BOLTON & MENK

Real People. Real Solutions.

1243 Cedar Street NE
Sleepy Eye, MN 56085

Phone: (507) 810-4184
Bolton-Menk.com

January 16, 2025

Kelly Hendrickson
Freeborn County Auditor-Treasurer
411 Broadway S
P.O. Box 1147
Albert Lea, MN 56007

Re: Preliminary Engineer's Report
Improvement of Main Open Ditch
Freeborn-Waseca Judicial Ditch No. 8
BMI Project No.: 0S1.132250

Greetings:

I am enclosing 8 copies of the Preliminary Engineer's Report for the Improvement of Main Open Ditch, Freeborn-Waseca Judicial Ditch No. 8 in Freeborn County. With the submission of this report, the project should be ready to move toward the Preliminary Hearing.

As you probably know, the DNR requires a 30-day review period for the report prior to the hearing. The DNR Commissioner has designated an email address to submit public drainage system documents and an electronic copy of the report has been submitted accordingly.

In addition to the DNR, we should also notify the Freeborn County SWCD and NRCS offices as well as any other affected agencies or individuals for coordination and potential funding. Under a separate letter, we will send copies of the report to the SWCD and NRCS office. Additional copies of the Report should be distributed to the County Board members prior to the Hearing. I am also sending copies of the report to the ditch petitioners.

Please check with Rinke Noonan and myself prior to setting the hearing date to assure that there are no meeting conflicts. My understanding is that the hearing may be scheduled for February or March 2025. As you know, published and mailed notice of the hearing to the landowners in the system is also required.

If you have any further questions regarding the project, please feel free to contact me.

Sincerely,
Bolton & Menk, Inc.

Shaun P. Luker, P.E.

cc: DNR Director, MN DNR (1 copy of report via e-mail)
John Kolb, Rinke-Noonan (1 copy of report)
Perry Berg, Attorney for Petitioners, Patton, Hoversten & Berg, P.A. (1 copy of report)
Dave Claussen, Freeborn County Drainage Inspector (1 copy of report)
Petitioners: Schultz, Hanson, Phillips Farm Family Partnership, Schadegg Properties LLC, Oban, Malakowsky (1 copy of report)

BOLTON & MENK

Real People. Real Solutions.

Preliminary Engineer's Report for

Improvement of Main Open Ditch
Freeborn-Waseca Judicial Ditch No. 8

0S1.132250

January 2025

Submitted by:
Bolton & Menk, Inc.
1243 Cedar Street NE
Sleepy Eye, MN 56085
P: 507-794-5541
F: 507-794-5542

Certification

Preliminary Engineer's Report

For

Improvement

Of

Main Open Ditch

Of

Freeborn-Waseca Judicial Ditch No. 8

January 2025

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.

By: Shaun P. Luker

Shaun P. Luker, P.E.
License No. 48756

Date: 1-14-2025

Table of Contents

Exhibits

STATE OF MINNESOTA

FREEBORN COUNTY, MINNESOTA

IN THE MATTER OF THE PETITION FOR AN IMPROVEMENT OF FREEBORN-WASECA JUDICIAL DITCH NO 8 IN FREEBORN COUNTY, MINNESOTA:

On October 3, 2023, the Joint Authority Board of Commissioners, acting as the Drainage Authority for Judicial Ditch No. 8 (JD 8) in Freeborn and Waseca Counties, in accordance with Minnesota Statute 103E.215, accepted a petition for the improvement of portions of JD 8. Subsequent to that authorization, preliminary field surveys were performed to obtain elevations and establish an alignment for the proposed open ditch and culvert crossing improvements.

This Preliminary Engineer's Report summarizes the findings of the research, surveys, and analysis for the improvement and is submitted for consideration by the Ditch Authority.

I. LOCATION AND SCOPE OF IMPROVEMENT

Judicial Ditch No. 8 lies within and provides drainage to a large watershed in the northwest portion of Freeborn County and south-central portion of Waseca County. The open ditch system is nearly five miles long and drains generally from south to north. The system provides drainage to Sections 1, 2, 12, 13, and 24 of Freeborn Township in Freeborn County and Section 35 of Byron Township in Waseca County.

The outlet for JD 8 is a natural waterway commonly known as Boot Creek about two miles south of New Richland in Waseca County. The total estimated watershed for JD 8 from USGS Streamstats data is 6.3 square miles.

The petition presented to the Board requests consideration for the improvement of the Main open ditch of JD 8. The petition requested improvement of the ditch flowline, culvert crossings, and weir control structure from 1360 linear feet downstream of the CSAH No. 10 crossing to the 335th Street crossing. The culverts at both road crossings were included in the petition to be investigated.

Bolton & Menk, Inc. collected field survey information in November of 2023 to determine the existing conditions of JD 8. This field survey information included the elevation of the bottom of the ditch, the top of both sides of the ditch, and tile/intake outlets throughout the project extents. The survey also included establishing the elevation and size of the culvert crossings and weir control structure, as well as centerline information of the roadway at the culvert crossings.

The design of the improvements has also utilized LIDAR data provided by the Minnesota Department of Natural Resources. This data, obtained from an aerial flight, provides additional elevation data at a confidence level equal to two-foot vertical contours.

Other information used for this report includes plans obtained from Freeborn County files.

II. EXISTING DITCH SYSTEM

Public information regarding the Judicial Ditch No. 8 system was received from Freeborn County. This information provides a limited history of the JD 8 system. JD 8 was petitioned for establishment in 1920, with construction completed in 1922. The original benefits for the ditch system were $87,813.94.

An extensive improvement of the existing system occurred in 1975 for the amount of $80,934.00.

III. CAPACITY OF THE EXISTING DRAINAGE SYSTEM

The portion of the proposed system improvements consists of open ditch. According to the petitioner reports, the system is not able to drain the watershed adequately, resulting in extended ponding in portions of the watershed. The main reason for the ponding in the upper portions of the system is because the existing box culvert at 335th Street is higher than the upstream culverts. The existing ditch upstream of 335th Street sits with permanent water in it and not allowing the upstream tiles to adequately drain into the ditch. This ponding results in crop stress and crop loss. The standing water in the ditch upstream of 335th Street also causes the existing ditch banks to be saturated and not allow the establishment of grasses which then causes sluffing and instability of the ditch banks. Because of the limitations of the drainage system, the petitioners requested an improvement of the drainage system.

The existing drainage system analysis used standard engineering methods. The estimated capacity of the existing open ditch used the Manning equation. The capacity calculations for the culvert crossings used HEC-RAS, a culvert modeling software developed by the US Army Corps of Engineers. The amount of drainage needed for modern crop production has been compared to standards recommended by the Natural Resources Conservation Service (NRCS). The NRCS Engineering Field Handbook Minnesota Supplement 650.0703 for Grassed Waterways Curve 2 was used to determine the design discharge for the ditch watershed at each of the culvert crossings within the study area. The watershed contributing flow to the open ditch at each of the culverts was delineated using the USGS Streamstats program and confirmed using LIDAR data.

The exiting capacity of the culverts within the study area was calculated by determining the headwater (upstream) elevation for each of the culverts at the design flow. NRCS Code 608 guidance states that one-foot of freeboard should be provided between the design water surface profile in the open ditch, and the ground elevation of the low areas being served by the open ditch. The headwater elevation was then compared to the maximum elevation for one-foot of freeboard for each of the culverts.

Table 1 show below states the upstream and downstream elevations for the two culverts within the proposed improvement and the culvert directly upstream.

Table 1 – Existing Culvert Elevations

Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	Culvert Invert Elevation (Feet)	
			Upstream	Downstream
Field Crossing W 1/2 SE 1/4 Sec 01-104-23	84" CMP	2592	1183.75	1184.38
Box Culv 335th Street (CR No. 70)	2 - 10' X 10' Concrete	3072	1186.80	1186.80
Culv Crossing 660th Ave (CSAH No. 10)	120" RCP	3162	1185.60	1186.00

As stated above in Table 1 the existing upstream field crossing's outlet is three feet below the inlet of the existing double box culvert on 335th Street. This causes water to be trapped within the system at a Normal Water Level of 1186.80.

A summary of the existing headwater elevations for the culverts within the area of the Improvement is in Table 2.

Table 2 – Culvert Headwater Elevation								
Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	Headwater Elevation (Feet)					
			2- year	5-year	10-year	25-year	50-year	100-year
Box Culv 335th Street (CR No. 70)	2 - 10' X 10' Concrete	3072	1190.67	1192.39	1193.59	1195.14	1196.36	1197.69
Culv Crossing 660th Ave (CSAH No. 10)	120" RCP	3162	1189.77	1191.52	1192.75	1194.36	1195.68	1197.03

Table 3 – Existing Ditch Capacity Computations										
Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	NRCS Ditch Flow (cfs)	NRCS Ditch Flow (In./ Day)	Ditch Bottom Width (ft)	Ditch Grade (%)	Ditch Capacity (cfs) (n= 0.035)	Culvert Capacity (cfs) at Max Depth	Limiting Capacity (cfs)	Ditch Efficiency Ratio
Field Crossing W 1/2 SE 1/4 Sec 01-104-23	84" CMP	2592	83	0.76	8	0.05	128	99	99	0.90
Box Culv 335th Street (CR No. 70)	2 - 10' X 10' Concrete	3072	97	0.75	8	0.05	102	102	102	0.79
Culv Crossing 660th Ave (CSAH No. 10)	120" RCP	3162	100	0.75	8	0.03	422	282	282	2.12
Control Structure (To be Removed)	Broad Crested Weir	3520	111	0.75	8	0.03	422	282	282	1.91

As can be seen in Table 2 and Table 3, the culverts are generally the limiting factor that determines the capacity of the ditch.

IV. DISCUSSION OF IMPROVEMENT

The petitioners for the Improvement of the Judicial Ditch 8 Open Ditch have requested the consideration of the construction of improvements in order to increase the drainage capacity of the system. A preliminary survey and the hydrologic and hydraulic analysis of potential improvements to the drainage system has been performed in order to establish preliminary grades and sizes of the proposed improved ditch and culverts, and the preliminary grades, sizes, and depths of the tile systems, and to analyze the outlet. General observations and results of the analysis are as follows:

A. DESCRIPTION

As shown in Exhibit 1, the proposed Improvement consists of the following:

The improvement of JD 8 includes removing the weir at station 82+00 and lowering/re-grading the ditch to upstream of 335th Street to match the existing ditch grade upstream of 335th Street. The upstream culvert is approximately 2.4 feet lower than the double 10’ x 10’ box culvert that currently exists at 335th Street (Table 1). Where the ditch parallels 335th Street the excess material that is removed to lower and regrade the ditch will take place primarily on the north side of the ditch. This is because this section of the ditch was relocated to the north to prevent erosion on the south side of the ditch that threatened 335th Street.

The improvement also includes adding a 36" steel culvert to be installed via trenchless methods at 660th Avenue/CSAH 10 in order to accommodate the lower ditch elevation.

The improvement also includes removing and replacing the existing cast-in-place 10' x 10' box culvert at 335th Street, which is 2.4 feet higher than the upstream ditch, with a new 10' x 10' box culvert at the lower ditch elevation. This work is proposed to be completed by the Freeborn County Highway Department, as the existing box culverts have been determined to be in need of replacement.

Other components of the proposed Improvement include:

a) Reconstructing the outlets of existing tiles coming into the open ditch, and any intakes adjacent to the spoil berm impacted by the work.

b) Construct riprap as erosion protection on the outlet side of the culverts, and at the inlet side of the culverts if warranted.

c) Construct riprap slope stabilization along the ditch slopes where side slope stability has been an issue.

d) Reseed the ditch slopes, a minimum of a one-rod buffer (16.5 feet), and any portions of the spoil bank that exceed a one rod width.

e) Reconstructing the surface above the culvert crossings.

B. DESIGN DATA

As shown on Exhibit 1, the proposed improvements to the Main Open Ditch consist of improving the open ditch, replacing drain outlet pipes, and installing a 36-inch trenchless culvert adjacent to the CSAH 10 crossing. The type of pipe that should be used for the improvement is as follows:

1. Steel pipe will be welded steel pipe, new material with a minimum yield strength of 35,000 PSIG (pounds per square inch gauge). With the 36-inch pipe having a wall thickness of 0.5-inches.

2. Corrugated Steel Pipe shall meet the requirements of MnDOT standard specifications as laid out in 3226. Including a metallic zinc (galvanized) coating of the pipe.

The criteria for the design of the open ditch system are based on Natural Resources Conservation Service (NRCS) methodology. The NRCS Engineering Field Handbook Minnesota Supplement 650.0703 for Grassed Waterways Curve 2 was used to determine the design discharge for the ditch watershed at each of the culvert crossings within the study area and then sizing the culverts to provide 1-foot of freeboard as stated in NRCS Code 608 guidance.

A summary of the proposed headwater elevations for the culverts within the area of the Improvement is in Table 4.

Table 4 – Culvert Headwater Elevation

Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	Headwater Elevation (Feet)					
			2- year	5-year	10-year	25-year	50-year	100-year
Box Culv 335th Street (CR No. 70)	2 - 10' X 10' Concrete	3072	1189.01	1190.79	1192.43	1194.06	1195.40	1196.81
Culv Crossing 660th Ave (CSAH No. 10)	120" RCP	3162	1188.81	1190.49	1192.15	1193.74	1194.98	1196.29

The proposed improvements' efficiency of the Main open ditch is shown in Table 5 below.

Table 5 – Existing Ditch Capacity Computations

Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	NRCS Ditch Flow (cfs)	NRCS Ditch Flow (In./ Day)	Ditch Bottom Width (ft)	Ditch Grade (%)	Ditch Capacity (cfs) (n= 0.035)	Culvert Capacity (cfs) at Max Depth	Limiting Capacity (cfs)	Ditch Efficiency Ratio
Field Crossing W 1/2 SE 1/4 Sec 01-104-23	84" CMP	2592	83	0.76	6	0.05	128	99	99	0.90
Box Culv 335th Street (CR No. 70)	2 - 10' X 10' Concrete	3072	97	0.75	6	0.05	102	102	102	0.79
Culv Crossing 660th Ave (CSAH No. 10)	120" RCP	3162	100	0.75	8	0.03	422	282	282	2.12
Removed Control Structure		3520	111	0.75	8	0.03	422	282	282	1.91

V. ALTERNATIVE SOLUTIONS

A. "DO NOTHING ALTERNATIVE"

The "Do Nothing" Alternative has been discussed. However, the petitioners have experienced poor drainage throughout the drainage system for many years with the excess surface water damaging crops and resulting in frequent crop stress or crop loss. This loss of production equates to an economic loss for Freeborn County and the State of Minnesota. The loss results in a reduced property value for the wet acres, thus affecting the taxing capacity of the County and State. In addition, the ability of the landowners to receive a reasonable return on their investment is diminished because of this inadequate drainage.

For these reasons, the "Do Nothing" alternative has been dismissed. The economic question of the cost of the Improvement versus the benefits derived still needs to be evaluated. However, the "Do Nothing" alternative is not viewed as solving the drainage problem in the watershed.

