

PRELIMINARY REPAIR REPORT FOR:

JOINT COUNTY DITCH NO. 1 REPAIR:

BLUE EARTH & FARIBAULT COUNTIES, MINNESOTA

August 2022

Project No. 18-20781

REPORT FOR:

Craig Austinson
Blue Earth County Drainage Authority
410 S Fifth Street
Mankato, MN 56001
507-304-4251
Craig.austinson@blueearthcountymn.gov

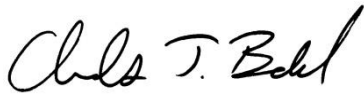
FROM:

Chuck Brandel PE
Vice President
ISG
115 East Hickory Street, Suite 300
Mankato, MN 56001
507.387.6651
chuck.brandel@isginc.com

ISG

Signature Sheet

I HEREBY CERTIFY THAT THESE CALCULATIONS WERE 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.



Charles J. Brandel, PE

Project Engineer

Reg. No. 43359

ISG

115 East Hickory Street, Suite 300

Mankato, Minnesota 56001

Joint County Ditch No. 01 Repair

Blue Earth County & Faribault Counties, Minnesota

Engineer's Project Number: 20781

Dated this 24th day of August, 2022



TABLE OF CONTENTS

PROJECT GOALS 1

Location + Watershed 1

History 1

Existing Conditions..... 2

Proposed Condtions..... 6

Practicality + Feasibility 9

Conclusions + Recommendations 9

APPENDICES

APPENDIX A: Exhibits A

APPENDIX B: Preliminary Cost Estimate..... B

APPENDIX C: Preliminary Construction Plans C



PROJECT GOALS

The goal of the Joint County Ditch Number 1 (JCD 1) is to repair the existing JCD1 mainline tile that has started to collapse. The proposed repair option will follow the existing alignment and be offset 25 feet. The repairs will be done on the mainline between the Lura Lake weir and the fish barrier in Section 35 of Sterling Township.

LOCATION + WATERSHED

The watershed for JD 1 drains area from Lura Lake and the surrounding area. The watershed provides drainage for approximately 2,850 acres and includes land from Sections 23, 24, 25, 26, and 34, 35, 36 of Sterling Township and Sections 19, 30 and 31 of Mapleton Township in Blue Earth County. The watershed boundary also extends into Sections 1, 2, 3 in Delavan Township in Faribault County. Elevations within the watershed range from approximately 979 to 1076 Mean Sea Level (MSL).

The proposed repair is for a portion of the mainline between the Lura Lake outlet weir and the fish barrier in Section 35 of Sterling Township. The mainline is used as the outlet for Lura Lake and regulates the water elevation. The mainline flows from the outlet structure to the northwest where it flows into Rice Creek.

The hydrological soil classification of JCD1 watershed is predominantly type "C/D" soils which are considered prime for farmland, if adequately drained based on Natural Resources Conservation Service (NRCS) web soil survey. Complete maps of the existing conditions as well as the hydrologic soil classification and the unified soil classification for the existing JCD 1 watershed can be found in Appendix A.

HISTORY

The information gathered from the Lura Lake Outlet Summary written by Leo Getsfried, the Mankato Area Hydrologist on 6-30-11 states that the original outlet was in the Northwest corner of Lake Lura. In 1971/1972 Joint Ditch No 1 was constructed and then in 1997 metal tile was replaced with 1,343 linear feet of 18-inch HDPE tile. The repair also included cleaning out the outlet structure. The letter also states that in late 1994 or in 1995 a second outlet was constructed to provide additional outflow capacity on the southwest end of Lura Lake. In 2012 a new weir outlet structure was installed. The weir structure was constructed to maintain the water elevation of Lura Lake at 1033.31. The water then flows over the weir and into the 18-inch tile which has an invert at 1028.47. The normal ordinary high water of Lura Lake is 1033.0'.



Figure 1. Installed New Outlet Structure

EXISTING CONDITIONS

The information in this document has been prepared from existing drawings and alignment maps provided by Blue Earth County and Faribault County. Existing conditions were also evaluated using the televising video provided to ISG. A close representation of the JCD 1 watershed was created using this information in conjunction with LiDAR contours, Minnesota Department of Natural Resources (DNR) Watershed lines, aerial photographs, televising, and tile investigation. A map illustrating the existing JCD 1 system can be found in Appendix A. The JCD 1 system consists of a weir on Lura Lake, 1,450 feet of 18-inch tile, 1,225 linear feet of 22-inch tile, and a fish barrier. The mainline tile outlets into Rice Creek in the Northwest ¼ of the Northwest ¼ of Section 35 of Sterling Township. The fish barrier is used to deter invasive fish from swimming upstream into Lura Lake. The 18-inch tile connects into the fish barrier then drops approximately 4 feet before draining into the 22-inch tile.

Defects were observed during the entire video and the following photos show examples of defects witnessed. The existing condition of the mainline tile is in poor shape. The televising revealed that the tile has an oval shape, cracks in the top and sides and private tile connections intruding too far into the mainline. The tiles are showing major cracks that are allowing sediment and roots to gather in the tile. The oval shape of the tiles was seen along the majority of the televising video. The private tile connection was intruding into the mainline by approximately 6-inches creating a flow restriction. Location of the photos and defects can be seen in the Televising Map in Figure 2.



Figure 2. Televising Location Map



Figure 3. Oval Shape, Cracks on Top

Figures 3-7 were all televised on the south side of Impulse Road. Televising started midway between the Impulse Road and Lura Lake and then headed downstream (north). The televising ended just before Impulse Road because of the major collapse seen in Figure 7. The camera could not pass this collapse.



Figure 4. Intruding Tile Restricting Flow

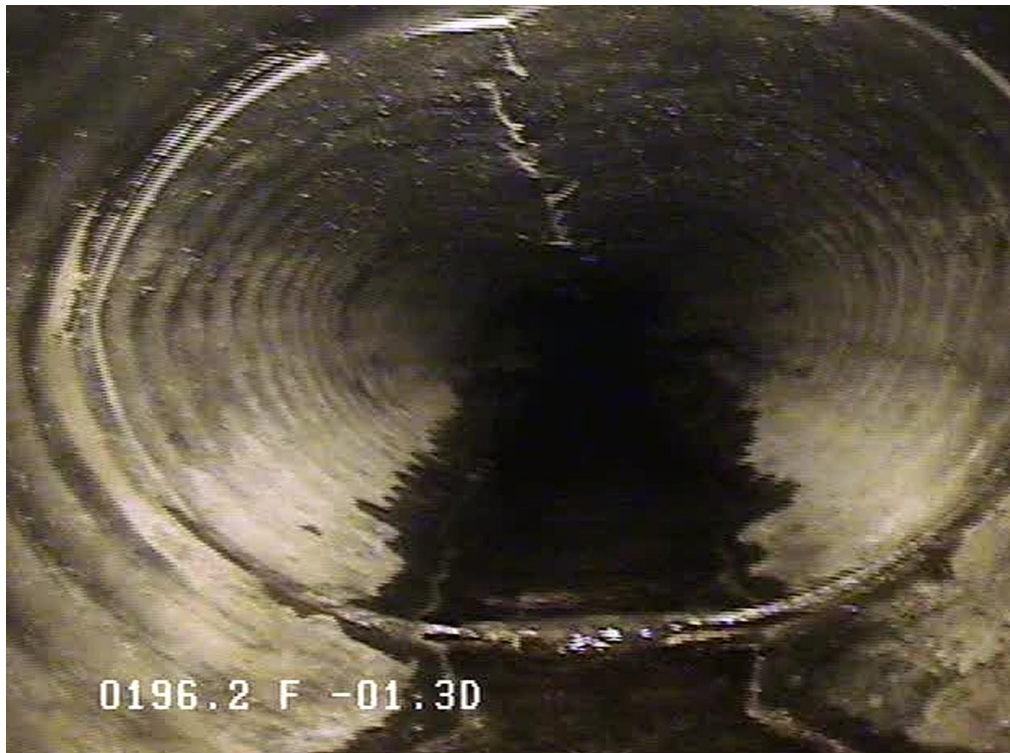


Figure 5. Cracks on Top

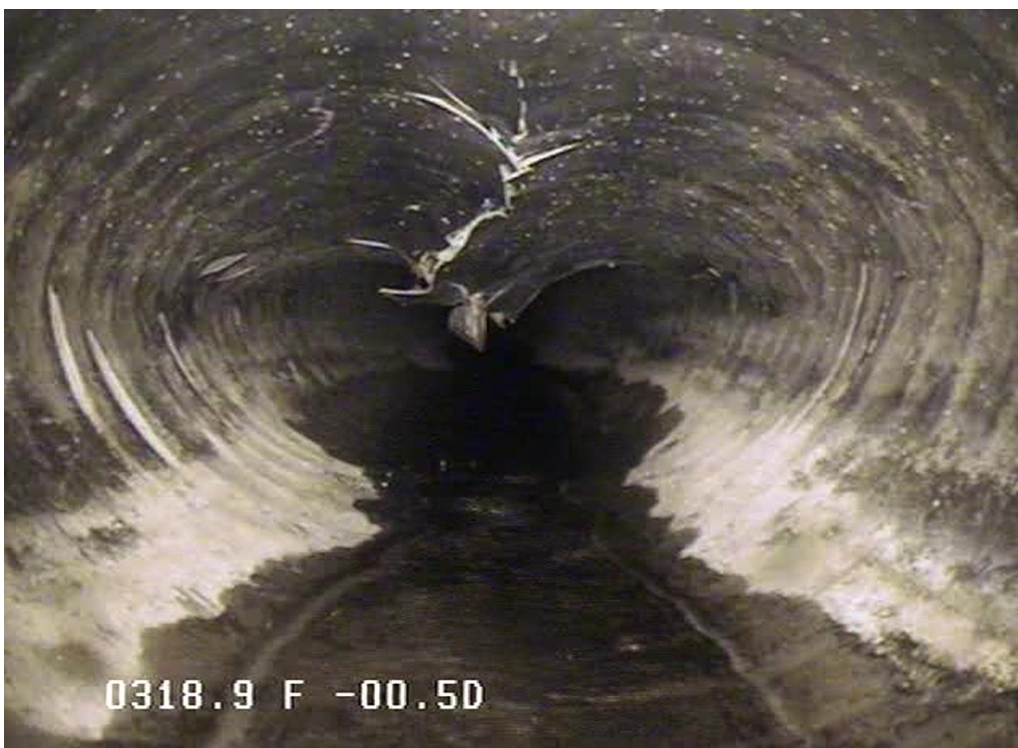


Figure 6. Collapsing Tile



Figure 7. Completely Collapsed Tile. (Just South of Impulse Road)

Existing Capacities

The capacity of agricultural tile is expressed as a drainage coefficient in inches per day (in/day) and is defined as the depth of water over the entire area of the upstream watershed that a tile can drain in a 24-hour period. For a system like JCD 1, the NRCS recommends a drainage coefficient of 0.50 to 0.75 in/day for buried tile.

Table 1. Existing Drainage Coefficients

Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Fish Barrier	18	0.60%	2680.0	0.07
Outlet	22	0.60%	2850.0	0.12
County Road 15 Crossing	24	0.10%	2606.0	0.07
DNR Structure	30	1.00%	2625.0	0.19
405th Avenue	24	0.10%	2715.0	0.03

PROPOSED CONDITIONS

The following paragraphs summarize the necessary repairs or improvements for the JCD 1 system. Detailed cost estimates are included in Appendix B. Formal construction plans were not prepared as part of this report. The proposed repairs are shown on the repair map. More photos and video can also be viewed to support the existing conditions and proposed options.

Repair Option 1

The existing 18-inch mainline will be repaired with a new 18-inch HDPE tile offset 25 feet to the west. The repair will consist of replacing the 18-inch tile from Lura Lake weir downstream to the fish barrier located to the north of Impulse Road. Drop intakes will be installed in the road ditches and the road will be restored. The repair will start at the outlet structure located by the lake and will end at the fish barrier structure located at station 14+80. The tile will be installed at a 0.60% grade to match legal grade and will connect into the fish barrier. The tile will be encased in concrete to seal the connection to the fish barrier.

Table 2. Repair Option 1 Drainage Coefficients

Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Fish Barrier	18	18	0.60%	0.60%	2680.0	0.07	0.07
Outlet	22	-	0.60%	-	2850.0	0.12	-

Repair Option 2

The second repair option would extend the repair option 1 to included replacing the existing 22-inch tile with 24-inch HDPE tile. The tile would outlet into Rice Creek. The repair would be from Lura Lake weir to Rice Creek. Repair option 1 and option 2 will include installing a fence between the intake structure and the lake to reduce the debris in the area.

Table 3. Repair Option 2 Drainage Coefficients

Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Fish Barrier	18	18	0.60%	0.60%	2680.0	0.07	0.07
Outlet	22	24	0.60%	0.60%	2850.0	0.12	0.15

Improvement - Option 3

The proposed improvement would consist of installing 36-inch and 42-inch tile. The 18-inch tile from Lura Lake to the fish barrier would be replaced with 36-inch tile. A new fish barrier would then be installed and the existing lines and the new proposed lines would inlet into the fish barrier. The fish barrier would then outlet into a new 42-inch tile that would drain into Rice Creek.

Table 4. Proposed Drainage Coefficients

Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Fish Barrier	18	36	0.60%	0.70%	2680.0	0.07	0.50
Outlet	22	42	0.60%	0.35%	2850.0	0.12	0.50

Alternative Improvement-Option 4

An alternative outlet was established by the DNR in late 1994 or in 1995 according to Permit 95-4011. The second outlet was installed to provide additional outflow capacity as part of an overall fish reclamation project. The outlet constructed was a 30" x 8' CMP drop inlet structure that flows into another 30" pipe Figure 8. The culvert under County Road 15 is a 24" RCP culvert and the Culvert under 405th Avenue is a 24" CMP culvert. Option four would replace the existing 24-inch culverts with 36 inch RCP culverts. The DNR structure would also be replaced with a 36-inch structure. The culvert under County Road 15 would control the outflow and would have a drainage coefficient of 0.24 in/day. The existing outlet structure on the west side of Lura Lake would be abandoned. The DNR structure was designed with an elevation of 1032. 6 feet according to Schereks 1983 work report. However, a post construction survey was not undertaken. The survey showed an elevation of 1032.63'.



