ENGINEER'S PRELIMINARY REPORT

REPAIR & IMPROVEMENT OF
COUNTY DITCH NO. 8
FREEBORN COUNTY, MN

PREPARED FOR:
Turtle Creek Watershed District
1408 21st Ave NW
Austin, MN 55912

PREPARED BY:
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JONES HAUGH SMITH
Engineers + Surveyors

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.

STEVEN J. PENKAVA

LIC. NO. 43895

DATE: December 19, 2023

PREPARED BY:

JONES, HAUGH & SMITH INC.

515 S WASHINGTON AVE

ALBERT LEA, MN 56007

REPAIR & IMPROVEMENT TO FREEBORN COUNTY DITCH NO. 8

PROJECT NUMBER: 18-175

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SUMMARY

1. HISTORY
    a. The project tiles were originally constructed as part of Judicial Ditch No. 7 (JD 7) which was established in 1922 and constructed in 1923. JD 7 outlets into County Ditch No. 8 (CD 8), which was established in the early 1900's.
    b. JD 7 consists of the main tile and six tile branches totaling approximately 14,485 feet in length with sizes ranging from 6 to 24 inches.
    c. In 1999, a Redetermination of Benefits and Damages was completed for ditches CD 8, JD 7, CD 57, CD 61 and CD 67 and the ditches were consolidated into CD 8.

2. INVESTIGATION AND FINDINGS
    a. The total watershed of CD 8 is approximately 6,149 acres of which approximately 509 acres (8.3%) are in the project watershed.
    b. Approximately 3,600 feet or 44 percent of the J7 Main tile was televised and located. Televising revealed cracked tile, misaligned joints, sags in the pipe, poorly installed tile connections and debris in the pipe as shown in the following pictures. Organic soils in low areas along the tile alignment have subsided resulting in shallow tile.
    c. The Natural Resource Conservation Service (NRCS) design guidelines recommend a drainage coefficient of 0.50 inches per day for the project watershed. The drainage coefficient is defined as the depth of water drained from the contributing watershed over a 24-hour period.
    d. The CD 8 tiles are undersized and lack sufficient capacity. The drainage coefficients of the tiles range between 0.09 to 0.26 inches per day. Tile with offset joints, roots, sags or other issues are likely to have even less than the calculated capacity.

3. PROPOSED SOLUTION
    a. The proposed improvements consist of constructing approximately 10,470 feet of subsurface tile ranging in size from 8 inches to 30 inches in diameter and construction of a 4-acre wetland.
    b. The proposed tile will replace the existing CD 8 tile and the existing tile will be crossed by the proposed tile and segmented and/or destroyed during construction. The proposed main tile will serve as the single outlet for the project watershed.
    c. The proposed tile will be non-perforated dual wall polyethylene tile (DWPE) with watertight connections. Township road crossings would be made by open trench methods and the roadway surface restored with 6 inches of gravel.
    d. The project will replace all existing open tile inlets with alternative tile inlets. No open inlets are planned as part of this project.

e. Tile inspection inlets will be installed at property boundaries and will be constructed approximately 4 feet above the natural grade and capped to prevent surface water from entering the system.

4. ABANDONMENT OF EXISTING TILE
    a. The proposed tile is designed to replace the existing J7 Main, J7 Branch D and J7 Branch C tiles. We recommend the existing tile be abandoned and said tile made private and therefore no longer maintained by the Drainage Authority.

5. APPORTIONMENT OF REPAIR COSTS
    a. In accordance with Minnesota Statute 103E.215 Subdivision 6, the repair cost allocation for the project is 56.8%. Engineering, legal, administrative, bonding and interest costs could be allocated similarly.

6. OPINION OF PROBABLE COST

SUMMARY	
J7 Main Tile Construction	$399,874
J7 Branch C Tile Construction	58,500
J7 Branch D Tile Construction	14,094
Wetland Restoration	51,850
Contingencies	78,700
Engineering, Legal, Viewing and Administrative	108,545
TOTAL ESTIMATED COST	**$711,563**

7. OUTLET ANALYSIS
    a. An existing and proposed conditions model was developed and pre versus post flow conditions were modeled at the next two downstream crossings.
    b. Post construction peak water surface elevations are estimated to increase 3.1-inches or less for all storm events at 780th Avenue and culvert outlets velocities are estimated to increase by 0.2 feet per second or less.
    c. A goal of the Cedar-Wapsipinicon Comprehensive Watershed Management Plan is to decrease flooding and increase watershed wide storage by 0.25 inches per acre. For the project watershed this results in a storage goal of 9.7 acre-feet.
    d. The initial wetland restoration work on the Ball property was limited due to the project tile traversing the site. The NRCS has approved construction of a 4 acre wetland which will provide an additional 4 acre-feet of water storage.
    e. The wetland will store surface water that is currently landlocked upstream of 330th Street and drained directly to CD 8. The wetland reduces peak flows for all storm events from the proposed scenario. Peak water surface elevations are estimated to remain

nearly unchanged for most storm events and decrease by 3.6 inches for the 100-year storm event at 780th Avenue.

f. The model results show the proposed improvement produces minimal impact at the project outlet and the next two downstream crossings. However, opportunities in the project watershed exist to incrementally implement storage goals from the Cedar-Wapsipinicon Comprehensive Watershed Management Plan by creating a 4 acre wetland. The wetland will reduce flooding and improve water quality within the project watershed.
g. It is the opinion of the Engineer that the outlet is adequate for the proposed improvements with or without the wetland construction.

8. ENVIRONMENTAL CRITERIA
    a. The Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021, Agricultural BMP Handbook for Minnesota, Cedar River Watershed Restoration and Protection Strategy Report and the Cedar-Wapsipinicon Comprehensive Watershed Management Plan were reviewed.
    b. Adverse effects of the proposed project will be temporary in nature and include temporary disruption of normal cropping practices and potential for reduced yields within the project construction limits. After construction, the trench area will be restored and salvaged topsoil re-spread, however, said area may lack in productivity for the first few years.
    c. Temporary noise and dust will be generated during construction.
    d. Project benefits include more manageable fields, timely cropping procedures, reduced compaction, and improved crop yields. Additional benefits will be derived from increased farm revenue and improved tax base within the watershed.
    e. No wetlands will be impacted by the proposed construction.
    f. The proposed BMP's will remove approximately 976 pounds of nitrogen, 122 tons of sediment and 11 pounds of phosphorus from the project watershed per year. Implementation of the proposed construction will maintain or improve the quality of water leaving the project watershed.
    g. Opportunities in the project watershed exist to incrementally implement storage goals from the Cedar-Wapsipinicon Comprehensive Watershed Management Plan by creating a 4-acre wetland. The wetland basin will reduce flooding and improve water quality within the project watershed, CD 8 and Geneva Lake.
    h. The proposed project is consistent with and works towards the goals of the Cedar-Wapsipinicon Comprehensive Watershed Management Plan, the Cedar River Watershed Restoration and Protection Strategy Report and Freeborn County Water Plan.

9. RIGHT-OF-WAY REQUIRED
    a. No permanent right-of-way is required for construction of the proposed tile.
    b. A current conservation easement is in place allowing construction of the proposed wetland.
    c. We recommend the Drainage Authority consider recording the right-of-way easement along the entire CD 8 drainage system to protect future drainage rights.

10. RECOMMENDATIONS
    a. The plans, profiles and narrative outlined herein provide sufficient details for the landowners and the Ditch Authority to evaluate the project. Hearings should be held to determine whether any additions to or deletions from the construction proposed herein and shown in the attached plans to this report should be made. Subject to discussion at hearings, the Engineer should be authorized to prepare and file the Final Report.
    b. Viewers should be appointed and commence their duties to determine benefits, damages and/or outlet fees.
    c. It is believed that the benefits derived from construction will exceed the costs and that the project is practical, necessary, and feasible.

STATE OF MINNESOTA
COUNTY OF FREEBORN

IN THE MATTER OF REPAIR AND IMPROVEMENT OF A SEPARABLE PART
OF COUNTY DITCH NO. 8
FREEBORN COUNTY, MINNESOTA

ENGINEER'S PRELIMINARY REPORT

TO THE BOARD OF MANAGERS OF TURTLE CREEK WATERSHED DISTRICT:

The undersigned Professional Engineer, Steven J. Penkava, representing Jones, Haugh & Smith Inc., Consulting Engineers, duly appointed by Order of said Board of Managers, dated May 15, 2018, having qualified as provided by law and assumed the duties of the office of Engineer, would now respectfully report on the investigation and examination of said drainage system as follows:

PETITION

The Petition filed in the above referenced matter requests that the J7 Main Tile, the lower end of J7 Branch C and J7 Branch D Tiles of County Ditch No. 8 be repaired and improved to provide adequate capacity and a better outlet.

HISTORY

The project tiles were originally constructed as part of Judicial Ditch No. 7 (JD 7) which was established in 1922 and constructed in 1923. JD 7 outlets into County Ditch No. 8 (CD 8), which was established in the early 1900's, in the SW ¼ NE ¼ Section 11, Bath Township. JD 7 consists of the main tile and six tile branches totaling approximately 14,485 feet in length with sizes ranging from 6 to 24 inches. Due to inadequacies of the JD 7 main tile, a petition was filed in 1944. An Engineering Report dated February 21, 1944, recommended replacing the main tile with open ditch in the N ½ of Section 11, Bath Township.

In 1999, a Redetermination of Benefits and Damages was completed for ditches CD 8, JD 7, CD 57, CD 61 and CD 67. Following approval of the Redetermination of Benefits and Damages the ditches were consolidated into CD 8.

INVESTIGATION AND FINDINGS

A topographic survey of the watershed area described in the Petition was made using aerial photography, light detection and ranging (LIDAR) data, U.S. Geological Survey contour maps, as-built plans, and soils surveys. The total watershed of CD 8 is approximately 6,149 acres of which approximately 509 acres (8.3%) are in the project watershed. The topography of the watershed is rolling with numerous landlocked depressional areas. Due to the random location of these areas, the original design used tile to provide surface and subsurface drainage outlets for the watershed. Maps and profiles of the established CD 8 system were reviewed and used in the investigation. Benchmark elevations are listed on the plans.

Approximately 3,600 feet or 44 percent of the J7 Main tile was televised, and field located. Televising revealed cracked tile, misaligned joints, sags in the pipe, poorly installed tile connections and debris in the pipe as shown in the following pictures. Organic soils in low areas along the tile alignment have subsided resulting in shallow tile. The televising report is attached in Appendix 4.

CD 8 J7 main tile sag, misaligned joints and cracked tile.

J7 Main Tile

The J7 Main tile investigation began at the junction with the open ditch in the SW ¼ NE ¼ Section 11, Bath Township and coursed in a northerly direction terminating in the NW ¼ NE ¼ Section 2, Bath Township. Ground elevations along the tile alignment range from elevation 1242 at the open ditch to elevation 1244 at the end of the tile. The existing tile was installed at an average grade of 0.05% or 2.6 feet of fall per mile. The lower 420 feet of tile was replaced with a 24-inch dual wall tile.

The J7 main tile in Section 11 is shallow with approximately 1.5 feet of cover and the tiles were found to be cracked with misaligned joints. Upstream of 330th Street the tile was in similar condition and cover over the tile averaged 2.5 feet. The J7 main tile crosses over two gas lines in the NW ¼ NE ¼ Section 2, Bath Township.

A Turtle Creek Watershed District Wetland Restoration Permit was approved in 2006 for the property along the J7 main tile in Section 11, Bath Township. The wetland restoration consisted of minimal construction due to the flat topography, concerns of impacting neighboring lands and the expense of replacing the J7 main tile.

J7 Branch C Tile

J7 Branch C tile investigation began at the junction with the J7 Main tile in the NW ¼ NE ¼ Section 11 and coursed in a westerly direction along the south side of 330th Street before turning northerly and terminating in a low area in the SW ¼ SW ¼ Section 2, Bath Township.

J7 Branch D Tile

J7 Branch D tile investigation began at the junction with the J7 Main tile in the NE ¼ SW ¼ Section 2 and coursed in a westerly direction before terminating near the west line of the NE ¼ SW ¼ Section 2, Bath Township.

The Natural Resource Conservation Service (NRCS) design guidelines recommend a drainage coefficient of 0.50 inches per day for the project watershed. The drainage coefficient is defined as the depth of water drained from the contributing watershed over a 24-hour period. The project tiles have less than the NRCS recommended drainage capacity at a typical roughness coefficient of 0.013 as shown in Table 1. Based on the televising and visual inspection of the tile and history of repairs, the system is operating at less than the calculated drainage coefficients shown below.

Tile	Location	Length (ft)	Size (in)	Grade (%)	Existing Drainage Coefficient (in/day)
J7 Main	0+00 to 4+20	420	24	0.05	0.26
J7 Main	4+20 to 27+50	2,330	24	0.05	0.24
J7 Main	27+50 to 50+00	2,250	18	0.03	0.13
J7 Main	50+00 to 55+00	500	14	0.04	0.10
J7 Main	55+00 to 60+00	500	12	0.06	0.11
J7 Main	60+00 to 81+50	2,150	10	0.03	0.09
J7 Branch C	0+00 to 18+00	1,800	12	0.10	0.21
J7 Branch D	0+00 to 7+67	767	8	0.10	0.26

Table 1: Existing CD 8 Tile Summary.

Based on visual observations during the investigation, crops were poor in low-lying areas and bordering areas showed damage from excess moisture. The areas requiring drainage improvements were visually evident.

PROPOSED SOLUTION

The construction proposed is believed to be the most practical to accomplish the results envisioned by the Petitioners. Factors considered and/or evaluated include design requirements for the contributing watershed, minimizing disruption of wildlife areas, downstream impacts, and general economics. A runoff coefficient of 0.50 inches per day was used for the project watershed. The proposed improvements consist of constructing approximately 10,470 feet of subsurface tile ranging in size from 8 inches to 30 inches in diameter and construction of a 4 acre wetland. General project design requirements are listed below, and a detailed description of each tile follows.

- The proposed tile will replace the existing J7 main, J7 Branch C and J7 Branch D tiles. The existing tile will be crossed by the proposed tile and segmented and/or destroyed during construction. The proposed tile will serve as the single outlet for the project watershed.

- The proposed tile will be non-perforated dual wall polyethylene tile (DWPE). All road crossings will be made with non-perforated dual wall polypropylene tile (DWPP).

- Township road crossings would be made by open trench methods and the roadway surface restored with 6 inches of gravel.

- Private tiles encountered during construction will be connected to the proposed tile if clean and in good condition. Landowners are encouraged to furnish the Engineer with private tile maps and provide input when staking for construction. Preservation, utilization and or improvements of private drainage systems will be the responsibility of the landowner thereof.

- The project will replace all existing open tile inlets with alternative tile inlets. No open inlets are planned as part of this project.

- Tile inspection inlets will be installed at property boundaries and will be constructed approximately 4 feet above the natural grade and capped to prevent surface water from entering the system.

- An MPCA Storm Water Construction Permit, a gas line crossing permit and a Township Road crossing permit are required to construct the project.

J7 Main Tile

Construct a replacement J7 Main tile beginning at the junction with the open ditch in the SW ¼ NE ¼ Section 11, Bath Township and course in a northerly direction terminating in the NE ¼ NW ¼ of Section 2, Bath Township. The existing tile will be destroyed or abandoned, and the proposed tile will serve as the single outlet for the project watershed. The proposed tile will generally parallel the course of the existing tile and consists of approximately 3,500 linear feet of 30-inch tile, 3,800 linear feet of 24-inch tile and 736 linear feet of 18-inch tile.

J7 Branch A Tile

The J7 Branch A tile in the SW ¼ NE ¼ Section 11, Bath Township is approximately 105 feet in length and is located entirely within the conservation easement project boundary. We recommend the Drainage Authority consider abandoning the tile as part of these proceedings.

Branch B and B-1 Tiles

Landowners have stated the alignment of the J7 Branch B and Branch B-1 tiles shown in the drainage record does not reflect the tile in the field. We recommend further investigation to determine the as-built alignment and condition of the tiles. We anticipate portions of the tile north of 330th Street have been destroyed and replaced with private tile.

J7 Branch C Tile

Construct a replacement J7 Branch C tile beginning at the junction with the J7 Main tile in the NW ¼ NE ¼ Section 11. Construction will terminate approximately 250 feet north of 330th Street in the SW ¼ SW ¼ Section 2, Bath Township. The proposed tile will generally parallel the course of the existing tile and consists of approximately 1,772 linear feet of 15-inch tile.

J7 Branch D Tile

Construct a replacement J7 Branch D tile beginning at the junction with the J7 Main tile and coursed in a westerly direction before terminating near the west line of the NE ¼ SW ¼ Section 2, Bath Township. The proposed tile will generally parallel the course of the existing tile and consists of approximately 662 linear feet of 8-inch tile.

Drainage coefficients of the proposed tiles are shown in Table 2. The proposed drainage coefficient exceeds design coefficient in some locations due to limited manufactured sizes of dual wall pipe and grade constraints; however, the capacity of the tile is controlled by the outlet during high flows.

Tile	Location	Length (ft)	Size (in)	Grade (%)	Proposed Drainage Coefficient (in/day)
J7 Main	0+00 to 35+00	3,500	30	0.05	0.51
J7 Main	35+00 to 58+00	2,300	24	0.06	0.53
J7 Main	58+00 to 73+00	1,500	24	0.06	0.74
J7 Main	73+00 to 81+85	885	18	0.06	0.63
J7 Branch C	0+00 to 17+72	1,772	15	0.20	0.65
J7 Branch D	0+00 to 3+50	350	8	0.40	0.56
J7 Branch D	3+50 to 6+62	312	8	1.00	0.89

Table 2: Proposed CD 8 Tile Summary.

ABANDONMENT OF EXISTING TILE

The proposed tile is designed to replace the existing J7 Main, J7 Branch D and J7 Branch C tiles. We recommend the existing tile be abandoned and said tile made private and therefore no longer maintained by the Drainage Authority.

APPORTIONMENT OF REPAIR COSTS

In accordance with Minnesota Statute 103E.215 Subdivision 6, repair costs of the proposed construction are detailed in Appendix 2. The Total Estimated Repair Costs ($403,969) is divided by the Total Estimated Cost for the project ($711,563), resulting in a Project Repair cost allocation of 56.8%. Engineering, legal, administrative, bonding and interest costs could be allocated similarly.

OUTLET ANALYSIS

An existing and proposed conditions HydroCAD (v.10.00-25) and HEC-RAS (v.6.0.3) model were developed to determine the effects of the proposed construction. The HydroCAD model is based on the NRCS TR-20 Hydrograph methods and simulates flow for a storm event, and models the runoff, stream flow, discharge and storage for each storm event. The watershed was divided into subwatersheds and storage simulated in many of these areas, typically at low basins in the watershed and road and field crossings. LIDAR data was used to determine the available storage within each subwatershed and as a result a number of assumptions were made in the development of the model. The model and model results should be viewed as approximations of the actual flow conditions in the watershed.

Design storms and rainfall data were obtained from the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 precipitation frequency estimates. The rainfall and return periods are shown in Table 3 below.

Return Period (years)	Rainfall (inches)
2	3.00
5	3.81
10	4.57
25	5.75
50	6.75
100	7.84

Table 3: Project rainfall depths.

The project watershed is drained by the existing tile system which was designed to remove approximately 0.25 inch of runoff per day from the watershed. The proposed construction will increase the tile capacity to remove 0.50 inches of runoff per day from the watershed. Table 4 compares before and after construction peak tile flow rates at the junction with CD 8.

Scenario	2-year	5-year	10-year	25-year	50-year	100-year
Existing	8	9	9	9	9	9
Proposed	14	18	21	23	24	24

Table 4: J7 Main Tile flows (cfs) at project outlet into CD 8.

The project outlets into CD 8 approximately 750 feet upstream of the railroad and 3,000 feet upstream of 780th Avenue. The watershed at each crossing is 5,000 acres and 5,345 acres respectively. Due to the large drainage area at each crossing a HEC-RAS model was created to model the pre versus post conditions at each crossing. Model results at each crossing are shown below in Tables 5 and 6. The current condition flow rates at each crossing were generated with StreamStats and cross sections were developed with a combination of lidar and survey data. The project tile flow increase was added to the StreamStats peak flow for each crossing. This modeling approach is conservative as the time of concentration varies for each watershed and peak flows are not likely to coincide. Peak water surface elevations are estimated to increase 0.13 feet (1.5 inches) or less for all storm events at the Railroad crossing and outlets velocities remain nearly unchanged.

Location	Scenario	2-year	5-year	10-year	25-year	50-year	100-year
Flow (cfs)	Existing	138	291	423	619	790	975
	Proposed	144	301	436	633	805	990
Elevation (feet)	Existing	1239.68	1241.40	1242.52	1243.99	1245.21	1246.84
	Proposed	1239.76	1241.49	1242.62	1244.09	1245.32	1246.97
Velocity (fps)	Existing	3.0	3.8	4.3	4.8	5.1	5.2
	Proposed	3.0	3.8	4.3	4.8	5.1	5.2

Table 5: Pre vs Post peak flows, elevation and velocity at downstream Railroad crossing.

Peak water surface elevations are estimated to increase 0.26 feet (3.1 inches) or less for all storm events at 780th Avenue and culvert outlet velocities are estimated to increase by 0.2 feet per second or less.

