

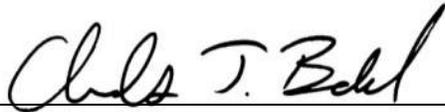
COUNTY DITCH No. 24
GRASSED WATERWAY REPAIR

FARIBAULT COUNTY
WINNEBAGO CITY TOWNSHIP, MINNESOTA

March 31, 2016
Project No. 12-14012

Signature Sheet

I HEREBY CERTIFY THAT 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.



Chuck Brandel, PE
Project Engineer
Reg. No. 43359

I+S Group, Inc.
115 East Hickory Street, Suite 300
Mankato, Minnesota 56001-3785

**Faribault County Ditch No. 24 Grassed Waterway Repair
Winnebago City Township, Minnesota**

Engineer's Project Number: 12-14012

Dated this 31st day of March 2016

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Watershed

Faribault County Ditch No. 24 (CD 24) is a 1,008 acre watershed located in Winnebago City Township in Northwest Faribault County. The CD 24 system consists of approximately 17,730 linear feet of buried tile, approximately 1,800 linear feet of deep open ditch, and approximately 9,000 feet of shallow grassed waterway. All drain in a general northeast direction and outlet into a steep ravine leading to the Blue Earth River.

Existing Conditions

Some tile televising was completed in early fall of 2014 near the outlet end of the shallow grassed waterway and revealed significant sediment deposits and some damaged pipe through the short portion that was able to be televised. A brief topographic survey by the Faribault County Highway Department revealed most of the grassed waterway is significantly below the legal grade set when the grassed waterway was originally constructed in 1959 (*Figure 1*); I+S Group (ISG) also completed a topographic survey of the waterway. The existing grade of the waterway is below legal ditch grade in Section 9 of Winnebago City Township from 338th Avenue to County Road 7.



Figure 1: Waterway Below Legal Ditch Grade

The remainder of the grassed waterway in Sections 8 and 17 is significantly higher than legal grade set in 1959. This portion of the grassed waterway is 2 to 3 feet above legal grade and has also been plowed through and farmed in recent years. The waterway has also been filled in higher than the culvert crossings on County Road 7 and 230th Street (*Figure 2*).



Figure 2: Waterway Above Legal Ditch Grade Through Culverts

Proposed Options

Option 1

Repair Option 1 will be to restore the entire waterway back to the original legal waterway grade as it was first constructed in 1959. It is assumed that over the years the waterway has been excavated or eroded deeper and there is enough material along the side of the waterway to fill and reshape it back to its original condition. This option will push and reshape the waterway to include a 50-foot cross-section with a 6-foot bottom and 5:1 side slopes; however, in some areas the side slopes may vary slightly. This will include filling in the open ditch in Section 9 from County Road 7 to 338th Avenue and re-establishing the waterway in Sections 8 and 17 from County Road 7 across 230th Street and back to County Road 7.

At the end of the existing tile mainline in the northwest quarter of the northeast quarter of Section 9, the tile has been determined to be in disrepair. This tile will be repaired from the waterway outlet to the deep open ditch up to Branch B for a total of 1110 feet of 15-inch tile. Damaged tile that is exposed in the waterway near the end of the waterway will be connected and repaired prior to the ditch being filled.

The existing 18-inch culvert crossing located near the property line of Charles Carlson and Loretta Rynearson in the north half of Section 9 will be removed and replaced with a 50 foot wide Flex-A-Mat concrete crossing. This crossing consists of a tied concrete block mat that will be placed within the waterway and will support any equipment crossing through the waterway without causing erosion or

rutting. A 48-inch field crossing will be constructed in the middle of Section 9 on the property line of Loretta Rynearson and Donna Brown ETAL. This crossing will provide access to the east side of the parcel, will act as an energy dissipation structure for waterway, and will be armored with rip rap to prevent erosion.

Along with pushing material back into the end of the waterway and seeding the 50-foot cross section, some intakes and portions of the existing tile will be repaired to prevent further degradation of the waterway and full collapse of the tile.

In an attempt to control erosion between the end of the waterway and beginning of the deep open ditch (*Figures 3 & 4*), the open ditch will be deepened for 430 feet west of 338th Avenue to the legal grade of 0.04%. To route water from the waterway to the open ditch, a 72-inch drop structure with a 48-inch grate and a 42-inch outlet pipe will be placed at the bend of this junction. The drop structure and grading to the open ditch will be covered with compacted clay covered with rip rap for erosion protection. The buffers along this open ditch section will also be re-seeded as spoils will be placed over the existing buffers.



Figure 3: Eroded Open Ditch Upstream of 338th Avenue



Figure 4: Erosion at Open Ditch and Waterway Junction

The total repair cost for Option 1 is approximately \$315,930.

Option 2

Repair Option 2 will be similar to Option 1, however the entire length of the waterway will not be re-graded to the 1959 legal ditch grade. This option will cut the filled in portion of the waterway in Sections 8 and 17, but will not fill the waterway in Section 9. Spot cleaning and filling of the waterway in Section 9 will occur to keep a linear grade of 0.10%, as it is naturally at. This option will also include the waterway crossings, tile repair, deepened open ditch, and drop structure that was described in Option 1.

The total repair cost for Option 2 is approximately \$300,420.

Open Ditch Outlet Options

The open ditch outlet in Section 10 east of 338th Street contains unstable soils that continue to erode prior to the open ditch joining the ravine outlet near the Blue Earth River. There are many large sloughs and gulley erosion areas through the banks on both sides, however the south side of the open ditch contains more erosion (*Figure 5*).



Figure 5: Erosion and Sloughing of Banks Downstream of 338th Avenue

Option 1

This repair option will include re-grading the open ditch outlet by widening the ditch banks, installing a two-stage ditch channel, and re-establishing a buffer along to top of the ditch. The open ditch profile will also be lowered from 0.04% to 0.20% to match existing grade near the rip rap lined ravine and to aid in flow control in the two-stage ditch cross section. This option also includes lining the newly graded channel with Flex-A-Mat to stabilize the eroding ditch banks and prevent future erosion. The Flex-A-Mat channel provides an anchored concrete blanket to the banks and also allows for vegetation to establish, creating a stable ditch bank. The two-stage ditch will also aid in bank stabilization by channelizing the flow in the ditch and keeping the flow away from the ditch banks. The open ditch would be widened on the south side of the ditch, as there are more sloughs on this side and the ditch banks are steeper. The expanded open ditch would cover an additional 0.5 acres of land which includes the widened ditch and additional buffer seeding for the 1-rod.

The existing 16-inch mainline tile alignment lies within the ditch bank on the south side of the open ditch for a stretch of 550 feet. It is likely that some of the erosion is due to this tile collapsing and soil washing out. This stretch will be abandoned by locating the tile in the bank, crushing the tile for this entire stretch, bulk-heading the tile where the alignment shifts away from the ditch bank to allow flow downstream, and grading the open ditch over the crushed tile.

The total open ditch repair cost for Option 1 is approximately \$486,680.

Option 2

This repair option includes the same re-grading of the two-stage ditch, lowered profile, and tile abandonment; however does not include the Flex-A-Mat lined channel. In lieu of the Flex-A-Mat, a concrete rate control weir will be installed at the end of the two-stage ditch section just upstream of the rip rap lined ravine. Additional rip rap will be installed in the spillway of the rate control weir and will tie into the existing ravine rip rap. Erosion control blanket will be required for this option to establish vegetation in the two-stage ditch.

The total open ditch repair cost for Option 2 is approximately \$252,210.

Option 3

Another option is to clean the open ditch outlet, fix all sloughs along the ditch banks, and abandon the existing 16-inch tile as describe previously. This could result in continued maintenance every 3-5 years based on the soil types and erosion in this area.

The total open ditch repair cost for Option 3 is approximately \$62,510.

Multi-Purpose Drainage Management

Multi-purpose drainage management incorporates Best Management Practices (BMPs) which utilize effective measures aimed at reducing sediment and nutrient loading, and improving water quality. These BMPs are divided into three areas: preventative measures, control measures, and treatment measures. Preventative measures that can be applied throughout the watershed include crop rotation, cover crops, residue management, and nutrient management. These measures are aimed at controlling sediment, minimizing erosion and nutrient loss, and sustaining the soils health, all without dramatically changing the current land use of the landscape.

Control measures are practices aimed at improving water quality directly associated with the flow of water by reducing peak flows, providing in stream storage, sedimentation, and nutrient uptake. Examples of control measures include alternative tile intakes, grassed waterways, two stage ditches, water control structures, and controlled subsurface drainage. These practices are directly linked to the conveyance of subsurface tile water or open channel ditch flow.

The function of treatment measures is to improve water quality by directly removing sediment and nutrients from the subsurface or surface water flow throughout a watershed. Examples of treatment measures include surge basins (storage ponds), filter/buffer strips, wetland restorations, woodchip bioreactors, and water and sediment control basins (WASCOBs). These practices may be incorporated to either the public or private drainage systems.

Funding options are available to land owners through the Environmental Quality Incentives Program (EQIP). EQIP is a voluntary program that provides financial assistance to individual land owners for various conservative practices as identified above. BMPs incorporated into the CD 24 repair includes **buffer strips** on the open ditch sections, a large control **drop structure** in the open ditch to prevent erosion in the waterway and open ditch banks, a **two-stage ditch** channel, and a **grassed waterway** for 9,000 feet.

Conclusions & Recommendations

Most of the existing County Ditch 24 Grassed Waterway is well below the legal depth and grade of the waterway that was established in 1959. However, there are also portions of the original Grassed Waterway that were either never established as designed or have been abandoned and filled in. It is the opinion of the Engineer and the County that repairs need to be completed to the waterway portion of the CD 24 system. The options for repair are described above with the cost estimates for each attached in Appendix A and design plans included in Appendix B.

It is the opinion of the Engineer that the options described above should be brought forth the Drainage Authority and the repairs shall proceed to the CD 24 Grassed Waterway. The favorable option for the waterway repair is Option 2 which is the least expensive option and involves re-establishing the waterway that has been filled in and spot cleaning the existing downstream waterway as the grade is establishing. The favorable option for the open ditch repair is Option 2 which includes the rate control weir, tile abandonment, and re-grading of the open ditch. Both of these options will have the least future maintenance involved.