Figure 8. 30-Inch DNR Drop Intake Structure

Table 5. Alternative Outlet Drainage

Crossing #	Location	Existing Type	Existing Material	Proposed Material	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
1	County Road 15	ROUND CULVERT	RCP	RCP	24	36	0.10%*	0.15%	2606	0.07	0.24
2	DNR Structure	ROUND CULVERT	CMP	CMP	30	36	1.00%	1.00%	2625	0.19	0.32
3	405th Ave	ROUND CULVERT	CMP	RCP	24	36	0.10%*	0.15%	2715	0.03	0.23

* Assumed Positive flow on Culvert

The map in Figure 9 shows the existing JCD 1 mainline on the west side of Lura Lake and the established DNR outlet on the Southwest side of Lura Lake. Both outlets were surveyed in 2018, inverts and other important elevations are shown in Figure 9.

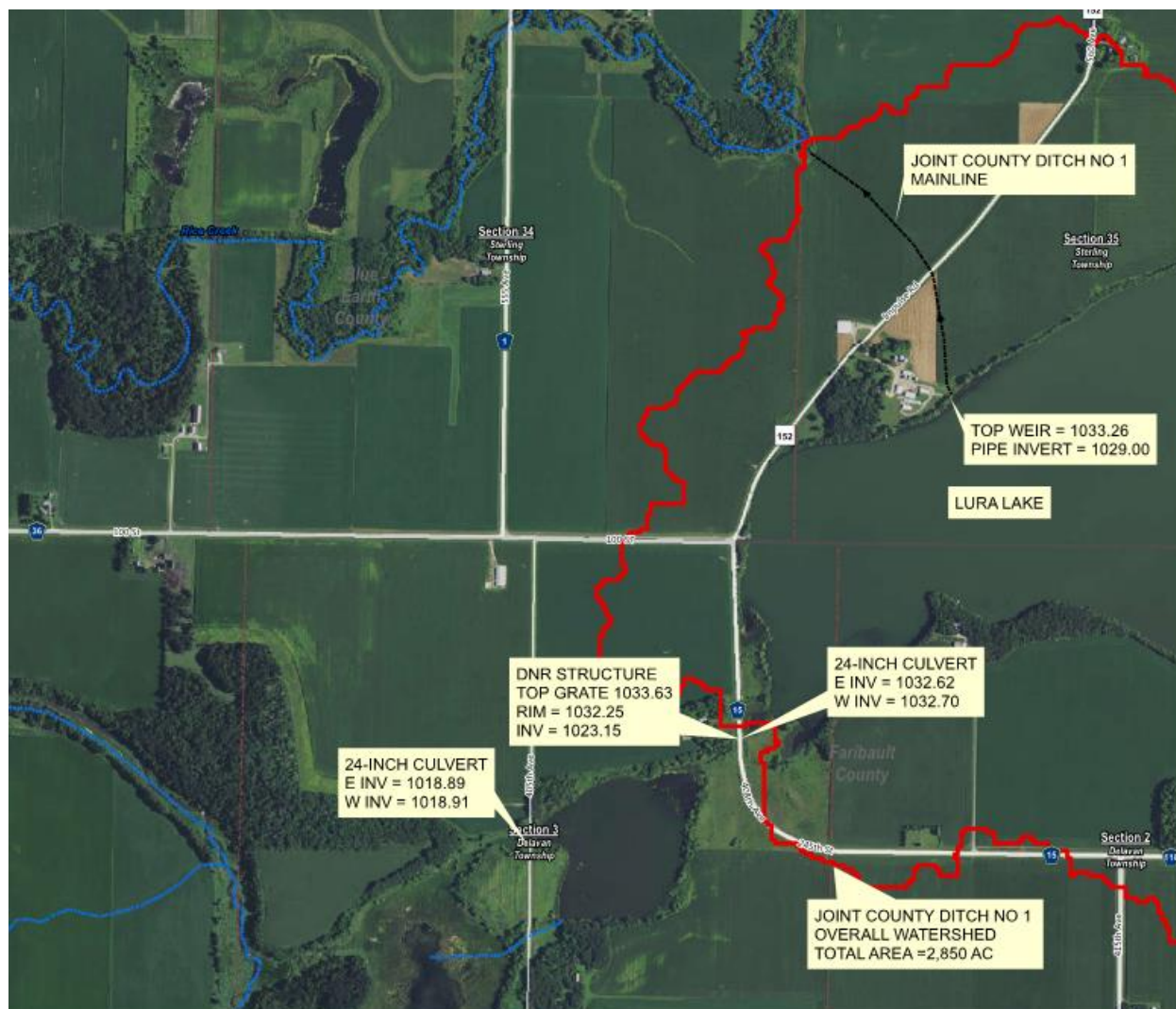


Figure 9. Alternative Outlet Location

PRACTICALITY + FEASIBILITY

The JCD 1 watershed will benefit from the repairs or improvement outlined in this report through less restrictions of flow, better maintained lake elevation, better water quality, and from less future maintenance required. Table 6 summarizes the cost of the repair project and the improvement option. Detailed cost estimates are included in Appendix B.

Table 6. Cost Estimate

Area	Total Project Cost
Mainline (Lura Lake to Fish Barrier) - Option 1	\$ 111,810
Mainline (Lura Lake to Rice Creek) - Option 2	\$ 219,336
Improvement - Option 3	\$ 366,460
Improvement - Option 4	\$ 111,465

The total cost to repair the tile from Lura Lake weir to the fish barrier is \$111,810 while the cost to repair the entire JCD 1 mainline would be \$219,336. To improve the entire mainline, the cost would be \$366,460. Both the repair and improvement are practical and feasible for a watershed of this size. Option 4 is estimated at \$111,465. It should be noted that the unit prices for the cost estimate are based on previous projects using High Density Polyethylene (HDPE) pipe for standard tile installation.

CONCLUSIONS + RECOMMENDATIONS

Informational meetings with landowners have been held on this project and no improvement petitions have been put forward. It is the opinion of the engineer that the options presented could be considered and the best option for the landowners should be chosen. As they are currently proposed, the Engineer recommends Repair Option 1, which would restore the system to its originally constructed condition. While explored for the purposes of this report, the Engineer does not recommend Improvement Option 4, as it would alter the hydrology of the existing Waterfowl Production Area to the South. We would appreciate the opportunity to discuss this in greater detail and to potentially meet with a group of landowners and discuss the findings. Please contact us with questions or comments.

APPENDIX A: EXHIBITS

Lura Lake Outlet Summary

Leo Getsfried, Mankato Area Hydrologist, revised 6/30/11

On the basis of the file information available in the Mankato area office, the following information is believed to be an accurate description of the lake outlet situation.

An April 1997 report by I&S Engineers to Blue Earth County Commissioner Al Bennett states that the original lake outlet was at the NW corner of the lake. I believe this information originated from a DOW survey report* dated 6/13/83 that refers to a previous 1962 state survey report which concluded this outlet was blocked by road construction in 1919, thereby "making the lake essentially landlocked". The I&S report further states that "in an effort to better control the Lake's elevation, Joint Ditch No. 1 was constructed through Wes Bonnett's land in 1971/1972". This project was authorized under Permit #71-1463 issued jointly to Blue Earth & Faribault Counties.

The JD 1 project consists of 2,400 feet of 18" & 22" tile that outlets into Rice Creek (tributary to Maple River). The project begins at the lake on the Bonnett farm with a 30" CMP drop inlet that includes a screwgate control. This structure drains into an 18" concrete tile. In the past it was necessary to keep this partially closed so as not to blow out the downstream tile. BEC Ditch Manager Craig Austinson advised that the county recently installed metal fencing around the intake to keep out debris. On the downstream side of CR 152 there is a second drop inlet that was apparently intended as a rough fish barrier. Below this structure the tile size increases to a 22" diameter for the remaining distance to Rice Creek.

There is also a second tile outlet located approximately one mile farther to the south at the lake's far southwest tip. This outlet is located in Faribault County and was established by DNR-Fisheries (Waterville office) in late 1994 or in 1995 pursuant to Permit 95-4011. According to the permit file this second outlet was needed to provide additional outflow capacity as part of an overall fish reclamation project wherein a temporary drawdown of the lake was done prior to applying rotenone. Former Ass't Manager Todd Kolander has informed me they needed to obtain permission from authorities in Faribault County to construct this second outlet into a wetland on the Smith WMA. The tile is a 30" x 8' CMP drop inlet into another 30" pipe. No elevation is specified in either the permit or sketch drawing. However, it is my understanding it was set to match the control elevation of the other drop inlet which is at 1032.6' according to Scherek's 1983 work report. However, a post-construction survey was not undertaken.

A service requisition will be submitted to have the survey crew determine the current elevations of these outlets.

* That same report indicates the NOHW of Lura Lake is 1033.0'.



Overview Map

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Tuesday, February 20, 2018

Legend

- JD_1_Tile
- JD 1 Watershed

PN: 17-20781

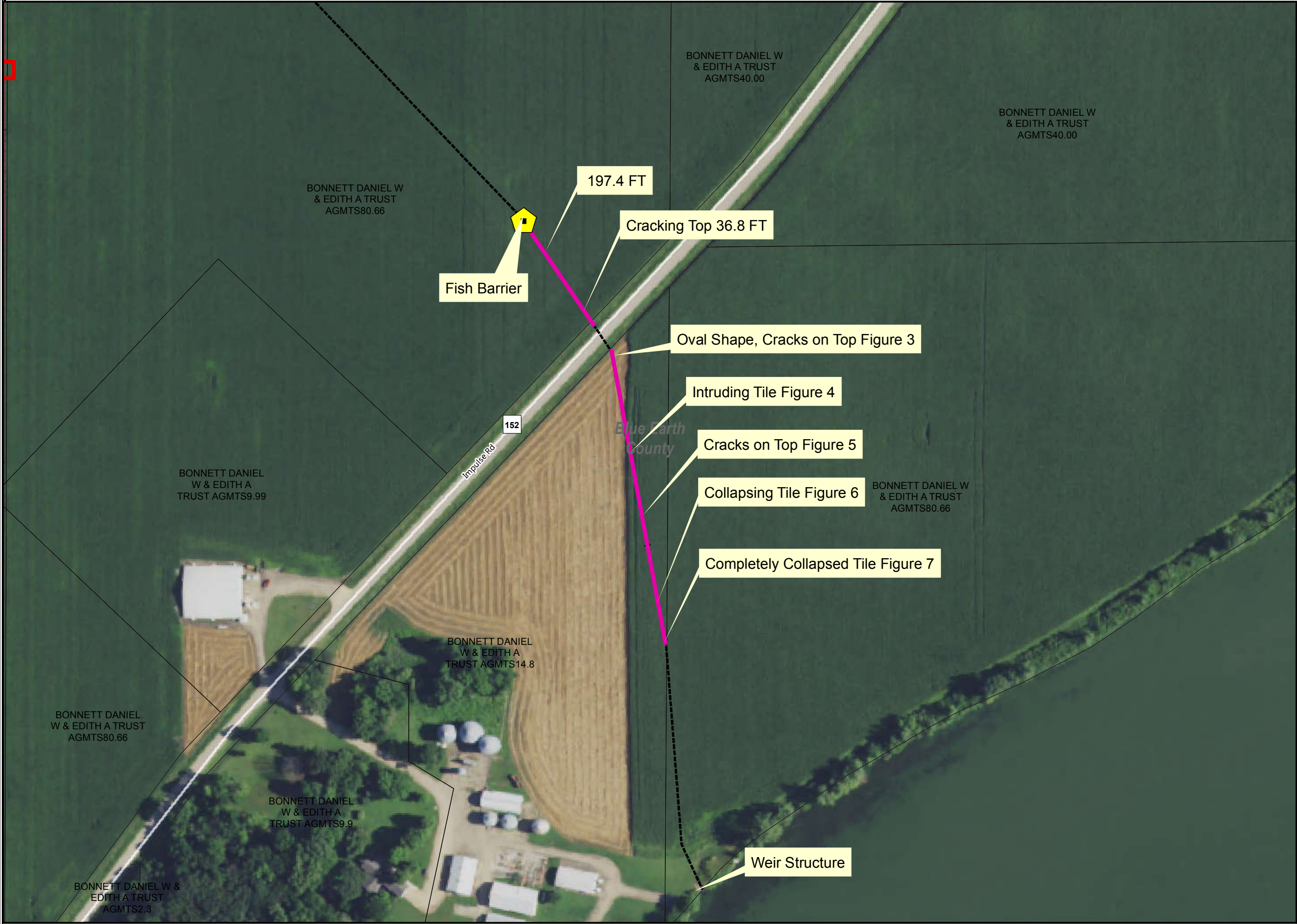
Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 475 950 1,900 Feet
1 inch = 2,000 feet





Televising Map

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Monday, April 02, 2018

Legend

- Televising_line
- JD_1_Tile
- JD 1 Parcels

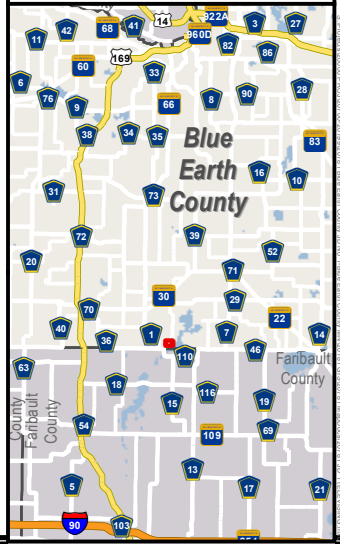
PN: 18-20781

Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 40 80 160 Feet
1 inch = 177 feet