Location	Scenario	2-year	5-year	10-year	25-year	50-year	100-year
Flow (cfs)	Existing	138	291	423	619	790	975
	Proposed	144	301	436	633	805	990
Elevation (feet)	Existing	1236.26	1238.34	1239.76	1241.58	1243.08	1245.67
	Proposed	1236.36	1238.46	1239.89	1241.70	1243.23	1245.93
Velocity (fps)	Existing	5.2	6.7	7.8	9.3	10.2	12.2
	Proposed	5.2	6.8	7.9	9.4	10.2	12.4

Table 6: Pre vs Post peak flows, elevation and velocity at downstream 780th Avenue crossing.

The increase in water surface elevations and velocities at both crossings are minimal and are not likely to result in damage to nearby property or the crossings. Based on the completed analysis, the project outlet is adequate without additional conservation practices.

A goal of the Cedar-Wapsipinicon Comprehensive Watershed Management Plan is to decrease flooding and increase watershed wide storage by 0.25 inches per acre. This results in a storage goal of 9.7 acre-feet for the project watershed. The initial wetland restoration work on the Ball property was limited due to the project tile traversing the center of the site. We have been working with the Natural Resource Conservation Service (NRCS) to develop additional storage on the Ball property within the guidelines of the existing conservation easement. The NRCS approved construction of the wetland basin shown on the attached plans. The basin is approximately 4 acres in size providing 4 acre-feet of water storage.

The proposed wetland will store surface water that is currently landlocked upstream of 330th Street and drained by the J7 Main tile directly to CD 8. Table 7 compares flows at CD 8 for the existing, proposed without storage and proposed with storage scenarios. The wetland reduces peak flows for all storm events from the proposed scenario. Table 8 compares water surface elevations and velocities at 870th Avenue.

Scenario	2-year	5-year	10-year	25-year	50-year	100-year
Existing	138	291	423	619	790	975
Proposed	144	301	436	633	805	990
Proposed with Wetland	140	297	427	624	797	960

Table 7: J7 Main Tile flows (cfs) at project outlet into CD 8.

Peak water surface elevations are estimated to remain nearly unchanged for most storm events and decrease by 0.3 feet (3.6 inches) for the 100-year storm event with construction of the wetland.

Location	Scenario	2-year	5-year	10-year	25-year	50-year	100-year
Elevation (feet)	Existing	1236.26	1238.34	1239.76	1241.58	1243.08	1245.67
	Proposed	1236.36	1238.46	1239.89	1241.70	1243.23	1245.93
	Proposed w/storage	1236.29	1238.41	1239.80	1241.62	1243.15	1245.36
Velocity (fps)	Existing	5.2	6.7	7.8	9.3	10.2	12.2
	Proposed	5.2	6.8	7.9	9.4	10.2	12.4
	Proposed w/storage	5.2	6.7	7.9	9.4	10.2	12.0

Table 8: Pre vs Post peak flows, elevation and velocity at 780th Avenue with and without storage.

The model results show the proposed improvement produces minimal impact at the project outlet and the next two downstream crossings. However, opportunities in the project watershed exist to incrementally implement storage goals from the Cedar-Wapsipinicon Comprehensive Watershed Management Plan by creating a 4-acre wetland. The wetland will store surface water that is currently drained to CD 8 by the J7 Main tile. The wetland will reduce flooding and improve water quality within the project watershed. It is the opinion of the Engineer that the outlet is adequate for the proposed improvements with or without the wetland construction.

ENVIRONMENTAL CRITERIA

Pursuant to the requirements of Minnesota Statutes 103E.015, Subdivision 1 with respect to environmental land use and multipurpose water management criteria, the following information is herewith submitted relative to the above referenced project:

Subd. 1a. Investigating potential use of external sources of funding and technical assistance.

The Cedar-Wapsipinicon River 1W1P Grant program is a potential source of funding. The program funds eligible practices such as grade stabilization structures, grass waterways, water and sediment control basins, controlled drainage, saturated buffers, denitrifying bioreactors and cover crops.

An additional source of external funding is provided by the Board of Water and Soil Resources Clean Water Fund through the Multipurpose Drainage Management Grant. The program funds practices which have been shown to reduce erosion and sedimentation, reduce peak flows and flooding and improve water quality. Eligible practices include grade stabilization structures, grass waterways, water and sediment control basins, open tile inlet replacement, controlled drainage, saturated buffers and denitrifying bioreactors.

The Environmental Quality Incentives Program (EQIP) provided by the Natural Resources Conservation Service is a voluntary conservation program that helps agricultural producers in a manner that promotes agricultural production and environmental quality. Numerous areas within the CD 8 watershed are suitable for Best Management Practices (BMP's) which would qualify for funding through EQIP. Typical practices include those mentioned above in addition to cover crops. The EQIP program can fund practices throughout the watershed and landowners are encouraged to contact the local NRCS office for more details.

If the Engineer's Preliminary Report is approved, the Petitioners will work with local agencies to determine if portions of the project are eligible for funding.

MINNESOTA STATUTE 103E.015, SUBD 1: Environmental land use and multipurpose water management criteria:

1. Private and public benefits and costs of the proposed drainage project:

Conservation practices implemented in the CD 8 watershed include wetland restorations, grassed waterways, grade stabilization structures, conservation tillage, strip till, no till, nutrient management, buffer strips and alternative tile inlets. The proposed construction will enhance the existing practices and provide landowners with a suitable outlet for additional practices. Project benefits include more manageable fields, timely cropping procedures, reduced compaction and improved crop yields. Additional benefits will be derived from increased farm revenue and improved tax base within the watershed. Public and Private benefits for the project will be established by the Viewers.

2. Alternative measures, including measures identified in applicable state-approved and locally adopted water management plans, to: (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;

The Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021, Cedar River Watershed Restoration and Protection Strategy Report, Cedar River Watershed Total Suspended Solids, Lake Eutrophication, and Bacteria Total Maximum Daily Load, Agricultural BMP Handbook for Minnesota and the Cedar-Wapsipinicon Comprehensive Watershed Management Plan were reviewed as part of this report.

The proposed project is consistent with and works toward the following goals and objectives of the Freeborn County Comprehensive Water Plan Amendment to Implementation 2016-2021:

- Surface Water Concerns, Goal 2; Manage watersheds to reduce bacteria, nutrients, chemicals and sediments from entering surface waters.
- Surface Water Concerns, Goal 3; Manage watersheds to control surface water runoff.
- Soil Erosion and Soil Quality Concerns, Goal 1; Protect and preserve topsoil.
- Soil Erosion and Soil Quality Concerns, Goal 2; Control Soil erosion.
- Drainage Concerns, Goal 1; Maintain drainage systems while improving agricultural productivity as well as improving drainage water quality, understanding the systems are a part of a larger tributary system.

The proposed project is consistent with and works toward the following strategies and actions of the Cedar River Watershed Restoration and Protection Strategy Report:

- Nitrogen: Reduce nitrogen loading by 20% by 2025
- Phosphorus: Reduce phosphorus loading by 12% by 2025
- Water Storage: Increase water detention areas, floodplains and soil profile

The Cedar-Wapsipinicon Comprehensive Watershed Management Plan was reviewed and used for reference. The Watershed Management Plan established a three-tiered issue prioritization with Tier I issues considered as top priority. The Tier I issues are; degraded surface water quality, accelerated erosion and sedimentation and excessive flooding and groundwater contamination. Measurable targets to address Tier I goals include:

- Implement structural and non-structural projects and practices to reduce watershed phosphorus, nitrogen and sediment loading.
- Increase average runoff retention by increasing watershed storage by 0.25 inches.

- Reduce nitrogen loading to groundwater through the implementation of field practices and reduction of fertilization rates.
- Reduce E. Coli loading through management of SSTS, un-sewered discharges and feedlots.

The project watershed is identified as a storage priority area and as a moderate to high priority implementation area in the Cedar-Wapsipinicon Comprehensive Watershed Management Plan.

The proposed project is consistent with and works toward the following Tier I project goals and objectives of the Cedar-Wapsipinicon Comprehensive Watershed Management Plan:

- Degraded Surface Water Quality
    - Reduce phosphorus loading by 45% by 2040
    - Reduce TSS concentrations in watershed streams to <10% of samples exceeding 65 mg/L
    - Reduce nitrogen loading by 45% by 2040
- Accelerated Erosion and Sedimentation
    - Reduce TSS concentrations in watershed streams to <10% of samples exceeding 65 mg/L
    - Target tolerable soil loss goal on all land within the watershed
- Excessive Flooding
    - Increase storage and reduce runoff in the Cedar River watershed
    - Reduce peak flows in the Cedar River by 20% relative to 2016 flow frequency analysis
    - Reduce flood risk to structures and major infrastructure
- Increase average runoff retention by increasing watershed storage by 0.25 inches

Implementation of conservation practices such as wetland restoration and water storage sites, water and sediment control basins (WASCOB's), saturated buffers, woodchip bioreactors, controlled drainage, grassed waterways, two-stage ditch, in-channel sediment basin and cover crops were discussed with the landowners in the project watershed and are shown on Map 1 attached to this report. In addition to the conservation practices, several alternatives to the proposed project were evaluated as part of this investigation and discussed with the Petitioners.

The Do Nothing alternative has been discussed but the Petitioners experience poor drainage in the project watershed and crop loss occurs on a frequent basis. The frequent crop loss results in lower property values for wet acres and landowners do not receive a reasonable return on their investment. Replacing the entire tile system with an open ditch was considered but due to increased right-of-way costs and the general course of said ditch, it was not preferred.

Another alternative is to restore typically flooded areas of the watershed to wetlands. This alternative provides storage in depressional areas to temporarily hold runoff until the existing drainage system can convey the flows. Five potential wetland restoration sites were investigated and discussed with landowners as part of this project. Potential wetland sites located north of 330th Street are more difficult and expensive to develop due to flat topography, crossing of two existing gas lines and the lack of an

existing conservation easement. The potential wetland site located south of 330th Street is within an existing conservation easement and was identified as the most practical to develop.

The alternative practices identified in this report involve voluntary participation by the landowners. Landowners understand that there are outside funding resources which may fund the conservation practices discussed in this report. Currently the landowners are not interested in pursuing a wetland restoration.

3. The present and anticipated land use within the drainage project or system, including compatibility of the project with local land use plans:

Land use within the watershed varies and is comprised of prime farmland, pasture, building sites, roads, and natural areas. All the agricultural lands in the project watershed are used for growing diversified crops or are pastured. It is not anticipated that lands will be used for purposes other than agricultural production.

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:

County Ditch 8 provides an adequate outlet for the project and the proposed construction will have minimal downstream impacts. Construction of a wetland basin in addition to the proposed tile improvements will lower peak flows and improve water quality and wildlife habitat in the watershed. See the Outlet Analysis section of the report for more detailed information regarding outlet adequacy.

5. The effects of the proposed drainage project on wetlands:

National Wetland Inventory Maps of the project area were reviewed and the location of the mapped, but not delineated wetlands are as follows. The J7 Main Tile between stations 4+00 to 28+00 in the W ½ NE ¼ Section 11, Bath Township; the J7 Main Tile between stations 51+00 to 58+00 in the NE ¼ SW ¼ Section 2, Bath Township; and the J7 Branch D Tile between stations 0+00 to 7+67 in the NW ¼ NE ¼ Section 2, Bath Township. Each of the areas identified are currently drained by the existing tile system. Potential impacts to the wetlands will be mitigated by use of non-perforated tile with watertight joints. The proposed project will restore a 4-acre wetland basin that is currently drained by the project tile.

Landowners are encouraged to contact the Natural Resource Conservation Service (NRCS) to complete Form AD 1026. Said Form allows the NRCS to review each parcel to identify wetlands and measures required to avoid wetland impacts. Due to federal data privacy regulations, the obligation for completing the Form rests with the individual landowners and not the project.

Freeborn County and the Turtle Creek Watershed District are strong supporters of wetland restoration projects. Restoration of wetlands will continue to be encouraged after the establishment of this project. The project is not anticipated to negatively affect wetlands.

6. The effects of the proposed drainage project on water quality:

The Cedar-Wapsipinicon Comprehensive Watershed Management Plan provides the following estimated pollutant loading for the project watershed.

Nutrient	Estimated Loading	Estimated Project Watershed Loading
Total Nitrogen Loading	24.4 lbs/ac/yr	12,420 lbs/yr
Total Phosphorus Loading	0.28 lbs/ac/yr	142 lbs/yr
Sediment Loading	3.06 tons/ac/yr	1,558 tons/yr

Table 9: Estimated project watershed pollutant loading based on 509-acre watershed.

The Cedar-Wapsipinicon Comprehensive Watershed Management Plan estimates pollutant removal efficiencies of alternative tile inlets to be 27 percent for nitrogen and phosphorus and 45 percent for sediment. The project will replace all existing open tile inlets with alternative tile inlets. The average watershed at each of the proposed alternative tile inlets is 10 acres. Based on estimated pollutant removal efficiencies, construction of the proposed alternative tile inlets will remove approximately 976 pounds of nitrogen, 122 tons of sediment and 11 pounds of phosphorus from the project watershed per year.

Additional reductions in sediment, nitrogen and phosphorus can be expected with construction of the proposed wetland restoration. The nutrient reductions will improve downstream water quality in CD 8 and Geneva Lake.

7. The effects of the proposed drainage project on fish and wildlife resources:

Aerial photographs were reviewed, and a cursory visual inspection of the watershed conducted. Wildlife habitat areas within the watershed typically consist of CRP, farm groves, fence lines and road ditches. Wildlife habitat will not be substantially reduced by the proposed construction. No fish were observed during the field investigation.

There may be some temporary disruption of upland wildlife habitat during construction. The extent and duration of habitat disturbance will be similar to that experienced during normal agricultural cropping practices. During the field survey for this project, the wildlife observed were common to that of other similar drainage systems in the general area, which have been properly repaired and maintained in the past.

8. Effects of the proposed drainage project on shallow groundwater availability, distribution, and use:

No change in availability, distribution or use of the ground water as a result of this project is anticipated.

9. The overall environmental impact of all the above criteria:

Adverse effects of the proposed project will be temporary in nature and include temporary disruption of normal cropping practices and potential for reduced yields within the project construction limits. After construction, the trench area will be restored and salvaged topsoil re-spread, however said area may lack in productivity for the first few years. Over time we anticipate crop production to return to pre-construction conditions. Temporary noise and dust will be generated during construction. The impacts will be similar to that experienced during the normal course of farming activities and are not viewed as significant. Temporary soil erosion within the construction limits may occur until permanent stabilization is achieved. Potential soil erosion will be addressed as required by the MPCA erosion control permit.

Replacing the existing open tile inlets with alternative tile inlets will improve water quality.

The proposed project will improve the drainage capabilities of lands in the project watershed and provide property owners with the availability of normal agricultural cropping programs. Project benefits include more manageable fields, timely cropping procedures, reduced compaction, and improved crop yields. Additional benefits will be derived from increased farm revenue and an improved tax base within the watershed.

The model results show the proposed improvement produces minimal impact at the project outlet and the next two downstream crossings. Opportunities in the project watershed exist to incrementally implement storage goals from the Cedar-Wapsipinicon Comprehensive Watershed Management Plan by creating a 4-acre wetland. The wetland construction would store surface waters that are currently drained directed to CD 8 by the J7 Main tile. The wetland basin will reduce flooding and improve water quality within the project watershed, CD 8 and Geneva Lake.

Additional voluntary water quality practices were shared and discussed with landowners during the project. Landowners understand that outside funding resources are available which may fund the conservation practices. Additional conservation practices can be implemented with this project if requested.

RIGHT-OF-WAY

No permanent right-of-way is required for construction of the proposed tile.

A current conservation easement allows construction of the proposed wetland.

We recommend the Drainage Authority consider recording the CD 8 right-of-way easement to protect future drainage rights.

EXHIBITS AND APPENDICES

Estimates of the cost of the project are appended at the end of this report in Appendix 1, under the heading "Opinion of Probable Cost".

Apportionment of Repair Cost Estimates of the project are appended at the end of this report in Appendix 2, under the heading "Apportionment of Repair Cost Estimate ".

Potential Conservation Practices and Potential Wetland Restoration Sites in the project watershed are appended at the end of this report in Appendix 3.

The project tile televising report is attached at the end of this report in Appendix 4.

The location, sizes, grades and depths of the proposed drains are shown on the plan-profile sheets attached to this report.

RECOMMENDATIONS

The plans, profiles and narrative outlined herein provide sufficient details for the landowners and the Ditch Authority to evaluate the project. It is the opinion of the Engineer that for the best type of construction and a system that will function adequately for the longest period, the design as shown on the plans attached to this report should be followed.

Hearings should be held to determine whether any additions to or deletions from the construction proposed herein and shown in the attached plans to this report should be made. Landowners should be cognizant of the proposal and understand that only the construction outlined in the Engineer's Report, as amended during the proceedings and included in the Final Order of the Ditch Authority may be done as part of the project. The Engineer has no authority to make changes from the Final Engineer's Report as ordered by the Ditch Authority. Subject to discussion at hearings, the Engineer should be authorized to prepare and file the Final Report. Viewers should be appointed and commence their duties to determine benefits, damages and/or outlet fees.

It is believed that the benefits derived from construction will exceed the costs and that the project is practical, necessary and feasible.

APPENDIX 1
OPINION OF PROBABLE COST

ENGINEER'S PRELIMINARY REPORT

IMPROVEMENT OF COUNTY DITCH NO. 8, FREEBORN COUNTY, MN

OPINION OF PROBABLE COST

J7 MAIN TILE					
Item No.	Description	Est. Qty.		Unit Price	Amount
1.	36" CMP Tile Outlet	20	LF	$ 140.00	$ 2,800.00
2.	30" Tile	3,440	LF	52.00	178,880.00
3.	24" Tile	3,800	LF	40.00	152,000.00
4.	18" Tile	736	LF	29.00	21,344.00
5.	30" HP Storm Tile @ 330th Street	40	LF	185.00	7,400.00
6.	Tile Inspection Inlets	4	EA	1,300.00	5,200.00
7.	Connect existing tile	20	EA	500.00	10,000.00
8.	Crushed rock for pipe foundation in poor soil	500	TON	25.00	12,500.00
9.	Riprap	50	TON	55.00	2,750.00
10.	Seed & Mulch	3	AC	2,000.00	6,000.00
11.	Erosion Control	1	LS	1,000.00	1,000.00
				SUBTOTAL TILE:	399,874.00

BRANCH C TILE					
1.	15" Tile	1,732	LF	25.00	43,300.00
2.	15" HP Storm Tile @ 330th Street	40	LF	110.00	4,400.00
3.	Connect existing tile	6	EA	500.00	3,000.00
4.	Alternative Tile Inlets	1	EA	1,700.00	1,700.00
5.	Tile Inspection Inlets	2	EA	1,300.00	2,600.00
6.	Crushed rock for pipe foundation in poor soil	100	TON	25.00	2,500.00
7.	Erosion Control	1	LS	1,000.00	1,000.00
				SUBTOTAL TILE:	58,500.00

BRANCH D TILE					
1.	8" Tile	662	LF	12.00	7,944.00
2.	Tile Inspection Inlets	1	EA	1,300.00	1,300.00
3.	Connect existing tile	4	EA	500.00	2,000.00
4.	Crushed rock for pipe foundation in poor soil	50	TON	25.00	1,250.00
5.	Seed & Mulch	0.8	AC	2,000.00	1,600.00
				SUBTOTAL TILE:	14,094.00

ENGINEER'S PRELIMINARY REPORT

IMPROVEMENT OF COUNTY DITCH NO. 8, FREEBORN COUNTY, MN

OPINION OF PROBABLE COST

	WETLAND RESTORATION				
1.	Common Excavation	5,000	CY	5.00	25,000.00
2.	Tile Block	850	LF	4.00	3,400.00
3.	Waterway Construction	210	LF	5.00	1,050.00
4.	Riprap spillway	80	TON	55.00	4,400.00
5.	Seeding & Erosion Control	9	AC	2,000.00	18,000.00
				SUBTOTAL TILE:	51,850.00

SUMMARY	
J7 MAIN TILE	399,874.00
BRANCH C TILE	58,500.00
BRANCH D TILE	14,094.00
WETLAND RESTORATION	51,850.00
SUBTOTAL:	$ 524,318.00
+ Contingencies (15%)	78,700.00
Total Estimated Construction Costs:	$ 603,018.00
+ Engineering, Legal, Viewing & Administrative:	108,545.00
TOTAL ESTIMATED COST:	$ 711,563.00

