

Preliminary Engineers Report

Judicial Ditch No. 414 Branch A40

Martin County and Faribault County, Minnesota

Date: February 7, 2020

ISG Project No.: 19-23608



Architecture
Engineering
Environmental
Planning

ISGInc.com

REPORT FOR:

Martin – Faribault Joint Drainage Authority
Drainage System Manager
201 Lake Avenue + Suite #201
Fairmont, Minnesota 56081
507.238.3130
michael.forstner@co.martin.mn.us

FROM:

ISG
Mark Origer, PE
Civil Engineer
115 E Hickory Street + Suite #300
Mankato, Minnesota 56001
507.387.6651
Mark.Origer@ISGInc.com

SIGNATURE 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.

Signature: Mark Origer

Printed Name: Mark Origer, PE

License Number: 54863

ISG
115 E Hickory Street, Suite 300
Mankato, Minnesota 56001

Judicial Ditch No. 414 Branch A40 Improvements

Martin County and Faribault County, Minnesota

Engineer's Project Number: 19-23608

Dated this 7th day of February, 2020

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EXECUTIVE SUMMARY

A petition was submitted to the Martin – Faribault County Joint Drainage Authority requesting an improvement to a portion of the Judicial Ditch No. 414 (JD 414) public drainage system. The petitioners requested to improve Branch A40 and its associated branches, which include Branch A43, A45, A46, and A47. Judicial Ditch No. 414 has a watershed of 10,893 acres consisting of gently rolling agricultural land and Branch A40 and its branches has a watershed of 453 acres. The system was constructed in 1910 with major repair completed in 2018, which included cleaning entire mainline open ditch and addressing maintenance items.

ISG prepared a feasibility report for landowners within the drainage system which then progressed into meeting with all landowners within the drainage system and county staff. Concluding the meetings, there was a general concern with the system's ability to drain portions of the watershed due to tile capacity issues along with failing tiles issues.

Currently, Branch A40 tile outlets into JD 414 open ditch with a 14-inch tile and has a drainage coefficient of 0.13 inches per day. Throughout the remaining portions of Branch A40 and its branches, drainage coefficients are consistently under the recommended drainage capacities.

The proposed projects include upsizing and deepening Branch A40 and its branches. The project includes installing approximately 6,700 linear feet of tile ranging from 24- to 8-inch tile generally following the existing tile alignments. The proposed tiles are improved to achieve the recommended 0.50 in/day drainage coefficient. A 1-acre storage pond located at the outlet of Branch A40 is recommended to be included with the improvement project. This location was determined to be the most cost effective, although other options may be explored upon landowner or county input. The proposed project as outlined above is referenced as at Option 2 within this report. Two alternative storage options are included which implement no storage and a 3-acre pond located at the outlet of Branch A40 as Option 1 and Option 3, respectively.

The preliminary estimated construction cost for JD 414 improvement Option 2 to improve drain tiles is approximately \$483,200. The storage basin construction cost for Option 2 is approximately \$92,100 to purchase permanent flowage easement for property, excavating the pond, control structures, and grade out the pond spoils. The total preliminary estimated construction for Option 2 is \$605,000.

PETITION + ORDER

Petition Summary

A Petition was received by the Martin – Faribault Joint Drainage Authority on August 2, 2019 to improve a portion of Judicial Ditch No. 414. The petitioners requested that the Drainage Authority improve Branch A40 and its branches, which include tile branches A40, A43, A45, A46, and A47. A copy of the signed Petition has been placed in Appendix B.

Order Summary

On September 17th, 2019 the Martin – Faribault Joint Drainage Authority, in regular session, made an Order related to the Petition in which it appointed ISG as the engineer. A copy of the signed Order has been placed in Appendix B.

SYSTEM WATERSHED

Location

Judicial Ditch No. 414 Branch A40 is located in Sections 3, 4, 7-10, 15-20, 29, and 30 of Pilot Grove Township in Faribault County and Sections 13-29 of East Chain Township in Martin County. The mainline open ditch runs generally northeast from its end in Section 17 of East Chain Township in Martin County to Section 3 of Pilot Grove Township in Faribault County to its outlet, County Ditch No. 514.

Branch A40 is located in Section 19 and 30 of Pilot Grove Township in Faribault County and Section 25 of East Chain Township in Martin County. Branch A40 flows generally northwest to its outlet into the mainline open ditch. Branch A40 contains 5 branches: Branch A41, Branch A43, Branch A45, Branch A46, and Branch A47.

Judicial Ditch No. 414 drains 10,893 acres and serves as an outlet to Judicial Ditch 314 draining 3,443 acres. Its watershed is characterized as relatively flat with an elevation difference of approximately 45-feet. Branch A40 and its branches drain 453 acres.

The predominant hydrologic soil type in the system's watershed is type "C/D" according to the Web Soil Survey (WSS). This classification "C" represents the drained condition with type "D" represents the undrained condition. The soils consist of silty clay loam soils that, when adequately drained, are prime for farmland. A level 1 wetland delineation was completed, and Branch A40 has potential wetlands located along County Road 2.

See Appendix C for maps depicting the watershed's location, elevation, hydrologic soils, unified soil classification, and Level 1 Wetland Delineation.

HISTORY

According to material supplied by Martin County and Faribault County, Judicial Ditch 414 was first constructed as part of Judicial Ditch No. 14 in 1910. During a re-determination of benefits in 2012-2013, the Judicial Ditch No. 14 system was divided into the current systems which include Judicial Ditch No. 214, Judicial Ditch No. 314, Judicial Ditch, 414, and County Ditch No. 514. The JD 414 system currently consisting of 92,015-feet of open ditch including the mainline and branches and 210,370-feet of tile including the mainline and branches.

Maintenance records indicate that JD 414 underwent repairs in 1950 consisting of open ditch cleaning. In the mid 1970's improvements were completed on the mainline open ditch, Branch A1, A2, A6, A7, and A20. A major repair was completed in 2018, which included cleaning the entire mainline open ditch and addressing maintenance items such as slough repairs, tile outlet repairs, buffer seeding, and alternative side inlet installation.

No known repairs or improvements have been completed on Branch A40, A43, A45, A6 or A47.

Early Coordination

Prior to the Petition for this drainage project a landowner meeting was held which were attended by the Engineer, county drainage staff, ISG staff, and watershed landowners. In response, the Engineer prepared a Feasibility Report which included options for repair and improvement of Branch A40 and its branches. The feasibility report formed the bases for both the petition and present report.

Investigation of External Sources of Funding and Technical Assistance

Section 103E.015, Subd. 1a of the Drainage Code requires that an investigation of external sources of funding and technical assistance be conducted prior to the appointment of an engineer for a drainage project or a petitioned repair. The funding can be used for wetland preservation or restoration or creation of water quality improvements, flood control, or alternative measures (per Section 103E.015, Subd. 1, clause (2)). The sources of funding authorized under this Section can be used outside the benefited area, but must be used in the watershed of the system.

A multipurpose drainage management (MDM) map is included in Appendix D. The MDM map shows potential locations for additional best management practices (BMPs) and will be proposed to landowners.

Due to limited BMPs that can be implemented in coordination with tile installation, additional BMPs may be implemented independently by individual landowners. These practices include nutrient management, conservation tillage, cover crops, blind rock inlets, and controlled drainage. The respective counties Soil and Water Conservation District (SWCD) representative can assist landowners with implementation and available funding.

Through the improvement project, it is recommended to implement a 1-acre storage pond. The storage pond will provides water-holding capacity within the watershed to reduces peak flow rates discharges from the system as well as providing ability for sedimentation and denitrification. Although there are many grants available in the state of Minnesota that support water quality, for many of the grants storage ponds are not considered an eligible practice. The investigation of sources of external funds will continue as the project moves forward and will include BWSR MDM grants, the Greater Blue Earth River Basin Alliance, and other MDM grants.

PRESENT CONDITION**System Capacity**

The following tables summarize the hydraulic analysis of Branch 40A and its branches in the As Constructed or Subsequently Improved Condition (ACSIC). The capacities listed in the tables reference the capacity of agricultural drainage which is expressed as a drainage coefficient (CD) and is defined as the depth of water over the entire area of the upstream watershed that a tile or ditch can drain in a 24-hour period (inches per day (in/day)). For a system like JD 414 Branch A40, drainage coefficients of 0.375 in/day to 0.50 in/day for tile are recommended for today's drainage needs.

TABLE 1. ACSIC TILE CAPACITIES

Branch	ACSIC Size (in)	ACSIC Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)
A40	14	0.20%	427.4	0.13
A40	12	0.20%	329.4	0.12
A40	12	0.10%	315.2	0.09
A40	10	0.05%	268.2	0.04
A40	8	0.50%	156.8	0.13
A40	8	0.40%	83.6	0.22
A40	8	0.20%	83.2	0.15
A40	8	0.40%	72.6	0.25
A40	8	0.30%	33.2	0.48
A40	8	1.00%	25.4	1.14
A40	8	2.00%	25.1	1.63
A43	8	0.05%	48.0	0.13
A45	8	0.20%	17.4	0.74
A45	8	1.60%	16.5	2.22
A45	8	4.40%	15.9	3.80
A45	8	2.00%	6.4	6.33
A46	10	0.05%	73.2	0.16
A46	8	0.05%	66.6	0.10
A46	8	0.10%	54.7	0.17
A46	8	0.30%	50.3	0.31
A46	8	0.80%	22.4	1.15
A46	8	1.00%	18.0	1.60
A47	6	0.05%	12.4	0.24

Nature and Capacity of the Outlet

The outlet for Branch 40A and its branches is JD 414 mainline open ditch with their junction located in SW ¼ of the NW ¼ of Section 19 of Pilot Grove Township in Faribault County. JD 414 open ditch is a 103E public drainage system and it is not anticipated that a permit will be required for this project as it is not classified as a public watercourse.

STATUTE REQUIRED + SUGGESTED EFFORTS

Project Necessity

After due consideration of the present condition of Branch A40 and its branches both observationally and by analysis, Judicial Ditch No. 414 Branch A40 is deemed necessary to improve drainage efficiencies to meet current farming practices and standards. The tiles throughout the watershed are over 100-years old and are deteriorating due to their age and shallow depth.

Environmental, Land Use, and Multipurpose Water Management Considerations

(Section 103E.015, Subd. 1)

The Drainage Code requires that the drainage authority assess the necessity and feasibility of a drainage project in relation to the environmental, land use, and multipurpose water management criteria of Section 103E.015, Subd. 1. To assist in providing thoroughness and clarity, the law will be used as the outline for this portion of the report.

103E.015 CONSIDERATIONS BEFORE DRAINAGE WORK IS DONE.

Subdivision 1. Environmental, land use, and multipurpose water management criteria. Before establishing a drainage project, the drainage authority must consider each of the following criteria:

(1) private and public benefits and costs of the proposed drainage project;

The drainage project will decrease the amount and duration of standing water of farm fields, therefore reducing the potential for crop loss and increasing the farmability of within watershed. The improvements to the drainage system will replace failing infrastructure to meet today's farming need for drainage.

Since the present project is on a public drainage system the financial cost will be borne by the benefitted landowners. The only costs that might be paid by the public would be those that are provided through grants or loans.

Storage options are included in preliminary phases of the improvement that will provide protection from increased flooding in downstream waters and adjacent lands and, improve water quality while improving the drainage for benefitted landowners.

(2) alternative measures, including measures identified in applicable state-approved and locally adopted water management plans, to:

The following water management plans were consulted to see what alternative measures might be applicable to the proposed drainage project:

Faribault County Local Water Management Plan 2018-2027

Martin County Local Water Plan 2017-2026

- (i) conserve, allocate, and use drainage waters for agriculture, stream flow augmentation, or other beneficial uses;*
- (ii) reduce downstream peak flows and flooding;*
- (iii) provide adequate drainage system capacity;*
- (iv) reduce erosion and sedimentation; and*
- (v) protect or improve water quality;*

Both Faribault and Martin County water plans have goals to reduce the impacts of altered hydrology and call out strategies which include implementation of wetland restorations, controlled drainage, storage basins, and other multipurpose drainage management practices. Through this project, a storage basin is being recommended for implementation to minimize impacts to downstream waters. The storage basin will help to reduce peak flows, provide additional water holding capacity within the drainage system, and allow for storage and treatment of tile drainage water. This project aligns with the goals and implementation strategies outlines in local water management plans.

(3) the present and anticipated land use within the drainage project or system, including compatibility of the project with local land use plans;

The present land use for the system is primarily agricultural. Minimal land use change is expected. It is recommended that 1-acre of farmland be converted into a storage pond at the outlet of Branch A40. The storage pond will be seeded with native seed-mix conducive to withstand the expected hydric conditions of the pond providing wildlife habitat to the watershed aligning with the county water plans.

(4) current and potential flooding characteristics of property in the drainage project or system and downstream for 5-, 10-, 25-, and 50-year flood events, including adequacy of the outlet for the drainage project;

The present and proposed improvement conditions were modeled with XP SWMM. XP SWMM is a fully dynamic modeling software that combines 1-dimensional flow calculations (open channel, pipe flow, ect.) with 2-dimensional flow calculations (floodplain, overland flow, etc.) to better analyze hydrologic and hydraulic conditions. The 1D aspect incorporates land use, soil type, topography, and the associated 2D components to simulate overland and floodplain flow associate with the triggered runoff from a watershed.

Design storms and rainfall data used to generate Type II rainfall distributions for the project area were obtained from the National Oceanic and Atmospheric Administration (NOAA's) Atlas 14 precipitation frequency estimates. Runoff calculations in the model were preformed using TR-55 method. Curve numbers for the project area were determined using GIS soil and land use data. A model was developed for the 2, 5, 10, 25, 50, and 100-year rainfall events for a 24-hour storm duration.

The XP SWMM model compares the legal condition to the proposed improvement for Branch A40 and its branches on JD 414. Three improvement options are being considered during the preliminary phase of this project. All options will include improving drainage tiles to a 0.50 in/day drainage coefficient. Option 1 will include no additional storage, Option 2 will incorporate a 1-acre storage pond, and Option 3 will incorporate a 3-acre storage pond. The options will be compared to show the difference in cost, benefit, and peak flows to downstream waters. Table 2 below summarizes the peak flow rates at the Branch A40 outlet into JD 414 and at the overall outlet of JD 414.

TABLE 2: PEAK FLOW RATE COMPARISONS

		2-Year		5-Year		10-Year		25-Year		50-Year		100-Year	
		Flow (cfs)	% Change	Flow (cfs)	% Change	Flow (cfs)	% Change	Flow (cfs)	% Change	Flow (cfs)	% Change	Flow (cfs)	% Change
Existing	Branch A40 Outlet	9.8	NA	24.9	NA	36.9	NA	68.4	NA	90.6	NA	110.6	NA
	JD 414 Outlet	260	NA	528	NA	760	NA	1110	NA	1410	NA	1760	NA
Option 1 <i>No Storage</i>	Branch A40 Outlet	37.6	284%	40.6	63%	45.8	24%	72.7	6%	107.1	18%	134.1	21%
	JD 414 Outlet	287.8	11%	543.7	3%	768.9	1%	1114.3	0%	1426.5	1%	1783.5	1%
Option 2 <i>1ac Pond</i>	Branch A40 Outlet	17.9	83%	22.6	-9%	33.1	-10%	44.2	-35%	55.9	-38%	115.9	5%
	JD 414 Outlet	268.1	3%	525.7	0%	756.2	0%	1085.8	-2%	1375.28	-2%	1765.3	0%
Option 3 <i>3ac Pond</i>	Branch A40 Outlet	12.4	27%	15.4	-38%	18.9	-49%	34.5	-49%	57.77	-36%	113.9	3%
	JD 414 Outlet	262.6	1%	518.5	-2%	742.1	-2%	1076.2	-3%	1377.19	-2%	1763.3	0%

The increases in peak flowrates from the Branch A40 outlet show large increase in peak flow rate percentages. However this number is skewed as the Branch A40 watershed is small in nature and low peak flowrates exit the system. As a result, even small numerical differences in peak flowrates show a large percentage increase. Therefore, the outlet peak flowrate comparison used the combined flows from the JD 414 open ditch for a more accurate depiction on the impacts to the outlet of the system.

Option 1 implements the improvement with no additional storage incorporated into the system. When comparing the peak flowrates to the legal system, there is notable increase of peak flow rates on the 2-year and 5-year storm events with increases at the outlet of JD 414 open ditch of 11% and 3% respectively. For the 10-year through 100-year storm events the peak flow increases range from 0-1% increase which can be considered negligible at the JD 414 open ditch outlet.

Option 2 implements a 1-acre storage pond to offset increase for peak flows. The goal of the storage pond was to target reducing the 2-year and 5-year storm events as they produced increases from the improvement. When comparing the peak flowrates to the legal system, the peak flow rates for the 2-year storm event increased 3% at the outlet of JD 414 open ditch and had reduced or had no increase on flowrates at the JD 414 open ditch outlet for the remaining storm events modeled. This option nearly matches the outlet peak flowrates into JD 414 for the 2- through 100-year events and would be cost effective for a watershed of this size.

Option 3 implements a 3-acre storage pond to offset increase in peak flows. The goal of the 3-acre storage pond was to best match or reduce peak flows at the JD 414 open ditch outlet on all storm events. The 3-acre storage pond produced the same or reduced peak flowrates at the outlet of the JD 414 open ditch outlet for all events. However, a pond of this size for this size of watershed may not be cost effective based on recent improvement projects. Outside funding would likely be necessary to incorporate a pond of this size to make the overall project cost effective.

(5) the effects of the proposed drainage project on wetlands;

Drainage projects must comply with a variety of state and federal wetland regulations: USACOE 404, Minnesota Wetland Conservation Act, and USDA Swampbuster. A Level 1 wetland delineation was completed in areas where improvements are slated to take place. Where tile improvements encroach identified wetland areas, non-perforated tile and water tight connections will be utilized. Connections of existing private tiles will not be enlarged with the improvement in these areas. Therefore, there are no anticipated effects on wetland with this improvement.

(6) the effects of the proposed drainage project on water quality;

Water quality issues pertinent to drainage projects can include erosion and sediment transport potential, and non-point pollution. After checking available TMDL information and the MPCA Impaired Waters listing, its notes that JD 414 east of the county boundary, County Road 342, is impaired for macroinvertebrate bioassessments. The utilization of drainage will not decrease the water quality of existing conditions to macroinvertebrates.

The proposed storage pond options with add detention and will also provide sediment and nutrient trapping which increases overall quality of water exiting JD 414 Branch A40. The sediment trap in the proposed storage pond will retain sediment, keeping it from going downstream with proper maintenance.

Please refer to the multipurpose drainage management plan map in Appendix D for additional water quality and best management practices. The multi-purpose drainage management plan was shared with landowners for implementation of preventative, control, and treatment measures. The respective county Soil and Water Conservation Districts can assist landowners with implementation and funding as many of the practice are out of the jurisdiction of the drainage authority. A 1-acre storage pond is recommended with the project that will increase water quality at the outlet of the Branch A40 tile watershed. Other preventative practices can be incorporated throughout the watershed on a private landowner basis to further improve water quality and soil health.

(7) the effects of the proposed drainage project on fish and wildlife resources;

The proposed drainage project will not have any impacts on fish and wildlife resources as no landscapes changes of this nature will occur. The implementation of a storage pond will provide additional wildlife habitat within the watershed if incorporated.

(8) the effects of the proposed drainage project on shallow groundwater availability, distribution, and use; and

There is no anticipated effect of the proposed project shallow groundwater; the project should only impact the soil saturation levels. There are no known irrigation or personal wells located close enough to the ditch to be effected by drainage tiles.

(9) the overall environmental impact of all the above criteria.

The project will have negligible environmental impacts, as there are no major land use changes, wetland impacts, fish and wildlife habitat changes or any adverse effects to water quality. Land use changes include conversion of farmland to construct a 1-acre storage and treatment pond. The implementation of storage with the improvement will provide storage and treatment to the watershed and additional wildlife habitat. The project as recommended will have negligible effects to downstream waters and downstream water quality.

Statement of Necessity and Feasibility, Section 103E.015, Subd. 1,

After assessing the necessity and feasibility of this drainage project on behalf of the Martin – Faribault Joint Drainage Authority in relation to the environmental, land use, and multipurpose water management criteria of Section 103E.015, Subd. 1, the engineer deems the proposed project to be both necessary and feasible.

Substantial Affect on Public Waters

Upon filing of the Preliminary Engineers Report (PER) to the respective county auditors, the Engineer mailed a physical copy of the PER to the Director of the Division of Ecological and Water Resources of the DNR and an electronic copy to the respective DNR regional office for preparation of the Commissioner Preliminary Advisory Report. Items in the Commissioners Preliminary Advisory Report will be addressed in a response letter or during the Preliminary Hearing.

If the project moves forward, it is expected that no permit will be needed as the improvement outlets into a 103E public drainage ditch that is not listed as a public watercourse.

PROPOSED PROJECT

The following project has been proposed in response to the Petition with due regard to the results of the Preliminary Survey:

While alternatives will be analyzed, there are certain things that will, by necessity, characterize any configuration of the proposed drainage project.

COEFFICIENT OF DRAINAGE

The capacity of agricultural drainage is expressed as a drainage coefficient which is defined as the depth of water over the entire area of the upstream watershed that a tile or ditch can drain in a 24-hour period (inches per day (in/day)). For Branch A40 and its branches, a drainage coefficient of 0.50 in/day for tile is recommended with timing further influencing design.

SYSTEM DEPTH

The depth of Branch A40 and its branches are controlled by three criteria: 1. Provide a minimum of five feet of cover in low spots along public tile alignments, 2. Increase tile grades to improve capacity, and 3. Provide deeper outlets for private tile.

EROSION CONTROL

Required temporary erosion control will consist of silt fence or bio-roll around all drop intakes, ponds and ditches until vegetation is established. The temporary erosion control will be maintained throughout the construction process according to the Minnesota Pollution Control Agency (MPCA) regulations.

Permanent erosion control will consist of riprap around all tile outlets into ditches and ponds as necessary. Seeding and erosion control blanket will be placed on all disrupted areas around road crossings. All disturbed vegetation throughout the project will be reseeded with the appropriate seed mix and mulch.

A Storm Water Pollution Prevention Plan will be developed before final construction plans are complete and a National Pollution Discharge and Elimination System (NPDES) permit application will be filed before construction.

TILE AND CONNECTION MATERIALS

All public tile is non-perforated dual wall HDPE or RCP pipe. Per ISG construction specifications, watertight connections and fittings are required for all drainage tile installation.

TILE REPLACEMENT AND CONNECTIONS

When tiles are replaced, whether through repair or improvement proceedings, the replaced tiles are left in the ground and are segmented. The segments are then used as headers for private tiles. Segments are connected to the replacement tile at property lines and before the tile outlets. The replaced tile will be the responsibility of the landowner into the future. See connection detail on Sheet 4 in the Preliminary Plans.

Project Components

Systems can be all ditch, all tile, or a combination of the two. Each project will, therefore, have its own list of components. The improvement to Branch A40 and its branches will have the following components:

TILE

This drainage project proposes to improve Branch A40 and its branches by enlarging and deepening tile. The proposed tile sizes and its corresponding drainage coefficient are noted below in Table 3. Branches included in the improvement included Branch A40 and its branches A43, A45, A46, and A47. All tiles were sized to provide a drainage coefficient of 0.50 in/day. In some locations, the improvement may cause the proposed drainage coefficient to exceed 0.50 in/day. The most common reasons for this is the limited availability of dual wall pipe sizes and the necessity for the county tile to act as a header for private tile. Due to this some of the smaller branches the drainage coefficient often exceeds the 0.50 in/day recommendation values. However, during high flows the outlet of each branch will control the flow.

TABLE 3: PROPOSED TILE CAPACITIES

Branch	ACSIC Size (in)	Proposed Size (in)	ACSIC Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
A40	14	24	0.20%	0.15%	427.4	0.13	0.49
A40	12	24	0.20%	0.15%	329.4	0.12	0.63
A40	12	24	0.10%	0.10%	315.2	0.09	0.54
A40	10	24	0.05%	0.10%	268.2	0.04	0.64
A40	8	18	0.50%	0.10%	156.8	0.13	0.51
A40	8	15	0.40%	0.10%	83.6	0.22	0.58
A40	8	15	0.20%	0.10%	83.2	0.15	0.59
A40	8	12	0.40%	0.20%	72.6	0.25	0.52
A40	8	8	0.30%	0.50%	33.2	0.48	0.61
A40	8	8	1.00%	0.50%	25.4	1.14	0.80
A40	8	8	2.00%	0.50%	25.1	1.63	0.81
A43	8	15	0.05%	0.05%	48.0	0.13	0.72
A45	8	8	0.20%	0.20%	17.4	0.74	0.74
A45	8	8	1.60%	1.00%	16.5	2.22	1.75
A45	8	8	4.40%	2.50%	15.9	3.80	2.86
A45	8	8	2.00%	2.50%	6.4	6.33	7.08
A46	10	18	0.05%	0.05%	73.2	0.16	0.77
A46	8	15	0.05%	0.05%	66.6	0.10	0.52
A46	8	15	0.10%	0.05%	54.7	0.17	0.63
A46	8	10	0.30%	0.30%	50.3	0.31	0.57
A46	8	8	0.80%	0.75%	22.4	1.15	1.12
A46	8	8	1.00%	0.75%	18.0	1.60	1.39
A47	6	8	0.05%	0.05%	12.4	0.24	0.52

DROP INLET

A drop inlet is a structure used along a tile to aid in televising tile, accessing the tile to check for sediment accumulation, and draining surface water. Drop inlets are also utilized for connection to the existing public tile or for private tile connection. They are installed periodically along tile alignments, generally in low areas and/or on each side of road crossings. They are also placed at property lines and as replacements for existing drop intakes.

Standard drop inlets are designed to provide surface drainage through slotted intakes during low flow events. The slots are cut in each rib from 10-inches above grade to as much as 4-feet below grade (surrounded with rock in order to promote sedimentation and infiltration). During high flow events, a standard surface inlet trash rack provides an overflow in order to prevent extensive flooding.

When located in a road ditch, water quality inlets may be provided in lieu of a standard drop inlet. Water quality inlets are designed to provide surface drainage infiltration through a washed rock filter during low flow events. This allows for increased settling of sediment and provides an opportunity for nutrient uptake prior to surface runoff entering the tile system. An integrated slotted (or perforated) intake provides an overflow during high flow events, preventing extensive flooding similar to a standard drop intake. With the existing mainline and branch tile lines remaining in place, the new mainlines and branch tiles may not be constructed

through the lowest point of road ditches or fields. To assure proper drainage, water quality intakes will be offset into these low areas.

STORAGE

Drainage improvements can increase flows, change timing of flows, and increase flooding downstream. Storage is recommended for the project to mitigate these effects. There are three types of storage that can be used on a public drainage system: 1. On-ditch storage where the ditch is expanded (widened) and the resulting pond is controlled by a reduced size culvert or control structure. 2. On-tile storage where the tile is removed within the pond. This pond type is controlled by a structure as well. 3. Off-ditch storage where the pond is constructed to one side of the ditch. The storage pond designed for the JD 414 Branch A40 drainage system utilized on tile storage where the upstream tile will outlet into the pond for temporary storage. The pond will then outlet into the open ditch.

Three options in the preliminary phase of the improvement to Branch A40 and its branches. Option 1 implements the tile improvements with no additional storage incorporated with the project. There are considerable increases to peak flow rates on the 2-year and 5-year storm events.

Option 2 incorporates a 1-acre pond located at the outlet of Branch A40 adjacent to the JD 414 open ditch. The pond is 10.5-feet deep with a storage capacity of 10.5 acre-feet. The pond outlet will be controlled by a 15-inch concrete pipe located at the bottom of the pond, allowing the pond to completely drain during dry periods. The 15-inch outlet pipe matches the size of pipe that can legally be repaired at the outlet of Branch A40 given it is the next available pipe size on the market. The 15-inch pipe will connect into a manhole structure to allow water to overflow during large rain events and enter a larger 24-inch concrete pipe. The 24-inch pipe will outlet into the JD 414 open ditch. The pond inlets and outlets will be armored with riprap to protect from erosion. The 1-acre pond will have a 3% increase on the 2-year storm event and have negligible change on all other storm events. When analyzing the adequacy of the outlet for Branch A40 and its branches, the JD 414 open ditch has capacity to handle a 3% increase in flows for the 2-year event.

Option 3 incorporates a 3-acre pond located at the outlet of Branch A40 adjacent to the JD 414 open ditch. The pond is 10.5feet deep with a storage capacity of 31.5 acre-feet. The pond outlet will be controlled by a 15-inch concrete pipe located at the bottom of the pond, allowing the pond to completely drain during dry periods. The 15-inch pipe will connect into a manhole structure to allow water to overflow during large rain events and enter a larger 24-inch concrete pipe. The 24-inch pipe will outlet into the JD 414 open ditch. The pond inlets and outlet will be armored with riprap to protect from erosion. The 3-acre pond will maintain or decrease flows for all rain events.

It's recommended that Option 2, a 1-arce storage pond, be implemented with the tile improvements to Branch A40 and its branches. When analyzing the improvement without storage the 2-year and 5-year events are the events that are increased by the improvement, and therefore storage should be included and sized to mitigate the peak flow rates for these events. The 1-acre pond maintains or reduces peak flow rates for all storm events except for the 2-year storm event where there is a 3% increase. The JD 414 open ditch has adequate capacity to handle the increase for the 2-year event. Option 3 maintains or reduces the peak flow rates for all storm events although costs approximately \$124,040 more. If PER is approved, viewers will be appointed to analyzed the monetary benefits of the improvement. It is anticipated that the costs will not out-weight the benefits for the improvement when implementing a 3-arce pond without the contribution of outside funding.

Preliminary Cost Estimates

The preliminary estimated construction cost for improvement to Branch A40 and its branches is approximately \$512,976 as outlined in Option 1. Option 2 and Option 3 include the cost for storage and cost \$605,064 and \$729,104 respectively. Per Minnesota state statue, the road authority is charged with the duty of maintaining the crossing of drainage systems. Therefore, costs are included as such in the preliminary cost estimates to the county and township road authorities for tile crossings at County Road 2 and 310th Street. Cost estimates assume boring tile under paved county roads and open cutting gravel township roads.

Detailed cost estimates of the improvement and separable maintenance are included in Appendix F and are summarized below in Table 4. Unit prices were estimated based on recent projects with similar scale and scope of work. Unit prices for standard tile installation were assumed to use High Density Polyethylene (HPDE) pipe and steel pipe for all borings under paved roadways.

Separable Maintenance

When proposing to do an improvement and a separable portion of a larger system is in need of repair, the drainage statute, Section 103E.215, Subd. 6, allows the separation of the cost of repair from the cost of the improvement project. Separable maintenance can be applied to the portions of the existing system that will be replaced or improved by the proposed project. Based on previous projects, the proposed improvement to Branch A40 and its branches described in this report are cost effective and the benefits should outweigh the costs when separable maintenance is considered.

TABLE 4: PRELIMINARY COST ESTIMATE

OPTION 1 - TILE IMPROVEMENT			
Area	Separable Maintenance	Improvement Cost	Net Cost
Branch A40 Tile	\$ 230,091	\$ 332,751	\$ 102,661
Branch A43 Tile	\$ 25,787	\$ 33,372	\$ 7,586
Branch A45 Tile	\$ 25,653	\$ 27,561	\$ 1,908
Branch A46 Tile	\$ 58,117	\$ 70,993	\$ 12,876
Branch A47 Tile	\$ 12,409	\$ 17,827	\$ 5,418
Subtotal without Road Crossings	\$ 352,056	\$ 482,504	\$ 130,448
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870.20
Total	\$ 370,251	\$ 520,568	\$ 150,318
Subtotal Landowner Costs			\$ 509,277
Net Costs			\$ 150,318
Viewers Costs			\$ 3,000.00
Total Project Costs for Landowners			\$ 512,277

OPTION 2 - TILE IMPROVEMENT W/ 1-AC STORAGE			
Area	Separable Maintenance	Improvement Cost	Net Cost
Tile Improvement	\$ 352,056	\$ 482,504	\$ 130,448
Storage - 1 AC	\$ -	\$ 92,087	\$ 92,087
Subtotal without Road Crossings	\$ 352,056	\$ 574,591	\$ 222,535
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870.20
Total	\$ 370,251	\$ 612,656	\$ 242,405
Subtotal Landowner Costs			\$ 601,364
Net Costs			\$ 242,405
Viewers Cost			\$ 3,000.00
Total Project Costs for Landowners			\$ 604,364

OPTION 3 - TILE IMPROVEMENT W/ 3-AC STORAGE			
Area	Separable Maintenance	Improvement Cost	Net Cost
Tile Improvement	\$ 352,056	\$ 482,504	\$ 130,448
Storage - 3 AC	\$ -	\$ 216,128	\$ 216,128
Subtotal without Road Crossings	\$ 352,056	\$ 698,632	\$ 346,575
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870.20
Total	\$ 370,251	\$ 736,696	\$ 366,445
Subtotal Landowner Costs			\$ 725,404
Net Costs			\$ 366,445
Viewers Cost			\$ 3,000.00
Total Project Costs for Landowners			\$ 728,404

The preliminary costs estimates for Options 1 and 2 are considered practicable and feasible for an improvement of this size. Option 3 may not be cost effective without outside funding give the cost of the storage pond compared to the watershed size.

SUMMARY OF FINDINGS, CONCLUSIONS + RECOMMENDATIONS

After review, the existing Branch A40, A43, A45, A46, and A47 were determined to have lower capacities than the recommended 0.50 in/day to meet today's standard of farming. The system is approximately 110-years old, which is the life expectancy of tile systems like that of Branch A40 and its branches. This improvement would be a public benefit and contribute to the public welfare of this area.

Branch A40 and its branches tiles will be increased in size to increase drainage capacity to reduce flooding extends and duration of standing water within the watershed. The improvement modeled the hydrology and hydraulics of the watershed and compared it to the existing condition of the system. Three options are considered during the preliminary phase of the improvement. The option include: 1. No storage 2. 1-acre storage pond, and 3. 3-acre storage pond. The 1-acre storage basin is the most cost effective and feasible option for the improvement and is recommended by the Engineer.

In accordance with Section 103E.245, Subd. 1: Whereas the engineer has examined the petition and order and conducted a preliminary survey and, whereas the engineer has found the proposed drainage project to be necessary due to problems found and clarified during the survey, and whereas the engineer has determined the proposed drainage project is necessary and feasible with reference to the environmental, land use, and multipurpose water management criteria in section 103E.015, subdivision 1 and, whereas the engineer determined that the proposed drainage project *does not* substantially affect Public Waters, and whereas the engineer has examined the nature and capacity of the outlet and any extension of the outlet, therefore the engineer recommends the proposed project (or alternative) to the Drainage Authority for preliminary approval.

Since the engineer finds the proposed drainage project in the petition is feasible and complies with the environmental, land use, and multipurpose water management criteria in section 103E.015, Subdivision 1, the engineer has in accordance with Section 103E.245, Subd. 4 included a set of preliminary plans of the drainage project in Appendix A.

PRELIMINARY PLANS

The Preliminary Plans are provided in Appendix A in keeping with Section 103E.245, Subd. 4. They are preliminary plans and are therefore unsigned as signed construction plans are not required at this phase of the project..