B. REMOVE AND REPLACE EXISTING CULVERT

An alternate solution to adding an additional culvert underneath CSAH 10 would be to remove the existing culvert and place it at the design invert elevations of the additional culvert. The existing 169-inch by 107-inch precast concrete arch pipe was installed in 2011 and under a bituminous roadway. It is feasible to remove and replace the existing structure. However, with the structure only being constructed in 2011 it is not recommended for a full replacement of the existing structure. It is also not advisable to re-use the structure after it has been excavated and removed from its current location. The risk associated with this type of construction outweighs any cost savings or hydraulic characteristics benefits.

VI. OTHER CONSIDERATIONS

A. PERMIT REQUIREMENTS

A permit from the Minnesota Pollution Control Agency for stormwater and erosion control for the project would be necessary. This permit requirement, which applies to any project that disturbs more than one acre of land, requires that the contractor and owner secure a

permit for the project. The permit process will also require erosion control measures to be taken during the construction. Typical erosion control measures include place of riprap and grass stabilization on the ditch bank and inlet protection around installed inlet areas. The fee for this permit is currently $400.00. This permit will be applied for shortly before construction is scheduled so that the contractor can also sign the permit application.

A permit will also be necessary for the crossing of CSAH 10 from the Freeborn County Highway Department. This permit will be applied for after the Preliminary Hearing

B. WETLANDS

National Wetland Inventory Maps have been reviewed to locate potential wetlands subject to regulations. These maps do not show any wetlands within the project watershed, as shown on Sheet 1.01 in Exhibit 1. However, wetlands on farm ground often do not show up on the national inventory maps. Impacts of the potential drainage system on individual land parcels will be evaluated by the Natural Resources Conservation Service upon filing of a Form AD 1026 by landowners. This NRCS process will identify any wetlands and measures that need to be taken in order for the drainage project to avoid impact to these wetlands. Because of federal data privacy requirements, it is not possible for non-landowners to obtain this information. Thus, the obligation for filling out these forms and doing this investigation will rest with individual landowners.

Drainage of non-directly impacted wetland will be controlled by supplemental drainage systems installed by private owners. Owners are advised that under US Army Corps of Engineers and NRCS rules, such supplemental drainage may not be permitted, and may affect US Department of Agriculture program eligibility.

C. PUBLIC AND PRIVATE BENEFITS AND COSTS

The estimated cost of the proposed Improvement to JD 8 is shown in Exhibit 3 of this report. Benefits for the Improvement, both public and private, will be established by the viewers and a report will be available at the final hearing.

Landowners certainly have other costs associated with construction and maintenance of their individual drainage systems. The proposed Improvement would only serve as an outlet or collector of runoff and drainage flow from the lands within the watershed. Each landowner is responsible to construct and maintain their own drainage system in order to drain their farmlands adequately. Individual benefits for an adequate drainage system are in increased crop production from farmlands.

The estimated cost of the proposed Improvement is included in this report. The public and private benefits and damages will be available at the final hearing.

D. AGRICULTRUAL EFFECTS

Once the improvements are constructed, the lands within the improved watershed will be largely dependent on this drainage system for both surface and subsurface drainage flows. Thus, it is imperative that the proposed system have adequate capacity in order to allow for modern farming operations.

It should be noted that many of the established ditch systems in Minnesota are now 70 to 100 years old. These systems are approaching the need for complete repair or replacement if the farmland is to remain productive. When feasible, it is economically imperative that these drainage systems be improved to become compatible with present day farming techniques and they be continually maintained. If properly maintained during normal growing seasons, the agricultural lands in the watershed are some of the most productive in

the State of Minnesota.

E. WATER QUALITY

Little change in measurable water quality is anticipated because of this Improvement. However, there are components of the Improvement that will mitigate erosion and help improve water quality on a micro watershed scale. Some of the existing culvert crossings are hydraulically undersized, which leads to higher velocities through the undersized culvert, which can cause scour and erosion on the outlet end of the culvert. Increasing the size of the culvert crossings will lead to lower outlet velocities. At the culvert outlets, riprap will be constructed to further reduce the energy at the outlets, and lessen the erosive force. The largest source of suspended solids in tile system drainage is from water discharging into open intakes. Although open intakes will still be used on the system, ponding occurs around these intakes for any significant storm events. Thus, solids have time to settle rather than being discharged. The use of Hickenbottom risers on these intakes has been shown to result in a significant reduction in suspended solids discharge and thus their use will help with water quality. The one-rod (16.5 feet) buffer strip will be acquired if not already done so, or re-established along the Improvement limits.

As a requirement of the MPCA Erosion Control Permit, the establishment of an erosion control plan is anticipated. Incorporation of such devices as inlet protection, riprap at the outlet and permanent grasses as soon as possible following the construction are anticipated. All of these measures will help to reduce erosion and maintain water quality during the construction of the project.

The Freeborn County SWCD and NRCS Offices will be contacted regarding conservation measures. The SWCD encourages landowners to sign up for the Conservation Reserve Program (CRP). This is a volunteer program, so landowners are encouraged to call the local agencies to discuss additional conservation measures.

F. FISH AND WILDLIFE

The only threatened or endangered species to have the potential to be in Freeborn County at the time of this report is the northern long-eared bat. According to the Minnesota DNR, there are no known roost trees or hibernacula in Freeborn County. Additionally, there are no trees to be removed as a part of the improvement, so there is no impact to the northern long-eared bat. Bald eagles are present in Freeborn County and are protected under the Bald and Golden Eagle Protection Act. Again, there are no trees to be removed as a part of the improvement, so there is no impact to the bald eagle.

The open ditch and existing grass buffers are potential wildlife habitat. These areas will be temporarily impacted during the construction of the improvement but will be restored or improved following the construction. The improvements made to the culvert crossings will reduce the water velocities through the culverts, which will allow for easier passage of fish.

Current wet areas within the project watershed do provide for transitory stop over locations for migratory waterfowl. However, these areas currently dry up following wet periods and are then under cultivation and production. It is anticipated that some of these temporary ponding areas will still exist after the construction of the Improvement although ponding times will likely be reduced. Therefore, the provisions for adequate drainage of these lands will not be of a detrimental nature to local wildlife resources.

G. GROUNDWATER

The purpose of an agricultural drainage system is to maintain the elevation of the shallow groundwater table sufficiently below the surface to provide for efficient production of

crops. The level at which the groundwater will be maintained has been and will be determined by the depth of the tile system and private tiles in the area. The proposed Improvement will not significantly lower the bottom of the ditch or the tile system. Additionally, soils within the watershed are typically C or D soils, with low infiltration rates. Therefore, no change in the availability, distribution, or use of the groundwater beyond that necessary for the sufficient production of crops within the watershed is anticipated by this construction.

H. ENVIRONMENTAL IMPACT

The adverse effects of the proposed Improvement are of a temporary nature and are listed as follows:

1. Disturbing the ground surface during construction could result in the loss of one crop within the construction limits.

2. Embankment areas will be stripped of topsoil prior to the placement of non-topsoil material in order to preserve topsoil.

3. Temporary noise and dust generation can be expected from the construction operations. These impacts are not viewed as significant since there are no residences near the proposed construction route.

4. Temporary erosion of soil may occur in the construction area until permanent ground cover and ground stabilization occurs. Although these effects need to be considered, they are not significantly different from the current topsoil loss that occurs annually from erosion of topsoil due to overland flow in the watershed. This construction erosion will be minimized using inlet protection, riprap, and rapid establishment of permanent grass cover.

Numerous beneficial effects are anticipated from the proposed Improvement. Most of these benefits are directly attributable to increased crop production from lands presently damaged through period flooding and ponding. Among the most obvious benefits are the following:

1. The re-establishment of the grass buffer along the open ditch, decreasing the outlet velocity at the culvert crossings, and the use of Hickenbottom intakes will improve water quality on a micro watershed scale.

2. Increased personal farm income

3. Increased value of benefited farmland

4. Contribution to the local economy through additional purchases, farm modernization, and expansion.

I. LAND USE

The present use of the land in the Improvement watershed is largely agricultural. This use is expected to continue into the future.

VII. ADEQUACY OF THE OUTLET

A. GENERAL INFORMATION

Judicial Ditch 8 generally flows South to North to an eventual outlet into Boot Creek, approximately 3 miles northeast of the project boundary.

B. ADEQUACY OF THE OUTLET

A HecRas model of the watershed was developed to estimate the change in the peak flow rates on the downstream side of CSAH 10. A summary of the existing and proposed peak flows are presented in the table below. A summary of the change in headwater elevations can be found in Table 1 and Table 3 of this report.

Table 6 – Adequacy of the Outlet

Flow Event	Existing Peak Flow (cfs)	Existing Tail Water Elevation	Proposed Peak Flow (cfs)	Proposed Tail Water Elevation	Change in Peak Flow (Pro.-Ex.) (cfs)	Change in Peak Elevation (Pro.-Ex.)
2-Year	107	1189.32	107	1188.00	0	-1.32
5-Year	224	1190.72	224	1189.53	0	-1.19
10-Year	326	1191.64	326	1190.50	0	-1.14
25-Year	477	1192.75	477	1191.65	0	-1.10
50-Year	607	1193.56	607	1192.46	0	-1.07
100-Year	1140	1194.30	1140	1193.22	0	-1.08

As can be seen in Table 5, the additional culvert underneath CSAH 10 does not impact actual flow rates through the system. The system can transport these flows uninterrupted without the additional culvert. What can be seen is the overall decrease in peak elevation of the ditch system. With no increase in capacity of the ditch and a decrease in localized peak elevations it is our opinion that the outlet is adequate.

VIII. ESTIMATE OF COST

The preliminary cost estimate to construct the proposed Improvements, as described in this report is shown in Exhibit 3. The total estimated project cost storage is approximately $341,110. The cost estimate also includes compensation for agricultural land that will be temporarily taken out of production by the construction for temporary right-of-way (4 acres). The individual landowners will be compensated for this loss through the damage process of the further ditch proceedings.

IX. RECOMMENDATIONS

The proposed Improvements to the Judicial Ditch 8 in Freeborn County as described in this report is feasible and practical and is necessary in order to provide drainage for the open ditch. The existing drainage in the area is inadequate to provide proper drainage. The outlet is adequate in order to convey the discharge.

It is the recommendation of your engineer that the Preliminary Engineer's Report be approved, the Board determines if the online storage alternative is to be included in the scope of the improvement, that the Board appoint Viewers, and order the preparation of the Final Engineer's Report for the Improvement.

EXHIBIT 1: PRELIMINARY PLANS AND PROFILES

PRELIMINARY CONSTRUCTION PLANS FOR

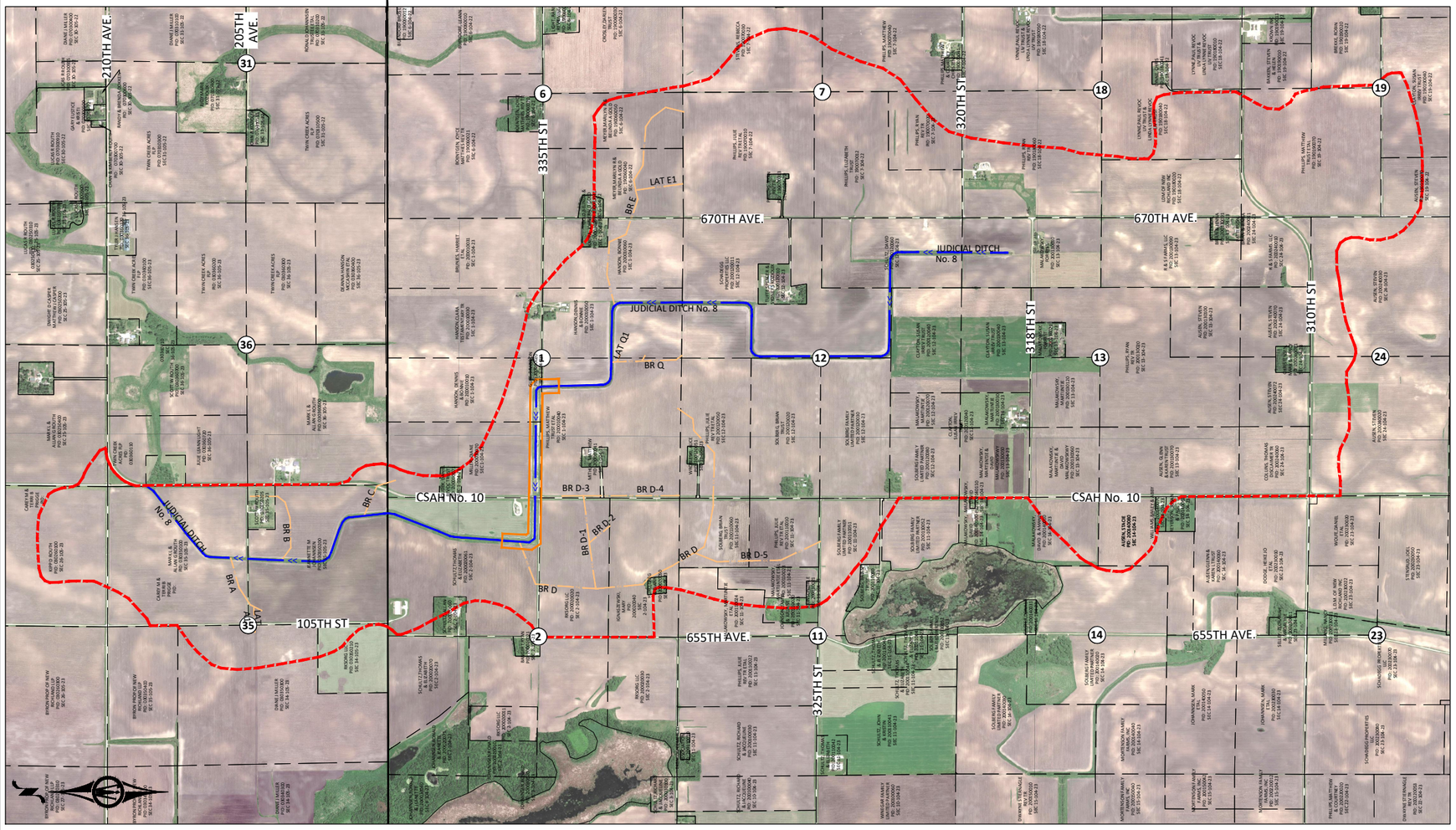
JUDICIAL DITCH No. 8 IMPROVEMENTS

FREEBORN COUNTY, MINNESOTA

DITCH IMPROVEMENTS, CULVERT REPLACEMENTS, TILE OUTLET REPLACEMENTS

JANUARY, 2025

WASECA COUNTY ⟷ FREEBORN COUNTY



SHEET NUMBER	SHEET TITLE
GENERAL	
G0.01 - G0.02	TITLE SHEET, LEGEND, GENERAL NOTES
CIVIL	
C0.01	TRAFFIC CONTROL PLAN
C1.01 - C1.02	TABLES, DETAILS, TYPICAL SECTIONS, PHASING PLAN
C5.01 - C5.02	STORM SEWER PLAN & PROFILE
C8.01 - C8.05	CROSS SECTIONS
THIS PLAN SET CONTAINS 12 SHEETS.	