APPENDIX 2:
APPORTIONMENT OF REPAIR COST ESTIMATE

ENGINEER'S PRELIMINARY REPORT

IMPROVEMENT OF COUNTY DITCH NO. 8, FREEBORN COUNTY, MN

APPORTIONMENT OF REPAIR COST ESTIMATE

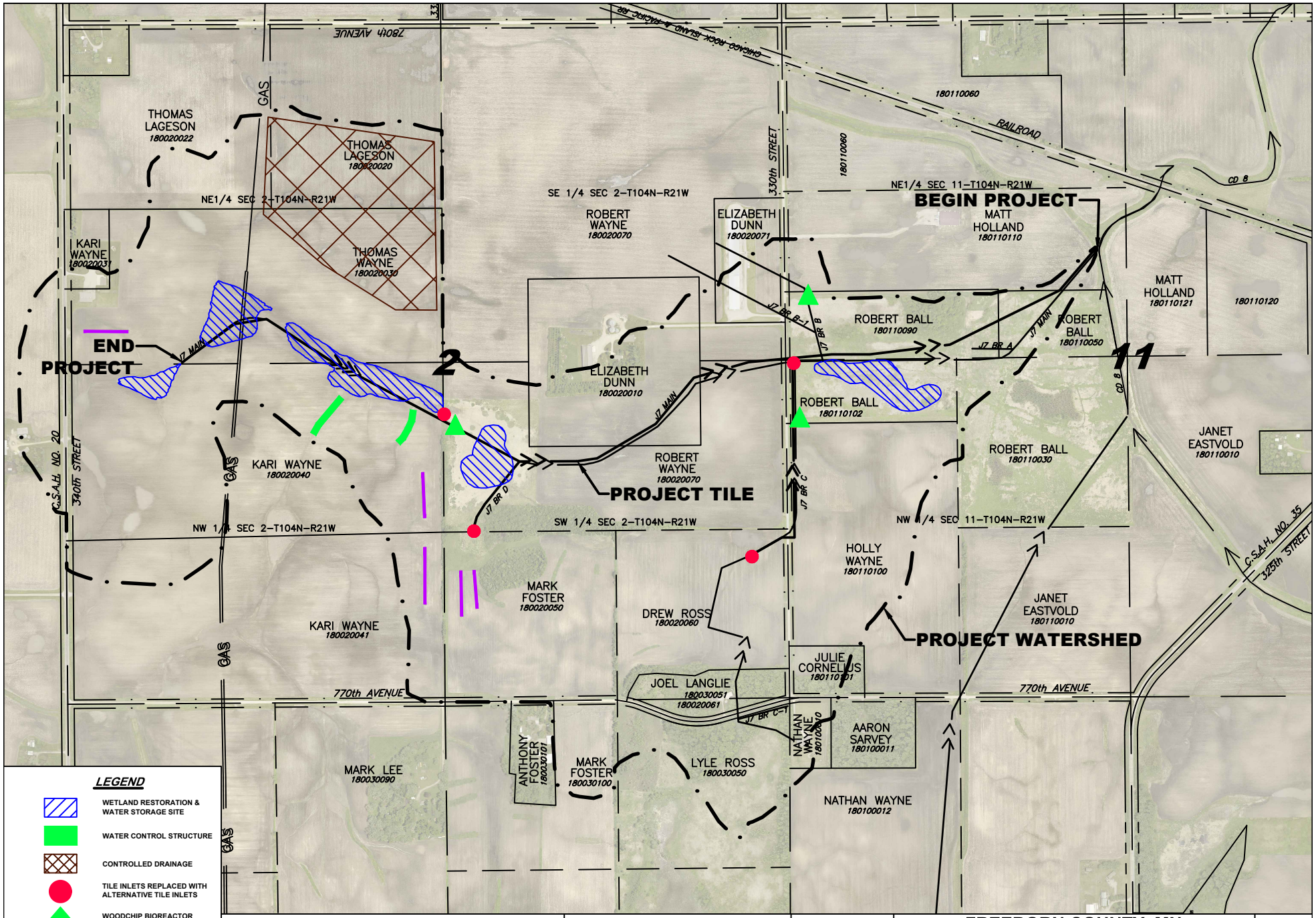
J7 MAIN TILE					
Item No.	Description	Est. Qty.		Unit Price	Amount
1.	30" CMP Tile Outlet	20	LF	$ 140.00	$ 2,800.00
2.	24" Tile	2,730	LF	40.00	109,200.00
3.	18" Tile	2,200	LF	29.00	63,800.00
4.	15" Tile	500	LF	25.00	12,500.00
5.	12" Tile	500	LF	18.00	9,000.00
6.	10" Tile	775	LF	15.00	11,625.00
7.	18" HP Storm Tile @ 330th Street	50	LF	100.00	5,000.00
8.	Connect existing tile	20	EA	500.00	10,000.00
9.	Crushed rock for pipe foundation in poor soil	800	TON	25.00	20,000.00
10.	Riprap	20	TON	55.00	1,100.00
11.	Erosion Control	1	LS	1,000.00	1,000.00
				SUBTOTAL TILE:	246,025.00

BRANCH C TILE					
1.	12" Tile	1,717	LF	18.00	30,906.00
2.	12" HP Storm Tile @ 330th Street	50	LF	85.00	4,250.00
3.	Connect existing tile	6	EA	500.00	3,000.00
4.	Crushed rock for pipe foundation in poor soil	100	TON	25.00	2,500.00
5.	Erosion Control	1	LS	1,000.00	1,000.00
				SUBTOTAL TILE:	41,656.00

BRANCH D TILE					
1.	8" Tile	770	LF	12.00	9,240.00
2.	Connect existing tile	4	EA	500.00	2,000.00
3.	Crushed rock for pipe foundation in poor soil	50	TON	25.00	1,250.00
				SUBTOTAL TILE:	12,490.00

SUMMARY	
J7 MAIN TILE	246,025.00
BRANCH C TILE	41,656.00
BRANCH D TILE	12,490.00
SUBTOTAL:	$ 300,171.00
+ Contingencies	45,100.00
Total Estimated Construction Costs:	$ 345,271.00
+ Engineering, Legal, Viewing & Administrative:	58,698.00
TOTAL ESTIMATED COST:	$ 403,969.00
REPAIR COST ALLOCATION:	**56.8%**

APPENDIX 3:
POTENTIAL CONSERVATION PRACTICES AND
POTENTIAL WETLAND RESTORATION SITES


BEGIN PROJECT
END PROJECT
PROJECT TILE
PROJECT WATERSHED
NE1/4 SEC 11–T104N–R21W
SE 1/4 SEC 2–T104N–R21W
NE1/4 SEC 2–T104N–R21W
NW 1/4 SEC 2–T104N–R21W
SW 1/4 SEC 2–T104N–R21W
NW 1/4 SEC 11–T104N–R21W
330th STREET
340th STREET
325th STREET
770th AVENUE
780th AVENUE
RAILROAD
CHICAGO ROCK ISLAND & PACIFIC RR
C.S.A.H. NO. 20
C.S.A.H. NO. 35
CD 8
J7 MAIN
J7 BR A
J7 BR B
J7 BR B-1
J7 BR C
J7 BR C-1
J7 BR D
GAS
THOMAS LAGESON 180020022
THOMAS LAGESON 180020020
THOMAS WAYNE 180020030
KARI WAYNE 180020031
ROBERT WAYNE 180020070
ELIZABETH DUNN 180020071
ELIZABETH DUNN 180020010
KARI WAYNE 180020040
KARI WAYNE 180020041
MARK FOSTER 180020050
DREW ROSS 180020060
JOEL LANGLIE 180030051 180020061
MARK LEE 180030090
ANTHONY FOSTER 180030101
MARK FOSTER 180030100
LYLE ROSS 180030050
NATHAN WAYNE 180100012
NATHAN WAYNE 180100010
AARON SARVEY 180100011
JULIE CORNELIUS 180110101
HOLLY WAYNE 180110100
MATT HOLLAND 180110110
MATT HOLLAND 180110121
180110120
ROBERT BALL 180110090
ROBERT BALL 180110050
ROBERT BALL 180110102
ROBERT BALL 180110030
JANET EASTVOLD 180110010
180110060
180110060
2
11
LEGEND
WETLAND RESTORATION & WATER STORAGE SITE
WATER CONTROL STRUCTURE
CONTROLLED DRAINAGE
TILE INLETS REPLACED WITH ALTERNATIVE TILE INLETS
WOODCHIP BIOREACTOR
GRASSED WATERWAY
EXISTING TERRACES
NOT TO SCALE
N
JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
507-451-4598
DESIGNED:
DRAWN: SJP
CHECKED:
DATE: 10-23-2023
FILE NO: 18-175.DWG
FREEBORN COUNTY, MN
REPAIR & IMPROVEMENT TO
COUNTY DITCH NO. 8
POTENTIAL CONSERVATION PRACTICES
MAP
1

APPENDIX 4:
TELEVISING REPORT

Empire Pipe Services
415 Truman Street, North Mankato, MN
Tel. 507-388-2895
swenner@empire-pipe.com

Table of Contents

Project		
CD8-J7_ FREEBORN CNTY_2017_06_21		**6/21/2017**

Empire Pipe Services
415 Truman Street, North Mankato, MN
Tel. 507-388-2895
swenner@empire-pipe.com

Legend of Classification (Section)

Project		
CD8-J7_ FREEBORN CNTY_2017_06_21		**6/21/2017**

1:	Excellant Condition Minor Defects - Failure unlikely in the forseeable future.
2:	Good Condition Defects that have not begun to deteriorate - Pipe unlikely to fail for at least 20 years.
3:	Fair Condition Moderate defects that will continue to deteriorate - Pipe may fail in 10-20 years.
4:	Poor Condition Severe Defects that will become Grade 5 defects within the foreseeable future - Pipe will probably fail in 5-10 years.
5:	Immediate Attention Defects require immediate attention- Pipe has failed or will likely fail within the next 5 years.

Empire Pipe Services
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Section Profile

Project		
CD8-J7_ FREEBORN CNTY_2017_06_21		**6/21/2017**

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
9	08-3187	08-3172	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	14.90	14.90

1 x Circular 10 = 14.90 Total Length (14.90 Length Surveyed)

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
7	08-3131	08-3000	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	131.30	131.30
8	08-3172	08-3131	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	41.60	41.60

2 x Circular 12 = 172.90 Total Length (172.90 Length Surveyed)

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
3	08-1159	8-0100	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	1,159.00	1,159.00
4	08-0100	08-0095	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	38.90	38.90
5	08-2097	08-1159	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	938.50	938.50
6	08-2141	08-2097	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	44.30	44.30

4 x Circular 18 = 2180.70 Total Length (2180.70 Length Surveyed)

Nr.	Upstream MH	Downstream MH	Date	Street	Media Label	Material	Total Length	Length Surveyed
1	08-0000	08-1159	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	1,159.70	1,159.70
2	08-0100	08-0000	6/21/2017	330TH ST		Concrete Pipe (non-reinforced)	95.00	95.00

2 x Circular 24 = 1254.70 Total Length (1254.70 Length Surveyed)

Total: 9 = 3623.20 Total Length (3623.20 Length Surveyed)

Empire Pipe Services
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swenner@empire-pipe.com

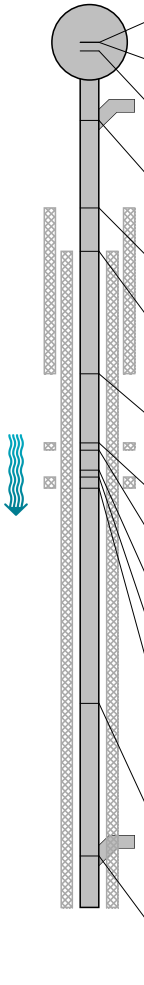
Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-0000-08-1159**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Downstream**		**1159.7**	**1159.7**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-0000**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-1159**
Location Details :	**SEC11**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**24**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :



1:9559 Distance		Code	Observation	Counter	Photo	Grade
0.00		AMH	Manhole / EAP-08-0000, START RUN	00:00:00		
0.00		MWL	Water Level, 25% of cross sectional area	00:00:21		
10.90		MGO	General Observation / RESIZED CRAWLER	00:01:38		
98.70		TBI	Tap Break-In Intruding at 9 o'clock, 10inch dim, 3inch intrusion, within 8 inch	00:04:07		M2
209.50	S01	MWLS	Water Level, Sag in pipe, 45% of cross sectional area, Start	00:06:38		
264.30	S02	RFJ	Roots Fine Joint from 12 o'clock to 12 o'clock, Start, within 8 inch	00:08:00		
419.40	F01	MWLS	Water Level, Sag in pipe, 45% of cross sectional area, Finish	00:11:54		
506.80	S03	MWLS	Water Level, Sag in pipe, 50% of cross sectional area, Start	00:14:07		
515.90	F03	MWLS	Water Level, Sag in pipe, 50% of cross sectional area, Finish	00:14:33		
541.10		JOL	Joint Offset Large, 4Inch	00:15:32		S2
549.90	S04	MWLS	Water Level, Sag in pipe, 90% of cross sectional area, Start	00:16:18		
564.00	F04	MWLS	Water Level, Sag in pipe, 50% of cross sectional area, Finish	00:17:37		
836.20		CH4	Crack Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch	00:25:01		S5
1029.20		TBI	Tap Break-In Intruding at 10 o'clock, 6inch dim, 3inch intrusion, within 8 inch	00:31:09		M2

Empire Pipe Services
415 Truman Street, North Mankato, MN
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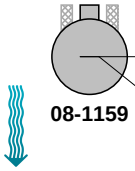
Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-0000-08-1159**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Downstream**		**1159.7**	**1159.7**



1:9559	Distance		Code	Observation	Counter	Photo	Grade
	1159.70	F02	RFJ	Roots Fine Joint from 12 o'clock to 12 o'clock, Finish, within 8 inch	00:34:44		M1
	1159.70		MSA	Survey Abandoned / OUT OF CABLE END RUN	00:34:50		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5121	2210	7.0	183.0	190.0	3.5	1.0	1.0

Empire Pipe Services
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Section Pictures - 6/21/2017 - 08-0000-08-1159

City	Street	Date	Pipe Segment Reference	Work Order
BATH TOWNSHIP	**330TH ST**	**6/21/2017**	**08-0000-08-1159**	**2297**

, 00:25:01, 836.20
Crack Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch

Empire Pipe Services
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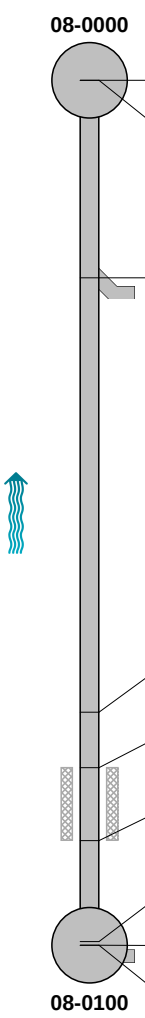
Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-0100-08-0000**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Upstream**		**95.0**	**95.0**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-0100**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-0000**
Location Details :	**SECTION-11**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**24**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :



1:830 Distance		Code	Observation	Counter	Photo	Grade
0.00		AMH	Manhole / EAP-08,0000, START RUN	00:00:00		
0.00		MWL	Water Level, 25% of cross sectional area	00:00:22		
21.70		TB	Tap Break-In at 9 o'clock, 10inch dim, within 8 inch	00:01:13		
69.40		CL	Crack Longitudinal at 12 o'clock, within 8 inch	00:03:28		S2
75.50	S01	CH4	Crack Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch, Start	00:04:09		
83.50	F01	CH4	Crack Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch, Finish	00:04:37		S5
94.60		TBI	Tap Break-In Intruding at 9 o'clock, 15inch dim, 3inch intrusion, within 8 inch	00:05:05		M3
95.00		MWLS	Water Level, Sag in pipe, 100% of cross sectional area	00:06:29		
95.00		MSA	Survey Abandoned / CAN NOT GET AROUND TAP END RUN	00:06:42		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5221	3100	12.0	3.0	15.0	6.0	3.0	5.0

Empire Pipe Services
415 Truman Street, North Mankato, MN
Tel. 507-388-2895
swenner@empire-pipe.com

Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-1159-8-0100**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Upstream**		**1159.0**	**1159.0**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-1159**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**8-0100**
Location Details :	**SECTION-11**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**18**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:10123 Distance		Code	Observation	Counter	Photo	Grade
0.00		AMH	Manhole / EAP-08-0100, START RUN	00:00:00		
0.00		MWL	Water Level, 15% of cross sectional area	00:00:27		
11.30	S01	FH4	Fracture Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch, Start	00:01:13		
20.50	F01	FH4	Fracture Longitudinal Hinge, 4 from 12 o'clock to 12 o'clock, within 8 inch, Finish	00:01:39		S5
228.60	S02	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Start	00:07:23		
319.10	F02	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Finish	00:09:48		S2
377.80	S03	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Start	00:11:34		
439.80	F03	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Finish	00:13:42		S2
541.40		LL	Alignment Left, 5% changed	00:16:28		M1
634.10		TB	Tap Break-In at 12 o'clock, 4inch dim, within 8 inch	00:19:09		
1044.60		TB	Tap Break-In at 10 o'clock, 6inch dim, within 8 inch	00:31:01		
1063.20		TBI	Tap Break-In Intruding at 3 o'clock, 6inch dim, 2inch intrusion, within 8 inch	00:31:49		M2
1159.00		MSA	Survey Abandoned / THIS IS THE END OF THE CABEL, END RUN	00:35:05		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
522E	2111	70.0	3.0	73.0	23.3	1.5	14.6

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Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-0100-08-0095**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Downstream**		**38.9**	**38.9**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-0100**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-0095**
Location Details :	**SECTION-11**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**18**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:340 Distance	Code	Observation	Counter	Photo	Grade
0.00	AMH	Manhole / EAP-08-0100, START RUN	00:00:00		
0.00	MWL	Water Level, 20% of cross sectional area	00:00:22		
13.00	TB	Tap Break-In at 3 o'clock, 8inch dim, within 8 inch	00:01:14		
13.90	TBI	Tap Break-In Intruding at 9 o'clock, 6inch dim, 3inch intrusion, within 8 inch	00:01:32		M2
35.70	MWLS	Water Level, Sag in pipe, 100% of cross sectional area	00:02:15		
38.90	MSA	Survey Abandoned / STOPPING AT THIS POINT DUE TO SAG IN LINE	00:02:41		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0.0	2.0	2.0	0.0	2.0	2.0

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Section Pictures - 6/21/2017 - 08-0100-08-0095

City	Street	Date	Pipe Segment Reference	Work Order
BATH TOWNSHIP	**330TH ST**	**6/21/2017**	**08-0100-08-0095**	**2297**

, 00:02:15, 35.70
Water Level, Sag in pipe, 100% of cross sectional area

, 00:02:41, 38.90
Survey Abandoned / STOPPING AT THIS POINT DUE TO SAG IN LINE

Empire Pipe Services
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Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-2097-08-1159**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Downstream**		**938.5**	**938.5**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-2097**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-1159**
Location Details :	**SEC 11,**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**18**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:8197 Distance		Code	Observation	Counter	Photo	Grade
0.00		AMH	Manhole / EAP 08-2097, START RUN	00:00:00		
0.00		MWL	Water Level, 20% of cross sectional area	00:00:24		
73.90	S01	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Start	00:02:11		
92.00	F01	CL	Crack Longitudinal at 12 o'clock, within 8 inch, Finish	00:03:05		S2
150.60		TB	Tap Break-In at 3 o'clock, 6inch dim, within 8 inch	00:05:00		
233.00		TBI	Tap Break-In Intruding at 2 o'clock, 6inch dim, 4inch intrusion, within 8 inch	00:07:41		M2
715.70		TB	Tap Break-In at 11 o'clock, 6inch dim, within 8 inch	00:09:08		
725.10		TF	Tap Factory Made at 2 o'clock, 6inch dim, within 8 inch	00:09:35		
770.40		TB	Tap Break-In at 10 o'clock, 8inch dim, within 8 inch	00:16:04		
854.00		TB	Tap Break-In at 9 o'clock, 6inch dim, within 8 inch	00:18:24		
938.50		MSA	Survey Abandoned / THIS IS EAP1159, END RUN	00:20:40		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
2400	2100	8.0	2.0	10.0	2.0	2.0	2.0

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Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-2141-08-2097**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Upstream**		**44.3**	**44.3**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-2141**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-2097**
Location Details :	**SEC11,**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**18**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:387	Distance	Code	Observation	Counter	Photo	Grade
08-2097						
	0.00	AMH	Manhole / EAP-08-2097, START EUN	00:00:00		
	0.00	MWL	Water Level, 25% of cross sectional area	00:00:21		
	28.00	TBI	Tap Break-In Intruding at 10 o'clock, 8inch dim, 4inch intrusion, within 8 inch	00:01:26		M2
	37.20	RPP	Repair Patch from 12 o'clock to 12 o'clock, within 8 inch / CORRAGATED METAL	00:01:55		
	43.30	TBI	Tap Break-In Intruding at 3 o'clock, 8inch dim, 6inch intrusion, within 8 inch	00:02:16		M2
08-2141	44.30	MSA	Survey Abandoned / CAN NOT GET PAST TAP, END RUN	00:02:52		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2200	0.0	4.0	4.0	0.0	2.0	2.0

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Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-3131-08-3000**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	Not Known	**Upstream**		**131.3**	**131.3**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-3131**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-3000**
Location Details :	**SEC11,**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**12**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:1147	Distance	Code	Observation	Counter	Photo	Grade
08-3000						
	0.00	AMH	Manhole / EAP-08-3000, START RUN	00:00:00		
	0.00	MWL	Water Level, 70% of cross sectional area	00:00:27		
	130.90	TBI	Tap Break-In Intruding at 9 o'clock, 6inch dim, 3inch intrusion, within 8 inch	00:03:35		M2
08-3131	131.30	MSA	Survey Abandoned / CANT GET AROUND TAP, END RUN	00:03:52		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0.0	2.0	2.0	0.0	2.0	2.0

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Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-3172-08-3131**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Upstream**		**41.6**	**41.6**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-3172**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-3131**
Location Details :	**SEC11,**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**12**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

Additional Info :

1:364	Distance	Code	Observation	Counter	Photo	Grade
08-3131						
	0.00	AMH	Manhole / EAP-08-3131, START RUN	00:00:00		
	0.00	MWL	Water Level, 70% of cross sectional area	00:00:15		
	41.60	B	Broken at 2 o'clock, within 8 inch	00:03:37		S3
08-3172	41.60	MSA	Survey Abandoned / CAN NOT GET PAST BROKEN PIPE, END RUN.	00:03:53		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
3100	0000	3.0	0.0	3.0	3.0	0.0	3.0

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swenner@empire-pipe.com

Inspection report

Date :	Work Order :	Weather :	Surveyed By :	Certificate Number :	Pipe Segment Ref. :
6/21/2017	**2297**	**Damp**	**Ryan B**	**U-316-07003575**	**08-3187-08-3172**
Year laid :	Pre-cleaning :	Direction :	Pipe Joint Length :	Total Length :	Length Surveyed :
	No Pre-Cleaning	**Upstream**		**14.9**	**14.9**