Appendix A: Preliminary Plans

MARTIN-FARIBAULT COUNTY

JUDICIAL DITCH No. 414 BRANCH A40 IMPROVEMENT



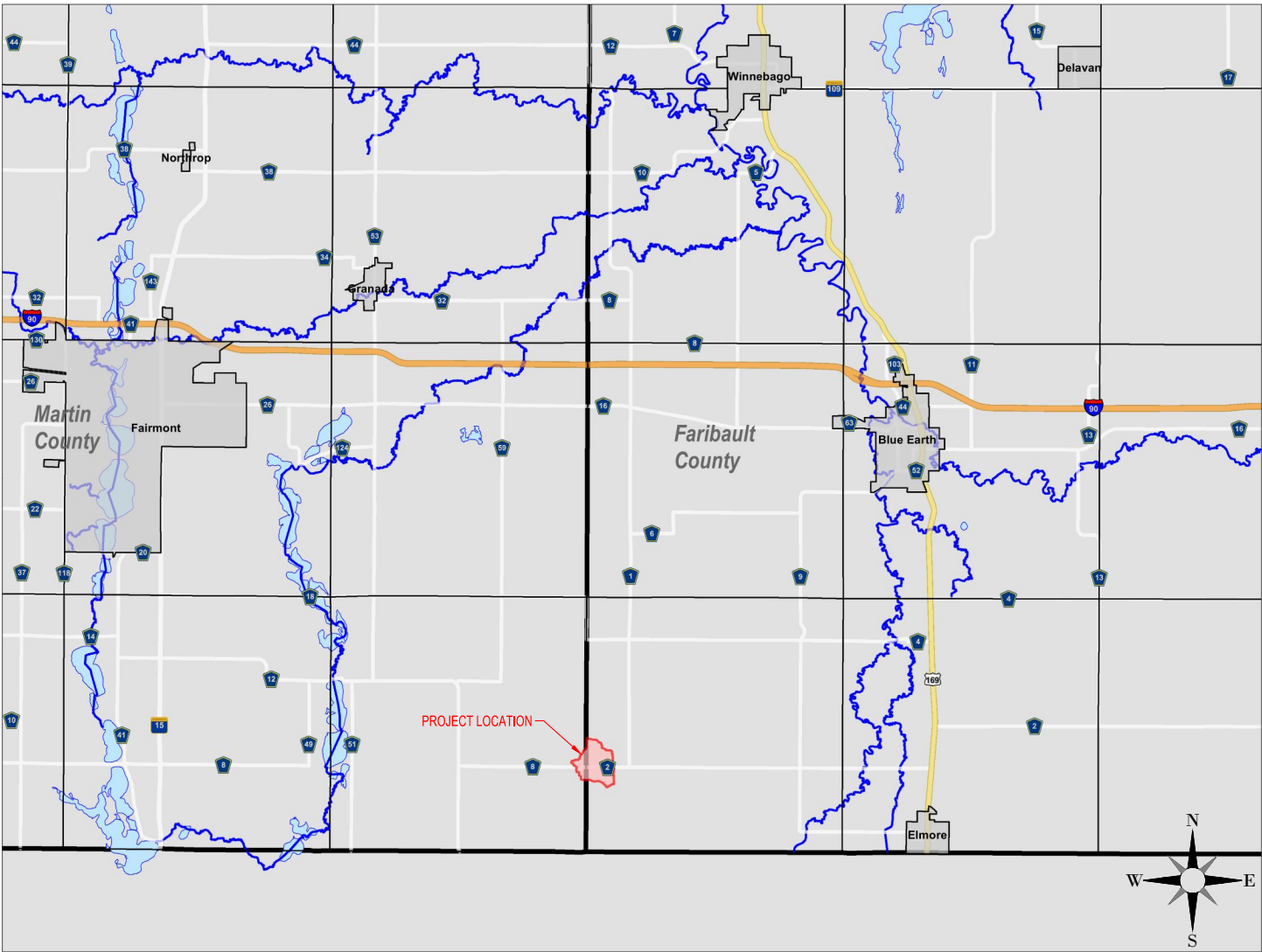
MARTIN-FARIBAULT COUNTY, MINNESOTA PRELIMINARY ENGINEERING REPORT

ISG PROJECT # 19-23608

LEGEND

- EXISTING**
- WATERSHED BOUNDARY
 - CITY LIMITS
 - SECTION LINE
 - QUARTER SECTION LINE
 - RIGHT OF WAY LINE
 - PROPERTY / LOT LINE
 - EASEMENT LINE
 - ACCESS CONTROL
 - WATER EDGE
 - WET
 - WETLAND BOUNDARY
 - FENCE LINE
 - EXISTING OPEN DITCH
 - CULVERT
 - DITCH TILE
 - PRIVATE TILE
 - 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
 - DROP INTAKE
 - HYDRANT
 - POWER POLE

- PROPOSED**
- EASEMENT
 - PROPOSED OPEN DITCH
 - OPEN DITCH REPAIR
 - CULVERT (RCP)
 - CULVERT (CMP)
 - TILE
 - TILE (PIPE WIDTH)
 - WATER
 - GAS
 - OVERHEAD ELECTRIC
 - UNDERGROUND ELECTRIC
 - UNDERGROUND TV
 - CONTOUR (MAJOR)
 - CONTOUR (MINOR)
 - DROP INTAKE
 - SLOUGH REPAIR
 - SPOIL PLACEMENT
 - TREE CLEARING
 - REMOVE TREE
 - BUFFER



LOCATION MAP

SHEET INDEX

- 1 TITLE
- 2 NOTES AND QUANTITIES
- 3 DETAILS
- 4 DETAILS
- 5 DETAILS
- 6 DETAILS
- 7 EXISTING OVERALL
- 8 PROPOSED OVERALL
- 9 BRANCH A40 PLAN & PROFILE
- 10 BRANCH A40 PLAN & PROFILE
- 11 BRANCH A40 PLAN & PROFILE
- 12 BRANCH A43 PLAN & PROFILE
- 13 BRANCH A45 PLAN & PROFILE
- 14 BRANCH A46 PLAN & PROFILE
- 15 BRANCH A47 PLAN & PROFILE

GIS DISCLAIMER:

INFORMATION FOR THE BOUNDARY / LOT LINES, AND UNDERGROUND UTILITIES SHOWN WAS DERIVED FROM DIGITAL DATABASES AND IS FOR INFORMATIONAL PURPOSES ONLY. DATA MAY NOT HAVE BEEN PREPARED FOR, OR BE SUITABLE FOR, LEGAL, ENGINEERING, OR SURVEYING PURPOSES.

PROJECT GENERAL NOTES

1. 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.
2. 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.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
4. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. 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.
6. 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.
7. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
8. 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.
9. 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).

NOTE:
THE CLARITY OF THESE PLANS DEPEND
UPON COLOR COPIES. IF THIS TEXT DOES
NOT APPEAR IN COLOR, THIS IS NOT AN
ORIGINAL PLAN SET AND MAY RESULT IN
MISINTERPRETATION.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR
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SUPERVISION AND THAT I AM A DULY LICENSED
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE
STATE OF MINNESOTA.

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DATE: _____ LIC. NO. _____

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PROJECT

**MARTIN-FARIBAULT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 TITLE
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	10/1/19
CLIENT PROJECT NO.	-

TITLE

TITLE

SHEET

1

OF 14

PROJECT INDEX:

**OWNER: MARTIN-FARIBAULT JOINT
DRAINAGE AUTHORITY**

OWNER NAME: MIKE FORSTNER

**OWNER ADDRESS: 201 LAKE AVENUE,
SUITE 201, FAIRMONT, MN 56081**

PH: 507-238-3130

**PROJECT
ADDRESS / LOCATION:**

**SEC: 25
EAST CHAIN TWP**

**SEC: 19 & 30
PILOT GROVE TWP**

MANAGING OFFICE:

**MANKATO OFFICE
115 EAST HICKORY STREET
SUITE 300
MANKATO, MN 56001
PHONE: 507.387.6651
FAX: 507.387.3583**

**PROJECT MANAGER: MARK ORIGER
EMAIL: MARK.ORIGER@ISGINC.COM**

SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE MARTIN COUNTY REQUIREMENTS AND MINNEDOT 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 MARTIN 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=1161.22
48.78 FEET WEST OF CR 53
24.04 FEET S/SW OF N END OF CULVERT
1.5 FEET EAST OF WITNESS POST

TOPOGRAPHIC SURVEY

THIS PROJECT'S TOPOGRAPHIC SURVEY CONSISTS
OF DATA COLLECTED IN SEPTEMBER-OCTOBER,
2019 BY ISG.

GENERAL TILE INSTALLATION NOTES:

1. DURING CONSTRUCTION, CONTRACTOR SHALL MAINTAIN A DRAINAGE OUTLET FOR THE ENTIRE JD 414 BRANCH A40 PROJECT AREA.
2. ALL PIPE DIMENSIONS REFERENCED IN THE PLANS REFER TO THE INSIDE DIAMETER.
3. ALL ROAD SIGNAGE, COORDINATION, AND TRAFFIC CONTROL SIGNAGE SHALL BE INCIDENTAL TO ROAD RESTORATIONS.
4. ALL DEWATERING FOR THE PROJECT IS INCIDENTAL.
5. UNLESS OTHERWISE NOTED, CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITY TO WITHIN A 100-FOOT WIDE SWATH ALONG PROPOSED TILE ALIGNMENTS FOR 24" TILE OR LESS, AND A 150-FOOT SWATH ALONG PROPOSED TILE ALIGNMENTS FOR TILES LARGER THAN 24". THE SWATH NEED NOT BE CENTERED ON THE PROPOSED TILE ALIGNMENT. ALL ACCESS ROADS SHOULD FOLLOW THE PROPOSED ALIGNMENTS. THE SWATH SHALL NOT DISTURB ANY NON-AGRICULTURAL PRIVATE PROPERTY. DISTURBANCE THROUGH ROAD CROSSINGS, ROAD DITCHES, AND GRASS BUFFERS SHALL BE LIMITED TO THE WIDTH OF A TRENCH NECESSARY FOR SAFE CONSTRUCTION PRACTICES, AND MUST BE RE-SEEDED WHERE NEEDED.
6. ALL EFFORTS SHALL BE MADE DURING CONSTRUCTION TO SEPARATE SOIL TYPES. BACKFILL SHALL BE COMPACTED PRIOR TO PLACEMENT OF TOPSOIL, EXCEPT THE TOP TWO (2) FEET, FOR WHICH COMPACTION SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. TOPSOIL SHALL BE PLACED TO A MINIMUM DEPTH OF 6", OR UNIFORM TO THE TOPSOIL DEPTH OF THE SURROUNDING AREA. EXCAVATED SPOILS SHALL BE SPREAD EVENLY IN CONSTRUCTION AREA AS TO NOT IMPEDE DRAINAGE. ALL EFFORTS SHALL BE MADE TO KEEP TOPSOIL ON TOP AND SEPARATED. NO TOPSOIL SHALL BE PLACED IN THE TRENCH BELOW 2' FROM EXISTING GROUND UNLESS APPROVED BY THE ENGINEER.
7. ALL SPOIL LEVELING, GRADING, AND RESTORATION OF DISTURBED AREAS SHALL BE IN ACCORDANCE TO THE CONTRACT DOCUMENTS AND SHALL BE INCIDENTAL TO THE WORK.
8. MISCELLANEOUS TREE CLEARING SHALL BE INCIDENTAL TO TILE INSTALLATION.
9. ALL PIPE BEDDING AND ENCASEMENT IS INCIDENTAL TO STANDARD TILE INSTALLATION. REFER TO SPECIFICATIONS FOR DEFINITIONS. FOUNDATION MATERIAL SHALL BE USED IF UNSUITABLE OR UNSTABLE SOILS ARE PRESENT. THE USE OF FOUNDATION MATERIAL SHALL BE APPROVED BY THE ENGINEER BEFORE PLACEMENT.
10. UNLESS OTHERWISE NOTED, ALL HDPE BENDS AND FITTINGS SHALL BE INCIDENTAL TO THE TILE PAY ITEMS, MUST BE BANDED, WRAPPED IN FABRIC, AND SURROUNDED WITH CRUSHED ROCK.
11. ALL TILE ENDS MUST BE CAPPED TO NOT TAKE SEDIMENT UNLESS ANOTHER TILE (PRIVATE OR PUBLIC) IS CONNECTED INTO THE PROPOSED TILE. CAPPING SHALL BE INCIDENTAL TO TILE INSTALLATION.
12. ALL BENDS LARGER THAN 11.25° MUST BE CONSTRUCTED AS PRE-FABRICATED BENDS. ANY BENDS LARGER THAN 45° MUST BE CONSTRUCTED WITH MULTIPLE BENDS WITH AT LEAST 10 FEET IN BETWEEN EACH BEND.
13. UNLESS SPECIFICALLY NOTED, HDPE AND RCP WILL BE THE ONLY ACCEPTABLE MATERIALS FOR ALL PROPOSED BURIED TILE. REFER TO SPECIFICATIONS FOR PROPER INSTALLATION REQUIREMENTS.
14. VERIFY EXISTING TILE LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION, PAID FOR AS TILE INVESTIGATION. ANY ALIGNMENT CHANGES MADE DUE TO TILE INVESTIGATION SHALL BE APPROVED BY THE ENGINEER DURING CONSTRUCTION. ALL EFFORTS WILL BE MADE TO UTILIZE THE SAME FITTINGS AS DESIGNED AND CONTRACTOR SHALL BE COMPENSATED FOR ADDITIONAL BENDS AND FITTINGS, IF NEEDED.
15. DROP INTAKES WILL BE PAID FOR BY EACH AND NO ADDITIONAL COMPENSATION WILL BE MADE FOR IN-FIELD ELEVATIONS THAT VARY FROM THE PLANS. MINOR SHAPING AROUND DROP INTAKES AND CULVERT INLETS SHALL BE INCIDENTAL TO THEIR RESPECTIVE PAY ITEMS.
16. DROP INTAKES THAT ARE NOT INTENDED TO TAKE SURFACE FLOW MAY BE CAPPED, AS DETERMINED BY THE ENGINEER. INTAKES MAY BE CUT DOWN AND BURIED AFTER FINAL TELEVISION, PER LANDOWNER REQUEST, AND WILL BE PAID FOR AS "CAP DROP INTAKE".
17. DROP INTAKES THAT ARE DESIGNED TO BE ON PROPERTY LINES SHALL BE ADJUSTED IN THE FIELD TO MATCH ACTUAL LOCATION OF PROPERTY LINE.
18. AT CROSSINGS OF EXISTING TILE, ONLY THE UPSTREAM SIDE NEED BE CONNECTED, UNLESS OTHERWISE DEEMED NECESSARY. EACH CROSSING WILL BE PAID FOR AS ONE CONNECTION. ALL BENDS, TEES, CONNECTING TILE, AND OTHER FITTINGS NECESSARY FOR CONNECTION SHALL BE INCIDENTAL TO CONNECTION BID ITEM.
19. ALL TILE CONNECTIONS MUST BE CONNECTED ON THE SIDE OF THE RECEIVING PIPE. TILE CONNECTIONS CANNOT BE MADE COMPLETELY VERTICAL TO PIPE.
20. EXISTING BRANCH CONNECTIONS SHALL BE CONSTRUCTED ONE SIZE LARGER THAN THE EXISTING SIZE, UNLESS OTHERWISE SPECIFIED, WITH DUAL WALL HDPE AND APPROPRIATE FITTINGS. (SINGLE WALL PE TILE WILL NOT BE ALLOWED)
21. ALL PRIVATE TILE CONNECTIONS SHALL BE CONSTRUCTED WITH INSERTA-TEE CONNECTIONS OR APPROVED EQUAL, WHERE POSSIBLE. CONNECTING TILE SHALL MATCH EXISTING SIZE AND SLOPE. (PE TILE WILL BE ALLOWED FOR PRIVATE TILE CONNECTIONS ONLY)

TOTAL ESTIMATED QUANTITIES			
Item Code	Item	Unit	Estimated Quantity
2021.501	MOBILIZATION	LS	1
2021.601	TILE INVESTIGATION	HR	23
2106.501	COMMON EXCAVATION (P) (EV)	CY	65340
2451.509	GRANULAR PIPE FOUNDATION	CY	781
2501.511	24-INCH CLASS III RCP PIPE	LF	108
2501.511	15-INCH CLASS III RCP PIPE	LF	72
2501.515	24-INCH RCP APRON	EA	6
2502.541	INSTALL 12-INCH PERFORATED TILE (WATER QUALITY INLET)	LF	158
2503.603	24-INCH AGRICULTURAL TILE	LF	4245
2503.603	18-INCH AGRICULTURAL TILE	LF	700
2503.603	15-INCH AGRICULTURAL TILE	LF	1758
2503.603	12-INCH AGRICULTURAL TILE	LF	1220
2503.603	10-INCH AGRICULTURAL TILE	LF	200
2503.603	8-INCH AGRICULTURAL TILE	LF	2399
2506.502	FURNISH & INSTALL WATER QUALITY INLET	EA	4
2506.502	INSTALL DROP INTAKE (18-INCH)	EA	15
2506.502	CAP DROP INTAKE (18-INCH)	EA	6
2506.516	INSTALL STRUCTURE S-1 WITH GALVINIZED GRATE	LS	3
2506.602	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	45
2506.602	CONNECT EXISTING 18-INCH TILE	EA	1
2506.602	CONNECT EXISTING 15-INCH TILE	EA	1
2506.602	CONNECT EXISTING 10-INCH TILE	EA	2
2506.602	CONNECT EXISTING 8-INCH TILE	EA	9
2506.602	CONNECT EXISTING 6-INCH TILE	EA	1
2506.602	15-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1
2506.602	12-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	2
2506.602	8-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1
2506.603	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1
2511.501	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	150
2575.501	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	1.19
2575.501	STANDARD SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	1.29
2575.541	BUFFER STRIP MOWING	AC	2.37
2575.545	WEED SPRAYING	AC	3.66



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

PRELIMINARY NOT FOR CONSTRUCTION

DATE: _____ LIC. NO. _____

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PROJECT

MARTIN-FARIBAULT COUNTY

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

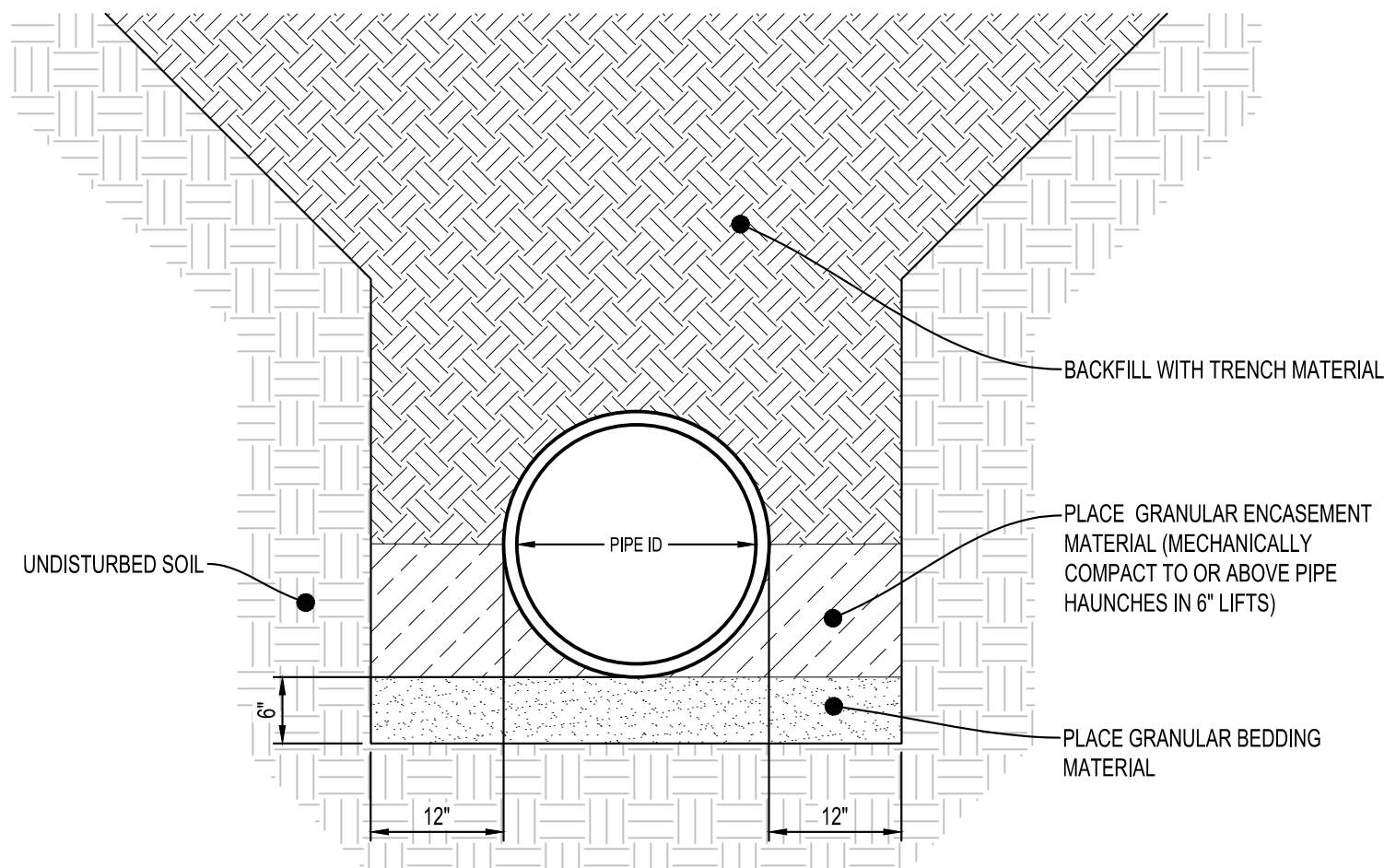
MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 NOTES & DETAILS
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

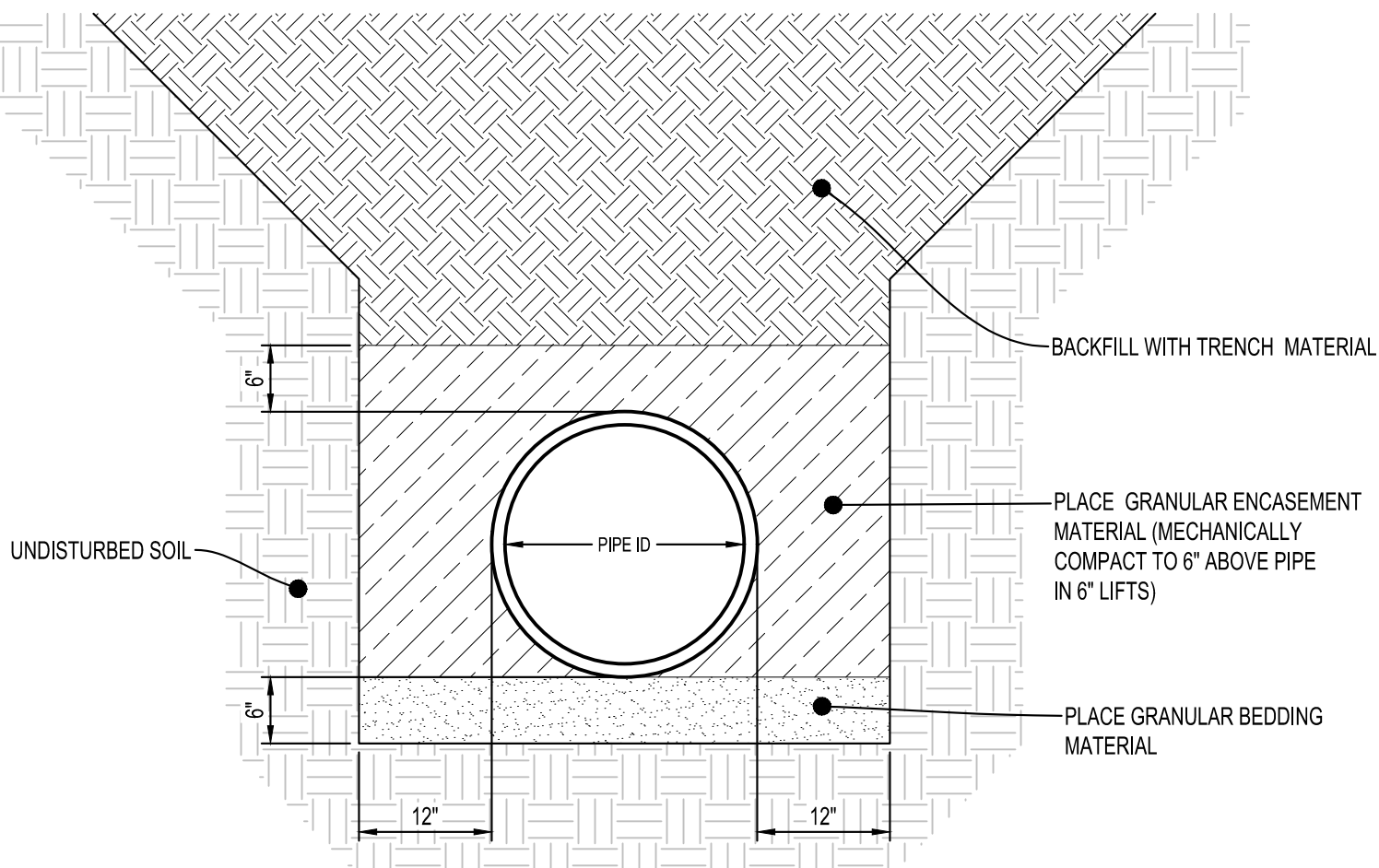
TITLE

**NOTES AND
QUANTITIES**



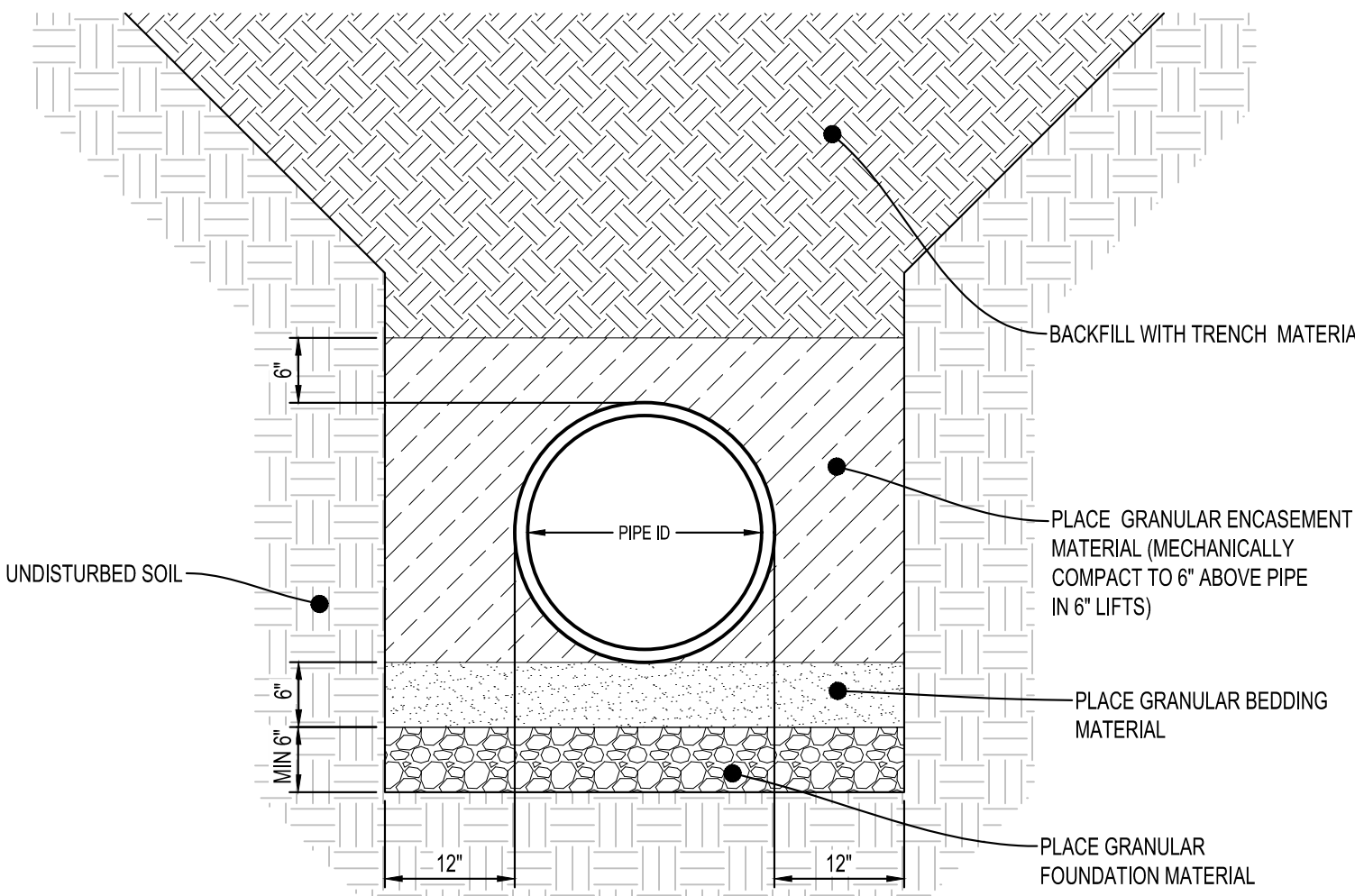
NOTE:
GRANULAR BEDDING, GRANULAR ENCASEMENT, AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.

**RCP FLAT BOTTOM
TRENCH BEDDING**
NTS AG100



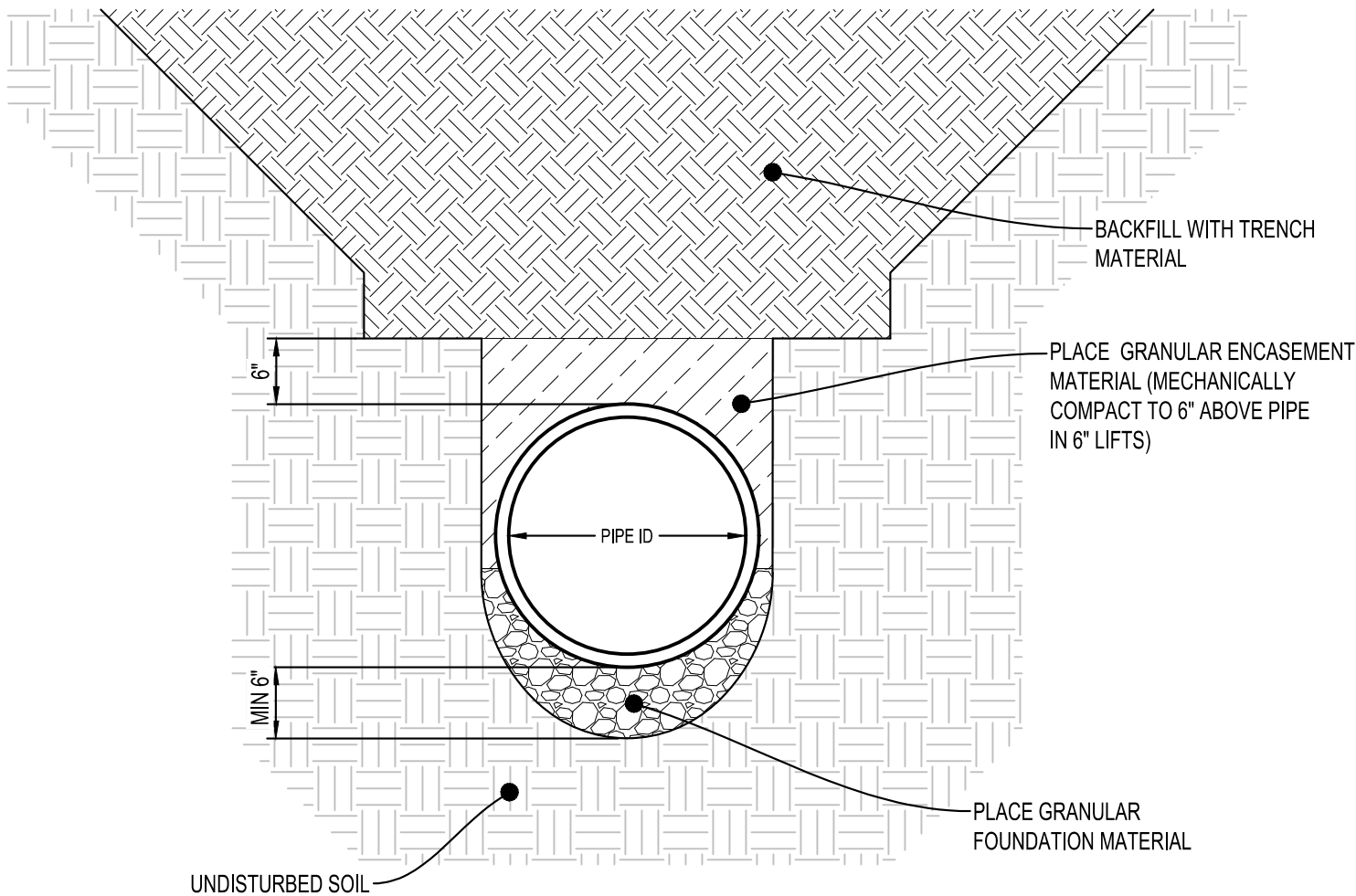
NOTE:
GRANULAR BEDDING, GRANULAR ENCASEMENT, AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.

**HDPE FLAT BOTTOM
TRENCH BEDDING**
NTS AG105



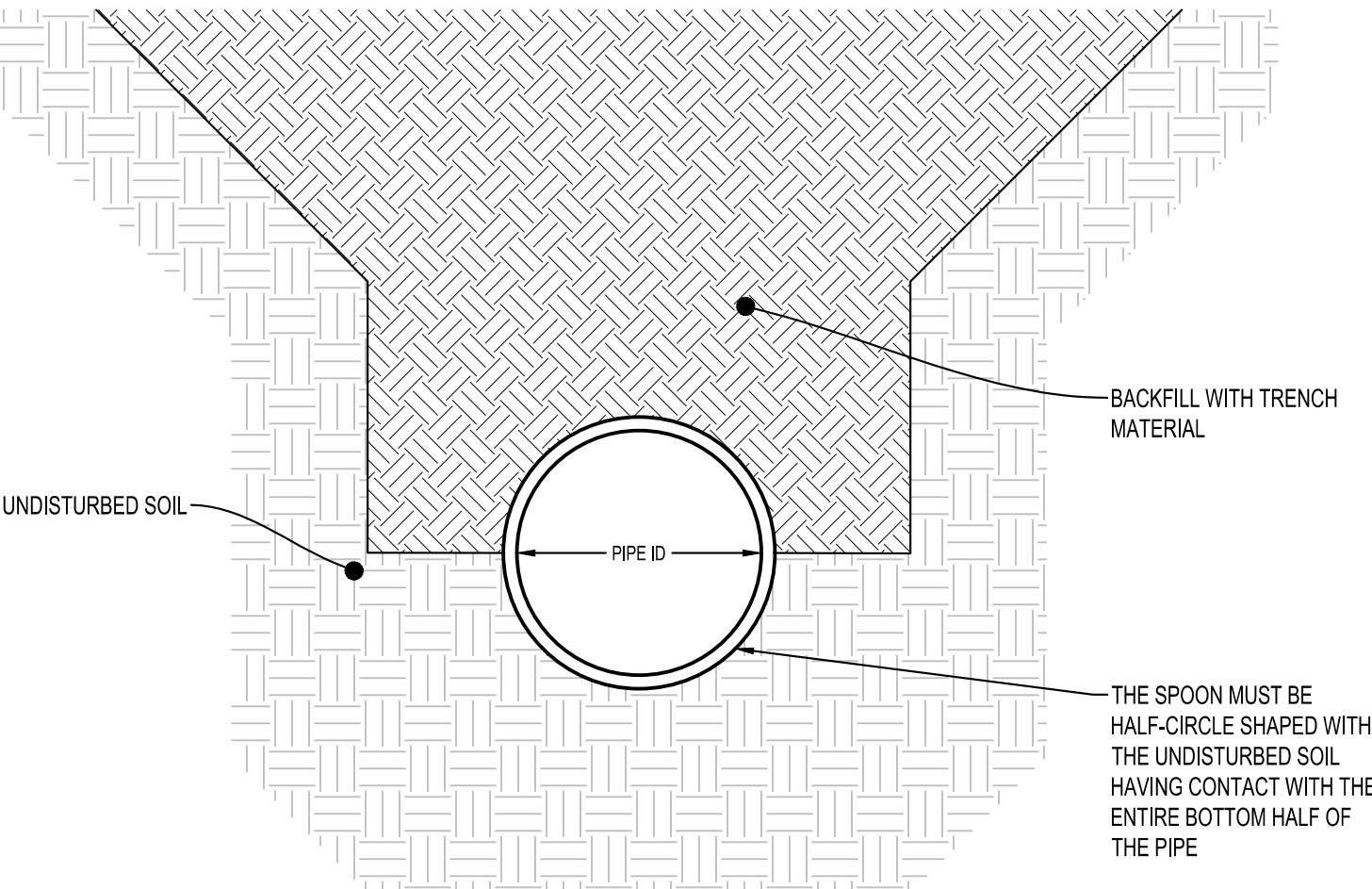
NOTES:
GRANULAR BEDDING, GRANULAR ENCASEMENT, AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
GRANULAR FOUNDATION BELOW THE PIPE PAID FOR BY CUBIC YARD ONLY WHERE NEEDED AND APPROVED BY ENGINEER.