Appendix A: Cost Estimates



Faribault County Ditch No. 24
March 31, 2016

I+S GROUP

**Grassed Waterway Repair
Cost Estimate Summary**

Option	Cost Estimate
Waterway Option 1 - Restore to 1959 Waterway	\$ 315,930
Waterway Option 2 - Restore to Less than 1959 Waterway	\$ 300,420
Open Ditch Repair Option 1 - Flex-A-Mat	\$ 486,680
Open Ditch Repair Option 2 - Concrete Rate Control Weir	\$ 252,210
Open Ditch Repair Option 3 - Clean Open Ditch	\$ 62,510



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Grassed Waterway Repair Costs
Option 1 - Restore to 1959 Waterway

Waterway Seeding and Grading

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 7,500.00	\$ 7,500.00
002	Common Borrow (CV) (P)*	CY	3,400	\$ 4.50	\$ 15,300.00
003	Common Excavation (CV) (P)	CY	2,000	\$ 4.00	\$ 8,000.00
004	15-inch Agricultural Tile	LF	1,100	\$ 23.00	\$ 25,300.00
005	Waterway Side Inlet	EA	2	\$ 2,000.00	\$ 4,000.00
006	Repair Drop Intake In Waterway	EA	4	\$ 1,200.00	\$ 4,800.00
007	Seed Waterway MnDOT Seed Mix 32-241	AC	10.00	\$ 2,100.00	\$ 21,000.00
008	Erosion Control Blanket, Category 4 (12 feet wide)	SY	11,500	\$ 2.80	\$ 32,200.00
009	Repair 15-inch Tile in Waterway	LF	75	\$ 23.00	\$ 1,725.00
010	Class III Riprap with Geotextile Fabric	CY	40	\$ 75.00	\$ 3,000.00
011	48-inch RCP Field Crossing	LF	50	\$ 85.00	\$ 4,250.00
012	Flex-A-Mat Waterway Crossing	SF	3,000	\$ 5.50	\$ 16,500.00
Subtotal					\$ 143,600.00
10% Unforeseen					\$ 14,360.00
Total					\$ 157,960.00
	Temporary Damages	AC	10.0	\$ 600.00	\$ 6,000.00
	County Administration Costs				\$ 3,950.00
	Repair Plans, and Specifications				\$ 12,640.00
	Construction Staking & Administration				\$ 15,800.00
Option 1 Waterway Grading & Seeding Cost					\$ 196,350.00

*Assume Material is Available on Site



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**Grassed Waterway Repair Costs
 Option 1 - Restore to 1959 Waterway**

Drop Structure/Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 4,700.00	\$ 4,700.00
002	Common Excavation (CV) (P)	CY	6300	\$ 4.50	\$ 28,350.00
003	Class III Riprap with Geotextile Fabric	CY	400	\$ 75.00	\$ 30,000.00
004	72-inch Manhole/Drop Structure	LF	8	\$ 650.00	\$ 5,200.00
005	42-inch RCP	LF	80	\$ 100.00	\$ 8,000.00
006	Open Ditch and Buffer Seeding	AC	1.2	\$ 2,100.00	\$ 2,520.00
007	Erosion Control Blanket, Category 4	SY	4,000	\$ 2.80	\$ 11,200.00
Subtotal					\$ 90,000.00
10% Unforeseen					\$ 9,000.00
Total					\$ 99,000.00
	Temporary Damages	AC	0.5	\$ 600.00	\$ 280.00
County Administration Costs					\$ 2,480.00
Repair Plans, and Specifications					\$ 7,920.00
Construction Staking & Administration					\$ 9,900.00
Drop Structure/Open Ditch					\$ 119,580.00

Option 1 Waterway Grading & Seeding Cost	\$ 196,350.00
Drop Structure/Open Ditch	\$ 119,580.00
Total Grassed Waterway Option 1 Cost	\$ 315,930.00



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Grassed Waterway Repair Costs
Option 2 - Restore to 1959 Waterway

Waterway Seeding and Grading

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 6,600.00	\$ 6,600.00
002	Common Excavation (CV) (P)	CY	1,500	\$ 4.00	\$ 6,000.00
003	Spot Cleaning	LF	1,000	\$ 4.50	\$ 4,500.00
004	15-inch Agricultural Tile	LF	1,100	\$ 23.00	\$ 25,300.00
005	Waterway Side Inlet	EA	2	\$ 2,000.00	\$ 4,000.00
006	Repair Drop Intake In Waterway	EA	4	\$ 1,200.00	\$ 4,800.00
007	Seed Waterway MnDOT Seed Mix 32-241	AC	10.00	\$ 2,100.00	\$ 21,000.00
008	Erosion Control Blanket, Category 4 (12 feet wide)	SY	11,500	\$ 2.80	\$ 32,200.00
009	Repair 15-inch Tile in Waterway	LF	75	\$ 23.00	\$ 1,725.00
010	Class III Riprap with Geotextile Fabric	CY	40	\$ 75.00	\$ 3,000.00
011	48-inch RCP Field Crossing	LF	50	\$ 125.00	\$ 6,250.00
012	Flex-A-Mat waterway crossing	SF	3,000	\$ 5.50	\$ 16,500.00
Subtotal					\$ 131,900.00
10% Unforeseen					\$ 13,190.00
Total					\$ 145,090.00
	Temporary Damages	AC	10.0	\$ 600.00	\$ 6,000.00
County Administration Costs					\$ 3,630.00
Repair Plans, and Specifications					\$ 11,610.00
Construction Staking & Administration					\$ 14,510.00
Option 2 Waterway Grading & Seeding Cost					\$ 180,840.00

*Assume Material is Available on Site



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Grassed Waterway Repair Costs
Option 2 - Restore to 1959 Waterway

Drop Structure/Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 4,700.00	\$ 4,700.00
002	Common Excavation (CV) (P)	CY	6300	\$ 4.50	\$ 28,350.00
003	Class III Riprap with Geotextile Fabric	CY	400	\$ 75.00	\$ 30,000.00
004	72-inch Manhole/Drop Structure	LF	8	\$ 650.00	\$ 5,200.00
005	42-inch RCP	LF	80	\$ 100.00	\$ 8,000.00
006	Open Ditch and Buffer Seeding	AC	1.2	\$ 2,100.00	\$ 2,520.00
007	Erosion Control Blanket, Category 4	SY	4,000	\$ 2.80	\$ 11,200.00
Subtotal					\$ 90,000.00
10% Unforeseen					\$ 9,000.00
Total					\$ 99,000.00
	Temporary Damages	AC	0.5	\$ 600.00	\$ 280.00
County Administration Costs					\$ 2,480.00
Repair Plans, and Specifications					\$ 7,920.00
Construction Staking & Administration					\$ 9,900.00
Drop Structure/Open Ditch					\$ 119,580.00

Option 2 Waterway Grading & Seeding Cost					\$ 180,840.00
Drop Structure/Open Ditch					\$ 119,580.00
Total Grassed Waterway Option 2 Cost					\$ 300,420.00



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Open Ditch Outlet Repair
Option 1 - Flex-A-Mat Stabilization

Open Ditch Outlet Repair

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 14,100.00	\$ 14,100.00
002	Common Excavation (CV) (P)	CY	21,500	\$ 4.00	\$ 86,000.00
003	Seed Open Ditch MnDOT Seed Mix 32-241	AC	3.80	\$ 2,100.00	\$ 7,980.00
004	Seed 1-rod Buffer and Damaged CRP	AC	1.00	\$ 2,100.00	\$ 2,100.00
005	Flex-A-Mat lining (40-feet wide)	SF	50,000	\$ 5.00	\$ 250,000.00
006	Abandon Existing Tile	LF	550	\$ 6.00	\$ 3,300.00
Subtotal					\$ 363,500.00
10% Unforeseen					\$ 36,350.00
Total					\$ 399,850.00
	Temporary Damages	AC	1.0	\$ 600.00	\$ 600.00
	Permanent Damages (Widen Ditch and Buffer)	AC	0.5	\$ 8,500.00	\$ 4,250.00
	County Administration Costs				\$ 10,000.00
	Repair Plans, and Specifications				\$ 31,990.00
	Construction Staking & Administration				\$ 39,990.00
	Option 1 Flex-A-Mat Stabilization				\$ 486,680.00



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Open Ditch Outlet Repair
Option 2 - Concrete Rate Control Weir

Open Ditch Outlet Repair

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 5,100.00	\$ 5,100.00
002	Common Excavation (CV) (P)	CY	21,500	\$ 4.00	\$ 86,000.00
003	Seed Open Ditch MnDOT Seed Mix 32-241	AC	3.80	\$ 2,100.00	\$ 7,980.00
004	Erosion Control Blanket, Category 4 (50 feet wide)	SY	7,000	\$ 2.80	\$ 19,600.00
005	Seed 1-rod Buffer and Damaged CRP	AC	1.00	\$ 2,100.00	\$ 2,100.00
006	Class III Riprap with Geotextile Fabric	CY	500	\$ 75.00	\$ 37,500.00
007	Rate Control Weir	LS	1	\$ 25,000.00	\$ 25,000.00
008	Abandon Existing Tile	LF	550	\$ 6.00	\$ 3,300.00
Subtotal					\$ 186,600.00
10% Unforeseen					\$ 18,660.00
Total					\$ 205,260.00
Temporary Damages		AC	1.0	\$ 600.00	\$ 600.00
Permanent Damages (Widen Ditch and Buffer)		AC	0.5	\$ 8,500.00	\$ 4,250.00
County Administration Costs					\$ 5,140.00
Repair Plans, and Specifications					\$ 16,430.00
Construction Staking & Administration					\$ 20,530.00
Option 2 Concrete Rate Control Weir					\$ 252,210.00



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Open Ditch Outlet Repair
Option 3 - Clean Open Ditch

Open Ditch Outlet Repair

Item No.	Item	Unit	Quantity	Unit Price	Amount
001	Mobilization	LS	1	\$ 1,800.00	\$ 1,800.00
002	Ditch Cleaning	LF	1,250	\$ 4.50	\$ 5,625.00
003	Open Ditch Slough Repair	LF	500	\$ 8.00	\$ 4,000.00
004	Seed Open Ditch MnDOT Seed Mix 32-241	AC	3.80	\$ 2,100.00	\$ 7,980.00
005	Erosion Control Blanket, Category 4 (50 feet wide)	SY	7,000	\$ 2.80	\$ 19,600.00
006	Seed 1-rod Buffer and Damaged CRP	AC	1.00	\$ 2,100.00	\$ 2,100.00
007	Class III Riprap with Geotextile Fabric	CY	30	\$ 75.00	\$ 2,250.00
008	Abandon Existing Tile	LF	550	\$ 6.00	\$ 3,300.00
Subtotal					\$ 46,700.00
10% Unforeseen					\$ 4,670.00
Total					\$ 51,370.00
	Temporary Damages	AC	1.0	\$ 600.00	\$ 600.00
County Administration Costs					\$ 1,290.00
Repair Plans, and Specifications					\$ 4,110.00
Construction Staking & Administration					\$ 5,140.00
Option 3 Clean Open Ditch					\$ 62,510.00

