



**BOLTON  
& MENK**

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Engineer's Report

# Drainage District No. 129

## East Main Tile Repair

Kossuth County

Filed: June 30, 2026

**Submitted by:**

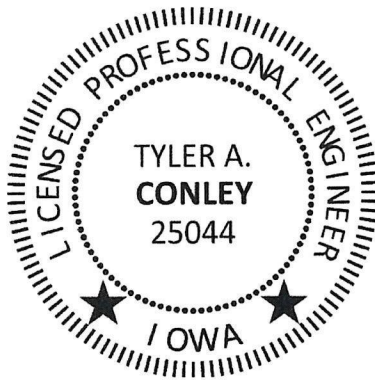
Bolton & Menk, Inc.  
1609 U.S. Hwy 18 East  
Algona, IA 50511  
P: 515-395-3140

Proj. No. 0T7.129778

# Certification

Engineer's Report  
for  
East Main Tile Repair  
Drainage District No. 129  
Kossuth County, Iowa

June 30, 2026



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 Iowa. My renewal date is December 31, 2027.

By: \_\_\_\_\_

*Tyler A. Conley*  
Tyler A. Conley, P.E.  
License No. 25044

Date: \_\_\_\_\_

*6/30/26*

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## **I. INTRODUCTION**

### **A. SCOPE OF WORK**

The purpose of this report is to provide information related to drainage relief requested by landowners of Drainage Districts No. 129, East Main Tile, Kossuth County, Iowa (DD129). The Board of Supervisors, acting as trustees, appointed Tyler A. Conley, P.E., Bolton & Menk, Inc., to complete the necessary preliminary survey, study, and engineering report.

This report addresses landowner requests for facility repairs associated with the East Main Tile of DD129. This report examines the conditions that would be necessary to restore the drainage efficiency of the East Main Tile to the original planned conditions. Copies of the drainage petitions are attached with this report in Appendix A.

### **B. LOCATION & DISTRICT FACILITIES**

DD129 is a Joint District with Faribault County Minnesota. The drainage facilities of DD129 drain to Lateral 162 of County Ditch No. 41 (CD41) and then the Main Open Ditch of CD41. The CD41 Open Ditch flows to the Middle Branch of the Blue Earth River, then the Blue Earth River, the Minnesota River, and eventually the Mississippi River.

The watershed of DD129 lies within Kossuth County, southeast of the city of Elmore, Minnesota. The watershed of DD129 is located in Sections 8, 9, 10, 15, 16, & 17 of Hebron Township (T-100-N, R-27-W).

The primary facilities of DD129 consist of an East Main Tile and a West Main Tile. The West Main Tile serves Lateral 10 and Lateral 11 which flows to Lateral 10. The East Main Tile supports 8 lateral tiles and 4 additional sub-lateral tiles. Appendix D contains a preliminary plan set that includes a site plan that outlines the facility locations of DD129.

### **C. HISTORY SUMMARY**

A petition for the review of a potential repair or improvement to the DD129 tile system was filed and acted on by the Kossuth County Board of Supervisors, acting as Trustees, on January 17, 2023. Since that time several informational meetings in Iowa and Minnesota have been held, as well as a formal hearing being held in Minnesota. These meetings/hearings have been to discuss the existing facilities conditions and what should be done to provide relief to the landowners by way of repairing those damaged systems.

It is our understanding from the district records that since the establishment of the drainage district in the early 1900s the facilities have remained largely unchanged. An engineer's report from February 2012 agrees with that analysis as the tile sizes, grades, and material are all the same as in the original engineering documents found at the courthouse. Additionally, the report and original documents align with a feasibility report for improvement that was issued by the Faribault County Drainage Department in the fall of 2022.

From these hearings, the damages reported, and the field condition survey, it was determined that repairs are required on both the Iowa and Minnesota portions of the East Main Tile and Lateral 162 respectively.

At the first informational meetings there was discussion of an improvement project to increase the capacity of the system. The difficulties of completing an improvement project in Minnesota were outlined and as a result a repair project was pursued for the outlet in Minnesota (Lateral 162 Tile). The formal hearing and approval of the Minnesota Lateral 162



repair project was held on February 24, 2026. Bids have since been received and construction on the Minnesota portion of the repair is tentatively set to begin in July of 2026. A final set of plans and bid tabulation from that bid letting have been attached to this report as Appendix C.

Lastly, a redistribution of benefits was entered into between Kossuth County and Faribault County as representatives of this Joint District. The split of project costs for the Minnesota portion of the repair project is 84.1% Kossuth County DD129, and 15.9% Faribault County CD41. This split was determined using the modern Iowa approach to calculation based reclassification of benefits analyzed over the total observed watershed. This observed watershed had approximately 30.7 acres of area that is not currently on the standing assessment schedule. Based on the repair status of the potential project an Annexation and Reclassification would not be required.

## II. INVESTIGATION

### A. SURVEY & INVESTIGATION

In August of 2023, a field review and preliminary survey were performed for the CD41 Lateral 162 and DD129 East Main Tile systems. Topographic data and tile flowlines were gathered along the main tile system, including two locations (one in Iowa and one in Minnesota), that were notably lacking in ground cover. This survey was gathered to determine the existing ground cover and current tile slopes so that any potential additional ground cover could be investigated. It was found that approximately 2 additional feet of ground cover can be provided to the East Main Tile starting at the State line based on the planned Lateral 162 repair. Utilizing the outlet elevation data and the original designed slope the capacity of the system could also be calculated.

### B. CAPACITY ANALYSIS

The standard design method for sub-surface tile drains utilizes drainage coefficients. The drainage coefficient is the rate at which water can be removed and is expressed as the equivalent depth of water covering the design area that can be removed in 24 hours. Based on the potential project being a repair, the original design capacity must be maintained, or the next conventional/commercially available sized tile may be utilized. The following table shows the design condition drainage coefficients as well as the drainage coefficient obtained by constructing the next conventional tile size:

| DISTRICT FACILITY CAPACITY<br>EXISTING DRAINAGE COEFFICIENT<br>DRAINAGE DISTRICT NO. 129<br>KOSSUTH COUNTY, IOWA |               |             |           |           |       |                     |               |                               |                                |                             |                                                      |
|------------------------------------------------------------------------------------------------------------------|---------------|-------------|-----------|-----------|-------|---------------------|---------------|-------------------------------|--------------------------------|-----------------------------|------------------------------------------------------|
| Existing East Main Tile                                                                                          |               |             |           |           |       |                     |               |                               |                                |                             |                                                      |
| Segment                                                                                                          | Station Start | Station End | Size (in) | Grade (%) | n     | Flow Capacity (cfs) | Drainage Area | Drainage Coefficient (in/day) | Existing % of 1/2" Coefficient | Next Conventional Size (in) | Next Conventional Size Drainage Coefficient (in/day) |
| 1                                                                                                                | 0+00          | 20+00       | 32        | 0.050     | 0.013 | 10.92               | 1826.5        | 0.142                         | 28.5%                          | 36                          | 0.230                                                |
| 2                                                                                                                | 20+00         | 0+00        | 28        | 0.050     | 0.013 | 7.65                | 1216.6        | 0.150                         | 29.9%                          | 30                          | 0.213                                                |
| 3                                                                                                                | 0+00          | 12+00       | 24        | 0.100     | 0.013 | 7.17                | 1058.5        | 0.161                         | 32.3%                          | 24                          | 0.191                                                |
| 4                                                                                                                | 12+00         | 33+00       | 22        | 0.100     | 0.013 | 5.69                | 895.8         | 0.151                         | 30.2%                          | 24                          | 0.225                                                |
| 5                                                                                                                | 33+00         | 51+00       | 20        | 0.100     | 0.013 | 4.41                | 787.9         | 0.133                         | 26.7%                          | 24                          | 0.256                                                |
| 6                                                                                                                | 51+00         | 55+00       | 18        | 0.100     | 0.013 | 3.33                | 358.5         | 0.221                         | 44.2%                          | 18                          | 0.261                                                |
| 7                                                                                                                | 55+00         | 63+00       | 16        | 0.100     | 0.013 | 2.43                | 354.1         | 0.164                         | 32.7%                          | 18                          | 0.265                                                |
| 8                                                                                                                | 63+00         | 66+00       | 14        | 0.100     | 0.013 | 1.70                | 254.8         | 0.159                         | 31.8%                          | 15                          | 0.226                                                |
| 9                                                                                                                | 66+00         | 70+00       | 12        | 1.100     | 0.013 | 3.75                | 103.5         | 0.862                         | 172.3%                         | 12                          | 1.018                                                |

### III. PROPOSED REPAIR

#### A. REPAIR SUMMARY

The investigation has confirmed the need for drainage relief in the district. It is recommended that the East Main Tile be completely replaced from the connection with the new Lateral 162 at the State line to the upstream original end point. This replacement would be at the original planned capacity at a deeper depth to provide adequate protection from the elements and farming implements. It is recommended to have a minimum of 3-feet of ground cover atop the Main Tile to provide adequate facility protection. Iowa Code Chapter 468.126 states: "... the board shall keep the improvement in repair" and "may order done whatever is necessary to restore or maintain a drainage or levee improvement in its original efficiency or capacity". Under the code, a repair is defined as maintenance or replacement of existing district tile without increasing the original planned capacity. Additionally, under the code a repair option also allows for the tile to be replaced with the next commercially available tile size, and the tile can be lowered as long as no additional changes to capacity are made. Because of these allowances in a repair option and due to the shallow nature of the existing tile the repaired tile should be lowered to gain cover and provide additional protection.

#### B. WORK LIMITS & DAMAGES

Landowners are entitled to full reimbursement for damages resulting from the work on lands outside of district rights-of-way. These damages will be established at a project completion hearing after the work is complete. The contractor will be assigned temporary work limits along each side of the tile line to allow for construction activities. The work limits for the tile line will be set at approximately 40 to 65 feet on either side of the tile centerline.

It is anticipated that the repair work will commence in the Fall and Winter of 2026. Crops that are damaged during construction would be paid for by the district based on crop appraisals. The construction zone would be minimized, and the work scheduled to minimize the loss of crops.

Buffer Strips or conservation acres may exist within the work area. Seeding of these areas is typically performed by the landowner with reimbursement being made at the project completion hearing. Seed mixes for these lands is often very specific for the type of conservation practice which is utilized.

If there are farm program buffer strips in place along the project alignment there are some manageable drawbacks which must be addressed by the owners of the buffer strips and conservation acres.

The destruction of buffer strip vegetation by spoil placement or leveling along the open ditch and tile installation places the landowner in violation of farm program conservation rules. The penalties can include loss of the CRP contract, forfeiture of back CRP payments, and penalties. To avoid these, landowners must request a waiver from the USDA Farm Service Agency County Committee. The county committee will typically grant waivers for ditch maintenance and tile installation if seeding restoration in compliance with NRCS requirements. If the work on the tile repair is authorized, all farm program owners on the repair portion of the tile should independently seek the FSA County Committee waivers. This process can take two or three months and should be initiated immediately if this repair is authorized.

## IV. OPINIONS OF PROBABLE COST

The cost estimate for the repair option is contained in Appendix B. This estimate represents our best judgment of the probable cost based upon our experience with similar projects. The quantities and unit costs for construction are believed to be reasonably accurate for use in this report and hearing. Actual costs are subject to the market for the respective components and to other economic forces. These estimates carry no actual or implied guarantees.

The total estimated assessable cost for the proposed repair option is \$756,000.00

## V. SUMMARY & DISCUSSION

This report has confirmed the need for drainage relief for Drainage District No. 129, East Main Tile. The work described herein for the repair option can accomplish that relief. We recommend proceeding with the repair option. The proposed repair is considered to be of public benefit and conducive to the public health, convenience or welfare.

### Recommendations

#### Repair Recommended

This report has confirmed the need for drainage relief for Drainage District No. 129, East Main Tile. It is recommended that the East Main Tile be replaced to repair damaged and shallow portions of the tile. The repaired tile would also be lowered to achieve a minimum 3-foot ground cover. The proposed repair is considered to be of public benefit and is conducive to the public health, convenience or welfare.

#### Installment Payments

Iowa drainage law allows for drainage district costs for large projects to be spread over no fewer than ten and no more than twenty years at the discretion of the Board of Supervisors. Typically, the board would spread assessments of this magnitude over twenty years.

#### Recommended Steps

It is recommended that the Board of Supervisors, acting as trustees, for Drainage District No. 129 take appropriate action, with legal guidance, to accomplish the following:

1. Tentatively approve this Engineer's Report and schedule a public hearing to receive and consider the input of the district landowners.
2. Adopt the repair alternate recommended for construction, modified as deemed appropriate, to satisfy the desires of the District.
3. Direct the engineer to prepare final plans and specifications for the adopted plan and proceed toward a bid letting.

Respectfully submitted,  
**Bolton & Menk, Inc.**

**Tyler A. Conley, P.E.**  
Project Manager

## Appendix A: Petitions

## Board of Supervisors

I was recently contact by Dustin Anderson from the Faribault county about repairing the Lateral 162 in MN. This lateral is the outlet for drainage district 129 of Herbron township. MN would like to fix lateral 162 and have the Iowa side help pay for the MN portion. I would submit that if we are to help pay for any improvements on the MN side, I would want there to be an improvement of both the MN and IA side (The complete line, both MN and IA). There are problems on both sides of the state line. On the MN side they have the county tile partially covered with extra dirt because of its shallowness and there are portions on the IA side that are failing because of age and shallowness and in desperate need of upgrading and repair. All of DD 129 flows north and it should be upgraded and repaired at the same time. The stateline should not cause a problem of upgrading and maintaining drainage that was put in many years ago. I have included a map and outlined some of the spots I know are in need of desperate repair. I farm the 80 west of my buildings (my uncle owns), own the 80 I live on, which is part of DD 129, and had many spots that have broken through over the past few years. The concrete tile just crumbles when touched and isn't very deep. The board needs to investigate the undersized and failing tile system.

Thank you

Jeff Willmert

## DRAINAGE PETITION

TO THE BOARD OF SUPERVISORS OF Kossuth COUNTY, IOWA:The undersigned ask that a drainage  
commencing at \_\_\_\_\_and running thence Hybron township DD 129

↓

FARIBAULT LATERAL 162Have included some maps

and terminating at \_\_\_\_\_

be \_\_\_\_\_

Your petitioners further state that the lands situated in DRAINAGE DISTRICT 129

are subject to overflow (or are too wet for cultivation or subject to erosion or flood danger), and the public benefit, utility, health, convenience and welfare will be promoted by the above mentioned project.

NAMES

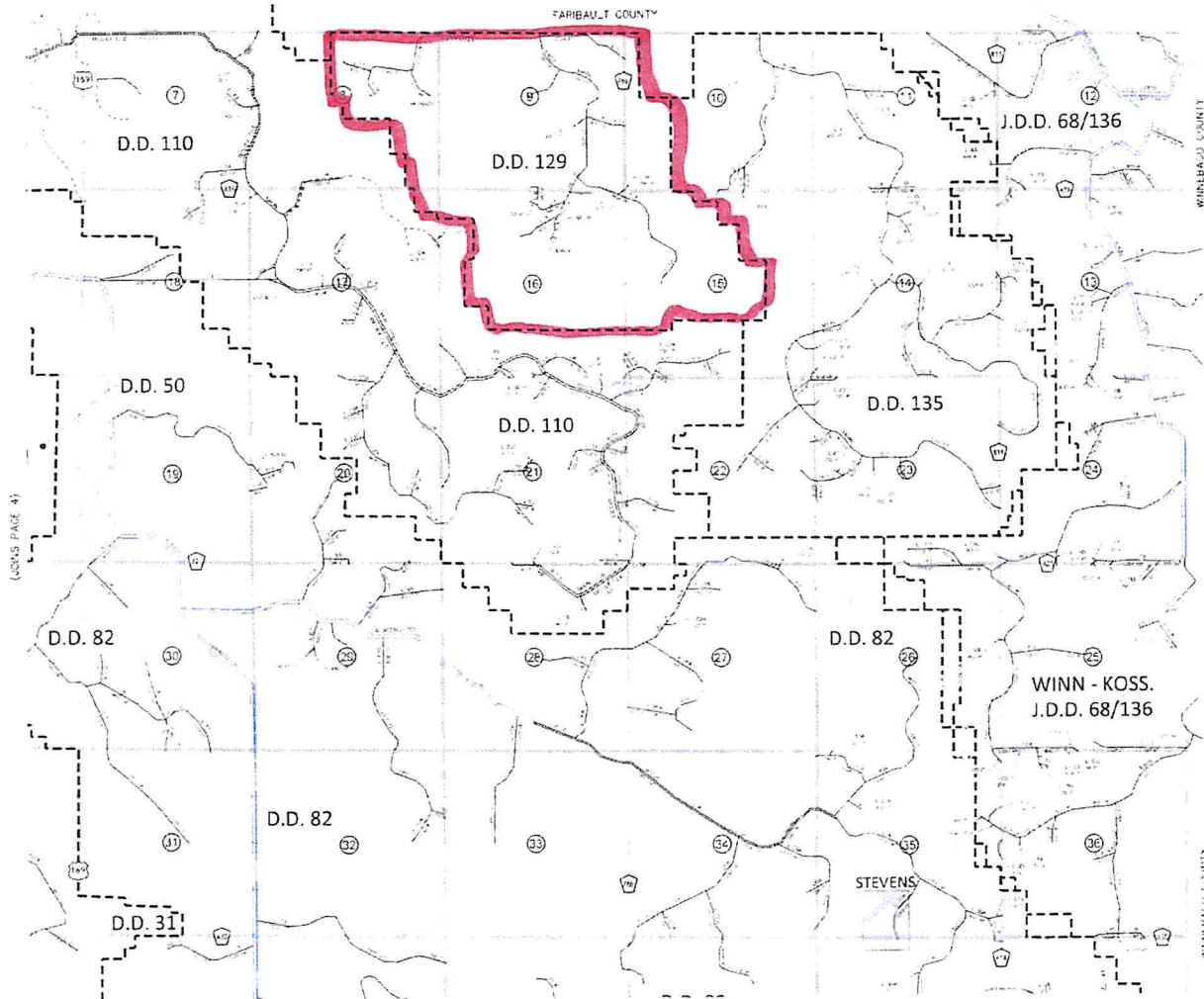
[Signature]Harley WillmerKerry RobertsMike [Signature]

NAMES

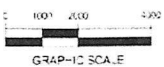
# HEBRON

T100N - R27W

STATE OF MINNESOTA  
FARIBAUT COUNTY



NORTH



## Appendix B: Opinions of Probable Costs



**Engineer's Opinion of Probable Cost  
Proposed East Main Tile Repair  
Drainage District No. 129  
Kossuth County, Iowa  
2026**