**HDPE FLAT BOTTOM TRENCH
WITH GRANULAR FOUNDATION**
NTS AG110



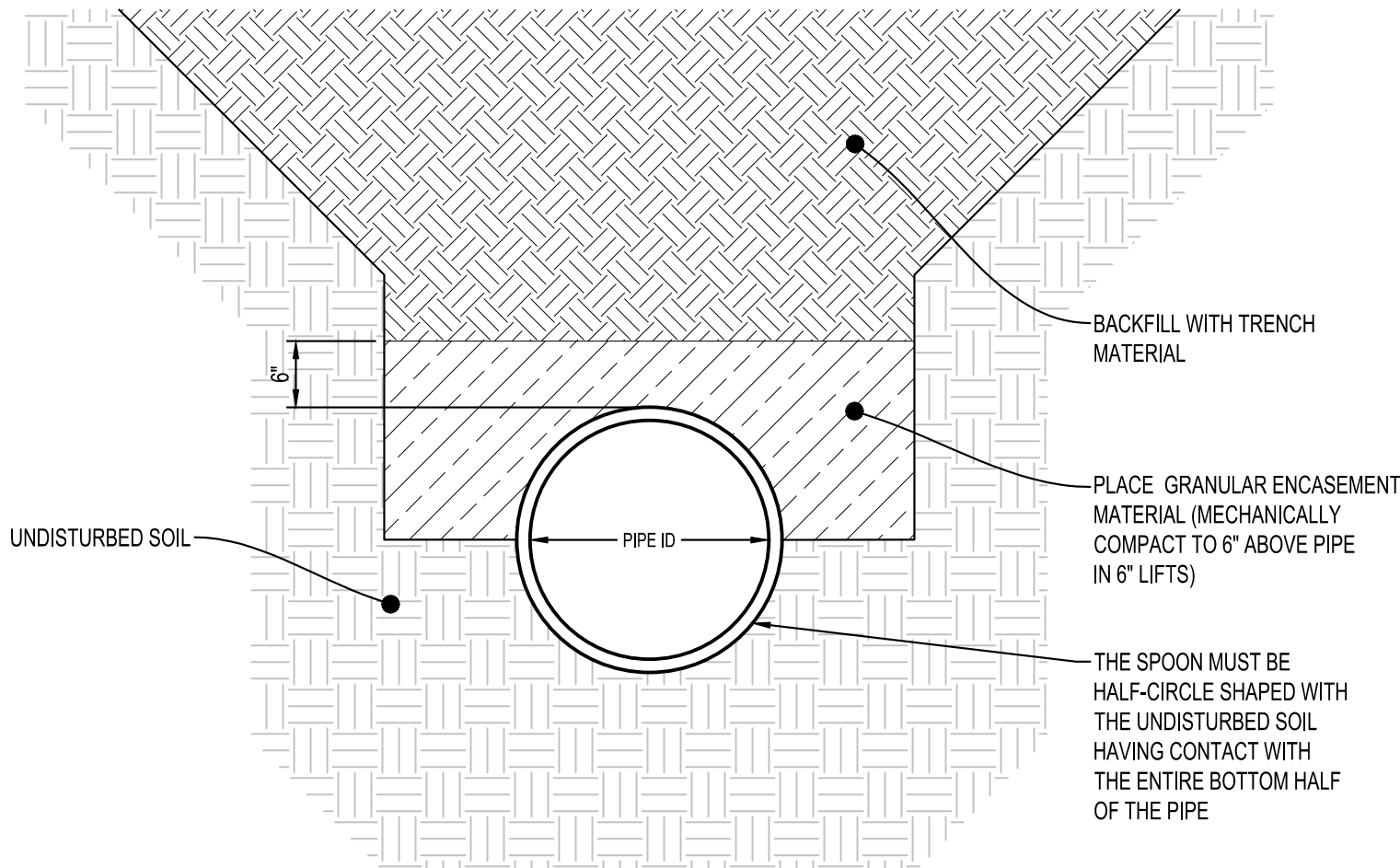
NOTES:
BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
GRANULAR FOUNDATION BELOW THE PIPE PAID FOR BY CUBIC YARD ONLY WHERE NEEDED AND APPROVED BY ENGINEER.

**SPOON TRENCH
WITH GRANULAR FOUNDATION**
NTS AG115



NOTES:
BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
SPOON DIMENSIONS SHALL COMPLY WITH PIPE MANUFACTURER SPECIFICATIONS.

**RCP SPOON
TRENCH BEDDING**
NTS AG120



NOTES:
GRANULAR ENCASEMENT AND BACKFILL SHALL BE INCIDENTAL TO CONSTRUCTION.
SPOON DIMENSIONS SHALL COMPLY WITH PIPE MANUFACTURER SPECIFICATIONS.

**HDPE SPOON
TRENCH BEDDING**
NTS AG125



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PROJECT
MARTIN-FARIBAUT COUNTY
JUDICIAL DITCH No. 414 BRANCH A40 IMPROVEMENT
MARTIN-FARIBAUT COUNTY MINNESOTA

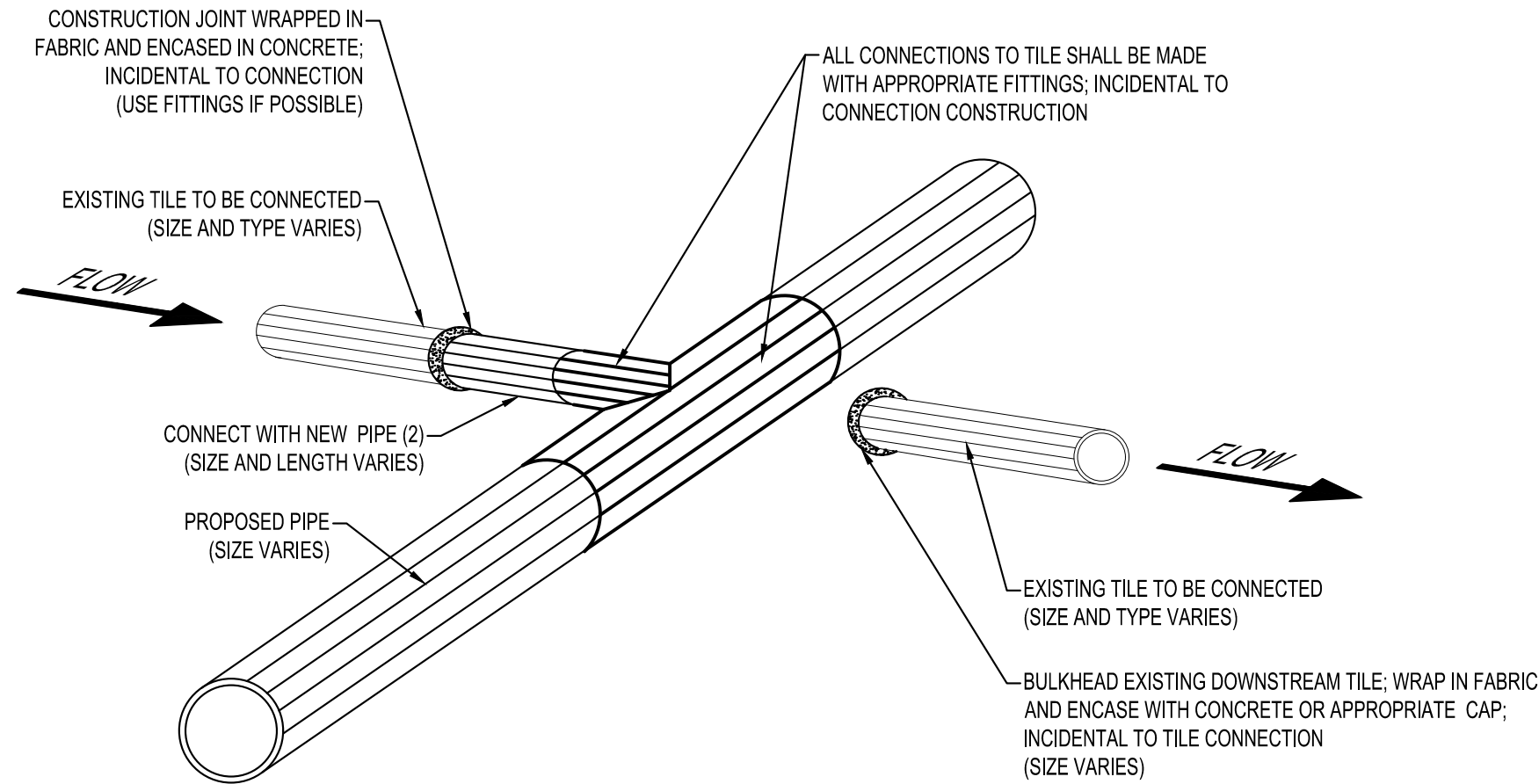
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 NOTES & DETAILS
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

TITLE

DETAILS

SHEET

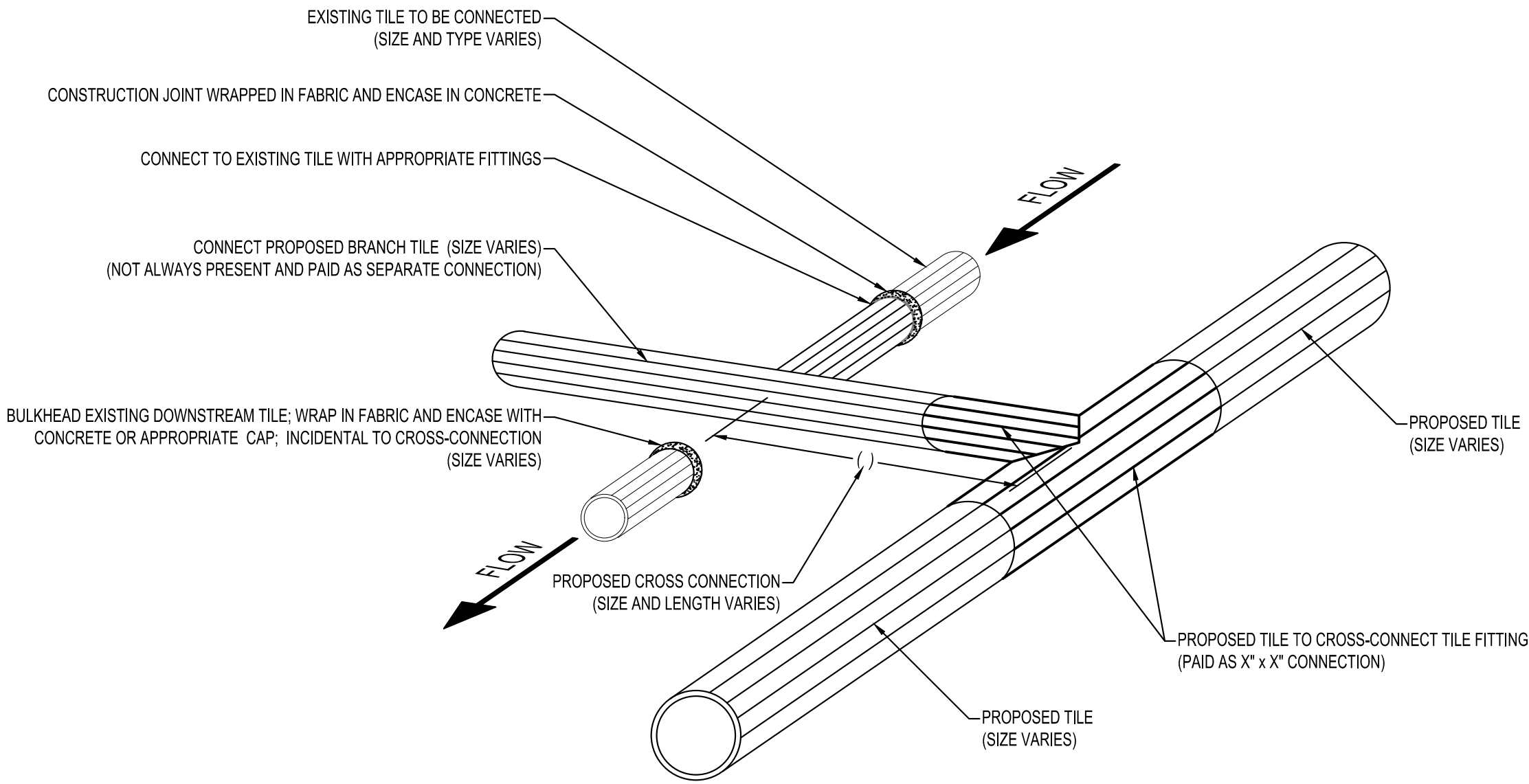


NOTES:

ALL TILE CONNECTIONS SHALL BE CONSTRUCTED WITH APPROPRIATE FITTINGS (INCIDENTAL TO CONNECTION).
ALL TILE CONNECTIONS SHALL NOT BE INSTALLED COMPLETELY VERTICAL FROM TOP OF PIPE.

CONNECT TO EXISTING TILE

NTS AG200

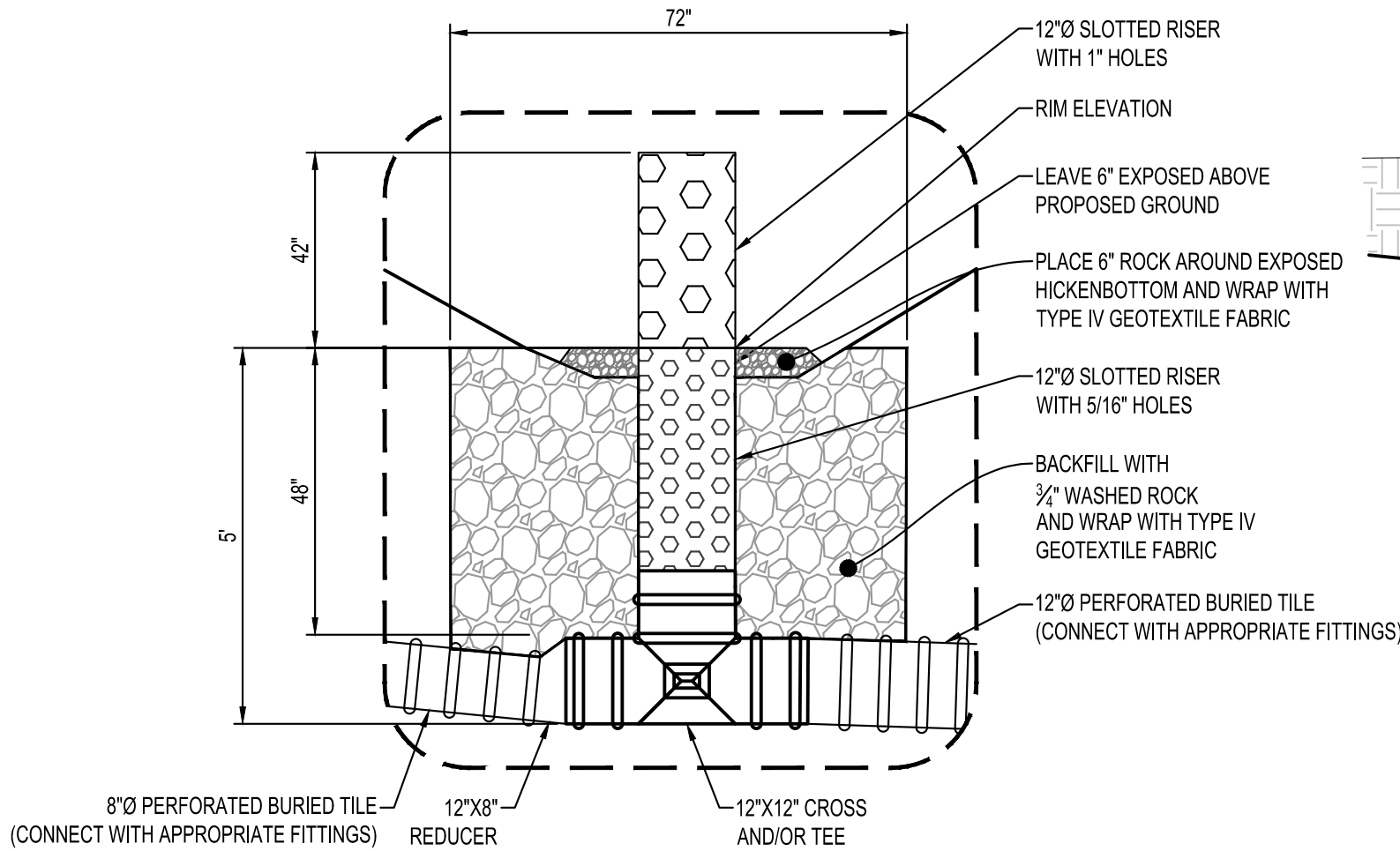


NOTES:

CROSS-CONNECT SHALL BE PAID AS THREE (3) SEPARATE PAY ITEMS:
1. X" x X" CONNECTION.
2. LINEAR FOOTAGE OF NEW TILE.
3. CONNECTION TO EXISTING X" TILE.
CLAY OR CONCRETE TILE SHALL BE CONNECTED BY INSTALLING DUAL WALL OVER OR INSIDE EXISTING TILE AND CONSTRUCTION JOINT INSTALLED WITH FABRIC.
ALL TILE CONNECTIONS SHALL NOT BE INSTALLED COMPLETELY VERTICAL FROM TOP OF PIPE.

CROSS-CONNECT TO EXISTING TILE

NTS AG210



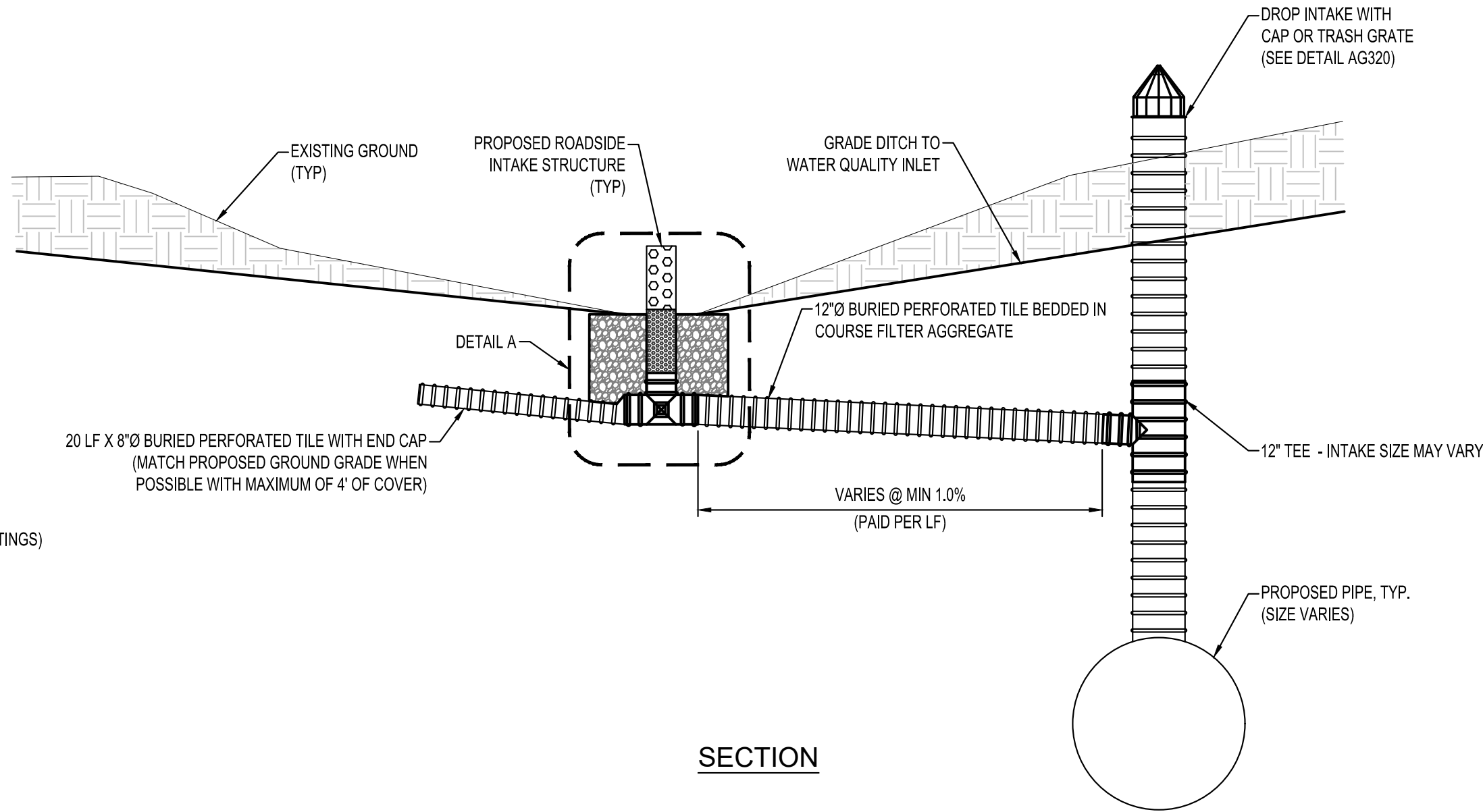
DETAIL A

NOTES:

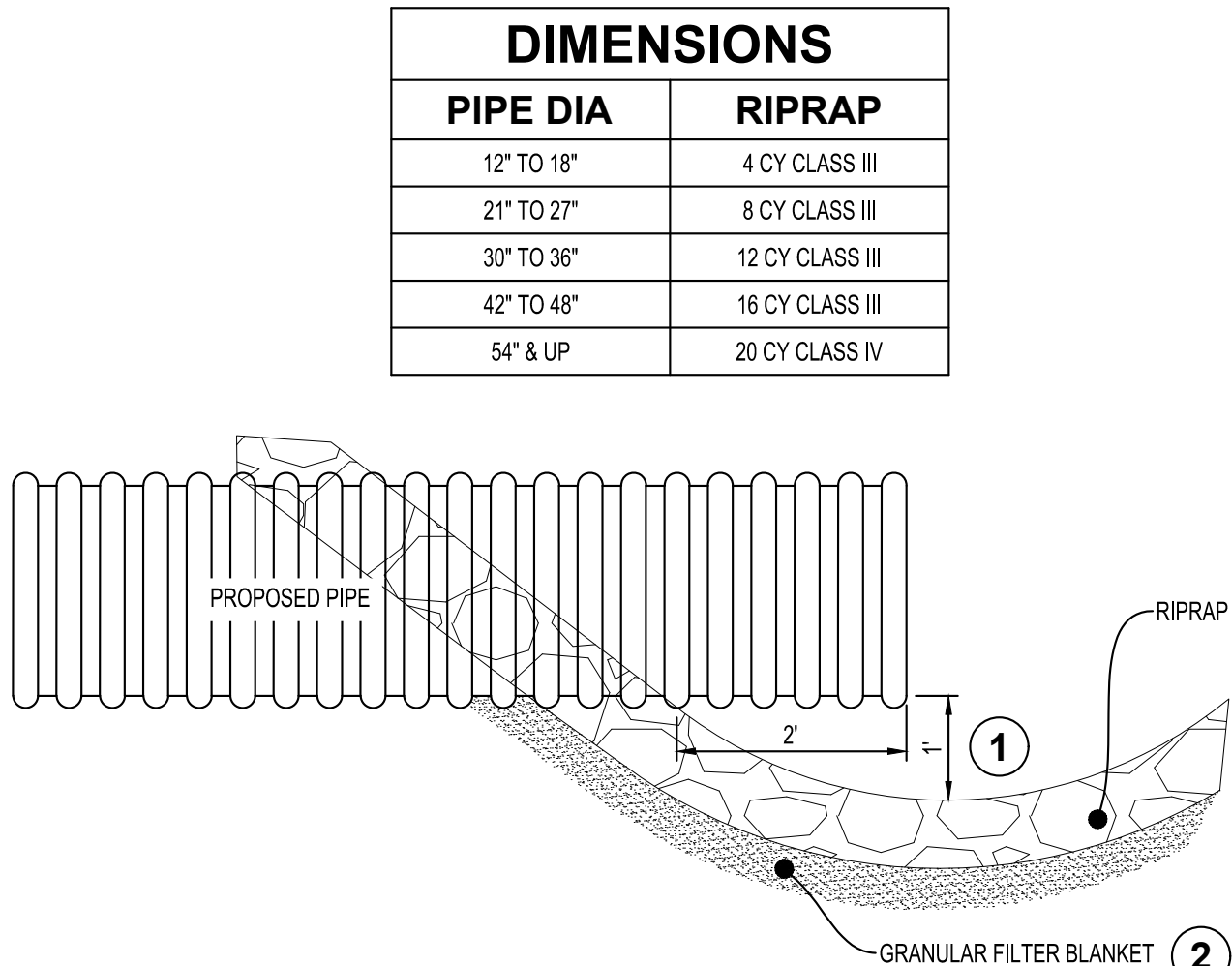
FULLY ENCASE WATER QUALITY LATERALS WITH MnDOT COURSE FILTER AGGREGATE.
WATER QUALITY INLETS ARE TO BE PAID AS EACH. CONNECTION TO THE DROP INTAKE OR PROPOSED TILE SHALL BE PAID FOR BY LINEAR FOOT OF HORIZONTAL DISTANCE.

OFFSET WATER QUALITY INLET

NTS AG310



SECTION



DIMENSIONS	
PIPE DIA	RIPRAP
12" TO 18"	4 CY CLASS III
21" TO 27"	8 CY CLASS III
30" TO 36"	12 CY CLASS III
42" TO 48"	16 CY CLASS III
54" & UP	20 CY CLASS IV

NOTES:

- 1' MIN. ABOVE RIPRAP. FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5' - 2'.
- THE CONTRACTOR, AS AN OPTION, MAY SUBSTITUTE A GEOTEXTILE FABRIC, SPEC. 3601, FOR THE GRANULAR FILTER BLANKET. THE FABRIC SHOULD EXTEND BEYOND THE RIPRAP BY 3' IN ALL DIRECTIONS.
FOR PIPES LESS THAN 18", INSTALL RODENT GUARD (INCIDENTAL TO TILE OUTLET)
RIPRAP AT OUTLET SHALL NOT IMPEDE FLOW FROM PIPE, OR RECEIVING BODY. RIPRAP AT OUTLET SHALL ALSO EXTEND ABOVE AND ALONG SIDES OF PIPE.
ADDITIONAL RIPRAP MAY BE NECESSARY BASED ON ELEVATIONS (PAID FOR BY CY)

RIPRAP AT TILE OUTLET

NTS AG620



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MARTIN-FARIBAULT COUNTY

JUDICIAL DITCH No. 414 BRANCH A40 IMPROVEMENT

MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 NOTES & DETAILS
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	11-1-2019
CLIENT PROJECT NO.	-

TITLE

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**MARTIN-FARIBAUT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

MARTIN-FARIBAUT COUNTY MINNESOTA

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CLIENT PROJECT NO.	-

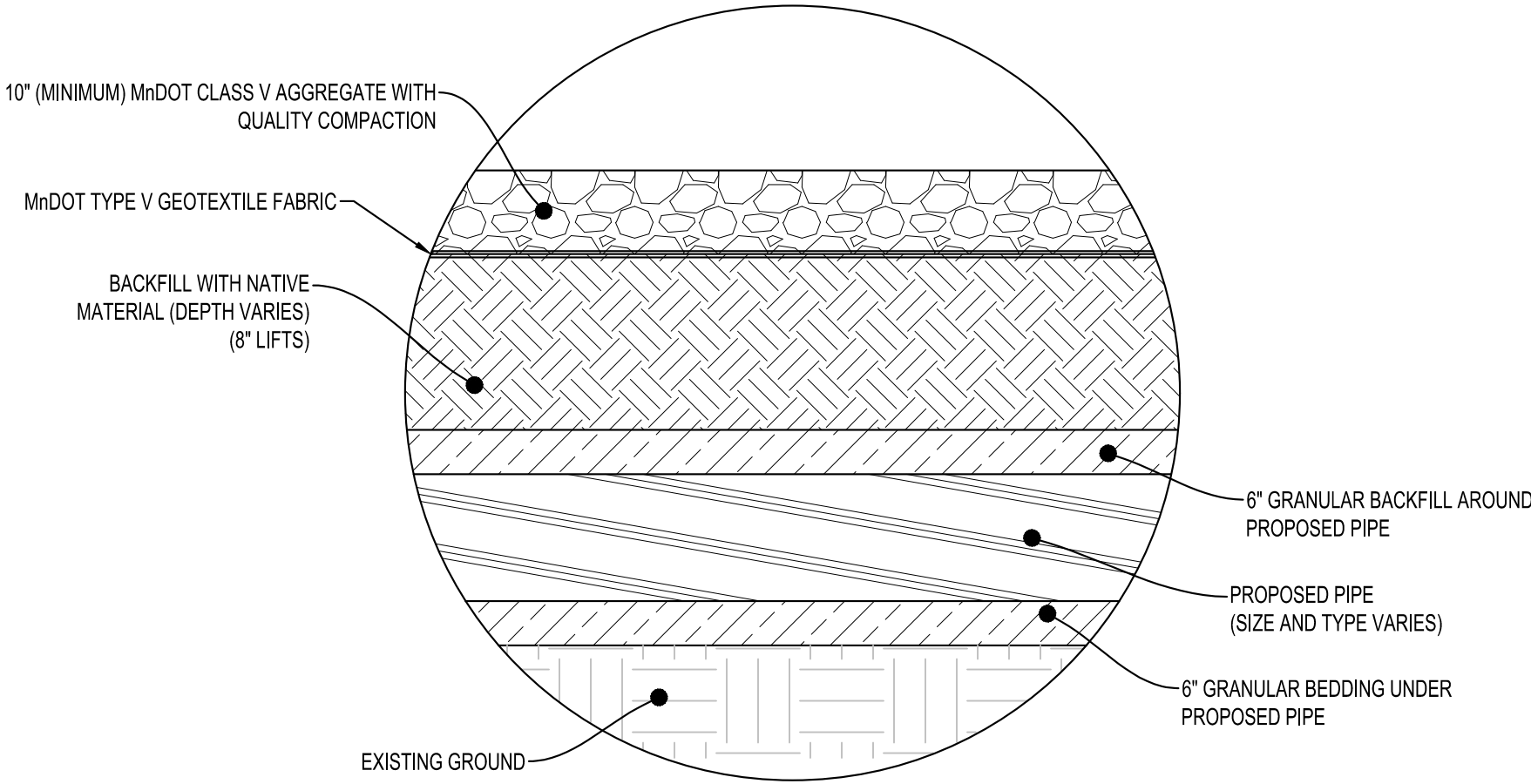
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DETAILS

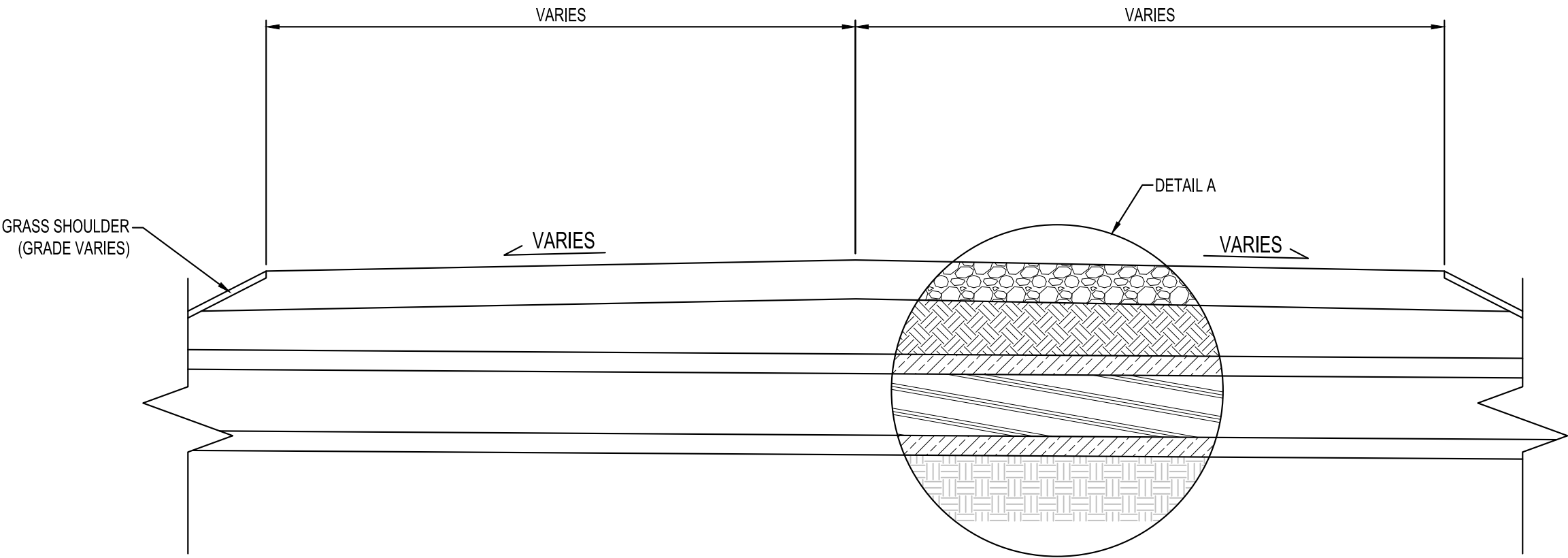
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OF 14



DETAIL A



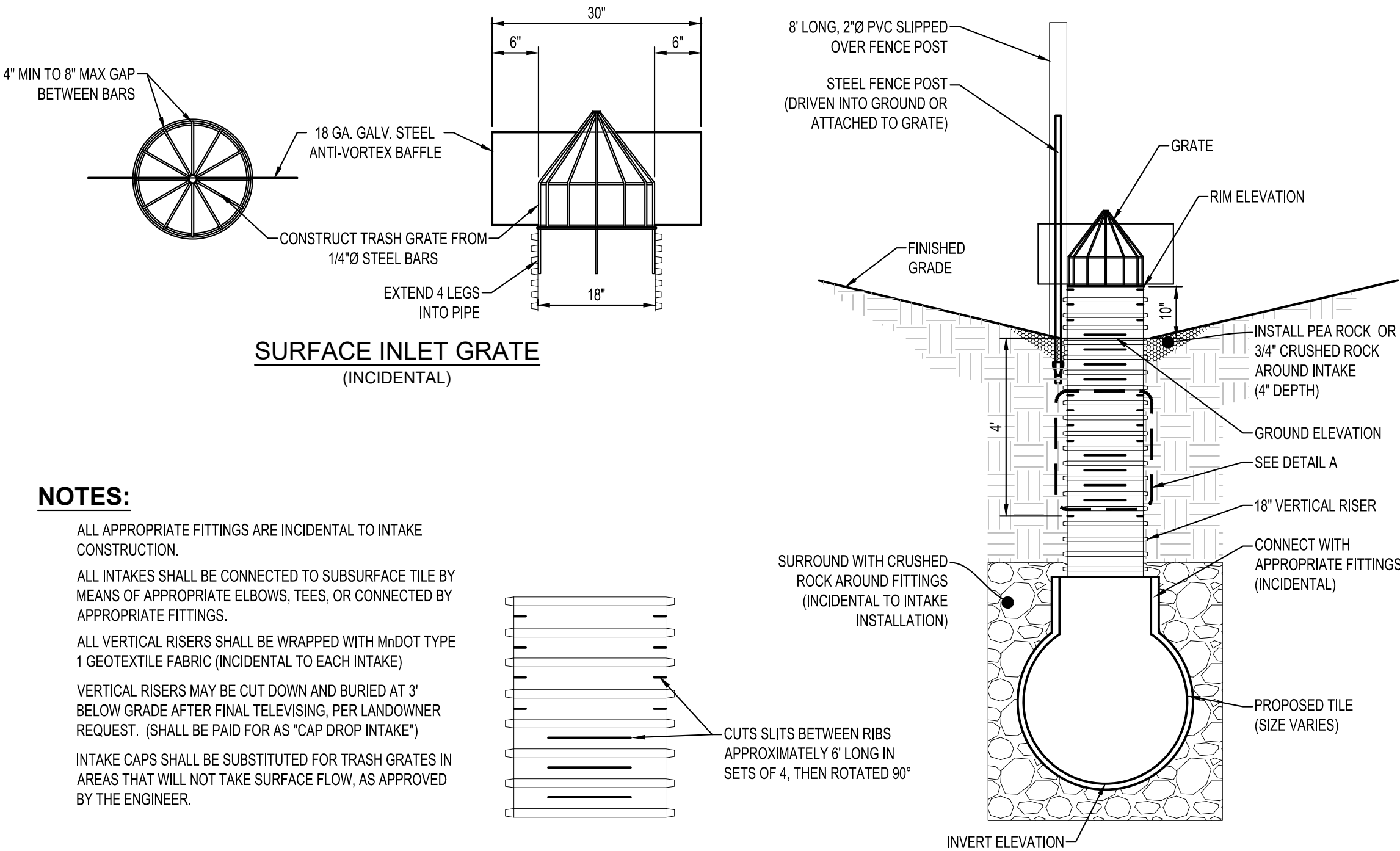
SECTION

NOTES:

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

TYPICAL ROADWAY SECTION

NTS AG700



**SURFACE INLET GRATE
(INCIDENTAL)**

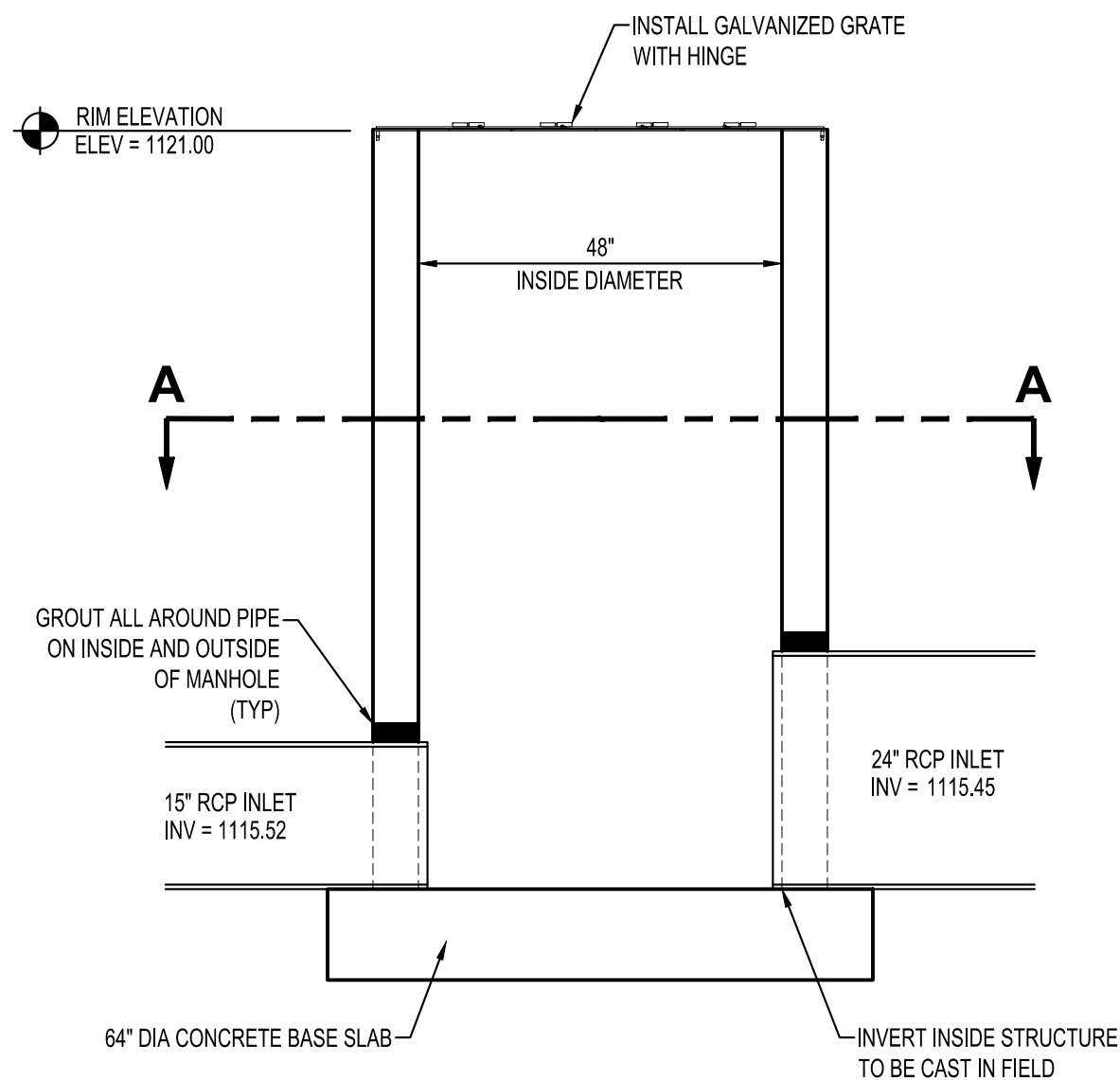
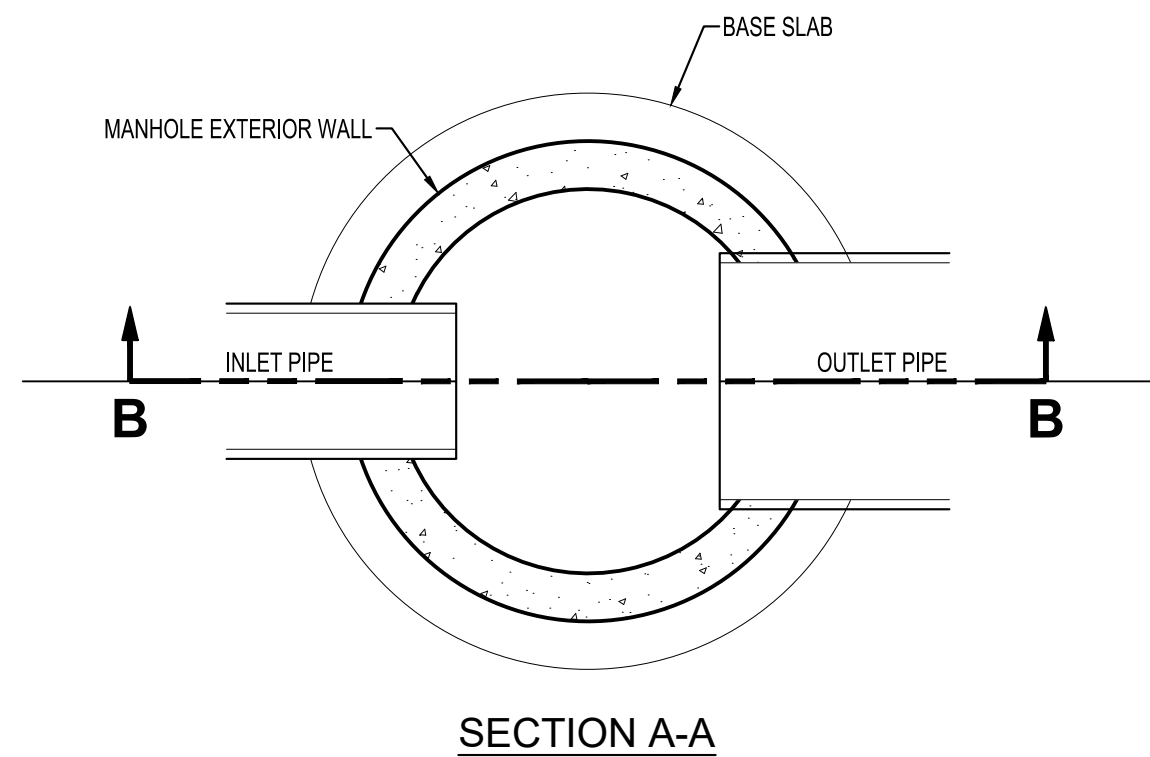
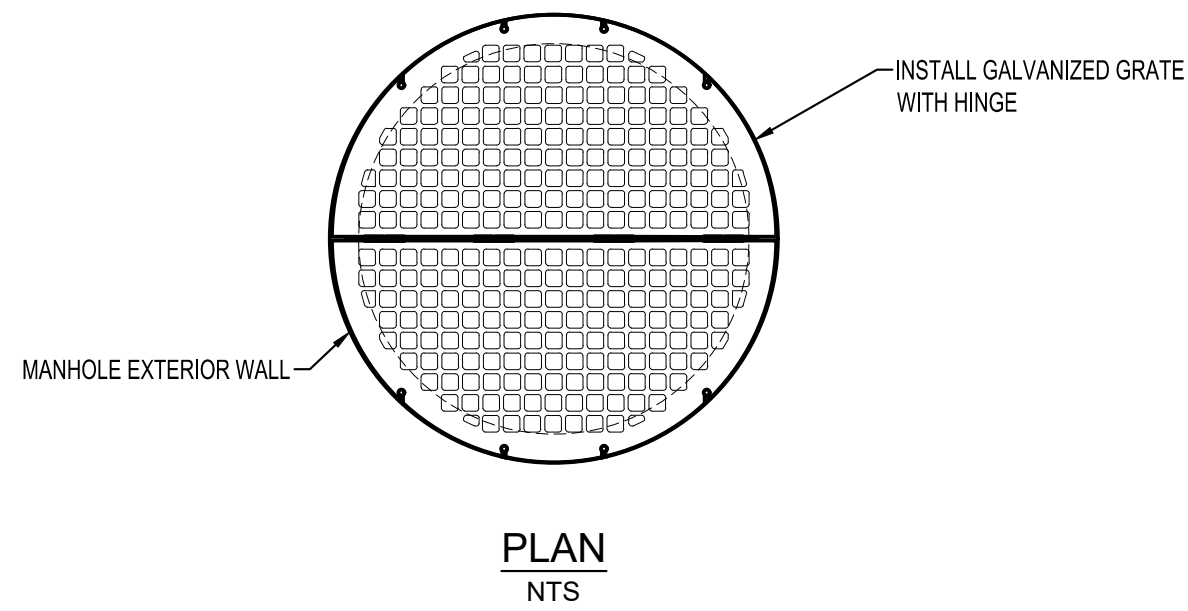
NOTES:

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

DETAIL A

DROP INTAKE

NTS AG320



SECTION B-B

S-1
RCP OUTLET STRUCTURE
NTS AG600



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PROJECT

**MARTIN-FARIBAULT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 NOTES & DETAILS
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	CJB
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

TITLE

DETAILS

SHEET

6

OF 14



Legend

- Open Ditch
- Exsiting Tile
- Parcels
- BranchA40Watershed



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COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

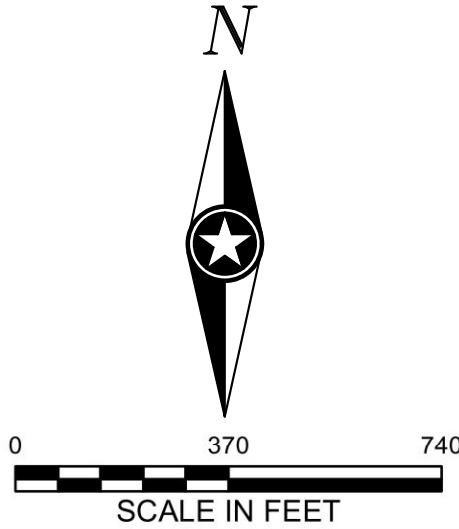
MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 TITLE
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	11-1-11
CLIENT PROJECT NO.	-

TITLE

**EXISTING
OVERALL**



- Open Ditch
- Exsiting Tile
- Proposed Tile
- Storage
- Parcels
- BranchA40Watershed

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JUDICIAL DITCH No. 414 BRANCH A40 IMPROVEMENT

MARTIN-FARIBAULT COUNTY MINNESOTA

[illegible]

PROJECT NO.	19-23608
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FILE NAME	23608 TITLE
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DRAWN BY	DMP
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DESIGNED BY BPG

REVIEWED BY MAO

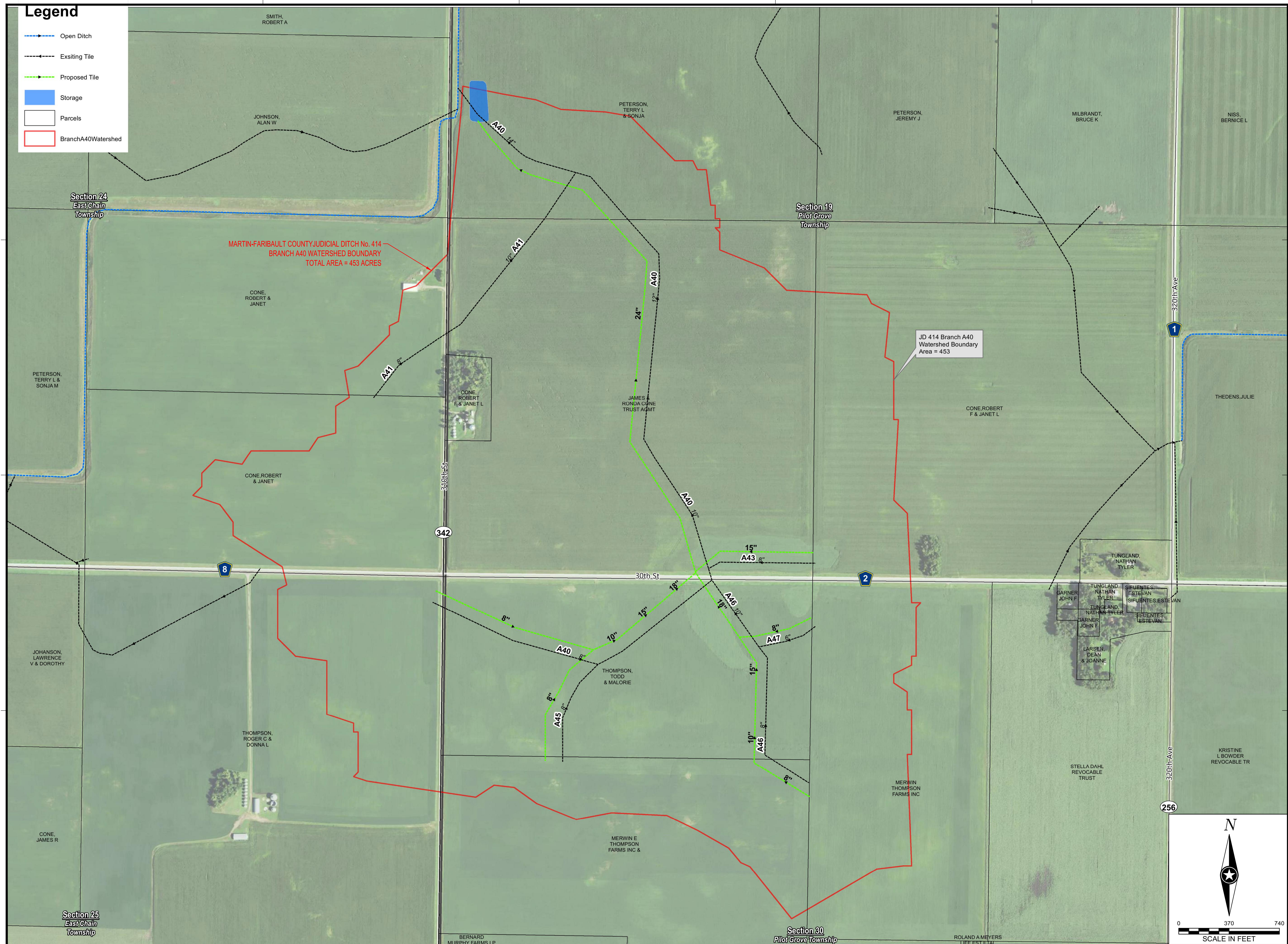
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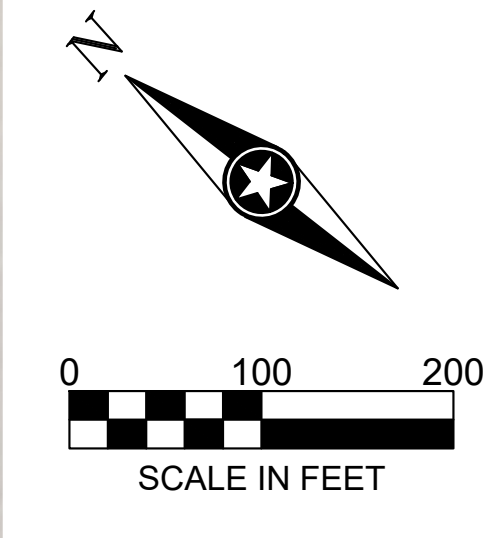
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TITLE

**PROPOSED
OVERALL**

SHEET **8** OF 14





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PROJECT

**MARTIN-FARIBAUT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

MARTIN-FARIBAUT COUNTY MINNESOTA

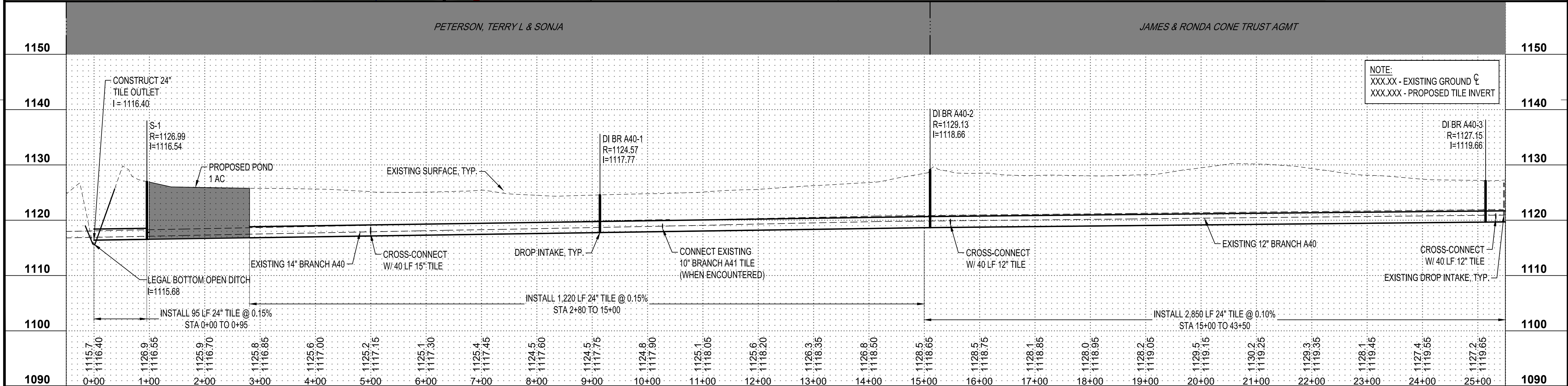
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

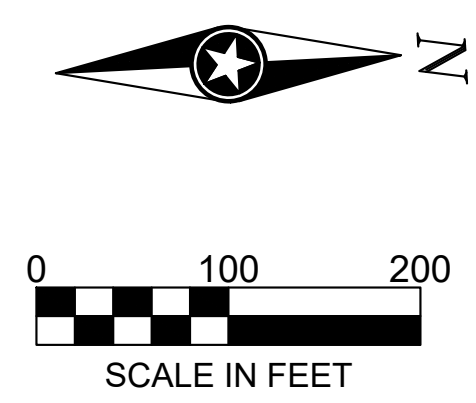
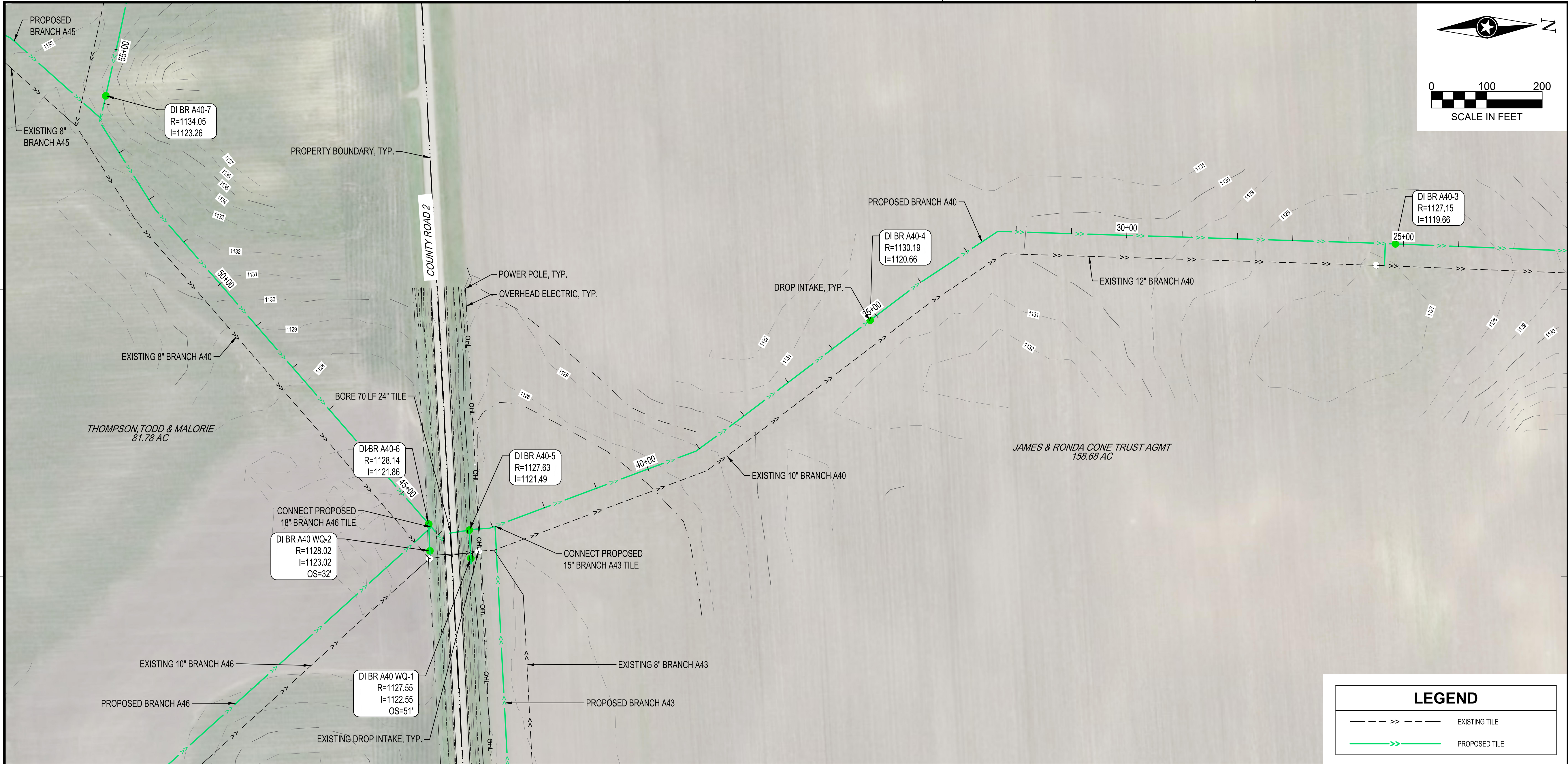
PROJECT NO.	19-23608
FILE NAME	23608 PROF (BRANCH A40)-1
DRAWN BY	DMP
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TITLE

**BRANCH A40
PLAN & PROFILE**

SHEET





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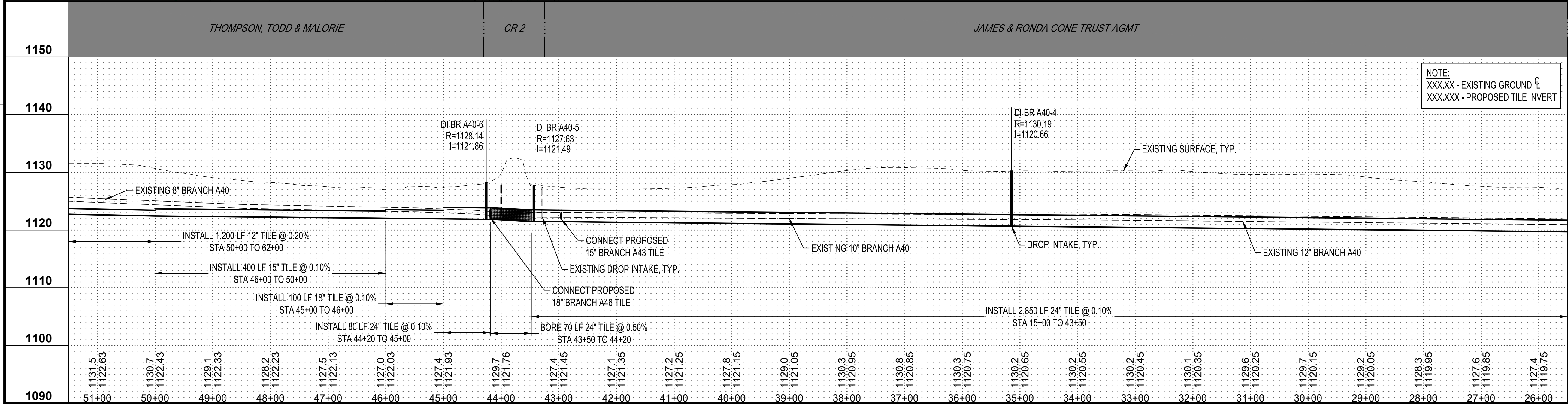
MARTIN-FARIBAUT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
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TITLE
**BRANCH A40
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10
OF 14



NOTE:
XXX.XX - EXISTING GROUND ∇
XXX.XXX - PROPOSED TILE INVERT



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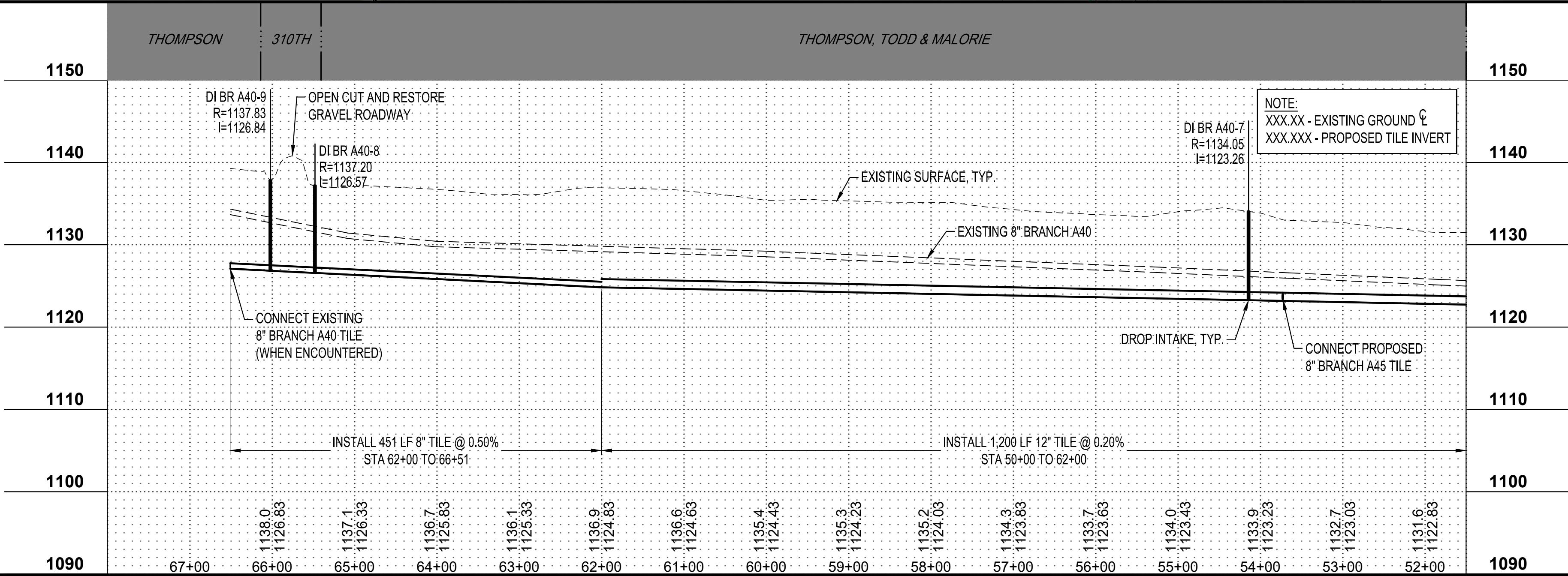
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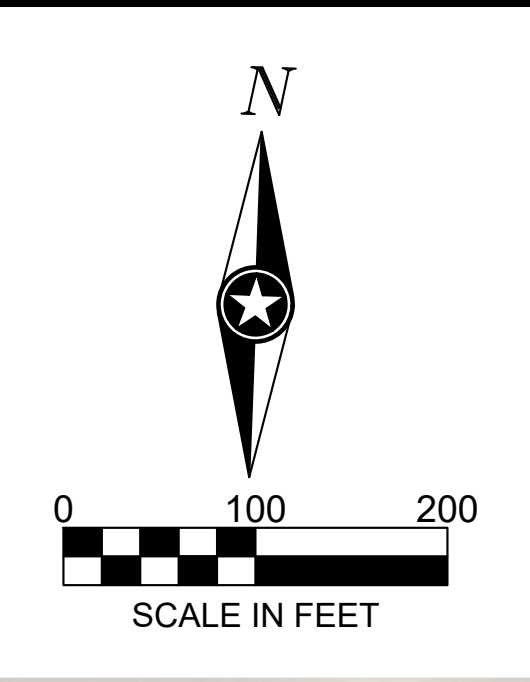
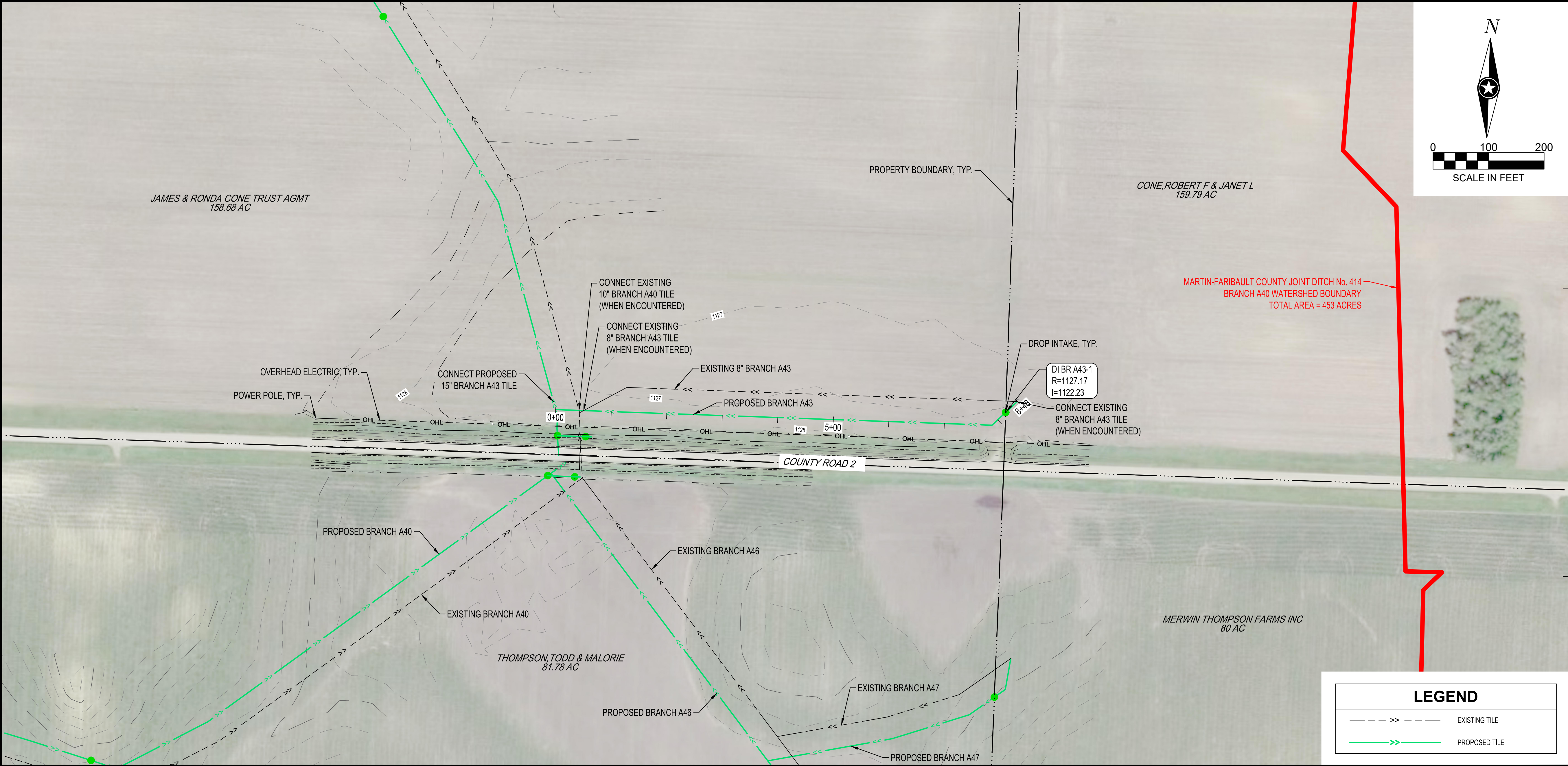
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DATE	DESCRIPTION	BY

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TITLE

**BRANCH A40
PLAN & PROFILE**





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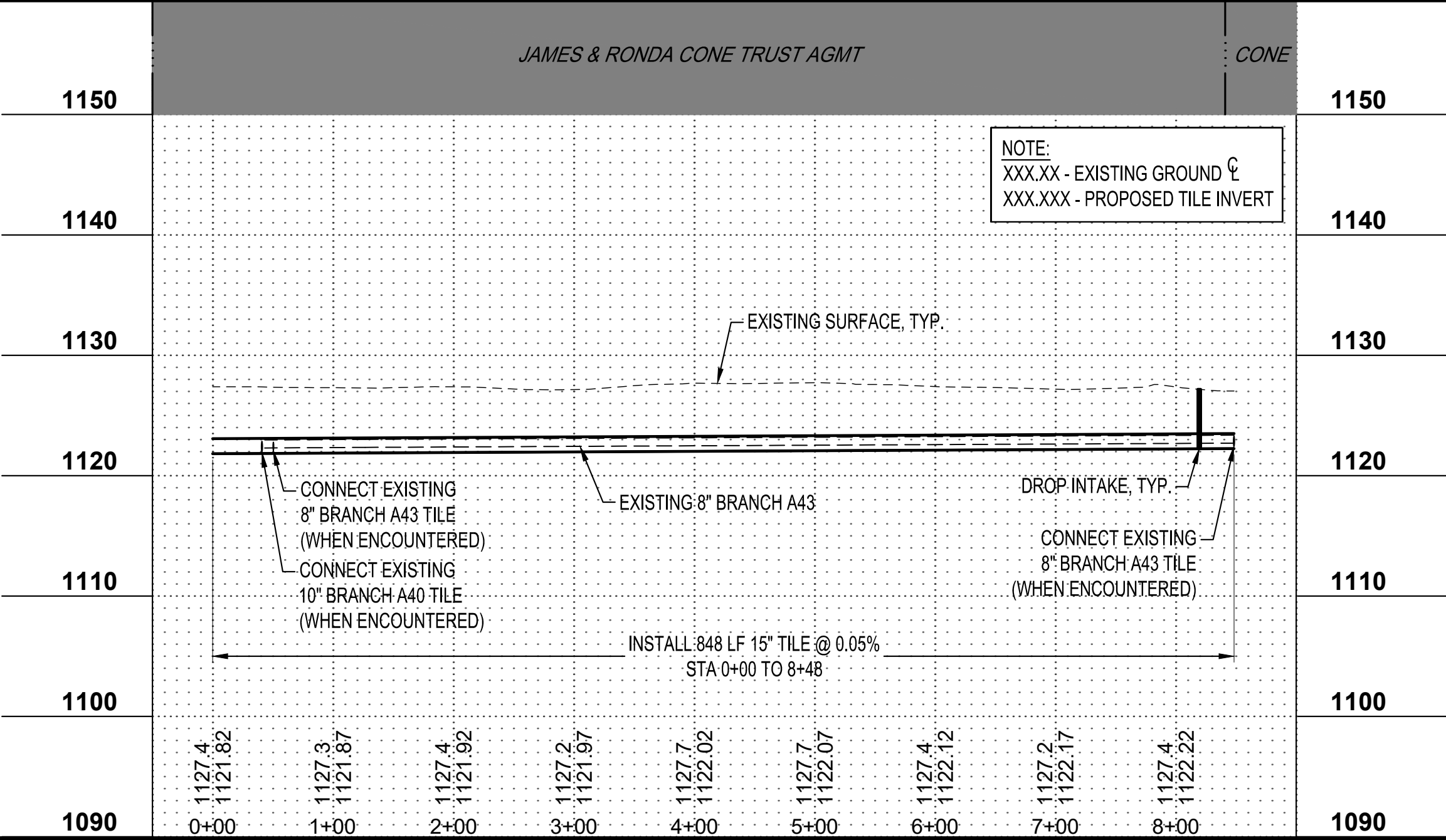
MARTIN-FARIBAUT COUNTY MINNESOTA