City :	**BATH TOWNSHIP**	Drainage Area :	**J7 MAIN TILE**	Upstream MH :	**08-3187**
Street :	**330TH ST**	Media Label :		Up Rim to Invert :	**0.0**
Location Code :		Flow Control :	**Not Controlled**	Downstream MH :	**08-3172**
Location Details :	**SEC11,**	Sheet Number :		Down Rim to Invert :	**0.0**

Pipe shape:	**Circular**	Sewer Use:	**Stormwater**
Pipe size:	**10**	Sewer Category :	**SEC**
Pipe material:	**Concrete Pipe (non-reinforced)**	Purpose:	**Infiltration/Inflow Investigation**
Lining Method :		Owner :	**FREEBORN CNTY**

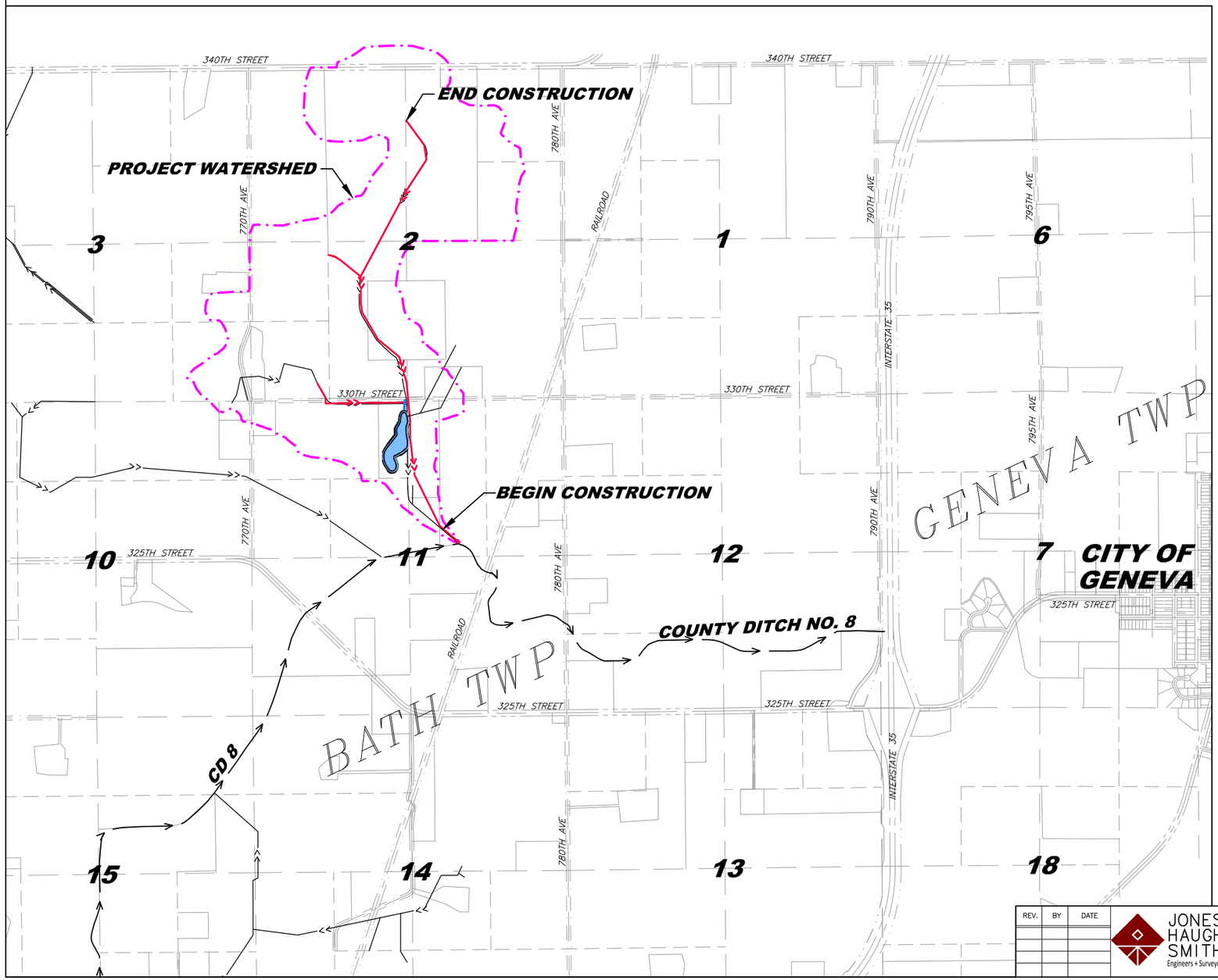
Additional Info :

1:131	Distance	Code	Observation	Counter	Photo	Grade
	0.00	AMH	Manhole / EAP-08-3172, START RUN	00:00:00		
	0.00	MWL	Water Level, 80% of cross sectional area	00:00:25		
	14.90	TBI	Tap Break-In Intruding at 9 o'clock, 6inch dim, 3inch intrusion, within 8 inch	00:00:51		M2
	14.90	MSA	Survey Abandoned / CAN NOT GET PAST TAP, END RUN	00:00:57		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	0.0	2.0	2.0	0.0	2.0	2.0

FREEBORN COUNTY, MN

PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 8



INDEX TO SHEETS

SHEET	SUBJECT
1	TITLE SHEET
2	WATERSHED MAP
3-5	J7 MAIN TILE PLAN & PROFILES
6	J7 BRANCH C TILE PLAN & PROFILE
7	J7 BRANCH D TILE PLAN & PROFILE
8	WETLAND RESTORATION PLAN
9-10	WETLAND DETAILS
11	TILE BLOCK DETAIL
12-14	SWPPP PLAN & DETAILS
15-16	STANDARD DRAINAGE STRUCTURES

N

1000 0 1000

SCALE IN FEET

SCALE
11X17 HORIZ: 1"=2000'
22X34 HORIZ: 1"=1000'

LEGEND

- APPROXIMATE PROJECT WATERSHED
- APPROXIMATE INTERIOR WATERSHED
- APPROXIMATE EXTERIOR WATERSHED
- OPEN DITCH (Project)
- LEGAL OPEN DITCH (Not Project)
- PRIVATE OPEN DITCH
- TILE DITCH (Project)
- LEGAL TILE DITCH (Not Project)
- PRIVATE TILE
- PRIVATE WATERWAY
- NATURAL STREAM
- GAS LINE — GAS —
- OVERHEAD ELECTRIC — OHD ELEC —
- UNDERGROUND TELEPHONE — TEL BUR —
- CITY LIMITS
- FENCE LINE — x — x —
- ALTERNATIVE TILE INLET
- TILE INSPECTION INLET
- OVERHEAD TELEPHONE — OT —
- FIBER-OPTICS — FO —
- UNDERGROUND ELECTRIC — UE —
- LIGHT POLE
- POWER POLE

ABBREVIATIONS

JD = JUDICIAL DITCH
CD = COUNTY DITCH
JCD = JOINT COUNTY DITCH
MOD = MAIN OPEN DITCH
LAT = LATERAL
BR = BRANCH
PVT = PRIVATE
POD = PRIVATE OPEN DITCH
L/W = LOW-WATER
XG = CROSSING
O/L = OUTLET

BENCHMARK ELEVATION = 1278.23

MNDOT GEODETIC CONTROL STATION #9192, GENE MNDT. LOCATED 1.2 MILES WEST-SOUTHWEST OF GENEVA, AT THE JUNCTION OF INTERSTATE HIGHWAY 35 AND COUNTY ROAD 35, AT INTERSTATE HIGHWAY 35 MILEPOINT 23.0, 18.6 FEET NORTH OF COUNTY ROAD 35, 79.0 FEET EAST OF NORTHBOUND INTERSTATE HIGHWAY 35, 2.8 FEET NORTH OF GUARDRAIL, 15.0 FEET EAST-NORTHEAST OF THE NORTHEAST CORNER OF A BRIDGE, 2.3 FEET EAST OF A WITNESS POST.

NOTE: THIS IS A COLOR PLAN SET. IF THIS TEXT DOES NOT APPEAR IN COLOR, THIS IS NOT AN ORIGINAL PLAN SET AND MAY RESULT IN MISINTERPRETATION.

NO RESPONSIBILITY IS ACCEPTED FOR THE LOCATIONS OF UTILITIES SHOWN HEREON. VERIFICATION OF ACTUAL LOCATIONS SHOULD BE REQUESTED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OR THE TAKING OF ANY OTHER ACTION RELYING ON THE ACTUAL LOCATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATION FROM PLAN.

LOCATIONS OF ALL UTILITIES SHOWN ARE APPROXIMATE.
GOPHER STATE ONE-CALL: 1-800-252-1166

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH WORK.

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.

Steven J. Penkava
Steven J. Penkava
Lic. No. 43895 Date: 12-19-23

PRELIMINARY REPORT

REV.	BY	DATE

JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
507-451-4598

DESIGNED: SJP
DRAWN: SJP
CHECKED: SJP
DATE: 12-19-23
FILE NO: 18-175.DWG

FREEBORN COUNTY, MN
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 8
TITLE SHEET

SHEET 1 OF 16

THOMAS LAGESON 180020022
THOMAS LAGESON 180020020
NE1/4 SEC 2–T104N–R21W
KARI WAYNE 180020031
THOMAS WAYNE 180020030
GAS
SE 1/4 SEC 2–T104N–R21W
ROBERT WAYNE 180020070
ELIZABETH DUNN 180020071
330th STREET
180110060
180110062
RAIL ROAD
180110040
CD 8
NE1/4 SEC 11–T104N–R21W
MATT HOLLAND 180110110
BEGIN CONSTRUCTION
MATT HOLLAND 180110121
180110120
ROBERT BALL 180110090
J7 BR B-1
J7 BR B
J7 MAIN
ROBERT BALL 180110050
J7 BR A
2
11
ELIZABETH DUNN 180020010
END CONSTRUCTION
ROBERT BALL 180110102
PROPOSED WETLAND
ROBERT BALL 180110030
BR 61
CD 8
JANET EASTVOLD 180110010
C.S.A.H. NO. 20
340th STREET
KARI WAYNE 180020040
ROBERT WAYNE 180020070
J7 BR D
J7 BR C
NW 1/4 SEC 2–T104N–R21W
SW 1/4 SEC 2–T104N–R21W
NW 1/4 SEC 11–T104N–R21W
END CONSTRUCTION
END CONSTRUCTION
PROJECT WATERSHED
HOLLY WAYNE 180110100
MARK FOSTER 180020050
DREW ROSS 180020060
JANET EASTVOLD 180110010
C.S.A.H. NO. 35
325th STREET
KARI WAYNE 180020041
JULIE CORNELIUS 180110101
180110010
JOEL LANGLIE 180030051 180020061
770th AVENUE
770th AVENUE
J7 BR C-1
NATHAN WAYNE 180100010
AARON SARVEY 180100011
STEELE COUNTY
FREEBORN COUNTY
180030081
MARK LEE 180030090
ANTHONY FOSTER 180030101
MARK FOSTER 180030100
LYLE ROSS 180030050
NATHAN WAYNE 180100012
180030080

660 0 660
HORIZ. SCALE FEET

SCALE
11X17 HORIZ: 1"=660'
22X34 HORIZ: 1"=330'

No responsibility is accepted for the locations of utilities shown hereon. Verification of actual locations should be requested prior to the commencement of construction or the taking of any other action relying on the actual locations.

GOPHER STATE ONE–CALL: 1–800–252–1166

REV.	BY	DATE

JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
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DESIGNED:	SJP
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CHECKED:	SJP
DATE:	12–19–23
FILE NO:	18–175.DWG

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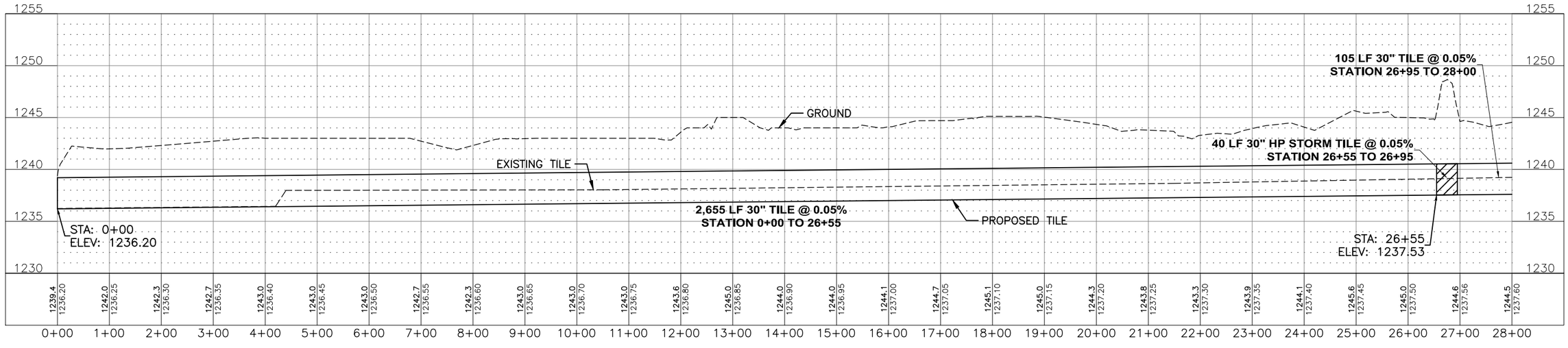
Steven J. Penkava
Lic. No. 43895 Date: 12–19–23

FREEBORN COUNTY, MN IMPROVEMENT OF COUNTY DITCH NO. 8 WATERSHED MAP

SHEET 2 OF 16

XXXX.X = EXISTING GROUND ELEVATION
XXXX.XX = PROPOSED TILE ELEVATION

SCALE
11X17 HORIZ: 1"=200' - VERT: 1"=10'
22X34 HORIZ: 1"=100' - VERT: 1"=5'



200 0 200
HORIZ. SCALE FEET

10 0 10
VERT. SCALE FEET

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GOPHER STATE ONE–CALL: 1–800–252–1166

REV.	BY	DATE

JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
507-451-4598

DESIGNED:	SJP
DRAWN:	SJP
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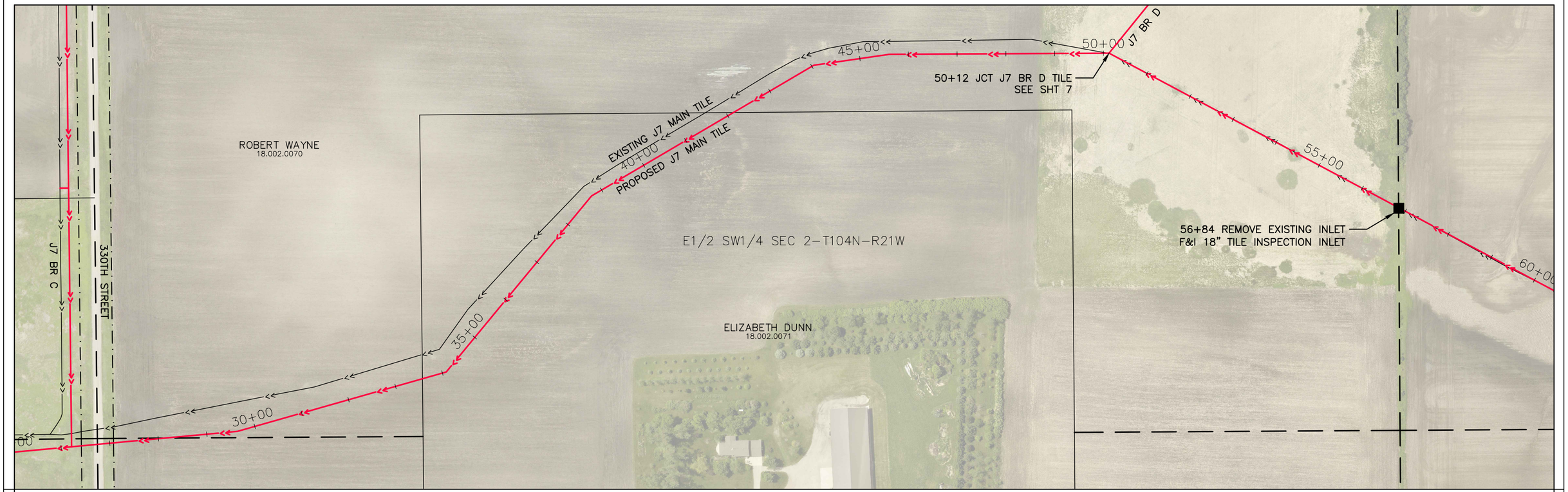
FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
J7 MAIN TILE
PLAN & PROFILE
W1/2 NE1/4 SEC 11–T104N–R21W

SHEET 3 OF 16



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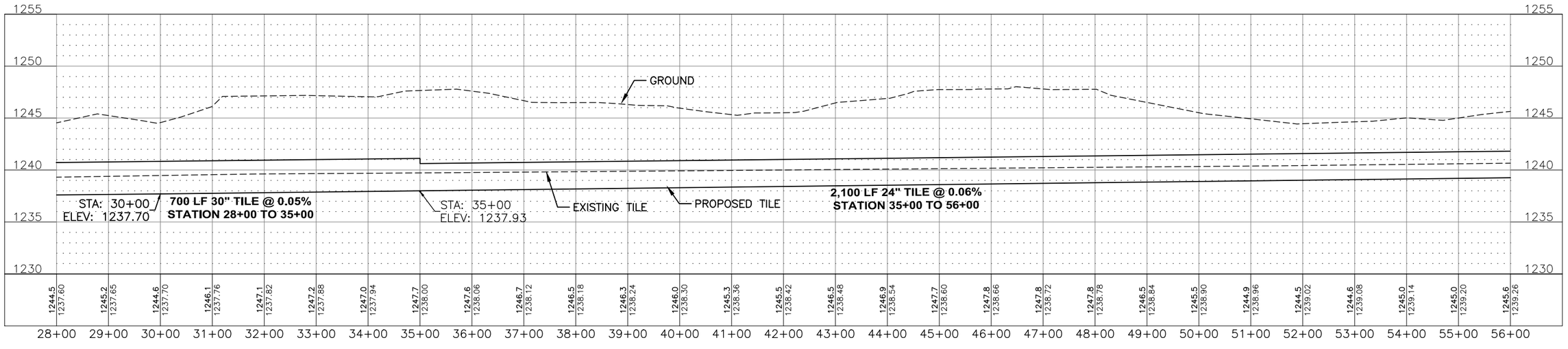

200 0 200
HORIZ. SCALE FEET

10 0 10
VERT. SCALE FEET

N

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GOPHER STATE ONE–CALL: 1–800–252–1166

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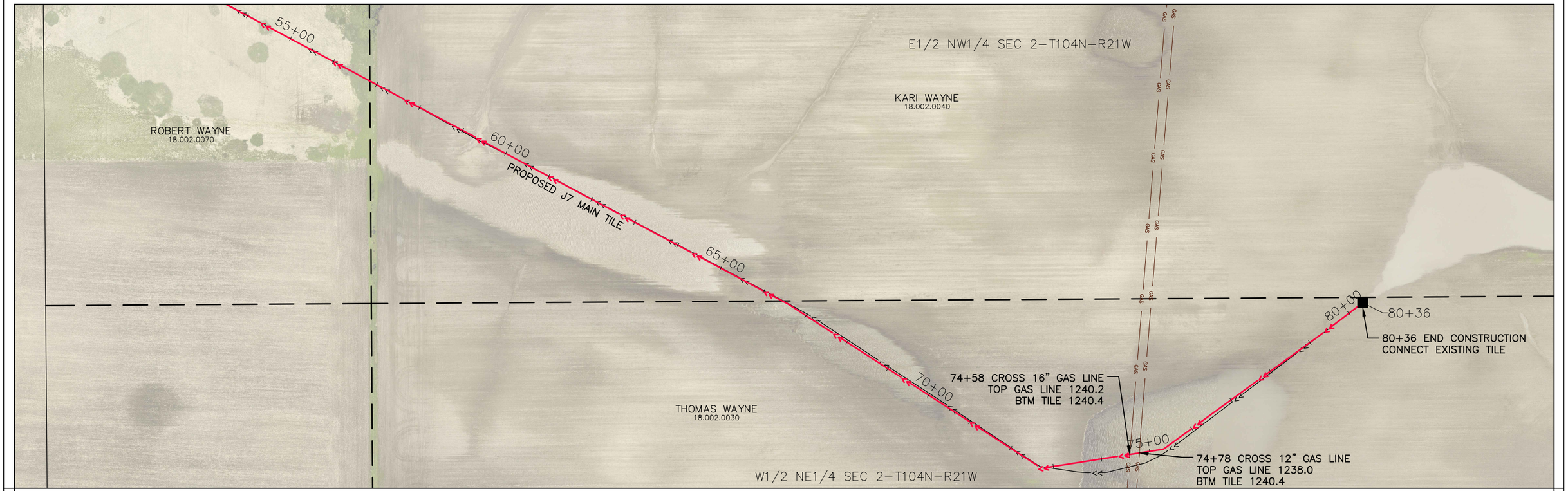
FREEBORN COUNTY, MN
IMPORVEMENT OF COUNTY DITCH NO. 8
J7 MAIN TILE
PLAN & PROFILE
E1/2 SW1/4 SEC 2–T104N–R21W