**Division 1 - Main Tile Repair - Replacement**

| <b>Item</b> | <b>Description</b>                            | <b>Unit</b> | <b>Quantity</b> | <b>Unit Price</b> | <b>Total</b> |
|-------------|-----------------------------------------------|-------------|-----------------|-------------------|--------------|
| 101         | Lateral Tile Connections, 10" Dia. Or Smaller | EA          | 16              | \$200             | \$3,200      |
| 102         | Lateral Tile Connections, 12" Dia. Or Larger  | EA          | 5               | \$250             | \$1,250      |
| 103         | 24" Dia. HDPE Elbow Section, Fabrication Only | EA          | 11              | \$1,500           | \$16,500     |
| 104         | 18" Dia. HDPE Elbow Section, Fabrication Only | EA          | 2               | \$1,400           | \$2,800      |
| 105         | 24" to 18" Reducer, Fabrication Only          | EA          | 1               | \$1,500           | \$1,500      |
| 106         | 18" to 15" Reducer, Fabrication Only          | EA          | 1               | \$1,400           | \$1,400      |
| 107         | 15" to 12" Reducer, Fabrication Only          | EA          | 1               | \$1,300           | \$1,300      |
| 108         | 12" End Cap, Fabrication Only                 | EA          | 1               | \$1,200           | \$1,200      |
| 109         | Spot Tile Exploration                         | HR          | 24              | \$250             | \$6,000      |
| 110         | Trench Foundation Stone                       | TN          | 477             | \$40              | \$19,074     |
| 111         | Drain Tile, Trenched, HDPE Dual Wall 24" Dia. | LF          | 5,000           | \$70              | \$350,000    |
| 112         | Drain Tile, Trenched, HDPE Dual Wall 18" Dia. | LF          | 1,112           | \$55              | \$61,160     |
| 113         | Drain Tile, Trenched, HDPE Dual Wall 15" Dia. | LF          | 300             | \$45              | \$13,500     |
| 114         | Drain Tile, Trenched, HDPE Dual Wall 12" Dia. | LF          | 400             | \$35              | \$14,000     |
| 115         | Crush Pipe in Place, Existing Tile            | LF          | 6,812           | \$4               | \$27,248     |
| 116         | Fence Cuts                                    | EA          | 3               | \$500             | \$1,500      |
| 117         | Mobilization                                  | LS          | 1               | \$26,100          | \$26,100     |
| 118         | Construction Contingency                      | LS          | 1               | \$52,268          | \$52,268     |

**Estimated Construction Cost - Division 1 - Main Tile Repair      \$600,000**

**Division 2 - County Road Crossing - 500th Street**

| <b>Item</b> | <b>Description</b>                          | <b>Unit</b> | <b>Quantity</b> | <b>Unit Price</b> | <b>Total</b> |
|-------------|---------------------------------------------|-------------|-----------------|-------------------|--------------|
| 201         | Drain Tile, Trenched, Class III R.C.P., 18" | LF          | 88              | \$125             | \$11,000     |
| 202         | Safety Closures                             | EA          | 1               | \$100             | \$100        |
| 203         | Traffic Control                             | LS          | 1               | \$1,500           | \$1,500      |
| 204         | Seeding and Fertilization (Rural)           | AC          | 0.1             | \$5,000           | \$500        |
| 205         | Silt Fence, Installation And Removal        | LF          | 200             | \$5               | \$1,000      |
| 206         | Plug & Fill Tile 16"                        | LF          | 90              | \$35              | \$3,150      |
| 207         | Construction Contingency                    | LS          | 1               | \$1,750           | \$1,750      |

**Estimated Total Construction - Division 2 - County Road Crossings - 500th Street      \$19,000**

**Engineer's Opinion of Probable Cost  
Proposed East Main Tile Repair  
Drainage District No. 129  
Kossuth County, Iowa  
2026**

**Non-Construction Costs**

|                                                                       |                  |
|-----------------------------------------------------------------------|------------------|
| Construction Related Damages                                          | \$12,500         |
| Basic Engineering Services                                            |                  |
| Survey, Study & Report. Meetings & Hearing                            | \$35,000         |
| Construction Plans, Specifications, & Bid Letting                     | \$35,000         |
| Construction Engineering Services, Staking, and Inspection            | \$40,000         |
| Legal Services, Publications, Mailings, Etc..                         | \$3,500          |
| Finance, Interest & Contingency                                       | <u>\$30,000</u>  |
| <b>Estimated Total Non-Construction Costs</b>                         | <b>\$156,000</b> |
| <b>Estimated Total Assesable Project Cost - East Main Tile Repair</b> | <b>\$756,000</b> |
| Estimated Average Cost Per Benefited Acre (1512)                      | \$500            |
| Estimated Average Cost Per Acre Per Year (10 years, 5% interest)      | \$61.67          |
| Estimated Average Cost Per Acre Per Year (20 years, 5% interest)      | \$38.21          |

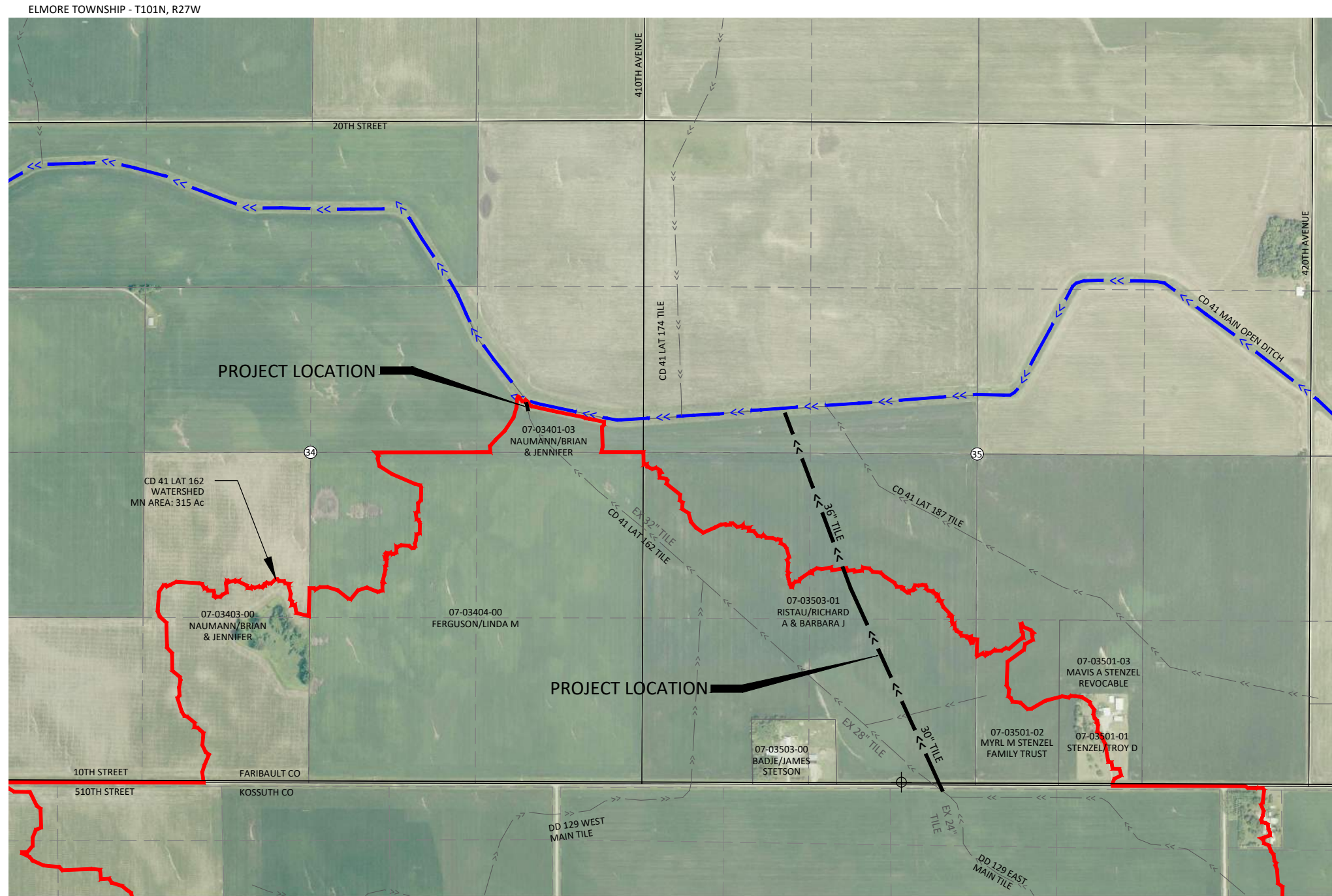
## Appendix C: Minnesota CD41 Lateral 162

# FARIBAULT COUNTY

## PRELIMINARY PLANS FOR

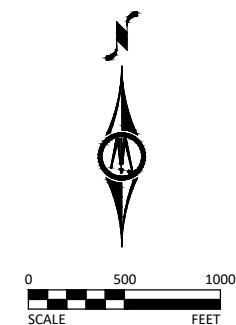
# COUNTY DITCH 41 LATERAL 162 TILE REPAIR

MARCH 2026



| SHEET NUMBER                            | SHEET TITLE                        |
|-----------------------------------------|------------------------------------|
| GENERAL                                 |                                    |
| G0.01 - G0.02                           | TITLE SHEET, LEGEND, GENERAL NOTES |
| G1.01                                   | STATEMENT OF ESTIMATED QUANTITIES  |
| CIVIL                                   |                                    |
| C1.01 - C1.02                           | TABLES, DETAILS, TYPICAL SECTIONS  |
| C2.01                                   | EROSION CONTROL PLAN               |
| C5.01 - C5.02                           | STORM SEWER PLAN & PROFILE         |
| THIS PLAN SET CONTAINS <u>8</u> SHEETS. |                                    |

PARTIAL MAP OF  
FARIBAULT COUNTY, MN



#### RESOURCE LIST

FARIBAULT COUNTY  
COURTHOUSE  
415 N MAIN STREET  
BLUE EARTH, MN 56013

BOARD OF COMMISSIONERS:  
GREG YOUNG, CHAIR  
BRUCE ANDERSON, VICE CHAIR  
BILL GROSKREUTZ  
TOM LOVEALL  
GERTRUDE PASCHKE

DRAINAGE DEPARTMENT:  
BLUE EARTH AG CENTER  
415 S GROVE STREET - SUITE 8  
BLUE EARTH, MN 56013  
507-526-2388

DRAINAGE MANAGER:  
MERISSA LORE

DRAINAGE PROJECT MANAGER:  
DUSTIN ANDERSON

DRAINAGE INSPECTOR:  
LUKE SCHONBORN

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

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

#### LEGEND

— << — EXISTING TILE  
— << — OPEN DITCH

— << — PROPOSED TILE  
— WATERSHED BOUNDARY

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.

*Derek D. Behrens*  
DEREK D. BEHRENS, P.E.  
LIC. NO. 62755 DATE 03/24/2026



1501 SOUTH STATE ST, SUITE 100  
FAIRMONT, MN 56031  
Phone: (507) 238-4738  
Email: Fairmont@bolton-menk.com  
www.bolton-menk.com

| DESIGNED         | NO. | ISSUED FOR | DATE       |
|------------------|-----|------------|------------|
| DDB              | --  | BID        | 03/24/2026 |
| DRAWN            | DDB |            |            |
| CHECKED          | SPL |            |            |
| CLIENT PROJ. NO. |     |            |            |

BM=1114.74  
SE PROP CORNER  
OF ACREAGE, 900'  
WEST OF CROSSING  
AT 10TH STREET

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

#### RECORD DRAWING INFORMATION

OBSERVER:  
CONTRACTOR:  
DATE:

FARIBAULT COUNTY, MINNESOTA  
CD 41 LATERAL 162 TILE REPAIRS

TITLE

SHEET

G0.01

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A:\P&C\031122631\CD\CD131245001.dwg 3/24/2026 2:18:39 PM

EXISTING TOPOGRAPHIC SYMBOLS

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

PROPOSED TOPOGRAPHIC SYMBOLS

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

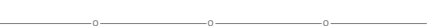
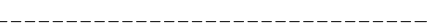
SURVEY SYMBOLS

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

EXISTING TOPOGRAPHIC LINES

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

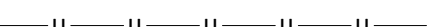
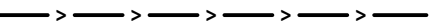
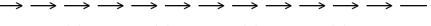
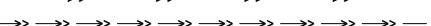
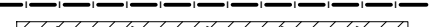
SURVEY LINES

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

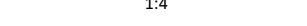
EXISTING UTILITY LINES

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

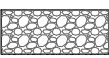
PROPOSED UTILITY LINES

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

GRADING INFORMATION

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

HATCH PATTERNS

|                                                                                       |            |                                                                                       |        |
|---------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------|--------|
|  | BITUMINOUS |  | GRAVEL |
|  | CONCRETE   |                                                                                       |        |

EXISTING PRIVATE UTILITY LINES

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

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

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

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

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

UTILITY QUALITY LEVELS:

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

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

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

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

ABBREVIATIONS

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

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.

  
DEREK D. BEHRENS, P.E.  
LIC. NO. 62755 DATE 03/24/2026



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|                  |     |            |            |
|------------------|-----|------------|------------|
| DESIGNED         | NO. | ISSUED FOR | DATE       |
| DDB              | --  | BID        | 03/24/2026 |
| DRAWN            |     |            |            |
| DDB              |     |            |            |
| CHECKED          |     |            |            |
| SPL              |     |            |            |
| CLIENT PROJ. NO. |     |            |            |

FARIBAULT COUNTY, MINNESOTA  
CD 41 LATERAL 162 TILE REPAIRS

LEGEND

SHEET

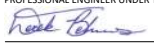
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A:\PACD\CD41\22631\CD41\CD41 162 Tile Repairs 3/24/2026 2:18:46 PM

| STATEMENT OF ESTIMATED QUANTITIES |                              |          |                |
|-----------------------------------|------------------------------|----------|----------------|
| ITEM NO.                          | ITEM                         | UNIT     | TOTAL QUANTITY |
| BASE BID                          |                              |          |                |
| 1                                 | Mobilization                 | LUMP SUM | 1              |
| 2                                 | Exploratory Excavation       | HOURL    | 20             |
| 3                                 | Aggregate Surfacing, Class 5 | TON      | 40             |
| 4                                 | Remove Drain Tile            | LIN FT   | 155            |
| 5                                 | 18" Intake Riser & Grate     | EACH     | 2              |
| 6                                 | 36" Intake Riser & Grate     | EACH     | 1              |
| 7                                 | 24" RC Intake Riser & Grate  | EACH     | 1              |
| 8                                 | 36" X 24" Wye                | EACH     | 1              |
| 9                                 | 6" Drain Tile                | LIN FT   | 100            |
| 10                                | 8" Drain Tile                | LIN FT   | 100            |
| 11                                | 24" Drain Tile               | LIN FT   | 20             |
| 12                                | 30" Drain Tile               | LIN FT   | 580            |
| 13                                | 36" Drain Tile               | LIN FT   | 2800           |
| 14                                | 24" RC Pipe, Class 3         | LIN FT   | 40             |
| 15                                | 30" RC Pipe, Class 3         | LIN FT   | 80             |
| 16                                | Drain Tile Connection        | EACH     | 15             |
| 17                                | Random Riprap, Class III     | TON      | 86             |
| 18                                | Inlet Protection             | EACH     | 6              |
| 19                                | Bioroll Ditch Check          | EACH     | 4              |
| 20                                | Mulch Material, Type 1       | TON      | 13             |
| 21                                | Rapid Stabilization Method 4 | SQ YD    | 1586           |

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.

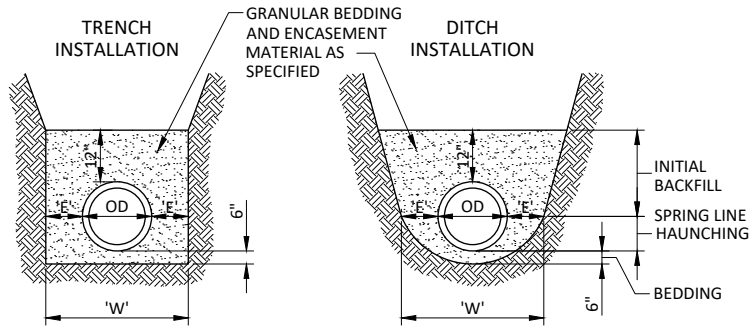
  
DEREK D. BEHRENS, P.E.  
LIC. NO. 62755 DATE 03/24/2026



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|                  |     |     |            |            |
|------------------|-----|-----|------------|------------|
| DESIGNED         | DDB | NO. | ISSUED FOR | DATE       |
| DRAWN            | DDB | 1   | BID        | 03/24/2026 |
| CHECKED          | SPL |     |            |            |
| CLIENT PROJ. NO. |     |     |            |            |

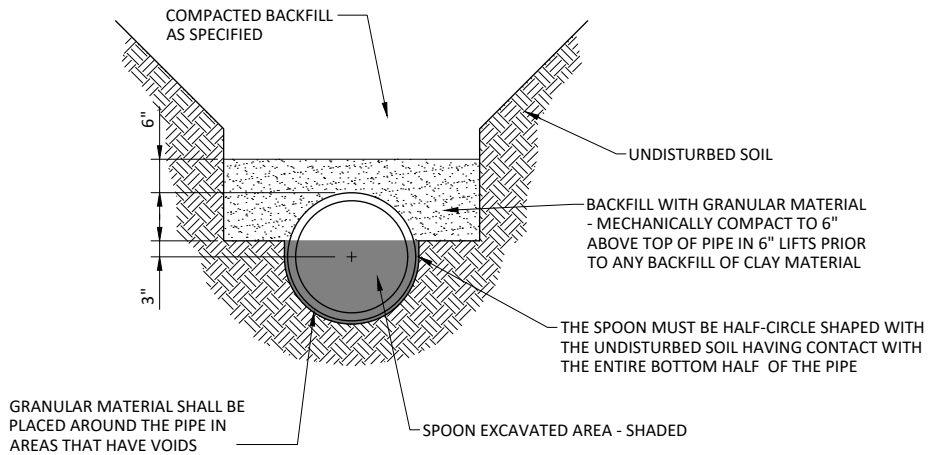
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| FARIBAULT COUNTY, MINNESOTA       | SHEET<br><br>G1.01 |
| CD 41 LATERAL 162 TILE REPAIRS    |                    |
| STATEMENT OF ESTIMATED QUANTITIES |                    |



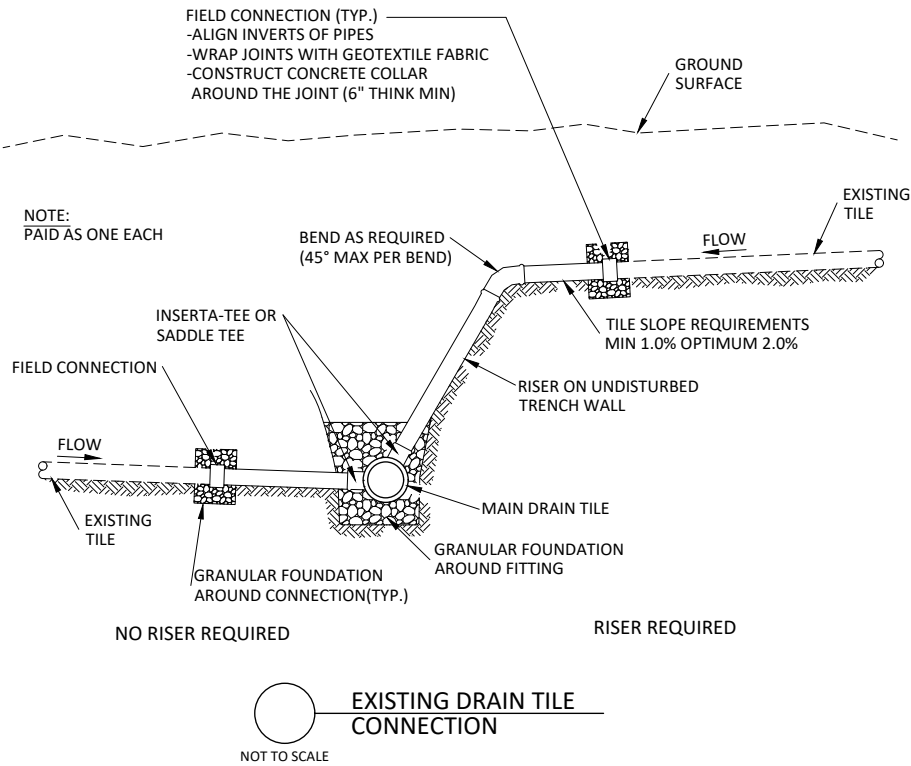
NOTES:  
 1. BEDDING AND EMBEDMENT MATERIAL PER SPECIFICATIONS.  
 2. CONSTRUCTION REQUIREMENTS PER SPEC 2451 MODIFIED SO THAT EMBEDMENT MATERIAL IS COMPACTED IN UNIFORM LIFTS, 8" OR LESS IN DEPTH, LOOSE MEASURE, TO 95% STANDARD PROCTOR DENSITY FROM THE BEDDING TO A MINIMUM DEPTH OF AT LEAST 12" ABOVE THE CROWN OF THE PIPE.  
 3. COST FOR FURNISHING AND INSTALLING GRANULAR BEDDING AND ENCASEMENT MATERIALS SHALL BE INCLUDED IN THE PRICE BID FOR POLYETHYLENE PIPE, PER LINEAL FOOT.