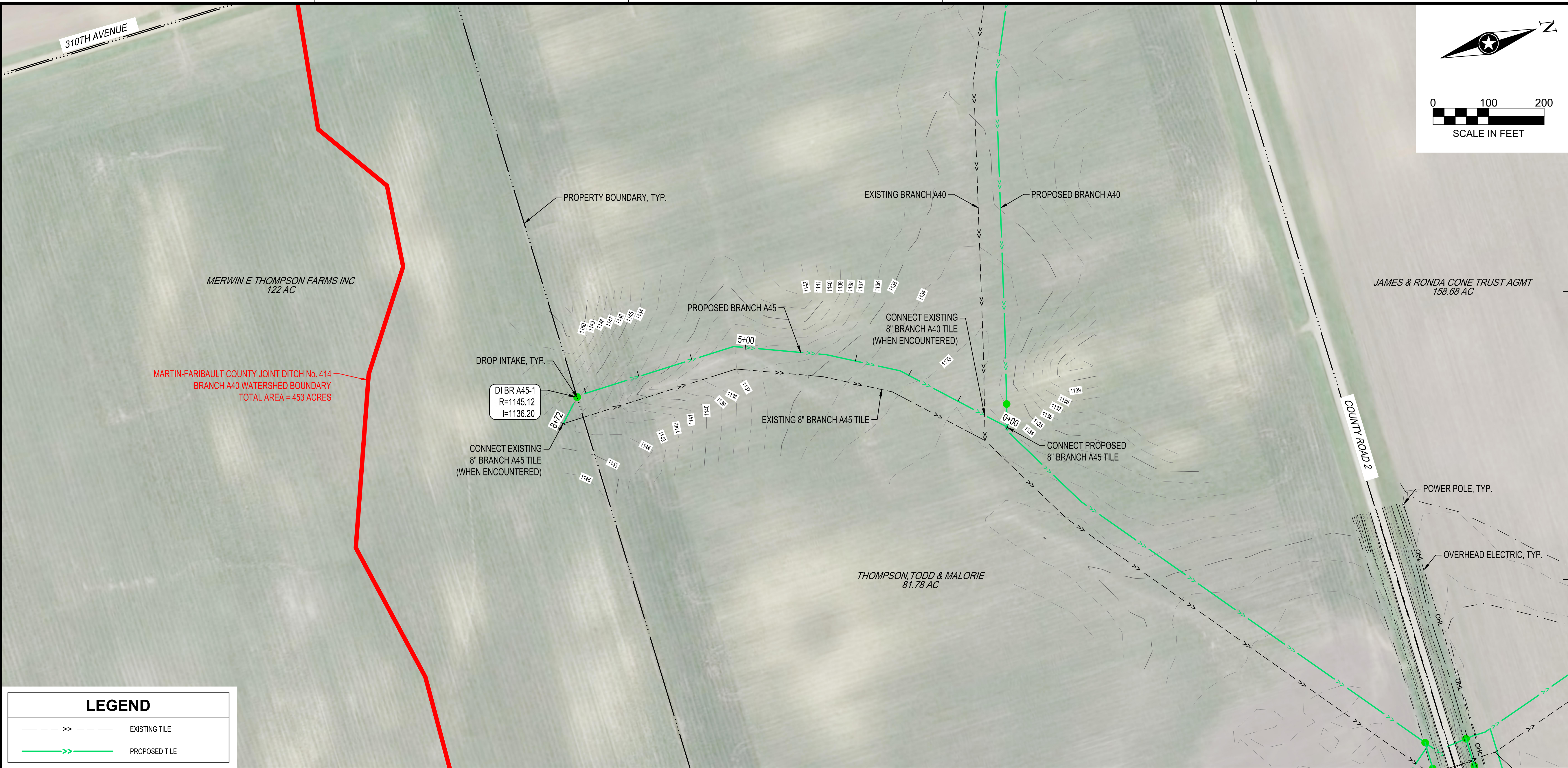
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 PROF (BRANCH A43)-1
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TITLE
**BRANCH A43
PLAN & PROFILE**

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MARTIN-FARIBAUT COUNTY MINNESOTA

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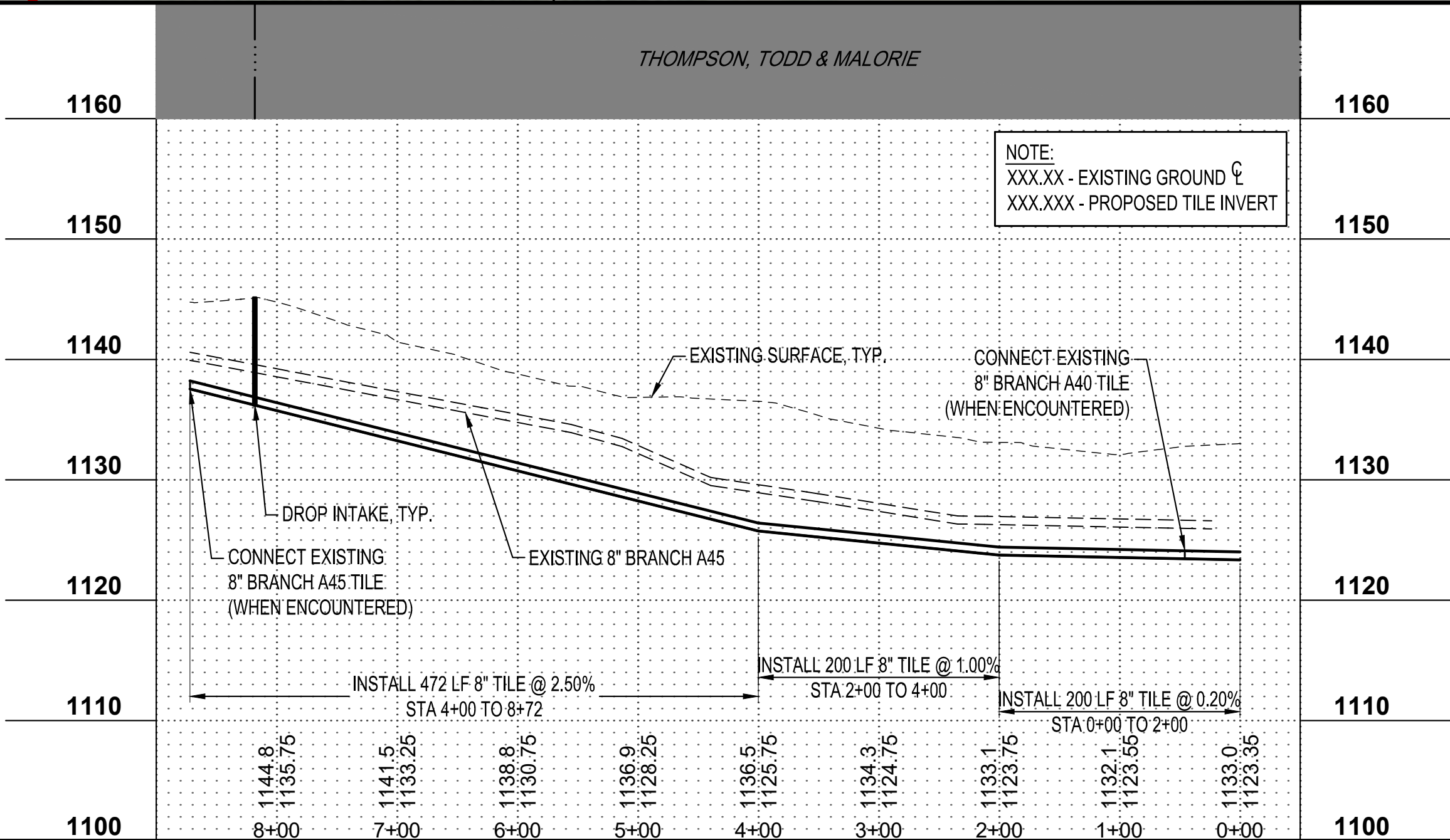
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FILE NAME	23608 PROF (BRANCH A45)-1
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**MARTIN-FARIBAULT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

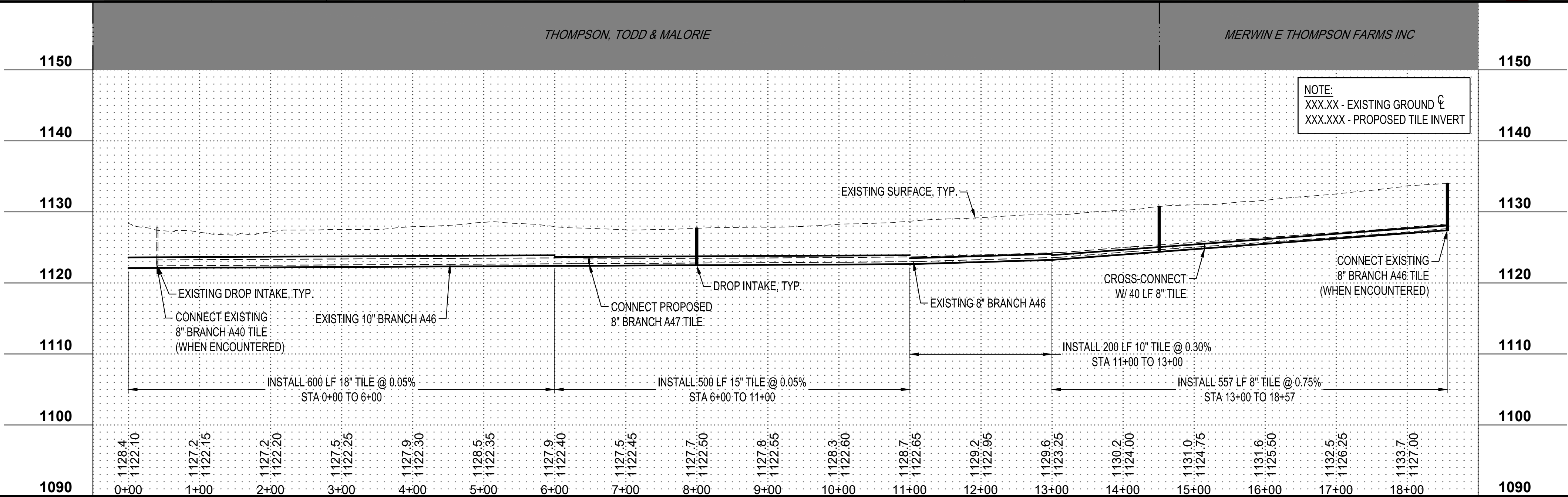
PROJECT NO. 19-23608
FILE NAME 23608 PROF (BRANCH A46)-1
DRAWN BY DMP
DESIGNED BY BPG
REVIEWED BY MAO
ORIGINAL ISSUE DATE --/--
CLIENT PROJECT NO. -

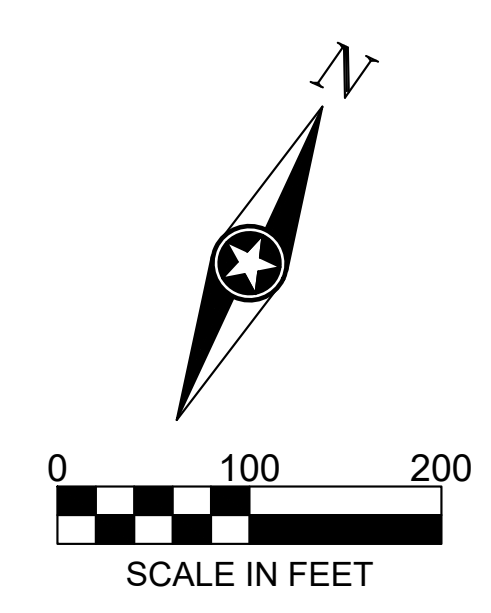
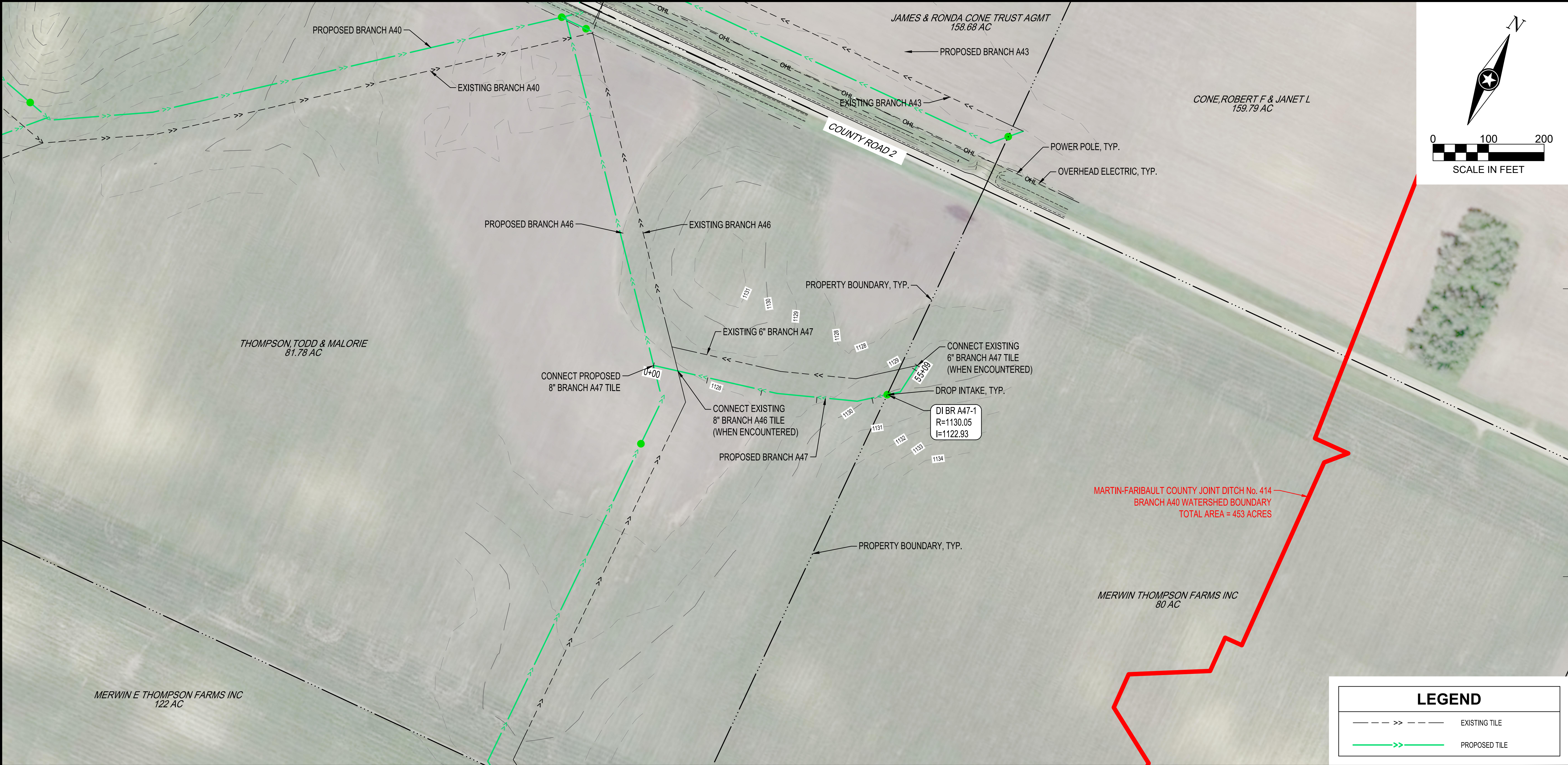
TITLE

**BRANCH A46
PLAN & PROFILE**

SHEET

14 OF 14





NOTE:
THE CLARITY OF THESE PLANS DEPEND
UPON COLOR COPIES. IF THIS TEXT DOES
NOT APPEAR IN COLOR, THIS IS NOT AN
ORIGINAL PLAN SET AND MAY RESULT IN
MISINTERPRETATION.

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
STATE OF MINNESOTA.

**PRELIMINARY NOT
FOR CONSTRUCTION**

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

**MARTIN-FARIBAULT
COUNTY**

**JUDICIAL DITCH
No. 414 BRANCH
A40 IMPROVEMENT**

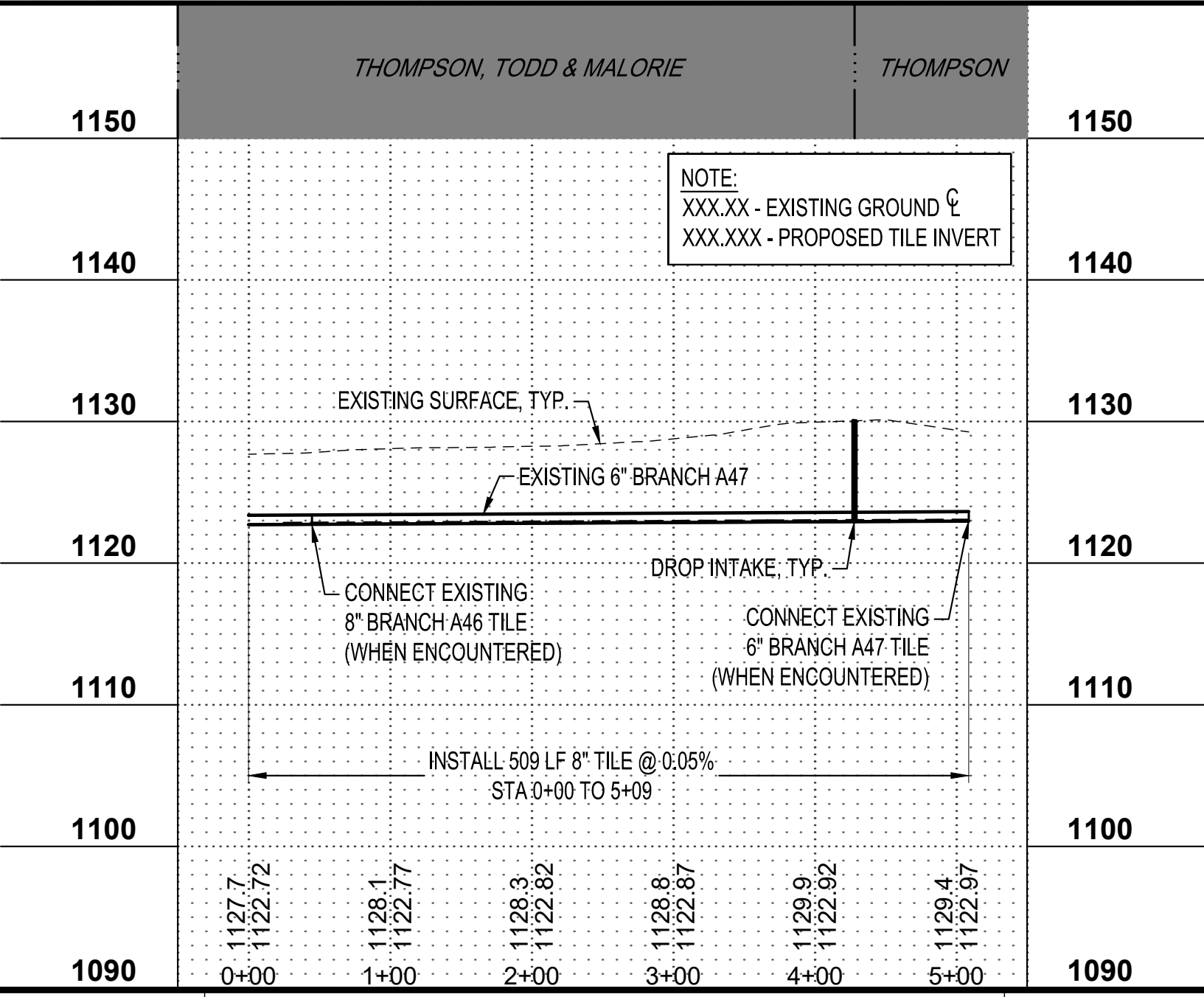
MARTIN-FARIBAULT COUNTY MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	19-23608
FILE NAME	23608 PROF (BRANCH A47)-1
DRAWN BY	DMP
DESIGNED BY	BPG
REVIEWED BY	MAO
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

TITLE

**BRANCH A47
PLAN & PROFILE**



NOTE:
XXX.XX - EXISTING GROUND ℓ
XXX.XXX - PROPOSED TILE INVERT

Appendix B: Order + Petition



Wendland Sellers Law Office

ATTORNEYS AT LAW

BRUCE E. SELLERS
SELLERS@WENDLANDLAW.COM

BLUE EARTH OFFICE:
825 EAST SECOND STREET
P.O. BOX 247
BLUE EARTH, MN 56013
TELEPHONE: (507) 526-2196
FAX: (507) 526-3065

MAPLETON OFFICE:
101 SMITH STREET NE
MAPLETON, MN 56065
TELEPHONE: (507) 524-4110

REPLY TO BLUE EARTH OFFICE

August 2, 2019

John Thompson
Faribault County Drainage Manager
PO Box 130
Blue Earth, MN 56013

RE: Improvement Petition for Faribault-Martin County Judicial Ditch No. 414
Our File No.: 3507.01

Dear Mr. Thompson:

Our office represents petitioners for the proposed improvement to Faribault-Martin County Judicial Ditch No. 414, Branch A40 ("J.D. 414" or "the system"). Pursuant to Minn. Stat. §103E.202, enclosed please find the following for filing:

1. Petition for Improvement of Faribault-Martin County Judicial Ditch No. 414 ("Petition");
2. A Map referred to and incorporated as "Exhibit A" depicting the starting point and general course and terminus of the proposed improvement project which adequately satisfies the requirement under Minn. Stat. §103E.215, Subd. 4(c)(3); and
3. Corporate Surety Bond ("Bond") in the face amount of \$50,000.00 payable to the Drainage Authority of Faribault-Martin County Judicial Ditch No. 414.

All information used to determine the delineation of the watershed boundary for J.D. 414, Branch A40 as depicted on Exhibit A, were obtained from I+S Group engineers ("ISG") using the Surface Water Hydrology Atlas from Minnesota State University-Mankato, current Geographical Information Systems software, Lidar Contour Lines, ArcGIS, and original tile maps received from Faribault and Martin Counties and landowners.

Exhibit A depicts "Tracts" which indicate the number of owners of 40-acre tracts or government lots within the watershed, the boundary of which was also provided by ISG using the ArcGIS software. ArcGIS is a geographic information system that provides the infrastructure for making and working with maps and geographic information by compiling geographic data and analyzing mapped information. The parcel data is provided by Faribault and Martin Counties, and, based on the section information (also provided by the

* Qualified Neutral under Rule 114 of Minnesota General Rules of Practice

REAL ESTATE • PROBATE • ESTATE PLANNING • CIVIL LITIGATION • DEFENSE OF PUBLIC ENTITIES • EMPLOYMENT
• PRIVATE/PUBLIC DRAINAGE • PERSONAL INJURY • CORPORATE/BUSINESS • CONTRACTS • FAMILY LAW

County), the parcel areas are “split” to identify the 40 acre “Tracts”, and another software program is used to calculate the parcel area for each “Tract” within the information developed by the ArcGIS. Additionally, I personally cross-referenced the landowner information with the information available through the Faribault and Martin Counties’ GIS website and/or using the online Beacon software.

Pursuant to Minn. Stat. §103E.215, Subd. 4(a), a petition is considered to be adequate if it is signed by: (1) at least 26% of the owners of the property affected by the proposed improvements; OR (2) at least 26% of the owners of the property that the proposed improvement passes over; OR (3) the owners of at least 26% of the property area affected by the proposed improvement; OR (4) the owners of at least 26% of the property area that the proposed improvement passes over.

With respect to the adequacy of this Petition as it relates to satisfying the requirements of Minn. Stat. §103E.215, Subd. 4(a), I will address each sub-section of this particular statute.

- (1) at least 26 percent of the owners of the property affected by the proposed improvement;

There are a total of 7 owners affected by the proposed improvement benefited or damaged by the project. I have submitted a petition which includes a total of 4 owners (57.14%) of property affected by the proposed improvement.

- (2) at least 26 percent of the owners of property that the proposed improvement passes over;

There are a total of 7 owners of property that is bordered by, touched by, or is underneath the path of the proposed drainage project. I have submitted a petition which includes a total of 4 owners (57.14%) of property the proposed improvement “passes over”.

- (3) the owners of at least 26 percent of the property area affected by the proposed improvement; or

The Faribault-Martin County Judicial Ditch No. 414, Branch A40 watershed benefits a total property area consisting of approximately 445.19 acres. I have submitted a petition which includes a total of 4 owners owning a total of approximately 342.14 acres (76.85%) of the property area affected by the proposed improvement.

- (4) the owners of at least 26 percent of the property area that the proposed improvement passes over.

The proposed improvement drainage project borders, touches, or is underneath the path of a total property area consisting of approximately 374.25 acres. I have submitted a petition which includes a total of 4 owners owning a total of approximately 289.23 acres (77.28%) of the property area that the proposed improvement passes over.

Therefore, I believe the petition satisfies the requirements of Minn. Stat. §103E.215, Subd. 4 by containing signatures the owners of (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; and (4) the owners of at least 26 percent of the property area that the proposed improvement passes over.

August 2, 2019

Page | 3

I have also enclosed a spreadsheet which details the information provided above. After you have had an adequate opportunity to review and verify the information provided, I would request that this Petition be presented to the Faribault-Martin County Joint Board of Commissioners acting as Drainage Authority for Judicial Ditch No. 414.

Chuck Brandel, civil engineer with ISG, has been involved with this proposed improvement project from the initial stages. At the request of the Petitioners, Mr. Brandel provided the preliminary review and feasibility study to landowners for their review and consideration, and that information was used by Petitioners to assist them with their decision to move forward with this Petition. As such, for the sake of convenience and expense, the Petitioners would request that Mr. Brandel and ISG be appointed as engineers for the proposed improvement project.

Please contact me at your earliest convenience if you have further questions, require further information, or believe there are issues that need to be addressed prior to acceptance of the Petition. Thank you in advance for your consideration and prompt attention with this matter.

Sincerely yours,

WENDLAND SELLERS LAW OFFICE

A handwritten signature in black ink that reads "Bruce E. Sellers". The signature is written in a cursive, flowing style.

Bruce E. Sellers
FOR THE FIRM

Enc.

**PETITION FOR AN IMPROVEMENT OF
FARIBAULT-MARTIN COUNTY JUDICIAL DITCH NO. 414**

TO THE FARIBAULT AND MARTIN COUNTY JOINT BOARD OF COMMISSIONERS
AS DRAINAGE AUTHORITY IN RELATION TO FARIBAULT-MARTIN COUNTY
JUDICIAL DITCH NO. 414 ("DRAINAGE AUTHORITY")

The Petitioners herein respectfully represent:

WHEREAS, this Petition specifically relates to Branch A40 and its subsurface tile laterals, specifically, A41, A43, A45, A46, and A47 (together, "Branches"), of Faribault-Martin County Judicial Ditch No. 414 subsurface tile ("the system") located in Sections 19 and 30 of Pilot Grove Township, Faribault County, and Sections 24 and 25 of East Chain Township, Martin County, with the intention of improving the system by increasing the drainage capacity; and

WHEREAS, the Branches have insufficient capacity or requires enlarging in order to furnish sufficient capacity. Petitioners propose enlarging said Branches and laterals to furnish sufficient capacity thereof ("proposed Improvement Project"); and

WHEREAS, the starting point, general course and terminus of the proposed Improvement Project is depicted on Exhibit A which is attached hereto for reference; and

WHEREAS, Petitioners further request that the engineer be specifically ordered to determine and offer alternative proposals for the consideration of the Drainage Authority which relate to the proposed improvement of the drain capacity of the system that the engineer deems feasible, if any, including repairs to the current mainline open ditch and alternative outlets, if any; and

WHEREAS, Petitioners assert that the proposed Improvement Project will benefit and be useful to the public and will promote the public health; and

WHEREAS, Petitioners recognize that water storage benefits the entire system and requests that the engineer appointed by the Drainage Authority consider water storage designs into the proposed Improvement Project. Petitioners further request and will support actively seeking outside funding for said water storage; and

WHEREAS, a separable part of the drainage system may need repair. Petitioners requests, pursuant to Minn. Stat. §103E.215, subd. 6, that separable maintenance be used for those locations where existing tiles are being replaced with new tile. Petitioner requests that the appointed project engineer be ordered to determine a proportionate share of life span based on the existing condition versus the tiles original designed capacity. It is recommended by Petitioners that the separable maintenance to be paid by the entire system is that percentage of the in-place tile whose life span capacity has been used and that the improvement pay for that percentage of the tile, life span or capacity that still is in repair; and

WHEREAS, Petitioners request the engineer appointed by the Drainage Authority is asked to include in its detailed survey report a statement showing the proportionate estimated cost of the proposed improvement required to repair the separable part of the existing system and the estimated proportionate share of the cost of the added work required for the improvement. The Petitioners, as landowners, request that a percentage be paid as separable maintenance by the entire system and a percentage be paid for by the improvement benefits as determined by the appointed project engineer and viewers; and

WHEREAS, the names and addresses of owners of the property area that the Improvement passes over is depicted on the attached Exhibit A are as follows:

Tract 1*

Owner/Address:

Terry L. & Sonja Peterson
2927 50th St.
Blue Earth, MN 56013

Tract 2

Owner/Address:

Terry L. & Sonja Peterson
2927 50th St.
Blue Earth, MN 56013

Tract 3

Owner/Address:

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 4*

Owner/Address:

James & Ronda Cone Trust Agreement
James & Ronda Cone, Trustees
640 W Interlaken Rd.
Fairmont, MN 56031

Tract 5*

Owner/Address:

James & Ronda Cone Trust Agreement
James & Ronda Cone, Trustees
640 W Interlaken Rd.
Fairmont, MN 56031

Tract 5

Owner/Address:

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 6**Owner/Address:**

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 7**Owner/Address:**

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 8**Owner/Address:**

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 9***Owner/Address:**

James & Ronda Cone Trust Agreement
James & Ronda Cone, Trustees
640 W Interlaken Rd.
Fairmont, MN 56031

Tract 9**Owner/Address:**

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 10***Owner/Address:**

James & Ronda Cone Trust Agreement
James & Ronda Cone, Trustees
640 W Interlaken Rd.
Fairmont, MN 56031

Tract 11***Owner/Address:**

Robert F. & Janet L. Cone
389 Lake Aires Rd.
Fairmont, MN 56031

Tract 12***Owner/Address:**

Merwin Thompson Farms, Inc.
c/o Roger Thompson
190 280th Ave.
Elmore, MN 56027

Tract 13*	
Owner/Address:	Todd & Malorie Thompson 268 280th Ave. Elmore, MN 56027

Tract 14*	
Owner/Address:	Todd & Malorie Thompson 268 280th Ave. Elmore, MN 56027

Tract 15*	
Owner/Address:	Roger Thompson & Donna Bosek Revocable Trust, et al. 10695 Kingsfield Lane Woodbury, MN 55139

Tract 16	
Owner/Address:	Roger Thompson & Donna Bosek Revocable Trust, et al. 10695 Kingsfield Lane Woodbury, MN 55139

Tract 17*	
Owner/Address:	Merwin E. Thompson Farms, Inc. & Roger C. Thompson, et al. 190 280th Ave. Elmore, MN 56027

Tract 18*	
Owner/Address:	Merwin E. Thompson Farms, Inc. & Roger C. Thompson, et al. 190 280th Ave. Elmore, MN 56027

Tract 19*	
Owner/Address:	Merwin Thompson Farms, Inc. c/o Roger Thompson 190 280th Ave. Elmore, MN 56027



WHEREAS, this Petition is signed by at least 26% of the owners of the property area affected by the proposed improvement project; and WHEREAS, this Petition is signed by: (1) at least 26% of the owners of the property affected by the proposed improvements; (2) at least 26% of the owners of the property that the proposed improvement passes over; (3) the owners of at least 26% of the property area affected by the proposed improvement; or (4) the owners of at least 26% of the property area that the proposed improvement passes over; and

WHEREAS, Petitioner provides herewith a surety bond in the face amount of \$50,000 payable to the Drainage Authority of Faribault-Martin County Judicial Ditch No. 414, said bond conditioned to pay the costs incurred if the proceeding are dismissed or a contract is not awarded to allow the costs incurred to exceed the amount of the bond and that they will cause additional bond to be filed if it appears that the costs exceed the amount of the bond; and


WHEREAS, Petitioner has been informed and understands that they may not withdraw as a Petitioner at any time after this Petition is accepted by the Drainage Authority. Petitioner further acknowledges that if the proposed drainage project is not constructed, they are liable to the Drainage Authority for all of the costs incurred including engineering, legal and miscellaneous fees and expenses in relation to this Petition as outlined under Minnesota Statutes 103E; and

WHEREAS, this Petition may be signed in counterparts.

NOW THEREFORE, Petitioners request the Faribault County Auditor present this Petition to the Faribault County Board of Commissioners (after examination by legal counsel), and for the formation and appointment of members of the Faribault and Martin County Joint County Board of Commissioners, to act together as the drainage authority to oversee the proposed Improvement Project proceeding, and, after formation, further request the acceptance of the Petition and for the appointment of Chuck Brandel, I+S Group, or, in the alternative, another engineer skilled in public drainage matters, to examine the proposed work.

Owner Signature	Property Owned	Affected Acres
 Robert F. Cone	Parcel ID: 14.019.0100 Parcel ID: 03.024.0200 Parcel ID: 03.024.0600	33.50 9.22 39.13
 Janet L. Cone		

Owner Signature	Property Owned	Affected Acres
 Trustee, James & Ronda Cone James & Ronda Cone Trust Agreement	Parcel ID: 14.010.0400	151.74
 Trustee, James & Ronda Cone James & Ronda Cone Trust Agreement		
By: <u>Todd Thompson</u> Merwin E. Thompson Farms, Inc By:  Its: <u>Thompson P.O.A</u>	Parcel ID: 14.030.0100	36.56
 Todd Thompson  Malorie Thompson	Parcel ID: 14.030.0600	80.93



Bruce E. Sellers
Attorney for Petitioners
Wendland Sellers Law Office
825 East Second Street
P.O. Box 247
Blue Earth, MN 56013
507-526-2196

This petition is prepared by:
Bruce E. Sellers, Attorney at Law
Wendland Sellers Bromeland, P.A.
825 East Second Street, P.O. Box 247
Blue Earth, MN 56013
507-526-2196



Bond No. 66329842

SURETY BOND
Public Official, License or
Permit Bonds and Probate Bonds

SURETY BOND

KNOW ALL MEN BY THESE PRESENTS

That we, Todd Thompson and Faribault-Martin County Judicial Ditch 414 landowners/petitioners, as Principal, and the
Auto-Owners Insurance Company, a corporation organized under the laws of the State of

Michigan, and having its principal office at Lansing, Michigan, as Surety, are held and firmly bound unto _____

Drainage Authority for Faribault-Martin County J D 414 in the penal sum of (\$ 50 000 00)

Fifty Thousand and 00/100 Dollars,

lawful money of the United States of America, for which payment, well and truly to be made, we jointly and severally bind ourselves, our successors, administrators and assigns, firmly by these presents.

SIGNED, SEALED, and DATED this 15th day of July, 2019.

WHEREAS the aforesaid Principal has petitioned to proceed in the matter of the improvements of multiple Branches of A40
(If a Public Official Bond insert "been elected or appointed (name) for the terms beginning (date) and ending (date)")

of Faribault-Martin County Judicial Ditch 414. Said petition is being addressed before the Board of Commissioners Drainage Authority
(If a License or Permit Bond insert "been granted a license or permit as (name business) by the said Obligor for the period of one year from (date)")

of Faribault-Martin County pursuant to Minnesota Statutes 103E 215 with respect to a petition for improvement (#1)
(If a Probate Bond insert "been appointed [Executor, Administrator, Guardian, Conservator] of the estate of [name of deceased, minor or incompetent]")

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the aforesaid Principal shall

pay all cost and expenses which may be incurred in case the proceedings herein are dismissed for any reason and no contract is
(If a Public Official Bond insert "faithfully perform the duties of said office")

entered into for the construction of such improvement as proposed in the petition. Petitioners covenant they will not allow the costs
(If a License or Permit Bond insert "comply with the laws of the aforesaid Obligor governing said License or Permit")

incurred to exceed the amount of the bond submitted herewith. Being part of a County Ditch the improvement will be a public (#2)
Principal as (Guardian, Administrator, Conservator, Executor, etc.) will faithfully discharge the duties of their trust as Fiduciary of the person and/or estate in this matter according to law

Then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED: That the liability of the Surety shall in no event exceed the penalty of this Bond.

the petitioners acknowledge that they have been informed and understand that they may not withdraw as a petitioner at any time
(If no further conditions insert "no further conditions")

once this petition is filed. The petitioners understand that if the proposed drainage proceedings are dismissed each of them is

responsible for the payment of all costs incurred. The Surety may terminate this bond at any time by giving thirty (30) days written

notice of cancellation to both the Obligor and the Principal.