SHEET 4 OF 16



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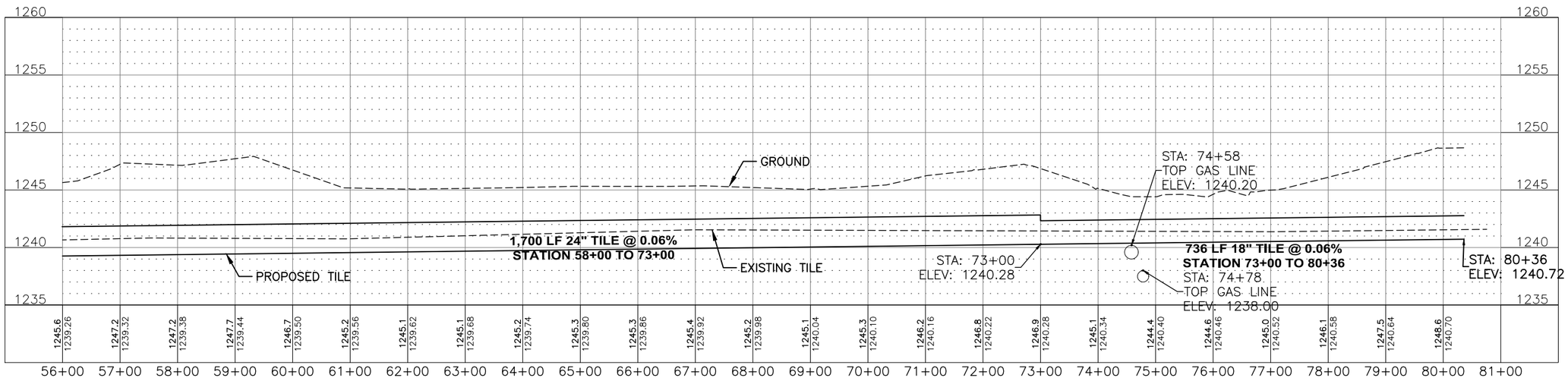

200 0 200
HORIZ. SCALE FEET

10 0 10
VERT. SCALE FEET

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GOPHER STATE ONE–CALL: 1–800–252–1166

REV.	BY	DATE

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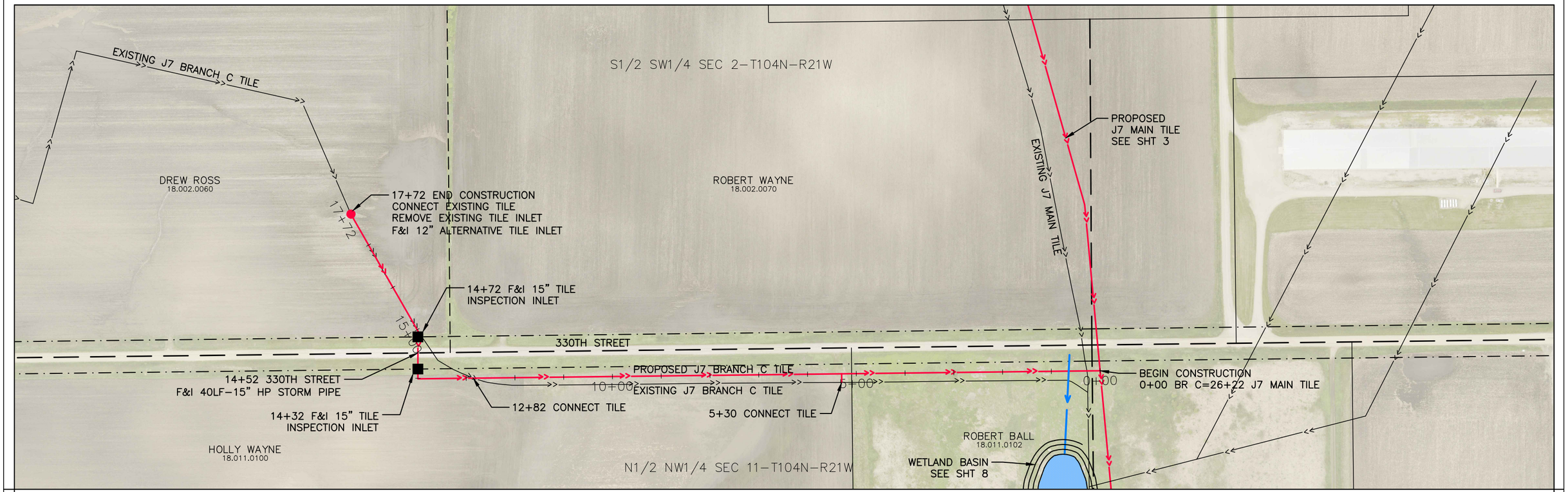
FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
J7 MAIN TILE
PLAN & PROFILE
SEC 2–T104N–R21W

SHEET 5 OF 16



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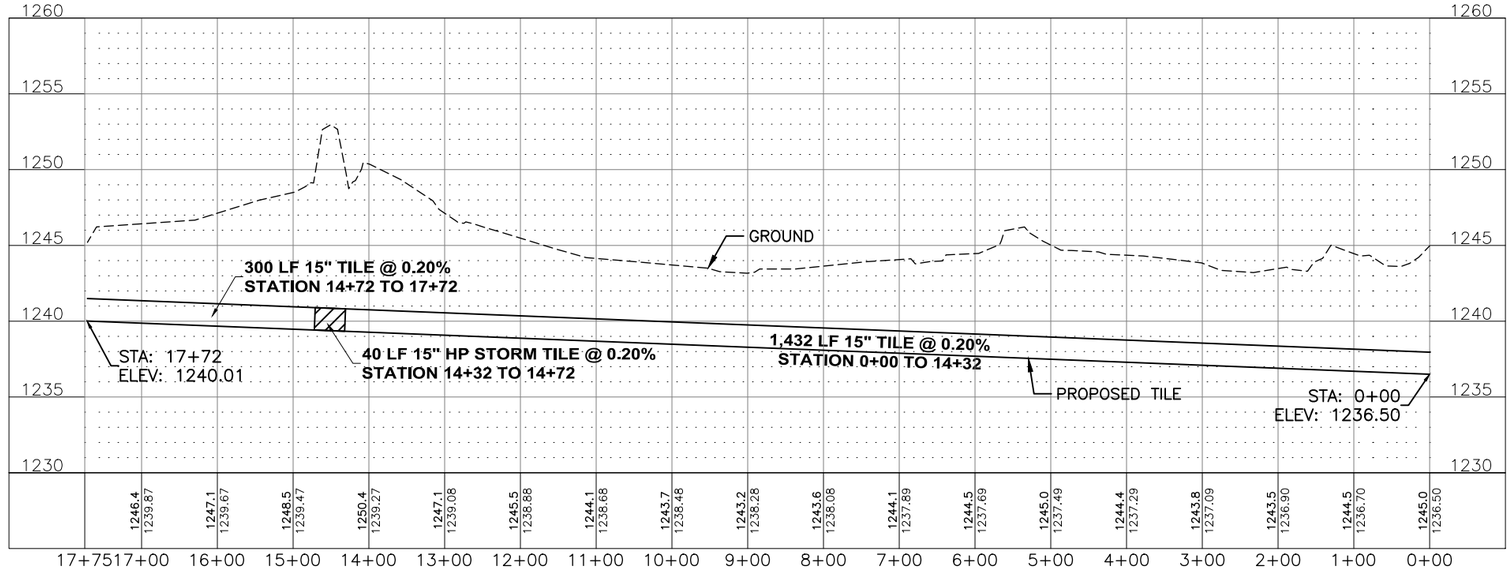

200 0 200
HORIZ. SCALE FEET

10 0 10
VERT. SCALE FEET

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GOPHER STATE ONE–CALL: 1–800–252–1166

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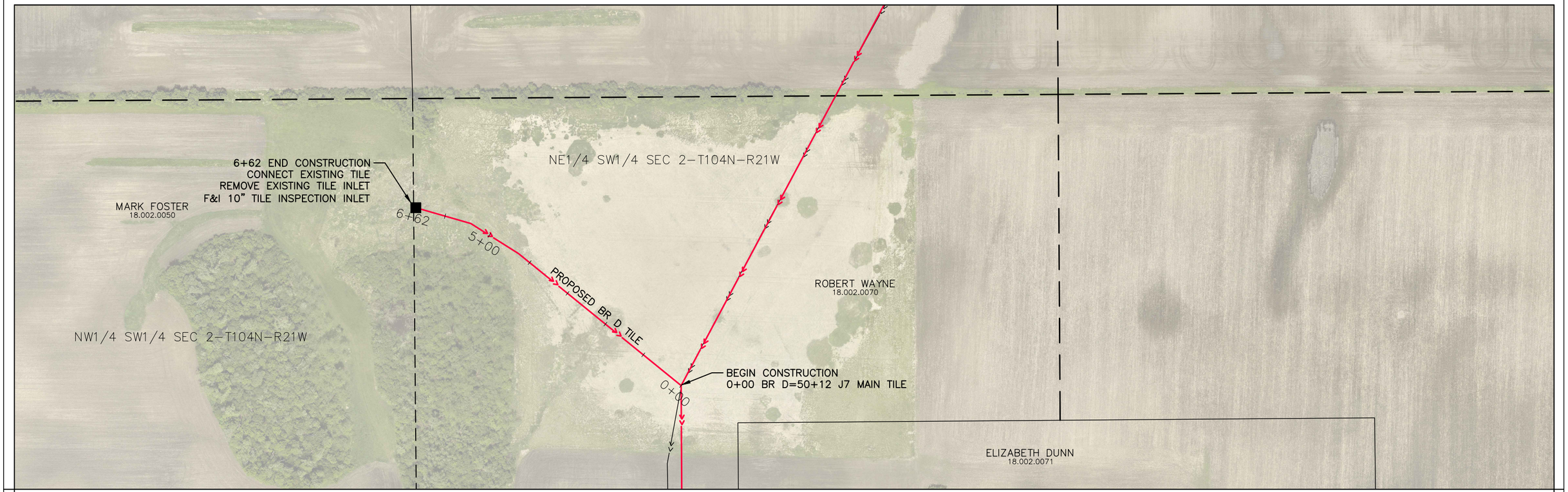
FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
J7 BRANCH C TILE
PLAN & PROFILE
NW 1/4 SEC 11–T104N–R21W

SHEET 6 OF 16



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XXXX.XX = PROPOSED TILE ELEVATION

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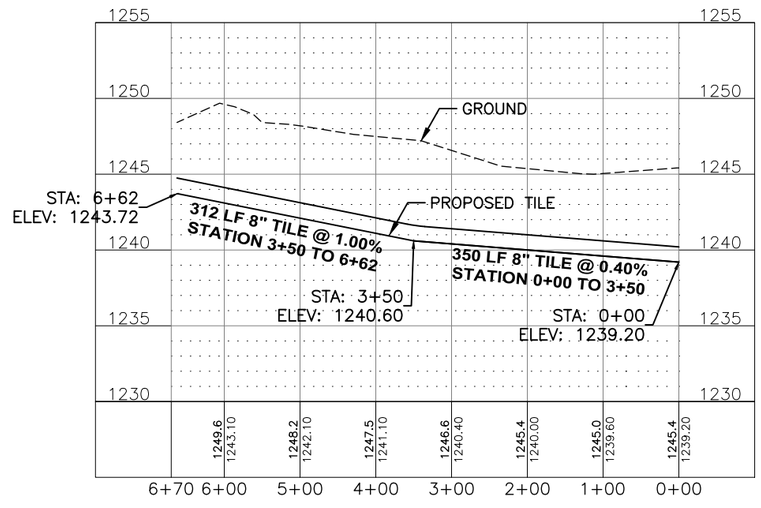

200 0 200
HORIZ. SCALE FEET

10 0 10
VERT. SCALE FEET

N

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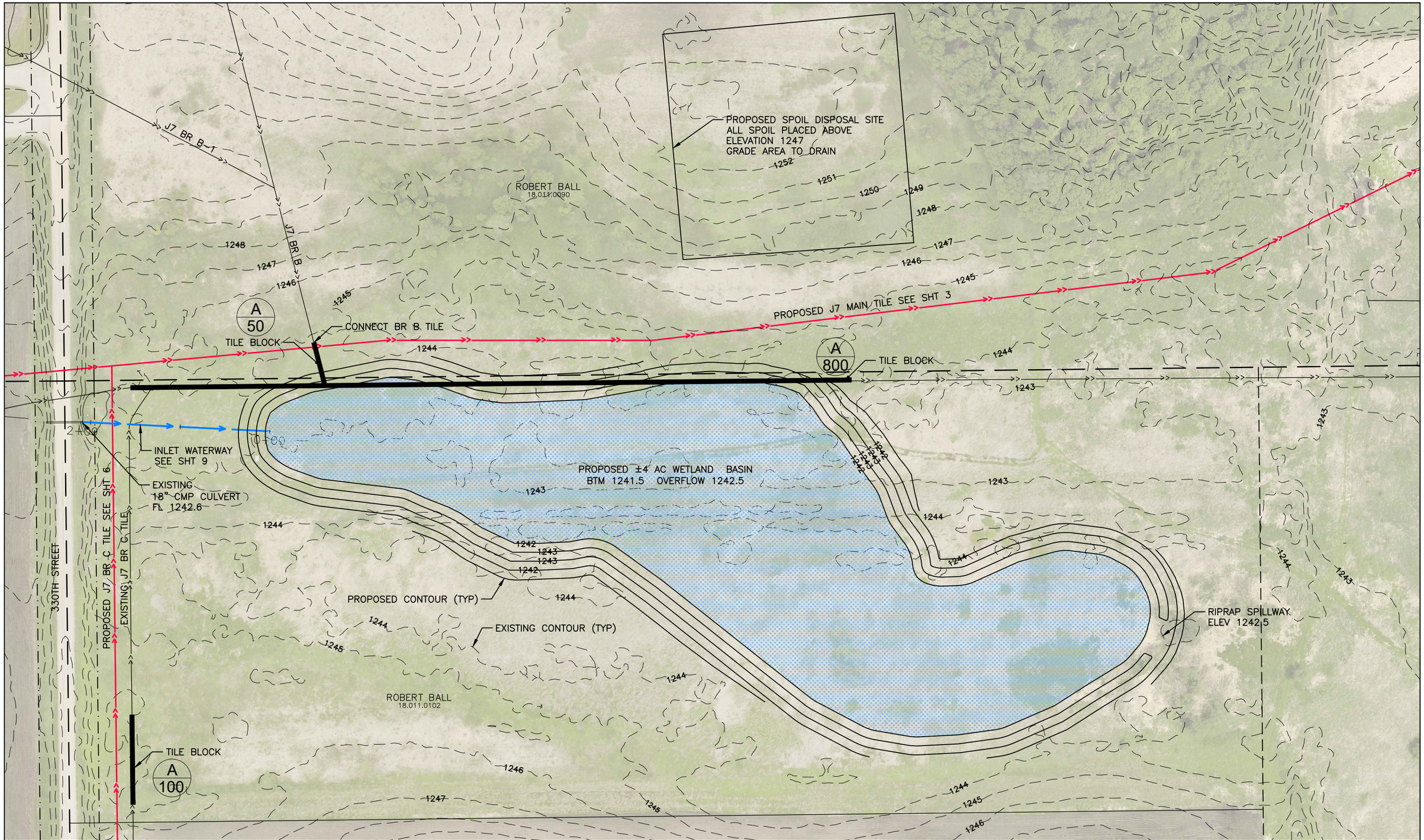
FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
J7 BRANCH D TILE
PLAN & PROFILE
NE1/4 SW1/4 SEC 2-T104N-R21W

SHEET 7 OF 16



100 0 100
HORIZ. SCALE FEET

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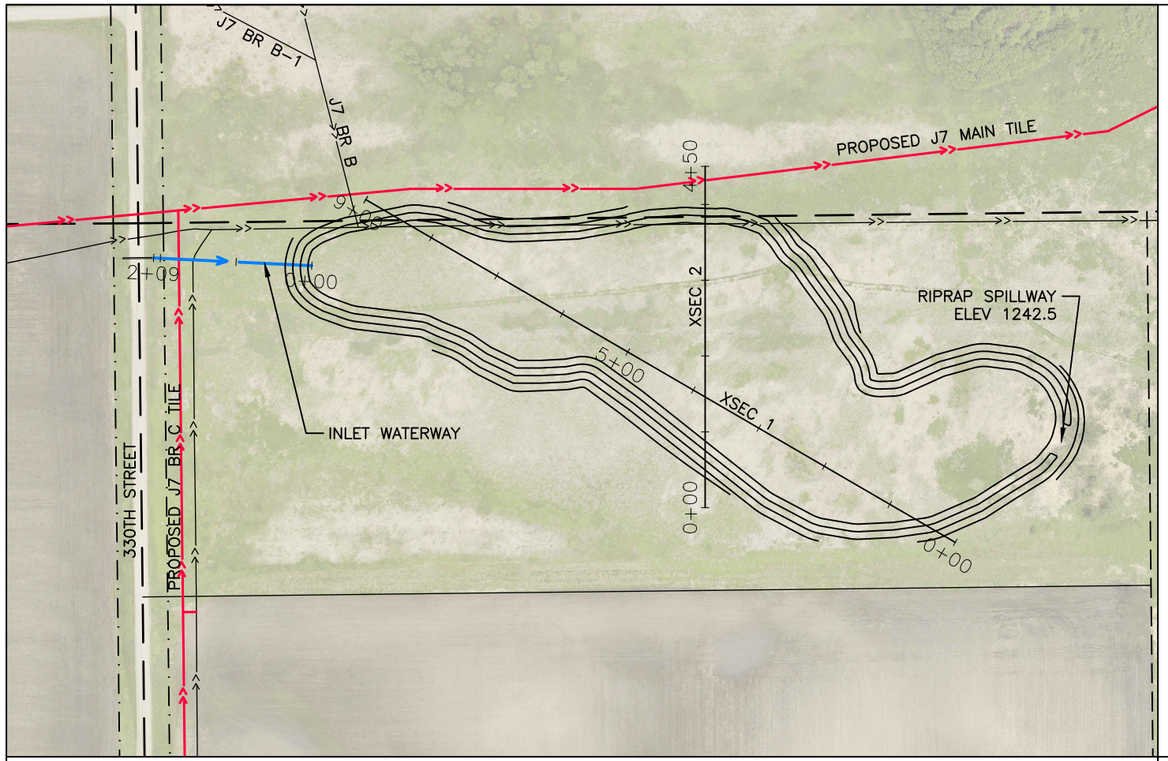
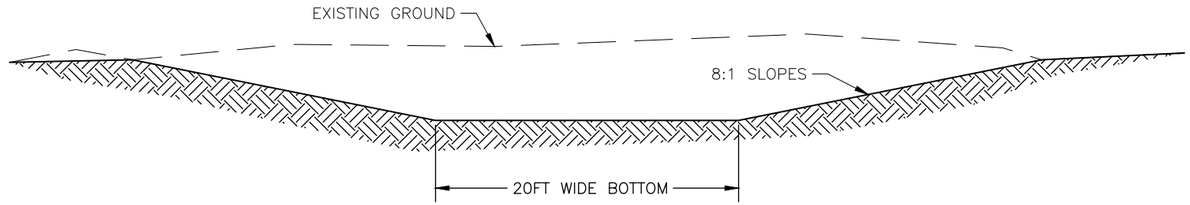
FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
WETLAND RESTORATION PLAN

SHEET 8 OF 16



NOTES:
1. THE WORK SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED FOR THE EXCAVATION, HAULING AND SPREADING OF MATERIALS AS REQUIRED BY THE DRAWINGS OR AS STAKED. THIS WORK INCLUDES THE CONTROL OF WATER DURING EXCAVATION, THE SHAPING OF SLOPES TO THE LINES AND GRADES SHOWN IN THE DRAWINGS AND THE DISPOSAL OF MATERIALS WITHIN DESIGNATED AREAS. THE PROJECT ENGINEER MAY CHANGE THE DEPTH, SLOPE, SHAPE, SIZE, OR LOCATION OF THE EXCAVATION AT THEIR DISCRETION.
2. CONTRACTOR SHALL PLACE EXCAVATED MATERIAL IN LOCATIONS IDENTIFIED OR AS DIRECTED BY THE ENGINEER.
3. THE FINISHED SHAPE OF THE EXCAVATION SHALL BE IRREGULAR AS SHOWN.
4. THE FINISHED SURFACE OF THE EXCAVATION SHALL BE ROUGH (NOT GRADED SMOOTH).
5. UNLESS OTHERWISE SPECIFIED THE PLACEMENT OF ALL EXCAVATED MATERIALS SHALL BE INCIDENTAL TO THE COST OF THE EXCAVATION (I.E., NOT A PAY ITEM).