Appendix B: Repair Plans and Profiles

FARIBAULT COUNTY COUNTY DITCH No. 24 REPAIRS



WINNEBAGO, MINNESOTA

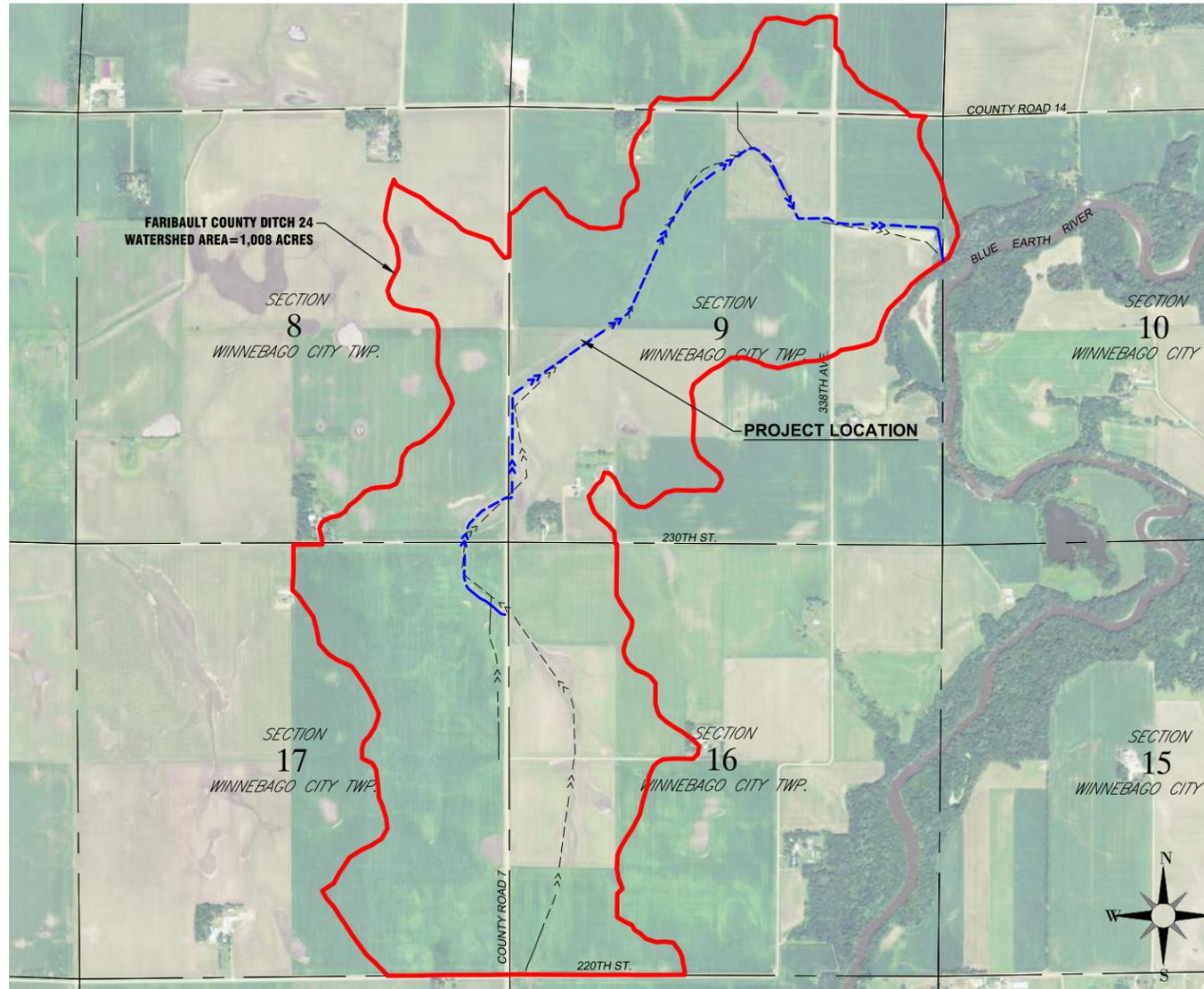
CONSTRUCTION PLANS FOR:

ISG PROJECT # 14012

+S GROUP

GRASSED WATERWAY REPAIRS

LEGEND	
EXISTING	
---	CITY LIMITS
---	SECTION LINE
---	QUARTER SECTION LINE
---	RIGHT OF WAY LINE
---	PROPERTY / LOTLINE
---	EASEMENT LINE
△	ACCESS CONTROL
W	WATER EDGE
WET	WETLAND BOUNDARY
W	WETLAND / MARSH
X	FENCE LINE
>	CULVERT
<<	STORM SEWER
<	SANITARY SEWER
II	SANITARY SEWER FORCEMAIN
I	WATER
UT	UNDERGROUND TELEPHONE
OE	OVERHEAD ELECTRIC
UE	UNDERGROUND ELECTRIC
UTV	UNDERGROUND TV
G	GAS
FBO	UNDERGROUND FIBER OPTIC
990	CONTOUR (MAJOR)
989	CONTOUR (MINOR)
○	DECIDUOUS TREE
★	CONIFEROUS TREE
—	TREE LINE
□	MANHOLE
○	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)
I	WATER
OE	OVERHEAD ELECTRIC
UE	UNDERGROUND ELECTRIC
UTV	UNDERGROUND TV
G	GAS
1015	CONTOUR
●	MANHOLE
■	CATCH BASIN
○	HYDRANT
⊗	VALVE



Sheet Number	Sheet Title
1	TITLE
2	OVERALL WATERSHED MAP
3	WATERWAY REPAIR PLAN
4	WATERWAY REPAIR PLAN
5	DROP STRUCTURE DETAILS
6	TYPICAL DITCH SECTION
7	INTAKE & BEDDING DETAILS
8	OPEN DITCH REPAIR OPTIONS
9	WATERWAY PLAN & PROFILE
10	WATERWAY PLAN & PROFILE
11	WATERWAY PLAN & PROFILE
12	WATERWAY PLAN & PROFILE
13	OPEN DITCH REPAIR PLAN & PROFILE

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 (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. 48 HOURS PRIOR TO EXCAVATION / CONSTRUCTION (1-800-252-1166) A "GOPHER STATE ONE CALL" WAS OR WAS NOT PERFORMED AT THE TIME OF THE TOPOGRAPHIC SURVEY.

PROJECT INDEX:

OWNER:
FARIBAULT COUNTY DITCH AUTHORITY
FARIBAULT COUNTY AG CENTER
145 S. GROVE ST, SUITE 8
BLUE EARTH, MN 56013
PH: 507-525-8076

PROJECT ADDRESS / LOCATION:
SECTIONS 8, 9, 17

WINNEBAGO CITY TWP
WINNEBAGO, MINNESOTA

MANAGING OFFICE:

MANKATO, MN
115 EAST HICKORY ST.
SUITE 300
MANKATO, MN 56001
PHONE: 507-387-6651

PROJECT MANAGER: CHUCK BRANDEL
EMAIL: CHUCK.BRANDEL@IS-GRP.COM



SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE COUNTY OF FARIBAULT REQUIREMENTS AND MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2014 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), 1996 ADJUSTMENT (NAD83(1996)) ON THE FARIBAULT 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.

B.M. ELEVATION=1058.43

3.0 MILES NORTH ALONG TH 169 FROM THE TH 169/109 INTERSECTION; THEN 0.75 MILE WEST ON 220TH STREET; 30 FEET SOUTH OF 220TH STREET; 52 FEET WEST OF ENTRANCE

TOPGRAPHIC SURVEY

THIS PROJECTS TOPOGRAPHIC SURVEY CONSISTS OF DATA COLLECTED BY I+S GROUP IN OCTOBER OF 2014

KEY PLAN

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CHARLES J. BRANDEL

DATE _____ LIC. NO. 43359

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PROJECT

FARIBAULT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR

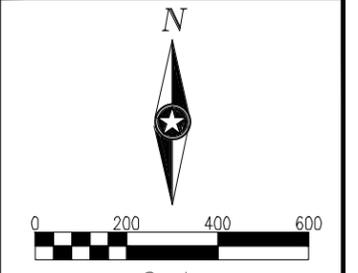
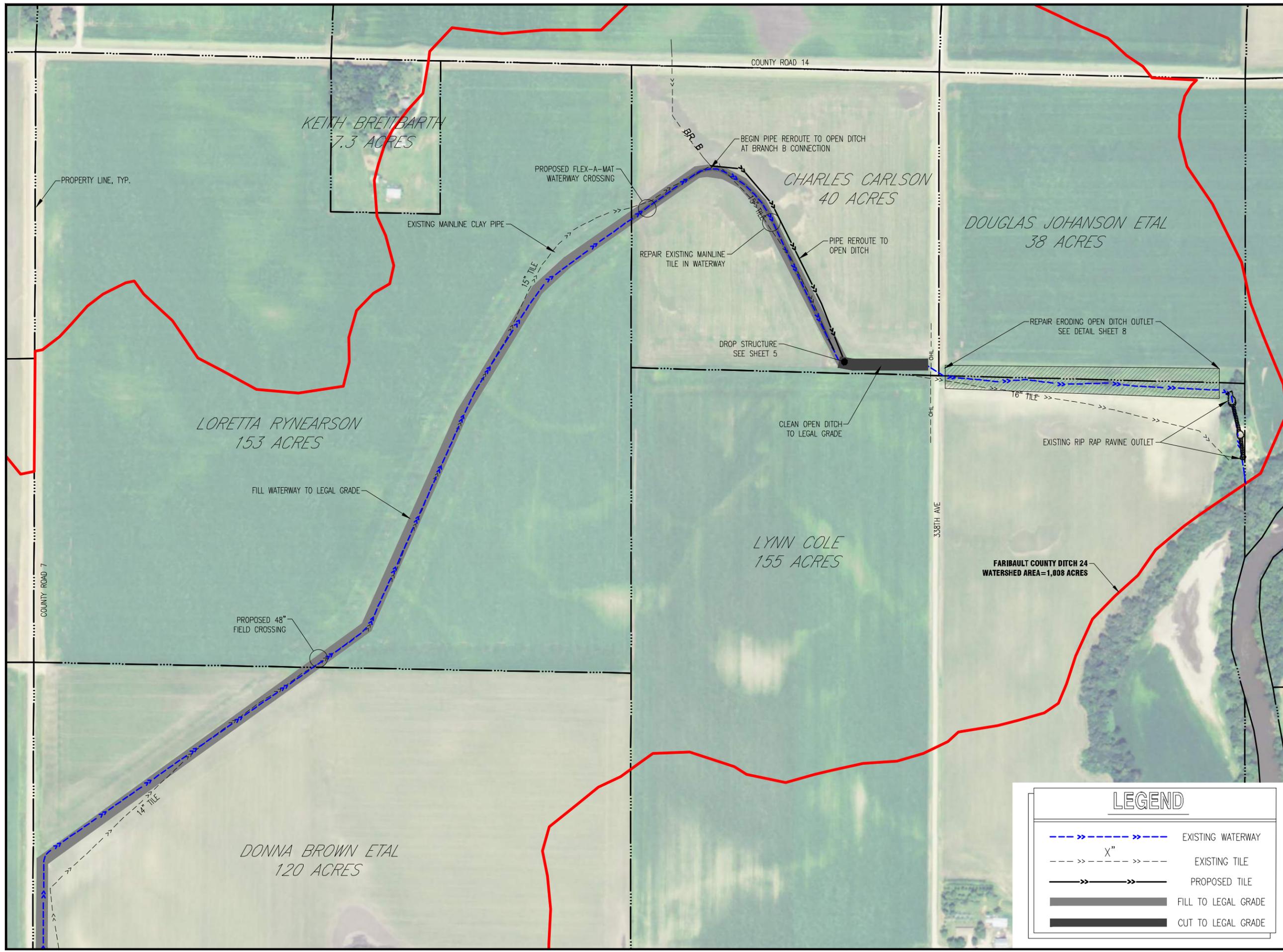
WINNEBAGO MINNESOTA