Todd Thompson and Faribault-Martin County Judicial Ditch 414 landowners/petitioners

X

Principal

Auto-Owners

Surety

By

Attorney-in-Fact



BOND NUMBER_____

Todd Thompson and Faribault-Martin County Judicial Ditch 414

#1 This bond may be automatically renewed for additional terms by Continuation Certificate issued by the Surety.

#2 utility. If a contract is entered into for the construction of such improvement the petitioners acknowledge that they have been informed and understand that they may not withdraw as petitioner at any time once this petition is filed. The petitioners understand that if the proposed drainage proceedings are dismissed each of them is responsible for the payments of all costs incurred. The Surety may terminate this bond at any time by giving thirty (30) as written notice of cancellation to both the Obligee and the Principal.

DATE AND ATTACH TO ORIGINAL BOND
AUTO-OWNERS INSURANCE COMPANY
LANSING, MICHIGAN
POWER OF ATTORNEY

NO. 66329842

KNOW ALL MEN BY THESE PRESENTS: That the AUTO-OWNERS INSURANCE COMPANY AT LANSING, MICHIGAN, a Michigan Corporation, having its principal office at Lansing, County of Eaton, State of Michigan, adopted the following Resolution by the directors of the Company on January 27, 1971, to wit:

"RESOLVED, That the President or any Vice President or Secretary or Assistant Secretary of the Company shall have the power and authority to appoint Attorneys-in-fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity, and other writings obligatory in the nature thereof. Signatures of officers and seal of Company imprinted on such powers of attorney by facsimile shall have same force and effect as if manually affixed. Said officers may at any time remove and revoke the authority of any such appointee."

Does hereby constitute and appoint CHAD W OSTERMANN

its true and lawful attorney(s)-in-fact, to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and the execution of such instrument(s) shall be as binding upon the AUTO-OWNERS INSURANCE COMPANY AT LANSING, MICHIGAN as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office.

IN WITNESS WHEREOF, the AUTO-OWNERS INSURANCE COMPANY AT LANSING, MICHIGAN, has caused this to be signed by its authorized officer this 1st day of August, 2016.

Denise Williams

Denise Williams

Senior Vice President

STATE OF MICHIGAN } ss.
COUNTY OF EATON }

On this 1st day of August, 2016, before me personally came Denise Williams, to me known, who being duly sworn, did depose and say that they are Denise Williams, Senior Vice President of AUTO-OWNERS INSURANCE COMPANY, the corporation described in and which executed the above instrument, that they know the seal of said corporation, that the seal affixed to said instrument is such Corporate Seal, and that they received said instrument on behalf of the corporation by authority of their office pursuant to a Resolution of the Board of Directors of said corporation.



My commission expires March 10, 2022.

Susan E. Theisen
Susan E. Theisen

Notary Public

STATE OF MICHIGAN } ss.
COUNTY OF EATON }

I, the undersigned First Vice President, Secretary and General Counsel of AUTO-OWNERS INSURANCE COMPANY, do hereby certify that the authority to issue a power of attorney as outlined in the above board of directors resolution remains in full force and effect as written and has not been revoked and the resolution as set forth is now in force.

Signed and sealed at Lansing, Michigan. Dated this 1st day of July, 2019.



William F. Woodbury

William F. Woodbury, First Vice President, Secretary and General Counsel

Agency Name M & M INSURANCE AGENCY LLC

Agency Code 06-0636-00

Name of Principal TODD THOMPSON AND FARIBAULT-MARTIN COUNTY JUDICIAL DIT

Effective Date 07/01/2019

Mailing Address 268 280TH AVE, ELMORE, MN 56027-504

Premium Charge \$1,080.00

Name of Obligor DRAINAGE AUTHORITY FOR FARIBAULT-MARTIN COUNTY JUDICIAL

Amount of Bond \$50,000.00

Address of Obligor PO BOX 130, BLUE EARTH, MN 56013-0130

Type of Bond License/Permit

COMPLETE AND ATTACH ALL PAPERS UNDER THIS REPORT THE SAME DAY THE BOND IS SIGNED

PIN	TRACT NO.	OWNER	Affected Property Owners	Affected Property Owners Received	Passed Over Property Owners	Passed Over Property Owners Received	Total Affected Property Area	Affected Property Area Received	Total Passed Over Property Area	Passed Over Property Area Received
14 019 0300	1	TERRY L & SONJA PETERSON	1		1		24.67		24.67	0.00
14 019 0300	2	TERRY L & SONJA PETERSON					5.35			
14 019 0100	3	ROBERT F & JANET L CONE	1	1			8.92			
14 019 0400	4	JAMES & RONDA CONE TRUST AGREEMENT	1	1	1	1	32.19	32.19	32.19	32.19
14 019 0100	5	ROBERT F & JANET L CONE					1.89	1.89		
14 019 0400	5	JAMES & RONDA CONE TRUST AGREEMENT					38.65	38.65	38.65	38.65
03 024 0200	6	ROBERT F & JANET L CONE					9.22	9.22		
03 024 0600	7	ROBERT F & JANET L CONE					5.46	5.46		
03 024 0600	8	ROBERT F & JANET L CONE					33.67	33.67		
14 019 0100	9	ROBERT F & JANET L CONE					2.69	2.69		
14 019 0400	9	JAMES & RONDA CONE TRUST AGREEMENT					41.07	41.07	41.07	41.07
14 019 0400	10	JAMES & RONDA CONE TRUST AGREEMENT					39.83	39.83	39.83	39.83
14 019 0100	11	ROBERT F & JANET L CONE			1	1	20.00	20.00	20.00	20.00
14 030 0100	12	MERWIN THOMPSON FARMS INC	1	1	1	1	21.19	21.19	21.19	21.19
14 030 0600	13	TODD & MALORIE THOMPSON	1	1	1	1	38.70	38.70	38.70	38.70
14 030 0600	14	TODD & MALORIE THOMPSON					42.23	42.23	42.23	42.23
03 025 0100	15	ROGER THOMPSON & DONNA BOSEK REVOCABLE TRUST ET AL	1		1		28.55		28.55	0.00
03 025 0100	16	ROGER THOMPSON & DONNA BOSEK REVOCABLE TRUST ET AL					3.75			
14 030 1200	17	MERWIN E THOMPSON FARMS INC & ROGER C THOMPSON ET AL	1		1		10.89		10.89	0.00
14 030 1200	18	MERWIN E THOMPSON FARMS INC & ROGER C THOMPSON ET AL					20.91		20.91	0.00
14 030 0100	19	MERWIN THOMPSON FARMS INC					15.37	15.37	15.37	15.37
			7	4	7	4	445.19	342.14	374.25	289.23
			57.14%		57.14%		76.85%		77.28%	

Parcels, Tracts, and Owners considered "passed over" are marked in red

**BEFORE THE JOINT BOARD OF
MARTIN & FARIBAULTCOUNTY COMMISSIONERS,
ACTING AS DRAINAGE AUTHORITY
FOR MARTIN & FARIBAULT COUNTY JD #414**

**Findings of Fact and Order Regarding
Acceptance of Petition and Appointment of
Engineer**

WHEREAS, a Petition was submitted to the Joint Board of Martin & Faribault County Board of Commissioners, acting as Drainage Authority for Martin & Faribault County JD #414, requesting the Improvement of Branch A40 of Martin & Faribault County JD #414; and

WHEREAS, the Petition was referred to Kurt Deter to review to establish that it meets the requirements of the a Petition, under Minnesota Statutes 103E.215; and

WHEREAS, the Petition does meet the requirements under Minnesota Statutes 103E.215.

NOW, THEREFORE, the Joint Board of Martin & Faribault County Board of Commissioners, acting as Drainage Authority for Martin & Faribault County JD #414, makes the following Findings of Fact and Order:

FINDINGS OF FACT

1. That the Petition is accepted as meeting the requirements of Minnesota Statutes 103E.215.
2. That I&S Group has been recommended to be the engineers for the proposed Improvement project.

ORDER

NOW, THEREFORE, it is hereby ordered that the Petition is accepted for the Improvement of Branch A40 of Martin & Faribault County JD #414 and I&S Group is appointed the engineer and is to proceed in the preparation of a Preliminary Engineer's Report.

Dated this 17th day of September, 2019.

**JOINT BOARD OF
MARTIN & FARIBAULTCOUNTY COMMISSIONERS,
ACTING AS DRAINAGE AUTHORITY
FOR MARTIN & FARIBAULT COUNTY JD #414**

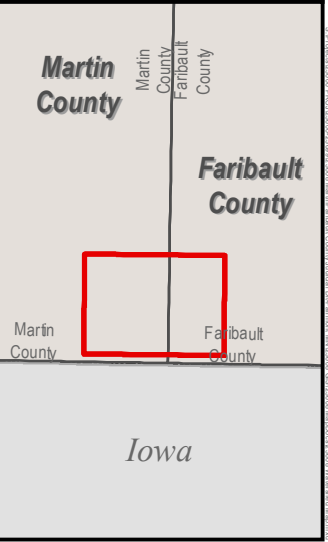
By *Elliot Belgard*
Its Chairperson

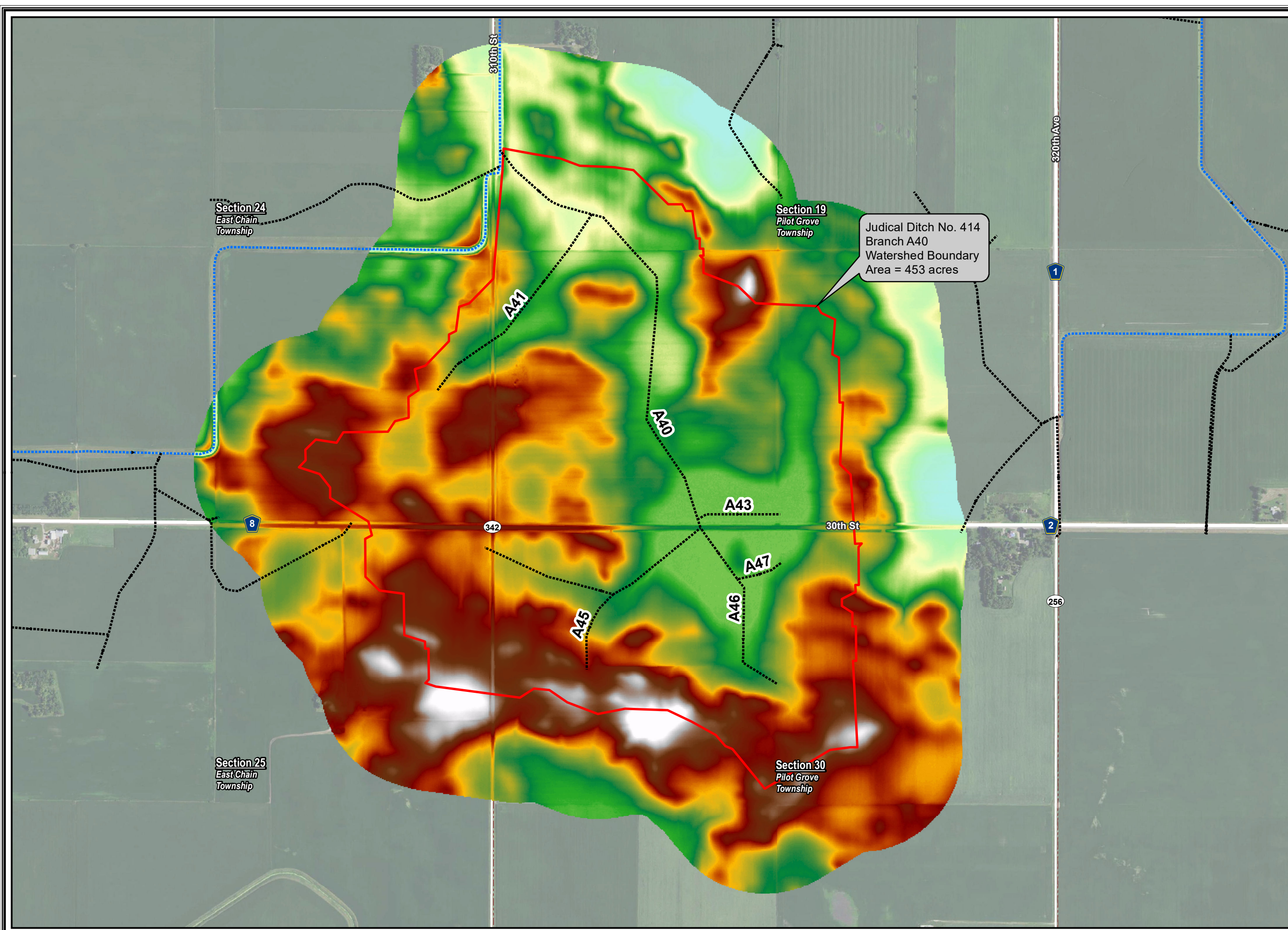
Appendix C: Maps



 OPEN CHANNEL
 TILE
 Proposed Tile
 BranchA40Watershed
 JD414 Watershed
 Counties

0 750 1,500 3,000 Feet
1 inch = 3,333 feet



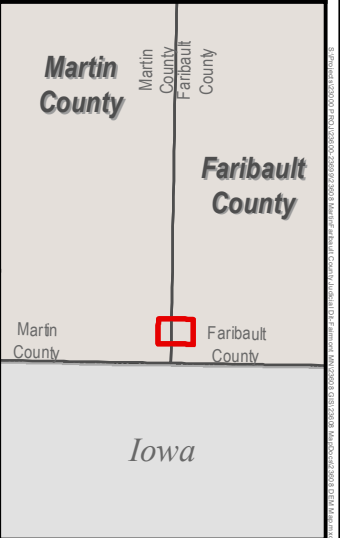


**Digital
Elevation
Map**
Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Tuesday, January 7, 2020

- Legend**
- OPEN CHANNEL
 - TILE
 - Branch A40 Watershed
- Elevation (ft)**
High : 1170.2
Low : 1116.82

PN: 19-23608
Source:
Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 200 400 800 Feet
1 inch = 833 feet





Hydrologic Soil Group Map

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Tuesday, January 7, 2020

Legend

- OPEN CHANNEL
- TILE
- Branch A40 Watershed

HSG

- B
- B/D
- C
- C/D

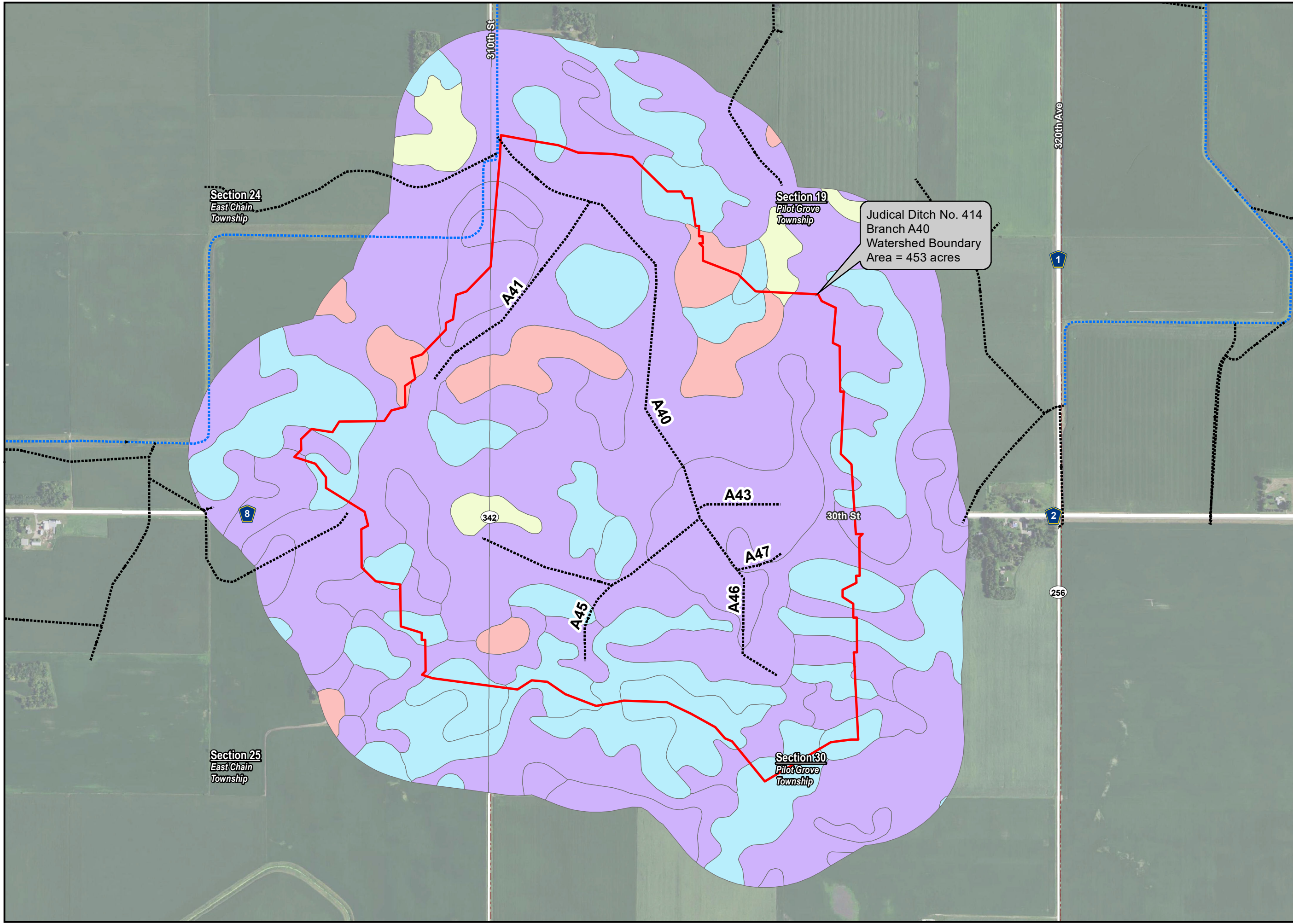
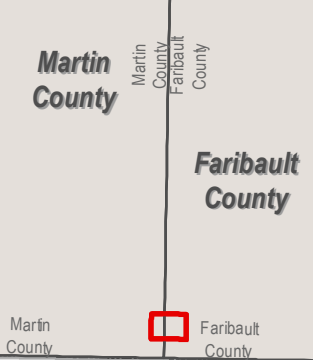
PN: 19-23608

Source:

Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 200 400 800 Feet
1 inch = 833 feet





Soil Classification Map

Judical Ditch No. 414
Martin - Faribault County,
Minnesota

Tuesday, January 7, 2020

PN: 19-23608

Source:

Orthophotograph (MnGeo WMS, 2015)

Tile/Ditch (XX County, 12/16/2016)

Parcels (XX County, 12/16/2016)

Lakes (MN DNR, July, 2008)

Major Stream (MN DNR, July 2008)

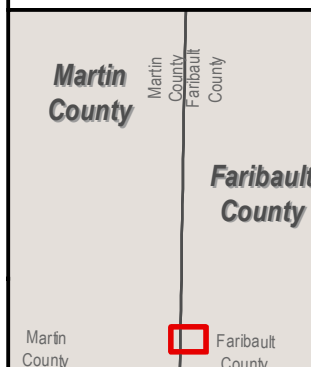
Counties (MN DNR, July 2013)

PLSS (MnGeo/USGS)



0 200 400 800 Feet

1 inch = 833 feet



Iowa

Legend

OPEN CHANNEL

TILE

Branch A40 Watershed

Soil Classification

Canisteo-Glencoe complex, 0 to 2 percent slopes

Clarion loam, 2 to 6 percent slopes

Clarion-Estherville complex, 2 to 6 percent slopes

Clarion-Storden complex, 6 to 10 percent slopes, moderately eroded

Clarion-Storden loams, 2 to 6 percent slopes

Clarion-Storden-Estherville complex, 12 to 18 percent slopes, eroded

Clarion-Storden-Estherville complex, 6 to 12 percent slopes, eroded

Clarion-Swanlake complex, 2 to 6 percent slopes

Clarion-Swanlake loams, 2 to 6 percent slopes

Crippin loam

Delft clay loam, 0 to 2 percent slopes

Fostoria loam

Glencoe clay loam, 0 to 1 percent slopes

Klossner muck, 0 to 1 percent slopes

Nicollet clay loam, 1 to 3 percent slopes

Nicollet-Crippin complex

Okoboji silty clay loam, 0 to 1 percent slopes

Webster clay loam, 0 to 2 percent slopes

Judical Ditch No. 414
Branch A40
Watershed Boundary
Area = 453 acres

Section 24
East Chain
Township

Section 19
Pilot Grove
Township

Section 25
East Chain
Township

Section 30
Pilot Grove
Township

Section 29
Pilot Grove
Township



**Level 1 Wetland
Delineation Map**

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Wednesday, January 15, 2020

Legend

- Potential Wetlands
- Open Ditch
- Existing Tile
- Proposed Tile
- Watershed

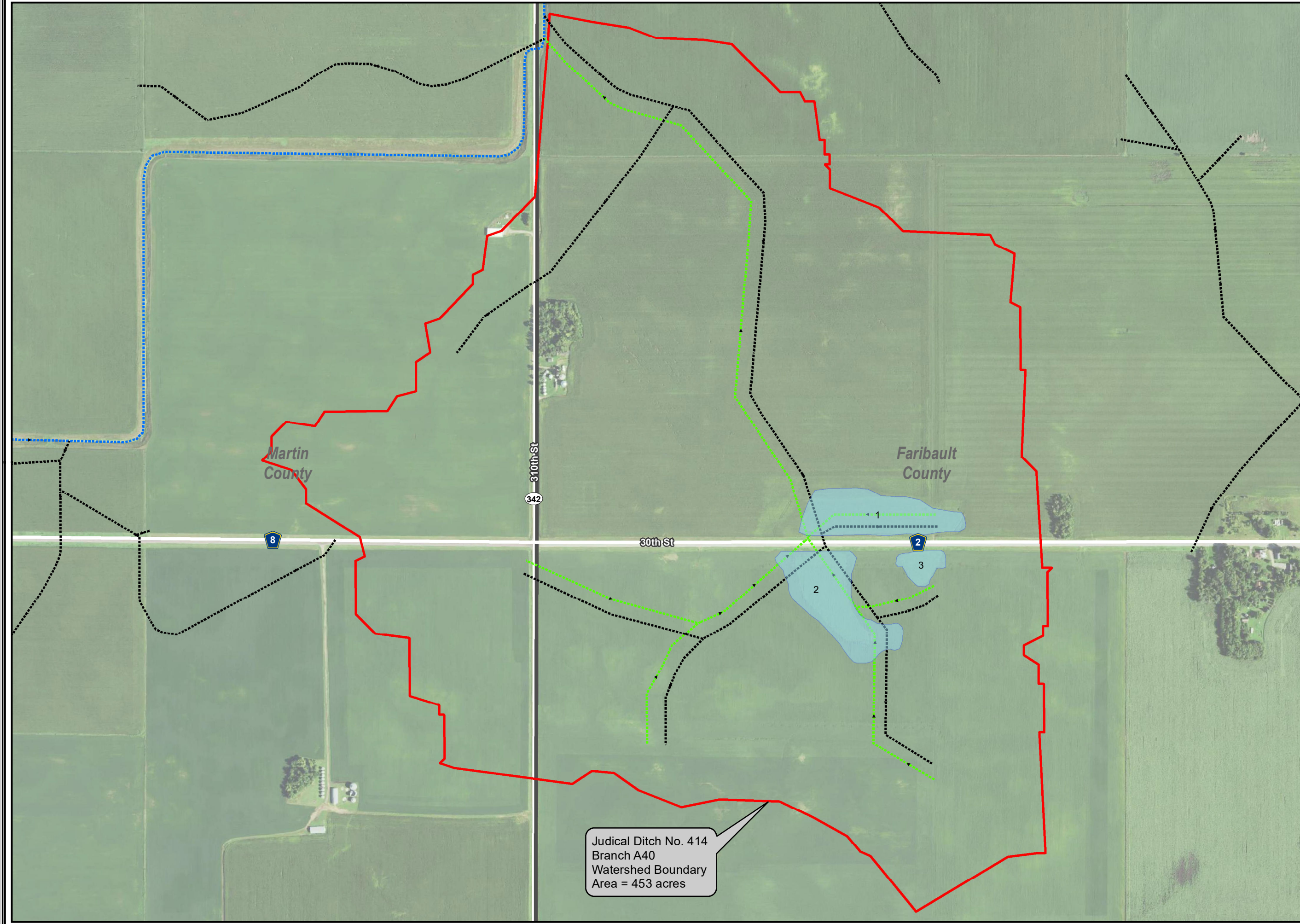
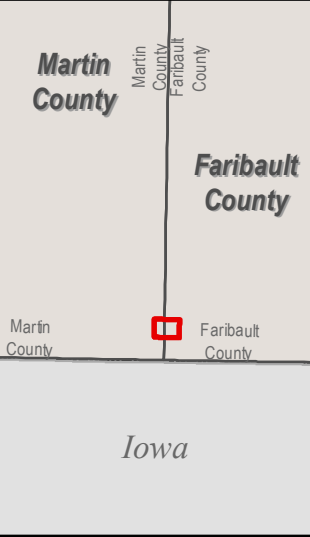
PN: 19-23608

Source:

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Tile/Ditch (Faribault County, 2012)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

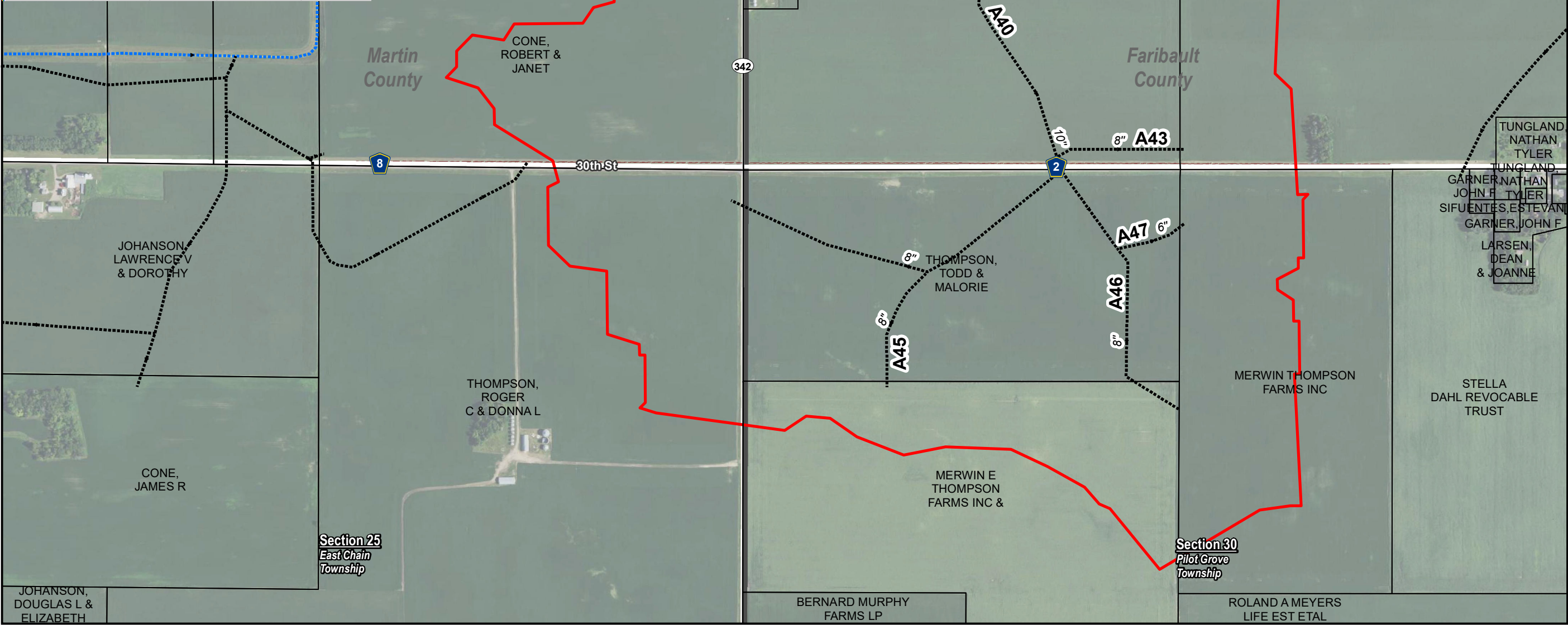


0 150 300 600 Feet
1 inch = 600 feet



Judical Ditch No. 414
Branch A40
Watershed Boundary
Area = 453 acres

Branch	ACSIC Size (in)	ACSIC Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)
A40	14	0.20%	427.4	0.13
A40	12	0.20%	329.4	0.12
A40	12	0.10%	315.2	0.09
A40	10	0.05%	268.2	0.04
A40	8	0.50%	156.8	0.13
A40	8	0.40%	83.6	0.22
A40	8	0.20%	83.2	0.15
A40	8	0.40%	72.6	0.25
A40	8	0.30%	33.2	0.48
A40	8	1.00%	25.4	1.14
A40	8	2.00%	25.1	1.63
A43	8	0.05%	48.0	0.13
A45	8	0.20%	17.4	0.74
A45	8	1.60%	16.5	2.22
A45	8	4.40%	15.9	3.80
A45	8	2.00%	6.4	6.33
A46	10	0.05%	73.2	0.16
A46	8	0.05%	66.6	0.10
A46	8	0.10%	54.7	0.17
A46	8	0.30%	50.3	0.31
A46	8	0.80%	22.4	1.15
A46	8	1.00%	18.0	1.60
A47	6	0.05%	12.4	0.24



Existing Map

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Friday, February 7, 2020

Legend

- Open Ditch
- Existing Tile
- Parcels
- Branch A40 Watershed
- Counties

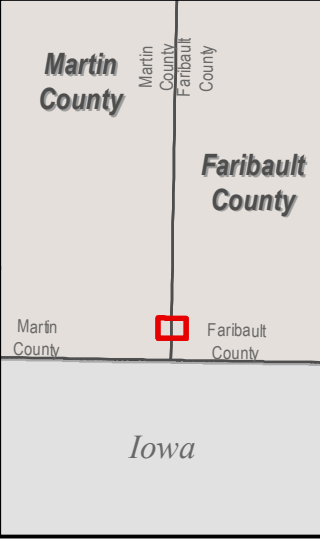
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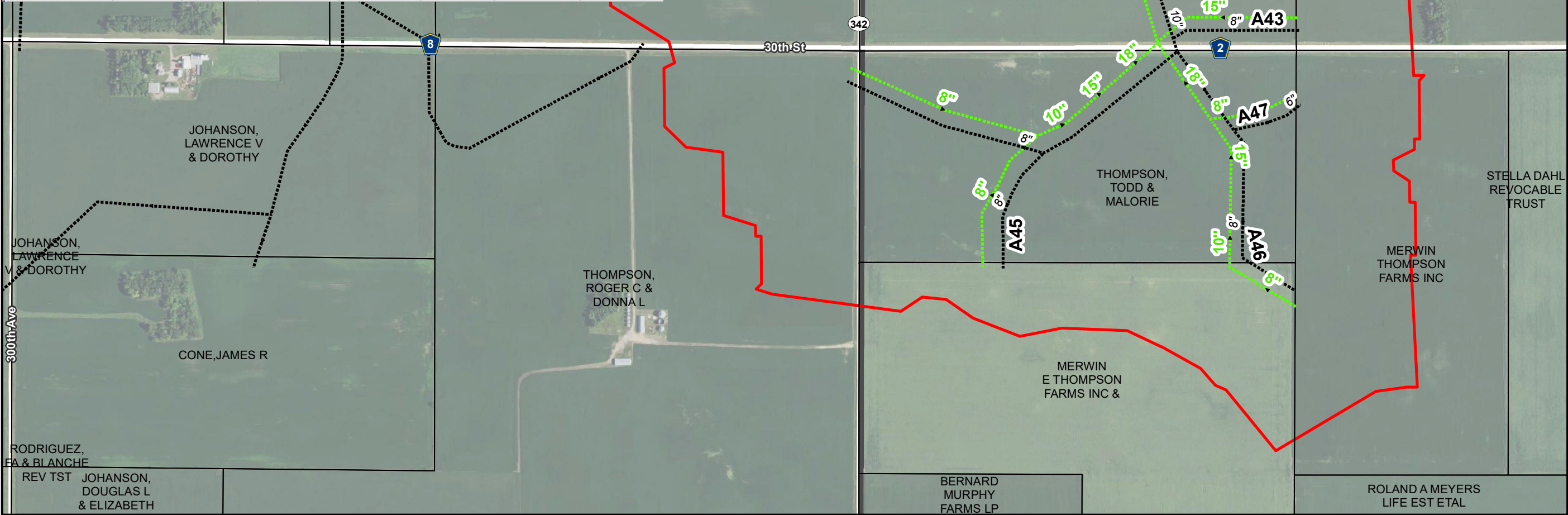
Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 155 310 620 Feet
1 inch = 667 feet



Branch	ACSIC Size (in)	Proposed Size (in)	ACSIC Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
A40	14	24	0.20%	0.15%	427.4	0.13	0.49
A40	12	24	0.20%	0.15%	329.4	0.12	0.63
A40	12	24	0.10%	0.10%	315.2	0.09	0.54
A40	10	24	0.05%	0.10%	268.2	0.04	0.64
A40	8	18	0.50%	0.10%	156.8	0.13	0.51
A40	8	15	0.40%	0.10%	83.6	0.22	0.58
A40	8	15	0.20%	0.10%	83.2	0.15	0.59
A40	8	12	0.40%	0.20%	72.6	0.25	0.52
A40	8	8	0.30%	0.50%	33.2	0.48	0.61
A40	8	8	1.00%	0.50%	25.4	1.14	0.80
A40	8	8	2.00%	0.50%	25.1	1.63	0.81
A43	8	15	0.05%	0.05%	48.0	0.13	0.72
A45	8	8	0.20%	0.20%	17.4	0.74	0.74
A45	8	8	1.60%	1.00%	16.5	2.22	1.75
A45	8	8	4.40%	2.50%	15.9	3.80	2.86
A45	8	8	2.00%	2.50%	6.4	6.33	7.08
A46	10	18	0.05%	0.05%	73.2	0.16	0.77
A46	8	15	0.05%	0.05%	66.6	0.10	0.52
A46	8	15	0.10%	0.05%	54.7	0.17	0.63
A46	8	10	0.30%	0.30%	50.3	0.31	0.57
A46	8	8	0.80%	0.80%	22.4	1.15	1.15
A46	8	8	1.00%	0.80%	18.0	1.60	1.43
A47	6	8	0.05%	0.05%	12.4	0.24	0.52



Improvement Map - Option 1

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Friday, February 7, 2020

Legend

- Open Ditch
- Existing Tile
- Proposed Tile
- Parcels
- BranchA40Watershed
- Counties