TYPICAL INLET WATERWAY XSEC
NOT TO SCALE

XXXX.X = EXISTING GROUND ELEVATION
XXXX.XX = PROPOSED TILE ELEVATION

SCALE
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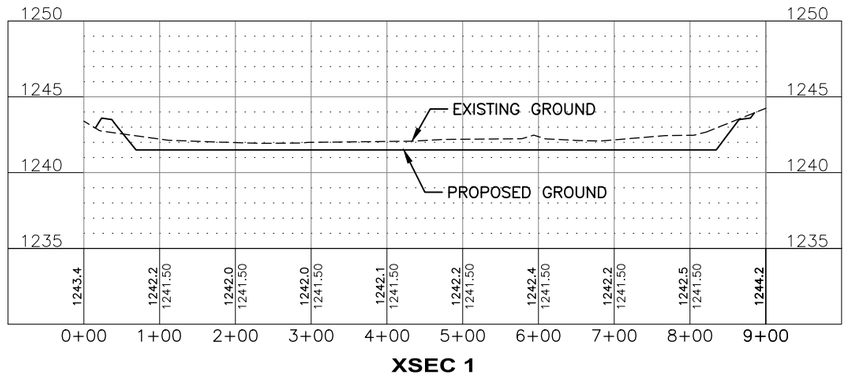
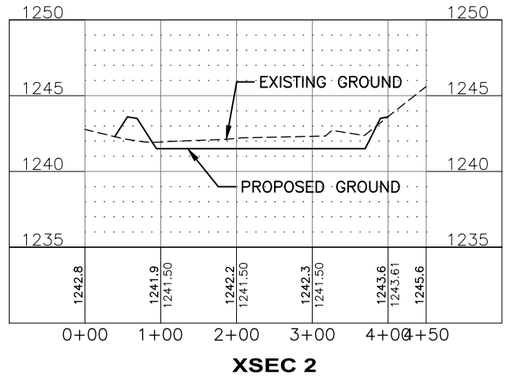
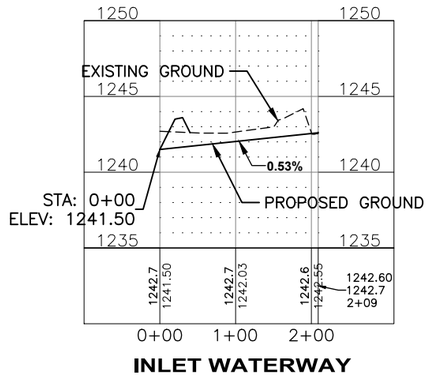


XSEC 1



XSEC 2



INLET WATERWAY

200 0 200 HORIZ. SCALE FEET
10 0 10 VERT. SCALE FEET

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GOPHER STATE ONE-CALL: 1-800-252-1166

REV.	BY	DATE

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Engineers + Surveyors
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Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
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FREEBORN COUNTY, MN
IMPROVEMENT OF COUNTY DITCH NO. 8
WETLAND DETAILS

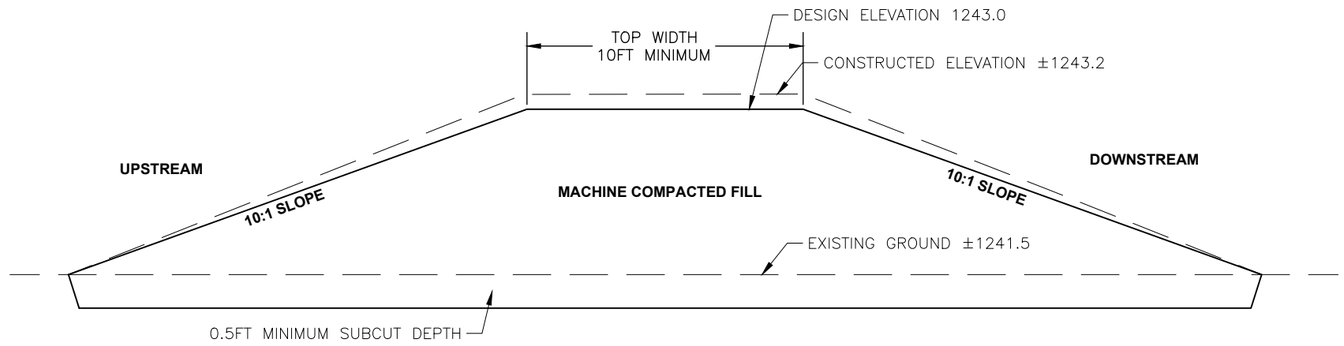
SHEET 9 OF 16

NOTES:
1. ADD 10% OF THE EXCAVATION DEPTH TO THE DESIGN ELEVATION TO DETERMINE THE CONSTRUCTED ELEVATION. CONSTRUCTED ELEVATION INCLUDES THE REQUIRED AMOUNT OF OVERBUILD TO ACCOUNT FOR EXPECTED SETTLEMENT.
2. THE ENGINEER MAY INCREASE THE SUBCUT DEPTH DEPENDING ON SOIL CONDITIONS AT THE TIME OF CONSTRUCTION.
3. EMBANKMENT CONSTRUCTION SHALL BE PAID FOR ON A LUMP SUM BASIS PER SPECIFICATIONS UNLESS OTHERWISE NOTED.

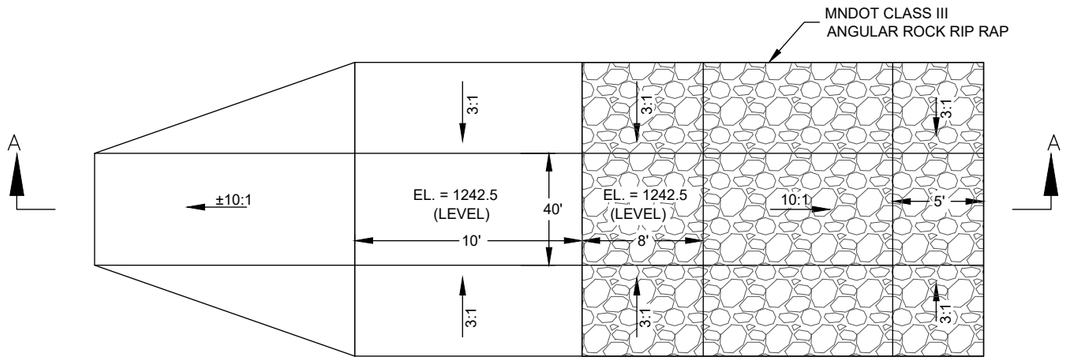
EMBANKMENT DESIGN DATA

DESIGN ELEVATION	= 1243.0
TOP WIDTH	= 10 FT
UPSTREAM SLOPE	= 10:1
DOWNSTREAM SLOPE	= 10:1
SETTLEMENT	= 10%
SUBCUT QTY	= 1740 CY
CUT QTY	= 5003 CY
FILL QTY*	= 2610 CY
EXCESS	= 4133 CY

*COMPACTION FACTOR OF 1.4

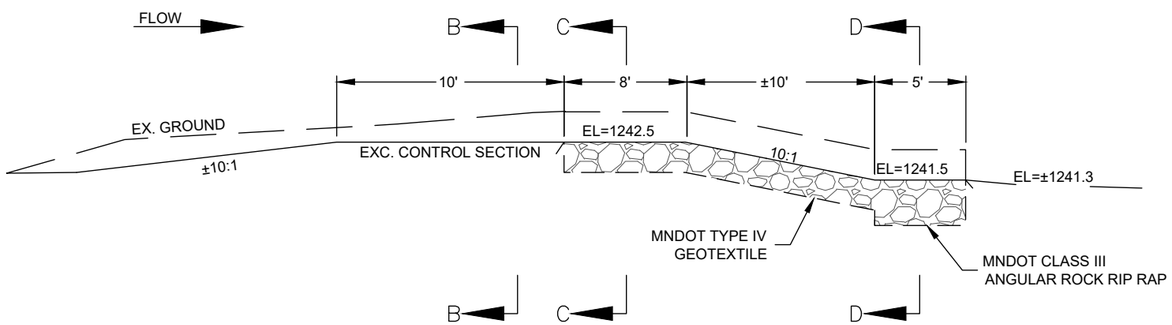


EMBANKMENT DETAIL



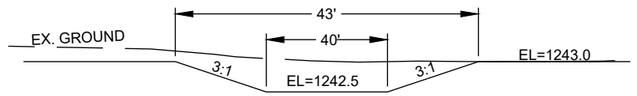
PLAN VIEW OF WETLAND OUTLET

NOT TO SCALE



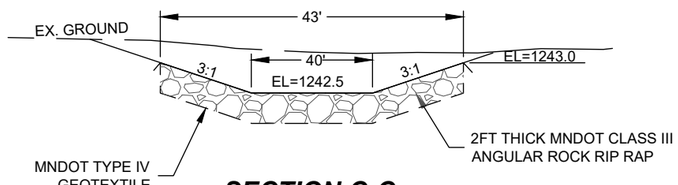
SECTION A-A

NOT TO SCALE



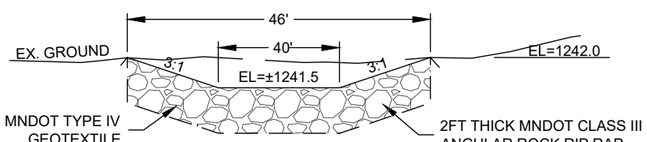
SECTION B-B

NOT TO SCALE



SECTION C-C

NOT TO SCALE



SECTION D-D

NOT TO SCALE

NOT TO SCALE

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REV.	BY	DATE

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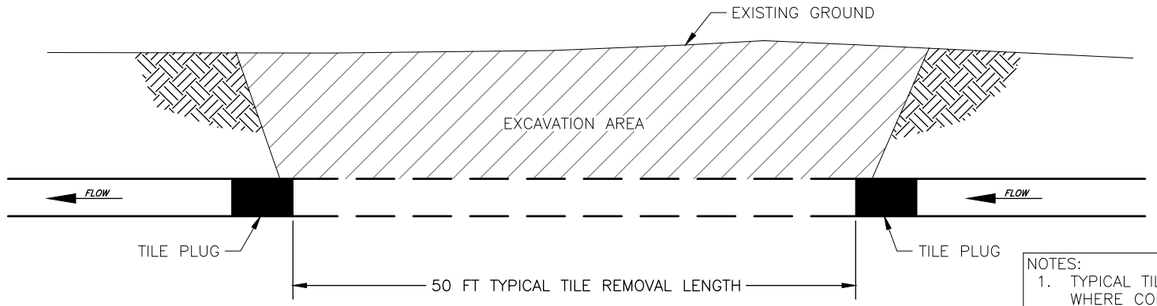
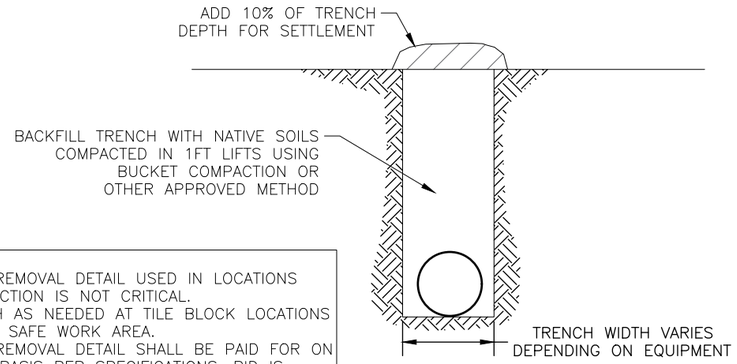
FREEBORN COUNTY. MN
IMPROVEMENT OF
COUNTY DITCH NO. 8
WETLAND DETAILS

SHEET 10 OF 16





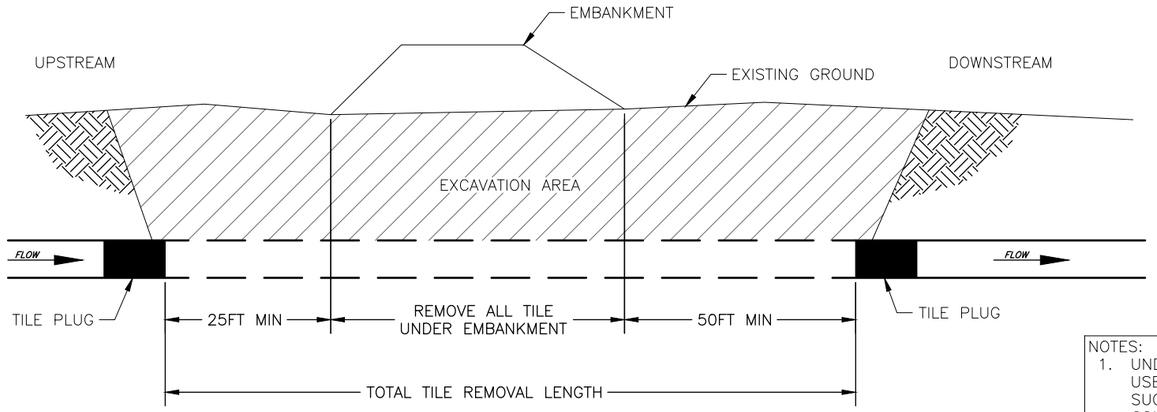
TYPE A - TYPICAL TILE REMOVAL DETAIL

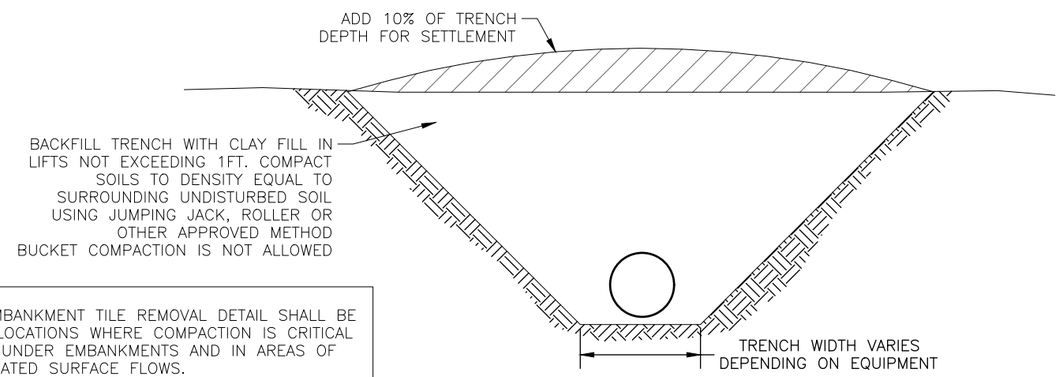
NOTES:
1. TYPICAL TILE REMOVAL DETAIL USED IN LOCATIONS WHERE COMPACTION IS NOT CRITICAL.
2. SLOPE TRENCH AS NEEDED AT TILE BLOCK LOCATIONS TO PROVIDE A SAFE WORK AREA.
3. TYPICAL TILE REMOVAL DETAIL SHALL BE PAID FOR ON A LUMP SUM BASIS PER SPECIFICATIONS. BID IS BASED ON 50 FT OF PIPE UNLESS OTHERWISE SPECIFIED.
4. TILE BLOCKS SHALL BE APPROVED BY THE ENGINEER AND SHALL PREVENT SEDIMENT FROM ENTERING THE TILE.
5. UNEXPECTED TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER.

NOTES:
1. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDED WITH SEED MIX MN CP 43 WITH TYPE MULCH OR CATEGORY 20 EROSION CONTROL BLANKET.

A
50

- TILE REMOVAL DETAIL LOCATION AND TYPE WILL BE SHOWN ON THE PLAN BY THIS SYMBOL.
- THE TOP LETTER SHALL DENOTE THE TYPE OF TILE REMOVAL
- THE BOTTOM NUMBER SHALL DENOTE THE ESTIMATED LENGTH OF TILE TO BE REMOVED.





TYPE B - UNDER EMBANKMENT TILE REMOVAL DETAIL

NOTES:
1. UNDER EMBANKMENT TILE REMOVAL DETAIL SHALL BE USED IN LOCATIONS WHERE COMPACTION IS CRITICAL SUCH AS UNDER EMBANKMENTS AND IN AREAS OF CONCENTRATED SURFACE FLOWS.
2. SLOPE TRENCH AT MINIMUM 1 TO 1 OR FLATTER SIDES SLOPES.
3. UNDER EMBANKMENT TILE REMOVAL DETAIL SHALL BE PAID FOR ON A LUMP SUM BASIS PER SPECIFICATIONS. BID IS BASED ON 100 FT OF PIPE UNLESS OTHERWISE SPECIFIED.
4. TILE BLOCKS SHALL BE APPROVED BY THE ENGINEER AND SHALL PREVENT SEDIMENT FROM ENTERING THE TILE.
5. UNEXPECTED TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER.

NOT TO SCALE

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REV.	BY	DATE

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DESIGNED:
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Lic. No. 43895 Date: 12-19-23

FREEBORN COUNTY. MN
IMPROVEMENT OF COUNTY DITCH NO. 8
TILE BLOCK/REMOVAL DETAILS

SHEET 11 OF 16

CONSTRUCTION ACTIVITY INFORMATION

PROJECT NARRATIVE: THE PROJECT CONSISTS OF THE CONSTRUCTION TO COUNTY DITCH NO. 8. THE PROJECT IS LOCATED APPROXIMATELY 2.5 MILES NORTHWEST OF THE CITY OF GENEVA, MN; IN SECTIONS 2 & 11, BATH TOWNSHIP, FREEBORN COUNTY, MN. THE PROJECT INCLUDES INSTALLATION OF 10,470 FEET OF TILE, 4 ACRE WETLAND RESTORATION, SEEDING AND ASSOCIATED EROSION CONTROL.

PROJECT NAME: IMPROVEMENT TO COUNTY DITCH NO. 8

PROJECT LOCATION: SECTION 2 AND 11, BATH TOWNSHIP, FREEBORN COUNTY, MN

PROJECT AREAS:
TOTAL ESTIMATED PROJECT SIZE: 20 ACRES DISTURBED
EXISTING IMPERVIOUS SURFACE AREA = 0.00 ACRES
POST CONSTRUCTION IMPERVIOUS SURFACE AREA = 0.00 ACRES
TOTAL NEW IMPERVIOUS SURFACE AREA = 0.00 ACRES

PROJECT TYPE: AGRICULTURAL DRAINAGE

SOIL TYPES:
41 ESTHERVILLE SANDY LOAM, 0 TO 2 PERCENT SLOPES
41B ESTHERVILLE SANDY LOAM, 2 TO 6 PERCENT SLOPES
94B TERRIL LOAM, 2 TO 6 PERCENT SLOPES
102B CLARION LOAM, 2 TO 6 PERCENT SLOPES
102C CLARION LOAM, 6 TO 10 PERCENT SLOPES
255 MAYER LOAM, 0 TO 2 PERCENT SLOPES
350 CANISTEO LOAM, 0 TO 2 PERCENT SLOPES
392 BISCAY CLAY LOAM, 0 TO 2 PERCENT SLOPES
525 MUSKEGO SOILS, 0 TO 1 PERCENT SLOPES
944B LESTER-ESTHERVILLE COMPLEX, 2 TO 6 PERCENT SLOPES
L78A CANISTEO CLAY LOAM, 0 TO 2 PERCENTS SLOPES
L83A WEBSTER CLAY LOAM, 0 TO 2 PERCENT SLOPES
L84A GLENCOE CLAY LOAM, 0 TO 2 PERCENT SLOPES

RECEIVING WATERS:
FREEBORN COUNTY DITCH 8
IN SW ¼ NE ¼ SECTION 11, BATH TOWNSHIP
RECEIVING WATER IS IDENTIFIED AS A "SPECIAL OR IMPAIRED" WATER
ADDITIONAL BMP'S ARE REQUIRED

DATES OF CONSTRUCTION: 2024

A NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER CONSTRUCTION PERMIT MUST BE SECURED FROM THE MPCA AT LEAST 7 DAYS PRIOR TO BEGINNING CONSTRUCTION.

CONTRACTOR AND ENGINEER SHALL IDENTIFY A PERSON KNOWLEDGEABLE AND EXPERIENCED TO OVERSEE THE EROSION AND SEDIMENT CONTROL BMP'S.

COMPANY: CONTACT PERSON: PHONE:

COMPANY: CONTACT PERSON: PHONE:

OWNER AND PARTY RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE:
FREEBORN COUNTY
DRAINAGE INSPECTOR
411 SOUTH BROADWAY
ALBERT LEA, MN 56007

GENERAL CONSTRUCTION SITE INFORMATION
INATALLATION OF EROSION CONTROL MEASURES SHALL BE COMPLETED BEFORE CONSTRUCTION ACTIVITIES OCCUR. CONSTRUCTION SHALL BE PHASED WHENEVER PRACTICAL TO MINIMIZE EROSION. CONTRACTOR SHALL SCHEDULE CONSTRUCTION SO THAT THE GENERAL SITE CAN BE MULCHED AND RE-SEEDED SOON AFTER DISTURBANCE.

THE CONTRACTOR SHALL COORDINATE SPOIL LEVELING AND FINISHING OPERATIONS WITH APPROPRIATE EROSION CONTROL BMP'S TO REDUCE TO A MINIMUM THE LAG TIME BETWEEN INITIAL AND FINAL PHASES OF THE COMBINED WORK. FINISH GRADING SHALL BE CONDUCTED AND COMPLETED ON A SECTION BY SECTION BASIS TO THE FULLEST EXTENT PRACTICAL WITHOUT DELAY AND BEFORE UNDESIRABLE WEEDS OR EROSION OCCUR.

ALL EROSION CONTROL MEASURES SHALL REMAIN IN PLACE AND BE MAINTAINED IN GOOD CONDITION UNTIL THE SITE HAS BEEN STABILIZED. BARRIERS WILL BE REMOVED WHEN FINAL STABILIZATION OF THE SLOPES HAS BEEN COMPLETED AS DETERMINED BY THE ENGINEER.

THIS PROJECT IS NOT LOCATED IN A KARST AREA NECESSITATING MEASURES TO PROTECT DRINKING WATER SUPPLY.

EROSION PREVENTION PRACTICES
APPROPRIATE CONSTRUCTION PRACTICES WILL BE USED TO MINIMIZE EROSION. AREAS OF NON-DISTURBANCE WILL BE DELINEATED (FLAGGED, ETC.) ON THE SITE BEFORE WORK BEGINS. CONTRACTOR SHALL PHASE CONSTRUCTION, MAINTAIN VEGETATIVE BUFFER STRIPS, AND PROVIDE HORIZONTAL SLOPE STAKING IN ORDER TO MINIMIZE EROSION.