Soil Map

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Tuesday, February 20, 2018

Legend

--- JD_1_Tile

Soil Classification

- WATER
- B/D
- C
- C/D
- JD 1 Watershed

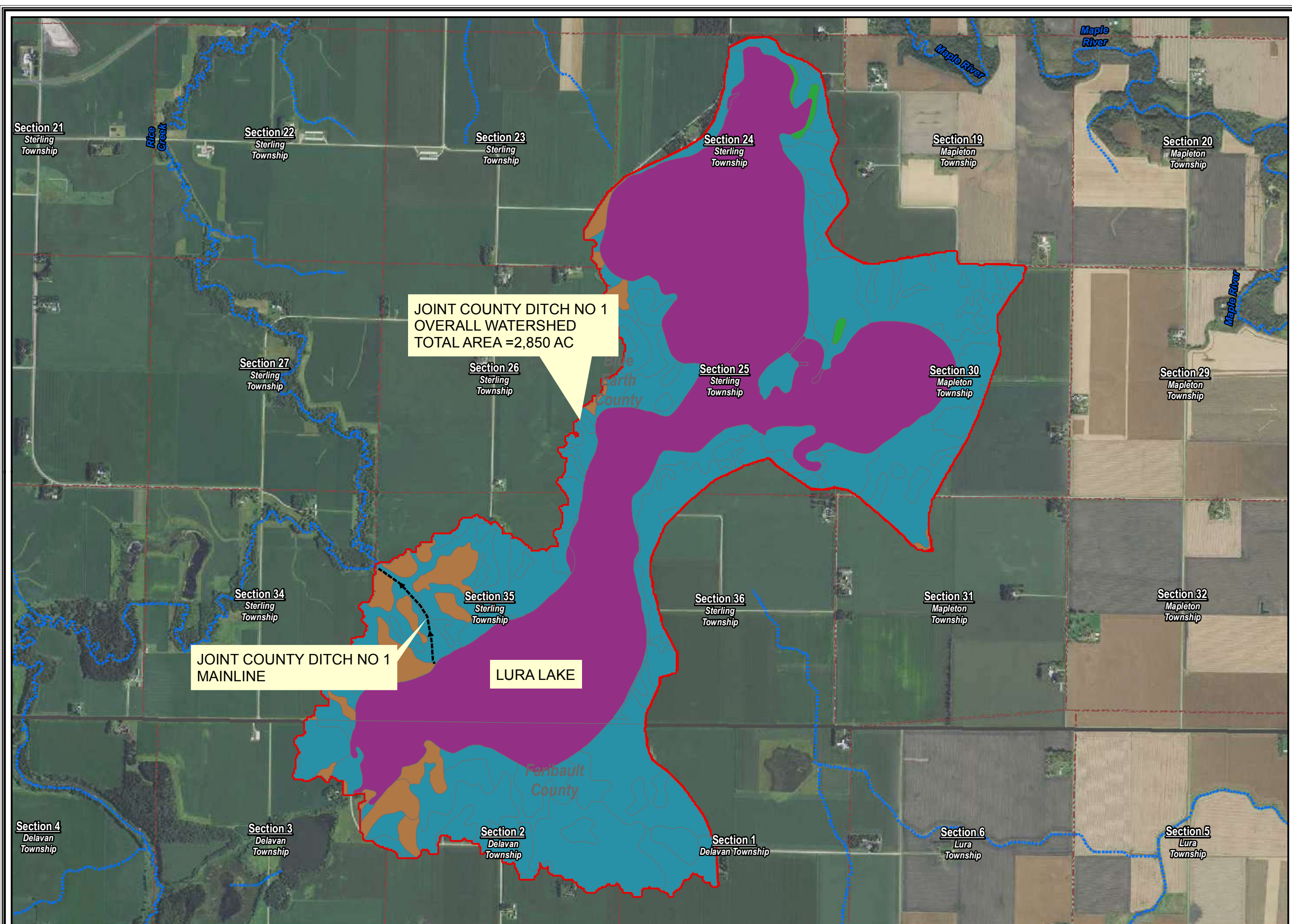
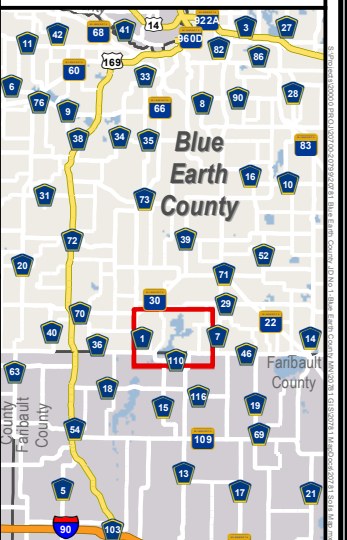
PN: 17-20781

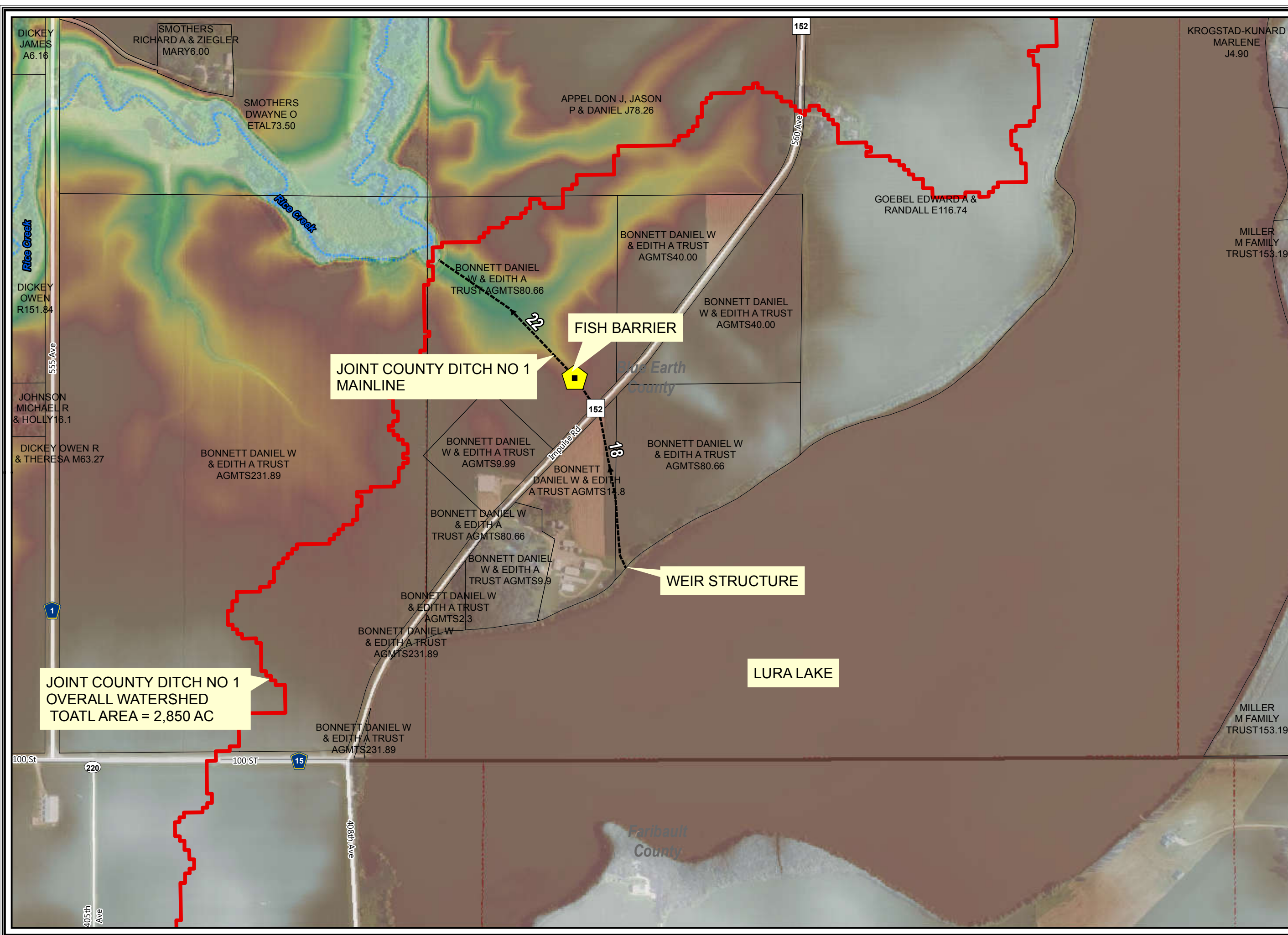
Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 475 950 1,900 Feet
1 inch = 2,000 feet





Elevation Map

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Tuesday, February 20, 2018

Legend

- JD_1_Tile
- JD 1 Watershed
- JD 1 Parcels
- USGS Streams

Elevation_FT

Value
High : 1053.01
Low : 1002.41

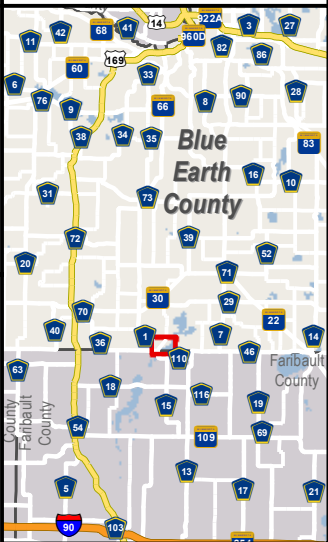
PN: 18-20781

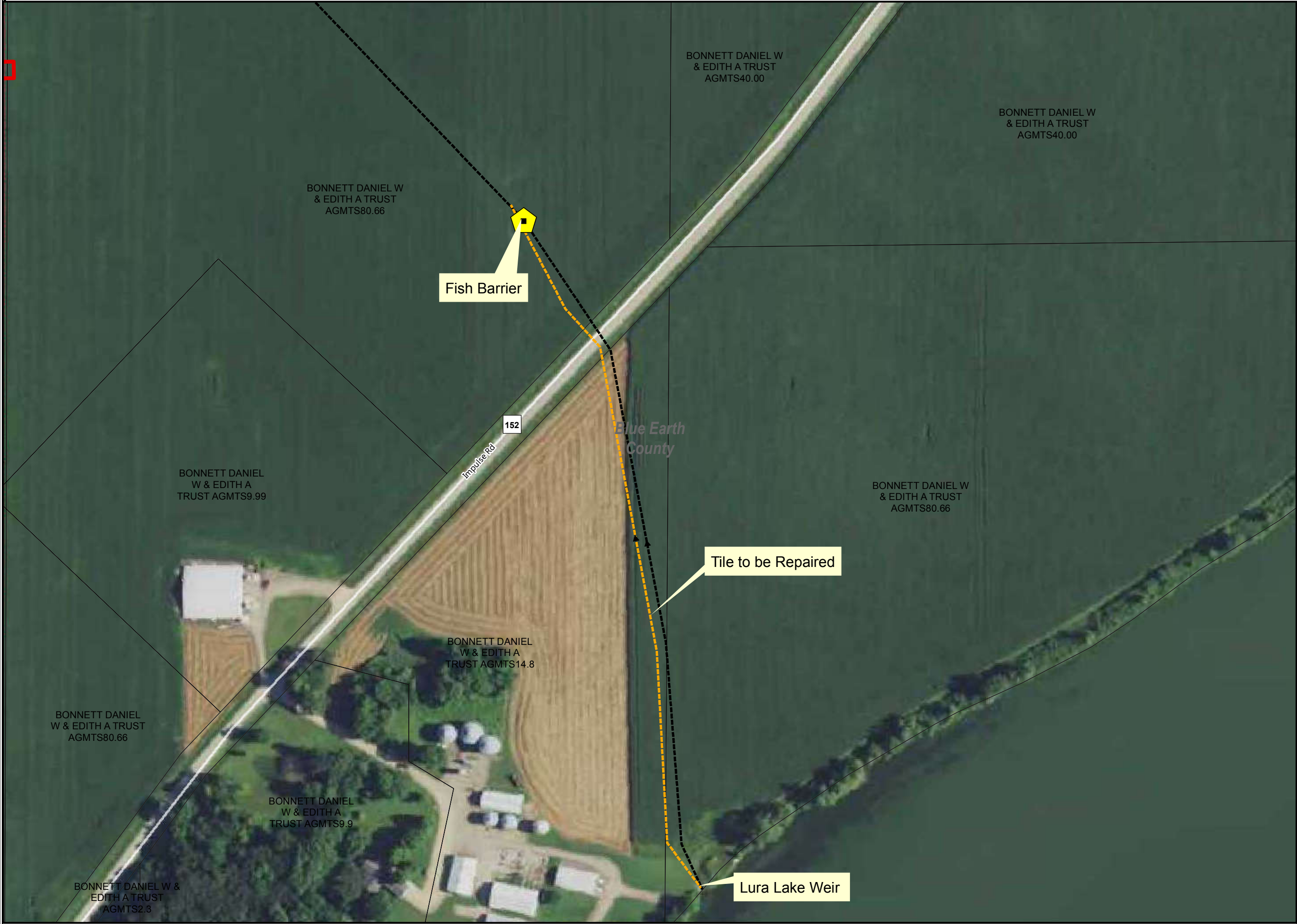
Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 145 290 580 Feet
1 inch = 615 feet





Repair Map

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Friday, March 30, 2018

Legend

- Repair Location
- JD_1_Tile
- JD 1 Parcels

PN: 18-20781

Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 40 80 160 Feet
1 inch = 177 feet





Survey Points

Joint County Ditch No.1
Blue Earth County,
Faribault County.
Minnesota
Wednesday, April 18, 2018