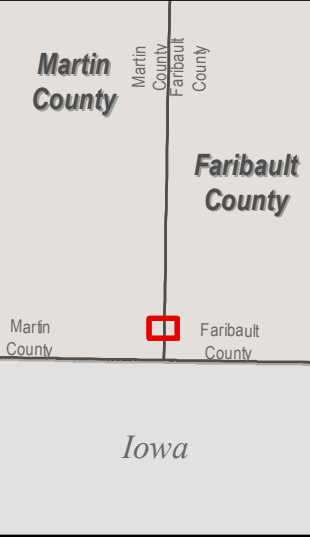
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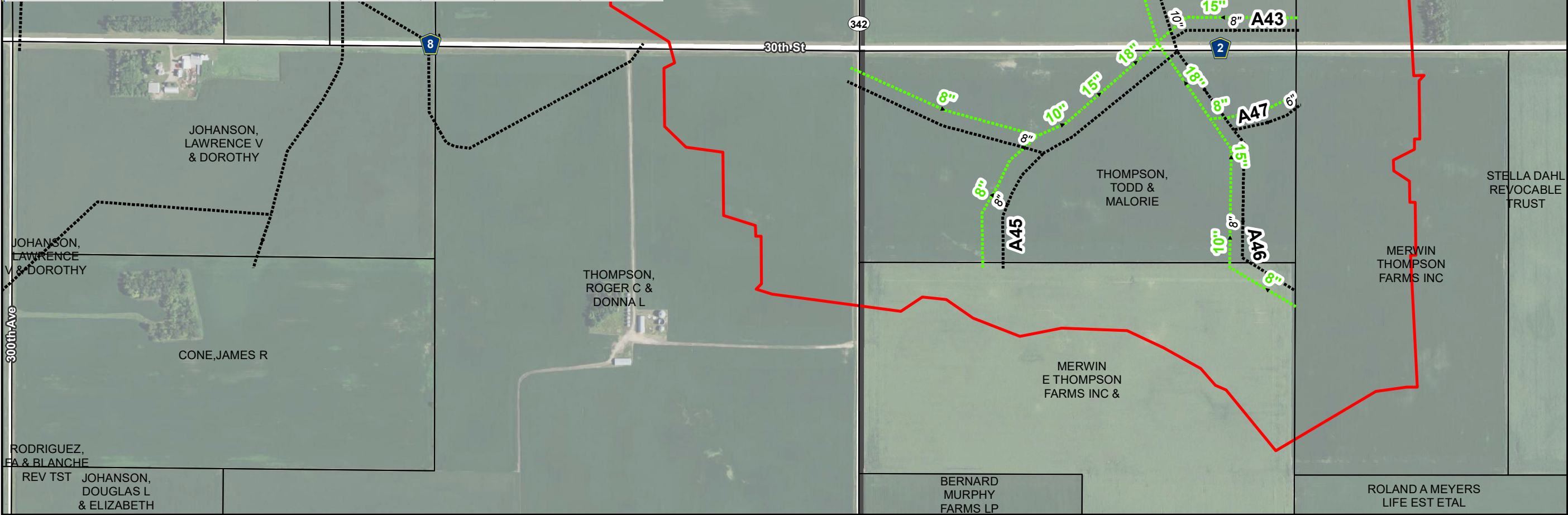
Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 160 320 640 Feet
1 inch = 667 feet



Branch	ACSIC Size (in)	Proposed Size (in)	ACSIC Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
A40	14	24	0.20%	0.15%	427.4	0.13	0.49
A40	12	24	0.20%	0.15%	329.4	0.12	0.63
A40	12	24	0.10%	0.10%	315.2	0.09	0.54
A40	10	24	0.05%	0.10%	268.2	0.04	0.64
A40	8	18	0.50%	0.10%	156.8	0.13	0.51
A40	8	15	0.40%	0.10%	83.6	0.22	0.58
A40	8	15	0.20%	0.10%	83.2	0.15	0.59
A40	8	12	0.40%	0.20%	72.6	0.25	0.52
A40	8	8	0.30%	0.50%	33.2	0.48	0.61
A40	8	8	1.00%	0.50%	25.4	1.14	0.80
A40	8	8	2.00%	0.50%	25.1	1.63	0.81
A43	8	15	0.05%	0.05%	48.0	0.13	0.72
A45	8	8	0.20%	0.20%	17.4	0.74	0.74
A45	8	8	1.60%	1.00%	16.5	2.22	1.75
A45	8	8	4.40%	2.50%	15.9	3.80	2.86
A45	8	8	2.00%	2.50%	6.4	6.33	7.08
A46	10	18	0.05%	0.05%	73.2	0.16	0.77
A46	8	15	0.05%	0.05%	66.6	0.10	0.52
A46	8	15	0.10%	0.05%	54.7	0.17	0.63
A46	8	10	0.30%	0.30%	50.3	0.31	0.57
A46	8	8	0.80%	0.80%	22.4	1.15	1.15
A46	8	8	1.00%	0.80%	18.0	1.60	1.43
A47	6	8	0.05%	0.05%	12.4	0.24	0.52



Improvement Map - Option 2

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Friday, February 7, 2020

Legend

- Open Ditch
- Existing Tile
- Proposed Tile
- Storage
- Parcels
- BranchA40Watershed
- Counties

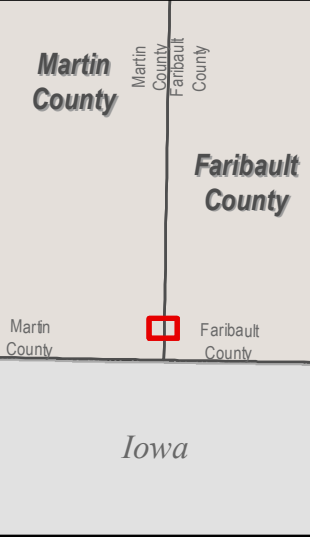
PN: 19-23608

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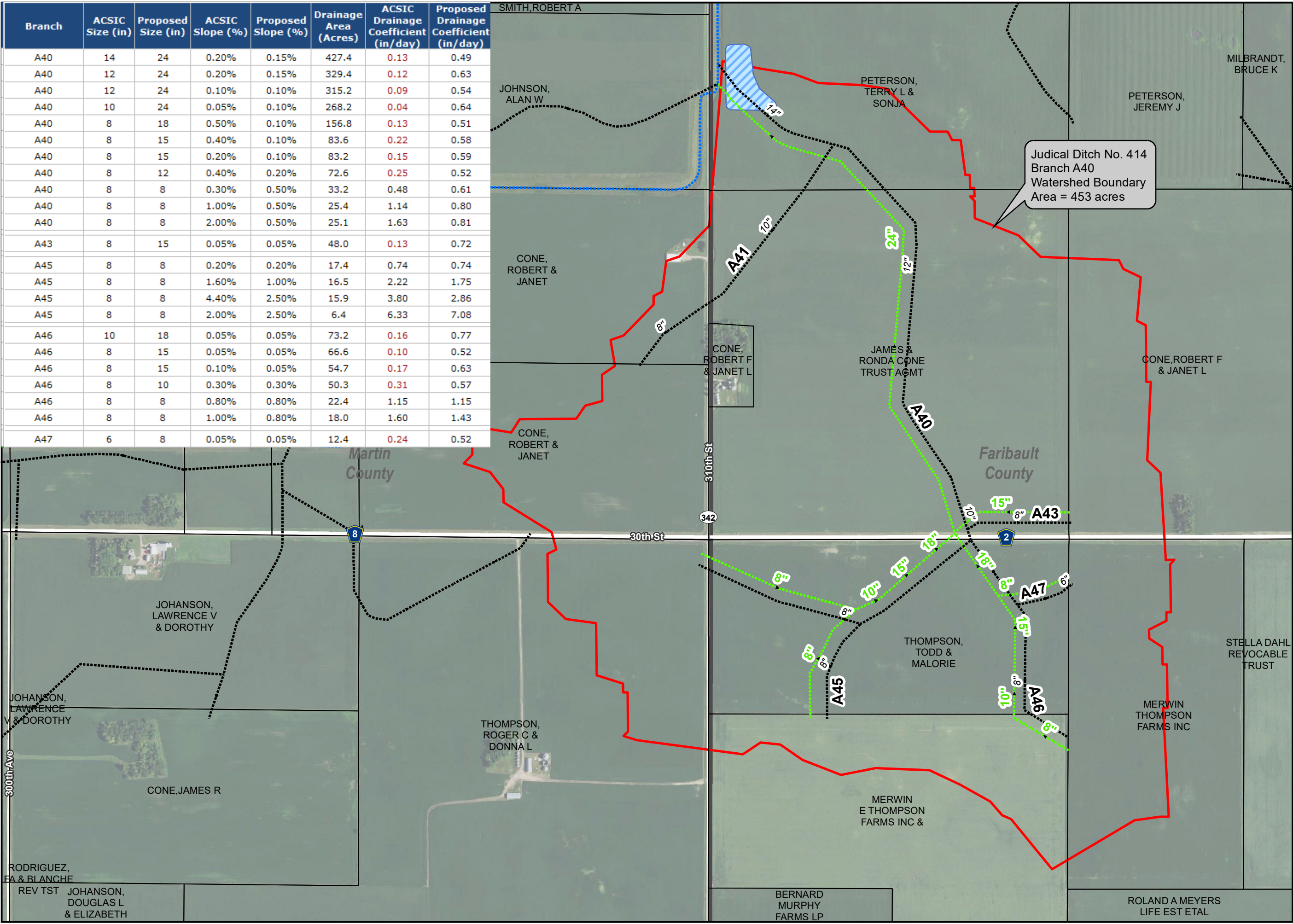
Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 155 310 620 Feet
1 inch = 667 feet



Branch	ACSIC Size (in)	Proposed Size (in)	ACSIC Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	ACSIC Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
A40	14	24	0.20%	0.15%	427.4	0.13	0.49
A40	12	24	0.20%	0.15%	329.4	0.12	0.63
A40	12	24	0.10%	0.10%	315.2	0.09	0.54
A40	10	24	0.05%	0.10%	268.2	0.04	0.64
A40	8	18	0.50%	0.10%	156.8	0.13	0.51
A40	8	15	0.40%	0.10%	83.6	0.22	0.58
A40	8	15	0.20%	0.10%	83.2	0.15	0.59
A40	8	12	0.40%	0.20%	72.6	0.25	0.52
A40	8	8	0.30%	0.50%	33.2	0.48	0.61
A40	8	8	1.00%	0.50%	25.4	1.14	0.80
A40	8	8	2.00%	0.50%	25.1	1.63	0.81
A43	8	15	0.05%	0.05%	48.0	0.13	0.72
A45	8	8	0.20%	0.20%	17.4	0.74	0.74
A45	8	8	1.60%	1.00%	16.5	2.22	1.75
A45	8	8	4.40%	2.50%	15.9	3.80	2.86
A45	8	8	2.00%	2.50%	6.4	6.33	7.08
A46	10	18	0.05%	0.05%	73.2	0.16	0.77
A46	8	15	0.05%	0.05%	66.6	0.10	0.52
A46	8	15	0.10%	0.05%	54.7	0.17	0.63
A46	8	10	0.30%	0.30%	50.3	0.31	0.57
A46	8	8	0.80%	0.80%	22.4	1.15	1.15
A46	8	8	1.00%	0.80%	18.0	1.60	1.43
A47	6	8	0.05%	0.05%	12.4	0.24	0.52



Improvement Map - Option 3

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Friday, February 7, 2020

Legend

- Open Ditch
- Existing Tile
- Proposed Tile
- Storage
- Parcels
- Branch A40 Watershed
- Counties

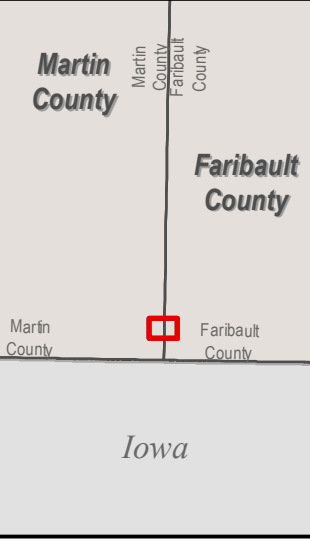
PN: 19-23608

Source:

Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 160 320 640 Feet
1 inch = 667 feet



Appendix D: Multipurpose Drainage Management Plan

Multi-Purpose Drainage Management Plan

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 the following three areas.

Preventative 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

Control measures are practices aimed at improving water quality directly associated with the flow of water by reducing peak flow and 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.

Treatment Measures

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.

Conservative Drainage Practices

Conservative drainage practices, such as construction of controlled drainage systems, provide an option for improving the water quality within a drainage system. Through utilization of control structures, these systems are designed to allow agricultural producers to regulate water levels in their fields. The water level in the ground can be lowered during planting and harvest seasons and allowed to rise during the growing season. Water and nutrients stored in the soil during the growing season can then be used by the crops during drier periods, potentially increasing yields.

Funding

There are several outside sources of funding to potentially help pay for water quality improvements implemented in a ditch improvement project such as this. A main source of funding for this type of project is through the Minnesota Board of Water and Soil Resources (BWSR) Clean Water Fund (CWF). The primary purpose of activities funded with grants associated with the CWF is to restore, protect and enhance water quality. One CWF grant program is the Multipurpose Drainage Management Grant. This grant is geared towards implementing practices that will reduce the transport of sediment and nutrient loads. Some practices that have been funded in the past include grade stabilization, grassed waterways, water and sediment control basins, alternative side inlets, saturated buffers, storage wetlands, denitrifying bioreactors, etc.

Another potential source is the Legislative-Citizen Commission on Minnesota Resources (LCCMR) Environment and Natural Resources Trust Fund (ENRTF) which was established to provide funding for activities that protect, conserve, preserve, and enhance Minnesota's "air, water, land, fish, wildlife, and other natural resources." The LCCMR prioritizes innovative ideas that provide multiple benefits.

Potential locations for additional BMPs are shown on the Multi-Purpose Drainage Management map in this Appendix. If landowners are interested in pursuing practices that go beyond this project scope, a few programs may be a source for funding. The Agriculture Best Management Practices (BMP) Loan Program provides loans to rural landowners to encourage BMPs that help counteract pollution problems.

Another option for individual landowners that are interested in pursuing additional practices is the Environmental Quality Incentives Program (EQIP). EQIP is a voluntary program through the NRCS that provides financial assistance to individual landowners for various conservative practices as identified above.

In addition, the BWSR Community Partners Grant may be an option. This grant leverages the interest of non-governmental partners such as lake and river associations, boy/girl scout troops and other civic groups to install on-the-ground projects that reduce runoff and keep water on the land. It also allows for multiple local government units to work together on a project that involves the Community Partners Grant. Projects installed with the Community Partners Grant are intended to be structural or vegetative practices designed to reduce runoff and/or keep water on the land.

All of the water quality measures proposed with this project are applicable for some source of outside funding. The sources listed above are grants that could be a good fit for this project and if the timing of the project works in conjunction with the grant schedule. These grants can be applied for, if there is support from the drainage authority and/or interest from landowners.

Currently, this project proposes to use Alternative Tile Inlets which we call Water Quality Inlets in all public road ditches. In addition, a 1-acre storage pond is recommended to be implemented as part of the improvement project. Potential locations for these and additional BMPs are shown on the *Multi-Purpose Drainage Management Map* and will be proposed to landowners. Furthermore; additional water quality measures can be implemented with this project if requested.



**MDM
Map**

Judical Ditch No. 414
Martin - Faribault County,
Minnesota
Thursday, January 23, 2020

Legend

- Blind Rock Inlet
- ASI
- ▨ Storage
- ▨ Controlled Drainage
- ▨ Open Ditch
- ⋯ Existing Tile
- ▭ BranchA40Watershed
- ▭ Counties

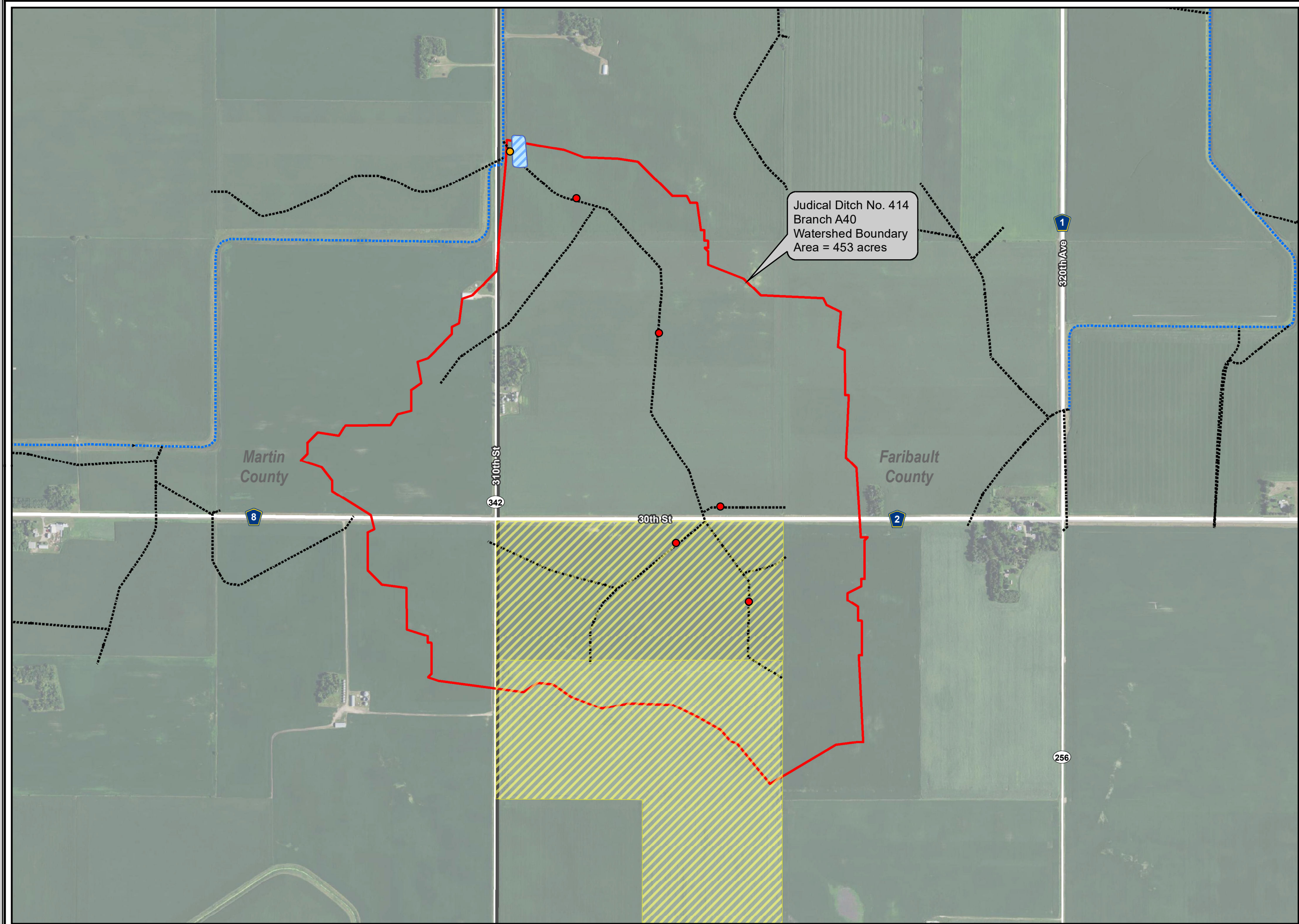
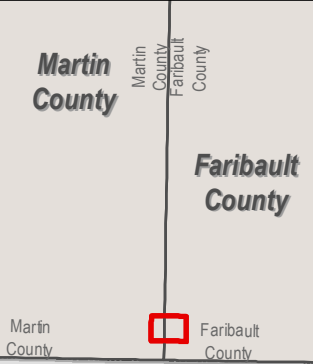
PN: 19-23608

Source:

Orthophotograph (MnGeo WMS, 2015)
Tile/Ditch (XX County, 12/16/2016)
Parcels (XX County, 12/16/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



0 195 390 780 Feet
1 inch = 833 feet



Appendix E: Modeling with Maps

ISG

XP SWMM FLOWRATE TABLE

Denotes peak flows less than or equal to existing



XP SWMM ELEVATION TABLE

[illegible]

ISG

XP SWMM FLOWRATE TABLE

[illegible]



XP SWMM ELEVATION TABLE

[illegible]

ISG

XP SWMM FLOWRATE TABLE

Denotes peak flows less than or equal to existing



XP SWMM ELEVATION TABLE

[illegible]