RESOURCE LIST

FREEBORN COUNTY
411 BROADWAY S
ALBERT LEA, MN 56007

COUNTY COMMISSIONERS: FREEBORN COUNTY
BRAD EDWIN - CHAIR
LUKAS SEVERSON
CHRISTOPHER SHOFF
DAWN KAASA
NICOLE ECKSTROM

AUDITOR-TREASURER:
KELLY HENDRICKSON
507-337-5121

DRAINAGE INSPECTORS: FREEBORN COUNTY
DAVE CLAUSSEN
507-377-4477

COUNTY ENGINEER:
PHILIP WACHOLZ
3300 BRIDGE AVE
ALBERT LEA, MN 56007
507-337-5188

COUNTY COMMISSIONERS: WASECA COUNTY
DOUG CHRISTOPHERSON
BRIAN HARGUTH
BRAD KRAUSE
DEANNE MALTERER
BRAD MILBRATH

0 1200 2400
SCALE FEET

LEGEND

EXISTING OPEN DITCH
PROPOSED DITCH IMPROVEMENTS
EXISTING TILE
WATERSHED BOUNDARY

BM=1201.70
MAG SPIKE
SECTION CORNER
AT INTERSECTION OF
335TH STREET & CSAH 10

PROJECT DATUM: FREEBORN COUNTY
HORIZONTAL: NAD83 (2011 ADJ)
VERTICAL: NAVD88

RECORD DRAWING INFORMATION
OBSERVER:
CONTRACTOR:
DATE:

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.

PRELIMINARY NOT FOR CONSTRUCTION

SHAUN P. LUKER, P.E.
LIC. NO. 48756 DATE 10/25/2024

BOLTON & MENK
1243 CEDAR STREET NE
SLEEPY EYE, MN 56085
Phone: (507) 810-4184
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
DDB			
DRAWN			
DDB			
CHECKED			
SPL			
CLIENT PROJ. NO.			
0S1.132250.000			

FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
TITLE

SHEET G0.01

EXISTING TOPOGRAPHIC SYMBOLS

- ACCESS GRATE
- AIR CONDITION UNIT
- ANTENNA
- AUTO SPRINKLER CONNECTION
- BARRICADE PERMANENT
- BASKETBALL POST
- BENCH
- BIRD FEEDER
- BOLLARD
- BUSH
- CATCH BASIN RECTANGULAR CASTING
- CATCH BASIN CIRCULAR CASTING
- CURB STOP
- CLEAN OUT
- CULVERT END
- DRINKING FOUNTAIN
- DOWN SPOUT
- FILL PIPE
- FIRE HYDRANT
- FLAG POLE
- FLARED END / APRON
- FUEL PUMP
- GRILL
- GUY WIRE ANCHOR
- HANDHOLE
- HANDICAP SPACE
- IRRIGATION SPRINKLER HEAD
- IRRIGATION VALVE BOX
- LIFT STATION CONTROL PANEL
- LIFT STATION
- LIGHT ON POLE
- LIGHT-GROUND
- MAILBOX
- MANHOLE-COMMUNICATION
- MANHOLE-ELECTRIC
- MANHOLE-GAS
- MANHOLE-HEAT
- MANHOLE-SANITARY SEWER
- MANHOLE-STORM SEWER
- MANHOLE-UTILITY
- MANHOLE-WATER
- METER
- ORDER MICROPHONE
- PARKING METER
- PAVEMENT MARKING
- PEDESTAL-COMMUNICATION
- PEDESTAL-ELECTRIC
- PEDESTRIAN PUSH BUTTON
- PICNIC TABLE
- POLE-UTILITY
- POLE-BRACE
- POST
- RAILROAD SIGNAL POLE
- REGULATION STATION GAS
- SATELLITE DISH
- SIGN NON TRAFFIC
- SIGN TRAFFIC
- SIGNAL CONTROL CABINET
- SOIL BORING
- SIREN
- TELEPHONE BOOTH
- TILE INLET
- TILE OUTLET
- TILE RISER
- TRANSFORMER-ELECTRIC
- TREE-CONIFEROUS
- TREE-DEAD
- TREE-DECIDUOUS
- TREE STUMP
- TRAFFIC ARM BARRIER
- TRAFFIC SIGNAL
- TRASH CAN
- UTILITY MARKER
- VALVE
- VALVE POST INDICATOR
- VALVE VAULT
- VAULT
- VENT PIPE
- WATER SPIGOT
- WELL
- WETLAND DELINEATED MARKER
- WETLAND
- WET WELL
- YARD HYDRANT

PROPOSED TOPOGRAPHIC SYMBOLS

- CLEANOUT
- MANHOLE
- LIFT STATION
- STORM SEWER CIRCULAR CASTING
- STORM SEWER RECTANGULAR CASTING
- STORM SEWER FLARED END / APRON
- STORM SEWER OUTLET STRUCTURE
- STORM SEWER OVERFLOW STRUCTURE
- CURB BOX
- FIRE HYDRANT
- WATER VALVE
- WATER REDUCER
- WATER BEND
- WATER TEE
- WATER CROSS
- WATER SLEEVE
- WATER CAP / PLUG
- RIP RAP
- DRAINAGE FLOW
- TRAFFIC SIGNS

SURVEY SYMBOLS

- BENCHMARK LOCATION
- CONTROL POINT
- MONUMENT FOUND
- CAST IRON MONUMENT
- STONE MONUMENT

EXISTING TOPOGRAPHIC LINES

- RETAINING WALL
- FENCE
- FENCE-DECORATIVE
- GUARD RAIL
- TREE LINE
- BUSH LINE

SURVEY LINES

- CONTROLLED ACCESS
- BOUNDARY
- CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- SETBACK LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- TEMPORARY EASEMENT

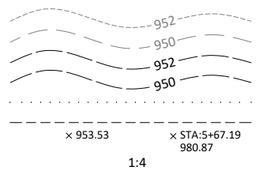
EXISTING UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE

PROPOSED UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- PIPE CASING
- TRENCHLESS PIPE (PLAN VIEW)
- TRENCHLESS PIPE (PROFILE VIEW)

GRADING INFORMATION



- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED GRADING LIMITS / SLOPE LIMITS
- PROJECT LIMITS
- PROPOSED SPOT ELEVATION
- RISE:RUN (SLOPE)

HATCH PATTERNS

- BITUMINOUS
- GRAVEL
- CONCRETE

EXISTING PRIVATE UTILITY LINES

NOTE:
EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-22, ENTITLED "STANDARD GUIDELINE FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".

- UNDERGROUND FIBER OPTIC
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND COMMUNICATION
- OVERHEAD ELECTRIC
- OVERHEAD COMMUNICATION
- OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G-A G-A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-22.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL.	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

PRELIMINARY - NOT FOR CONSTRUCTION

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SHAUN P. LUKER, P.E.
LIC. NO. 48756 DATE 10/25/2024

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CLIENT PROJ. NO. OS1.132250.000			

FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
LEGEND

SHEET G0.02

GENERAL TRAFFIC NOTES:

1. TRAFFIC CONTROL TO BE PAID BY THE LUMP SUM OF ALL TRAFFIC CONTROL DEVICES REQUIRED TO CONTROL TRAFFIC.
2. ALL TRAFFIC CONTROL DEVICES REQUIRED WILL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE MOST RECENT EDITION OF THE FIELD MANUAL FOR TEMPORARY TRAFFIC ZONE LAYOUTS.

MUTCD	SIZE	TYPE	QUANTITY
TYPE III BARRICADE	8'		4
R11-4 TYPE III BARRICADE	60"X30" 8'		2
W20-3	48"X48"	ROAD CLOSED AHEAD	2
W20-1	48"X48"	ROAD CONSTRUCTION AHEAD	2

HORZ. SCALE 0 200 400 FEET

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FREEBORN COUNTY, MINNESOTA

JUDICIAL DITCH No. 8 IMPROVEMENTS

TRAFFIC CONTROL PLAN

SHEET C0.01

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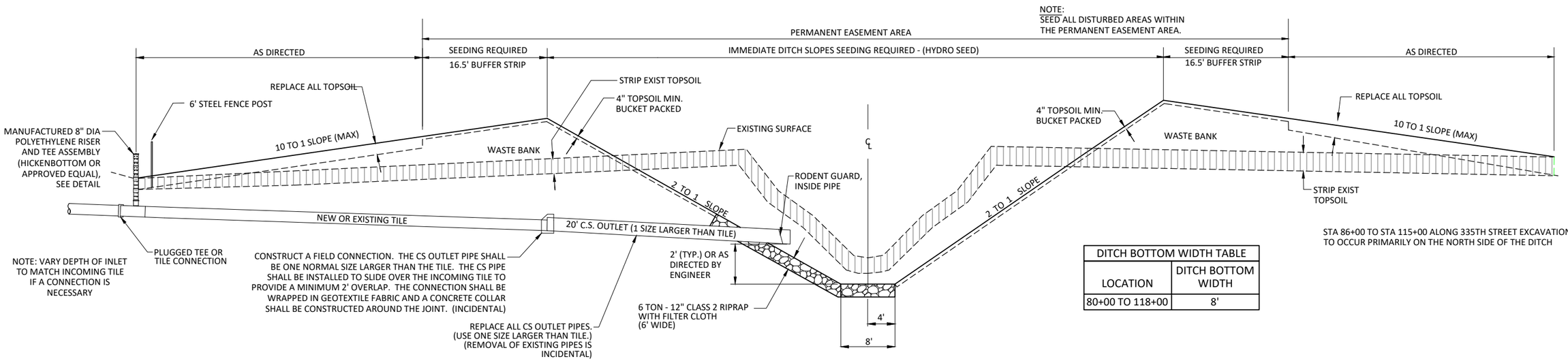
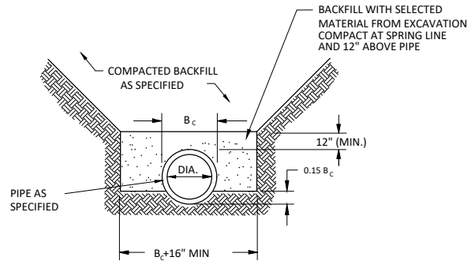


DITCH BOTTOM WIDTH TABLE	
LOCATION	DITCH BOTTOM WIDTH
80+00 TO 118+00	8'

STA 86+00 TO STA 115+00 ALONG 335TH STREET EXCAVATION TO OCCUR PRIMARILY ON THE NORTH SIDE OF THE DITCH

OPEN DITCH TYPICAL SECTION - STA 80+00 TO 118+00

NOT TO SCALE



PIPE DIA.	B
36" OR LESS	B_C + 24"
42" TO 54"	1.5 x B_C
60" OR OVER	B_C + 36"

TRENCH DETAIL FOR C.S. & R.C. PIPE WITH CLASS "C" BEDDING CONDITION

NOT TO SCALE

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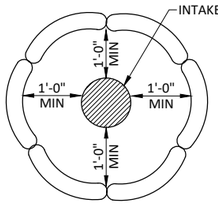
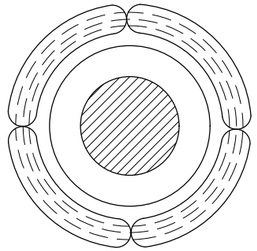
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
DETAILS
TYPICAL SECTIONS & DRAINAGE

SHEET
C1.01

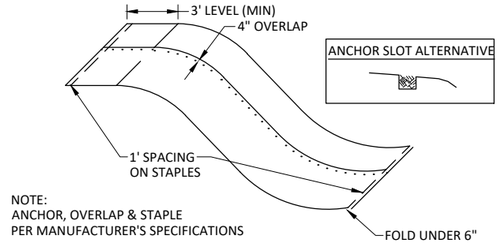


NOTE:
THIS INLET PROTECTION IS USED DURING ROUGH GRADING ONLY, USE BEFORE ROAD IS OPEN TO TRAFFIC OR IS PAVED

PAYMENT SHALL INCLUDE ALL MATERIALS, FILLING OF LOG, PLACEMENT, MAINTENANCE & REMOVAL;
80% OF BID PRICE SHALL BE PAID UPON PROPER PLACEMENT WITH THE FINAL 20% PAID UPON REMOVAL



INLET PROTECTION
WITH ROCK LOG



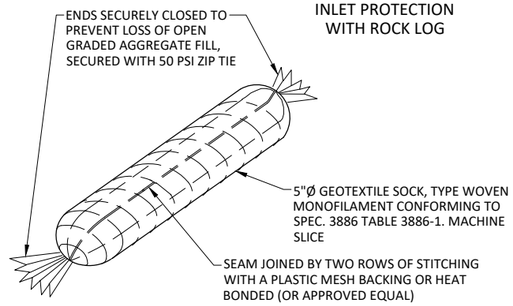
NOTE:
ANCHOR, OVERLAP & STAPLE
PER MANUFACTURER'S SPECIFICATIONS

EROSION CONTROL BLANKET INSTALLATION
NOT TO SCALE

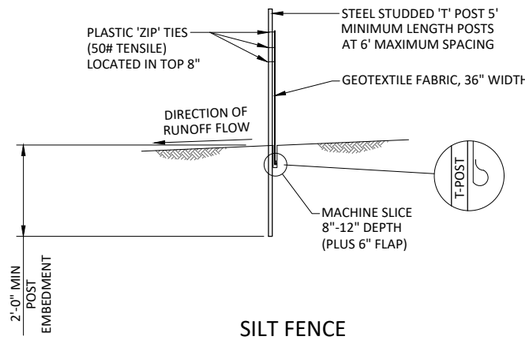
FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

GRADATION	
SIEVE SIZE	PERCENT PASSING
1 1/2"	100
1"	95-100
3/4"	65-95
3/8"	30-65
NO 4	10-35
NO 10	3-20
NO 40	0-8
NO 200	0-3

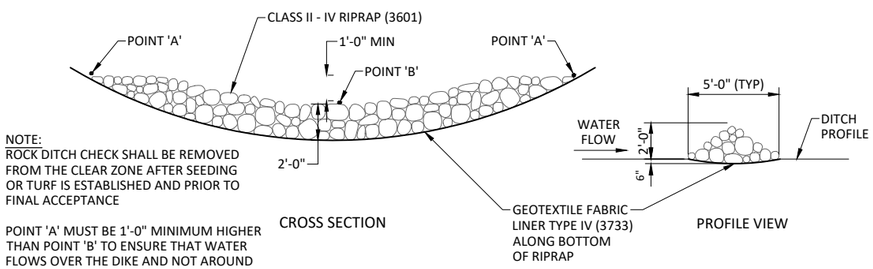
NOTE:
CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.