TURF ESTABLISHMENT OR TEMPORARY SEEDING OR MULCHING OF ALL EXPOSED SOIL NOT BEING ACTIVELY WORKED SHALL BE AS FOLLOWS:

TYPE OF SLOPE OR DISTUBED AREA	TIME AREA CAN REMAIN OPEN WITHOUT BEING ACTIVELY WORKED	
	NORMAL WATER	SPECIAL/IMPAIRED
STEEPER THAN 3:1	14 DAYS	7 DAYS
10:1 TO 3:1	14 DAYS	7 DAYS
FLATTER THAN 10:1	14 DAYS	7 DAYS
DITCHES	1 DAY	1 DAY
PIPE ENDS	1 DAY	1 DAY
WITHIN 200 FEET OF SURFACE WATER	1 DAY	1 DAY

PIPE OUTLETS SHALL BE PROVIDED WITH ENERGY DISSIPATION (RIP RAP) WITHIN 24 HOURS OF CONNECTION TO WATERS OF THE STATE.

DITCH SIDE SLOPES WILL BE STABILIZED WITH HYDROMULCH, CATEGORY 3 EROSION BLANKET OR TYPE 1 DISC ANCHORED MULCH AND APPROVED SEED MIX OR APPROVED EQUAL.

SEDIMENT CONTROL PRACTICES
CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN SEDIMENT CONTROLS FOR TEMPORARY AND PERMANENT DRAINAGE BASINS AND DRAINAGE DITCHES THAT ARE A PART OF THIS PROJECT.

INLET PROTECTION SHALL BE INSTALLED AT ALL DRAIN INLETS.

SILT FENCING SHALL BE PLACED AROUND TEMPORARY SOIL STOCKPILES.

ROCK OR WOOD CHIP CONSTRUCTION SITE ENTRANCES SHALL BE USED.

DEWATERING AND BASIN DRAINING
ALL DEWATERING ACTIVITIES SHALL DISCHARGE TO A TEMPORARY SEDIMENTATION BASIN OR DIRECTLY INTO PIPES OR INTAKES WHERE POSSIBLE. ENERGY DISSIPATION SHALL BE PROVIDED AT ALL DISCHARGE POINTS.

DEWATERING ACTIVITIES WILL NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR ON DOWN SLOPE PROPERTIES OR ADVERSELY AFFECT WETLANDS.

INSPECTIONS AND MAINTENANCE
CONTRACTOR SHALL INSPECT AND MAINTAIN MEASURES AT MINIMUM ONCE EVERY (7) DAYS DURING ACTIVE CONSTRUCTION, AND WITHIN 24 HOURS AFTER A RAINFALL EVENT OF 0.5" IN 24 HOURS.

INSPECTIONS WILL INCLUDE STABILIZED AREAS, EROSION PREVENTION AND SEDIMENT CONTROLS, AND INFILTRATION AREAS.

STABILIZED AREAS WILL BE INSPECTED ONCE PER MONTH. WHERE WORK HAS BEEN SUSPENDED DUE TO FROZEN GROUND CONDITIONS, INSPECTIONS AND MAINTENANCE WILL TAKE PLACE AS SOON AS FIRST RUNOFF OCCURS AT THE SITE OR PRIOR TO RESUMING CONSTRUCTION, WHICHEVER COMES FIRST.

CONSTRUCTION SITE VEHICLE ENTRANCES MUST BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT BEING TRACKED ONTO PAVED SURFACES. TRACKED SEDIMENT MUST BE REMOVED FROM ALL OFF-SITE PAVED SURFACES WITHIN 24 HOURS OF DISCOVERY.

REFER TO MPCA'S COMPLIANCE GUIDE FOR EROSION AND SEDIMENT FOR INSPECTION LOG REQUIREMENTS.

RECORDS RETENTION
CONTRACTOR SHALL MAINTAIN RECORDS OF THE SEDIMENT RETENTION PROCEDURES ON-SITE. RECORDS WILL INCLUDE BUT IS NOT LIMITED TO; COPY OF THE SWPPP AND ANY CHANGES, INSPECTION AND MAINTENANCE RECORDS, PERMANENT OPERATION AND MAINTENANCE AGREEMENTS AND CALCULATIONS FOR THE DESIGN OF TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS

SWPPP IMPLEMENTATION CHAIN OF RESPONSIBILITY
THE GENERAL CONTRACTOR SHALL PROVIDE A TRAINED, CERTIFIED, KNOWLEDGEABLE PERSON WHO SHALL SERVE AS THE SITE'S EROSION CONTROL INSPECTOR. THIS PERSON SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL BMP'S, AND SHALL MAINTAIN THE INSPECTION LOG AT THE PROJECT SITE.

EACH SUBCONTRACTOR ON-SITE WILL DESIGNATE AN EMPLOYEE AS ITS PROJECT SWPPP OFFICER. A LIST OF THESE OFFICERS WITH CONTACT INFORMATION WILL BE AVAILABLE ON-SITE. IT WILL BE SOLELY THE SWPPP OFFICERS' RESPONSIBILITY TO ENSURE THAT ALL ON-SITE ACTIVITIES PERFORMED BY ITS COMPANY COMPLY WITH THE SWPPP. THE GENERAL CONTRACTOR'S SWPPP INSPECTOR WILL HAVE AUTHORITY OVER ALL SUBCONTRACTOR'S SWPPP OFFICERS FOR WORK PERTAINING TO COMPLIANCE.

SHOULD A SUBCONTRACTOR FAIL TO COMPLY WITH THE SWPPP, THE GENERAL CONTRACTOR WILL ASSUME ALL RESPONSIBILITY FOR COMPLIANCE.

ATTACH TO THIS SWPPP: NAMES OF THE PERSONNEL TRAINED; DATES OF TRAINING; NAME OF INSTRUCTOR(S) AND ENTITY PROVIDING TRAINING; CONTENT OF TRAINING COURSE OR WORKSHOP (INCLUDING NUMBER OF HOURS OF TRAINING).

POLLUTION PREVENTION
IT IS THE DUTY OF THE CONTRACTOR TO NOTIFY THE MPCA IMMEDIATELY OF ANY DISCHARGE, ACCIDENTAL OR OTHERWISE, OF ANY SUBSTANCE OR MATERIAL UNDER HIS CONTROL WHICH, IF NOT RECOVERED, MAY CAUSE POLLUTION OF WATERS OF THE STATE, AND THE CONTRACTOR SHALL RECOVER AS RAPIDLY AND THOROUGHLY AS POSSIBLE SUCH SUBSTANCE OR MATERIAL AND TAKE IMMEDIATELY SUCH OTHER ACTION AS MAY BE REASONABLY POSSIBLE TO MINIMIZE OR ABATE POLLUTION OF WATERS OF THE STATE CAUSED THEREBY.

ALL SOLID WASTE COLLECTED FROM THE CONSTRUCTION SITE MUST BE DISPOSED IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. ALL HAZARDOUS MATERIALS (OIL, GASOLINE, FUEL, PAINT, ETC) MUST BE PROPERLY STORED TO PREVENT SPILLS, LEAKS, OR OTHER DISCHARGE. STORAGE AREAS SHALL PROVIDE SECONDARY CONTAINMENT AND A HAZARDOUS MATERIALS SPILL KIT. EQUIPMENT FUELING AND MAINTENANCE SHALL OCCUR IN A DESIGNATED, CONTAINED AREA. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS. ALL RUNOFF CONTAINING ANY HAZARDOUS MATERIAL MUST BE PROPERLY COLLECTED AND DISPOSED. NO ENGINE DEGREASING SHALL BE ALLOWED ON SITE.

ALL SANITARY WASTES MUST BE COLLECTED FROM PORTABLE UNITS ON SITE BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR. THE UNITS MUST BE SECURED AND SHALL BE MAINTAINED ON A REGULAR BASIS AS NEEDED TO PREVENT OVERFILLING.

EMERGENCY SPILL PLAN - THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION PERSONNEL TO BE INFORMED OF THE MANUFACTURERS' RECOMMENDED SPILL CLEANUP METHODS, AND THE LOCATION OF THAT INFORMATION AND CLEANUP SUPPLIES. THE CONTRACTOR SHALL MODIFY THE SWPPP AS REQUIRED WITHIN SEVEN CALENDAR DAYS OF KNOWLEDGE OF THE RELEASE TO: PROVIDE A DESCRIPTION OF THE RELEASE, THE CIRCUMSTANCES LEADING TO THE RELEASE, AND THE DATE OF THE RELEASE. PLANS MUST IDENTIFY MEASURES TO PREVENT THE REOCCURRENCE OF SUCH RELEASES.

THE CONTRACTOR IS RESPONSIBLE FOR MONITORING AIR POLLUTION AND ENSURING IT DOES NOT EXCEED LEVELS SET BY LOCAL, STATE, OR FEDERAL REGULATIONS. THIS INCLUDES DUST CREATED BY WORK BEING PERFORMED ON THE SITE. AIR POLLUTION AND DUST CONTROL CORRECTION IS CONSIDERED INCIDENTAL TO THE UNIT BID PRICES FOR WHICH WORK IS BEING PERFORMED. ADDITIONAL DUST CONTROL MEASURES MAY BE REQUIRED.

CONCRETE WASHOUT ONSITE: ALL LIQUID AND SOLID WASTES GENERATED BY CONCRETE WASHOUT OPERATIONS MUST BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER. A COMPACTED CLAY LINER THAT DOES NOT ALLOW WASHOUT LIQUIDS TO ENTER GROUND WATER IS CONSIDERED AN IMPERMEABLE LINER. THE LIQUID AND SOLID WASTES MUST NOT CONTACT THE GROUND, AND THERE MUST NOT BE RUNOFF FROM THE CONCRETE WASHOUT OPERATIONS OR AREAS. LIQUID AND SOLID WASTES MUST BE DISPOSED OF PROPERLY AND IN COMPLIANCE WITH MPCA REGULATIONS. A SIGN MUST BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES.

FINAL STABILIZATION: THE PERMITTEES MUST ENSURE FINAL STABILIZATION OF THE SITE. THE PERMITTEES MUST SUBMIT A NOTICE OF TERMINATION WITHIN 30 DAYS AFTER FINAL STABILIZATION IS COMPLETE OR CONTROL HAS BEEN PASSED TO ANOTHER OWNER. ALL TEMPORARY EROSION CONTROL MEASURES AND BMP'S MUST BE REMOVED AS PART OF THE FINAL SITE STABILIZATION. THE STORM WATER PERMIT FURTHER DEFINES FINAL STABILIZATION AND ITS REQUIREMENTS.

SWPPP GENERAL NOTES:
THIS PLAN IS MEANT AND PROVIDED AS A GUIDE IN THE PROVISION OF SEDIMENT AND EROSION CONTROL (ESC) BMP'S AS REQUIRED BY THE NPDES PERMIT. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES, ALTHOUGH NOT SHOWN HERE, MAY BE REQUIRED TO COMPLY WITH THE PROVISIONS OF THE PERMIT.

PROVISION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL BMP'S IN ACCORDANCE WITH THE NPDES PERMIT IS THE RESPONSIBILITY OF THE CONTRACTOR, REGARDLESS OF WHAT IS SHOWN ON THIS PLAN.

MAINTENANCE OF ESC BMP'S IS INCIDENTAL TO THE UNIT PRICE BID.

THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL FINES IMPOSED BY REGULATING AUTHORITIES DUE TO NON-COMPLIANCE WITH THE TERMS OF THE NPDES PERMIT.

ESTIMATED QTY'S*

DESCRIPTION	EST QTY
INLET PROTECTION	3 EA
ROCK CONSTRUCTION ENTRANCE	2 EA
EROSION CONTROL BLANKET–TYPE 2	20 SY
SILT FENCE–HEAVY DUTY	200 LF
FILTER LOGS–STRAW BIOROLL	100 LF
MULCH–TYPE 1	11.8 AC
HYDROSEEDING	0 AC
RIPRAP, CL 2 & 3	130 TON

*ESTIMATES NOT FOR BIDDING PURPOSES AND ARE TO BE USED AS A GUIDE ONLY. SEE SPECIAL PROVISION AND BID DOCUMENTS FOR MORE INFORMATION. BIDDERS ARE PRESUMED TO HAVE VIEWED THE PROJECT TO FAMILIARIZE THEMSELVES AS TO THE EXTENT OF THE BMP'S REQUIRED AND SHALL PERFORM THEIR OWN TAKEOFFS FOR BIDDING.

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GOPHER STATE ONE–CALL: 1–800–252–1166

REV.	BY	DATE

JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
507-451-4598

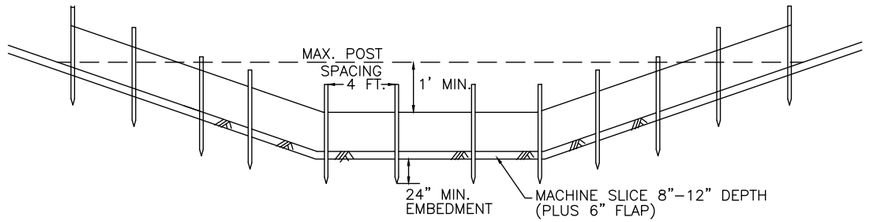
DESIGNED:	SJP
DRAWN:	SJP
CHECKED:	SJP
DATE:	12–19–23
FILE NO:	18–175.DWG

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.

Steven J. Penkava
Lic. No. 43895 Date: 12–19–23

FREEBORN COUNTY. MN
IMPROVEMENT OF COUNTY DITCH NO. 8
SWPPP NARRATIVE

SHEET 12 OF 16

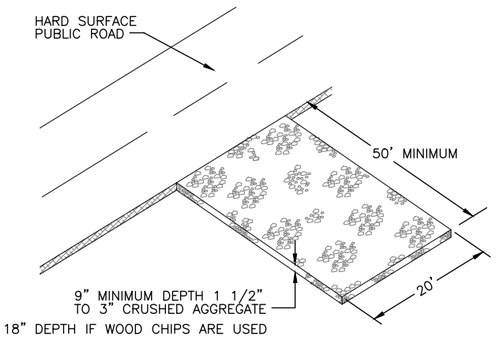


SPACING OF CHECKS:

SPACING (FT) = $\frac{\text{HEIGHT OF CHECK (FT) X 100}}{\text{DITCH GRADE (\%)}}$

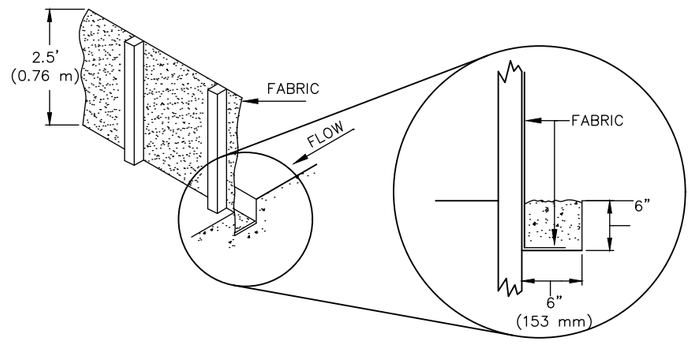
NOTE:
REMOVE SEDIMENT OR REPLACE FENCE WHEN SEDIMENT REACHES 1/3 HEIGHT OF FENCE

SILT FENCE DITCH CHECK



NOTES:
1. FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MIGRATION OF MUD THROUGH ROCK.
2. WOOD CHIPS USED FOR CONSTRUCTION ENTRANCES MUST BE 80% NOT LESS THAN 2 INCHES AND NOT MORE THAN 5 INCHES. NO CHIPPED UP MANUFACTURED WOOD AND/OR CHEMICALLY TREATED WOOD IS ALLOWED.
3. ENTRANCE MUST BE REGULARLY MAINTAINED TO PREVENT SEDIMENTATION ON PUBLIC ROADWAYS. FUGITIVE ROCK OR WOOD CHIPS WILL BE REMOVED FROM ADJACENT ROADWAYS DAILY OR MORE FREQUENTLY AS NECESSARY.

EROSION CONTROL PROTECTION AT CONSTRUCTION ACCESS

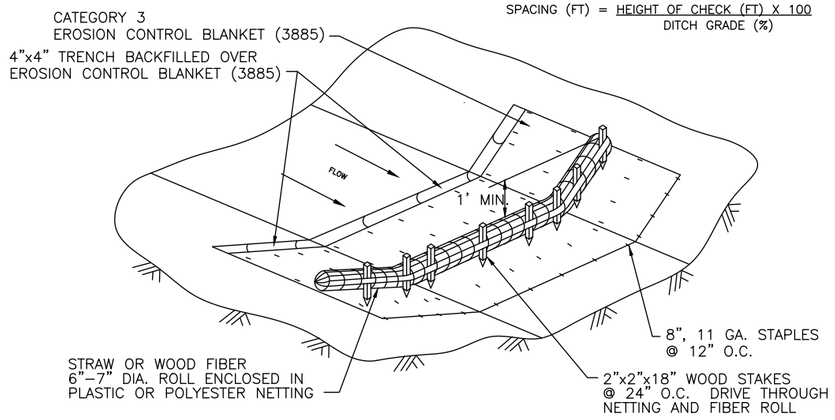


NOTES:
- PLACE BOTTOM EDGE OF FENCE INTO 6" (153 mm) DEEP
- POSTS SHALL BE:
  - 4' (1.22 m) ON CENTER
  - 2" (50.8 mm) X 2" (50.8 mm) HARDWOOD, PINE OR STANDARD STEEL FENCE POSTS
  - DRIVEN 2' (0.61 m) INTO THE GROUND.

EROSION CONTROL FENCE

SPACING OF CHECKS:

SPACING (FT) = $\frac{\text{HEIGHT OF CHECK (FT) X 100}}{\text{DITCH GRADE (\%)}}$



BIO-ROLL BLANKET DITCH CHECK

NOT TO SCALE

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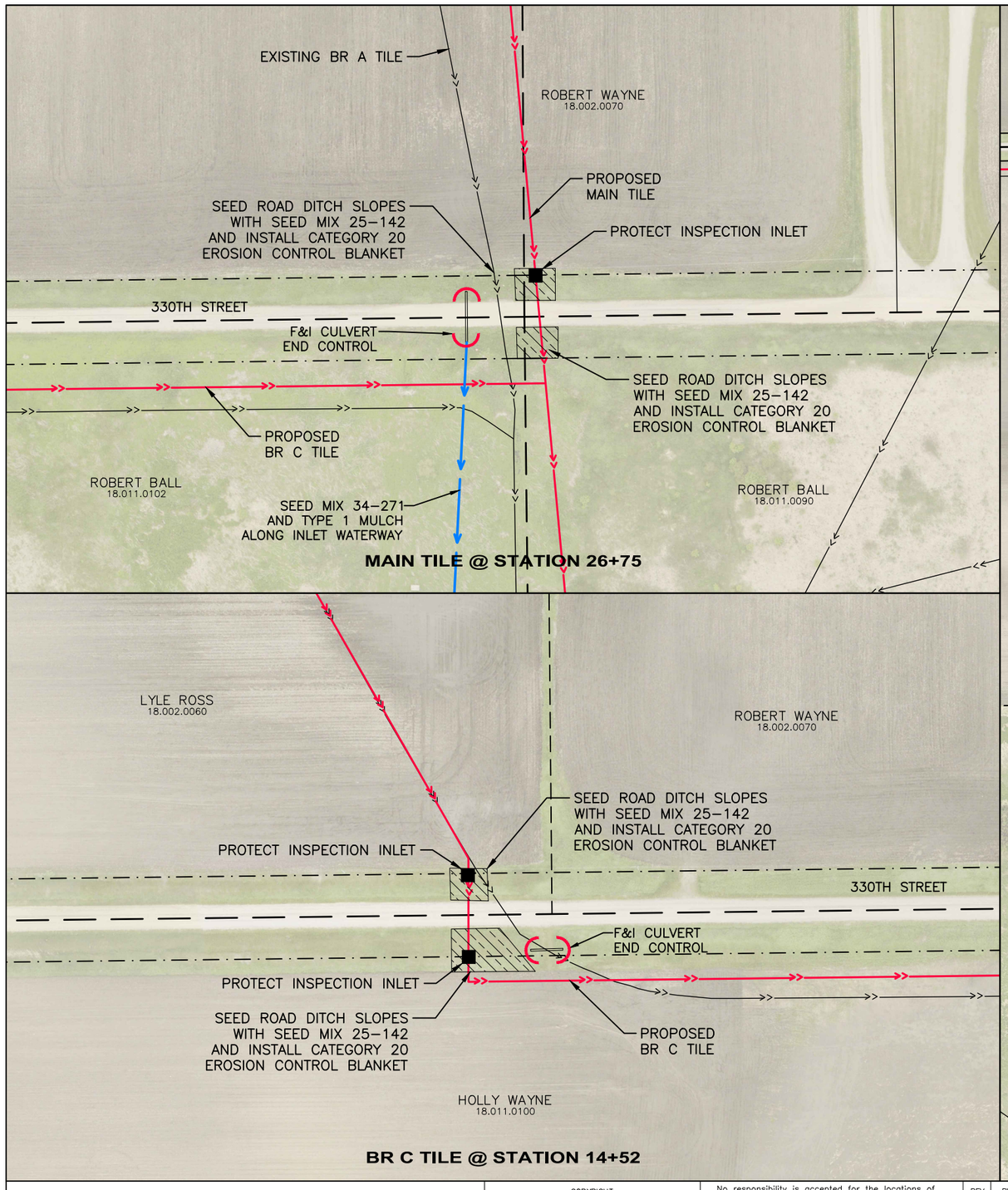
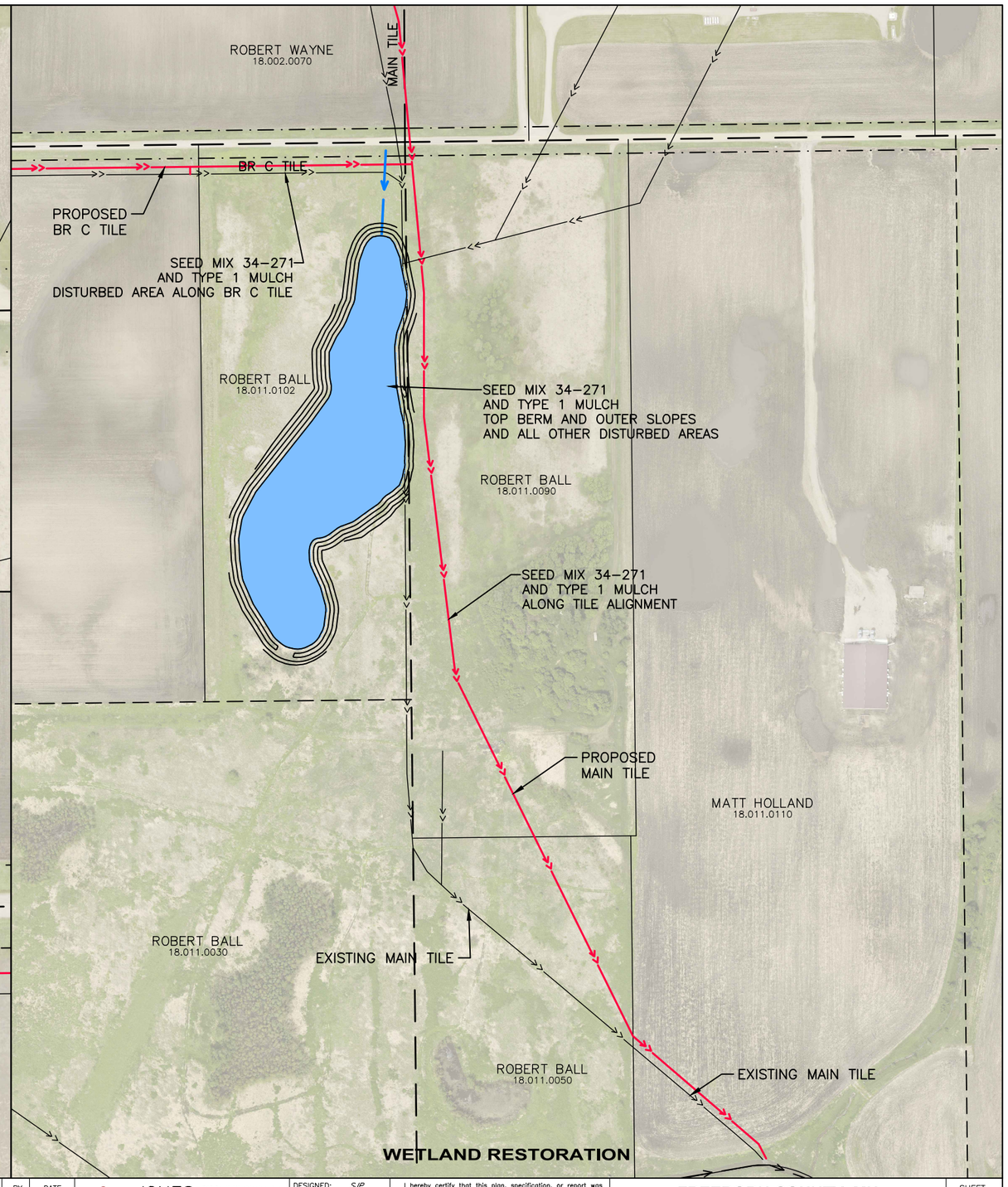
FREEBORN COUNTY. MN
IMPROVEMENT OF COUNTY DITCH NO. 8
SWPPP DETAILS