REVISION SCHEDULE		
NO	DATE	DESCRIPTION

PROJECT NO.	14012
FILE NAME	14012 WATERWAY
DRAWN BY	KDS/JD
DESIGNED BY	CJB/KDS
REVIEWED BY	CJB/KDS
ISSUE DATE	3/31/2016
CLIENT PROJECT NO.	-

TITLE
TITLE

SHEET
1 OF 13



KEY PLAN Scale:

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PROJECT
**FARIBAULT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR**

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
NO	DATE	DESCRIPTION

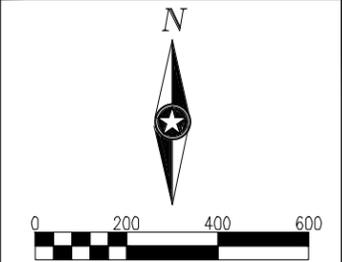
PROJECT NO. 14012
FILE NAME 14012 WATERWAY
DRAWN BY JD
DESIGNED BY CJB/KDS
REVIEWED BY CJB/KDS
ISSUE DATE 3/31/2016
CLIENT PROJECT NO. -

TITLE
**WATERWAY
REPAIR PLAN**

SHEET
3 OF 13

LEGEND

- EXISTING WATERWAY
- EXISTING TILE
- PROPOSED TILE
- FILL TO LEGAL GRADE
- CUT TO LEGAL GRADE



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PROJECT
FARIBAULT COUNTY

**COUNTY DITCH 24
GRASSED WATERWAY
REPAIR**

WINNEBAGO MINNESOTA

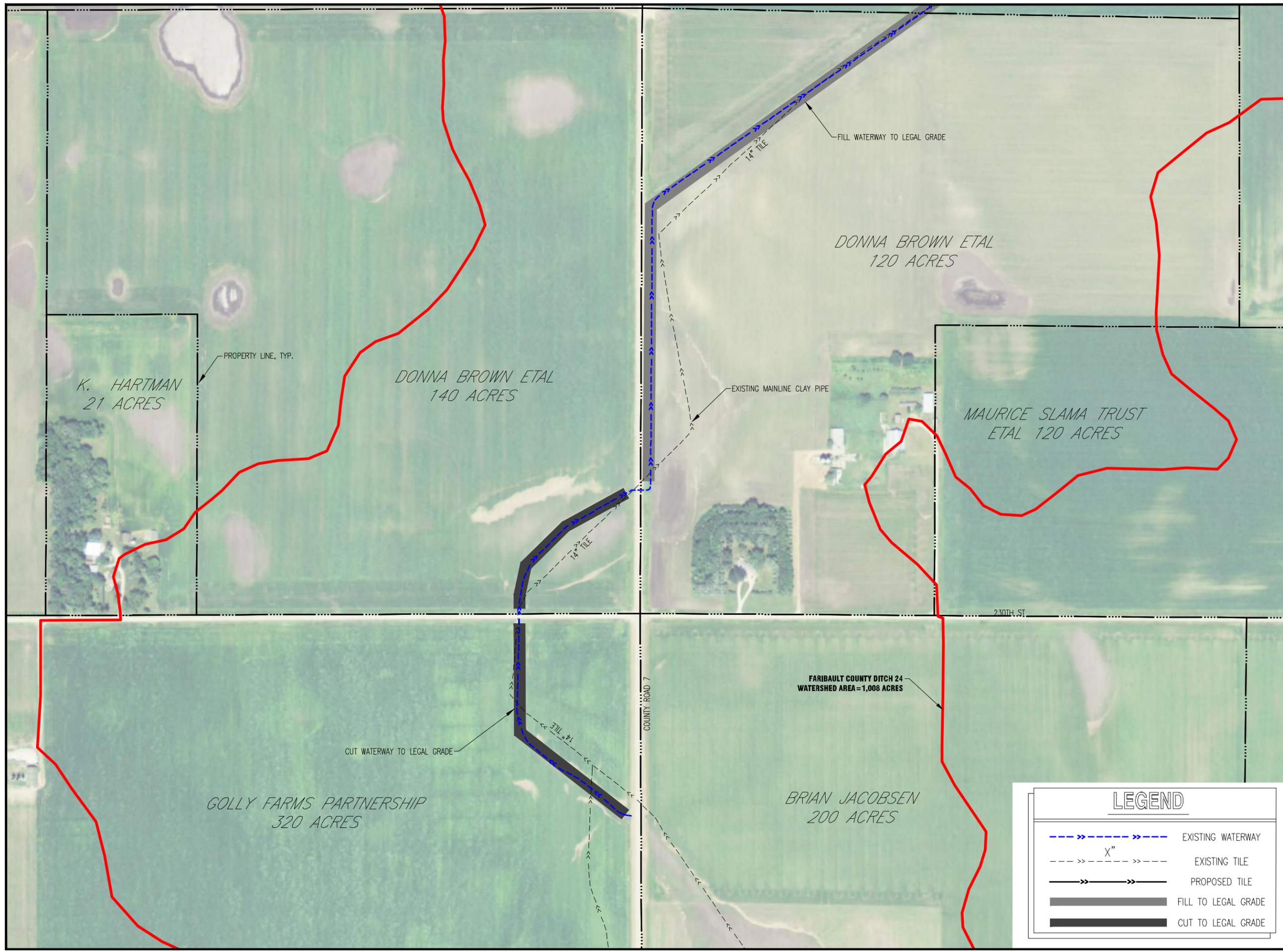
REVISION SCHEDULE	
NO	DESCRIPTION

PROJECT NO. 14012
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ISSUE DATE 3/31/2016
CLIENT PROJECT NO. -

TITLE

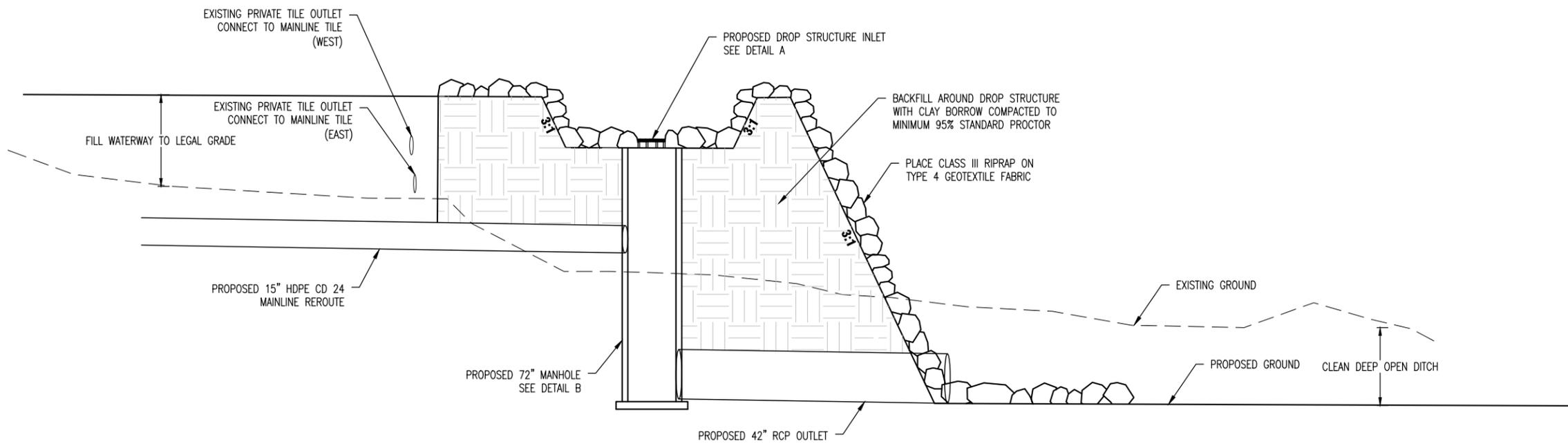
**WATERWAY
REPAIR PLAN**

SHEET
4
OF 13



LEGEND

- EXISTING WATERWAY
- EXISTING TILE
- PROPOSED TILE
- FILL TO LEGAL GRADE
- CUT TO LEGAL GRADE



DROP STRUCTURE OUTLET DETAIL

N.T.S.

KEY PLAN

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PROJECT

FARIBAUT COUNTY

**COUNTY DITCH 24
GRASSED WATERWAY
REPAIR**

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
NO	DATE	DESCRIPTION

PROJECT NO. 14012

FILE NAME 14012 WATERWAY

DRAWN BY KDS/JD

DESIGNED BY CJB/KDS

REVIEWED BY CJB/KDS

ISSUE DATE 3/31/2016

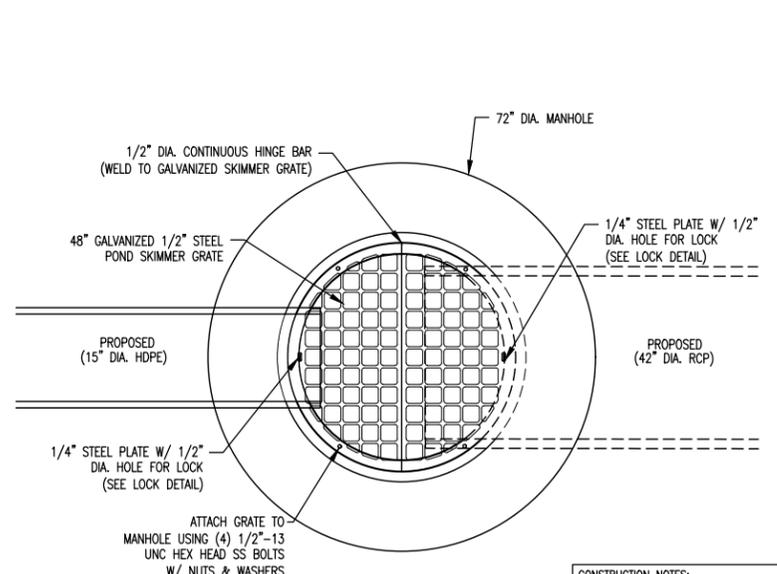
CLIENT PROJECT NO. -

TITLE

**DROP
STRUCTURE
DETAILS**

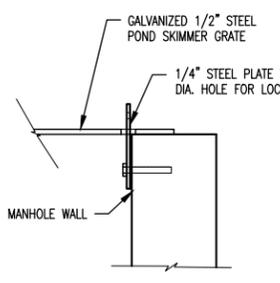
SHEET

5 OF 13



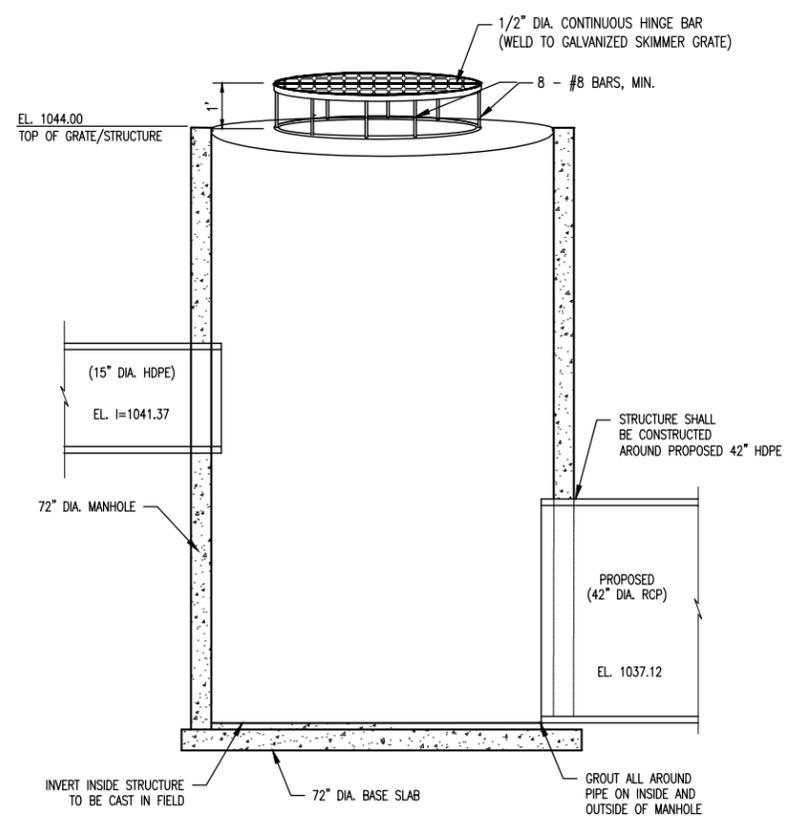
DETAIL A

N.T.S.