| PIPE SIZE | PIPE OD (Nominal) | 'E' ENVELOPE WIDTH (Minimum) | MINIMUM TRENCH WIDTH (OD+2E) |
|-----------|-------------------|------------------------------|------------------------------|
| 4"        | 4.6"              | 3"-4"                        | 10"                          |
| 6"        | 6.8"              | 4"-6"                        | 14"                          |
| 8"        | 9.5"              | 4"-6"                        | 20"                          |
| 10"       | 11.6"             | 5"-8"                        | 24"                          |
| 12"       | 14.2"             | 5"-8"                        | 30"                          |
| 15"       | 17.7"             | 5"-8"                        | 34"                          |
| 18"       | 22.0"             | 6"-10"                       | 38"                          |
| 24"       | 29.5"             | 8"-12"                       | 46"                          |
| 30"       | 35.4"             | 8"-12"                       | 60"                          |
| 36"       | 41.0"             | 8"-12"                       | 65"                          |
| 42"       | 47.4"             | 12"-14"                      | 74"                          |

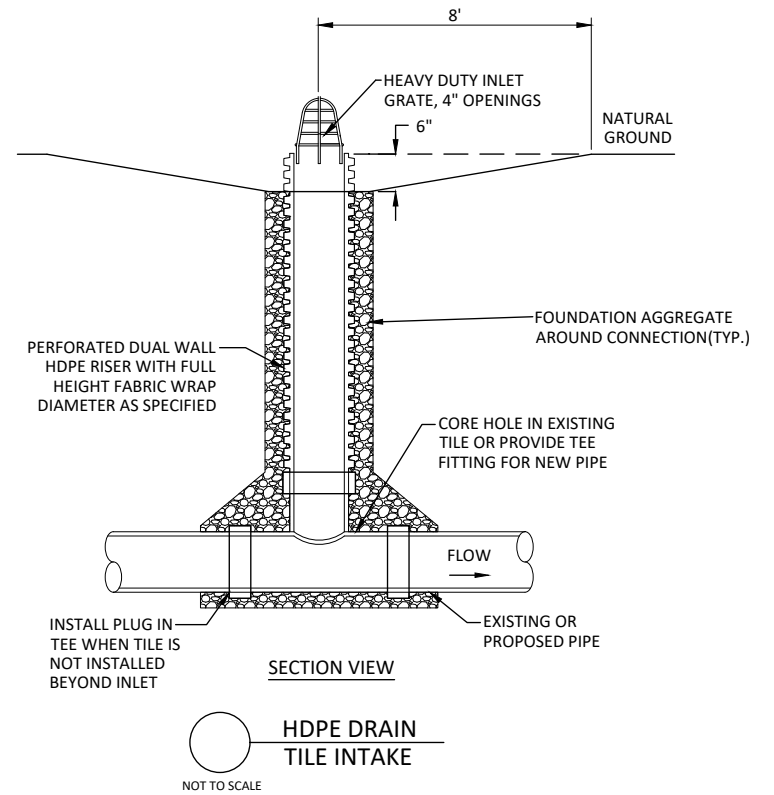
NOT TO SCALE  
 NON-RIGID DRAIN TILE TRENCH



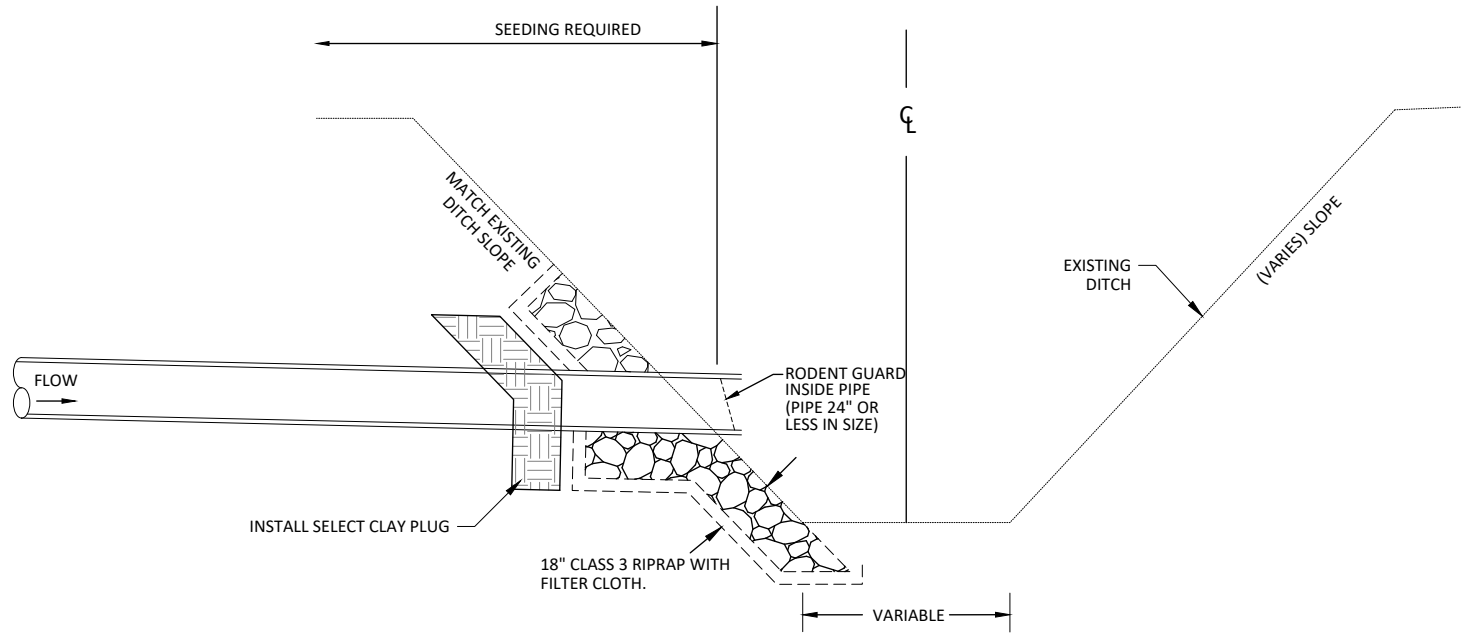
NOT TO SCALE  
 NON-RIGID DRAIN TILE TRENCH SPOON METHOD BEDDING



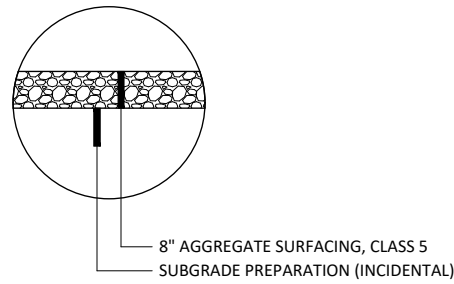
NOT TO SCALE  
 EXISTING DRAIN TILE CONNECTION



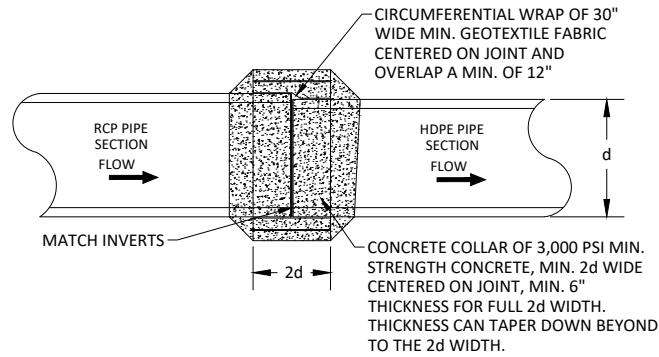
NOT TO SCALE  
 HDPE DRAIN TILE INTAKE



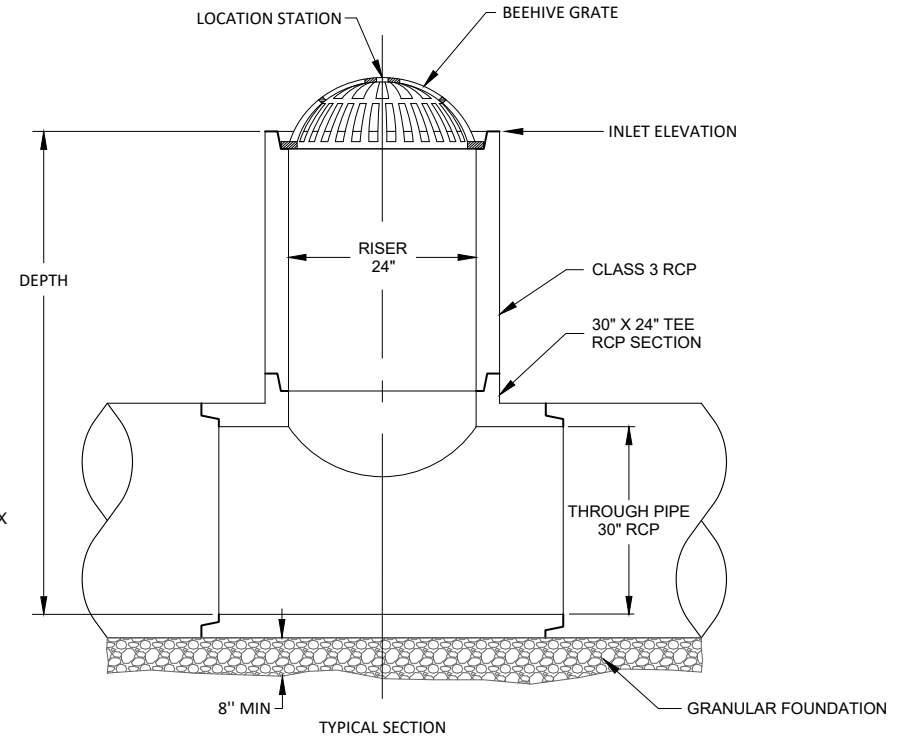
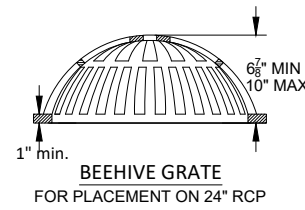
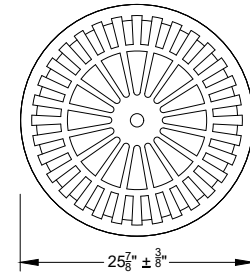
NOT TO SCALE  
 TYPICAL NON-RIGID DRAIN TILE OUTLET AT OPEN DITCH



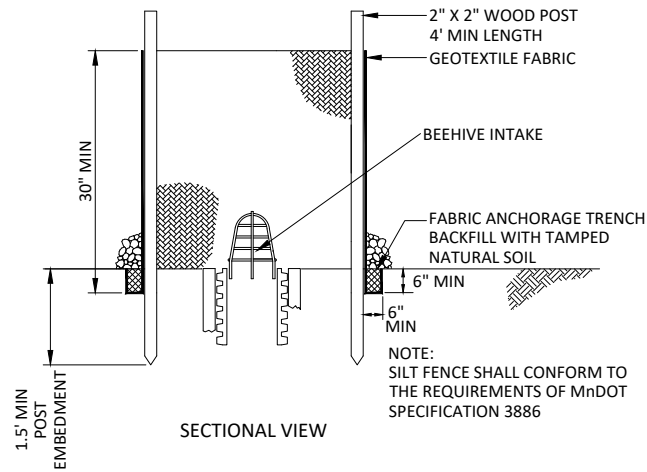
TOWNSHIP ROAD RESTORATION  
NOT TO SCALE



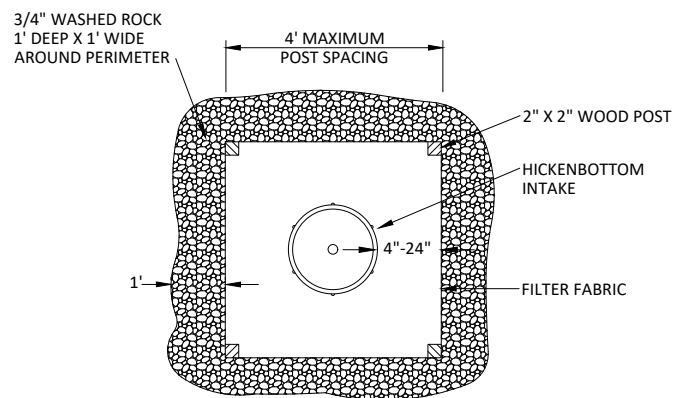
SIMILAR SIZE PIPE FIELD CONNECTION  
NOT TO SCALE



CIRCULAR AREA INTAKE RCP TEE RISER  
NOT TO SCALE

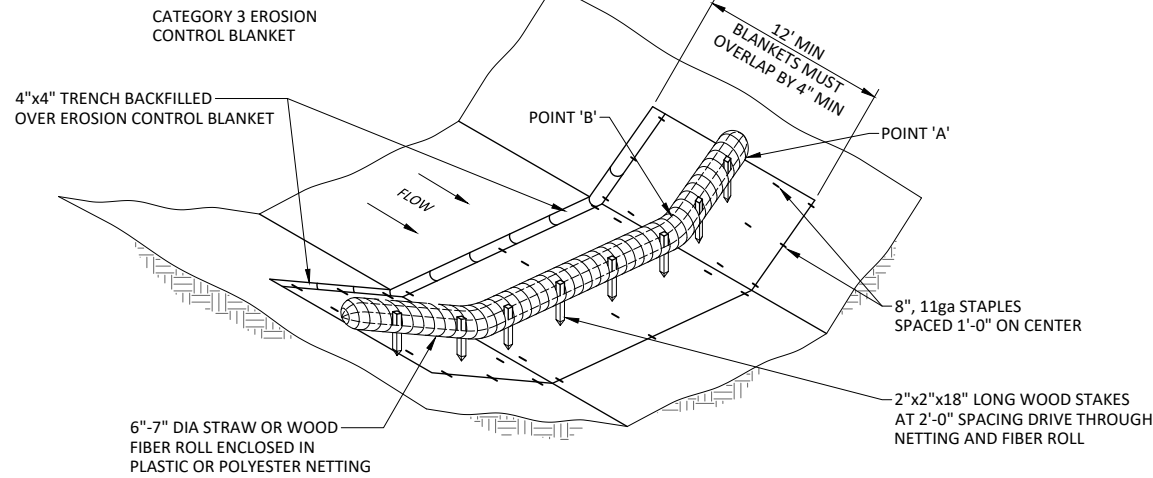


SECTIONAL VIEW



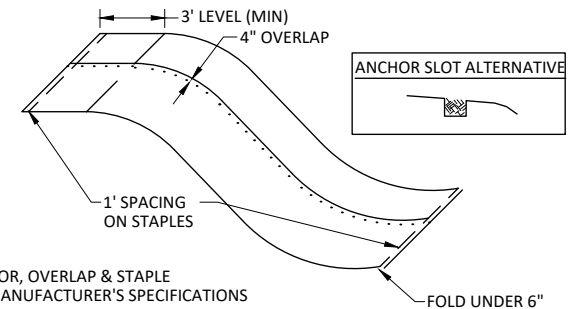
PLAN VIEW

INLET PROTECTION PREASSEMBLED SILT FENCE  
NOT TO SCALE



NOTE:  
POINT 'A' MUST BE 1'-0" MIN HIGHER THAN  
POINT 'B' TO ENSURE THAT WATER FLOWS OVER  
THE DITCH CHECK AND NOT AROUND THE ENDS