INLET PROTECTION
ROCK BAG
NOT TO SCALE



SILT FENCE
MACHINE SLICED
NOT TO SCALE



NOTE:
ROCK DITCH CHECK SHALL BE REMOVED FROM THE CLEAR ZONE AFTER SEEDING OR TURF IS ESTABLISHED AND PRIOR TO FINAL ACCEPTANCE

POINT 'A' MUST BE 1'-0" MINIMUM HIGHER THAN POINT 'B' TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

DITCH CHECK
RIPRAP
NOT TO SCALE

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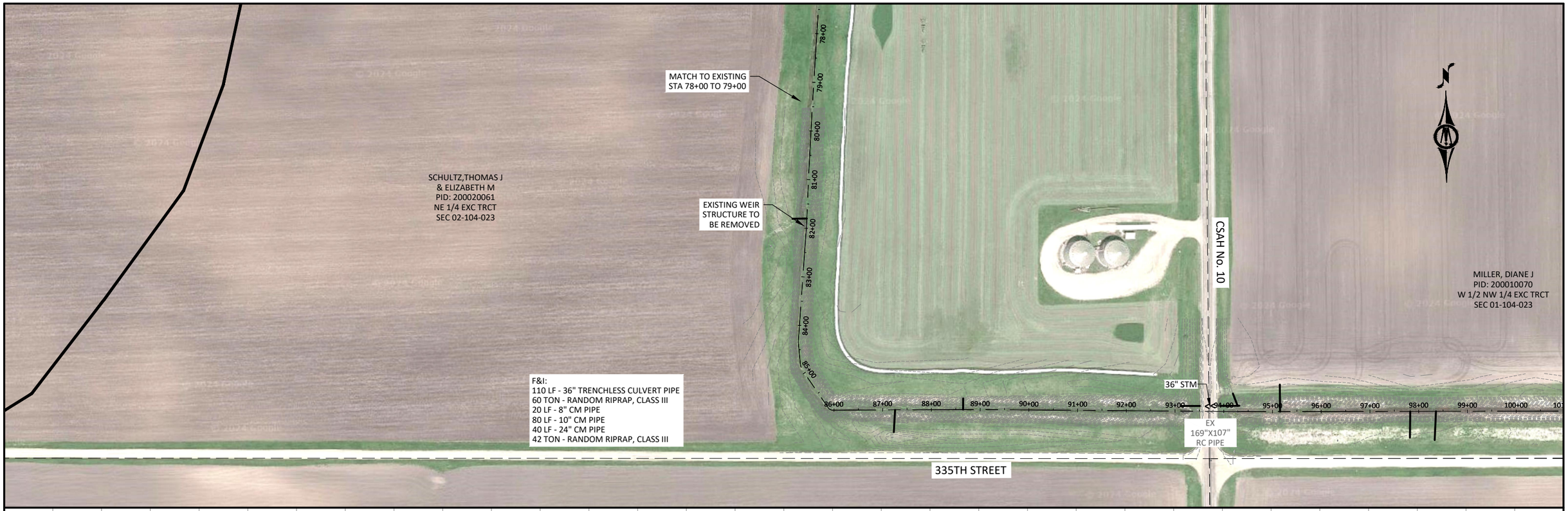
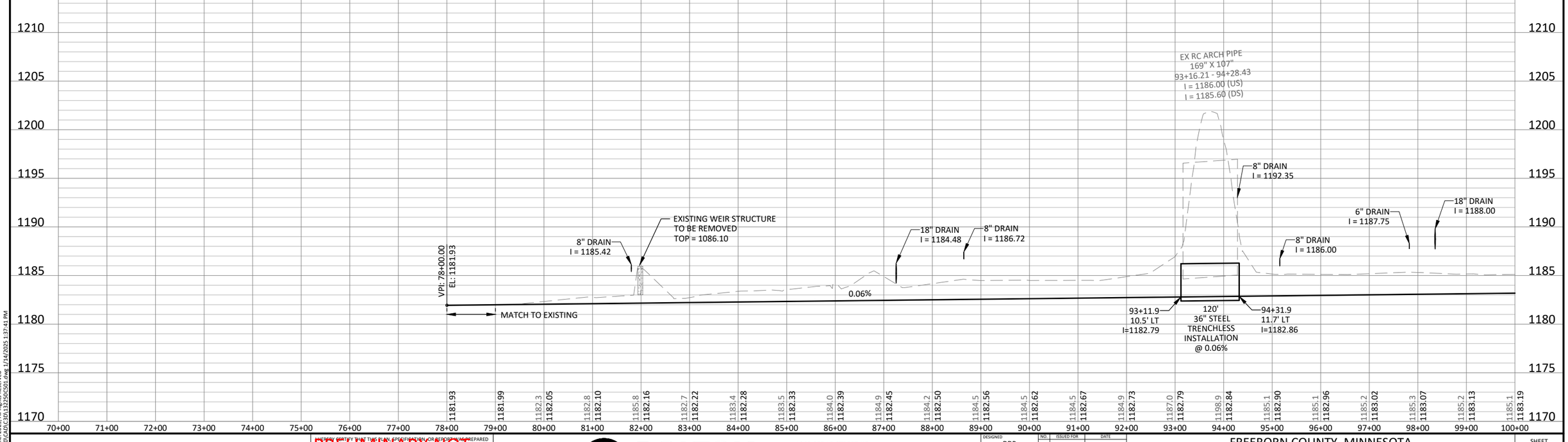
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
DETAILS
EROSION CONTROL

SHEET
C1.02





HORZ. SCALE 0 100 200 FEET

VERT. SCALE 0 5 10 FEET

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FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
JD NO. 8 OPEN DITCH - PLAN & PROFILE
STA 70+00 - 100+00

SHEET C5.01

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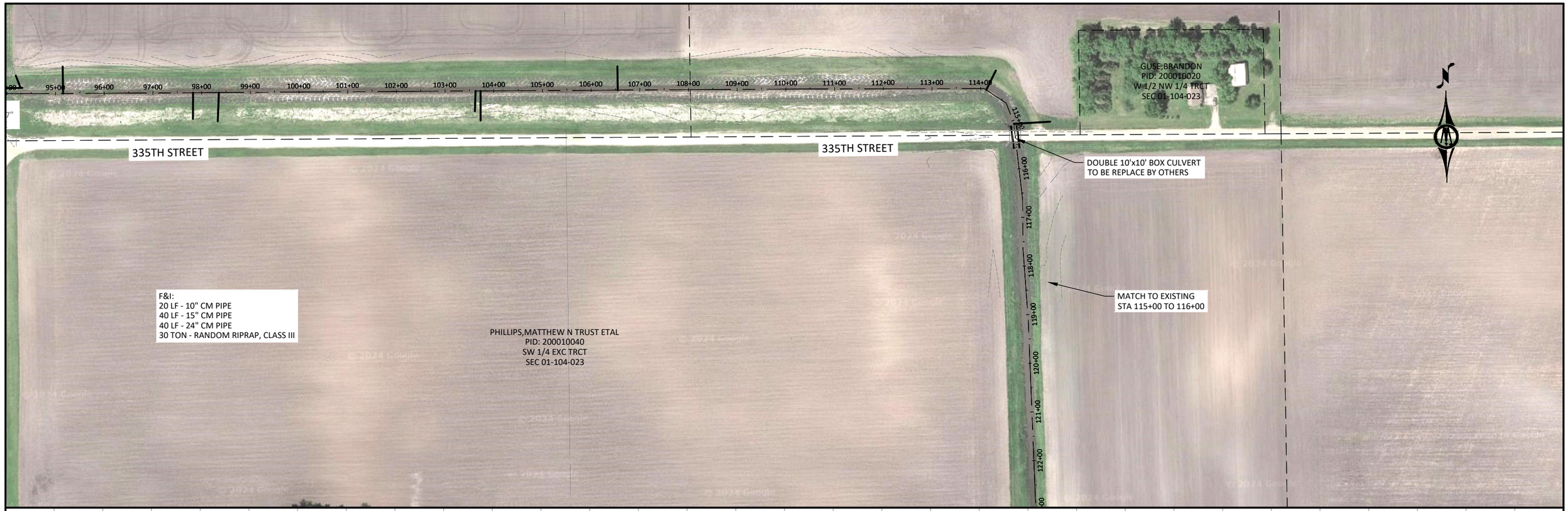

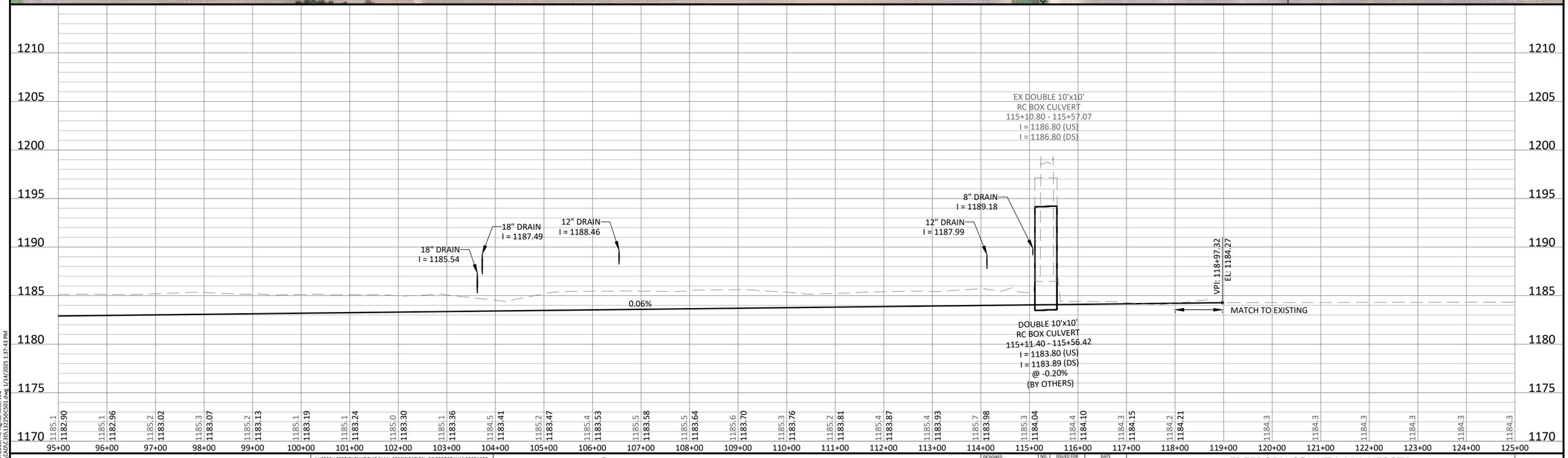

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JUDICIAL DITCH No. 8 IMPROVEMENTS
JD NO. 8 OPEN DITCH - PLAN & PROFILE
STA 95+00 - 125+00

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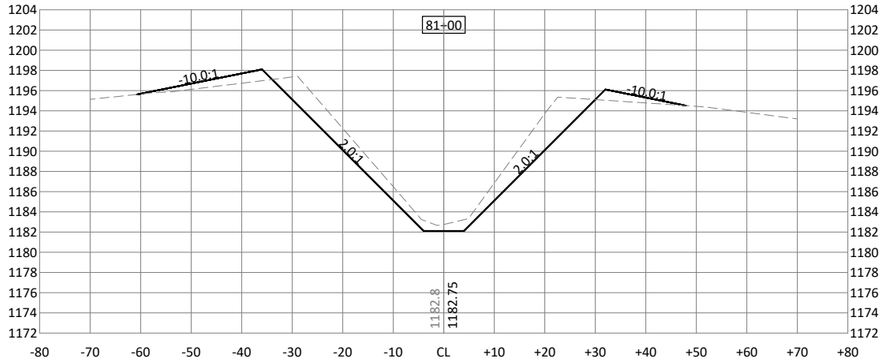

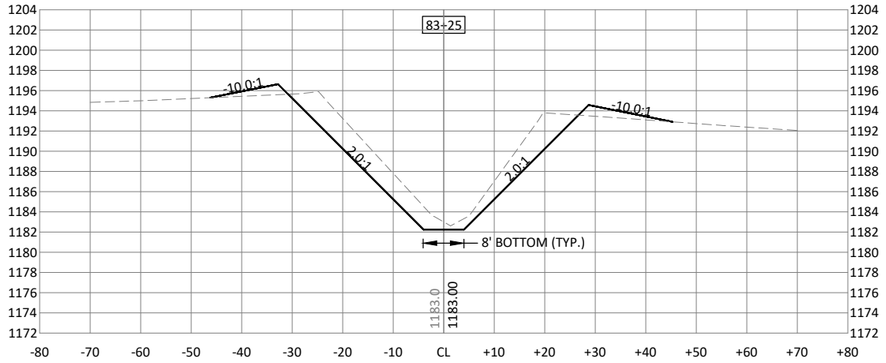

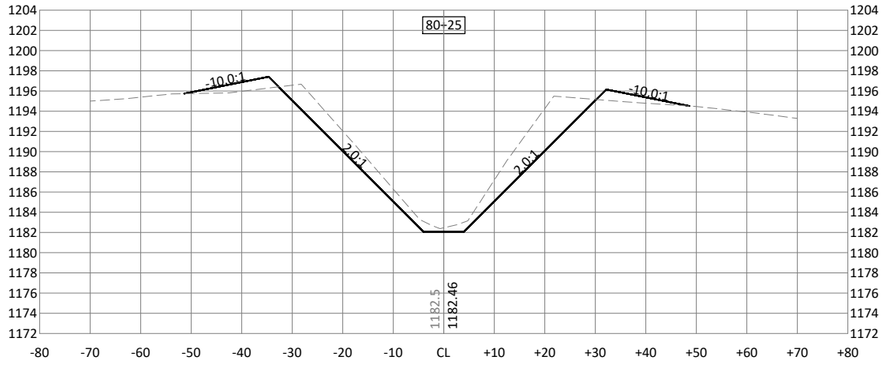

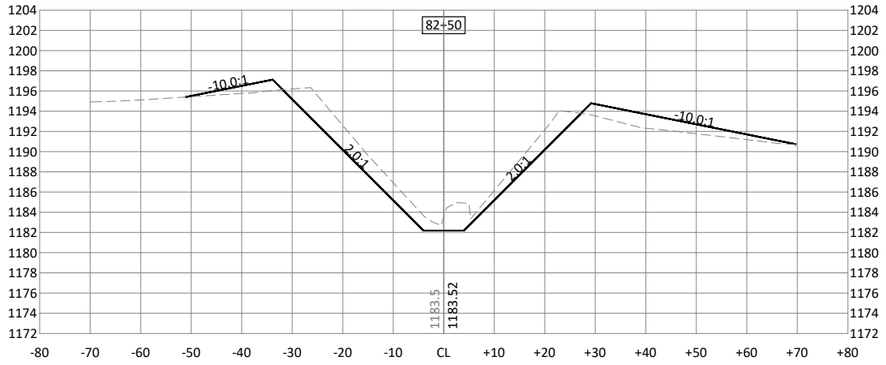

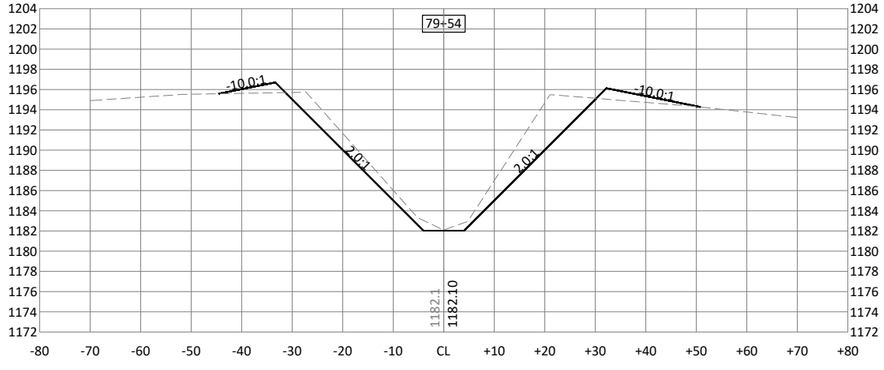

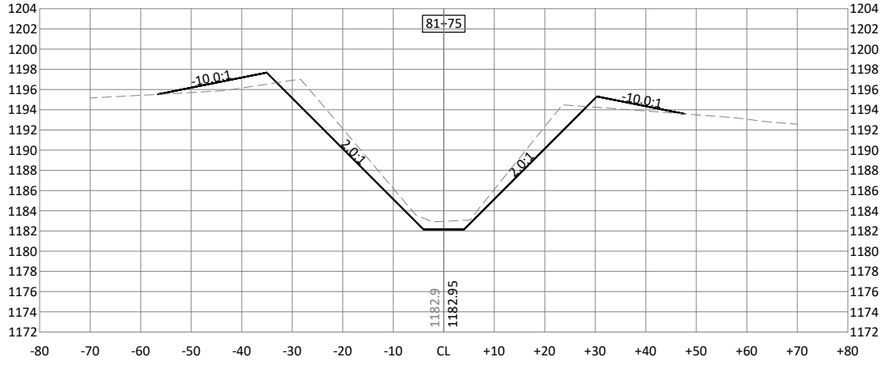

HORZ. 0 25 50 SCALE FEET

VERT. 0 5 10 SCALE FEET

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PRELIMINARY - NOT FOR CONSTRUCTION