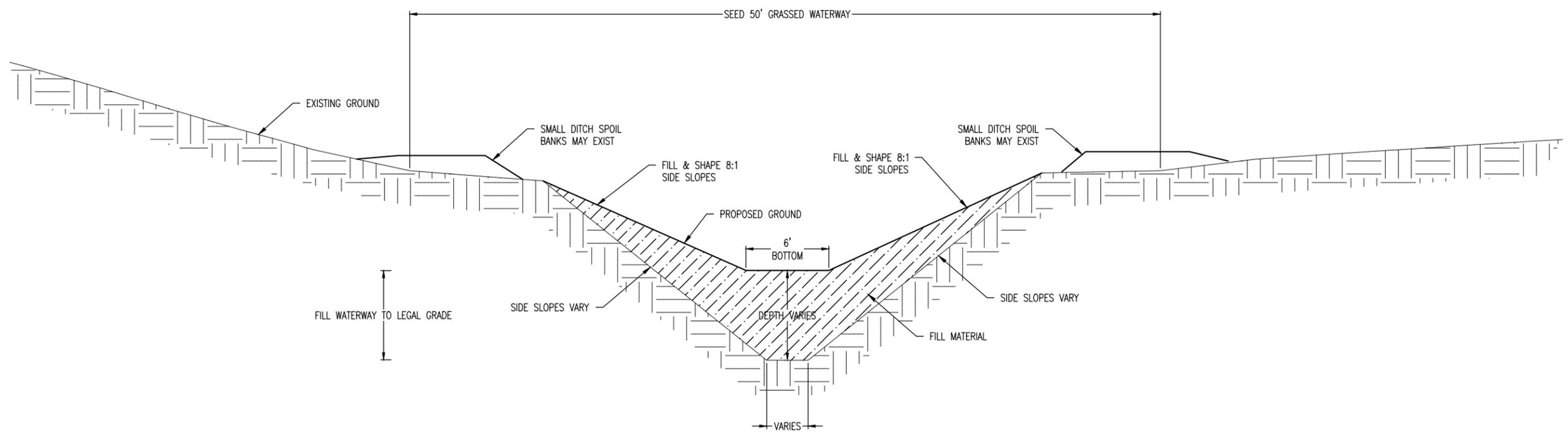
LOCK DETAIL

CONSTRUCTION NOTES:
GRIND EXPOSED FIELD & SHOP WELDS FLUSH WITH ADJACENT SURFACES.
AFTER FABRICATION, GALVANIZE STRUCTURAL SHAPES AND MISCELLANEOUS ITEMS IN ACCORDANCE WITH ASTM A123.
REPAIR DAMAGED & SCRATCHED GALVANIZED COATINGS AFTER INSTALLATION.



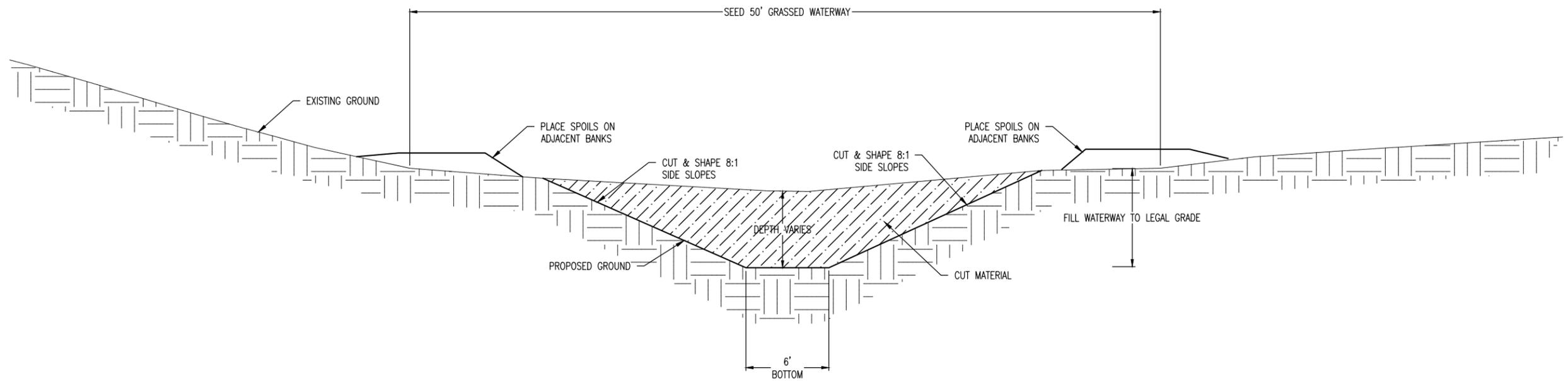
DETAIL B

N.T.S.



TYPICAL WATERWAY FILL CROSS-SECTION

N.T.S.



TYPICAL WATERWAY CUT CROSS-SECTION

N.T.S.

KEY PLAN

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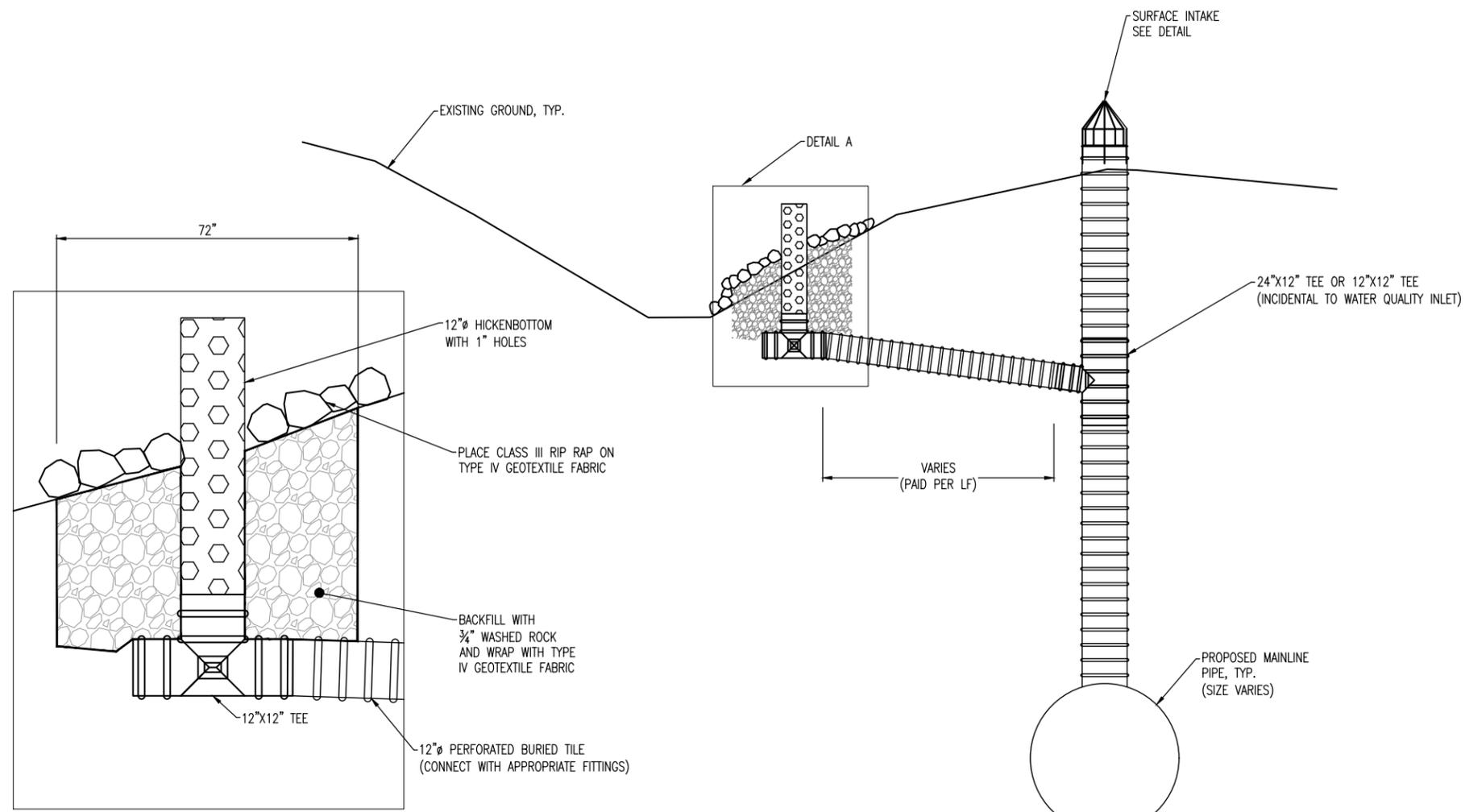
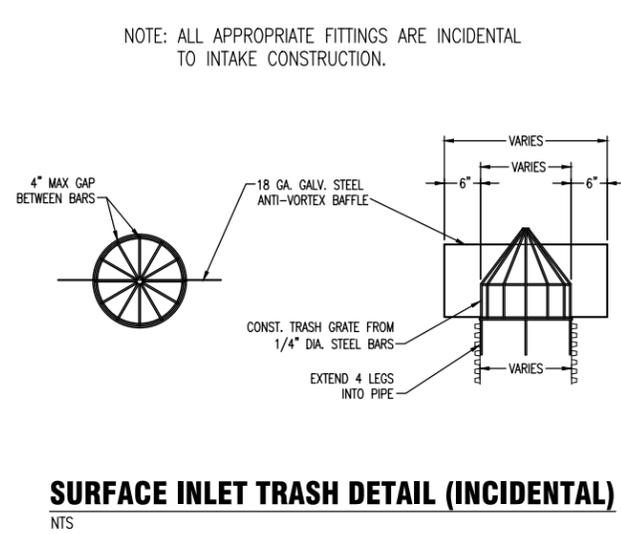
PROJECT
FARIBAUT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
NO	DATE	DESCRIPTION