Legend

- JD_1_Tile
- JD 1 Watershed

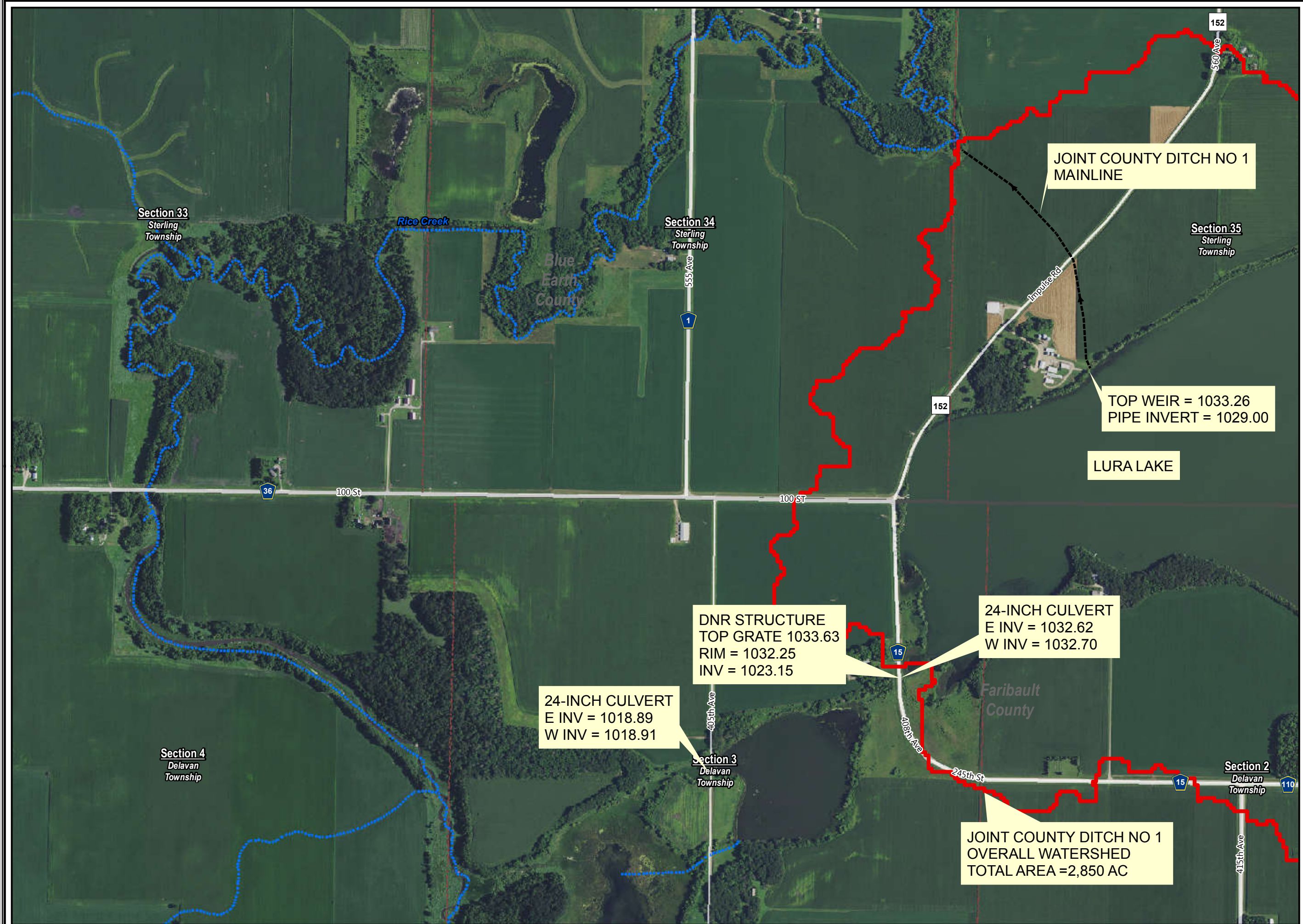
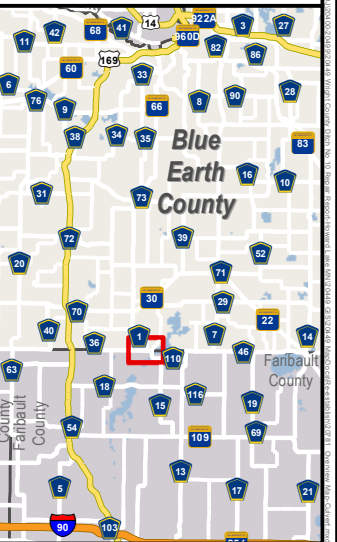
PN: 17-20781

Source:

Orthophotograph (XXXX County, 2016)
Tile/Ditch (XXXX County, 11/21/2016)
Parcels (XXXX County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 210 420 840 Feet
1 inch = 881 feet



APPENDIX B: PRELIMINARY COST ESTIMATE

**BLUE EARTH & FARIBAULT COUNTY
JUDICIAL DITCH No. 1**



PROPOSED REPAIR COST SUMMARY

Area	Repair Cost
Mainline (Lura Lake to Fish Barrier) - Option 1	\$ 96,285
Subtotal	\$ 96,285
Road Authority Repair Costs	\$ 15,525
Total Project Costs	\$ 111,810
Redetermination of Benefits Costs	\$ -
Permanent Damages (Buffer Strip Acquisition)	\$ -
Total Project Costs for Landowners	\$ 96,285

PROPOSED REPAIR COST SUMMARY

Area	Repair Cost
Mainline (Lura Lake to Rice Creek) - Option 2	\$ 203,812
Subtotal	\$ 203,812
Road Authority Repair Costs	\$ 15,525
Total Project Costs	\$ 219,336
Redetermination of Benefits Costs	\$ -
Permanent Damages (Buffer Strip Acquisition)	\$ -
Total Project Costs for Landowners	\$ 203,812

**BLUE EARTH & FARIBAULT COUNTY
JUDICIAL DITCH No. 1**

ISG

PROPOSED IMPROVEMENT OPTION 3 COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Improvement - Option 3	\$ 199,149	\$ 347,665	\$ 148,516
Road Crossing Costs	\$ -	\$ 3,271	\$ 3,271
Subtotal	\$ 199,149	\$ 350,936	\$ 151,787
Road Authority Repair Costs	\$ 15,525	\$ 15,525	\$ -
Total Project Costs	\$ 214,673	\$ 366,460	\$ 151,787
Subtotal Separable Maintenance Costs			\$ 199,149
Net Costs			\$ 151,787
Redetermination of Benefits Costs			\$ -
Permanent Damages (Buffer Strip Acquisition)			\$ -
Total Project Costs for Landowners			\$ 350,936

PROPOSED IMPROVEMENT OPTION 4 COST SUMMARY

Area	Separable	Improvement Cost	Net Cost
Improvement - Option 4	\$ -	\$ 38,684	\$ 38,684
Road Crossing Costs	\$ -	\$ 17,559	\$ 17,559
Subtotal	\$ -	\$ 56,243	\$ 56,243
Road Authority Repair Costs	\$ 55,222	\$ 55,222	\$ -
Total Project Costs	\$ 55,222	\$ 111,465	\$ 56,243
Net Costs			\$ 56,243
Redetermination of Benefits Costs			\$ -
Permanent Damages (Buffer Strip Acquisition)			\$ -
Total Project Costs for Landowners			\$ 56,243

SEPARABLE MAINTENANCE (REPAIR)

Mainline (Lura Lake to Fish Barrier) - Option 1

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,030.00	\$ 3,030
102	TILE INVESTIGATION	HR	3	\$ 226.26	\$ 679
103	18-INCH AGRICULTURAL TILE	LF	1405	\$ 32.82	\$ 46,112
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	6	\$ 575.00	\$ 3,450
105	18-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	2	\$ 2,476.26	\$ 4,953
106	GRANULAR PIPE FOUNDATION	CY	30	\$ 31.49	\$ 945
107	CONNECT TILE TO FISH BARRIER	EA	1	\$ 500.00	\$ 500
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,450.00	\$ 2,900
109	VACUUM CLEAN FISH BARRIER	EA	1	\$ 600.00	\$ 600
SUBTOTAL CONSTRUCTION COST					\$ 63,168
10% UNFORSEEN					\$ 6,317
TOTAL CONSTRUCTION COST					\$ 69,485
TEMPORARY DAMAGES		AC	3.23	\$ 650.00	\$ 2,097
TELEVISIONING (POST CONSTRUCTION)		LF	1405	\$ 1.00	\$ 1,405
COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)					\$ 3,475
TOPOGRAPHIC SURVEY					\$ 1,757
REPORTS, PLANS AND SPECIFICATIONS					\$ 8,339
CONSTRUCTION STAKING & ADMINISTRATION					\$ 9,728
TOTAL MAINLINE (LURA LAKE TO FISH BARRIER) - OPTION 1 REPAIR COST					\$ 96,285

Mainline (Lura Lake to Rice Creek) - Option 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,420.00	\$ 6,420
102	TILE INVESTIGATION	HR	6	\$ 226.26	\$ 1,358
103	24-INCH AGRICULTURAL TILE	LF	1300	\$ 43.28	\$ 56,264
104	18-INCH AGRICULTURAL TILE	LF	1405	\$ 32.82	\$ 46,112
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 575.00	\$ 6,325
106	18-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	3	\$ 2,476.26	\$ 7,429
107	GRANULAR PIPE FOUNDATION	CY	61	\$ 31.49	\$ 1,921
108	CONNECT TILE TO FISH BARRIER	EA	2	\$ 500.00	\$ 1,000
109	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,450.00	\$ 4,350
110	VACUUM CLEAN FISH BARRIER	EA	1	\$ 600.00	\$ 600
111	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,960.00	\$ 1,960
SUBTOTAL CONSTRUCTION COST					\$ 133,738
10% UNFORSEEN					\$ 13,374
TOTAL CONSTRUCTION COST					\$ 147,112
TEMPORARY DAMAGES		AC	7.70	\$ 650.00	\$ 5,006
TELEVISIONING (POST CONSTRUCTION)		LF	2705	\$ 1.00	\$ 2,705
COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)					\$ 7,356
TOPOGRAPHIC SURVEY					\$ 3,382
REPORTS, PLANS AND SPECIFICATIONS					\$ 17,654
CONSTRUCTION STAKING & ADMINISTRATION					\$ 20,596
TOTAL MAINLINE (LURA LAKE TO RICE CREEK) - OPTION 2 REPAIR COST					\$ 203,812

TOTAL REPAIR COST

Mainline (Lura Lake to Fish Barrier) - Option 1		\$ 96,285
Mainline (Lura Lake to Rice Creek) - Option 2		\$ 203,812

PROPOSED IMPROVEMENT - OPTION #1

Improvement - Option 3

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 11,090.00	\$ 11,090
102	TILE INVESTIGATION	HR	6	\$ 226.26	\$ 1,358
103	42-INCH AGRICULTURAL TILE	LF	1300	\$ 80.64	\$ 104,832
104	36-INCH AGRICULTURAL TILE	LF	1405	\$ 64.10	\$ 90,061
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 575.00	\$ 6,325
106	18-INCH CROSS-CONNECT W/40 LF OF SPECIFIED PIPE	EA	2	\$ 2,476.26	\$ 4,953
107	GRANULAR PIPE FOUNDATION	CY	86	\$ 31.49	\$ 2,708
108	INSTALL DROP INTAKE (24-INCH)	EA	3	\$ 1,250.00	\$ 3,750
109	INSTALL FISH BARRIER	LS	1	\$ 2,500.00	\$ 2,500
110	42-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 3,500.00	\$ 3,500
SUBTOTAL CONSTRUCTION COST					\$ 231,076
10% UNFORSEEN					\$ 23,108
TOTAL CONSTRUCTION COST					\$ 254,183
TEMPORARY DAMAGES		AC	9.31	\$ 650.00	\$ 6,055
TELEVISIONING (POST CONSTRUCTION)		LF	2705	\$ 1.00	\$ 2,705
COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)					\$ 12,710
TOPOGRAPHIC SURVEY					\$ 3,382
REPORTS, PLANS AND SPECIFICATIONS					\$ 33,044
CONSTRUCTION STAKING & ADMINISTRATION					\$ 35,586
TOTAL IMPROVEMENT - OPTION 3 IMPROVEMENT COST					\$ 347,665

Improvement - Option 4

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,270.00	\$ 1,270
102	TILE INVESTIGATION	HR	1	\$ 226.26	\$ 226
103	36-INCH AGRICULTURAL TILE	LF	100	\$ 64.10	\$ 6,410
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	1	\$ 575.00	\$ 575
105	GRANULAR PIPE FOUNDATION	CY	3	\$ 31.49	\$ 94
106	INSTALL DROP INTAKE (24-INCH)	EA	1	\$ 1,250.00	\$ 1,250
107	CAP DROP INTAKE (24-INCH)	EA	1	\$ 250.00	\$ 250
108	OPEN CUT & RESTORE FIELD CROSSING	EA	3	\$ 1,600.00	\$ 4,800
109	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	0.5	\$ 1,500.00	\$ 750
110	MOWING	AC	1	\$ 214.40	\$ 214
111	WEED SPRAYING	AC	1	\$ 307.80	\$ 308
112	INSTALL INLET PROTECTION	EA	1	\$ 183.20	\$ 183
113	OUTLET STRUCTURE	LS	1	\$ 10,000.00	\$ 10,000
SUBTOTAL CONSTRUCTION COST					\$ 26,331
10% UNFORSEEN					\$ 2,633
TOTAL CONSTRUCTION COST					\$ 28,964
TEMPORARY DAMAGES		AC	0.34	\$ 650.00	\$ 224
TELEVISIONING (POST CONSTRUCTION)		LF	100	\$ 1.00	\$ 100
COUNTY ADMINISTRATION COSTS (Legal, Staff, Bonding, Advertisement)					\$ 1,449
TOPOGRAPHIC SURVEY					\$ 125
REPORTS, PLANS AND SPECIFICATIONS					\$ 3,766
CONSTRUCTION STAKING & ADMINISTRATION					\$ 4,056
TOTAL IMPROVEMENT - OPTION 4 IMPROVEMENT COST					\$ 38,684