SHAUN P. LUKER, P.E.
LIC. NO. 48756 DATE 10/25/2024

BOLTON & MENK

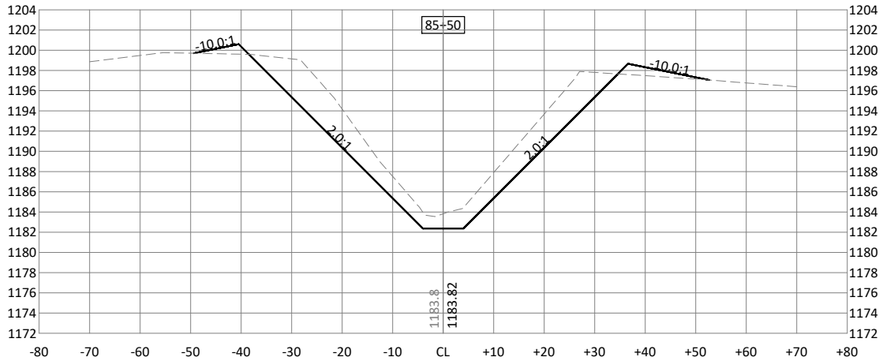
1243 CEDAR STREET NE
SLEEPY EYE, MN 56085
Phone: (507) 810-4184
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

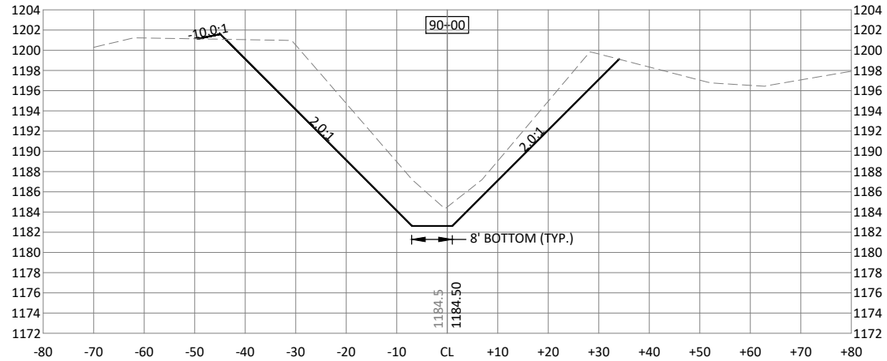
DESIGNED	DDB
DRAWN	DDB
CHECKED	SPL
CLIENT PROJ. NO.	0S1.132250.000

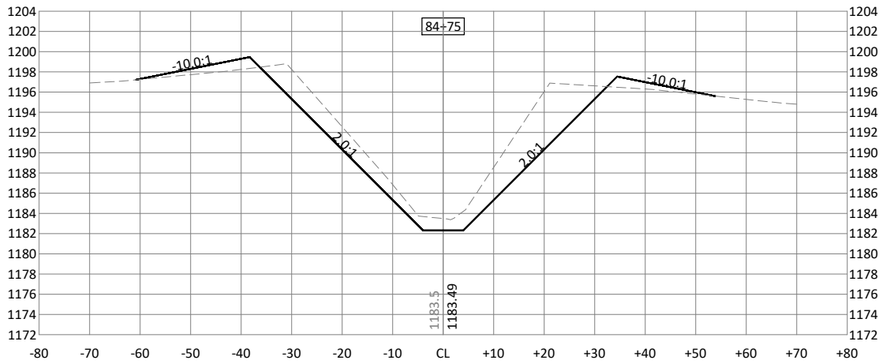
NO.	ISSUED FOR	DATE

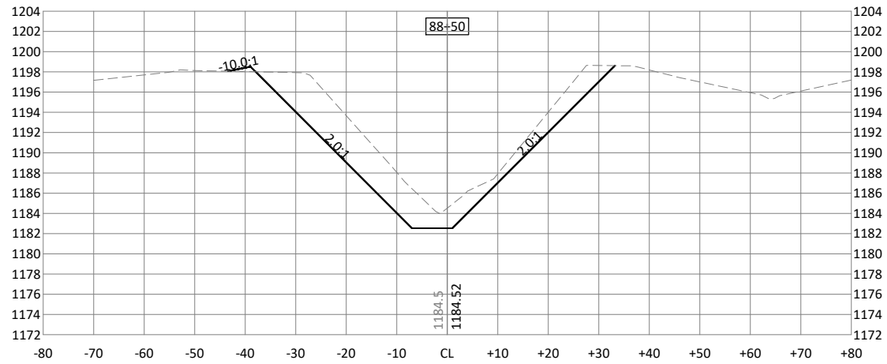
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
C8 - CROSS SECTIONS
STA 79+54 - 83+25

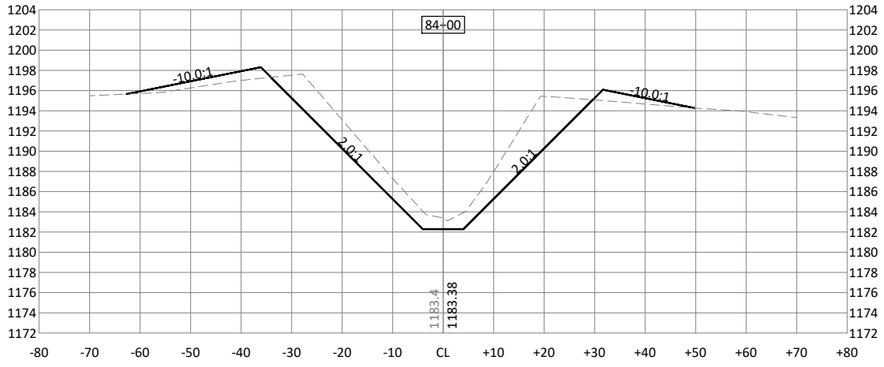
SHEET C8.01

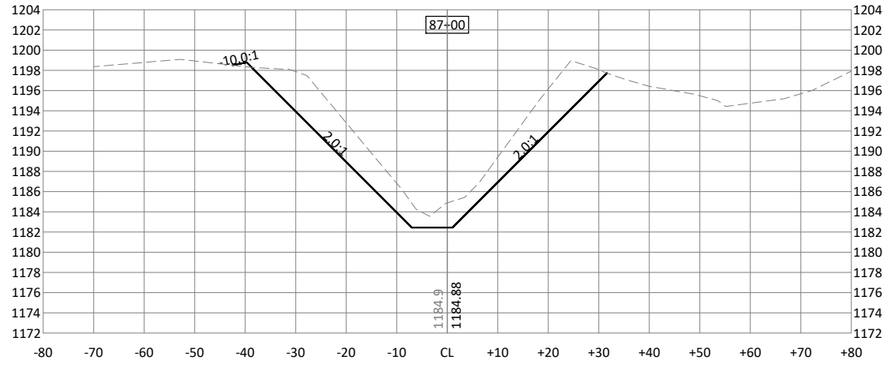












HORZ. SCALE 0 25 50 FEET

VERT. SCALE 0 5 10 FEET

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SHAUN P. LUKER, P.E.
LIC. NO. 48756 DATE 10/25/2024

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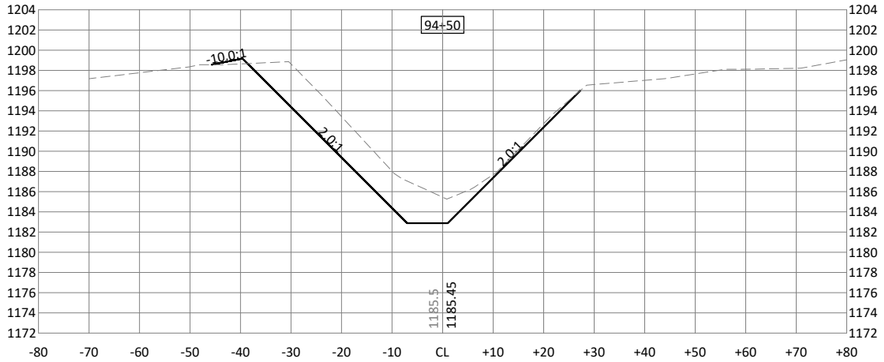
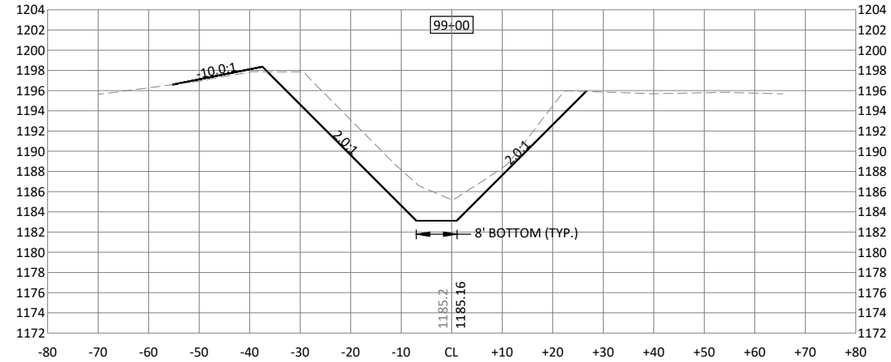
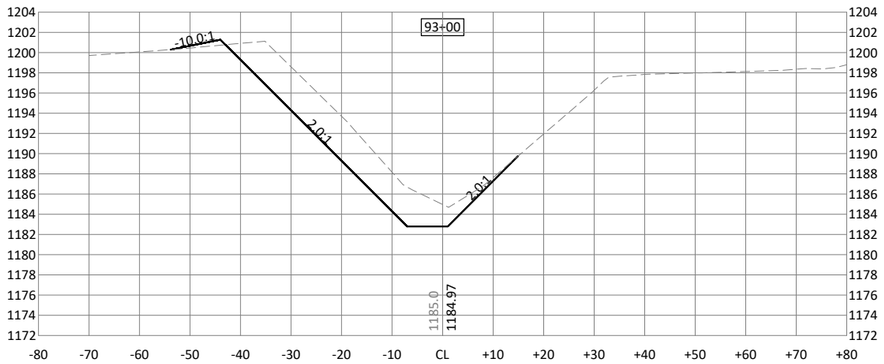
CLIENT PROJ. NO.			
051.132250.000			

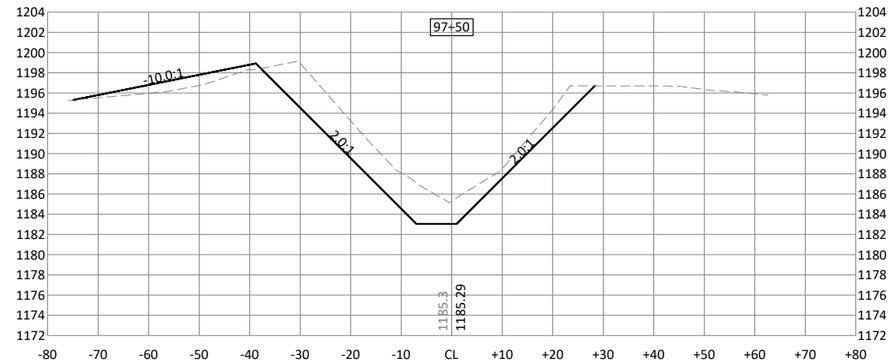
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
C8 - CROSS SECTIONS
STA 84+00 - 90+00