PROJECT NO. 14012
FILE NAME 14012 WATERWAY
DRAWN BY JD
DESIGNED BY CJB/KDS
REVIEWED BY CJB/KDS
ISSUE DATE 3/31/2016
CLIENT PROJECT NO. -

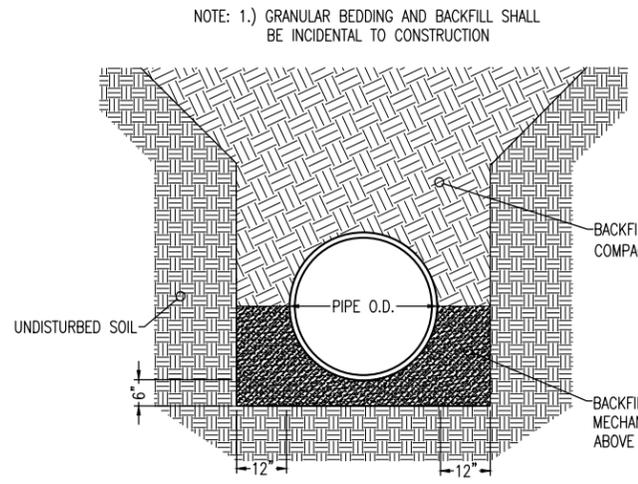
TITLE
TYPICAL DITCH SECTION



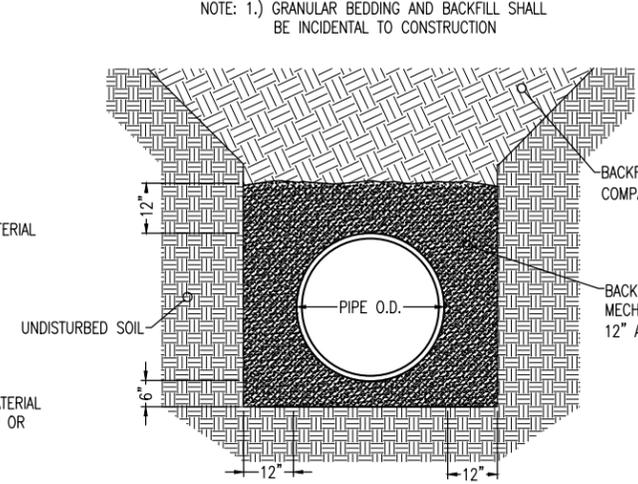
DETAIL A
NTS

NOTE: WHERE REPAIR DROP INTAKE IS CALLED OUT, DETAIL A SHALL BE USED AS THE REPAIR. ALL CONNECTIONS TO THE EXISTING MAINLINE SHALL USE APPROPRIATE FITTINGS, (INCIDENTAL).

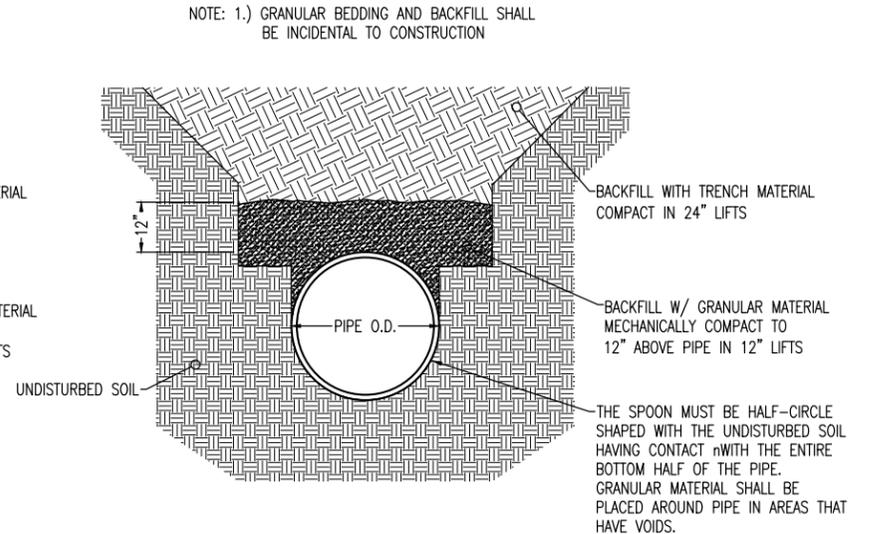
WATERWAY SIDE INLET DETAIL
NTS



RCP FLAT BOTTOM TRENCH BEDDING DETAIL
NTS



HDPE FLAT BOTTOM TRENCH BEDDING DETAIL
NTS



HDPE SPOON TRENCH BEDDING DETAIL
NTS

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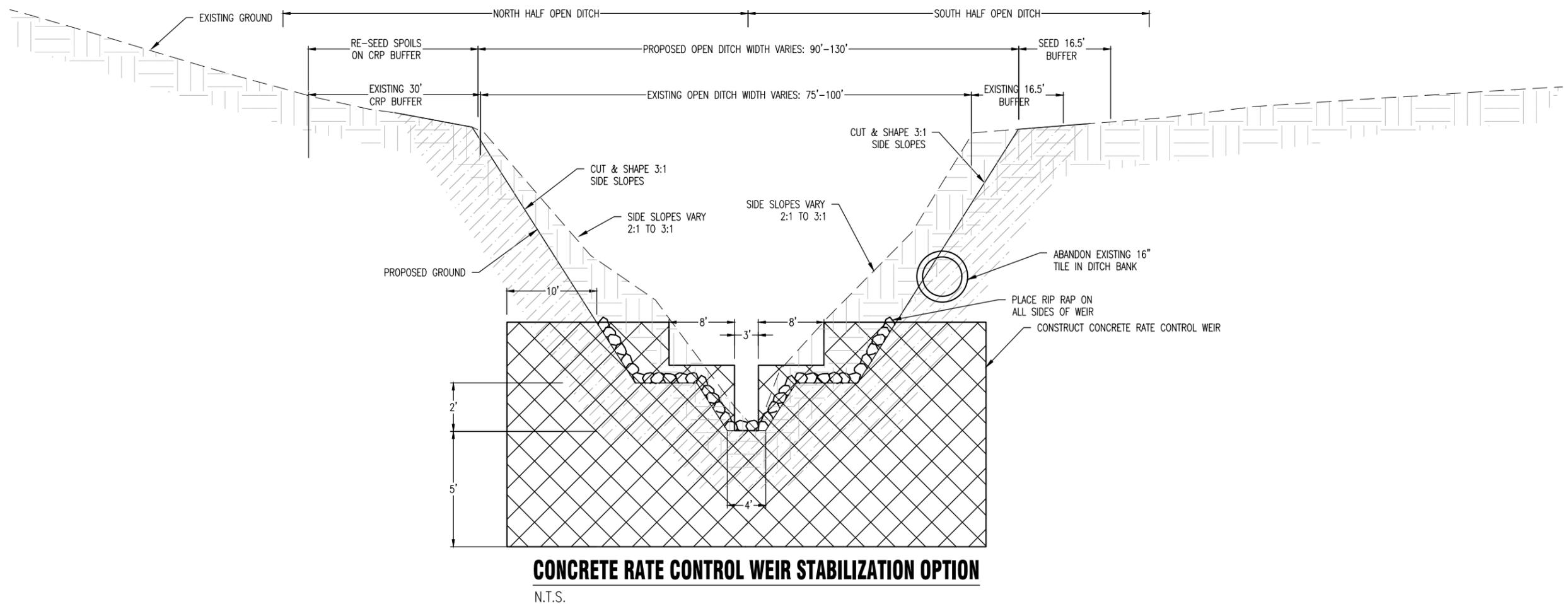
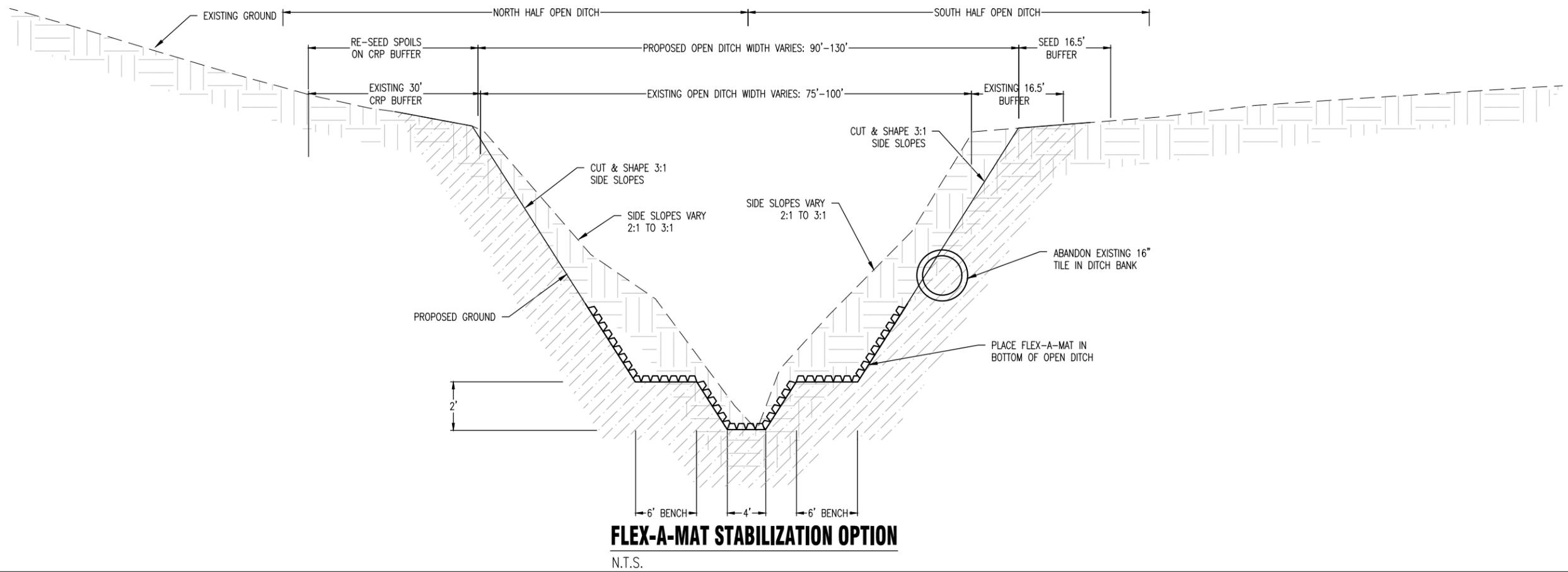
PROJECT
FARIBAUT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
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CLIENT PROJECT NO. -