SHEET 13 OF 16





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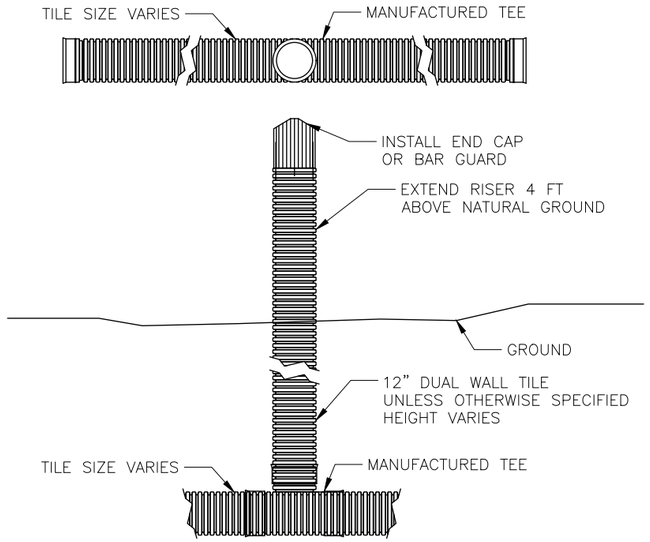
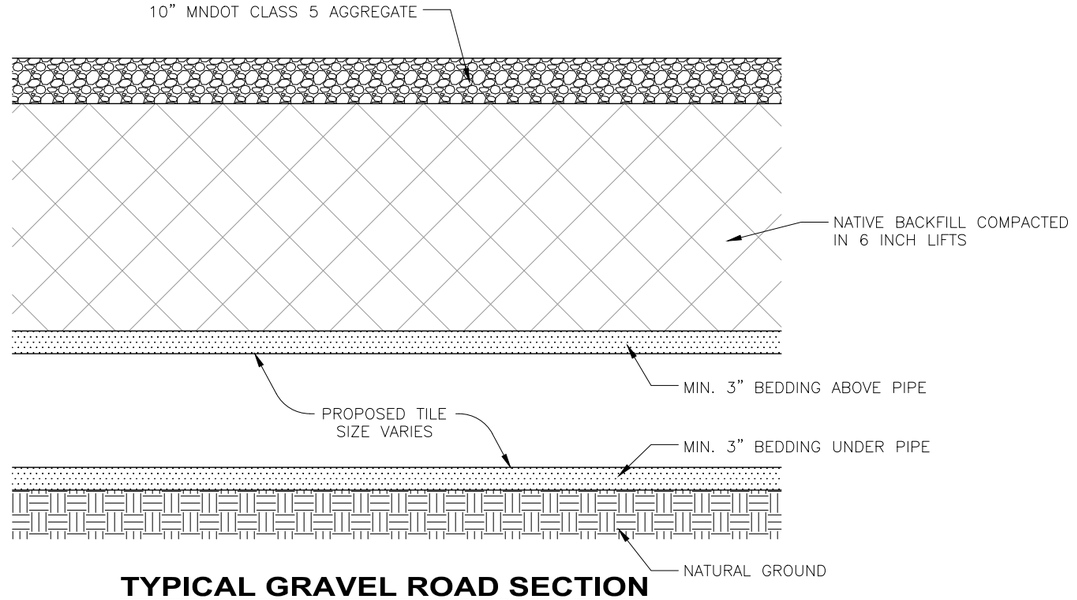
FREEBORN COUNTY. MN
IMPROVEMENT OF
COUNTY DITCH NO. 8
SWPPP DETAILS

SHEET 14 OF 16

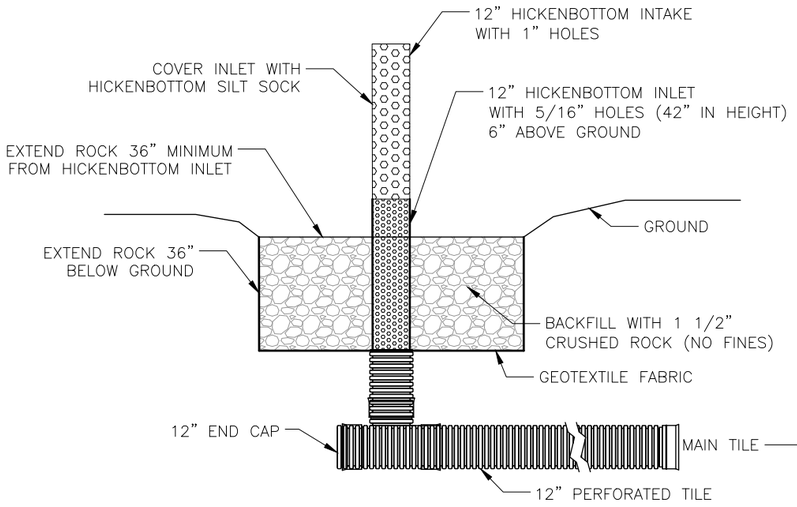


TILE INSPECTION INLET

NOTES:
1. EXTEND VERTICAL RISER A MINIMUM OF 4 FT ABOVE NATURAL GROUND SURFACE AND INSTALL END CAP OR BAR GUARD.
2. ALL CONNECTIONS SHALL BE MADE WITH MANUFACTURED FITTINGS WHENEVER POSSIBLE.
3. TILE INSPECTION INLETS SHALL BE PAID FOR AS A LUMP SUM PER SPECIFICATIONS. ALL FITTINGS AND BAR GUARD ARE INCIDENTAL TO TILE INSPECTION INLET CONSTRUCTION.



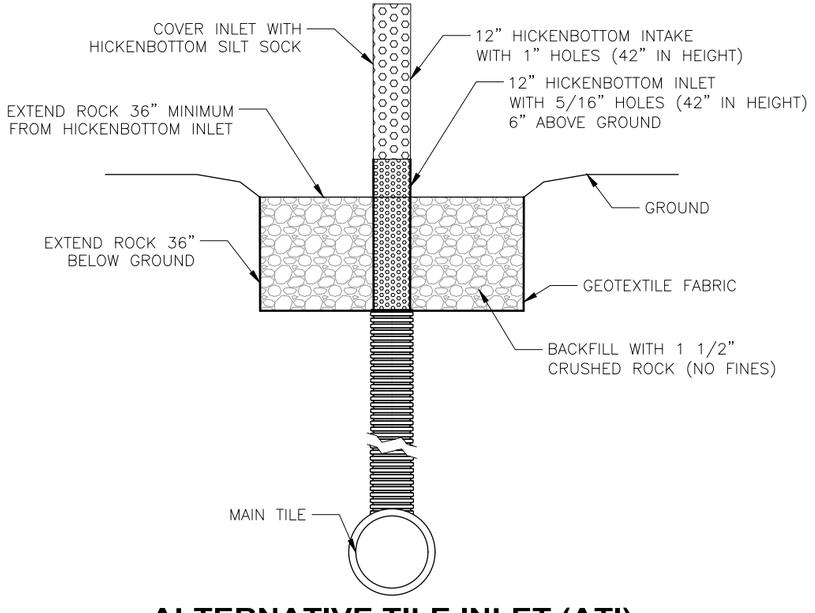
TYPICAL GRAVEL ROAD SECTION



OFFSET ALTERNATIVE TILE INLET (OATI)

NOTES:
1. ALL HICKENBOTTOM INLET SECTIONS SHALL BE 12" IN DIAMETER AND 42" IN HEIGHT.
2. ALL CRUSHED ROCK AGGREGATE BACKFILL SHALL BE CLEAN OF FINES AND DEBRIS.
3. CRUSHED ROCK AGGREGATE SHALL EXTEND A MINIMUM OF 36" FROM CENTER OF HICKENBOTTOM INLET.
4. CRUSHED ROCK AGGREGATE SHALL EXTEND A MINIMUM OF 36" BELOW GROUND.
5. ALL CONNECTIONS SHALL BE MADE WITH MANUFACTURED FITTINGS WHENEVER POSSIBLE.
6. ALTERNATIVE TILE INLETS SHALL BE PAID FOR AS A LUMP SUM PER SPECIFICATIONS AND INCLUDE ALL FITTINGS AND AGGREGATE MATERIAL.
7. OFFSET ALTERNATIVE TILE INLETS SHALL BE PAID FOR AS A LUMP SUM PER SPECIFICATIONS AND INCLUDE ALL FITTINGS AND AGGREGATE MATERIAL. BID QUANTITY BASED ON 20LF OF PIPE. ADDITIONAL PIPE TO BE PAID FOR PER SPECIFICATIONS.

NOTE: PROPOSED TILE TO BE TELEVISED AS PER SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO TILE FOR TELEVISING. INLETS MAY BE UPSIZED TO ACCOMMODATE TELEVISING EQUIPMENT AT NO COST TO OWNER. IF INLETS ARE UNDERSIZED FOR TELEVISING THE CONTRACTOR MUST EXCAVATE TILE TO PROVIDE ACCESS. NO EXTRA COMPENSATION WILL BE PROVIDED TO EXCAVATE AND REPAIR TILE.



ALTERNATIVE TILE INLET (ATI)

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REV.	BY	DATE

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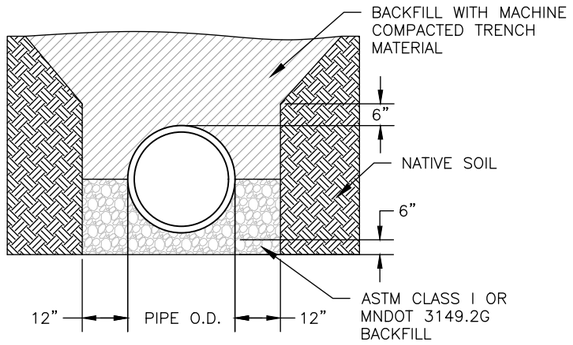
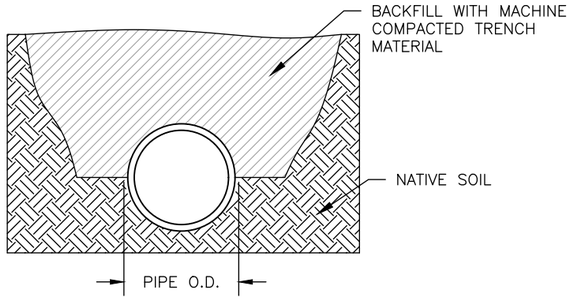
Lic. No. 43895 Date: 12-19-23

FREEBORN COUNTY. MN
IMPROVEMENT OF
COUNTY DITCH NO. 8
STANDARD DRAINAGE DETAILS



HDPE PIPE FLAT BOTTOM TRENCH INSTALLATION

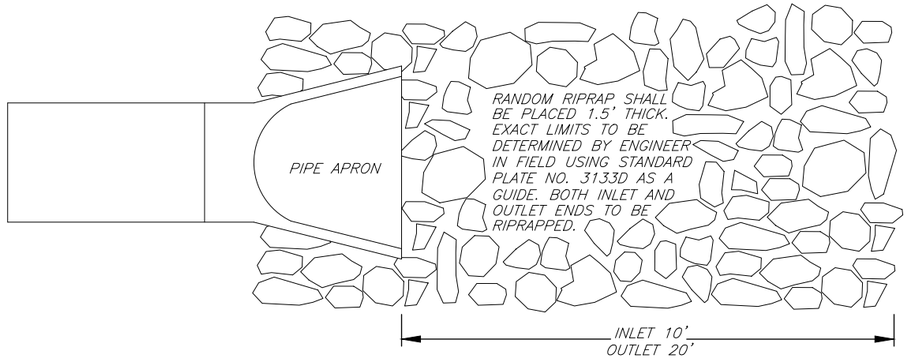
NOTES:
1. PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL.
3. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. MINIMUM BEDDING THICKNESS SHALL BE 6".
4. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.



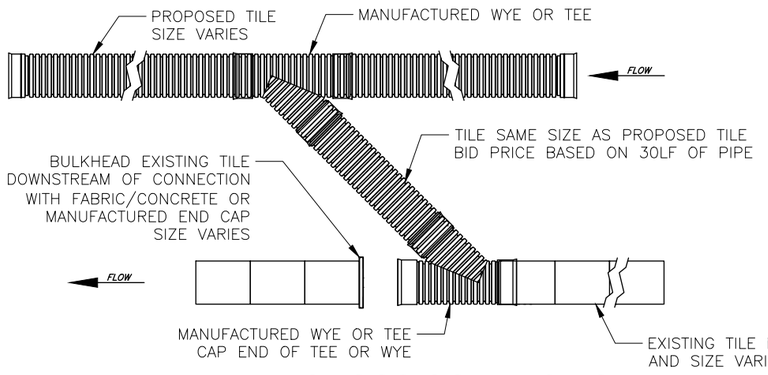
HDPE PIPE SPOON TRENCH INSTALLATION

NOTES:
1. NATIVE SOIL: SUITABLE IN-SITU MATERIAL SHALL BE OF ADEQUATE STRENGTH TO WITHSTAND TRENCHING OPERATIONS AND MAINTAIN THE FINAL TRENCH SHAPE. IF ANY PART OF THE TRENCH SIDEWALL SLOUGHS OFF DURING EXCAVATION, REMOVE MATERIAL FROM TRENCH AND REPLACE WITH SUITABLE MATERIAL.
2. SHAPED TRENCH: THE TRENCH SHALL BE CUT TO A DEPTH SUCH THAT THE TOP OF THE SHAPED TRENCH BOTTOM EXTENDS TO PIPE SPRINGLINE, OR HIGHER.
3. FILL MATERIAL: AFTER PLACEMENT OF THE PIPE IN THE SHAPED TRENCH, FILL MATERIAL MEETING A CLASS I, II, III OR IV MAY BE PLACED AND COMPACTED AROUND THE PIPE.

HDPE TILE INSTALLATION & BEDDING DETAIL

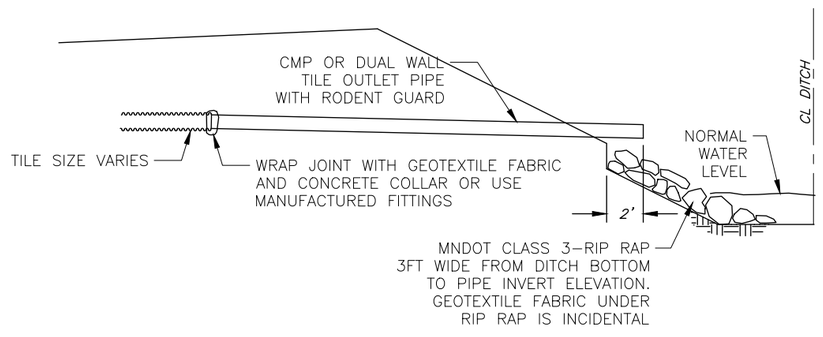


TYPICAL TILE INLET/OUTLET STABILIZATION



DRAIN TILE CROSS CONNECTION

NOTES:
1. ALL FITTINGS ARE INCIDENTAL TO DRAIN TILE CROSS CONNECTION.
2. ALL CONNECTIONS SHALL BE MADE WITH MANUFACTURED FITTINGS WHENEVER POSSIBLE.
3. CONNECTIONS TO CONCRETE OR CLAY TILE SHALL BE MADE BY SLIDING DUAL WALL TILE OVER THE EXISTING TILE AND WRAPPING THE JOINT IN GEOTEXTILE FABRIC.
4. DRAIN TILE CROSS CONNECTIONS SHALL BE PAID FOR AS A LUMP SUM PER SPECIFICATIONS. PRICE IS BASED ON 30 LF OF PIPE. ADDITIONAL PIPE TO BE PAID FOR PER SPECIFICATIONS.



NOTES:
1. OUTLET PIPES SHALL BE ONE SIZE LARGER THAN TILE.
2. JOINT BETWEEN TILE AND OUTLET PIPE SHALL BE MANUFACTURED FITTING OR THE OUTLET PIPE SHALL BE SLIDE OVER THE EXISTING TILE AND THE JOINT WRAPPED IN GEOTEXTILE FABRIC.
3. OUTLET PIPES 12" IN DIAMETER ARE GREATER SHALL BE RIVETED CMP, PIPES SMALLER THAN 12" IN DIAMETER SHALL BE DUAL WALL TILE.
4. AT THE TIME OF CONSTRUCTION THE ENGINEER WILL DESIGNATE OUTLETS TO BE REPLACED. EXISTING OUTLETS IN GOOD CONDITION SHALL BE ARMORED WITH RIP RAP.
5. TILE OUTLET PIPES SHALL BE PAID FOR AS A LUMP SUM PER SPECIFICATIONS.
6. RODENT GUARDS SHALL BE INSTALLED ON ALL TILE OUTLET PIPES LESS THAN 15" IN DIAMTER AS PER SPECIFICATIONS.
7. SLOPE PIPE TO TERMINATE APPROXIMATELY 2 FT ABOVE NORMAL WATER LEVEL EXCEPT AS REQUIRED BY GRADE AND ELEVATION, OR AS OTHERWISE DIRECTED BY ENGINEER.

TYPICAL TILE OUTLET PIPE INSTALLATION

NOT TO SCALE

No responsibility is accepted for the locations of utilities shown hereon. Verification of actual locations should be requested prior to the commencement of construction or the taking of any other action relying on the actual locations.

GOPHER STATE ONE-CALL: 1-800-252-1166

REV.	BY	DATE

JONES HAUGH SMITH
Engineers + Surveyors
515 South Washington Ave.
Albert Lea, MN 56007
507-373-4876
415 West North Street
Owatonna, MN 55060
507-451-4598

DESIGNED:
DRAWN: SJP
CHECKED:
DATE: 12-19-23
FILE NO: 18-175.DWG

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.

Steven J. Penkava
Lic. No. 43895 Date: 12-19-23

FREEBORN COUNTY. MN
IMPROVEMENT OF COUNTY DITCH NO. 8
STANDARD DRAINAGE DETAILS

SHEET 16 OF 16