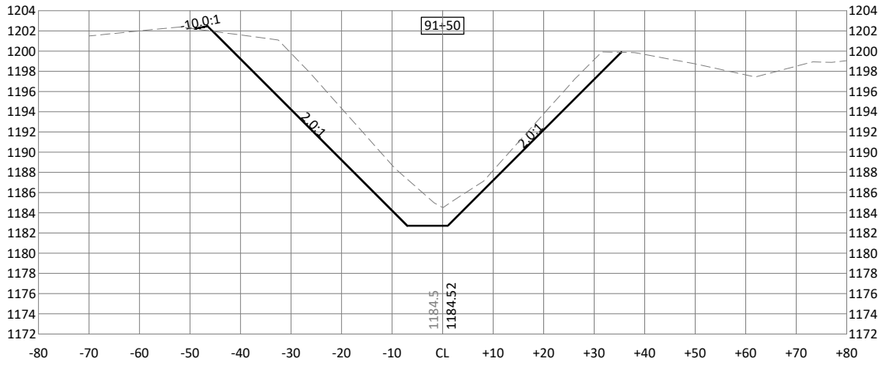
SHEET C8.02

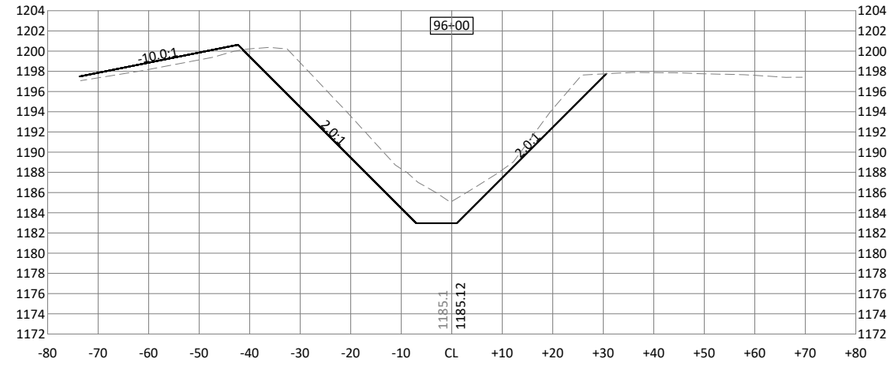












HORZ. SCALE 0 25 50 FEET

VERT. SCALE 0 5 10 FEET

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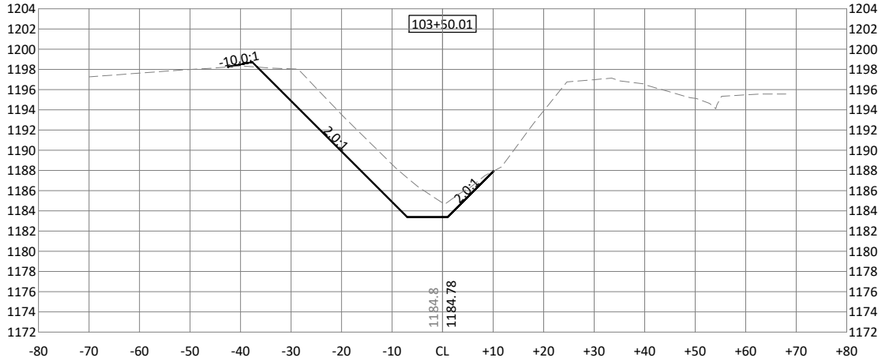
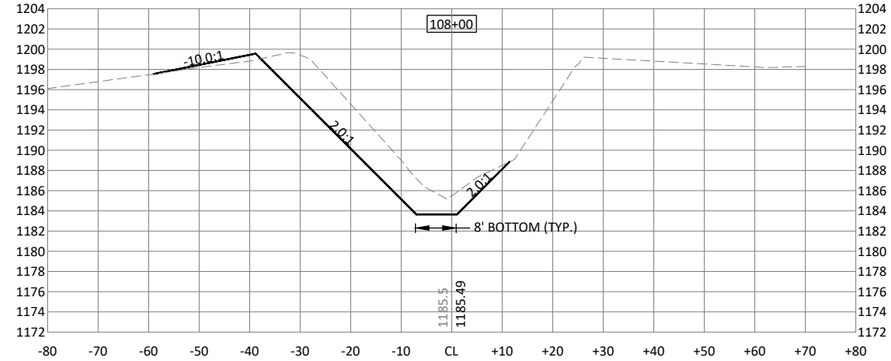
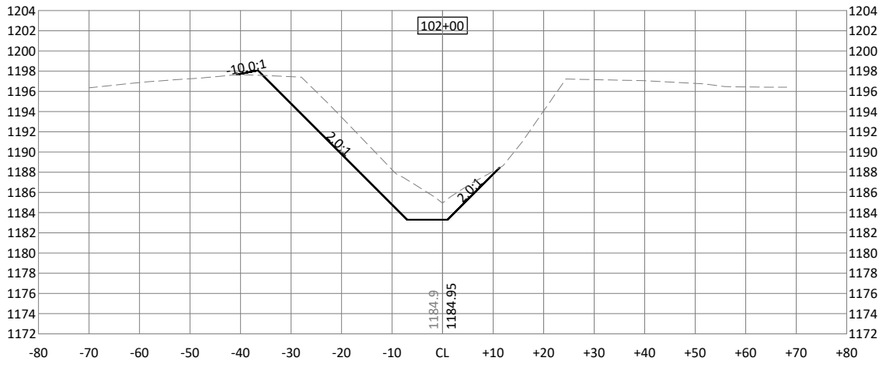
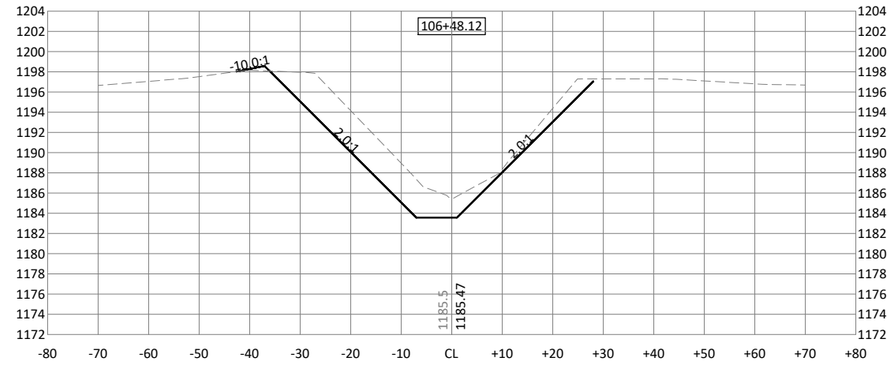
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
C8 - CROSS SECTIONS
STA 91+50 - 99+00

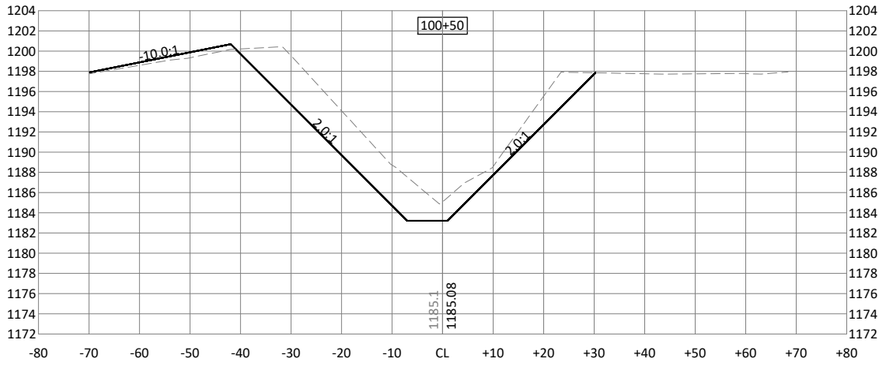
SHEET C8.03

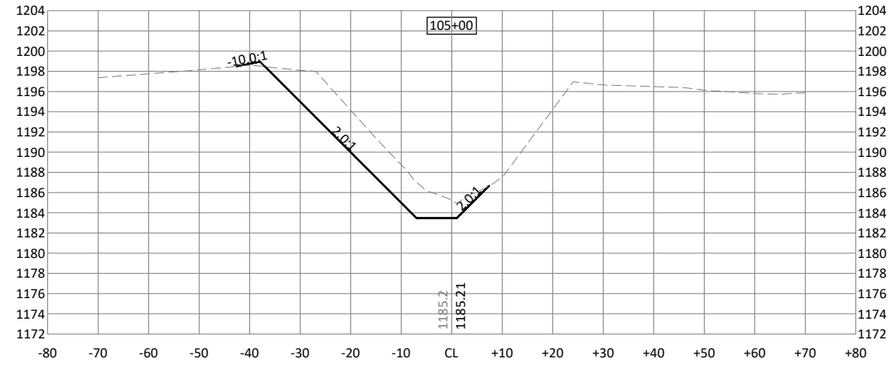












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SHAUN P. LUKER, P.E.
LIC. NO. 48756 DATE 10/25/2024

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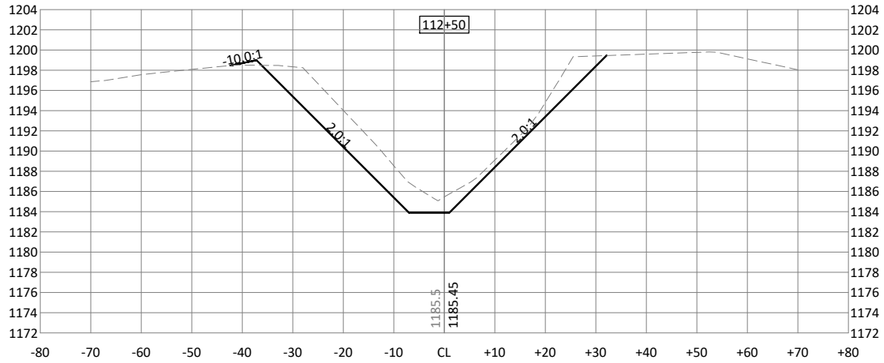
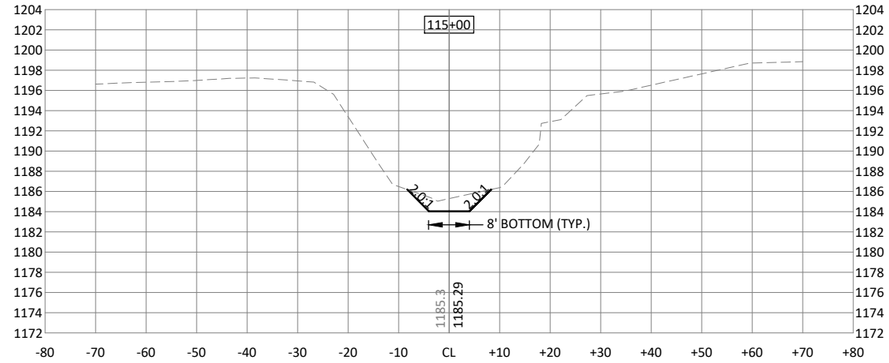
DESIGNED	DDB
DRAWN	DDB
CHECKED	SPL
CLIENT PROJ. NO.	0S1.132250.000

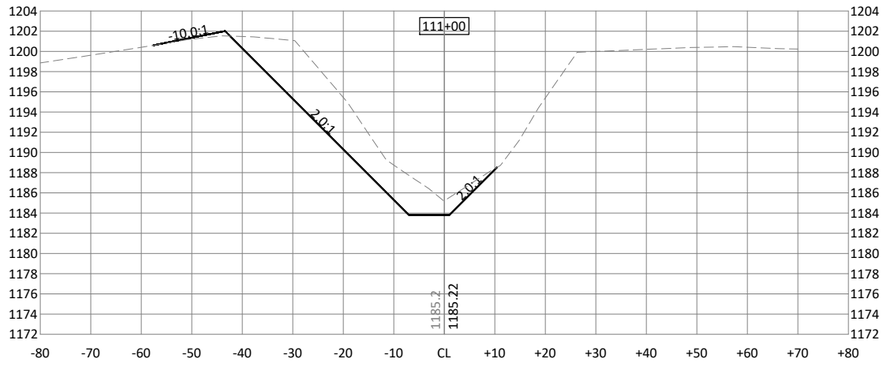
NO.	ISSUED FOR	DATE

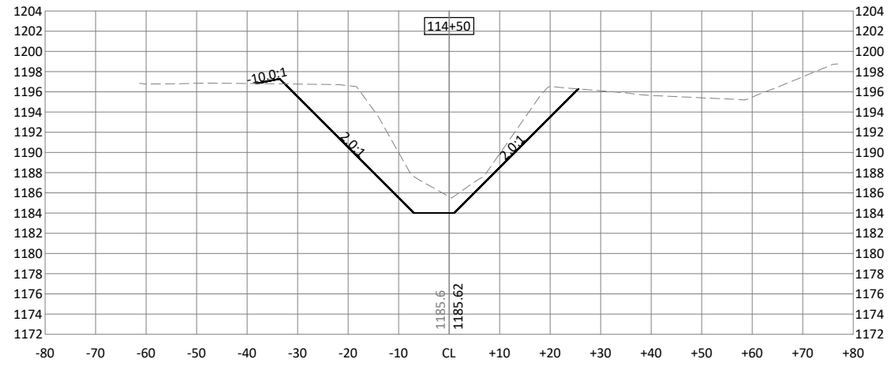
FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
C8 - CROSS SECTIONS
STA 100+50 - 108+00

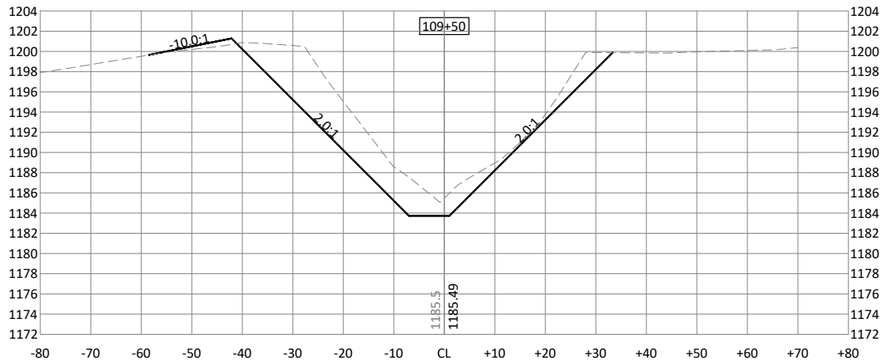
SHEET C8.04

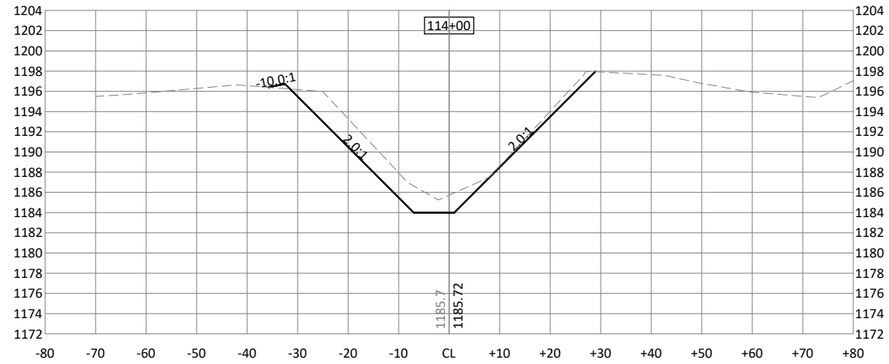












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CLIENT PROJ. NO.	0S1.132250.000

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FREEBORN COUNTY, MINNESOTA
JUDICIAL DITCH No. 8 IMPROVEMENTS
C8 - CROSS SECTIONS
STA 109+50 - 115+00

SHEET C8.05

EXHIBIT 2: PETITION FOR IMPROVEMENT

Patton Hoversten & Berg

A Professional Association / Attorneys at Law

July 11, 2023

Freeborn County Auditor
411 S. Broadway Ave.
Albert Lea, MN 56007

RE: Ditch Petition for Improvement
Our File No. 33089

Dear Sir or Madam:

Enclosed for filing, please find an original Petition as it relates improvement of Freeborn County Judicial Ditch 8, together with a copy of the $10,000 Western Surety Company Ditch Bond No. 72489907.

Please contact me should you have any questions or concerns.

Sincerely,

PATTON, HOVERSTEN & BERG, P.A.

Perry A. Berg
Perry.berg@phblawoffice.com
PAB/lja
Enclosures

Cc John Kolb, Esquire
Dennis Hanson

Minnesota

Western Surety Company

DITCH BOND

Effective Date: November 7th, 2022

STATE OF MINNESOTA)
) ss
COUNTY OF Freeborn)

IN RE: COUNTY DITCH Freeborn COUNTY
or (complete only one)
Ex Rel Judicial
DITCH Ditch 8 WATERSHED DISTRICT

KNOW ALL PERSONS BY THESE PRESENTS:

Bond No. 72489907

That we, Dennis Lee Hanson
of Madison Lake, Minnesota, as Principal(s), and WESTERN SURETY COMPANY, a corporation authorized to do surety business in the State of Minnesota, as Surety, are held and firmly bound unto
Freeborn County, Minnesota,
or (complete only one)
Ex Rel Judicial Ditch 8 Watershed District, in the penal sum of
Ten Thousand and 00/100 DOLLARS ($ 10,000.00),
for the payment of which well and truly to be made, we bind ourselves and our legal representatives, firmly by these presents.