TITLE
INTAKE & BEDDING DETAILS



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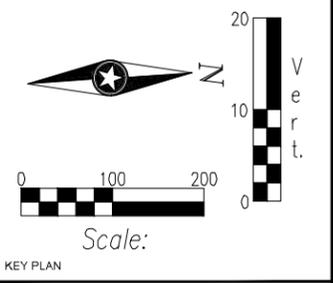
PROJECT
FARIBAUT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
NO	DATE	DESCRIPTION

PROJECT NO. 14012
FILE NAME 14012 WATERWAY
DRAWN BY JD
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REVIEWED BY CJB/KDS
ISSUE DATE 3/31/2016
CLIENT PROJECT NO. -

TITLE
OPEN DITCH
REPAIR OPTIONS



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PROJECT
FARIBAUT COUNTY
COUNTY DITCH 24
GRASSED WATERWAY
REPAIR

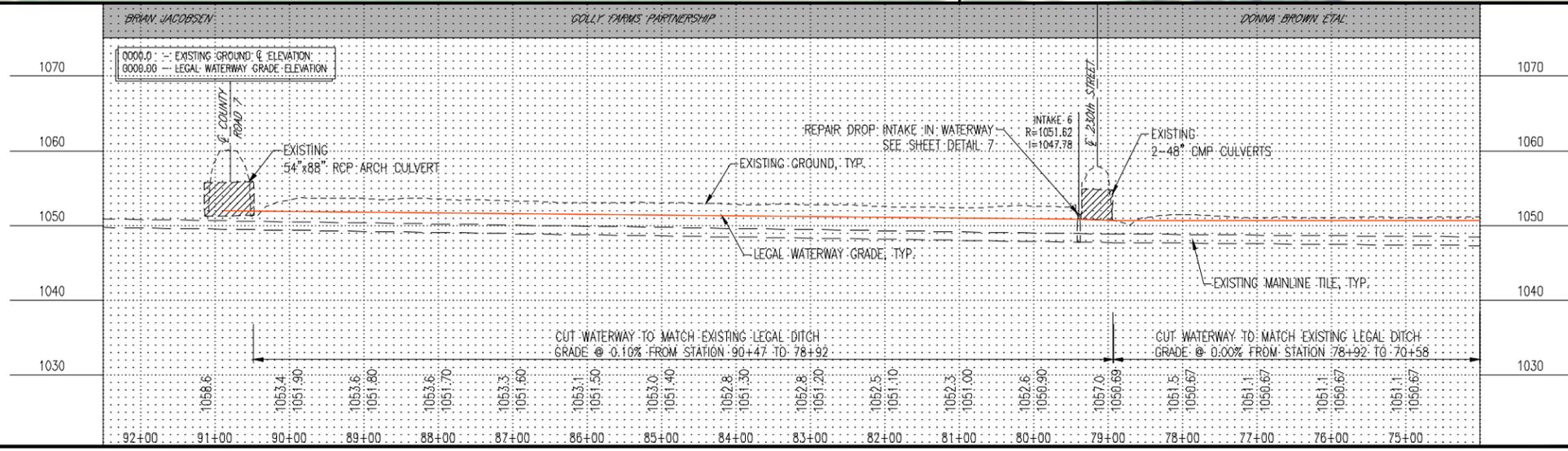
WINNEBAGO MINNESOTA

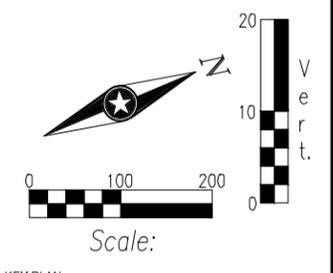
REVISION SCHEDULE		
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PROJECT NO. 14012
FILE NAME 14012 WATERWAY-PROF
DRAWN BY KDS/JD
DESIGNED BY CJB/KDS
REVIEWED BY CJB/KDS
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CLIENT PROJECT NO. -

TITLE
WATERWAY PLAN & PROFILE

SHEET
9 OF 13





KEY PLAN

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PROJECT

FARIBAUT COUNTY

COUNTY DITCH 24

GRASSED WATERWAY REPAIR

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
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PROJECT NO. 14012

FILE NAME 14012 WATERWAY-PROF

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DESIGNED BY CJB/KDS

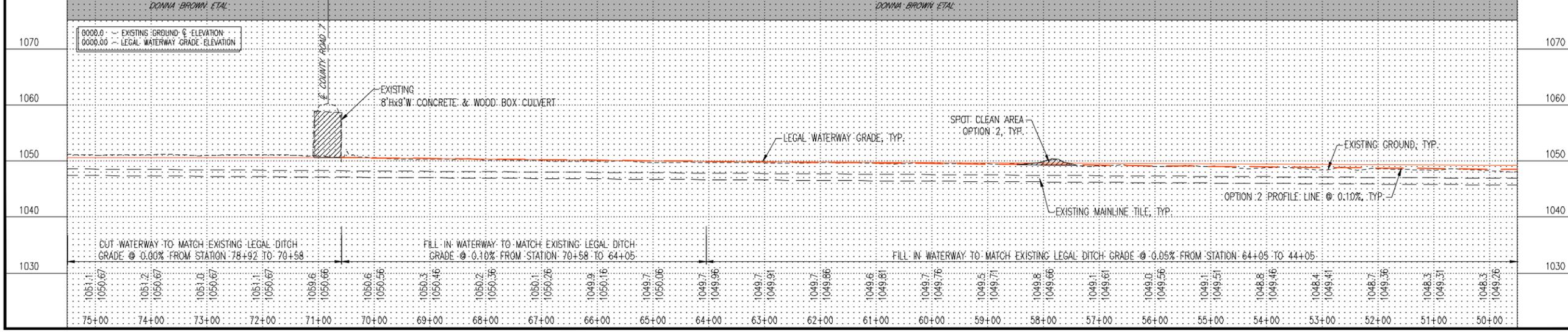
REVIEWED BY CJB/KDS

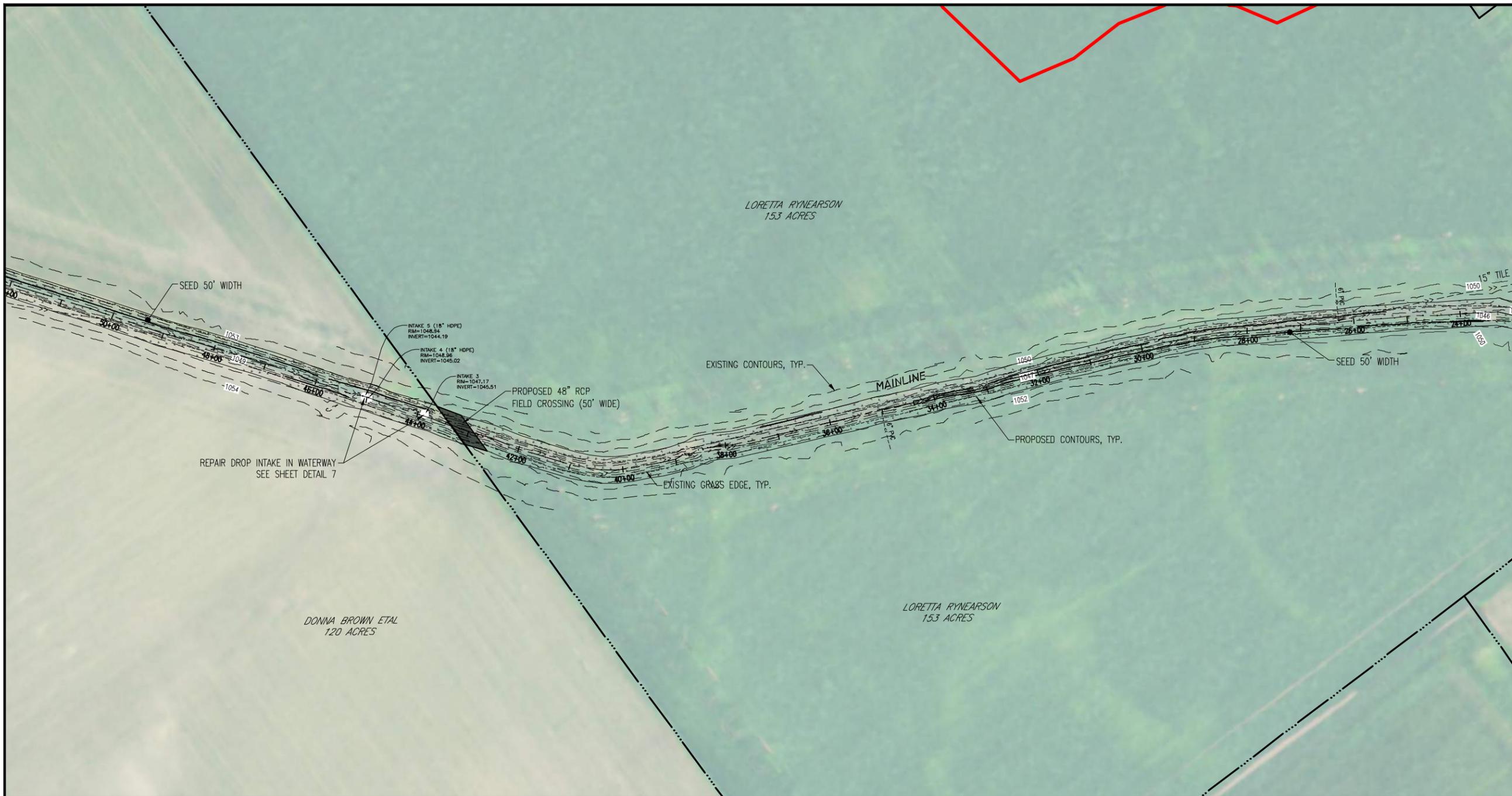
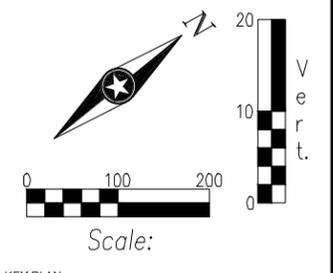
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WATERWAY PLAN & PROFILE





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PROJECT
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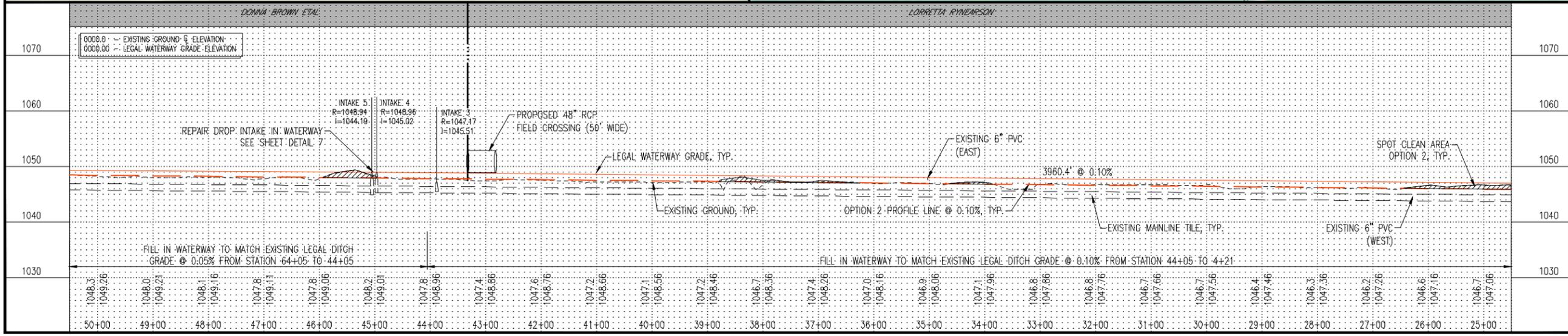
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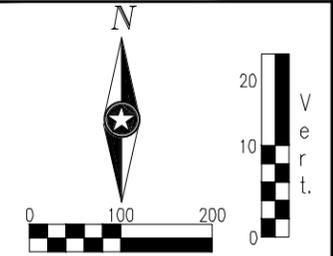
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WATERWAY PLAN
& PROFILE