TOTAL IMPROVEMENT COST

Improvement - Option 3	\$ 347,665
Improvement - Option 4	\$ 38,684

ROAD CROSSINGS

MAINLINE REPAIR COST - IMPULSE ROAD

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 700.00	\$ 700
102	TILE INVESTIGATION	HR	1	\$ 226.26	\$ 226
103	18-INCH AGRICULTURAL TILE	LF	75	\$ 32.82	\$ 2,462
104	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	1	\$ 575.00	\$ 575
105	GRANULAR PIPE FOUNDATION	CY	2	\$ 31.49	\$ 63
106	FURNISH & INSTALL WATER QUALITY INLET	EA	2	\$ 1,630.00	\$ 3,260
107	INSTALL 8-INCH PERFORATED TILE (WATER QUALITY INLET)	LF	80	\$ 22.90	\$ 1,832
108	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,450.00	\$ 1,450
109	CAP DROP INTAKE (18-INCH)	EA	1	\$ 236.10	\$ 236
110	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
SUBTOTAL CONSTRUCTION COST					\$ 10,568
10% UNFORSEEN					\$ 1,057
TOTAL CONSTRUCTION COST					\$ 11,625
COUNTY ADMINISTRATION COSTS					\$ 600
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,600
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,700
ESTIMATED MAINLINE REPAIR COST - IMPULSE ROAD					\$ 15,525

MAINLINE IMPROVEMENT COST - IMPULSE ROAD

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 800.00	\$ 800
202	TILE INVESTIGATION	HR	1	\$ 226.26	\$ 226
203	36-INCH AGRICULTURAL TILE	LF	75	\$ 64.10	\$ 4,808
204	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	1	\$ 575.00	\$ 575
205	GRANULAR PIPE FOUNDATION	CY	2	\$ 31.49	\$ 63
206	FURNISH & INSTALL WATER QUALITY INLET	EA	2	\$ 1,630.00	\$ 3,260
207	INSTALL 8-INCH PERFORATED TILE (WATER QUALITY INLET)	LF	80	\$ 22.90	\$ 1,832
208	INSTALL DROP INTAKE (24-INCH)	EA	1	\$ 1,250.00	\$ 1,250
209	CAP DROP INTAKE (24-INCH)	EA	1	\$ 250.00	\$ 250
210	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
SUBTOTAL CONSTRUCTION COST					\$ 12,814
10% UNFORSEEN					\$ 1,281
TOTAL CONSTRUCTION COST					\$ 14,095
COUNTY ADMINISTRATION COSTS					\$ 800
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,900
CONSTRUCTION STAKING & ADMINISTRATION					\$ 2,000
ESTIMATED MAINLINE IMPROVEMENT COST - IMPULSE ROAD					\$ 18,795

ROAD CROSSINGS

OPTION 4 REPAIR COST WITH ROAD - COUNTY ROAD 15

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,000.00	\$ 1,000
102	24-INCH CLASS III RCP PIPE	LF	85	\$ 123.58	\$ 10,504
103	GRANULAR BEDDING MATERIAL	CY	10	\$ 27.60	\$ 276
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
105	SEED MIX 25-142 W/MNDOT EROSION CONTROL BLANKET CATEGORY 3	SY	100	\$ 3.50	\$ 350
106	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	40	\$ 85.90	\$ 3,436
107	REMOVE RCP CULVERT	EA	1	\$ 1,685.90	\$ 1,686
SUBTOTAL CONSTRUCTION COST					\$ 19,362
10% UNFORSEEN					\$ 1,936
TOTAL CONSTRUCTION COST					\$ 21,298
COUNTY ADMINISTRATION COSTS					\$ 1,100
REPORTS, PLANS AND SPECIFICATIONS					\$ 2,800
CONSTRUCTION STAKING & ADMINISTRATION					\$ 3,000
ESTIMATED OPTION 4 REPAIR COST WITH ROAD - COUNTY ROAD 15					\$ 28,198

OPTION 4 IMPROVEMENT COST - COUNTY ROAD 15

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 1,400.00	\$ 1,400
302	36-INCH CLASS III RCP PIPE	LF	85	\$ 178.70	\$ 15,190
303	36-INCH RCP APRON	EA	2	\$ 1,500.00	\$ 3,000
304	GRANULAR BEDDING MATERIAL	CY	10	\$ 27.60	\$ 276
305	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
306	SEED MIX 25-142 W/MNDOT EROSION CONTROL BLANKET CATEGORY 3	SY	100	\$ 3.50	\$ 350
307	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	\$ 85.90	\$ 4,295
308	REMOVE RCP CULVERT	EA	1	\$ 1,685.90	\$ 1,686
SUBTOTAL CONSTRUCTION COST					\$ 28,306
10% UNFORSEEN					\$ 2,831
TOTAL CONSTRUCTION COST					\$ 31,137
COUNTY ADMINISTRATION COSTS					\$ 1,600
REPORTS, PLANS AND SPECIFICATIONS					\$ 4,100
CONSTRUCTION STAKING & ADMINISTRATION					\$ 4,400
ESTIMATED OPTION 4 IMPROVEMENT COST - COUNTY ROAD 15					\$ 41,237



ROAD CROSSINGS

OPTION 4 REPAIR COST WITH ROAD - 405TH AVE

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 900.00	\$ 900
102	36-INCH CLASS III RCP PIPE	LF	55	\$ 178.70	\$ 9,829
103	GRANULAR BEDDING MATERIAL	CY	6	\$ 27.60	\$ 166
104	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
105	SEED MIX 25-142 W/MNDOT EROSION CONTROL BLANKET CATEGORY 3	SY	100	\$ 3.50	\$ 350
106	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	40	\$ 85.90	\$ 3,436
107	REMOVE RCP CULVERT	EA	1	\$ 1,685.90	\$ 1,686
SUBTOTAL CONSTRUCTION COST					\$ 18,476
10% UNFORSEEN					\$ 1,848
TOTAL CONSTRUCTION COST					\$ 20,324
COUNTY ADMINISTRATION COSTS					\$ 1,100
REPORTS, PLANS AND SPECIFICATIONS					\$ 2,700
CONSTRUCTION STAKING & ADMINISTRATION					\$ 2,900
ESTIMATED OPTION 4 REPAIR COST WITH ROAD - 405TH AVE					\$ 27,024

OPTION 4 IMPROVEMENT COST - 405TH AVE

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 1,100.00	\$ 1,100
302	36-INCH CLASS III RCP PIPE	LF	55	\$ 178.70	\$ 9,829
303	36-INCH RCP APRON	EA	2	\$ 1,500.00	\$ 3,000
304	GRANULAR BEDDING MATERIAL	CY	6	\$ 27.60	\$ 166
305	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 2,110.00	\$ 2,110
306	SEED MIX 25-142 W/MNDOT EROSION CONTROL BLANKET CATEGORY 3	SY	100	\$ 3.50	\$ 350
307	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	40	\$ 85.90	\$ 3,436
308	REMOVE RCP CULVERT	EA	1	\$ 1,685.90	\$ 1,686
SUBTOTAL CONSTRUCTION COST					\$ 21,676
10% UNFORSEEN					\$ 2,168
TOTAL CONSTRUCTION COST					\$ 23,844
COUNTY ADMINISTRATION COSTS					\$ 1,200
REPORTS, PLANS AND SPECIFICATIONS					\$ 3,100
CONSTRUCTION STAKING & ADMINISTRATION					\$ 3,400
ESTIMATED OPTION 4 IMPROVEMENT COST - 405TH AVE					\$ 31,544

BLUE EARTH & FARIBAULT COUNTY**JUDICIAL DITCH No. 1****August 16, 2022****ROAD CROSSING SUMMARY**

Crossing	Road Authority	Road Authority Cost (Repair Cost With Road)	Improvement Cost	Project Cost for Road Crossings (Difference of Improvement Cost and Road Authority Cost)
Mainline				
Impulse Road	BLUE EARTH COUNTY	\$ 15,525	\$ 18,795	\$ 3,271
Option 4				
County Road 15	BLUE EARTH COUNTY	\$ 28,198	\$ 41,237	\$ 13,039
405TH Ave	DELEVAN TOWNSHIP	\$ 27,024	\$ 31,544	\$ 4,520
TOTAL OPTION 3		\$ 15,525	\$ 18,795	\$ 3,271
TOTAL OPTION 4		\$ 55,222	\$ 72,781	\$ 17,559
BLUE EARTH COUNTY ROAD AUTHORITY TOTAL OPTION 3		\$ 15,525	\$ 18,795	\$ 3,271
BLUE EARTH COUNTY ROAD AUTHORITY TOTAL OPTION 4		\$ 28,198	\$ 41,237	\$ 13,039
DELEVAN TOWNSHIP ROAD AUTHORITY TOTAL OPTION 4		\$ 27,024	\$ 31,544	\$ 4,520

APPENDIX C: PRELIMINARY CONSTRUCTION PLANS

BLUE EARTH & FARIBAULT COUNTY JOINT COUNTY DITCH No.1

STERLING TWP, MN

PRELIMINARY REPAIR PLANS FOR:

ISG PROJECT # 20781



TILE REPAIR

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

EXISTING	
	CITY LIMITS
	SECTION LINE
	QUARTER SECTION LINE
	RIGHT OF WAY LINE
	PROPERTY / LOTLINE
	EASEMENT LINE
	ACCESS CONTROL
	WATER EDGE
	WETLAND BOUNDARY
	WETLAND / MARSH
	FENCE LINE
	CULVERT
	STORM SEWER
	SANITARY SEWER
	SANITARY SEWER FORCEMAIN
	WATER
	GAS
	OVERHEAD ELECTRIC
	UNDERGROUND ELECTRIC
	UNDERGROUND TELEPHONE
	UNDERGROUND TV
	OVERHEAD UTILITY
	UNDERGROUND UTILITY
	UNDERGROUND FIBER OPTIC
	CONTOUR (MAJOR)
	CONTOUR (MINOR)
	DECIDUOUS TREE
	CONIFEROUS TREE
	TREE LINE
	MANHOLE/STRUCTURE
	CATCH BASIN
	HYDRANT
	VALVE
	CURB STOP
	POWER POLE
	UTILITY PEDESTAL / CABINET

PROPOSED	
	LOT LINE
	RIGHT OF WAY
	EASEMENT
	CULVERT
	STORM SEWER
	STORM SEWER (PIPE WIDTH)
	SANITARY SEWER
	SANITARY SEWER (PIPE WIDTH)
	WATER
	GAS
	OVERHEAD ELECTRIC
	UNDERGROUND ELECTRIC
	UNDERGROUND TV
	CONTOUR
	MANHOLE
	CATCH BASIN
	HYDRANT
	VALVE



BLUE EARTH &
FARIBAULT JOINT
COUNTY DITCH NO. 1
TOTAL AREA = 2,850 AC

PROJECT GENERAL NOTES

- ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, THE OWNER - CONTRACTOR AGREEMENT, THE PROJECT MANUAL (WHICH INCLUDES GENERAL SUPPLEMENTARY CONDITIONS AND SPECIFICATIONS), DRAWINGS OF ALL DISCIPLINES AND ALL ADDENDA, MODIFICATIONS AND CLARIFICATIONS ISSUED BY THE ARCHITECT/ENGINEER.
- CONTRACT DOCUMENTS SHALL BE ISSUED TO ALL SUBCONTRACTORS BY THE GENERAL CONTRACTOR IN COMPLETE SETS IN ORDER TO ACHIEVE THE FULL EXTENT AND COMPLETE COORDINATION OF ALL WORK.
- WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
- FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
- DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED THROUGHOUT THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO DETAILS SHOWN. WHERE SPECIFIC DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL MANUFACTURED ARTICLES, MATERIALS AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED AND CONDITIONED ACCORDING TO MANUFACTURERS' INSTRUCTIONS. IN CASE OF DISCREPANCIES BETWEEN MANUFACTURERS' INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
- THE LOCATION AND TYPE OF ALL INPLACE UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY AND ARE ACCURATE AND COMPLETE TO THE BEST OF THE KNOWLEDGE OF I & S GROUP, INC. (ISG). NO WARRANTY OR GUARANTEE IS IMPLIED. THE CONTRACTOR SHALL VERIFY THE SIZES, LOCATIONS AND ELEVATIONS OF ALL INPLACE UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
- THE CONTRACTOR IS TO CONTACT "GOPHER STATE ONE CALL" FOR UTILITY LOCATIONS, MINIMUM 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION / CONSTRUCTION (1-800-252-1166).

PROJECT INDEX:

OWNER:

BLUE EARTH COUNTY DRAINAGE
AUTHORITY
204 S FIFTH STREET
MANKATO, MN 56001
PH: (507) 304-4251

PROJECT

ADDRESS / LOCATION:

SECTIONS 23-26, AND 34-36 OF
STERLING TOWNSHIP
SECTIONS 19,30, AND 31 OF
MAPELTON TOWNSHIP.
SECTIONS 1-3 DELAVAN TOWNSHIPS
BLUE EARTH, FARIBAULT COUNTY
MN

MANAGING OFFICE:



SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE COUNTY OF BLUE EARTH REQUIREMENTS AND MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2018 EDITION, AND THE STANDARD SPECIFICATIONS FOR SANITARY SEWER, STORM DRAIN AND WATERMAIN AS PROPOSED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA 2013, UNLESS DIRECTED OTHERWISE.

PROJECT DATUM

HORIZONTAL COORDINATES HAVE BEEN REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 1986 ADJUSTMENT (NAD83(1996)) ON THE BLUE EARTH COUNTY COORDINATE SYSTEM, IN U.S. SURVEY FEET. ELEVATIONS HAVE BEEN REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RTK GPS METHODS WERE USED TO ESTABLISH HORIZONTAL AND VERTICAL COORDINATES FOR THIS PROJECT.