THE CONDITION of the above obligation is such that WHEREAS, a petition is filed with the County Auditor of
Freeborn County, Minnesota,
or (complete only one)
Ex Rel Judicial Ditch 8 Watershed District, for:

NOW, THEREFORE, if the said Principal(s) pay all costs and expenses which may be incurred in the case proceedings are dismissed or for any reason no contract is entered into for the construction of the improvement petitioned for, then this obligation to be void; otherwise to remain in full force and effect. In no event shall the total liability of the Surety for all claims exceed the amount of this bond.

Dated this 8th day of March, 2023.

_____ Principal

_____ Principal

_____ Principal

_____ Principal

_____ Principal

_____ Principal

WESTERN SURETY COMPANY, Surety

By Paul T. Bruflat
Paul T. Bruflat, Vice President

Form 1412-12-2014

Western Surety Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:

That WESTERN SURETY COMPANY, a corporation organized and existing under the laws of the State of South Dakota, and authorized and licensed to do business in the States of Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the United States of America, does hereby make, constitute and appoint

Paul T. Bruflat of Sioux Falls,
State of South Dakota, its regularly elected Vice President,
as Attorney-in-Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, the following bond:

One Ditch Petition Freeborn County Ex Rel Judicial Ditch 8

bond with bond number 72489907

for Dennis Lee Hanson
as Principal in the penalty amount not to exceed: $10,000.00.

Western Surety Company further certifies that the following is a true and exact copy of Section 7 of the by-laws of Western Surety Company duly adopted and now in force, to-wit:

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys-in-Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

In Witness Whereof, the said WESTERN SURETY COMPANY has caused these presents to be executed by its Vice President with the corporate seal affixed this 8th day of March, 2023.

ATTEST

L. Bauder, Assistant Secretary

WESTERN SURETY COMPANY

By Paul T. Bruflat

Paul T. Bruflat, Vice President

STATE OF SOUTH DAKOTA }
COUNTY OF MINNEHAHA } ss

On this 8th day of March, 2023, before me, a Notary Public, personally appeared Paul T. Bruflat and L. Bauder who, being by me duly sworn, acknowledged that they signed the above Power of Attorney as Vice President and Assistant Secretary, respectively, of the said WESTERN SURETY COMPANY, and acknowledged said instrument to be the voluntary act and deed of said Corporation.

M. BENT
NOTARY PUBLIC
SOUTH DAKOTA

M. Bent

Notary Public

My Commission Expires March 2, 2026

To validate bond authenticity, go to www.cnasurety.com > Owner/Obligee Services > Validate Bond Coverage.

Form F1975-11-2022

STATE OF MINNESOTA

COUNTY OF FREEBORN

In the Matter of the Improvement
And Repair of Judicial Ditch No. 8

BEFORE THE BOARD OF

LE SUEUR RIVER WATERSHED

Petition

Pursuant to Minnesota Statute §103E.215, Petitioners' seek improvement of a portion of Judicial Ditch No.8 that is located in the Le Sueur River Watershed, Freeborn County, State of Minnesota.

1. Petitioners seek to improve an outlet located in Freeborn Township between County Road 70 and County Road 10 and remove the Wier where Branch D County tile out lets into the Ditch.

2. The current system needs to be deepened in the area described in paragraph 1 above and the Wier removed to furnish sufficient drainage and reduce sitting water between these points. Adding 5-foot culverts next to the existing culverts at the County Road 10 and County Road 70 crossings. The County Road 70 culvert can be installed at an angle so the improvement will not affect the bridge.

3. The following is a description of the starting point, general course and terminus of the proposed improvement of the open ditch portion of :

   Judicial Ditch 8:

   - Commencing at the Wier wall in Judicial 8 in the NE1/4 of Section 2-Township 104 N-Range 23 W;
   - Thence south to just north of County Road 70 thence east into the NW ¼ of Section 1 – Township 104 N-Range 23 W to the point that the Ditch turns south and crosses under County Road 70 and ending on the south side of the County Road 70 culvert, which just into the SW ¼ of Section 1-Township 104 N – Range 23 W.
   - See Exhibit A. The improvement area is highlighted in "green".

4. The description of the lands and properties which will be affected in Freeborn County, Minnesota; are as follows:

   Sections 1 and 2 in Freeborn Township.
   The improvements will be in the:

   SE ¼ of NE ¼ of Section 2 owned by Leonard and Kristen Schultz.
   SW ¼ of NW 1/4 of Section 1 owned by Diane Miller.
   SE ¼ of NW ¼ of Section 1 owned by Dennis Hanson.
   NE ¼ of SW ¼ of Section 1 owned by Phillip Family Partnership.

5. That the names of the owners of the property that the open ditch is situated on and municipal

and other corporations affected therebyare as follows:

- Kristin and Leonard J. Schultz, 33998 655th Avenue, Hartland, MN 56042
- Diane Miller, 12828 210th Ave., New Richland, MN 56072
- Dennis L. and Bonnie L. Hanson, 22875 Koops Ln, Madison Lake, MN 56068
- Phillips Farm Family Partnership, 812 5th Ave. NE, Waseca, MN 56093
- Schadegg Properties LLC, 225 Bridge Pt. Dr, South St. Paul, MN 55075
- Karen Oban, 10513 Doering Ln, Austin, TX 78750
- Susan Wood Clayton Irrevocable Trust, 410 Hickory, Farmington, MN 55024
- Forrest Malakowsky, 66569 318th St., Hartland, MN 56042
- Solberg Family LP, Joseph Solberg, 2555 7th St South, #114, La Crosse, WI 54601
- Brian Solberg, 32285 660th Ave., Hartland, MN 56042

And Freeborn Township; County of Freeborn; State of Minnesota

6. The proposed improvement will be of public utility and promote the public health.

7. Petitioners will pay all costs and expenses that may be incurred if the proceedings are dismissed or a construction or implementation contract is not awarded to the project.

8. Petitioners have been informed, and understand that they may not withdraw as a petitioner at any time after this petition is filed. They also understand that if the proposed drainage project is not constructed, they are, and each other petitioner is, liable to the Drainage Authority for all costs incurred including engineering, legal, and auditor's fees.

9. The Petition must be signed by: (1) at least 26 percent of the owners of the property affected by the proposed improvement; (2) at least 26 percent of the owners of property that the proposed improvement passes over; (3) the owners of at least 26 percent of the property area affected by the proposed improvement; or (4) the owners of at least 26 percent of the property area that the proposed improvement passes over.

   The Petition has been signed by at least 26 percent of the owners of property that the proposed improvement passes over.

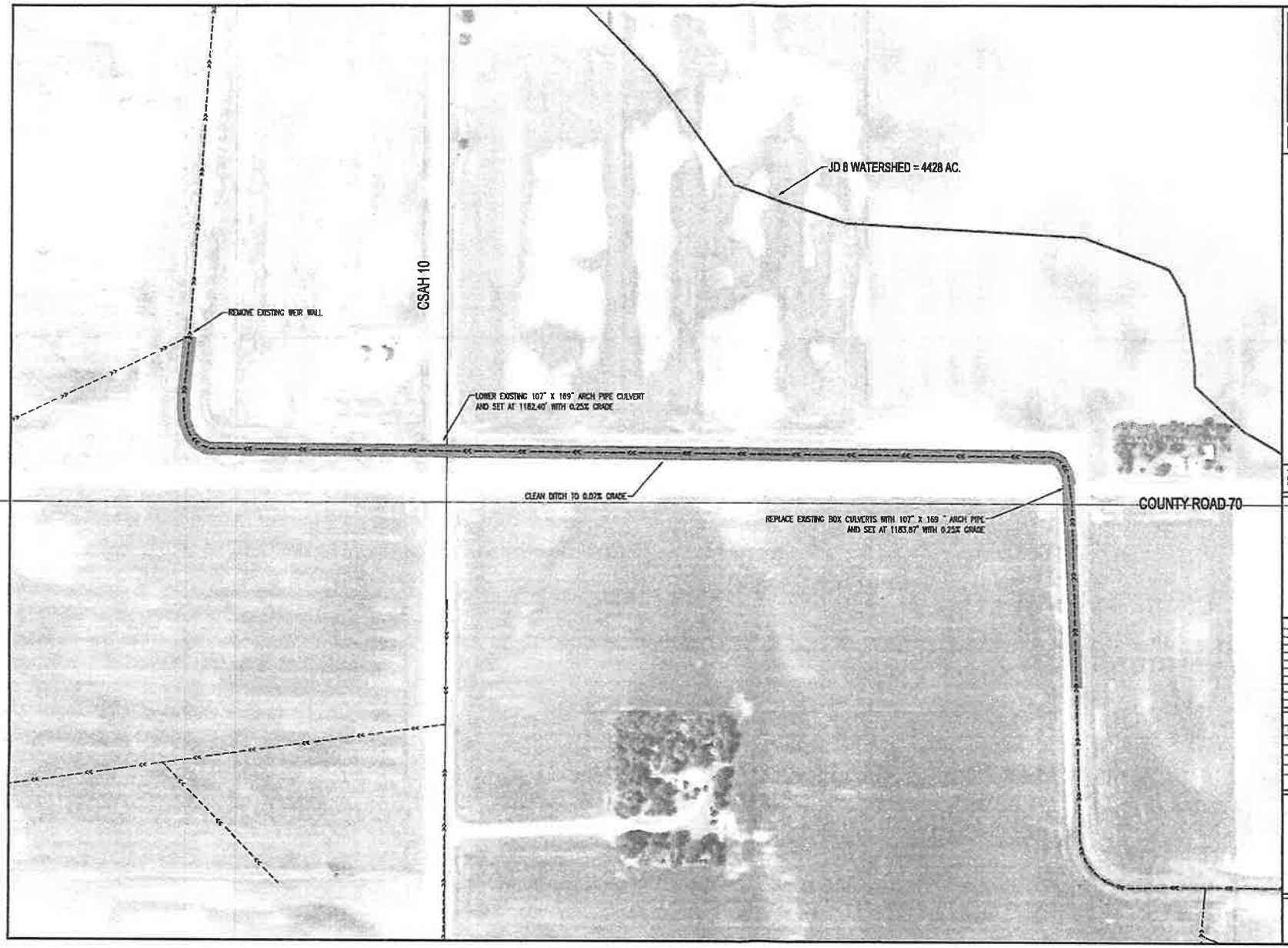
All signatories to the Petition must indicate the capacity in which they sign, i.e. owner, co-owner, corporate official, or government lot. In the case of a partnership, only one general partner needs to sign. In the case of a corporation, only one corporate official need sign. In the case of a co-ownership, all co-owners must sign. In the case of a trust, all trustees must sign. Signature pages are attached hereto. Use as many as needed. Be sure all signature blocks are fully completed. If you are unsure of whom must sign please contact the petitioner's attorney as named below.

4/26/23

Date

Perry A. Berg
Patton, Hoversten and Berg Law Office
215 E. Elm Avenue
P.O. Box 249
Waseca, MN 56093-0249
507-835-5240 Phone
507-835-1827 Fax
Attorney for Petitioners

EXHIBIT A



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Engineering
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N

0 150 300 450
Scale:

PROJECT
FREEBORN & WASECA COUNTIES

JD 8

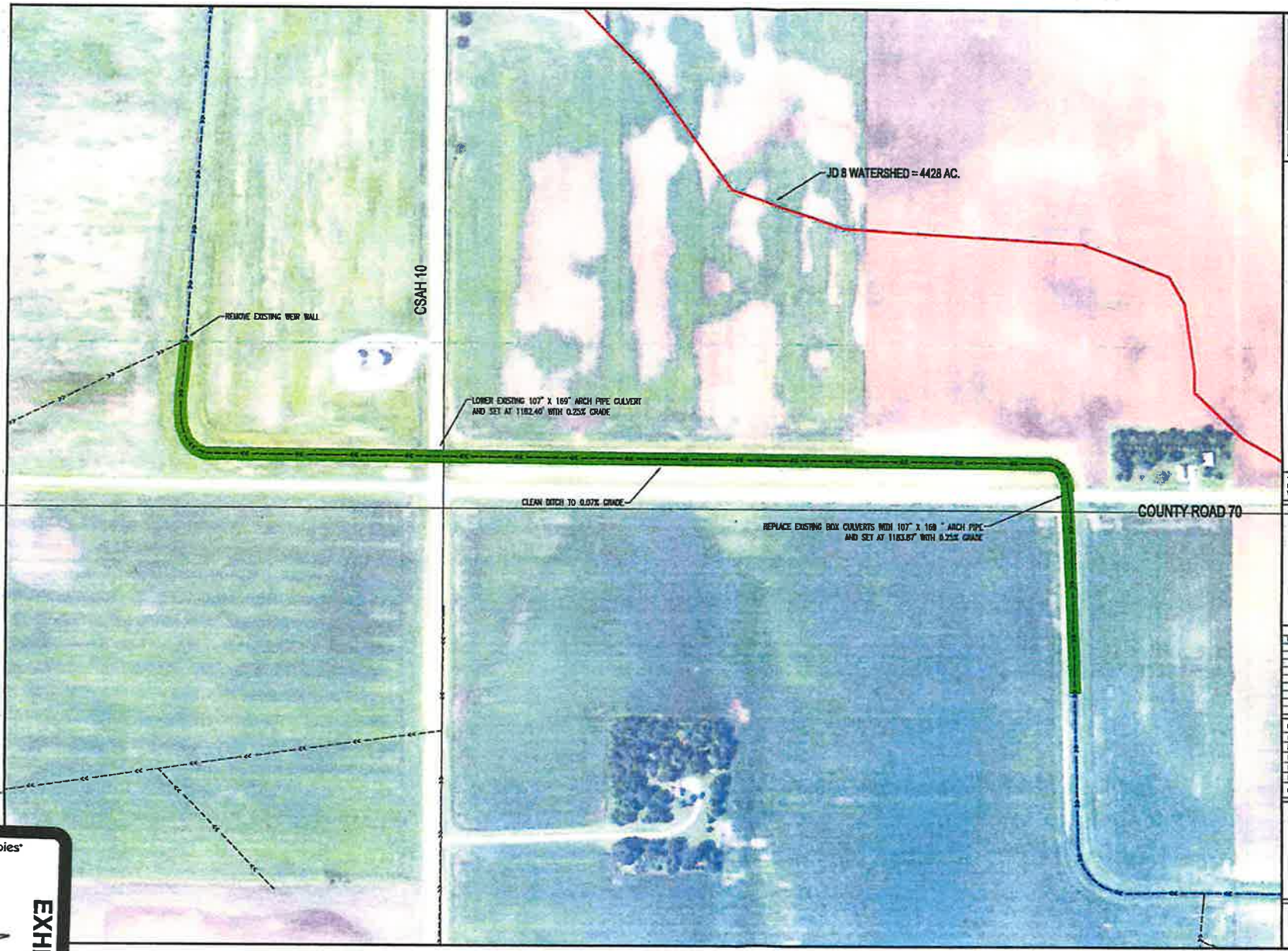
REVISION SCHEDULE

NO	DATE	DESCRIPTION

PROJECT NO.	15-18614
FILE NAME	18614 PRELIM V3
DRAWN BY	ASB
DESIGNED BY	ASB
REVIEWED BY	CJB
ISSUE DATE	3/3/2016
CLIENT PROJECT NO.	