SHEET
11 OF 13





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FARIBAUT COUNTY

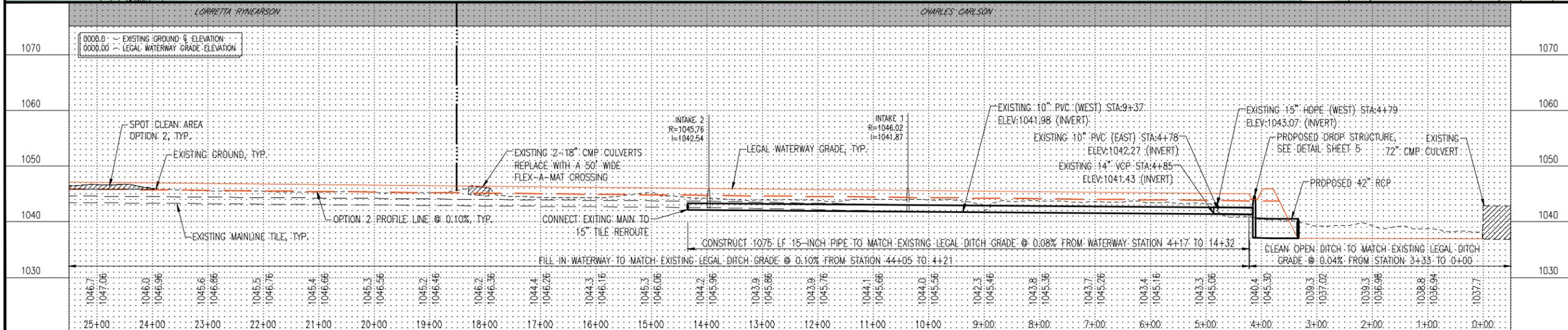
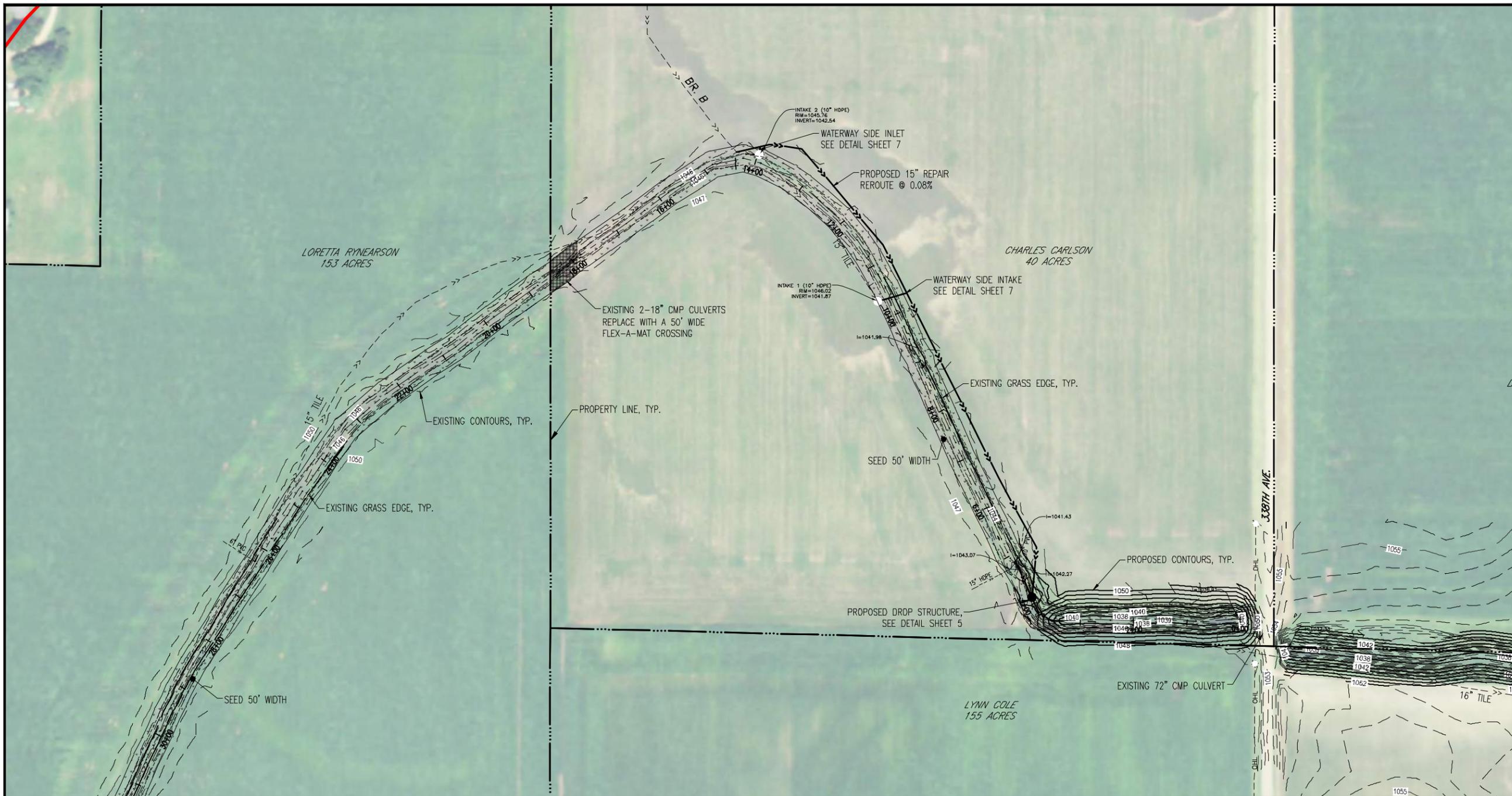
**COUNTY DITCH 24
GRASSED WATERWAY
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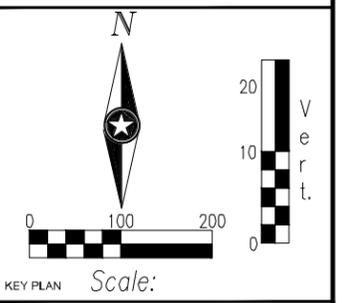
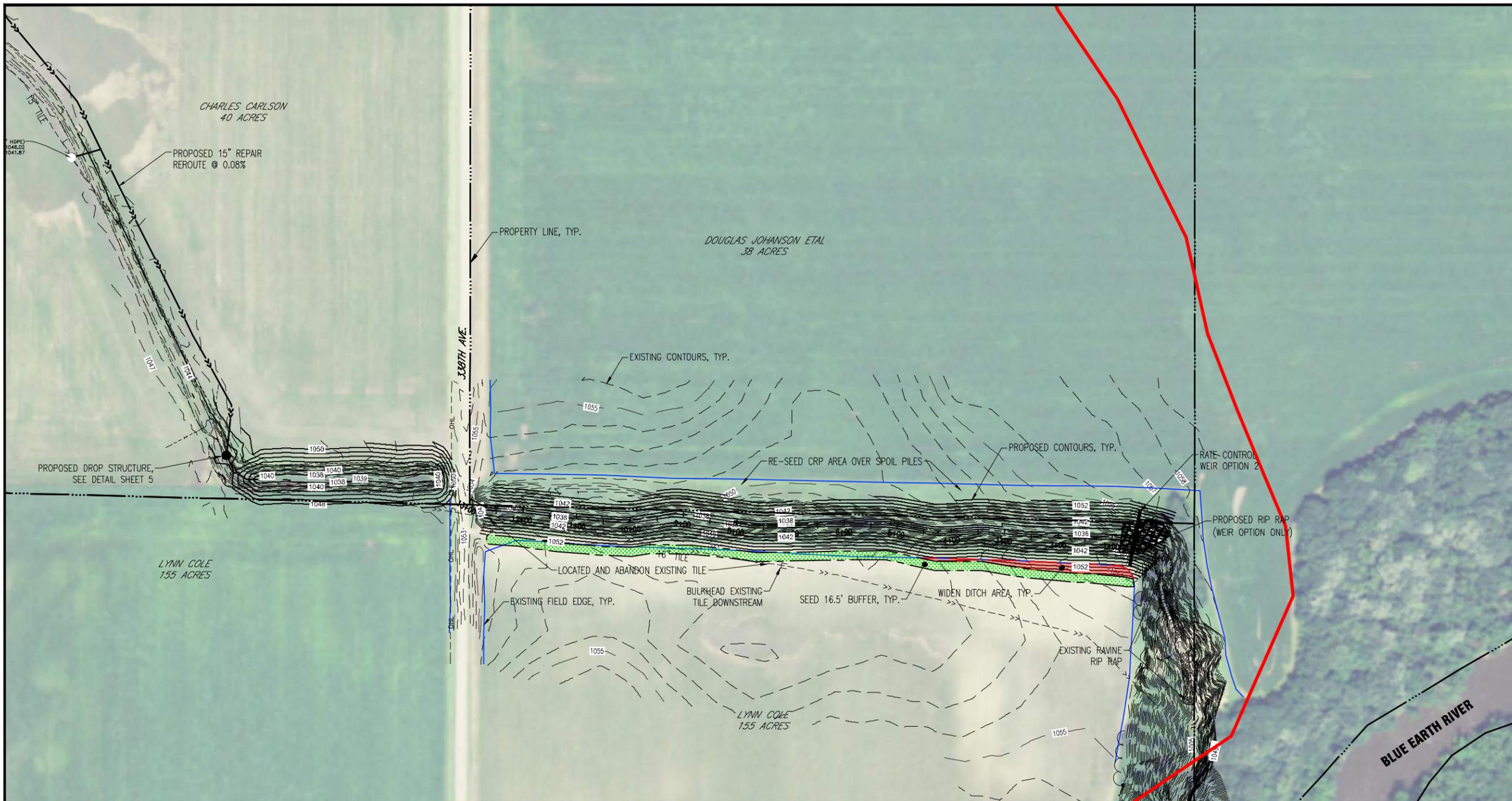
WINNEBAGO MINNESOTA

REVISION SCHEDULE		
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**WATERWAY PLAN
& PROFILE**





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PROJECT

FARIBAUT COUNTY

COUNTY DITCH 24

GRASSED WATERWAY REPAIR

WINNEBAGO MINNESOTA

REVISION SCHEDULE		
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TITLE

OPEN DITCH REPAIR PLAN & PROFILE