Sheet List Table

Sheet Number	Sheet Title
1	TITLE
2	NOTES & QUANTITIES
3	EXISTING WATERSHED
4	DETAILS
5	DETAILS
6	DETAILS
7	OPTION 1 PLAN & PROFILE
8	OPTION 4 PLAN & PROFILE

BLUE EARTH & FARIBAULT COUNTY JOINT COUNTY DITCH No.1

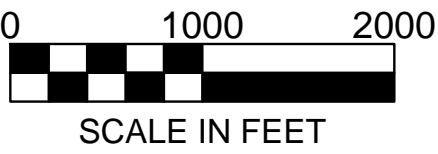
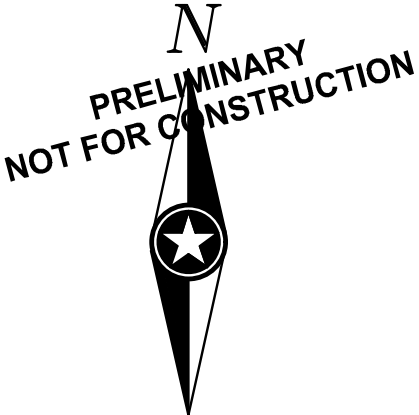
STERLING TWP MN

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	20781
CAD FILE NAME	20781-TITLE-QUANTITIES
DRAWN BY	---
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE
TITLE

SHEET



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.

DATE _____ LIC. NO. _____

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.

DATE _____ LIC. NO. _____

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
BLUE EARTH & FARIBAULT COUNTY JOINT COUNTY DITCH No.1

STERLING TWP MN

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	20781
CAD FILE NAME	20781-TITLE-QUANTITIES
DRAWN BY	FPS
DESIGNED BY	----
REVIEWED BY	----
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	

TITLE
EXISTING WATERSHED

SHEET



PRELIMINARY
NOT FOR CONSTRUCTION

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.

DATE _____ LIC. NO. _____

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.

DATE _____ LIC. NO. _____

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
**BLUE EARTH &
FARIBAULT
COUNTY
JOINT COUNTY
DITCH No. 1**

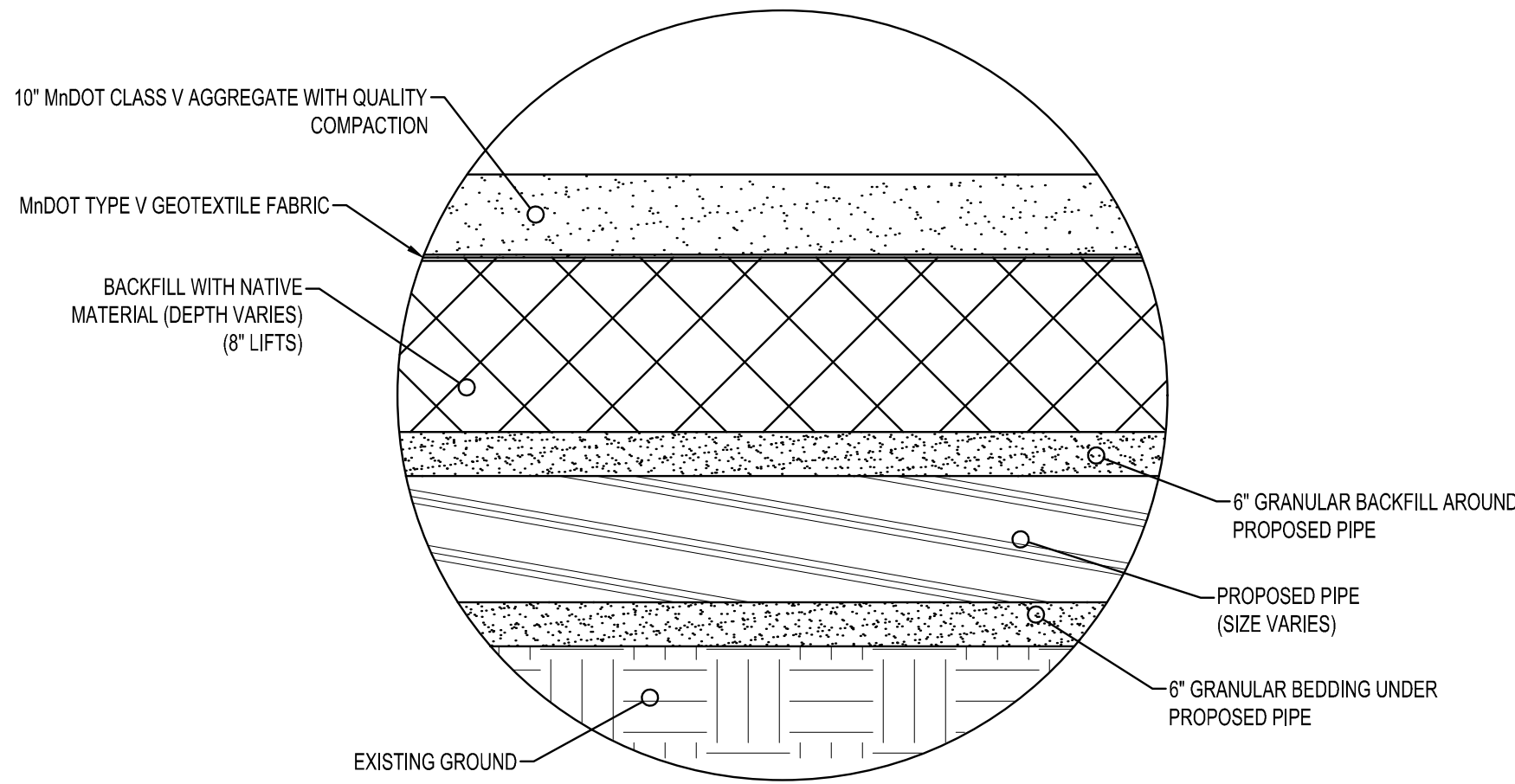
STERLING TWP MN

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

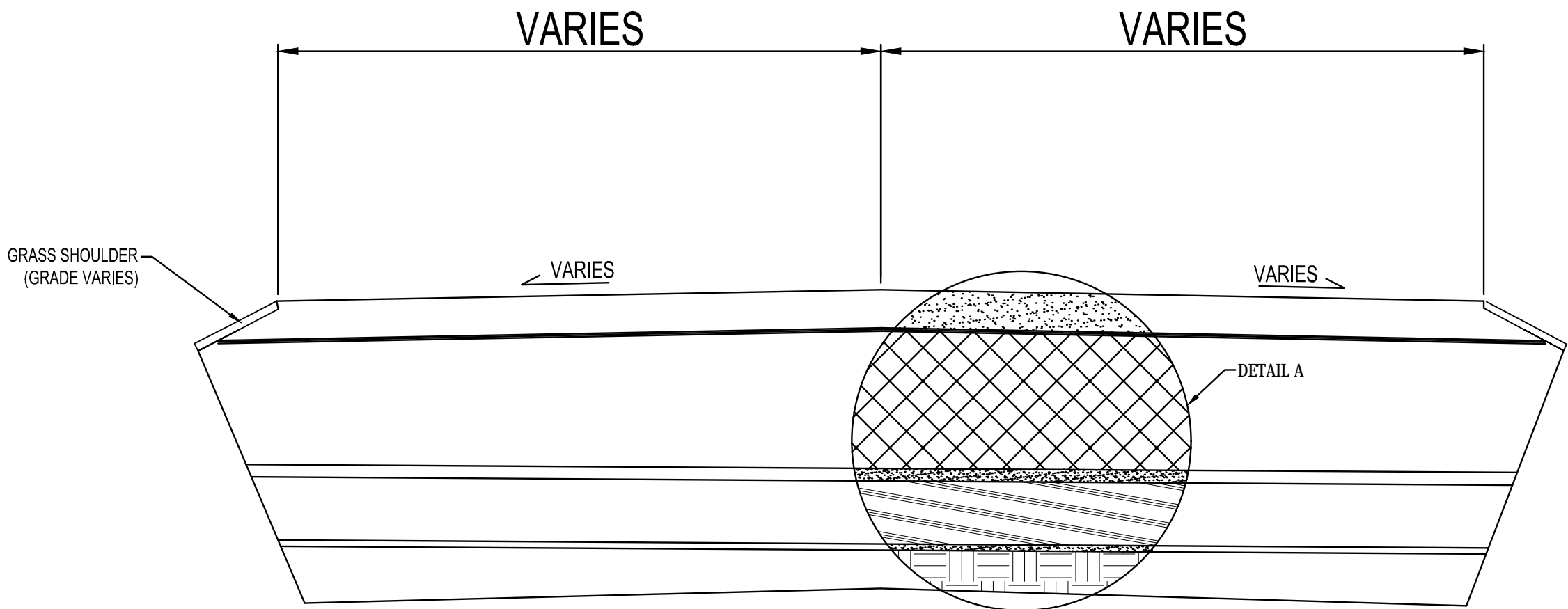
PROJECT NO.	20781
CAD FILE NAME	20781-TITLE-QUANTITIES
DRAWN BY	---
DESIGNED BY	--
REVIEWED BY	--
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

TITLE
DETAILS

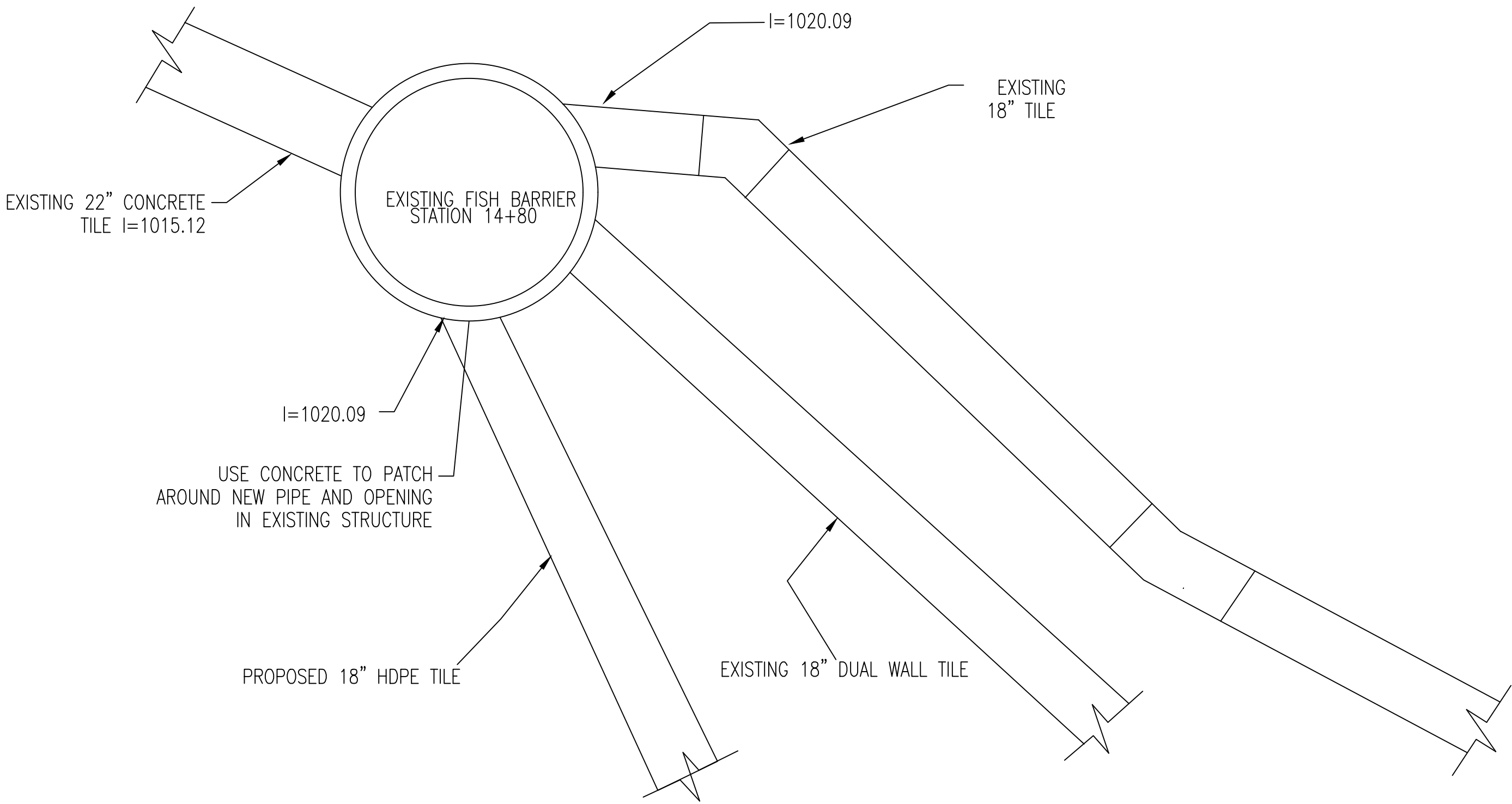
- NOTES:
1. ADDITIONAL CLASS III AGGREGATE MAY BE NEEDED TO MEET MINIMUM 10" DEPTH.
 2. SEED DISTURBED GRASS SHOULDER WITH MnDOT 25-142 WITH MnDOT CATEGORY 3 EROSION CONTROL BLANKET.
 3. CONTRACTOR IS RESPONSIBLE TO MAINTAIN THE DISTURBED ROADS UNTIL THE PROJECT IS COMPLETED OR ROAD AUTHORITY HAS RESUMED CONTROL, WHICHEVER IS SOONER



DETAIL A
NTS



TYPICAL ROADWAY SECTION
NTS AG600



FISH BARRIER DETAIL

N.T.S.