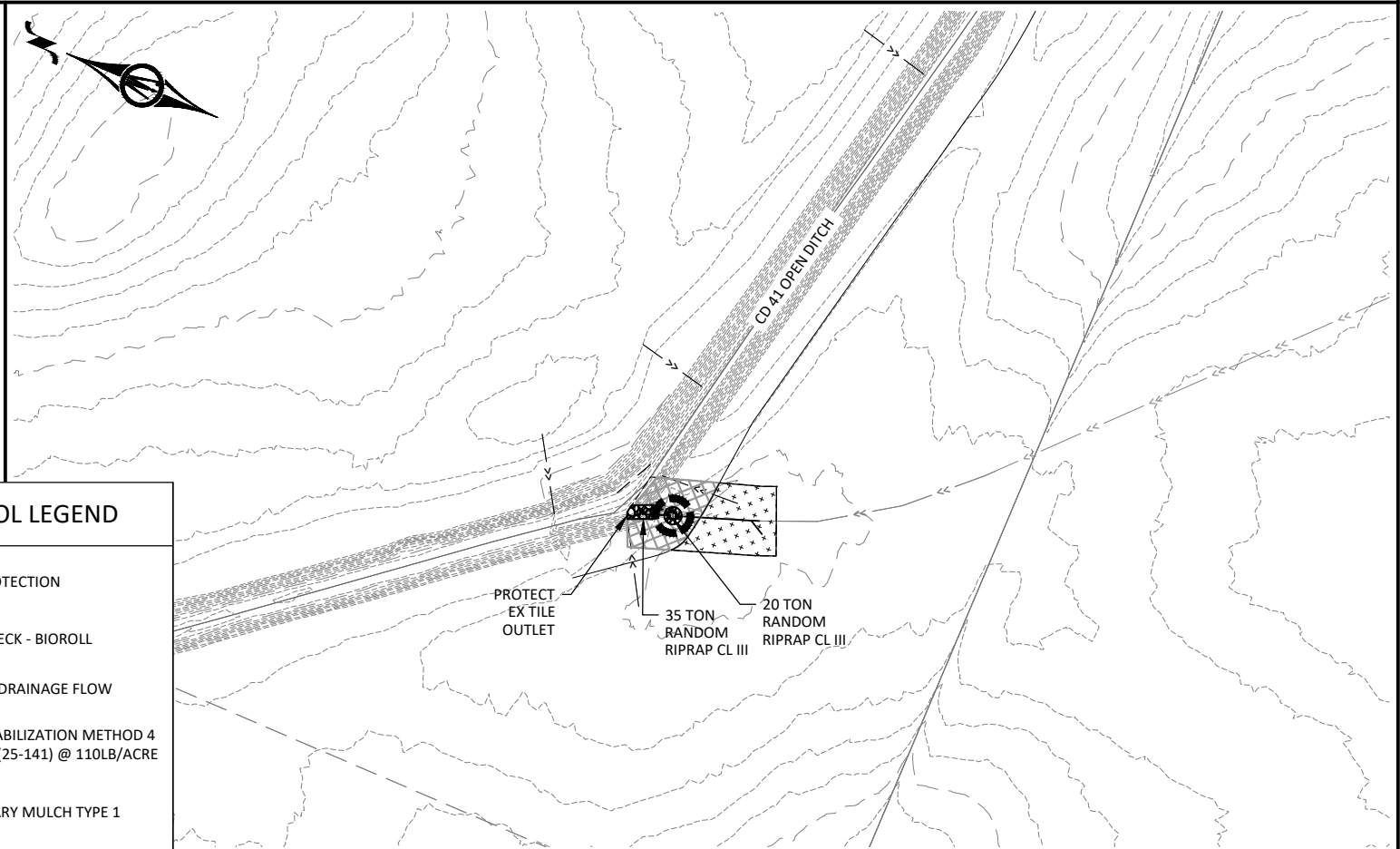
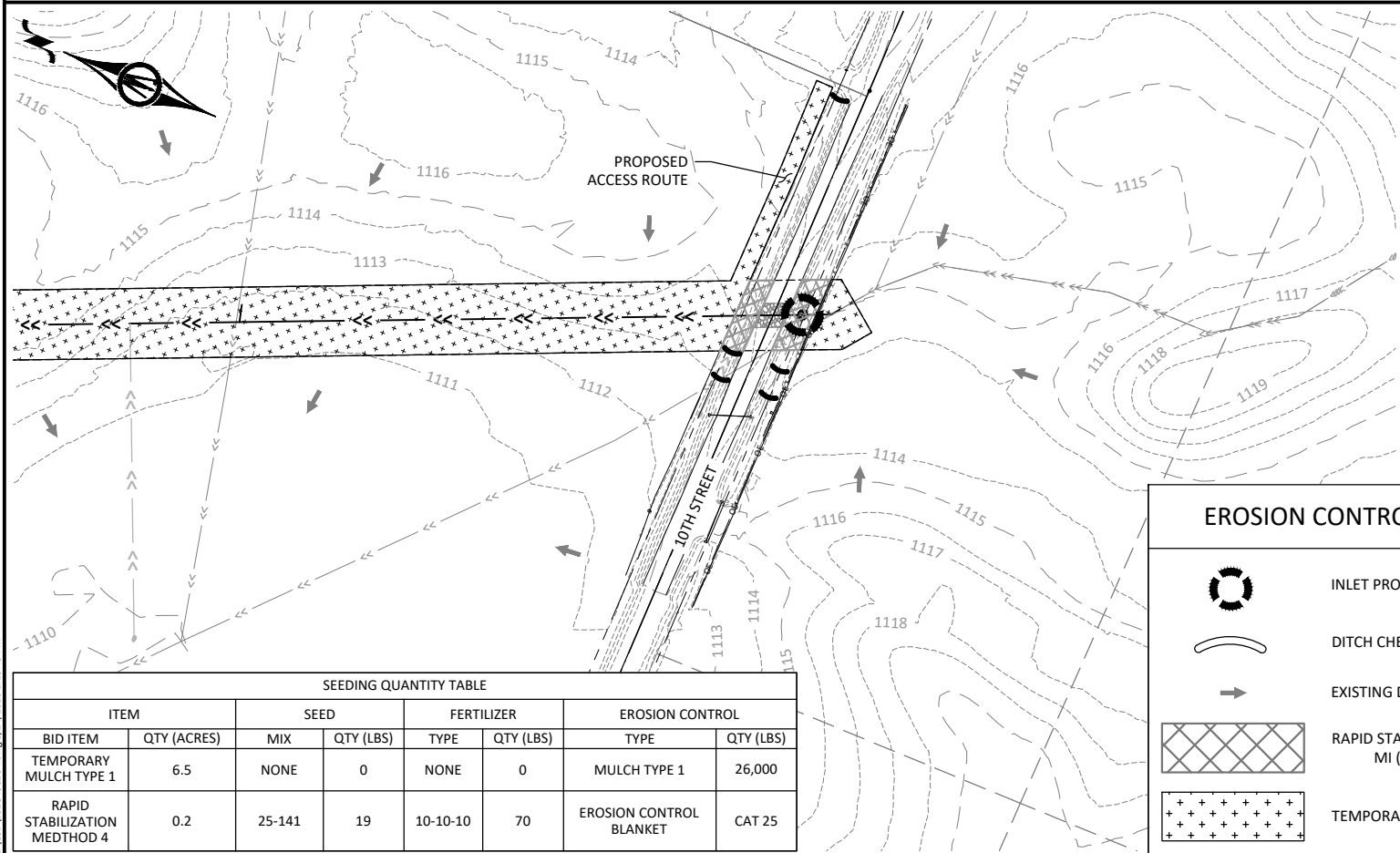
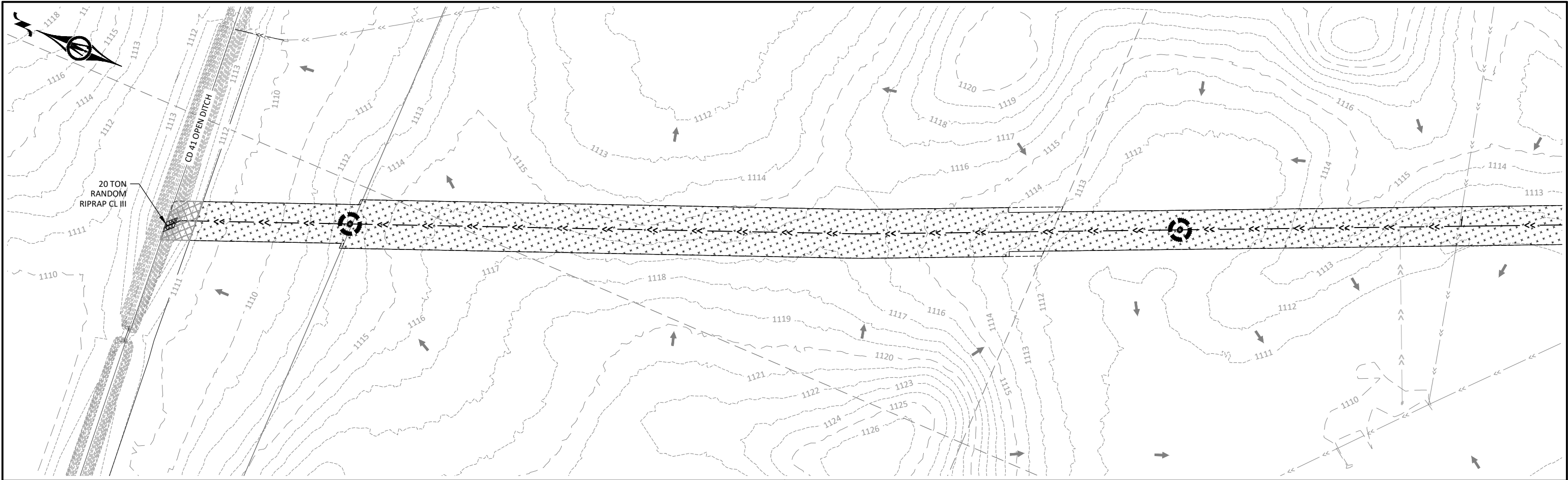
DITCH CHECK BIOROLL  
NOT TO SCALE



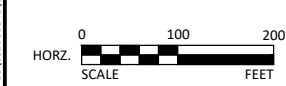
NOTE:  
ANCHOR, OVERLAP & STAPLE  
PER MANUFACTURER'S SPECIFICATIONS

EROSION CONTROL BLANKET INSTALLATION  
NOT TO SCALE





| SEEDING QUANTITY TABLE       |             |        |           |            |           |                         |           |
|------------------------------|-------------|--------|-----------|------------|-----------|-------------------------|-----------|
| ITEM                         |             | SEED   |           | FERTILIZER |           | EROSION CONTROL         |           |
| BID ITEM                     | QTY (ACRES) | MIX    | QTY (LBS) | TYPE       | QTY (LBS) | TYPE                    | QTY (LBS) |
| TEMPORARY MULCH TYPE 1       | 6.5         | NONE   | 0         | NONE       | 0         | MULCH TYPE 1            | 26,000    |
| RAPID STABILIZATION METHOD 4 | 0.2         | 25-141 | 19        | 10-10-10   | 70        | EROSION CONTROL BLANKET | CAT 25    |



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.

*Derek D. Behrens*  
DEREK D. BEHRENS, P.E.  
LIC. NO. 62755 DATE 03/24/2026



1501 SOUTH STATE ST, SUITE 100  
FAIRMONT, MN 56031  
Phone: (507) 238-4738  
Email: Fairmont@bolton-menk.com  
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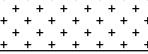
EROSION CONTROL LEGEND

INLET PROTECTION

DITCH CHECK - BIOROLL

EXISTING DRAINAGE FLOW

RAPID STABILIZATION METHOD 4  
MI (25-141) @ 110LB/ACRE

TEMPORARY MULCH TYPE 1

|                  |     |     |            |            |
|------------------|-----|-----|------------|------------|
| DESIGNED         | DDB | NO. | ISSUED FOR | DATE       |
| DRAWN            | DDB | -   | BID        | 03/24/2026 |
| CHECKED          | SPL |     |            |            |
| CLIENT PROJ. NO. |     |     |            |            |

FARIBAULT COUNTY, MINNESOTA

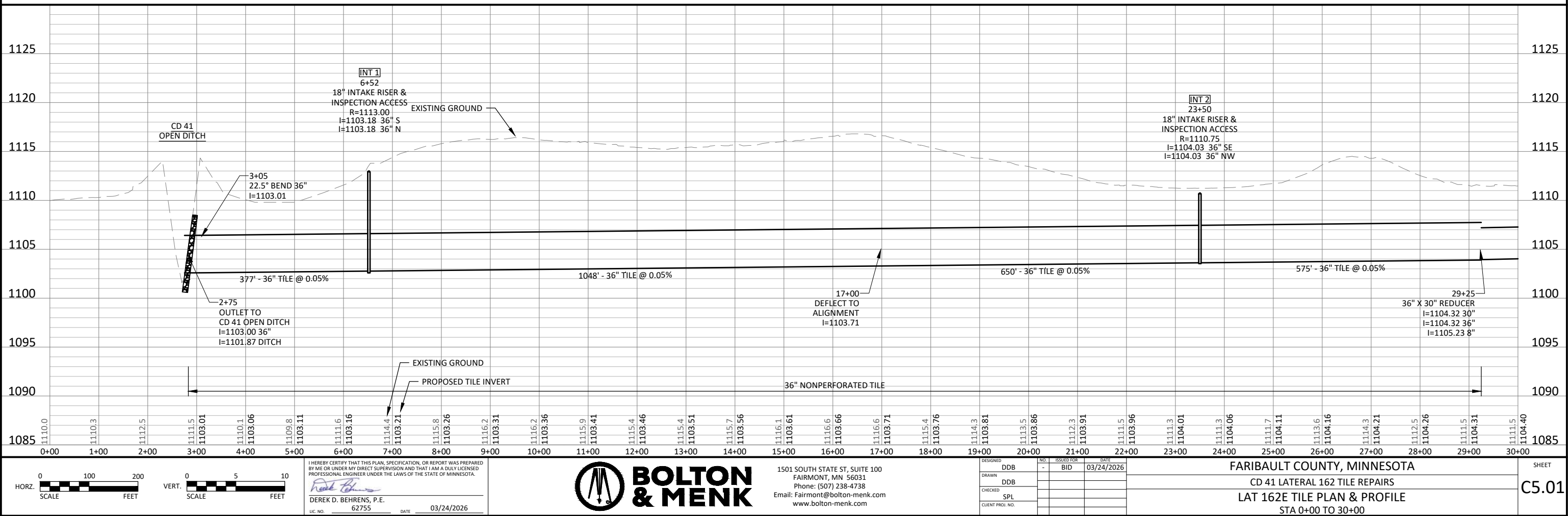
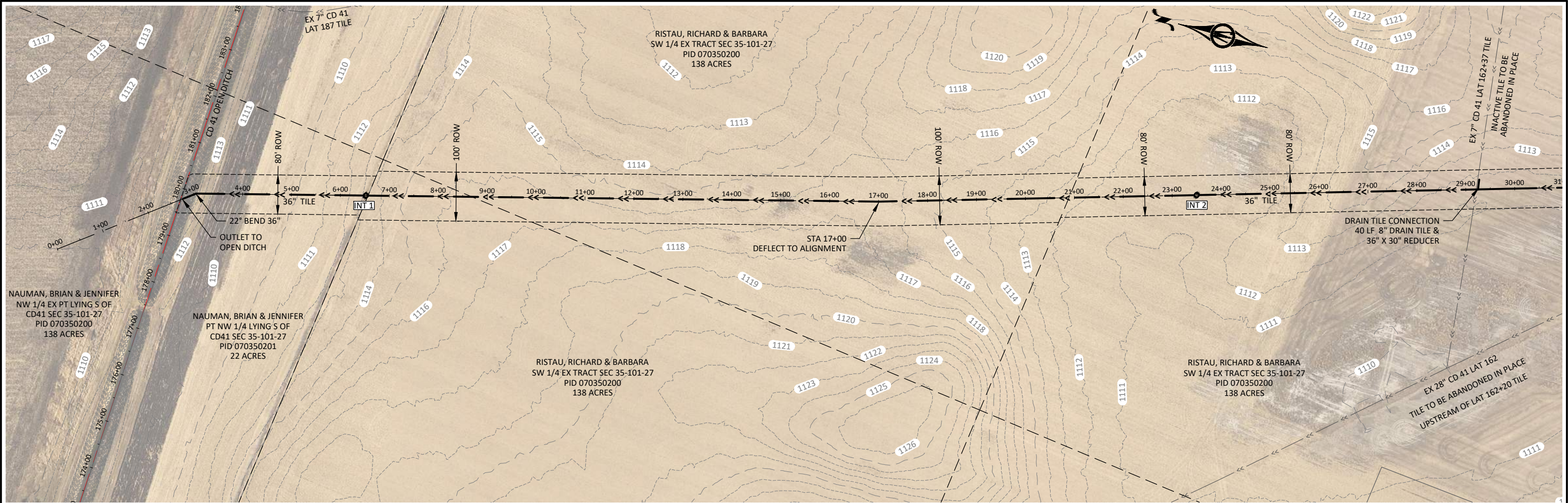
CD 41 LATERAL 162 TILE REPAIRS