TITLE
IMPROVEMENT OPTION 1

SHEET
4 OF 5



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ISSUE DATE	3/3/2016
CLIENT PROJECT NO.	

TITLE
IMPROVEMENT OPTION 1

SHEET
4 OF 5

tabbies®
EXHIBIT

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

Dated: 5-2-23

Kristin Schultz

Dated: 5-2-23

Leonard J. Schultz

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

Dated: 04/26/2023

Dennis L. Hanson

Dated: 04/26/2023

Bonnie L. Hanson

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

PHILLIPS FARM FAMILY
PARTNERSHIP

Dated: 5/1/23

BY _____

Its Owner

Dated: _____

BY _____

Its _____

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

SCHADEGG PROPERTIES LLC

Dated: 4/28/23

BY _____
Daniel M. Schadegg
Its Managing Member

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

Dated: 5/23/23

Karen Oban

Karen Oban

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

Dated: 5-15-2023

Forrest Malakowsky - owner

Forrest Malakowsky

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

SOLBERG FAMILY LP

Dated: Joseph Solberg BY: MAY 9 - 2023
Joseph Solberg
Joseph Solberg

PETITION FOR IMPROVEMENT OF
FREEBORN COUNTY JUDICIAL DITCH 8

Dated: May 9 2023

Brian Solberg

Brian Solberg

EXHIBIT 3: PRELIMINARY COST ESTIMATE

SEPERABLE MAINTENANCE

JUDICIAL DITCH No. 8 MAIN OPEN DITCH IMPROVEMENTS

FREEBORN & WASECA COUNTIES

BMI Project No.: 0S1.132250

BOLTON & MENK
Real People. Real Solutions.

H:\FRCO\0S1132250\2_Preliminary\A_Calculations\[132250 JD 8 Prelim Cost Est.xlsx]Seperable Maintenance 6/7/2024

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount
1	MOBILIZATION	1	LS	$50,000.00	$50,000.00
2	TRAFFIC CONTROL	1	LS	$2,000.00	$2,000.00
3	REMOVE WEIR STRUCTURE	1	LS	$2,000.00	$2,000.00
4	COMMON EXCAVATION	22000	CY	$4.00	$88,000.00
5	EXPLORATORY EXCAVATION	60	HR	$300.00	$18,000.00
6	8" CM PIPE	20	LF	$70.00	$1,400.00
7	10" CM PIPE	100	LF	$75.00	$7,500.00
8	15" CM PIPE	40	LF	$90.00	$3,600.00
9	24" CM PIPE	80	LF	$125.00	$10,000.00
10	RANDOM RIPRAP, CL 3	132	TON	$110.00	$14,520.00
11	INLET PROTECTION	20	EA	$200.00	$4,000.00
12	DITCH CHECK, BIOLOG	10	EA	$500.00	$5,000.00
13	SEEDING & BONDED FIBER MULCH	6	ACRE	$6,000.00	$36,000.00
14	MULCH TYPE, 1	4	TON	$350.00	$1,400.00
15	STABALIZED CONSTRUCTION EXIT	1	LS	$2,500.00	$2,500.00

	Subtotal				$245,920.00
	10% Contingency				$24,590.00
	Temporary Crop Damages	4	ACRE	$600.00	$2,400.00
				Total Estimated Construction Cost	**$272,910.00**
	Design, Administration and Construction Engineering				$68,200.00
				Total Estimated Project Cost	**$341,110.00**

EXHIBIT 4: HYDRAULIC REPORT & RISK ASSESSMENT

BOLTON & MENK
Real People. Real Solutions.

1243 Cedar Street NE
Sleepy Eye, MN 56085

Ph: (507) 794-5541
Fax: (507) 794-5542
Bolton-Menk.com

July 30, 2024

Philip Wacholz
Freeborn County Engineer
Freeborn County Public Works
3300 Bridge Avenue
Albert Lea, MN 56007

RE: Hydraulic Report & Risk Assessment
County Road over Judicial Ditch 8
Section 1 of Freeborn Township
Freeborn County, MN
Project No.: 0S1.132250

Dear Philip,

As requested, we analyzed hydraulic conditions for the Judicial Ditch 8 system. With an additional crossing over the ditch, approximately 4.5 miles south-west of New Richland, Minnesota. The bridge crossing is in Freeborn County, Minnesota as follows:

- Existing double 10'x10' RC Box Culvert (206 SF) of Freeborn Township (T104N, R23W)

The crossing watershed was analyzed using peak flow rates computed using the following:

- "Techniques for Estimating the Magnitude and Frequency of Peak Flows on Small Streams in Minnesota Based on Data through Water Year 2005", developed by the U.S. Geological Survey, and computed via "StreamStats 4.3.0" website.

EX BRIDGE 89308

The existing bridge consists of a non-standard double 10'x10' RC Box Culvert (206 SF). The existing roadway overtopping elevation is 1198.5 south of the crossing, the proposed elevation will remain the same. Along with the bridge there is a weir approximately 3320-feet downstream at an elevation of 1183.07 that will be removed along with the proposed project.

Bridge and waterway hydraulic conditions are presented below for the proposed structure. The proposed structure is as follows:

- The proposed double 10'x10' RC Box Culvert

The proposed culvert will have an upstream invert of 1183.9 and a downstream invert of 1183.8.

The attached table displays calculated hydraulic conditions. A risk assessment was also completed for the crossing. Risk assessment is attached.

The forecasted ADT for the County Road 70 crossing is less than 49 vehicles per day (vpd). The overtopping flood frequency for risk assessment in the MnDOT Drainage Manual for an ADT below 49 is a 5 Year Storm Event. The proposed bridge was selected based on the ADT requirement and Minnesota Drainage Statute 103E.525 which states the hydraulic capacity shall not be less than specified in the detailed survey report.

To our knowledge, this structure is not located on a designated trout stream. The immediate upstream floodplain is agricultural land with little apparent structural flood damage potential.

Navigational clearance is not required at this site.

This analysis may be subject to requirements of and review by appropriate regulatory agencies.

Please review the enclosed information and if you have any questions, please feel free to contact me.

Thank you.

Sincerely,
Bolton & Menk, Inc.

Jordan G. Bengtson, P.E.
MN. Licensed Professional Engineer
No. 62897

Enclosure(s)
1. Hydraulic Flood Analysis (1 Page)
2. Hydraulic Risk Assessment (4 Pages)

cc: Shaun Luker, P.E.
Derek Behrens, P.E.

BOLTON & MENK
Real People. Real Solutions.

1243 Cedar Street NE
Sleepy Eye, MN 56085

Ph: (507) 810-4184
Bolton-Menk.com

HYDRAULIC FLOOD ANALYSIS
Freeborn County
Section 1, T104N, R23W
Double 10'x10' RC Box

Stream	Judicial Ditch No. 8
Drainage area	6.3 Square Miles
Flood of record (year and flow)	Unknown
Maximum observed high water elevation	Unknown
Road sag point elevation	1198.5 feet
Design Flood (5-year frequency)	224 cubic feet/ second
Design stage	1190.4
Total stage increase	0.0 feet
Headwater Elevation	1190.4
Stage increase in place condition	1.8 feet
Mean velocity through structure	1.7 fps
Main channel velocity	1.5 fps
Overtopping year Flood (454-year frequency)	1095 cubic feet/ second
Design stage	1197.8
Total stage increase	0.7 feet
Headwater Elevation	1198.5
Stage increase in place condition	1.5 feet
Mean velocity through structure	5.4 fps
Regional Flood (100-year frequency)	749 cubic feet/ second
Design stage	1195.1
Total stage increase	0.1 feet
Headwater Elevation	1195.2
Stage increase in place condition	1.7 feet
Mean velocity through structure	3.8 fps
Approximate flow line elevation	1183.1 inlet
	1183.0 outlet
Skew from Roadway	6.0 Degrees
2-Year Velocity Through Culvert	1.1 fps

Double RC Box 10'x10'

RISK ASSESSMENT
FOR
ENCROACHMENT DESIGN

District 6 County *Freeborn* Vicinity of *Freeborn* Township Sec. 1 T 104N R 23W

DATA REQUIREMENTS

1. Location of Crossing: County Road 70 C.S.___ M.P.

2. Name of Stream: Judicial Ditch #8 Bridge No. Old: 89308 New: xxxxx

3. Current ADT 35; Projected ADT 35

4. Practicable detour available Yes X No _____

If no is checked, please explain:___
If there is no practicable detour available, then the use of the road must be analyzed. Considerations such as emergency vehicle access, emergency supply and evacuation route, and the need for school bus, milk and mail routes should be studied. Factors to consider for this analysis include design frequency, depth, duration, and frequency of inundation if appropriate, and available funding.

5. Hydraulic Data: (Fill in as appropriate) Approximate Flowline Elevation IL–1183.9.0; OL–1183.8

Q_2 = 107 cfs	TW_2	Elevation 1188.7
Q_5 = 224 cfs	TW_5	Elevation 1190.4
Q_{10} = 326 cfs	TW_{10}	Elevation 1191.6
Q_{25} = 477 cfs	TW_{25}	Elevation 1193.1
Q_{50} = 607 cfs	TW_{50}	Elevation 1194.2
Q_{100} = 749 cfs	TW_{100}	Elevation 1195.5
Q_{500} = 1140 cfs	TW_{500}	Elevation 1198.8

Circle Design Frequency
Reasons for selecting Design Frequency:
Minimum overtopping based on projected ADT from the MnDOT Drainage Manual (5-year) and Minnesota Drainage Statute 103E.525.

6. Magnitude and Frequency of the smaller of "Overtopping" or "500 yr." (454 yr) flood:
1095cfs 454-year frequency

7. Low member elevation N/A

8. Minimum roadway overflow elevation if appropriate: 1198.5

9. Elevation of high risk property, i.e. residences: 1204 (Lidar)

   Other buildings: 1203 (Lidar)

10. Horizontal location of overflow:

    At structure _____ (See 12); Not at structure x

11. Type of proposed structure:

    Bridge Double RC Box 10'x10' (See 12); Culvert(s)

12. If the proposed structure is a bridge with the sag point located on the bridge and there is ice and debris potential, strong consideration should be given to using Q_{50} as design discharge with 3 feet of clearance between the 50 year tailwater stage and low member.

1. BACKWATER DAMAGE - Major flood damage in this context refers to shopping centers, hospitals, chemical plants, power plants, housing developments, etc. LTEC DESIGN

1a. Is the overtopping flood greater than the 100 yr. flood?

Yes_X_(Go to I b.); No ___(Go to 1 e.)

1b. Is the overtopping flood greater than the "greatest" flood (500 yr. Frequency)?

Yes ___(Go to I d.); No _X_(Go to 1 c.)

1c. Is there major flood damage potential for the overtopping flood?

No _X_(Go to I e.) YES (Go to I e.)

1d. Is there major flood damage potential for the greatest flood (500 year frequency)?

No ___(Go to I e.) YES (Go to I e.)

1e. Will there be flood damage potential to residence(s) or other buildings during a 100 yr. flood?

Yes _____(Go to I f.); No _X_(Go to 2)

1f. Could this flood damage occur even if the roadway crossing wasn't there?

Yes ___(Go to I g.); No ___(Go to 1 h.)

1g. Could this flood damage be significantly increased by the backwater caused by the proposed crossing?

Yes ___(Go to I h.); No ___(Go to 2)

1h. Could the stream crossing be designed in such a manner so as to minimize this potential flood damage?

Yes ___(Go to I i.); No ___(Go to 2)

1i. Does the value of the building(s) and/or its contents have sufficient value to justify further evaluation of risk and potential flood damage?

No ___(Go to 2) YES (Go to 2)

2. TRAFFIC RELATED LOSSES

2a. Is the overtopping flood greater than the "greatest" flood (500 yr. frequency)?

Yes ___(Go to 3); No _X_(Go to 2 b.)

2b. Does the ADT exceed 50 vehicles per day?

Yes __(Go to 2 c.); No _X_(Go to 3)

2c. Would the (duration of road closure in days) multiplied by the (length of detour minus the length of normal route in miles) exceed 20?

Yes ___(Go to 2 d.); No ___(Go to 3)

2d. Does the annual risk cost for traffic related costs exceed 10% of the annual capital costs?

No ___(Go to 3) (See figures A and B for assistance) YES (Go to 3)

3. ROADWAY AND/OR STRUCTURE REPAIR COSTS

3a. Is the overtopping flood less than a 100 year frequency flood?

Yes ___(Go to 3 b.); No _X_(Go to 3 i.)

3b. Compare the tailwater (TW) elevation with the roadway sag point elevation for the overtopping flood. Check the appropriate category.

___When TW is above the sag point (Go to 4)

___When TW is between 0 and .5' below sag point (Go to 3 c.)

___When TW is between .5' and 1.0' below sag point (Go to 3 d.)

___When TW is 1.0' and 2.0' below sag point (Go to 3 e.)

___When TW is more than 2.0' below sag point (Go to 3 g.)

3c. Does the embankment have a good erosion resistant vegetative cover?

Yes ___(Go to 3 i.); No ___(Go to 3 d.)

3d. Is the shoulder constructed from erosion resistant material such as paved, coarse gravel, or clay type soil?

Yes ___(Go to 3 i.); No ___(Go to 3 e.)

3e. Will the duration of overtopping for the 25 year flood exceed 1 hour?

Yes ___(Go to 3 f.); No ___(Go to 3 i.)

3f. Is the embankment constructed from erosion resistant material such as a clay type soil?

Yes ___(Go to 3 i.); No ___(Go to 3 g.)

3g. Is the overtopping flood less than a 25 year frequency flood?

Yes ___(Go to 3 h.); No ___(Go to 3 i.)

3h. Will the cost of protecting the roadway and/or embankment from severe damage caused by overtopping exceed the cost of providing additional culvert or bridge capacity?

No ___(Go to 3 i.); YES (Go to 3i)

3i. Is there damage potential to the structure caused by scour, ice, debris or other means during the lesser of the overtopping flood or the 100 year flood?

Yes ___(Go to 3 j.); No __X_(Go to 4)

3j. Will the cost of protecting the structure from damage exceed the cost of providing additional culvert or bridge water capacity?

No ___(Go to 4); YES (Go to 4)

4. Will the capital cost of the structure exceed $500,000?

No __X__(Go to 5); V YES (Go to 5)

5. In your opinion, are there any other factors which you feel should require further study through a risk analysis?

No __X__(Go to 6); YES (Indicate)

6. If there are no v's in the LTEC Design column on the right, proceed with the design, selecting the lowest acceptable grade line and the smallest waterway opening consistent with the constraints imposed on the project. The risk assessment has demonstrated that potential flood damage costs, traffic related costs, roadway and/or structure repair costs are minor and therefore disregarded for this project.

One or more v's in the LTEC Design column indicates further analysis in the category checked may be required utilizing the LTEC design process or justification (below) why it is not required.

JUSTIFICATION:

_____

_____

_____

_____

_____

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota:

Signature: _____

Jordan G Bengtson
Bolton & Menk, Inc.

Registration Number: 62897 Date: September 19, 2024