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION

RCP FLAT BOTTOM
TRENCH BEDDING

NTSAG100

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION

HDPE FLAT BOTTOM
TRENCH BEDDING

NTSAG105

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION
2.) CRUSHED ROCK FOUNDATION BELOW THE PIPE PAID FOR BY CUBIC YARD ONLY WHERE NEEDED AND APPROVED BY ENGINEER

HDPE FLAT BOTTOM TRECH
WITH CRUSHED ROCK FOUNDATION

NTSAG115

ISG

PRELIMINARY
NOT FOR CONSTRUCTION

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.

DATELIC. NO.

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.

DATELIC. NO.

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
BLUE EARTH &
FARIBAULT
COUNTY
JOINT COUNTY
DITCH No.1
STERLING TWP MN

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO. 20781
CAD FILE NAME 20781-TITLE-QUANTITIES
DRAWN BY ---
DESIGNED BY ---
REVIEWED BY ---
ORIGINAL ISSUE DATE --/--/--
CLIENT PROJECT NO. ---

TITLE
DETAILS

SHEET
5 OF 8

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION

RCP SPOON
TRENCH BEDDING

NTSAG120

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION

HDPE SPOON
TRENCH BEDDING

NTSAG125

NOTE:
1.) GRANULAR BEDDING AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION
2.) CRUSHED ROCK FOUNDATION BELOW THE PIPE PAID FOR BY CUBIC YARD ONLY WHERE NEEDED AND APPROVED BY ENGINEER

RCP FLAT BOTTOM TRECH
WITH CRUSHED ROCK FOUNDATION

NTSAG110

ISG

PRELIMINARY
NOT FOR CONSTRUCTION

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.

DATELIC. NO.

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.

DATELIC. NO.

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
BLUE EARTH &
FARIBAULT
COUNTY
JOINT COUNTY
DITCH No.1
STERLING TWP MN

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO. 20781
CAD FILE NAME 20781-TITLE-QUANTITIES
DRAWN BY ---
DESIGNED BY ---
REVIEWED BY ---
ORIGINAL ISSUE DATE --/--/--
CLIENT PROJECT NO. ---

TITLE
DETAILS

SHEET
5 OF 8



PRELIMINARY
NOT FOR CONSTRUCTION

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.

DATE _____ LIC. NO. _____

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.

DATE _____ LIC. NO. _____

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
**BLUE EARTH &
FARIBAULT
COUNTY
JOINT COUNTY
DITCH No. 1**

STERLING TWP MN

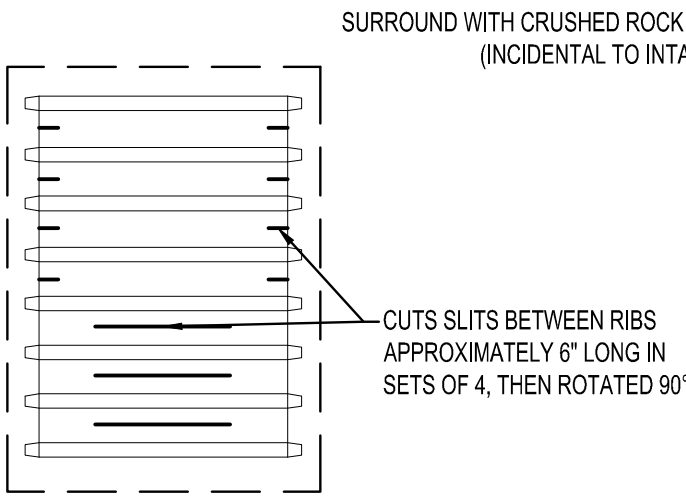
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	20781
CAD FILE NAME	20781-TITLE-QUANTITIES
DRAWN BY	---
DESIGNED BY	--
REVIEWED BY	--
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

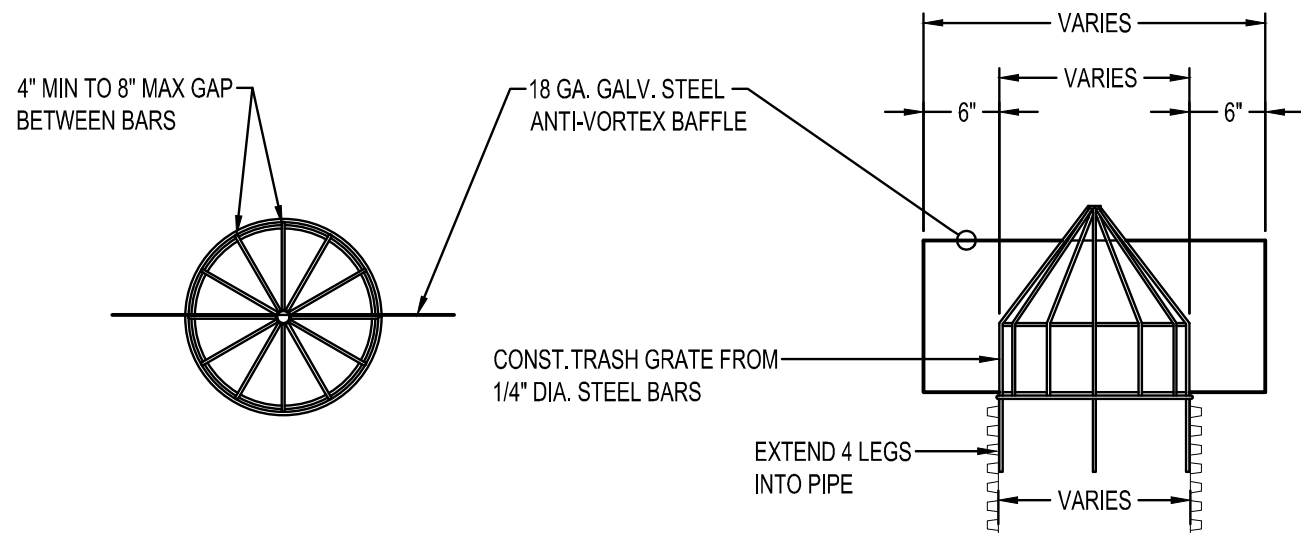
DETAILS

- NOTES:
1. ALL APPROPRIATE FITTINGS ARE INCIDENTAL TO INTAKE CONSTRUCTION
 2. ALL VERTICAL RISERS SHALL BE CONNECTED TO SUBSURFACE TILE BY MEANS OF APPROPRIATE ELBOWS, TEES, OR CONNECTED BY APPROPRIATE FITTINGS.
 3. ALL VERTICAL RISERS SHALL BE WRAPPED WITH MNDOT TYPE 1 GEOTEXTILE FABRIC (INCIDENTAL TO EACH INTAKE)
 4. VERTICAL RISERS MAY BE CUT DOWN AND BURIED AFTER FINAL TELEVISIONING; PER LANDOWNER REQUEST (SHALL BE PAID FOR AS "CAP DROP INTAKE")
 5. INTAKE CAPS SHALL BE SUBSTITUTED FOR TRASH GRATES IN AREAS THAT WILL NOT TAKE SURFACE FLOW, AS APPROVED BY THE ENGINEER.



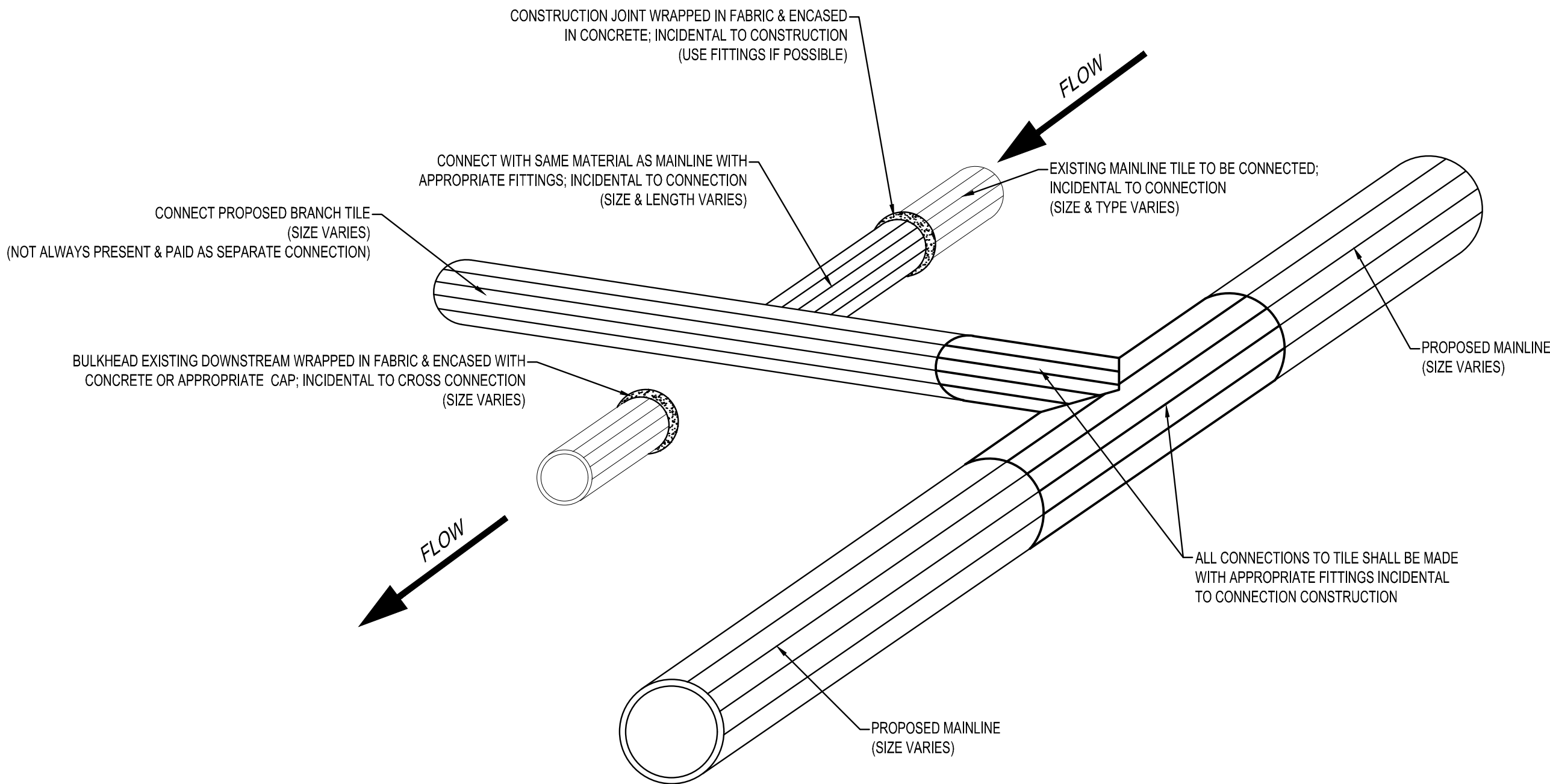
DETAIL A
NTS

DROP INTAKE
NTS AG320



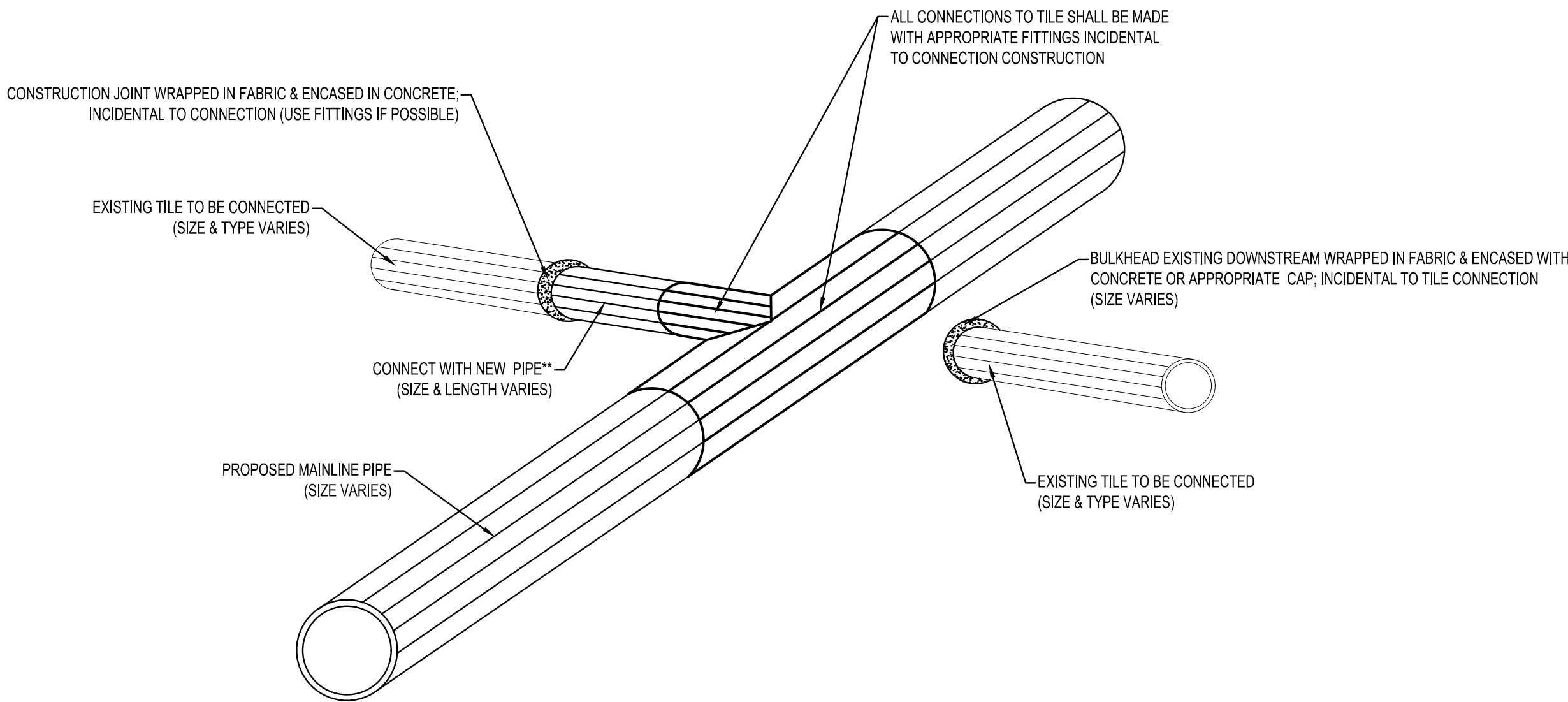
SURFACE INLET TRASH DETAIL (INCIDENTAL)
NTS