EROSION CONTROL PLAN

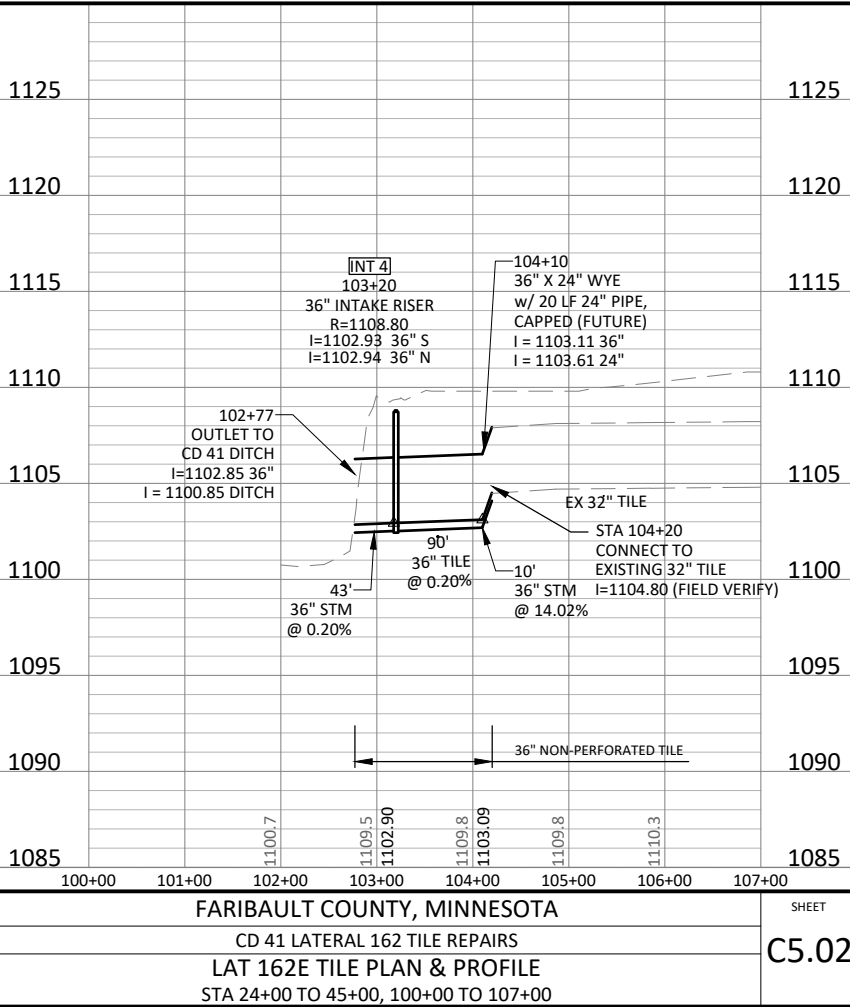
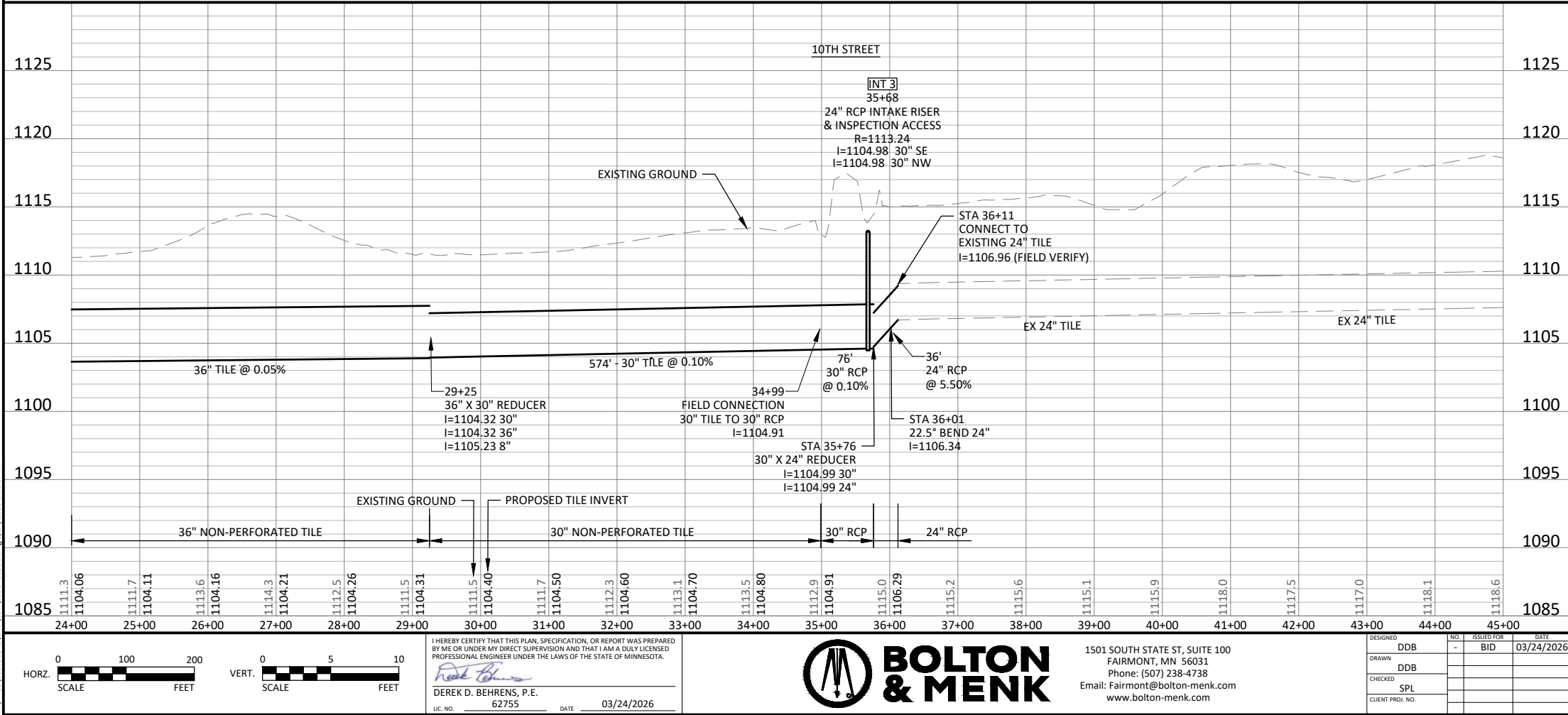
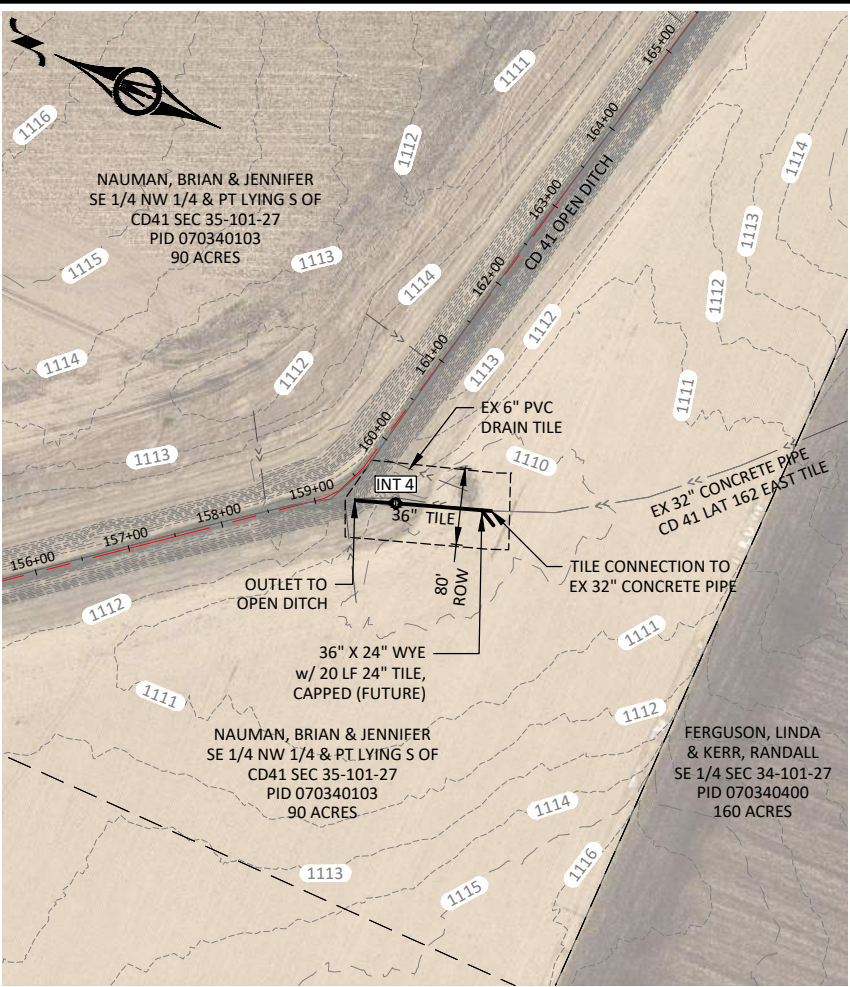
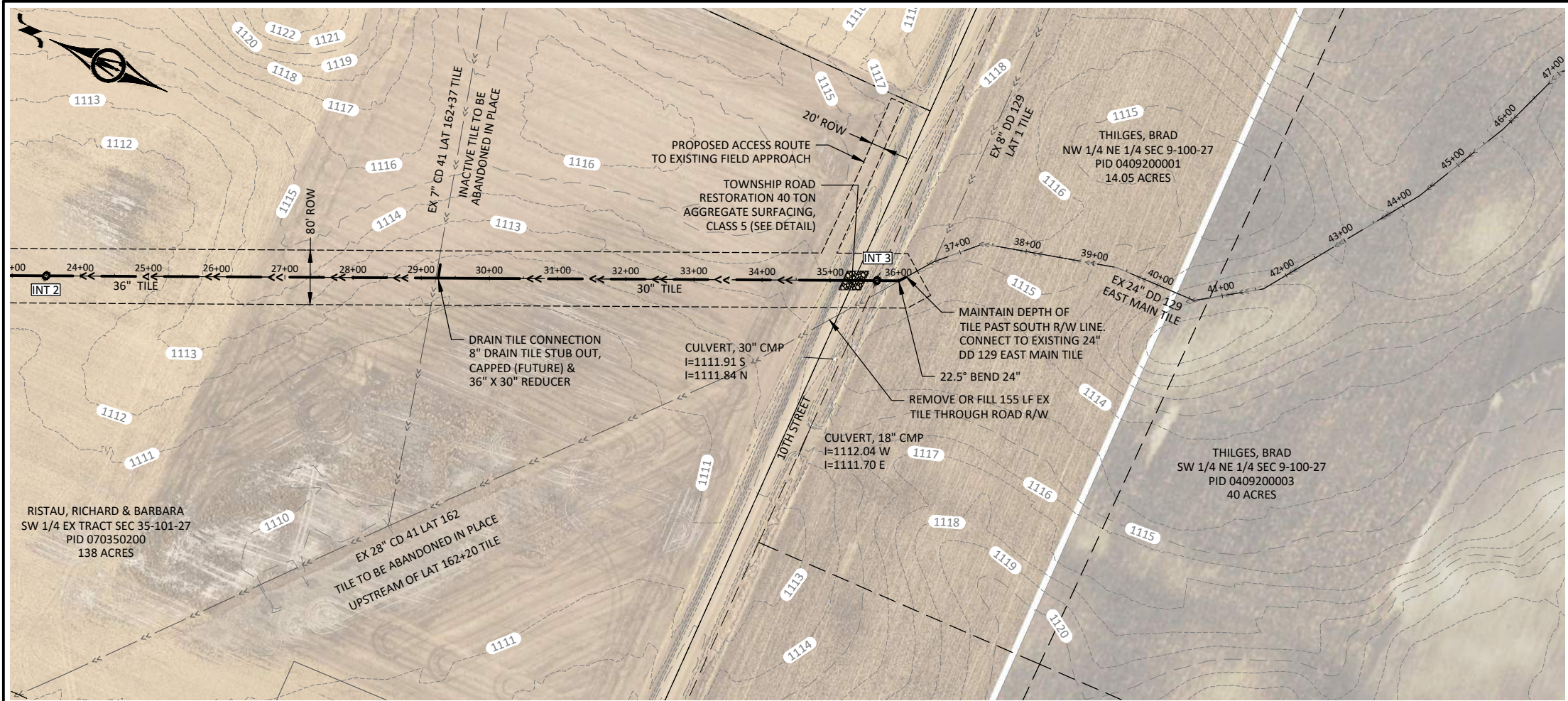
SHEET

C2.01

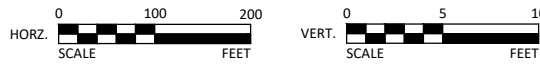








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A:\PROJECTS\CD41\CD4112251\CD4112251.dwg 3/24/2026 2:28:37 PM



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.

*Derek D. Behrens*  
DEREK D. BEHRENS, P.E.  
LIC. NO. 62755 DATE 03/24/2026



1501 SOUTH STATE ST, SUITE 100  
FAIRMONT, MN 56031  
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Email: Fairmont@bolton-menk.com  
www.bolton-menk.com

|                  |     |     |            |            |
|------------------|-----|-----|------------|------------|
| DESIGNED         | DDB | NO. | ISSUED FOR | DATE       |
| DRAWN            | DDB |     | BID        | 03/24/2026 |
| CHECKED          | SPL |     |            |            |
| CLIENT PROJ. NO. |     |     |            |            |

FARIBAUT COUNTY, MINNESOTA  
CD 41 LATERAL 162 TILE REPAIRS  
LAT 162E TILE PLAN & PROFILE  
STA 24+00 TO 45+00, 100+00 TO 107+00

SHEET  
C5.02

ABSTRACT OF BIDS

COUNTY DITCH 41 LATERAL 162 REPAIR

FARIBAULT COUNTY, MN

BMI PROJECT NO. 0F1.132843

| April 28, 2026<br>10:00 AM |                               |                |          |                                            |              | 1                                     |              | 2                                                |              | 3                            |              |
|----------------------------|-------------------------------|----------------|----------|--------------------------------------------|--------------|---------------------------------------|--------------|--------------------------------------------------|--------------|------------------------------|--------------|
| ITEM NO.                   | ITEM                          | APPROX. QUANT. | UNIT     | Engineer's Estimate<br>Bolton & Menk, Inc. |              | Opdahl Farm Drainage LLC<br>Fulda, MN |              | Leland Drainage & Excavating LLC<br>Bricelyn, MN |              | Hodgman HDD<br>Claremont, MN |              |
|                            |                               |                |          | UNIT PRICE                                 | AMOUNT       | UNIT PRICE                            | AMOUNT       | UNIT PRICE                                       | AMOUNT       | UNIT PRICE                   | AMOUNT       |
| BASE BID                   |                               |                |          |                                            |              |                                       |              |                                                  |              |                              |              |
| 1                          | Mobilization                  | 1              | LUMP SUM | \$20,000.00                                | \$20,000.00  | \$11,500.00                           | \$11,500.00  | \$8,500.00                                       | \$8,500.00   | \$16,269.00                  | \$16,269.00  |
| 2                          | Exploratory Excavation        | 20             | HOURL    | \$300.00                                   | \$6,000.00   | \$225.00                              | \$4,500.00   | \$50.00                                          | \$1,000.00   | \$165.00                     | \$3,300.00   |
| 3                          | Aggregate Surfacing, Class 5  | 40             | TON      | \$40.00                                    | \$1,600.00   | \$30.00                               | \$1,200.00   | \$35.00                                          | \$1,400.00   | \$39.38                      | \$1,575.20   |
| 4                          | Remove Drain Tile             | 155            | LIN FT   | \$10.00                                    | \$1,550.00   | \$10.00                               | \$1,550.00   | \$3.00                                           | \$465.00     | \$1.08                       | \$167.40     |
| 5                          | 18" Intake Riser & Grate      | 2              | EACH     | \$2,500.00                                 | \$5,000.00   | \$1,450.00                            | \$2,900.00   | \$1,600.00                                       | \$3,200.00   | \$2,000.00                   | \$4,000.00   |
| 6                          | 36" Intake Riser & Grate      | 1              | EACH     | \$4,000.00                                 | \$4,000.00   | \$2,200.00                            | \$2,200.00   | \$2,400.00                                       | \$2,400.00   | \$3,275.00                   | \$3,275.00   |
| 7                          | 24" RC Intake Riser & Grate   | 1              | EACH     | \$5,000.00                                 | \$5,000.00   | \$1,350.00                            | \$1,350.00   | \$3,900.00                                       | \$3,900.00   | \$2,500.00                   | \$2,500.00   |
| 8                          | 36" X 24" Wye                 | 1              | EACH     | \$3,000.00                                 | \$3,000.00   | \$1,450.00                            | \$1,450.00   | \$1,600.00                                       | \$1,600.00   | \$1,800.00                   | \$1,800.00   |
| 9                          | 6" Drain Tile                 | 100            | LIN FT   | \$20.00                                    | \$2,000.00   | \$9.00                                | \$900.00     | \$10.00                                          | \$1,000.00   | \$10.00                      | \$1,000.00   |
| 10                         | 8" Drain Tile                 | 100            | LIN FT   | \$24.00                                    | \$2,400.00   | \$11.00                               | \$1,100.00   | \$17.00                                          | \$1,700.00   | \$12.00                      | \$1,200.00   |
| 11                         | 24" Drain Tile                | 20             | LIN FT   | \$45.00                                    | \$900.00     | \$32.00                               | \$640.00     | \$40.00                                          | \$800.00     | \$35.41                      | \$708.20     |
| 12                         | 30" Drain Tile                | 580            | LIN FT   | \$55.00                                    | \$31,900.00  | \$39.00                               | \$22,620.00  | \$44.00                                          | \$25,520.00  | \$49.79                      | \$28,878.20  |
| 13                         | 36" Drain Tile                | 2800           | LIN FT   | \$65.00                                    | \$182,000.00 | \$43.25                               | \$121,100.00 | \$47.00                                          | \$131,600.00 | \$56.30                      | \$157,640.00 |
| 14                         | 24" RC Pipe, Class 3          | 40             | LIN FT   | \$85.00                                    | \$3,400.00   | \$176.00                              | \$7,040.00   | \$161.00                                         | \$6,440.00   | \$100.00                     | \$4,000.00   |
| 15                         | 30" RC Pipe, Class 3          | 80             | LIN FT   | \$95.00                                    | \$7,600.00   | \$180.00                              | \$14,400.00  | \$121.00                                         | \$9,680.00   | \$120.00                     | \$9,600.00   |
| 16                         | Drain Tile Connection         | 15             | EACH     | \$1,000.00                                 | \$15,000.00  | \$900.00                              | \$13,500.00  | \$400.00                                         | \$6,000.00   | \$500.00                     | \$7,500.00   |
| 17                         | Random Riprap, Class III      | 86             | TON      | \$100.00                                   | \$8,600.00   | \$65.00                               | \$5,590.00   | \$82.00                                          | \$7,052.00   | \$85.00                      | \$7,310.00   |
| 18                         | Inlet Protection              | 6              | EACH     | \$200.00                                   | \$1,200.00   | \$60.00                               | \$360.00     | \$250.00                                         | \$1,500.00   | \$100.00                     | \$600.00     |
| 19                         | Bioroll Ditch Check           | 4              | EACH     | \$500.00                                   | \$2,000.00   | \$2.75                                | \$11.00      | \$100.00                                         | \$400.00     | \$90.00                      | \$360.00     |
| 20                         | Mulch Material, Type 1        | 13             | TON      | \$250.00                                   | \$3,250.00   | \$65.00                               | \$845.00     | \$350.00                                         | \$4,550.00   | \$325.00                     | \$4,225.00   |
| 21                         | Rapid Stabilization Method 4  | 1586           | SQ YD    | \$5.00                                     | \$7,930.00   | \$2.00                                | \$3,172.00   | \$3.25                                           | \$5,154.50   | \$2.58                       | \$4,091.88   |
| TOTAL AMOUNT BID:          |                               |                |          | \$314,330.00                               |              | \$217,928.00                          |              | \$223,861.50                                     |              | \$259,999.88                 |              |
| ALTERNATE A                |                               |                |          |                                            |              |                                       |              |                                                  |              |                              |              |
| 7A                         | 24" HDPE Intake Riser & Grate | 1              | EACH     | \$3,000.00                                 | \$3,000.00   | \$1,550.00                            | \$1,550.00   | \$2,100.00                                       | \$2,100.00   | \$1,700.00                   | \$1,700.00   |
| 14A                        | 24" HDPE Drain Tile           | 40             | LIN FT   | \$45.00                                    | \$1,800.00   | \$38.00                               | \$1,520.00   | \$38.00                                          | \$1,520.00   | \$43.56                      | \$1,742.40   |
| 15A                        | 30" HDPE Drain Tile           | 80             | LIN FT   | \$55.00                                    | \$4,400.00   | \$39.50                               | \$3,160.00   | \$44.00                                          | \$3,520.00   | \$49.79                      | \$3,983.20   |



