headcut has migrated upstream of the spring; however brush was too thick for a clear picture of the spring.



Photo 4. Eroding banks downstream of the spring

# Technical Memorandum

**To:** Linda Loomis, Administrator  
Lower Minnesota River Watershed District

**From:** Shane Soukup, Water Resources Scientist  
Della Schall Young, CPESC, PMP

**Date:** August 1, 2019

**Re:** Amazon Stormwater Reroute Project—City of Shakopee Funding Review Request

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The City of Shakopee (“City”) has requested funding from the Lower Minnesota River Watershed District (“District”) for the Amazon Stormwater Reroute Project (“Project”). The proposed project information is presented in the WSB & Associates Feasibility Study—Reroute Stormwater to Protect Historic Sites, dated February 14, 2019. Below is a summary of the Project and Young Environmental Consulting Group’s (Young Environmental) recommendations.

The City is seeking to improve stormwater management near the Amazon Distribution Center by rerouting stormwater discharge away from historic sites. It has assessed three options. The preferred option involves rerouting stormwater through the ravine located on the east end of the Three Rivers Park District property adjacent to Murphy’s Landing off Hwy 101 in Shakopee, MN. This option routes the stormwater through a combination of existing and new drainage networks. WSB & Associates Feasibility study suggests that because of the long flow route and attenuation of stormwater, the ravine may not need to be stabilized or improved.

To determine how much to contribute to the Project, Barr Engineering Company (“Barr”) assessed the work required today by the District to restore and/or stabilize the ravine. Staff from the City, Barr, and Young Environmental, and the District’s administrator walked the ravine on May 23, 2019. During the field walk on May 23, the ravine was observed and assessed for any current erosion issues. A headcut and spring were noted approximately 100 feet upstream of the banks of the Minnesota River. Increased flow to the ravine is likely to accelerate the migration of the headcut upstream. These additional flows may exacerbate the erosion of the ravine and increase sediment load

into the Minnesota River. Barr proposes stabilizing the current erosion issues within the ravine. This can be accomplished by installing a grade control at or just downstream of the headcut. The grade control may be in the form of a constructed riffle, which will be contoured to keep flows in the center of the channel while also allowing spring water to exit the spring unimpeded.

The total cost estimate to stabilize the ravine is \$34,437—\$10,000 for engineering design costs and \$24,437.40 for construction costs. Stabilizing the ravine addresses the following water resources issues and goals highlighted in the District Watershed Management Plan (“Plan”):

- Issue 3: Water Quality
- Issue 5: Erosion and Sediment Control
- Goal 2: Surface Water Management—to protect, improve, and restore surface water quality
- Goal 4: Unique Natural Resources Management—to protect and manage unique natural resources (reducing sediment loading into the Minnesota River is beneficial for aquatic habitat)
- Goal 7: Erosion and Sediment Control—to manage erosion and control sediment discharge

### Conclusion and Recommendations

The Project embodies the District’s strategy to partner with the local government to leverage resources to protect, preserve, and manage water and natural resources within the District. Although it is low on the list of 2019 funding priorities, the Project aligns well with the priority to remedy erosion issues in the District and addresses the Plan’s goals. Young Environmental recommends contributing \$35,000 to the City’s Project. As a condition for accepting the District’s contribution, the City should be asked to share the following information with the District:

- Final option selected, designed, and constructed
- Funding contributors
- Final plans