- NOTES:
1. ADDITIONAL LENGTH OVER 30 LF SHALL BE PAID FOR PER LF OF THAT SIZE PIPE.
 2. CLAY OR CONCRETE TILE SHALL BE CONNECTED BY INSTALLING DUAL WALL OVER OR INSIDE EXISTING TILE & CONSTRUCTION JOINT INSTALLED WITH FABRIC

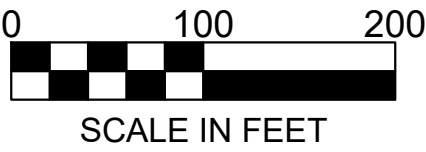
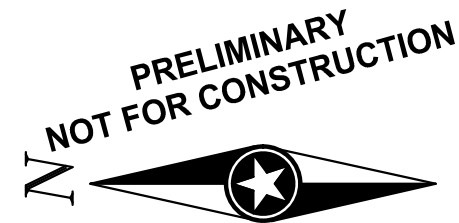
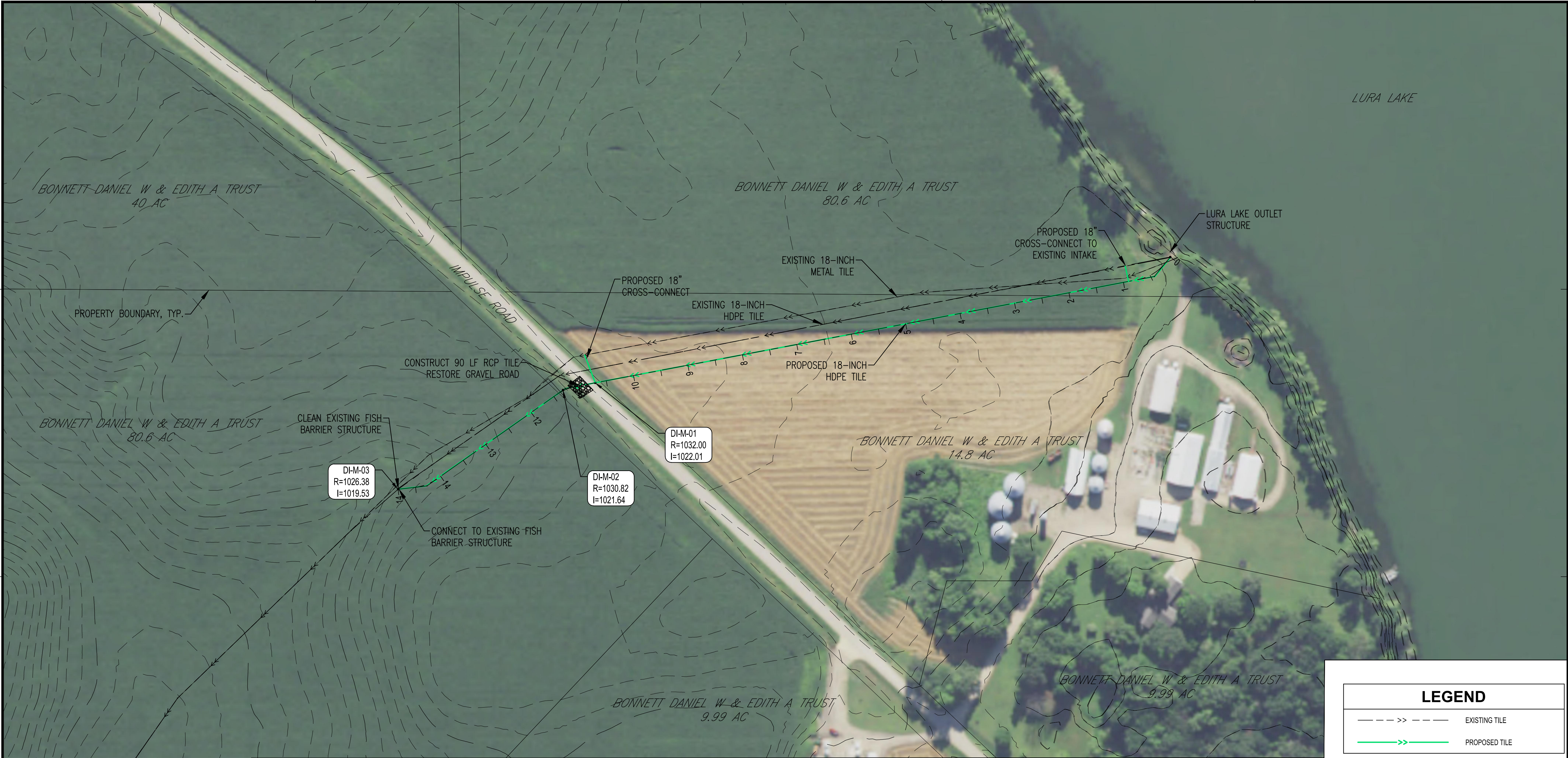


CROSS-CONNECT EXISTING MAINLINE DETAIL
NTS AG210

- NOTES:
1. ALL TILE CONNECTIONS SHALL BE CONSTRUCTED WITH APPROPRIATE FITTINGS (INCIDENTAL TO CONNECTION)



CONNECT TO EXISTING TILE
NTS AG200



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.

DATE: _____ LIC. NO. _____

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.

DATE: _____ LIC. NO. _____

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

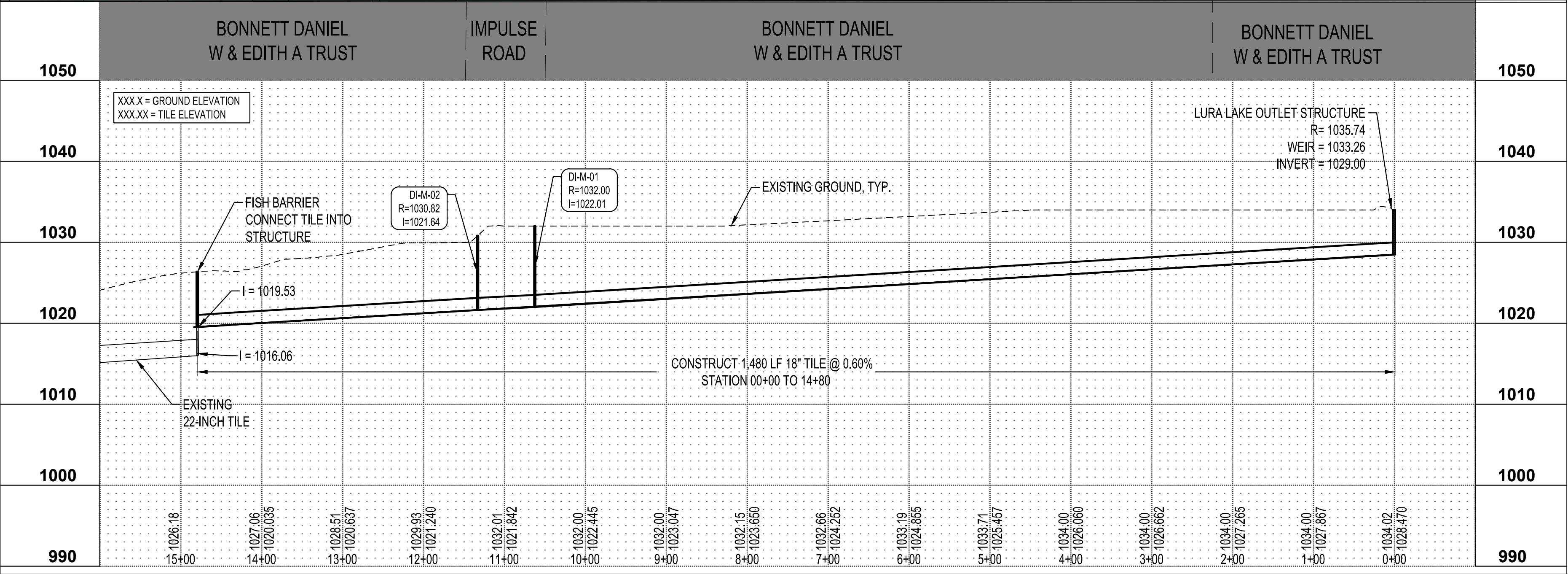
PROJECT
BLUE EARTH & FARIBAUT COUNTY JOINT COUNTY DITCH No.1

STERLING TWP MN

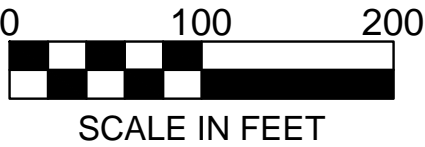
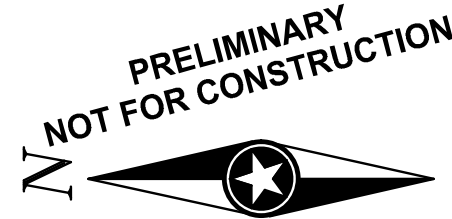
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	18-20781
CAD FILE NAME	20781-PROFILE
DRAWN BY	---
DESIGNED BY	--
REVIEWED BY	--
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE
OPTION 1 PLAN & PROFILE



LEGEND	
	EXISTING TILE
	PROPOSED TILE



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.

DATE _____ LIC. NO. _____

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.

DATE _____ LIC. NO. _____

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT
**BLUE EARTH &
FARIBAULT
COUNTY
JOINT COUNTY
DITCH No.1**

STERLING TWP MN

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	18-20781
CAD FILE NAME	20781-PROFILE
DRAWN BY	FPS
DESIGNED BY	----
REVIEWED BY	----
ORIGINAL ISSUE DATE	~/-/-
CLIENT PROJECT NO.	

TITLE
**OPTION 4 PLAN &
PROFILE**

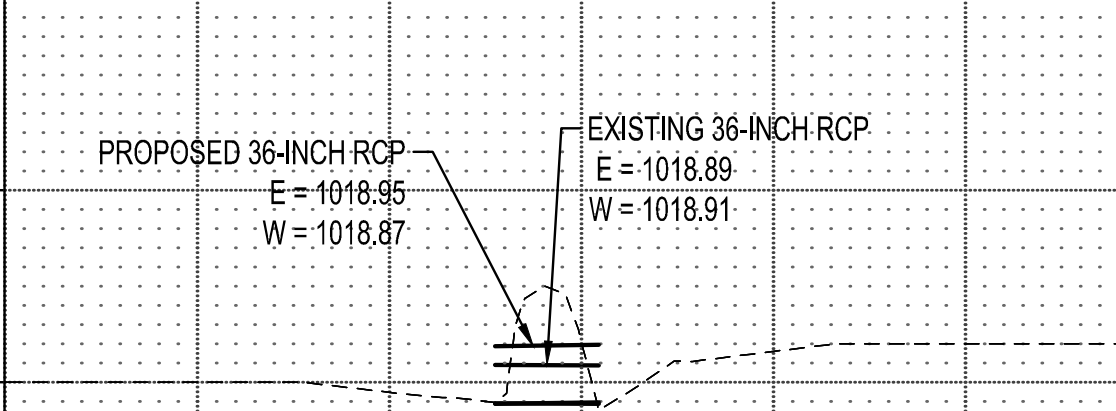
LEGEND

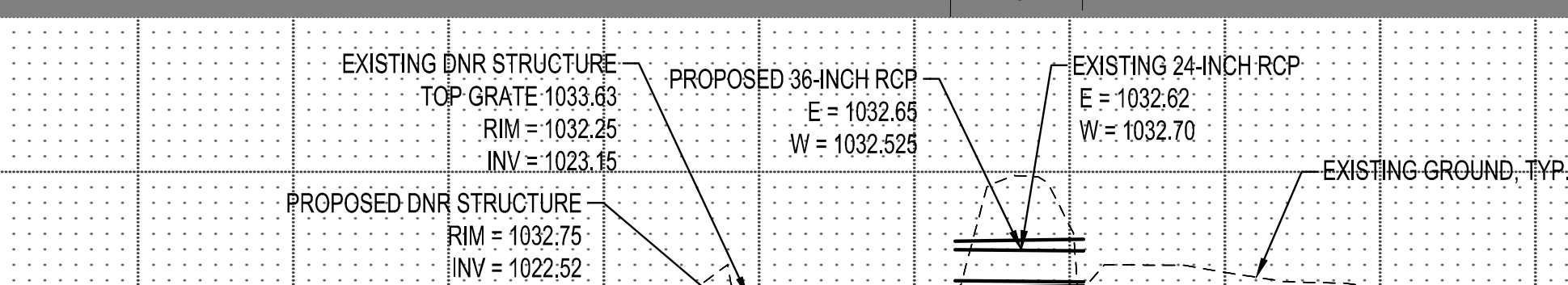
>>

EXISTING TILE

>>

PROPOSED TILE

	STATE OF MINNESOTA		405TH AVE	STATE OF MINNESOTA		
1040						1040
1030						1030
1020						1020
1010						1010
1000						1000
990	1020.00 27+00	1019.49 26+00	1022.23 25+00	1021.61 24+00	1022.00 23+00	990

STATE OF MINNESOTA										COUNTY ROAD 15		
1050												1050
1040												1040
1030												1030
1020												1020
1010												1010
1000	1022.00 9+00	1022.00 8+00	1022.50 7+00	1027.85 6+00	1031.65 5+00	1031.20 4+00	1036.54 3+00	1033.51 2+00	1032.53 1+00	1032.02 0+00	1000	