ABSTRACT OF BIDS

COUNTY DITCH 41 LATERAL 162 REPAIR

FARIBAULT COUNTY, MN

BMI PROJECT NO. 0F1.132843

| April 28, 2026<br>10:00 AM |                               |                |          | 4                                                  |              | 5                                          |              | 6                                    |              | 7                                 |              |
|----------------------------|-------------------------------|----------------|----------|----------------------------------------------------|--------------|--------------------------------------------|--------------|--------------------------------------|--------------|-----------------------------------|--------------|
| ITEM NO.                   | ITEM                          | APPROX. QUANT. | UNIT     | Stevens Drainage & Excavation<br>Vernon Center, MN |              | MSB Excavating & Tiling<br>Howard Lake, MN |              | Larson Contracting<br>Lake Mills, IA |              | A-1 Excavating LLC<br>Bloomer, WI |              |
|                            |                               |                |          | UNIT PRICE                                         | AMOUNT       | UNIT PRICE                                 | AMOUNT       | UNIT PRICE                           | AMOUNT       | UNIT PRICE                        | AMOUNT       |
| BASE BID                   |                               |                |          |                                                    |              |                                            |              |                                      |              |                                   |              |
| 1                          | Mobilization                  | 1              | LUMP SUM | \$17,800.00                                        | \$17,800.00  | \$20,000.00                                | \$20,000.00  | \$10,000.00                          | \$10,000.00  | \$80,000.00                       | \$80,000.00  |
| 2                          | Exploratory Excavation        | 20             | HOURL    | \$200.00                                           | \$4,000.00   | \$220.00                                   | \$4,400.00   | \$178.50                             | \$3,570.00   | \$100.00                          | \$2,000.00   |
| 3                          | Aggregate Surfacing, Class 5  | 40             | TON      | \$30.53                                            | \$1,221.20   | \$51.40                                    | \$2,056.00   | \$29.83                              | \$1,193.20   | \$60.00                           | \$2,400.00   |
| 4                          | Remove Drain Tile             | 155            | LIN FT   | \$46.00                                            | \$7,130.00   | \$5.00                                     | \$775.00     | \$42.44                              | \$6,578.20   | \$60.00                           | \$9,300.00   |
| 5                          | 18" Intake Riser & Grate      | 2              | EACH     | \$2,050.00                                         | \$4,100.00   | \$1,415.00                                 | \$2,830.00   | \$1,787.00                           | \$3,574.00   | \$3,500.00                        | \$7,000.00   |
| 6                          | 36" Intake Riser & Grate      | 1              | EACH     | \$2,165.00                                         | \$2,165.00   | \$2,255.00                                 | \$2,255.00   | \$2,500.00                           | \$2,500.00   | \$5,200.00                        | \$5,200.00   |
| 7                          | 24" RC Intake Riser & Grate   | 1              | EACH     | \$4,500.00                                         | \$4,500.00   | \$4,100.00                                 | \$4,100.00   | \$4,740.00                           | \$4,740.00   | \$7,900.00                        | \$7,900.00   |
| 8                          | 36" X 24" Wye                 | 1              | EACH     | \$1,480.00                                         | \$1,480.00   | \$1,350.00                                 | \$1,350.00   | \$1,671.00                           | \$1,671.00   | \$2,400.00                        | \$2,400.00   |
| 9                          | 6" Drain Tile                 | 100            | LIN FT   | \$14.50                                            | \$1,450.00   | \$8.70                                     | \$870.00     | \$15.40                              | \$1,540.00   | \$30.00                           | \$3,000.00   |
| 10                         | 8" Drain Tile                 | 100            | LIN FT   | \$16.50                                            | \$1,650.00   | \$12.25                                    | \$1,225.00   | \$17.88                              | \$1,788.00   | \$70.00                           | \$7,000.00   |
| 11                         | 24" Drain Tile                | 20             | LIN FT   | \$45.00                                            | \$900.00     | \$90.00                                    | \$1,800.00   | \$46.35                              | \$927.00     | \$100.00                          | \$2,000.00   |
| 12                         | 30" Drain Tile                | 580            | LIN FT   | \$47.77                                            | \$27,706.60  | \$44.95                                    | \$26,071.00  | \$50.47                              | \$29,272.60  | \$130.00                          | \$75,400.00  |
| 13                         | 36" Drain Tile                | 2800           | LIN FT   | \$53.50                                            | \$149,800.00 | \$55.15                                    | \$154,420.00 | \$60.16                              | \$168,448.00 | \$120.00                          | \$336,000.00 |
| 14                         | 24" RC Pipe, Class 3          | 40             | LIN FT   | \$133.95                                           | \$5,358.00   | \$190.00                                   | \$7,600.00   | \$185.73                             | \$7,429.20   | \$210.00                          | \$8,400.00   |
| 15                         | 30" RC Pipe, Class 3          | 80             | LIN FT   | \$146.80                                           | \$11,744.00  | \$216.00                                   | \$17,280.00  | \$249.34                             | \$19,947.20  | \$240.00                          | \$19,200.00  |
| 16                         | Drain Tile Connection         | 15             | EACH     | \$850.00                                           | \$12,750.00  | \$600.00                                   | \$9,000.00   | \$502.13                             | \$7,531.95   | \$100.00                          | \$1,500.00   |
| 17                         | Random Riprap, Class III      | 86             | TON      | \$84.00                                            | \$7,224.00   | \$75.00                                    | \$6,450.00   | \$65.83                              | \$5,661.38   | \$100.00                          | \$8,600.00   |
| 18                         | Inlet Protection              | 6              | EACH     | \$120.00                                           | \$720.00     | \$300.00                                   | \$1,800.00   | \$277.33                             | \$1,663.98   | \$100.00                          | \$600.00     |
| 19                         | Bioroll Ditch Check           | 4              | EACH     | \$190.00                                           | \$760.00     | \$77.00                                    | \$308.00     | \$73.50                              | \$294.00     | \$100.00                          | \$400.00     |
| 20                         | Mulch Material, Type 1        | 13             | TON      | \$150.00                                           | \$1,950.00   | \$390.00                                   | \$5,070.00   | \$407.92                             | \$5,302.96   | \$100.00                          | \$1,300.00   |
| 21                         | Rapid Stabilization Method 4  | 1586           | SQ YD    | \$2.50                                             | \$3,965.00   | \$3.03                                     | \$4,805.58   | \$3.22                               | \$5,106.92   | \$1.00                            | \$1,586.00   |
| TOTAL AMOUNT BID:          |                               |                |          |                                                    | \$268,373.80 |                                            | \$274,465.58 |                                      | \$288,739.59 |                                   | \$581,186.00 |
| ALTERNATE A                |                               |                |          |                                                    |              |                                            |              |                                      |              |                                   |              |
| 7A                         | 24" HDPE Intake Riser & Grate | 1              | EACH     | \$1,680.00                                         | \$1,680.00   | \$2,000.00                                 | \$2,000.00   | \$1,566.00                           | \$1,566.00   | \$3,000.00                        | \$3,000.00   |
| 14A                        | 24" HDPE Drain Tile           | 40             | LIN FT   | \$47.77                                            | \$1,910.80   | \$68.40                                    | \$2,736.00   | \$66.45                              | \$2,658.00   | \$120.00                          | \$4,800.00   |
| 15A                        | 30" HDPE Drain Tile           | 80             | LIN FT   | \$53.50                                            | \$4,280.00   | \$64.50                                    | \$5,160.00   | \$108.02                             | \$8,641.60   | \$130.00                          | \$10,400.00  |

## Appendix D: Preliminary Plans

PRELIMINARY PLANS FOR

# DRAINAGE DISTRICT NO. 129

## EAST MAIN TILE REPAIR

### KOSSUTH COUNTY, IOWA

## JUNE 2026

GOVERNING SPECIFICATIONS

THE xxxx EDITION OF THE "IOWA STATEWIDE URBAN SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" AND CITY OF xxxx SPECIFICATIONS.

MUTCD 2009 AS ADOPTED BY IOWA DEPARTMENT OF TRANSPORTATION.

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITHIN THE CONSTRUCTION OF THIS PROJECT.



NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY IOWA ONE CALL 1-800-292-8989 OR 811

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

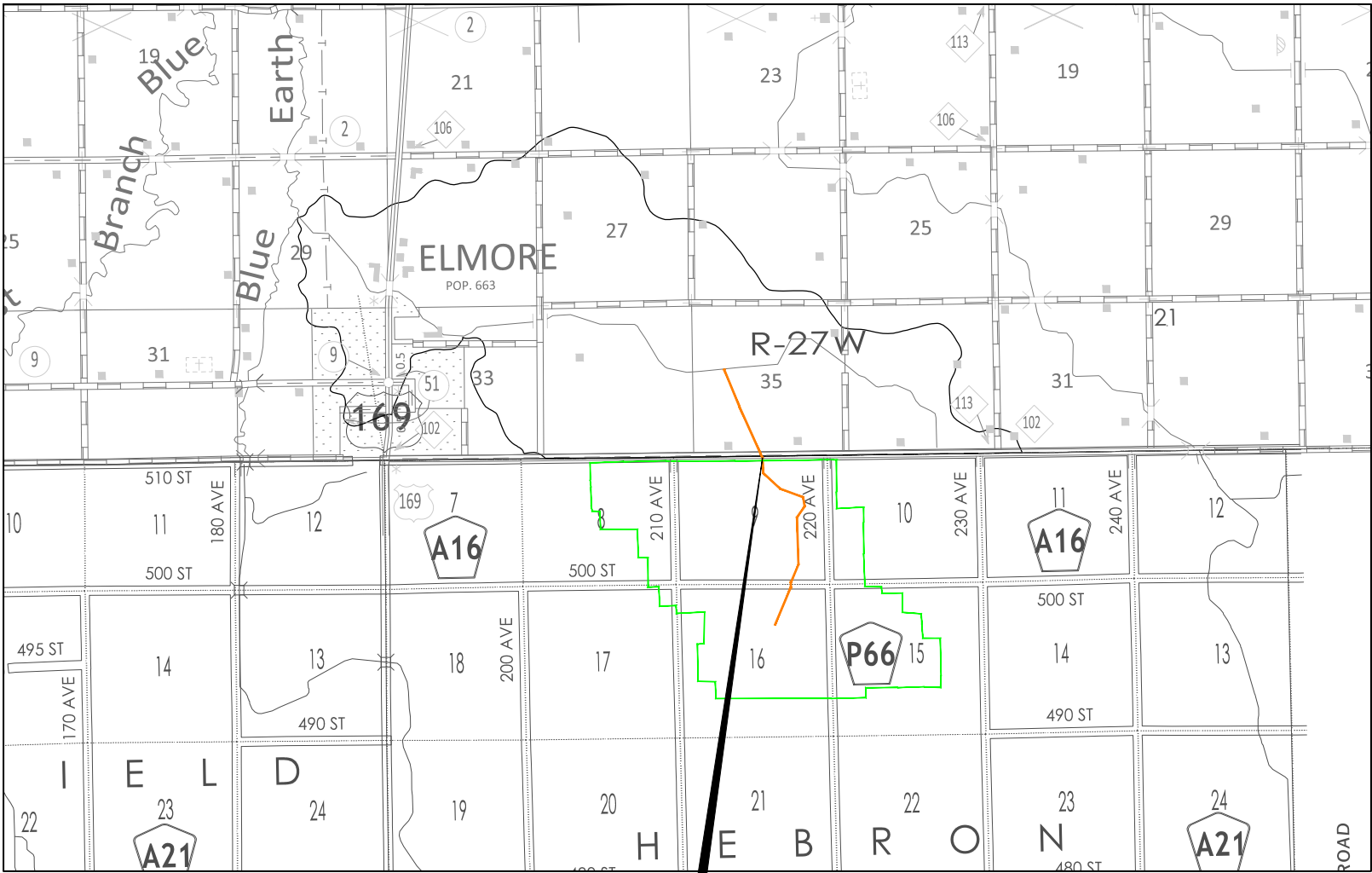
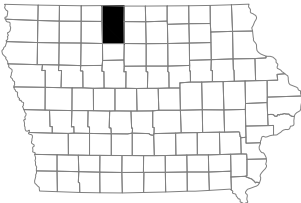
UTILITY CONTACTS

THE FOLLOWING ARE KNOWN, BUT NOT NECESSARILY THE ONLY UTILITY CONTACTS THAT SHOULD BE CONTACTED PRIOR TO BEGINNING OF EXCAVATION.

FRONTIER COMMUNICATIONS  
Trent Flockhart  
515-573-1268

COMMUNICATIONS 1 NETWORK, INC.  
Jayson Keiper  
641-762-3772

PRAIRIE ENERGY COOPERATIVE  
Ken Norem  
800-728-0013



PROJECT LOCATION



| SHEET LIST TABLE                  |                              |
|-----------------------------------|------------------------------|
| SHEET NUMBER                      | SHEET TITLE                  |
| A.01                              | TITLE SHEET                  |
| A.02                              | LEGEND                       |
| A.03                              | SITE PLAN                    |
| B.01                              | RCP INSTALLATION DETAIL      |
| B.02                              | CPDT INSTALLATION DETAIL     |
| B.03                              | OLD TO NEW CONNECTION DETAIL |
| C.01                              | ESTIMATED QUANTITIES         |
| C.02                              | CONSTRUCTION NOTES           |
| M.01 - M.03                       | PLAN & PROFILE - EAST MAIN   |
| THIS PLAN SET CONTAINS 11 SHEETS. |                              |

|                                                    |                                                                                                                                                                                                     |                                                                                   |               |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------|
|                                                    | I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA. |                                                                                   |               |
|                                                    | TYLER A. CONLEY, P.E.                                                                                                                                                                               | DATE: _____                                                                       |               |
|                                                    | LICENSE NUMBER: 25044                                                                                                                                                                               | MY LICENSE RENEWAL DATE IS DECEMBER 31, 2027                                      |               |
|                                                    | PAGES OR SHEETS COVERED BY THIS SEAL: _____                                                                                                                                                         |                                                                                   |               |
| PROJECT DATUM: IRCS1                               |                                                                                                                                                                                                     | RECORD DRAWING INFORMATION<br>OBSERVER: _____<br>CONTRACTOR: _____<br>DATE: _____ |               |
| HORIZONTAL: NAD83                                  |                                                                                                                                                                                                     |                                                                                   |               |
| VERTICAL: NAVD88                                   |                                                                                                                                                                                                     |                                                                                   |               |
| + BM=XXXX.XX<br>DESCRIPTION<br>STATION<br>LOCATION |                                                                                                                                                                                                     | DRAINAGE DISTRICT No. 129<br>KOSSUTH COUNTY, IOWA<br>TITLE SHEET                  | SHEET<br>A.01 |



1609 US HWY 18 EAST  
ALGONA, IA 50511  
Phone: (515) 395-3140  
Email: Algona@bolton-menk.com  
www.bolton-menk.com

| DESIGNED         | REV | DESCRIPTION | DATE |
|------------------|-----|-------------|------|
| TAK              |     |             |      |
| DRAWN            |     |             |      |
| JKF/ALR          |     |             |      |
| CHECKED          |     |             |      |
| TAK/NRS          |     |             |      |
| CLIENT PROJ. NO. |     |             |      |
| QT7129778        |     |             |      |



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EXISTING TOPOGRAPHIC SYMBOLS

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

PROPOSED TOPOGRAPHIC SYMBOLS

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

SURVEY SYMBOLS

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

EXISTING TOPOGRAPHIC LINES

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

SURVEY LINES

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

EXISTING UTILITY LINES

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

PROPOSED UTILITY LINES

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

GRADING INFORMATION

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

HATCH PATTERNS

|  |            |  |        |
|--|------------|--|--------|
|  | BITUMINOUS |  | GRAVEL |
|  | CONCRETE   |  |        |

EXISTING PRIVATE UTILITY LINES

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

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

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

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

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

UTILITY QUALITY LEVELS:

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

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

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

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

ABBREVIATIONS

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

DRAINAGE DISTRICT No. 129

KOSSUTH COUNTY, IOWA

LEGEND

SHEET

A.02



PIPE HAUNCH FILL AND COMPACTION METHOD  
PLAN REQUIREMENTS COMPLIANCE VERIFICATION

THE CONTRACTOR IS SOLEY RESPONSIBLE FOR THE INSTALLATION OF ALL PIPE ACCORDING TO PLAN REQUIREMENTS. THE CONTRACTOR'S PARTICIPATION IN AND COMPLIANCE WITH THE FOLLOWING PROCEDURE IS REQUIRED AND WILL ALLOW FOR FEWER SOIL DENSITY TESTS TO ENSURE PROPER PIPE INSTALLATION.

STEP 1  
BEFORE COMMENCING PIPE INSTALLATION, STANDARD SOIL PROCTOR DENSITY TEST RESULTS OF REPRESENTATIVE SAMPLE(S) OF PIPE HAUNCH FILL SHALL BE PROVIDED BY AN INDEPENDENT QUALIFIED SOILS TESTING LAB. THE SELECTION OF THE SAMPLE(S) WILL BE MADE BY THE ENGINEER AND CONTRACTOR (WHEN SPECIFIED).

STEP 2  
CONTRACTOR MAY BEGIN EXCAVATING THE MODIFIED TYPE 4 TRENCH WITH THE REQUIRED SHAPED BOTTOM GROOVE AND PLACE SEVERAL PIPE SECTIONS ONLY WHEN BOTH ENGINEER AND TESTING LAB TECHNICIAN ARE PRESENT

CONTRACTOR SHALL DEMONSTRATE THE INTENDED METHODS FOR COMPACTING THE FILL FOR THE PIPE HAUNCH AREAS. SOIL DENSITY TESTS SHALL BE TAKEN AT LOCATIONS DESIGNATED BY THE ENGINEER TO CONFIRM THAT THE INTEDNED METHODS FOR FILL AND COMPACTION OF THE PIPE HAUNCH AREAS SATIFIES THE PLAN REQUIREMENTS. CONTRACTOR SHALL MODIFY THE INSTALLATION METHODS AND REPEAT STEP 2 UNTIL ACCEPTABLE TESTS RESULTS ARE ACHIEVED.

STEP 3  
CONTRACTOR MAY INSTALL THE NEXT SEVERAL HUNDRED FEET OF PIPE. ENGINEER SHALL DESIGNATE SEVERAL LOCATIONS (APPROXIMATELY 10% OF THE INSTALLED LENGTH) WHERE CONTRACTOR SHALL LEAVE THE PIPE UNBLINDED FOR FURTHER DENSITY TESTS OF THE HAUNCH FILL AREA. ALL DENSITY TESTS MUST MEET PLAN REQUIREMENTS BEFORE WORK MAY PROCEED FURTHER.

IF DENSITY TESTING DATA CONFIRMS TO THE SATISFACTION OF THE ENGINEER THAT THE CONTRACTOR'S INSTALLATION METHOD WILL PRODUCE CONSISTENT COMPLIANCE WITH PLAN REQUIREMENTS, CONTRACTOR MAY CONTINUE INSTALLATION OF THE PIPE WITH NO ADDITIONAL TESTING REQUIRED. IF NOT, STEPS 2 AND 3 SHALL BE REPEATED UNTIL A RELIABLE, SUCCESSFUL METHOD OF PIPE INSTALLATION THAT PRODUCES SATISFACTORY RESULTS IS ESTABLISHED.

CONTRACTOR IS REQUIRED TO PROPERLY AND ADEQUATELY INSTRUCT SUBCONTRACTORS AND/OR SUBSEQUENT PIPE INSTALLATION WORKERS ON THE PROPER INSTALLATION METHOD.

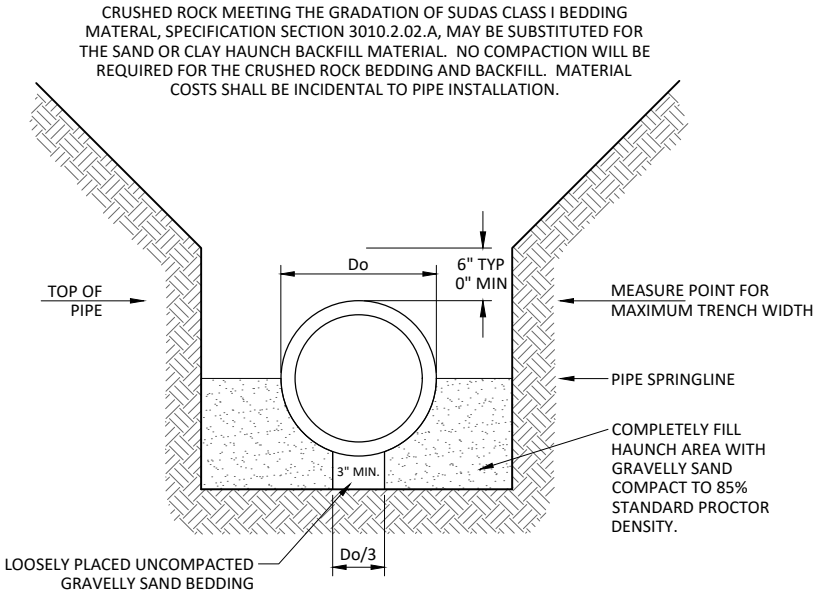
STEP 4A  
SOIL OR TRENCH CONDITION CHANGES

TO VERIFY CONTRACTOR'S COMPLIANCE WITH PLAN REQUIREMENTS UNDER THE CHANGED CONDITIONS, ENGINEER MAY STOP WORK AND REQUIRE ADDITIONAL SOIL PROCTOR TESTS AND/OR SOIL DENSITY TESTS SIMILAR TO STEPS 1 THROUGH 3. THE WORK AND COSTS OF THE FIRST TWO REVERIFICATIONS IS SUBSIDIARY TO THE PIPE INSTALLATION. SUBSEQUENT VERIFICATIONS WILL BE CONSIDERED EXTRA WORK.

STEP 4B  
CONTRACTOR FAILS TO CONSISTENTLY PERFORM INSTALLATION METHOD OR INSTRUCT OTHER INSTALLERS

IF CONTRACTOR FAILS TO CONSISTENTLY PERFORM OR ADEQUATELY INSTRUCT SUBCONTRACTORS AND/OR SUBSEQUENT PIPE INSTALLATION WORKERS ON THE APPROVED INSTALLATION METHOD, ENGINEER MAY STOP WORK AND REQUIRE ADDITIONAL SOIL PROCTOR TESTS AND/OR SOIL DENSITY TESTS SIMILAR TO STEPS 1 THROUGH 3 TO VERIFY CONTRACTOR'S COMPLIANCE WITH PLAN REQUIREMENTS. THE WORK AND COSTS OF ALL VERIFICATIONS UNDER SUCH CONDITIONS IS SUBSIDIARY TO THE PIPE INSTALLATION.