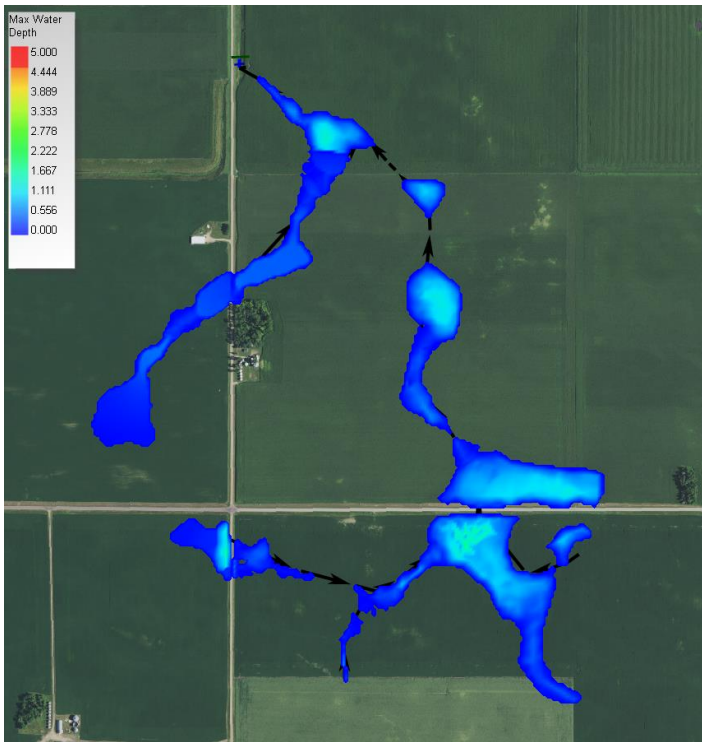


Figure 2: 2-year Rainfall Event Existing Flood Extents

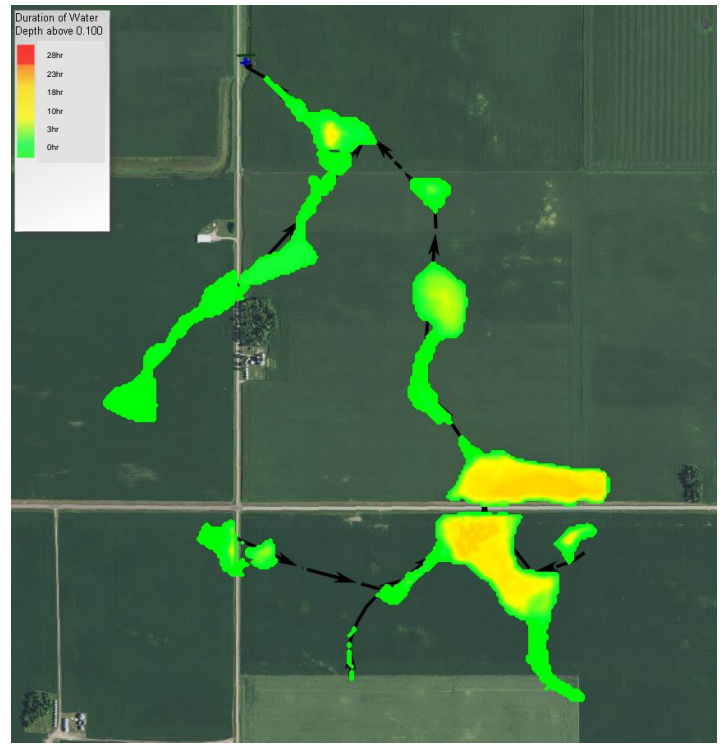


Figure 1: 2-year Rainfall Event Existing Flood Inundation Times

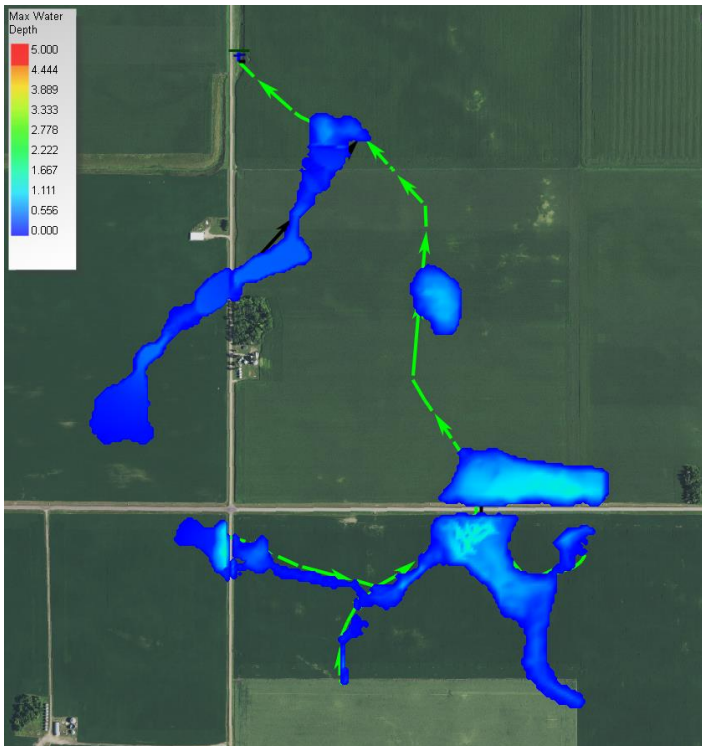


Figure 4: 2-year Rainfall Event Option 1 Flood Extents

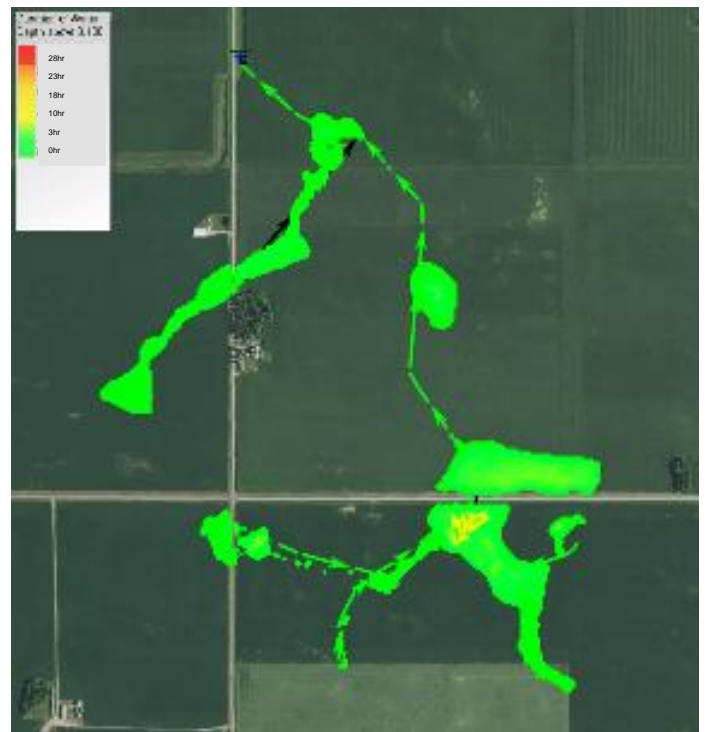


Figure 3: 2-year Rainfall Event Option 1 Inundation Times

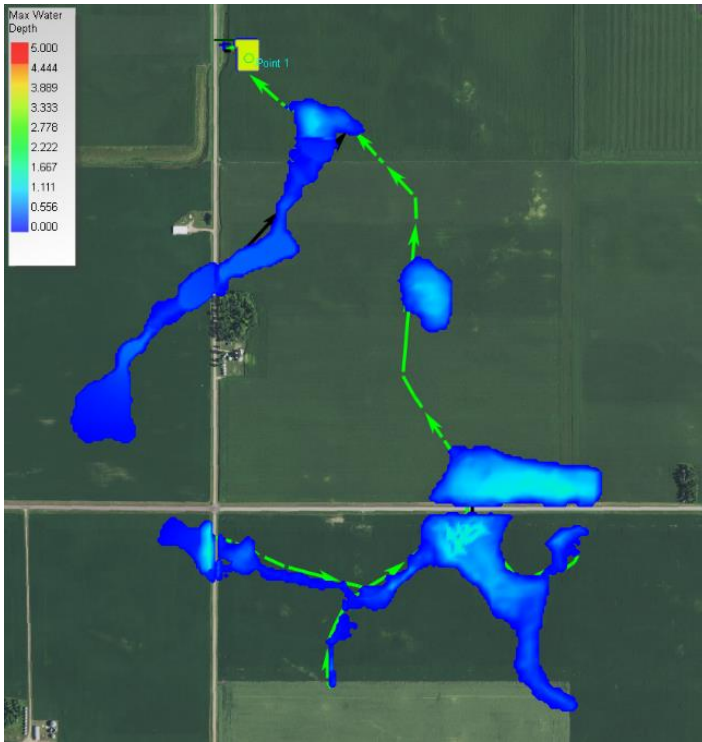


Figure 6: 2-year Rainfall Event Option 2 Flood Extents

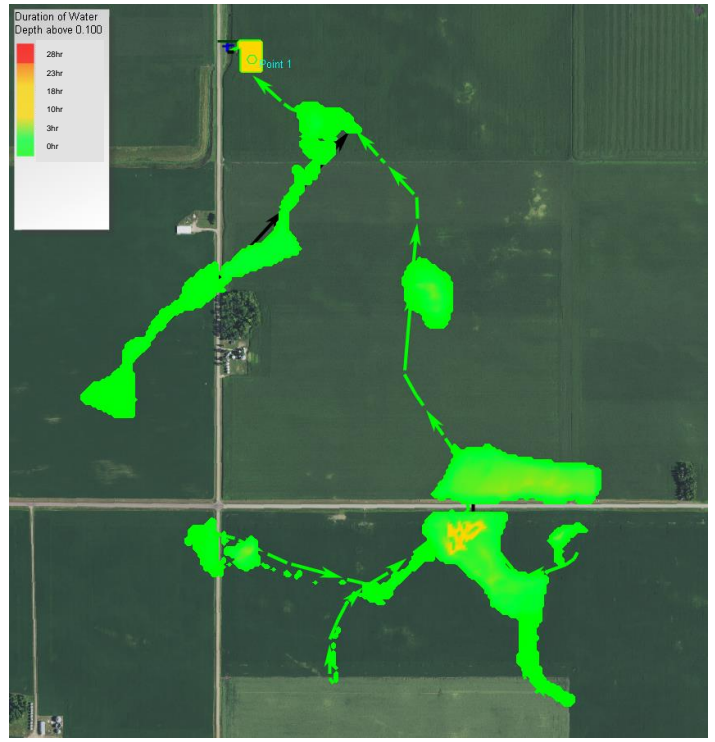


Figure 5: 2-year Rainfall Event Option 2 Inundation Times

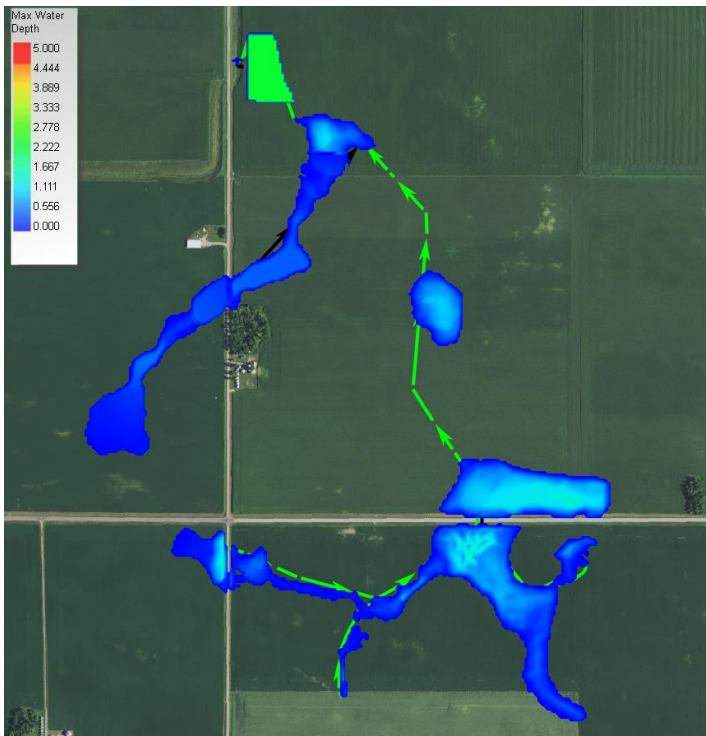


Figure 8: 2-year Rainfall Event Option 3 Flood Extents

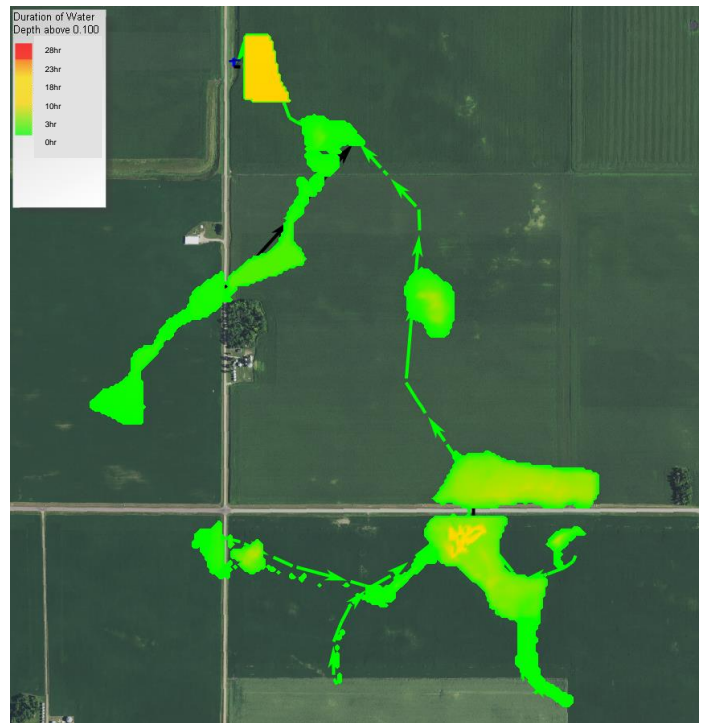


Figure 7: 2-year Rainfall Event Option 3 Inundation Times

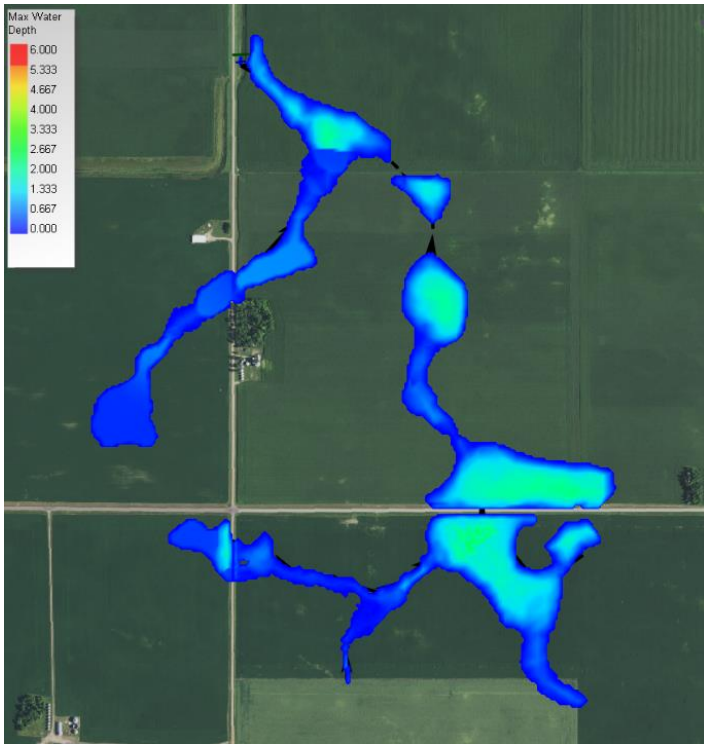


Figure 10: 10-year Rainfall Event Existing Flood Extents

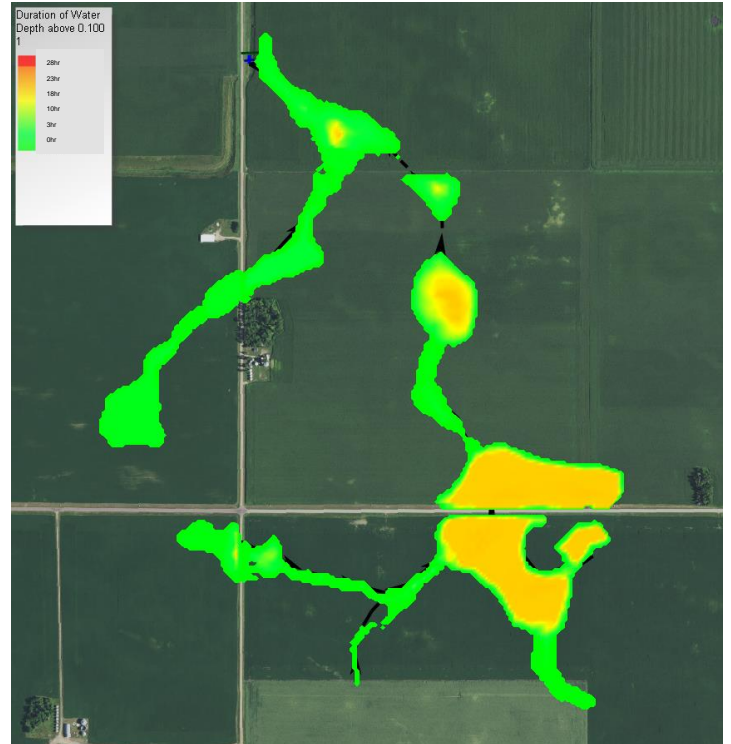


Figure 9: 10-year Rainfall Event Existing Induration Times

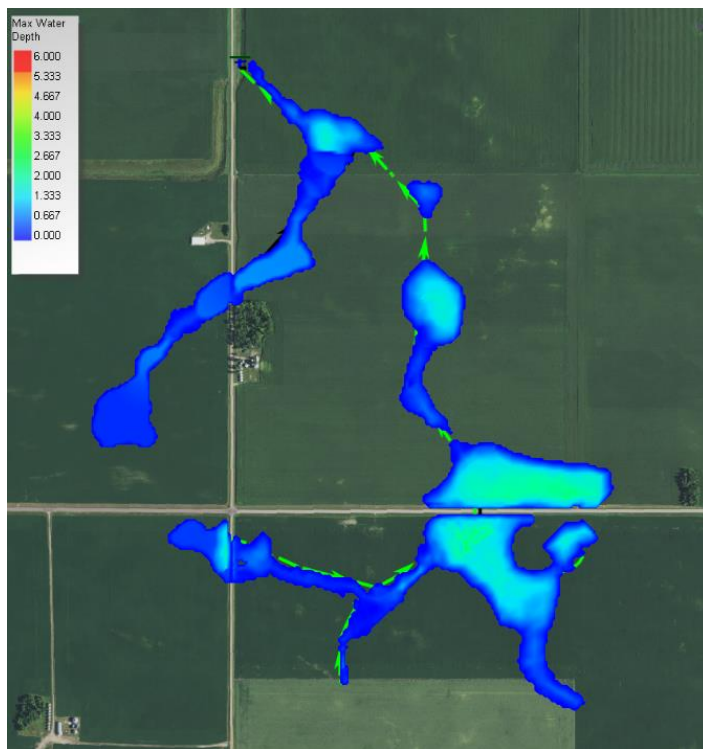


Figure 11: 10-year Rainfall Event Option 1 Flood Extents

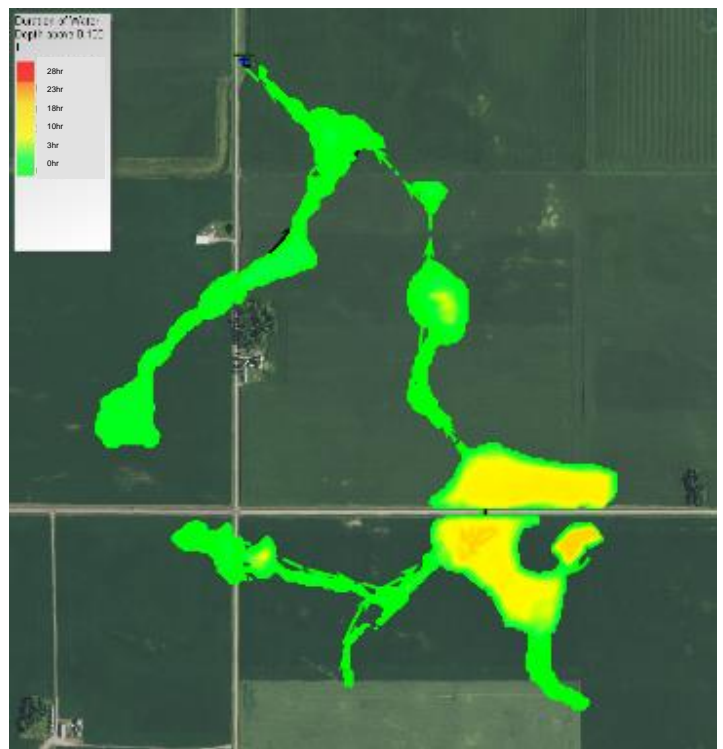


Figure 12: 10-year Rainfall Event Option 1 Inundation Times

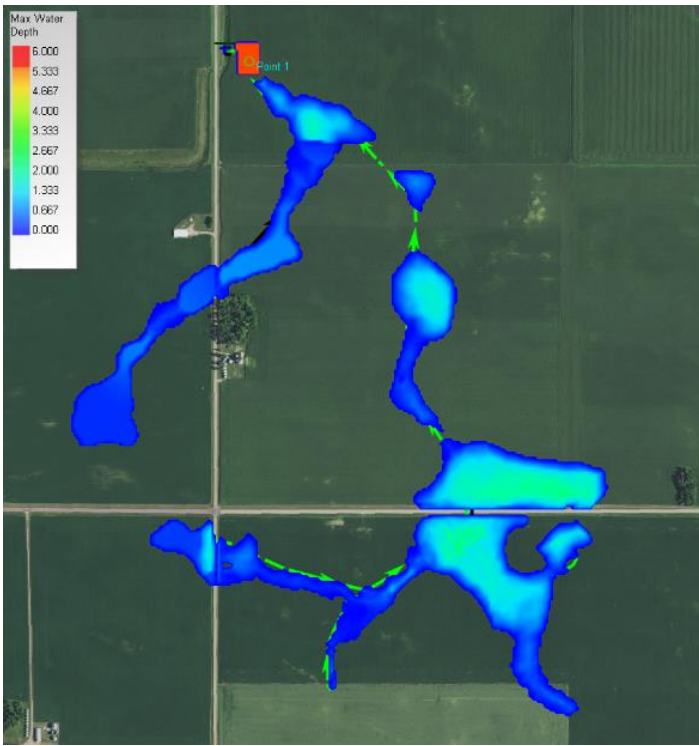


Figure 16: 10-year Rainfall Event Option 2 Flood Extents

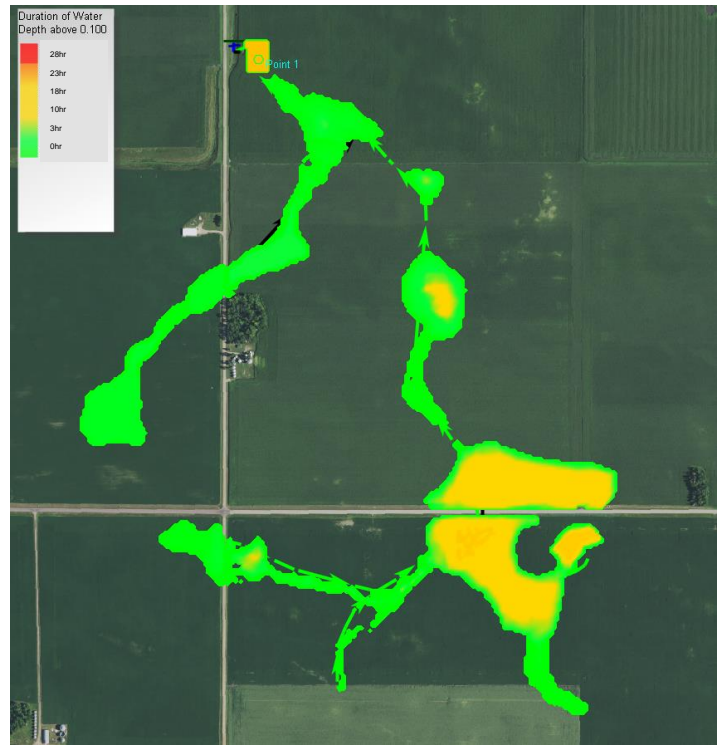


Figure 15: 10-year Rainfall Event Option 2 Inundation Times

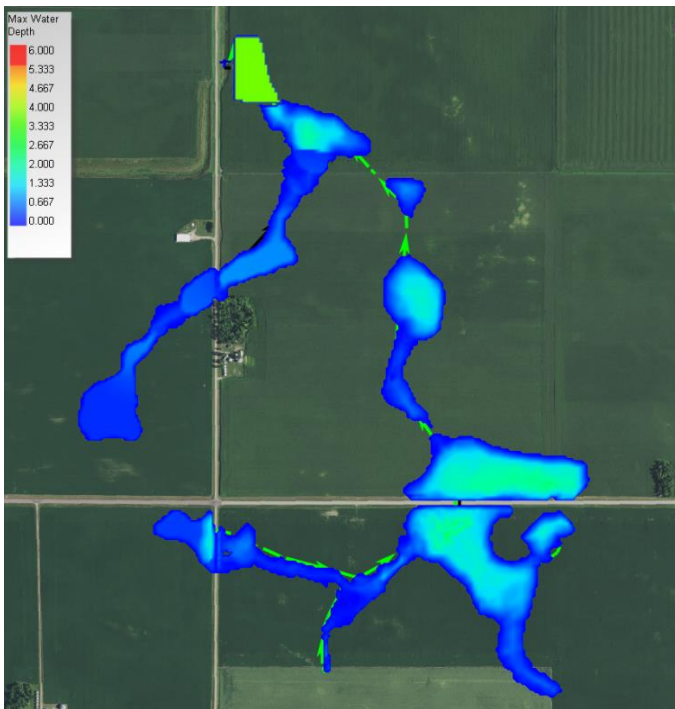


Figure 14: 10-year Rainfall Event Option 3 Flood Extents

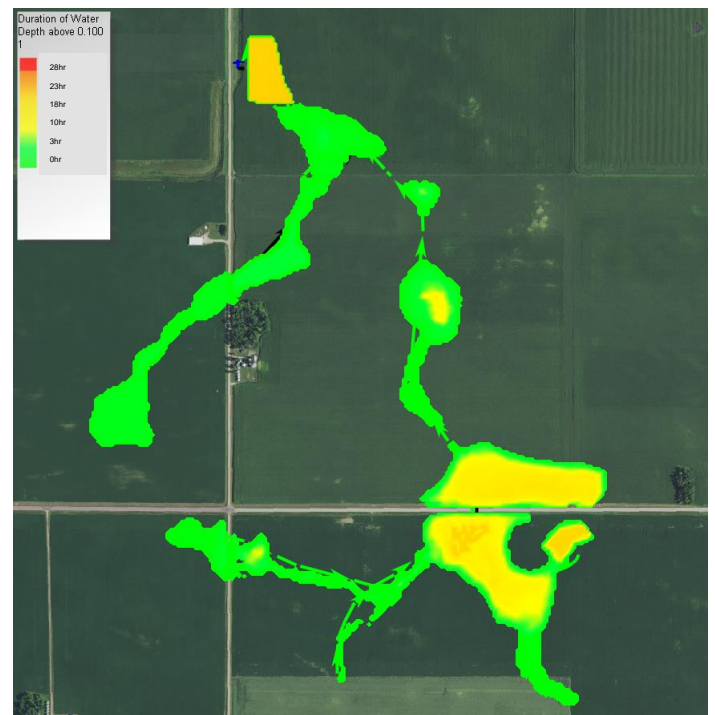


Figure 13: 10-year Rainfall Event Option 3 Indunation Times

Appendix F: Preliminary Cost Estimate

**MARTIN AND FARIBAULT COUNTIES
JUDICIAL DITCH No. 414**



PROPOSED IMPROVEMENT COST SUMMARY

OPTION 1 - TILE IMPROVEMENT

Area	Separable Maintenance	Improvement Cost	Net Cost
Branch A40 Tile	\$ 230,091	\$ 332,751	\$ 102,661
Branch A43 Tile	\$ 25,787	\$ 33,372	\$ 7,586
Branch A45 Tile	\$ 25,653	\$ 27,561	\$ 1,908
Branch A46 Tile	\$ 58,117	\$ 70,993	\$ 12,876
Branch A47 Tile	\$ 12,409	\$ 17,827	\$ 5,418
Subtotal without Road Crossings	\$ 352,056	\$ 482,504	\$ 130,448
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870
Total	\$ 370,251	\$ 520,568	\$ 150,318
Subtotal Landowner Costs			\$ 509,277
Net Costs			\$ 150,318
Viewers Costs			\$ 3,000
Total Project Costs for Landowners			\$ 512,277

OPTION 2 - TILE IMPROVEMENT W/ 1-AC STORAGE

Area	Separable Maintenance	Improvement Cost	Net Cost
Tile Improvement	\$ 352,056	\$ 482,504	\$ 130,448
Storage - 1 AC	\$ -	\$ 92,087	\$ 92,087
Subtotal without Road Crossings	\$ 352,056	\$ 574,591	\$ 222,535
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870
Total	\$ 370,251	\$ 612,656	\$ 242,405
Subtotal Landowner Costs			\$ 601,364
Net Costs			\$ 242,405
Viewers Cost			\$ 3,000
Total Project Costs for Landowners			\$ 604,364

OPTION 3 - TILE IMPROVEMENT W/ 3-AC STORAGE

Area	Separable Maintenance	Improvement Cost	Net Cost
Tile Improvement	\$ 352,056	\$ 482,504	\$ 130,448
Storage - 3 AC	\$ -	\$ 216,128	\$ 216,128
Subtotal without Road Crossings	\$ 352,056	\$ 698,632	\$ 346,575
Road Authority Cost	\$ 11,292	\$ 11,292	\$ -
Damages Paid To Road Authority	\$ 6,902	\$ 26,773	\$ 19,870
Total	\$ 370,251	\$ 736,696	\$ 366,445
Subtotal Landowner Costs			\$ 725,404
Net Costs			\$ 366,445
Viewers Cost			\$ 3,000
Total Project Costs for Landowners			\$ 728,404

SEPARABLE MAINTANENCE (REPAIR)

Branch A40 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,980.00	\$ 6,980
102	TILE INVESTIGATION	HR	14	\$ 130.60	\$ 1,828
103	15-INCH AGRICULTURAL TILE	LF	1100	\$ 19.50	\$ 21,450
104	12-INCH AGRICULTURAL TILE	LF	2400	\$ 17.30	\$ 41,520
105	10-INCH AGRICULTURAL TILE	LF	1000	\$ 16.70	\$ 16,700
106	8-INCH AGRICULTURAL TILE	LF	2350	\$ 14.60	\$ 34,310
107	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 876.80	\$ 877
108	CONNECT EXISTING 15-INCH TILE	EA	1	\$ 697.40	\$ 697
109	CONNECT EXISTING 10-INCH TILE	EA	1	\$ 580.20	\$ 580
110	CONNECT EXISTING 8-INCH TILE	EA	2	\$ 465.70	\$ 931
111	15-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1	\$ 1,073.80	\$ 1,074
112	12-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	2	\$ 1,049.00	\$ 2,098
113	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,170.70	\$ 1,171
114	GRANULAR PIPE FOUNDATION	CY	427	\$ 24.30	\$ 10,386
115	INSTALL DROP INTAKE (18-INCH)	EA	7	\$ 988.50	\$ 6,920
116	CAP DROP INTAKE (18-INCH)	EA	2	\$ 224.70	\$ 449
117	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	28	\$ 500.00	\$ 14,000
TOTAL					\$ 162,000
10% UNFORSEEN					\$ 16,200
SUBTOTAL					\$ 178,200
TEMPORARY DAMAGES		AC	15.73	\$ 650.00	\$ 10,222
COUNTY ADMINISTRATION COSTS					\$ 8,910
TOPOGRAPHIC SURVEY					\$ 5,138
REPORTS, PLANS AND SPECIFICATIONS					\$ 14,256
CONSTRUCTION STAKING & ADMINISTRATION					\$ 13,365
TOTAL BRANCH A40 TILE REPAIR COST					\$ 230,091

Branch A43 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 780.00	\$ 780
102	TILE INVESTIGATION	HR	2	\$ 130.60	\$ 261
103	8-INCH AGRICULTURAL TILE	LF	800	\$ 14.60	\$ 11,680
104	CONNECT EXISTING 10-INCH TILE	EA	1	\$ 580.20	\$ 580
105	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 465.70	\$ 466
106	GRANULAR PIPE FOUNDATION	CY	45	\$ 24.30	\$ 1,092
107	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
108	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 500.00	\$ 2,000
TOTAL					\$ 18,100
10% UNFORSEEN					\$ 1,810
SUBTOTAL					\$ 19,910
TEMPORARY DAMAGES		AC	1.84	\$ 650.00	\$ 1,194
COUNTY ADMINISTRATION COSTS					\$ 996
TOPOGRAPHIC SURVEY					\$ 600
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,593
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,494
TOTAL BRANCH A43 TILE REPAIR COST					\$ 25,787



SEPARABLE MAINTENANCE (REPAIR)

Branch A45 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 780.00	\$ 780
102	TILE INVESTIGATION	HR	2	\$ 130.60	\$ 261
103	8-INCH AGRICULTURAL TILE	LF	800	\$ 14.60	\$ 11,680
104	CONNECT EXISTING 8-INCH TILE	EA	2	\$ 465.70	\$ 931
105	GRANULAR PIPE FOUNDATION	CY	45	\$ 24.30	\$ 1,092
106	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
107	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
108	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 500.00	\$ 2,000
TOTAL					\$ 18,000
10% UNFORSEEN					\$ 1,800
SUBTOTAL					\$ 19,800
TEMPORARY DAMAGES		AC	1.84	\$ 650.00	\$ 1,194
COUNTY ADMINISTRATION COSTS					\$ 990
TOPOGRAPHIC SURVEY					\$ 600
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,584
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,485
TOTAL BRANCH A45 TILE REPAIR COST					\$ 25,653

Branch A46 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,760.00	\$ 1,760
102	TILE INVESTIGATION	HR	4	\$ 130.60	\$ 522
103	10-INCH AGRICULTURAL TILE	LF	600	\$ 16.70	\$ 10,020
104	8-INCH AGRICULTURAL TILE	LF	1200	\$ 14.60	\$ 17,520
105	CONNECT EXISTING 8-INCH TILE	EA	3	\$ 465.70	\$ 1,397
106	8-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1	\$ 775.40	\$ 775
107	GRANULAR PIPE FOUNDATION	CY	103	\$ 24.30	\$ 2,515
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 988.50	\$ 1,977
109	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
110	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	8	\$ 500.00	\$ 4,000
TOTAL					\$ 40,800
10% UNFORSEEN					\$ 4,080
SUBTOTAL					\$ 44,880
TEMPORARY DAMAGES		AC	4.13	\$ 650.00	\$ 2,686
COUNTY ADMINISTRATION COSTS					\$ 2,244
TOPOGRAPHIC SURVEY					\$ 1,350
REPORTS, PLANS AND SPECIFICATIONS					\$ 3,591
CONSTRUCTION STAKING & ADMINISTRATION					\$ 3,366
TOTAL BRANCH A46 TILE REPAIR COST					\$ 58,117



SEPARABLE MAINTANENCE (REPAIR)

Branch A47 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 370.00	\$ 370
102	TILE INVESTIGATION	HR	1	\$ 130.60	\$ 131
103	6-INCH AGRICULTURAL TILE	LF	450	\$ 9.90	\$ 4,455
104	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 465.70	\$ 466
105	CONNECT EXISTING 6-INCH TILE	EA	1	\$ 377.90	\$ 378
106	GRANULAR PIPE FOUNDATION	CY	24	\$ 24.30	\$ 574
107	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
108	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 500.00	\$ 1,000
TOTAL					\$ 8,600
10% UNFORSEEN					\$ 860
SUBTOTAL					\$ 9,460
TEMPORARY DAMAGES		AC	1.03	\$ 650.00	\$ 671
COUNTY ADMINISTRATION COSTS					\$ 473
TOPOGRAPHIC SURVEY					\$ 338
REPORTS, PLANS AND SPECIFICATIONS					\$ 757
CONSTRUCTION STAKING & ADMINISTRATION					\$ 710
TOTAL BRANCH A47 TILE REPAIR COST					\$ 12,409

TOTAL REPAIR COST

Branch A40 Tile	\$ 230,091
Branch A43 Tile	\$ 25,787
Branch A45 Tile	\$ 25,653
Branch A46 Tile	\$ 58,117
Branch A47 Tile	\$ 12,409
COMPLETE REPAIR COST	\$ 352,056

MARTIN AND FARIBAULT COUNTIES
JUDICIAL DITCH No. 414
February 7, 2020

ISG

PROPOSED IMPROVEMENT

Branch A40 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 10,260.00	\$ 10,260
102	TILE INVESTIGATION	HR	13	\$ 130.60	\$ 1,698
104	24-INCH AGRICULTURAL TILE	LF	4245	\$ 32.70	\$ 138,812
105	18-INCH AGRICULTURAL TILE	LF	100	\$ 22.50	\$ 2,250
106	15-INCH AGRICULTURAL TILE	LF	410	\$ 19.50	\$ 7,995
105	12-INCH AGRICULTURAL TILE	LF	1220	\$ 17.30	\$ 21,106
107	8-INCH AGRICULTURAL TILE	LF	451	\$ 14.60	\$ 6,585
108	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 876.80	\$ 877
109	CONNECT EXISTING 15-INCH TILE	EA	1	\$ 697.40	\$ 697
110	CONNECT EXISTING 10-INCH TILE	EA	1	\$ 580.20	\$ 580
111	CONNECT EXISTING 8-INCH TILE	EA	2	\$ 465.70	\$ 931
112	15-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1	\$ 1,073.80	\$ 1,074
113	12-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	2	\$ 1,049.00	\$ 2,098
114	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,658.60	\$ 1,659
116	FURNISH & INSTALL WATER QUALITY INLET	EA	4	\$ 1,152.60	\$ 4,610
117	INSTALL 12-INCH PERFORATED TILE	LF	158	\$ 13.00	\$ 2,054
118	GRANULAR PIPE FOUNDATION	CY	517	\$ 24.30	\$ 12,559
119	INSTALL DROP INTAKE (18-INCH)	EA	9	\$ 988.50	\$ 8,897
120	CAP DROP INTAKE (18-INCH)	EA	2	\$ 224.70	\$ 449
121	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	26	\$ 500.00	\$ 13,000
TOTAL					\$ 238,190
10% UNFORSEEN					\$ 23,819
SUBTOTAL					\$ 262,009
TEMPORARY DAMAGES		AC	14.75	\$ 650.00	\$ 9,589
COUNTY ADMINISTRATION COSTS					\$ 13,101
TOPOGRAPHIC SURVEY					\$ 4,820
REPORTS, PLANS AND SPECIFICATIONS					\$ 23,581
CONSTRUCTION STAKING & ADMINISTRATION					\$ 19,651
TOTAL BRANCH A40 TILE IMPROVEMENT COST					\$ 332,751

Branch A43 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,040.00	\$ 1,040
102	TILE INVESTIGATION	HR	2	\$ 130.60	\$ 261
103	15-INCH AGRICULTURAL TILE	LF	870	\$ 19.50	\$ 16,965
104	CONNECT EXISTING 10-INCH TILE	EA	1	\$ 580.20	\$ 580
105	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 465.70	\$ 466
106	GRANULAR PIPE FOUNDATION	CY	62	\$ 24.30	\$ 1,507
107	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
108	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 500.00	\$ 2,000
TOTAL					\$ 24,033
10% UNFORSEEN					\$ 2,403
SUBTOTAL					\$ 26,436
TEMPORARY DAMAGES		AC	2.00	\$ 650.00	\$ 1,298
COUNTY ADMINISTRATION COSTS					\$ 1,322
TOPOGRAPHIC SURVEY					\$ 653
REPORTS, PLANS AND SPECIFICATIONS					\$ 2,380
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,983
TOTAL BRANCH A43 TILE IMPROVEMENT COST					\$ 34,072

PROPOSED IMPROVEMENT

Branch A45 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 830.00	\$ 830
102	TILE INVESTIGATION	HR	2	\$ 130.60	\$ 261
103	8-INCH AGRICULTURAL TILE	LF	872	\$ 14.60	\$ 12,731
104	CONNECT EXISTING 8-INCH TILE	EA	2	\$ 465.70	\$ 931
106	GRANULAR PIPE FOUNDATION	CY	49	\$ 24.30	\$ 1,191
107	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
108	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 500.00	\$ 2,000
TOTAL					\$ 19,158
10% UNFORSEEN					\$ 1,916
SUBTOTAL					\$ 21,073
TEMPORARY DAMAGES		AC	2.00	\$ 650.00	\$ 1,301
COUNTY ADMINISTRATION COSTS					\$ 1,054
TOPOGRAPHIC SURVEY					\$ 654
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,897
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,581
TOTAL BRANCH A45 TILE IMPROVEMENT COST					\$ 27,561

Branch A46 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,160.00	\$ 2,160
102	TILE INVESTIGATION	HR	4	\$ 130.60	\$ 522
103	18-INCH AGRICULTURAL TILE	LF	600	\$ 22.50	\$ 13,500
104	15-INCH AGRICULTURAL TILE	LF	500	\$ 19.50	\$ 9,750
105	10-INCH AGRICULTURAL TILE	LF	200	\$ 16.70	\$ 3,340
106	8-INCH AGRICULTURAL TILE	LF	567	\$ 14.60	\$ 8,278
107	CONNECT EXISTING 8-INCH TILE	EA	3	\$ 465.70	\$ 1,397
108	8-INCH CROSS-CONNECT W/30 LF OF SPECIFIED PIPE	EA	1	\$ 775.40	\$ 775
109	GRANULAR PIPE FOUNDATION	CY	126	\$ 24.30	\$ 3,071
110	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 988.50	\$ 2,966
111	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
112	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	8	\$ 500.00	\$ 4,000
TOTAL					\$ 49,984
10% UNFORSEEN					\$ 4,998
SUBTOTAL					\$ 54,983
TEMPORARY DAMAGES		AC	4.29	\$ 650.00	\$ 2,786
COUNTY ADMINISTRATION COSTS					\$ 2,750
TOPOGRAPHIC SURVEY					\$ 1,401
REPORTS, PLANS AND SPECIFICATIONS					\$ 4,949
CONSTRUCTION STAKING & ADMINISTRATION					\$ 4,124
TOTAL BRANCH A46 TILE IMPROVEMENT COST					\$ 70,993

PROPOSED IMPROVEMENT

Branch A47 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 540.00	\$ 540
102	TILE INVESTIGATION	HR	2	\$ 130.60	\$ 261
103	8-INCH AGRICULTURAL TILE	LF	509	\$ 14.60	\$ 7,431
104	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 465.70	\$ 466
105	CONNECT EXISTING 6-INCH TILE	EA	1	\$ 377.90	\$ 378
106	GRANULAR PIPE FOUNDATION	CY	29	\$ 24.30	\$ 695
107	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 988.50	\$ 989
108	CAP DROP INTAKE (18-INCH)	EA	1	\$ 224.70	\$ 225
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	\$ 500.00	\$ 1,500
TOTAL					\$ 12,484
10% UNFORSEEN					\$ 1,248
SUBTOTAL					\$ 13,733
TEMPORARY DAMAGES		AC	1.17	\$ 650.00	\$ 760
COUNTY ADMINISTRATION COSTS					\$ 687
TOPOGRAPHIC SURVEY					\$ 382
REPORTS, PLANS AND SPECIFICATIONS					\$ 1,236
CONSTRUCTION STAKING & ADMINISTRATION					\$ 1,030
TOTAL BRANCH A47 TILE IMPROVEMENT COST					\$ 17,827

Storage - 1.0 AC

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,640.00	\$ 2,640
102	COMMON EXCAVATION (P) (EV)	CY	14520	\$ 2.30	\$ 33,396
103	INSTALL STRUCTURE S-1 WITH GALVINIZED GRATE	LS	1	\$ 14,462.30	\$ 14,462
104	24-INCH CLASS III RCP PIPE	LF	36	\$ 63.00	\$ 2,268
105	15-INCH CLASS III RCP PIPE	LF	24	\$ 35.00	\$ 840
106	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	\$ 75.90	\$ 3,795
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	0.32	\$ 1,368.20	\$ 441
108	STANDARD SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	0.35	\$ 2,958.50	\$ 1,039
109	STANDARD POND BOTTOM SEEDING (SEED MIX: 24-261 W/ TYPE 7 (BFM) MULCH)	AC	0.65	\$ 3,450.00	\$ 2,238
TOTAL					\$ 61,119
10% UNFORSEEN					\$ 6,112
SUBTOTAL					\$ 67,231
TEMPORARY DAMAGES		AC	6.00	\$ 650.00	\$ 3,900
LAND ACQUISITION/ PERMANENT DAMAGES		AC	1.00	\$ 6,500.00	\$ 6,500
COUNTY ADMINISTRATION COSTS					\$ 3,362
TOPOGRAPHIC SURVEY					\$ -
REPORTS, PLANS AND SPECIFICATIONS					\$ 6,051
CONSTRUCTION STAKING & ADMINISTRATION					\$ 5,043
TOTAL STORAGE - 1.0 AC IMPROVEMENT COST					\$ 92,087

MARTIN AND FARIBAULT COUNTIES
JUDICIAL DITCH No. 414
February 7, 2020

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PROPOSED IMPROVEMENT

Storage - 3.0 AC

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 5,960.00	\$ 5,960
102	COMMON EXCAVATION (P) (EV)	CY	43560	\$ 2.30	\$ 100,188
103	INSTALL STRUCTURE S-1 WITH GALVINIZED GRATE	LS	1	\$ 14,462.30	\$ 14,462
104	24-INCH CLASS III RCP PIPE	LF	36	\$ 63.00	\$ 2,268
105	15-INCH CLASS III RCP PIPE	LF	24	\$ 35.00	\$ 840
106	CLASS III RIPRAP WITH GEOTEXTILE FABRIC	CY	50	\$ 75.90	\$ 3,795
107	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	0.60	\$ 1,368.20	\$ 825
108	STANDARD SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 8 MULCH)	AC	0.66	\$ 2,958.50	\$ 1,946
109	STANDARD POND BOTTOM SEEDING (SEED MIX: 24-261 W/ TYPE 7 (BFM) MULCH)	AC	2.34	\$ 3,450.00	\$ 8,080
TOTAL					\$ 138,365
10% UNFORSEEN					\$ 13,837
SUBTOTAL					\$ 152,202
TEMPORARY DAMAGES		AC	18.00	\$ 650.00	\$ 11,700
LAND ACQUISITION/ PERMANENT DAMAGES		AC	3.00	\$ 6,500.00	\$ 19,500
COUNTY ADMINISTRATION COSTS					\$ 7,611
TOPOGRAPHIC SURVEY					\$ -
REPORTS, PLANS AND SPECIFICATIONS					\$ 13,699
CONSTRUCTION STAKING & ADMINISTRATION					\$ 11,416
TOTAL STORAGE - 3.0 AC IMPROVEMENT COST					\$ 216,128

MARTIN AND FARIBAULT COUNTIES
JUDICIAL DITCH No. 414
February 7, 2020



PROPOSED IMPROVEMENT
IMPROVEMENT - OPTION 1

Branch A40 Tile	\$	332,751
Branch A43 Tile	\$	34,072
Branch A45 Tile	\$	27,561
Branch A46 Tile	\$	70,993
Branch A47 Tile	\$	17,827

IMPROVEMENT - OPTION 1	\$	483,204
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IMPROVEMENT - OPTION 2

Tile Improvement Cost	\$	483,204
Storage - 1.0 AC	\$	92,087

IMPROVEMENT - OPTION 2	\$	575,291
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IMPROVEMENT - OPTION 3

Tile Improvement Cost	\$	483,204
Storage - 3.0 AC	\$	216,128

IMPROVEMENT - OPTION 3	\$	699,331
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MARTIN AND FARIBAULT COUNTIES

JUDICIAL DITCH No. 414

February 7, 2020



ROAD CROSSING SUMMARY

Crossing	Road Authority	Repair Cost With Road	Repair Cost Without Road	Improvement Cost	Road Authority Cost (Difference of Repair Cost With Road and Repair Cost Without Road)	Damages Paid To Road Authority (Difference of Improvement Cost and Road Authority Cost)
Branch A40 Tile						
County Road 2	FARIBAULT COUNTY	\$ 11,545	\$ 4,295	\$ 31,415	\$ 7,250	\$ 24,165
310th Avenue	TOWNSHIP	\$ 6,650	\$ 2,608	\$ 6,650	\$ 4,042	\$ 2,608
TOTAL		\$ 18,194	\$ 6,902	\$ 38,064	\$ 11,292	\$ 26,773
FARIBAULT COUNTY ROAD AUTHORITY TOTAL		\$ 11,545	\$ 4,295	\$ 31,415	\$ 7,250	\$ 24,165
TOWNSHIP ROAD AUTHORITY TOTAL		\$ 6,650	\$ 2,608	\$ 6,650	\$ 4,042	\$ 2,608

ROAD CROSSINGS

BRANCH A40 TILE REPAIR COST WITH ROAD - COUNTY ROAD 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 400.00	\$ 400
102	BORE 10-INCH TILE	LF	70	\$ 87.40	\$ 6,118
103	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 988.50	\$ 1,977
TOTAL					\$ 8,495
10% CONTINGENCY					\$ 850
SUBTOTAL					\$ 9,345
COUNTY ADMINISTRATION COSTS					\$ 500
REPORTS, PLANS AND SPECIFICATIONS					\$ 900
CONSTRUCTION STAKING & ADMINISTRATION					\$ 800
ESTIMATED BRANCH A40 TILE REPAIR COST WITH ROAD - COUNTY ROAD 2					\$ 11,545

BRANCH A40 TILE REPAIR COST WITHOUT ROAD - COUNTY ROAD 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 200.00	\$ 200
202	24-INCH AGRICULTURAL TILE	LF	70	\$ 32.70	\$ 2,289
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 500.00	\$ 1,000
TOTAL					\$ 3,489
10% CONTINGENCY					\$ 349
SUBTOTAL					\$ 3,838
TEMPORARY DAMAGES		AC	0.24	\$ 650.00	\$ 157
COUNTY ADMINISTRATION COSTS					\$ 100
REPORTS, PLANS AND SPECIFICATIONS					\$ 100
CONSTRUCTION STAKING & ADMINISTRATION					\$ 100
ESTIMATED BRANCH A40 TILE REPAIR COST WITHOUT ROAD - COUNTY ROAD 2					\$ 4,295

BRANCH A40 TILE IMPROVEMENT COST - COUNTY ROAD 2

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 1,100.00	\$ 1,100
302	BORE 24-INCH TILE	LF	70	\$ 290.00	\$ 20,300
303	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 988.50	\$ 1,977
TOTAL					\$ 23,377
10% CONTINGENCY					\$ 2,338
SUBTOTAL					\$ 25,715
COUNTY ADMINISTRATION COSTS					\$ 1,300
REPORTS, PLANS AND SPECIFICATIONS					\$ 2,400
CONSTRUCTION STAKING & ADMINISTRATION					\$ 2,000
ESTIMATED BRANCH A40 TILE IMPROVEMENT COST - COUNTY ROAD 2					\$ 31,415

ROAD CROSSINGS

BRANCH A40 TILE REPAIR COST WITH ROAD - 310TH AVENUE

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 300.00	\$ 300
102	8-INCH AGRICULTURAL TILE	LF	60	\$ 14.60	\$ 876
103	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 1,710.30	\$ 1,710
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 988.50	\$ 1,977
TOTAL					\$ 4,863
10% CONTINGENCY					\$ 486
SUBTOTAL					\$ 5,350
COUNTY ADMINISTRATION COSTS					\$ 300
REPORTS, PLANS AND SPECIFICATIONS					\$ 500
CONSTRUCTION STAKING & ADMINISTRATION					\$ 500
ESTIMATED BRANCH A40 TILE REPAIR COST WITH ROAD - 310TH AVENUE					\$ 6,650

BRANCH A40 TILE REPAIR COST WITHOUT ROAD - 310TH AVENUE

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	8-INCH AGRICULTURAL TILE	LF	60	\$ 14.60	\$ 876
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 500.00	\$ 1,000
TOTAL					\$ 1,976
10% CONTINGENCY					\$ 198
SUBTOTAL					\$ 2,174
TEMPORARY DAMAGES		AC	0.21	\$ 650.00	\$ 134
COUNTY ADMINISTRATION COSTS					\$ 100
REPORTS, PLANS AND SPECIFICATIONS					\$ 100
CONSTRUCTION STAKING & ADMINISTRATION					\$ 100
ESTIMATED BRANCH A40 TILE REPAIR COST WITHOUT ROAD - 310TH AVENUE					\$ 2,608

BRANCH A40 TILE IMPROVEMENT COST - 310TH AVENUE

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 300.00	\$ 300
302	8-INCH AGRICULTURAL TILE	LF	60	\$ 14.60	\$ 876
303	OPEN CUT & RESTORE GRAVEL ROAD OR DRIVEWAY	EA	1	\$ 1,710.30	\$ 1,710
304	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 988.50	\$ 1,977
TOTAL					\$ 4,863
10% CONTINGENCY					\$ 486
SUBTOTAL					\$ 5,350
COUNTY ADMINISTRATION COSTS					\$ 300
REPORTS, PLANS AND SPECIFICATIONS					\$ 500
CONSTRUCTION STAKING & ADMINISTRATION					\$ 500
ESTIMATED BRANCH A40 TILE IMPROVEMENT COST - 310TH AVENUE					\$ 6,650