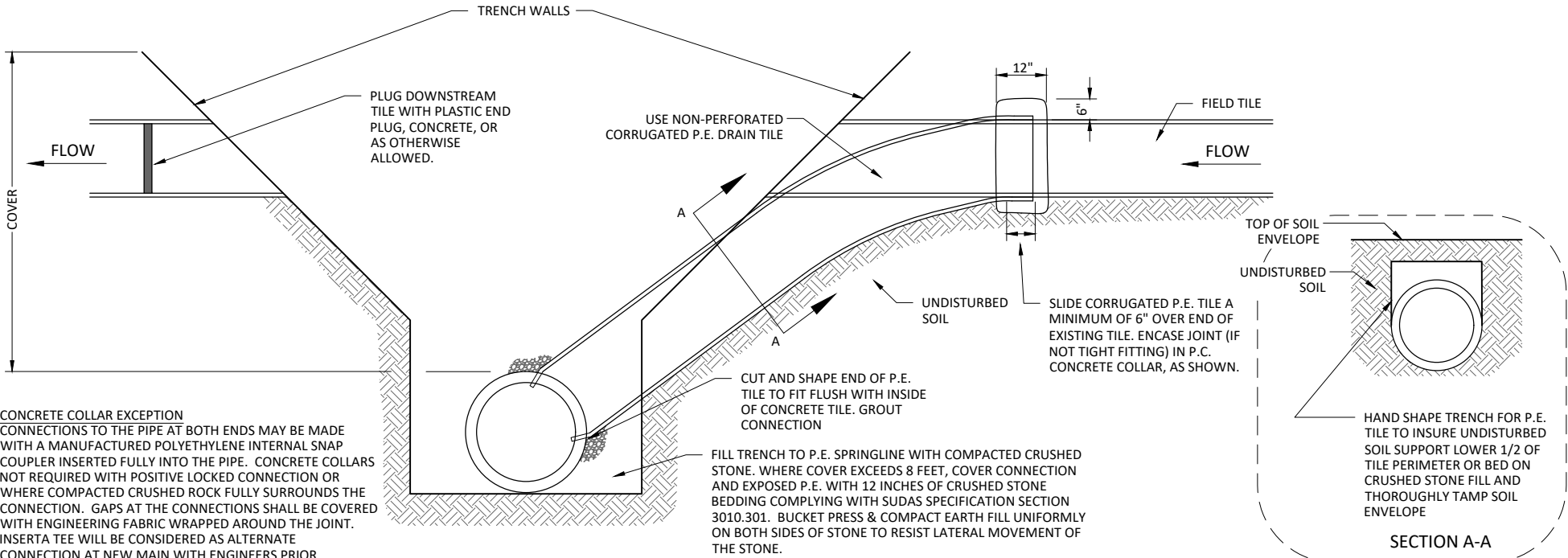
EXCEPTION  
IF CONTRACTOR ELECTS TO SHAPE THE TRENCH BOTTOM SUCH THAT A MINIMUM OF 45% OF THE OUTER CIRCUMFERENCE OF THE PIPE IS FIRMLY BEDDED IN AND CONSISTENTLY SUPPORTED BY UNDISTURBED SOIL, PIPE HAUNCH FILL COMPACTION TESTING WILL NOT BE REQUIRED. THE CONTRACTOR IS REQUIRED TO COMPLY WITH A PROPER INSTALLATION METHOD AND TO FULLY COMPLY WITH THE REQUIREMENTS OF THE VERIFICATION OUTLINED ABOVE FOR ALL SITUATIONS WHERE THIS EXCEPTION IS NOT MET.



GRAVELLY SAND BEDDING SHALL BE CONSISTENT WITH THE GRADATION AND OTHER CHARACTERISTICS OF STANDARD AASHTO A1 OR A3 SOIL. A REPRESENTATIVE SAMPLE OF THE MATERIAL AND A GRADATION REPORT OR SUPPLIER'S CERTIFICATION OF COMPLIANCE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO DELIVERY TO SITE. SEE SOIL DATA IN APPENDIX OF SPECIFICATIONS BOOKLET.

TRENCH INSTALLATION TYPE 3

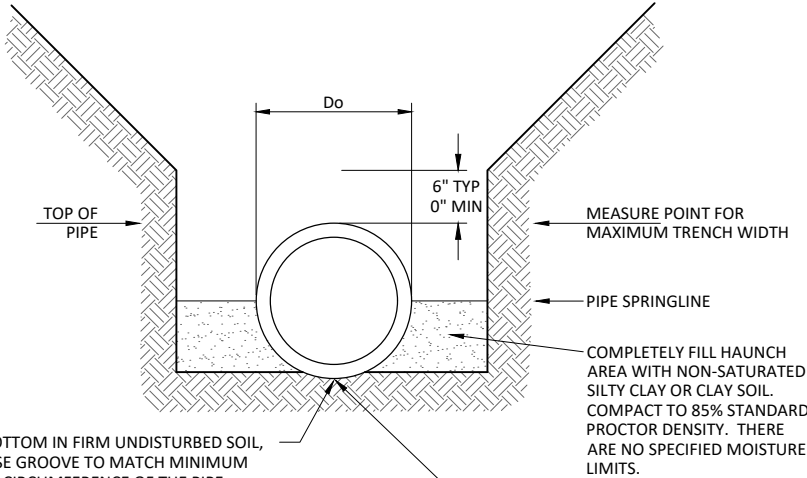
NOT TO SCALE  
SOURCE: AMERICAN CONCRETE PIPE ASSOCIATION  
CONCRETE PIPE DESIGN MANUAL



CONCRETE COLLAR EXCEPTION  
CONNECTIONS TO THE PIPE AT BOTH ENDS MAY BE MADE WITH A MANUFACTURED POLYETHYLENE INTERNAL SNAP COUPLER INSERTED FULLY INTO THE PIPE. CONCRETE COLLARS NOT REQUIRED WITH POSITIVE LOCKED CONNECTION OR WHERE COMPACTED CRUSHED ROCK FULLY SURROUNDS THE CONNECTION. GAPS AT THE CONNECTIONS SHALL BE COVERED WITH ENGINEERING FABRIC WRAPPED AROUND THE JOINT. INSERTA TEE WILL BE CONSIDERED AS ALTERNATE CONNECTION AT NEW MAIN WITH ENGINEERS PRIOR APPROVAL AND INSTALLATION PER MANUFACTURERS RECOMMENDATION.

TYPICAL FIELD TILE CONNECTION  
FOR FIELD TILE UP TO 10" DIAMETER

MINIMUM TRENCH WIDTH SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 12" OR THAT WIDTH WHICH IS REQUIRED FOR COMPACTION, WHICHEVER IS GREATER



WHERE TRENCH BOTTOM IN FIRM UNDISTURBED SOIL, SHAPE TRENCH BASE GROOVE TO MATCH MINIMUM 1/6 OF THE OUTER CIRCUMFERENCE OF THE PIPE. WHERE THE SHAPED GROOVE CANNOT BE CONSTRUCTED INTO UNDISTURBED GROUND OR WHERE EXCESS CUT OCCURS OVER EXCAVATE AND PLACE MINIMUM 3-INCH THICK COMPACTED GRAVELLY SAND BEDDING TO RESTORE GRADE SUCH THAT 1/6 OR MORE OF THE OUTER CIRCUMFERENCE OF THE PIPE IS BEDDED. THIS MATERIAL AND WORK IS SUBSIDIARY TO THE INSTALLATION OF THE PIPE. CONTRACTOR MAY SUBSTITUTE PIPE BEDDING ROCK AS THE BEDDING MATERIAL. IT ALSO IS SUBSIDIARY.

WHERE FIRM BASE IS NOT ENCOUNTERED. OVER EXCAVATE AS DIRECTED BY ENGINEER. PLACE CRADLING ROCK AND BED PIPE IN IT SUCH THAT 1/6 OR MORE OF THE OUTER CIRCUMFERENCE OF THE PIPE IS SUPPORTED. THIS ROCK IS PAID FOR UNDER A SEPARATE BID ITEM.

MODIFIED TRENCH INSTALLATION TYPE 4

NOT TO SCALE  
SOURCE: AMERICAN CONCRETE PIPE ASSOCIATION  
CONCRETE PIPE DESIGN MANUAL



**BOLTON & MENK**

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| DESIGNED         | TAK       | REV | DESCRIPTION | DATE |
|------------------|-----------|-----|-------------|------|
| DRAWN            | JKF/ALR   |     |             |      |
| CHECKED          | TAK/NRS   |     |             |      |
| CLIENT PROJ. NO. | 017129778 |     |             |      |

DRAINAGE DISTRICT No. 129  
KOSSUTH COUNTY, IOWA  
RCP INSTALLATION DETAIL

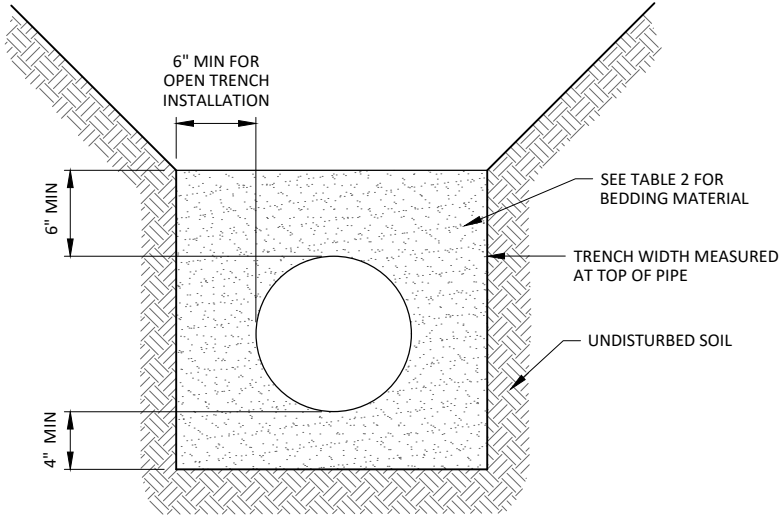
SHEET

B.01

CORRUGATED POLYETHYLENE DRAINAGE TUBING  
MATERIAL & INSTALLATION NOTES

- ALL CPDT AND CONNECTORS FURNISHED SHALL BE IN COMPLIANCE WITH MATERIAL STANDARDS ASTM F405 AND F667, AS APPLICABLE, AND SHALL BE CLASSIFIED AS HEAVY-DUTY UNDER THOSE STANDARDS.
- EXCEPT MODIFIED HEREIN OR OTHERWISE APPROVED BY ENGINEER, ALL CPDT SHALL BE INSTALLED IN COMPLIANCE WITH THE ASTM 449 STANDARD PRACTICE.
- FOR PIPES 6" DIAMETER AND SMALLER A 90° V GROOVE BOTTOM MAY BE USED, FOR ALL LARGER PIPE A TRAPEZOIDAL BOTTOM OR A CIRCULAR BOTTOM CONFORMING TO THE OUTSIDE DIAMETER OF THE PIPE SHALL BE USED. PRIOR TO THE INSTALLATION OF CPDT, CONTRACTOR MUST PROVE TO ENGINEER THAT THE INSTALLATION REQUIREMENTS, INCLUDING THE SHAPE OF THE TRENCH BOTTOM, WILL BE ACCOMPLISHED.
- WHERE TRENCH BOTTOM IS IN FIRM UNDISTURBED SOIL, SHAPE TRENCH BASE GROOVE. WHERE EXCESS CUT OCCURS, OVEREXCAVATE AND PLACE MINIMUM THREE (3) INCH THICK, GRAVELLY SAND BEDDING TO RESTORE GRADE. THIS BEDDING SHALL MEET THAT REQUIRED FOR TRENCH INSTALLATION TYPE 3 ON PLAN SHEET C.02. IF DUE TO CONTRACTOR ERROR THIS MATERIAL AND WORK IS SUBSIDIARY TO THE INSTALLATION OF THE PIPE. CONTRACTOR MAY SUBSTITUTE PIPE BEDDING ROCK AS THE BEDDING MATERIAL.
- NATIVE SOILS MAY BE USED AS BACKFILL MATERIAL UNLESS UNSTABLE TRENCH CONDITIONS PREVENT THE TRENCH BOTTOM HOLDING THE SHAPED GROOVE. IF TRENCH BOTTOM WILL NOT HOLD GROOVE SHAPE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY. A FLAT BOTTOM TRENCH INSTALLATION WILL THEN BE ASSUMED. THE REQUIRED BEDDING MATERIAL WILL BE PAID UNDER THE TILE TRENCH STABILIZATION AND CRADLING ROCK BID ITEM.
- MINIMUM TRENCH WIDTH IS PIPE OUTSIDE DIAMETER PLUS FOUR (4) INCHES FOR PLOWED INSTALLATION AND PIPE OUTSIDE DIAMETER PLUS TWELVE (12) INCHES FOR OPEN TRENCH INSTALLATION.
- ALL LATERAL CONNECTIONS, ELBOWS, TEES, ALIGNMENT CURVES, START HOLES AND ALL PORTIONS OF THE TRENCH NOT MEETING THE GROOVED TRENCH INSTALLATION REQUIREMENTS SHALL BE FILLED TO A MINIMUM OF SIX (6) INCH COVER OVER THE PIPE WITH GRADED CRUSHED STONE OR GRAVEL AS SHOWN ON TABLE 2 OF THIS SHEET. UNLESS DUE TO CONTRACTOR ERROR THIS BEDDING MATERIAL WILL BE PAID UNDER THE TILE TRENCH STABILIZATION AND CRADLING ROCK BID ITEM.
- MANUFACTURER'S ENDCAPS SHALL BE INSTALLED AT THE TERMINATION OF EACH LINE UNLESS A CONNECTION TO AN EXISTING DRAIN IS MADE.
- WITH THE INSTALLATION OF THE FIRST REACH OF CPDT ON THE PROJECT, CONTRACTOR IS REQUIRED TO WORK WITH THE ENGINEER TO CHECK AND CONFIRM THAT THE PIPE STRETCH, IF ANY, DOES NOT EXCEED 5%.
- ALIGNMENT TURNS MAYBE MADE USING EITHER A MANUFACTURED FITTING OR CURVING THE LINE WITH A 25' MINIMUM RADIUS.

| Table 1<br>Maximum Allowable Buried Depth to Flowline of CPDT             |                                |                                      |       |                              |                                       |
|---------------------------------------------------------------------------|--------------------------------|--------------------------------------|-------|------------------------------|---------------------------------------|
| Nominal Pipe Diameter (IN)                                                | Pipe Quality (ASTM)            | Trench Width at Top of the Pipe (FT) |       |                              |                                       |
|                                                                           |                                | 12"                                  | 18"   | 24"                          | 30" or Greater                        |
| 4                                                                         | Standard                       | 13                                   | 7     | 5.5                          | 5                                     |
|                                                                           | Heavy-duty                     | Any                                  | 10    | 7                            | 6                                     |
| 6                                                                         | Standard                       | 10                                   | 7     | 5.5                          | 5                                     |
|                                                                           | Heavy-duty                     | Any                                  | 9.5   | 6.5                          | 6                                     |
| 8                                                                         | Standard                       | 10                                   | 7     | 5.5                          | 5                                     |
|                                                                           | Heavy-duty                     | Any                                  | 10    | 7                            | 6                                     |
| 10                                                                        | Heavy-duty                     | ...                                  | 9     | 7                            | 6                                     |
| 12                                                                        | Heavy-duty                     | ...                                  | 9     | 7                            | 6                                     |
| 15                                                                        | Heavy-duty                     | ...                                  | ...   | 7                            | 6                                     |
| Table 2<br>Acceptable Bedding Material and Compaction Requirements        |                                |                                      |       |                              |                                       |
| Description                                                               | Percentage Passing Sieve Sizes |                                      |       | Minimum Standard Density (%) | Maximum Compaction Layer Height (IN.) |
|                                                                           | 1"                             | 3/4"                                 | No. 4 |                              |                                       |
| Crushed Stone<br>Crushed Gravel*                                          | 100%                           | > 95%                                | < 5%  | Dumped                       | 18                                    |
| * Class 1 Bedding Material Per SUDAS 3010.202A is an Allowable Substitute |                                |                                      |       |                              |                                       |

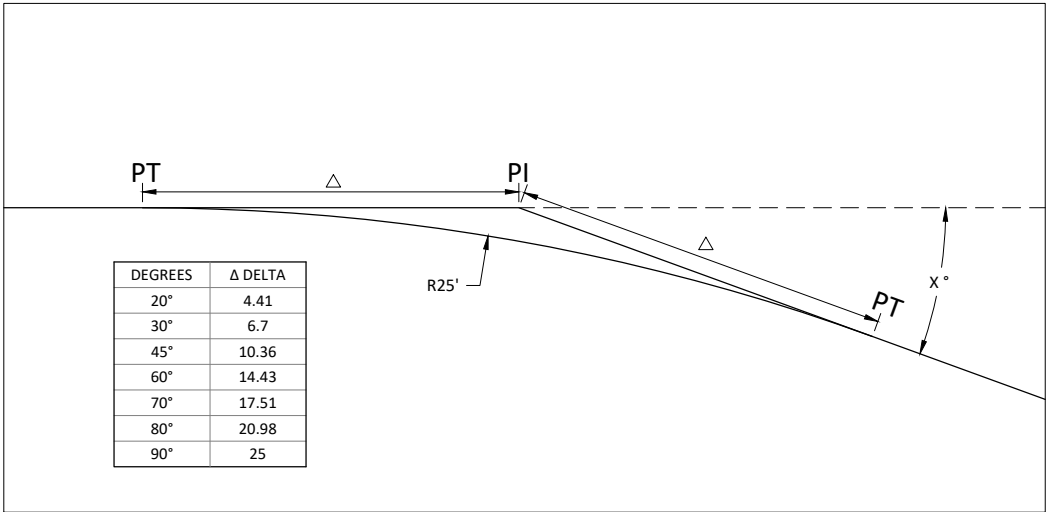


FILL TRENCH TO 6" ABOVE TOP OF PIPE WITH CRUSHED STONE OR GRAVEL MEETING THE REQUIREMENTS IN TABLE 2. BEDDING MATERIAL SHALL BE INCIDENTAL TO THE PIPE INSTALLATION.

FLAT BOTTOM TRENCH INSTALLATION

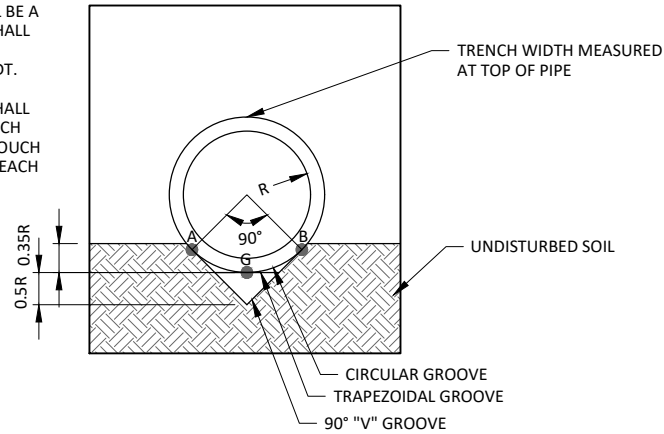
NOT TO SCALE  
SOURCE: ASTM F449

NOTE: THIS IS AN ALLOWED ALTERNATIVE INSTALLATION FOR CPDT



THE CIRCULAR GROOVE SHALL BE A MINIMUM 0.35R DEEP AND SHALL MATCH THE OUTSIDE CURVE SHAPE OF THE DEFLECTED CPDT.

THE TRAPEZOIDAL GROOVE SHALL BE SHAPED AND ADJUSTED SUCH THAT POINTS A, B, & C WILL TOUCH THE UNDEFLECTED CPDT FOR EACH SIZE INSTALLED.



PREFERRED TRENCH INSTALLATION BOTTOM

TRAPEZOIDAL GROOVE, "V" GROOVE, & CIRCULAR GROOVE  
NOT TO SCALE  
SOURCE: ASTM F449



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www.bolton-menk.com

| DESIGNED         | REV | DESCRIPTION | DATE |
|------------------|-----|-------------|------|
| TAK              |     |             |      |
| DRAWN            |     |             |      |
| JKF/ALR          |     |             |      |
| CHECKED          |     |             |      |
| TAK/NRS          |     |             |      |
| CLIENT PROJ. NO. |     |             |      |
| OT7129778        |     |             |      |

DRAINAGE DISTRICT No. 129

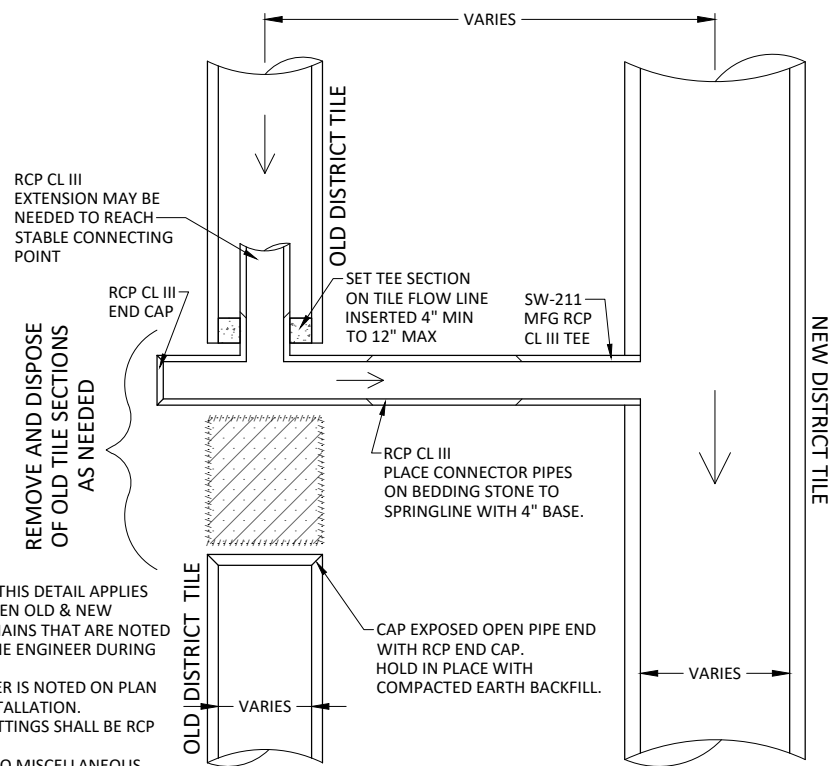
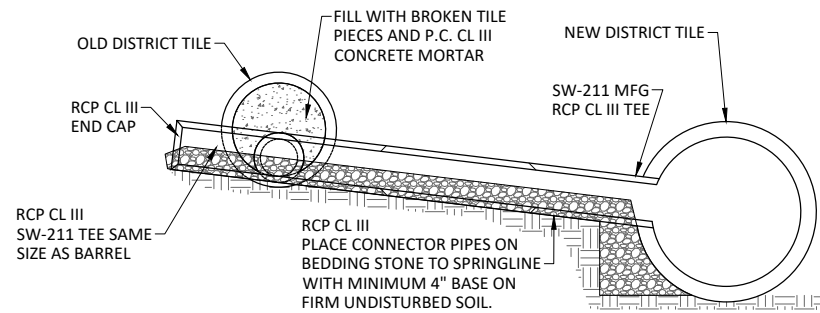
KOSSUTH COUNTY, IOWA

CPDT INSTALLATION DETAIL

SHEET

B.02

STANDARD DETAIL  
OLD TO NEW MAIN DRAINS CONNECTION  
(WHERE FLOW IS NOT CONTINUED IN OLD DRAIN)



- NOTES:
- 1.UNLESS OTHERWISE DIRECTED THIS DETAIL APPLIES ONLY TO CONNECTIONS BETWEEN OLD & NEW DISTRICT DRAINS OR PRIVATE MAINS THAT ARE NOTED ON THE PLANS OR ADDED BY THE ENGINEER DURING CONSTRUCTION.
  - 2.THE CONNECTOR PIPE DIAMETER IS NOTED ON PLAN AND IS CONSTANT IN EACH INSTALLATION.
  - 3.ALL CONNECTING PIPES AND FITTINGS SHALL BE RCP CLASS III.
  - 4.THIS DETAIL DOES NOT APPLY TO MISCELLANEOUS LATERAL CONNECTIONS PAID UNDER SEPARATE BID ITEMS.
  - 5.FIELD FABRICATE RCP ELBOWS, MAXIMUM 30° TURNS, WHERE NECESSARY. PRIOR APPROVAL OF ENGINEER REQUIRED.

WORK PAID UNDER SEPARATE BID ITEMS

- TEE FABRICATION
- RCP PIPE, TEES, END CAPS
- BEDDING STONE
- TOPSOIL WORK, WHERE APPLICABLE
- MOBILIZATION
- REMOVE & DISPOSED DRAIN TILE
- TILE SEARCH

WORK INCLUDED IN OLD TO NEW MAIN DRAINS BID ITEM

- ADDITIONAL HANDLING AND WORK BEYOND THAT INCLUDED IN SEPARATE BID ITEMS.
- PIPE CUTTING, WORKING OF JOINTS, NECESSARY CONCRETE COLLARS WHERE NOT FULLY SEATED PIPE JOINTS.
- CONNECTING RCP TEE TO OLD TILE AND FILLING PIPE OPENING.



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| TAK              |     |             |      |
| DRAWN            |     |             |      |
| JKF/ALR          |     |             |      |
| CHECKED          |     |             |      |
| TAK/NRS          |     |             |      |
| CLIENT PROJ. NO. |     |             |      |
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DRAINAGE DISTRICT No. 129  
KOSSUTH COUNTY, IOWA  
OLD TO NEW CONNECTION DETAIL

SHEET

B.03



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| Main Tile Repair - Replacement |                                               |      |          |
|--------------------------------|-----------------------------------------------|------|----------|
| Item                           | Description                                   | Unit | Quantity |
| 101                            | Lateral Tile Connections, 10" Dia. Or Smaller | EA   | 16       |
| 102                            | Lateral Tile Connections, 12" Dia. Or Larger  | EA   | 5        |
| 103                            | 24" Dia. HDPE Elbow Section, Fabrication Only | EA   | 11       |
| 104                            | 18" Dia. HDPE Elbow Section, Fabrication Only | EA   | 2        |
| 105                            | 24" to 18" Reducer, Fabrication Only          | EA   | 1        |
| 106                            | 18" to 15" Reducer, Fabrication Only          | EA   | 1        |
| 107                            | 15" to 12" Reducer, Fabrication Only          | EA   | 1        |
| 108                            | 12" End Cap, Fabrication Only                 | EA   | 1        |
| 109                            | Spot Tile Exploration                         | HR   | 24       |
| 110                            | Trench Foundation Stone                       | TN   | 477      |
| 111                            | Drain Tile, Trenched, HDPE Dual Wall 24" Dia. | LF   | 5,000    |
| 112                            | Drain Tile, Trenched, HDPE Dual Wall 18" Dia. | LF   | 1,112    |
| 113                            | Drain Tile, Trenched, HDPE Dual Wall 15" Dia. | LF   | 300      |
| 114                            | Drain Tile, Trenched, HDPE Dual Wall 12" Dia. | LF   | 400      |
| 115                            | Crush Pipe in Place, Existing Tile            | LF   | 6,812    |
| 116                            | Fence Cuts                                    | EA   | 3        |
| 117                            | Mobilization                                  | LS   | 1        |
| 118                            | Construction Contingency                      | LS   | 1        |

| Division 2 - County Road Crossing - 500th Street |                                             |      |          |
|--------------------------------------------------|---------------------------------------------|------|----------|
| Item                                             | Description                                 | Unit | Quantity |
| 201                                              | Drain Tile, Trenched, Class III R.C.P., 18" | LF   | 88       |
| 202                                              | Safety Closures                             | EA   | 1        |
| 203                                              | Traffic Control                             | LS   | 1        |
| 204                                              | Seeding and Fertilization (Rural)           | AC   | 0.1      |
| 205                                              | Silt Fence, Installation And Removal        | LF   | 200      |
| 206                                              | Plug & Fill Tile 16"                        | LF   | 90       |
| 207                                              | Construction Contingency                    | LS   | 1        |



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|                  |           |     |             |      |
|------------------|-----------|-----|-------------|------|
| DESIGNED         | TAK       | REV | DESCRIPTION | DATE |
| DRAWN            | JKF/ALR   |     |             |      |
| CHECKED          | TAK/NRS   |     |             |      |
| CLIENT PROJ. NO. | OT7129778 |     |             |      |

DRAINAGE DISTRICT No. 129  
KOSSUTH COUNTY, IOWA  
ESTIMATED QUANTITIES

SHEET

C.01

CONSTRUCTION NOTES - FOR SUBSURFACE DRAINS WORK

PLAN NOTES SUPERSEDE CONFLICTING PROVISIONS IN THE TECHNICAL SPECIFICATIONS.

1.

**WORK LIMITS.** ARE 50 FEET FROM THE CENTERLINE OF THE TILE, OR AS OTHERWISE SHOWN ON THE PLANS. THE WORK AREA MAY BE EXPANDED IF NECESSARY TO COMPLETE THE WORK WITH THE PRIOR APPROVAL OF ENGINEER. THE CONTRACTOR MAY SHIFT THE CORRIDOR RELATIVE TO THE CENTERLINE.
2.

**ACCESS.** IS AVAILABLE AT INTERSECTIONS OF WORK LIMITS AND PUBLIC ROADS OR AS CAN BE OTHERWISE ARRANGED BY CONTRACTOR. CONTRACTOR IS RESPONSIBLE TO SECURE PERMISSION OF COUNTY ENGINEER TO CONSTRUCT TEMPORARY ACCESSES IF NECESSARY.
3.

**TILE EXPLORATION.** CONTRACTOR IS REQUIRED TO SEARCH FOR AND LOCATE THE EXISTING TILE AHEAD OF TILE CONSTRUCTION TO THE EXTENT NECESSARY TO ALLOW NECESSARY CHANGES IN GRADE AND ALIGNMENT TO BE MADE TO THE NEW TILE SYSTEM. TILE HAS BEEN LOCATED IN SEVERAL LOCATIONS ALREADY, WORK WITH THE ENGINEER ON ADDITIONAL TILE EXPLORATION NEEDS. LOCATIONS SHOWN ON PLANS INDICATE AREAS OF INTEREST AND NOT SPECIFIC SEARCH AREAS.
4.

**CONNECT INTERCEPTED TILE.** 12" DIAMETER OR LARGER TO NEW TILE WITH RCP OF SAME OR NEXT LARGER SIZE. USE OF TWO STANDARD LENGTH SECTIONS OF RCP IS REQUIRED UNLESS LESS OR MORE IS AUTHORIZED ON A SITE BY SITE BASIS. RCP CLASS SHALL BE SAME OR STRONGER THAN THE CLASS OF THE RECEIVING PIPE. FIELD CUT AND SHAPE HOLE IN RECEIVING PIPE AND ENDS OF CONNECTING PIPE TO PROVIDE FOR TIGHT FIT AND UNRESTRICTED FLOW. ENCASE ALL CONNECTIONS, EXCEPT FULLY SEATED TONGUE & GROOVE JOINTS, IN MINIMUM 6-INCH THICK BY 12-INCH WIDE PC CONCRETE COLLARS. CONNECTION IS TO BE SUPPORTED ACROSS THE MAIN LINE TRENCH AND BE BEDDED IN THE INSTALLATION TRENCH WITH CRUSHED STONE BEDDING AS PER SUDAS SECTION 3010-108-C. PAYMENT FOR CRUSHED ROCK BEDDING SHALL BE LIMITED TO 5 TONS PER CONNECTION UNLESS OTHERWISE APPROVED BY ENGINEER PRIOR TO BACKFILL. THE FURNISHING AND PLACEMENT OF SPECIFIED CRUSHED ROCK FOR SUPPORT AND BEDDING SHALL BE CONSIDERED PART OF, AND BE MEASURED AND PAID FOR UNDER THE TRENCH STABILIZATION AND PIPE BEDDING ROCK BID ITEM. KEEP AND DELIVER TO ENGINEER A LOG OF CONNECTIONS INCLUDING THE LOCATION, EXISTING TILE MATERIAL, DIAMETER, APPROXIMATE DEPTH, DIRECTION OF FLOW AND CONDITION AS WELL AS MATERIALS USED. CAPPING OF DOWNSTREAM LINE WITH A PC CONCRETE PLUG IS INCLUDED IN THIS BID ITEM. SECTIONS OF RCP USED ARE TO BE MEASURED AND PAID FOR UNDER THE APPLICABLE PIPE BID ITEM.
5.

**CONNECT INTERCEPTED TILE.** 10" DIAMETER OR SMALLER, TO NEW TILE WITH CORRUGATED POLYETHYLENE DRAINAGE TUBING OF NEXT LARGER SIZE. SECURELY GROUT BOTH CONNECTIONS IN 6" X 12" CONCRETE COLLAR AND PLACE PIPE ON AND IN FIRMLY COMPACTED CRUSHED ROCK BEDDING AND SOIL ENVELOPE TO LIMIT SETTLEMENT AND DEFLECTION. WHERE COVER WILL EXCEED 8.0 FEET, EMBED CONNECTION IN MINIMUM 12 INCH THICK CRUSHED STONE BEDDING AS PER SUDAS SECTION 3010-108-C. PAYMENT FOR CRUSHED ROCK BEDDING SHALL BE LIMITED TO 3 TONS PER CONNECTION UNLESS OTHERWISE APPROVED BY ENGINEER PRIOR TO BACKFILL. THE FURNISHING AND PLACEMENT OF SPECIFIED CRUSHED ROCK FOR BEDDING AND ENVELOPE SHALL BE CONSIDERED PART OF, AND MEASURED AND PAID FOR UNDER, THE TRENCH STABILIZATION AND PIPE BEDDING ROCK BID ITEM. KEEP AND DELIVER TO ENGINEER A LOG OF CONNECTIONS INCLUDING THE LOCATION, EXISTING TILE MATERIAL, DIAMETER, APPROXIMATE DEPTH, DIRECTION OF FLOW AND CONDITION AS WELL AS MATERIALS USED. CAPPING OF DOWNSTREAM LINE IS INCLUDED IN THIS BID ITEM. FURNISHING UP TO 20 FEET OF DRAINAGE TUBING IS INCLUDED IN THIS BID ITEM. SEE DETAIL ON SHEET B.01.
6.

**UTILITIES.** IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY UTILITY COMPANIES AND TO COOPERATE WITH THEM IN THE LOCATION, MARKING & PROTECTION OF THEIR FACILITIES. CONTRACTOR IS TO IMMEDIATELY NOTIFY ENGINEER OF APPARENT CONFLICTS OF EXISTING PUBLIC UTILITIES WITH THE PLAN GRADE OF THE TILE.  
  
PRIOR TO STARTING ANY WORK AT THE SITE, CONTRACTOR SHALL EXAMINE ANY APPLICABLE DRAWINGS AVAILABLE FROM THE OWNER OR ENGINEER, AND CONSULT THE OWNER'S PERSONNEL AND THE INVOLVED UTILITY COMPANIES. NO COMPENSATION WILL BE ALLOWED FOR DAMAGE CAUSED DUE TO CONTRACTOR'S FAILURE TO COMPLY WITH THIS REQUIREMENT. CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA 1-CALL AT 1-800-292-8989.
7.

**WIND TURBINE BURIED ELECTRIC LINE CROSSINGS.** SEE DETAILS ON SHEET B.01. LARGE ELECTRIC CABLES ARE BURIED AT A TYPICAL DEPTH OF 5-6 FEET. APPROXIMATE LOCATIONS ARE SHOWN IN THE PLAN & PROFILE SHEETS. IN ALL BUT ONE INSTANCE THE TILE IS ANTICIPATED TO BE BELOW THE CABLES. THE ELECTRIC LINES ARE ANTICIPATED TO BE LIVE AT THE TIME OF CONSTRUCTION. BURIED ELECTRIC LINE CROSSINGS SHALL NOT BE MADE DURING FROZEN GROUND CONDITIONS. CABLES EXPOSED IN TILE TRENCH SHALL BE SUPPORTED PRIOR TO BACKFILLING. CRUSHED STONE SHALL BE BACKFILLED FROM THE BOTTOM OF THE TRENCH UP 0.5 FOOT ABOVE THE TOP OF THE CABLE. CONTRACTOR IS REQUIRED TO USE SEPARATE STOCKPILE OF ROCK AND PROVIDE SEPARATE WEIGH TICKETS FOR ROCK USED FOR THIS PURPOSE.
8.

**WIND TURBINE ACCESS ROAD CROSSINGS.** REMOVE TOP 1 FOOT OF ACCESS ROAD INCLUDING GRAVEL AND SOIL-CONCRETE MIXTURE. BREAK UP CONCRETE INTO SMALL PIECES AND BURY IN TILE TRENCH OUTSIDE THE ACCESS ROAD CROSSING WITH AT A MINIMUM SOIL COVER OF 24" USE TYPE 3 TRENCH FOR 50 LF CENTERED ON THE CENTERLINE OF THE ACCESS ROAD. MECHANICALLY COMPACT BACKFILL IN MAXIMUM OF 12" LIFTS UP TO GROUND SURFACE. ACCESS ROAD SURFACE TO BE RESTORED BY UTILITY COMPANY (MIDAMERICAN ENERGY).
9.

**WEED CONTROL.** CONTRACTOR IS REQUIRED TO CONTROL WEED GROWTH WITHIN THE WORK LIMITS, AS NEEDED, TO PREVENT WEEDS FROM GOING TO SEED. THIS WORK IS INCIDENTAL. FAILURE TO SATISFACTORILY CONTROL WEEDS MAY RESULT IN A DAMAGE CHARGE BY OWNER FOR ALL AFFECTED PARTIES AT COMPLETION HEARING.
10.

**DRAINAGE.** MAINTAIN DRAINAGE OF THE EXISTING DRAIN, DRAINAGE WAYS, AND TRIBUTARY FACILITIES AT ALL TIMES DURING CONSTRUCTION.
11.

**STORAGE.** NO WORK, OR EQUIPMENT OR MATERIAL STORAGE, TO BE DONE WITHIN COUNTY ROAD RIGHT-OF-WAY OR CITY STREETS WITHOUT THE KNOWLEDGE AND PERMISSION OF THE COUNTY ENGINEER OR CITY . CONTRACTOR IS RESPONSIBLE TO CONTACT COUNTY ENGINEER OR CITY AND TO OPERATE IN COMPLIANCE WITH THE REQUIRED SAFETY MEASURES.
12.

**TOPSOIL-TRENCH EXCAVATION.** FOR ALL REACHES OF THE TRENCH EXCAVATION, THE CONTRACTOR IS REQUIRED TO SEGREGATE MOST OF THE TOPSOIL FROM SUBSOIL BY PLACING TOPSOIL ON ONE SIDE OF TRENCH AND REMAINING EXCAVATION ON THE OPPOSITE SIDE. CONTRACTOR IS REQUIRED TO OPERATE SUCH THAT MOST OF THE TOPSOIL IS RETURNED TO THE TOP FOOT OF THE COMPLETED TILE TRENCH BACKFILL. TO ASSURE COMPLIANCE WITH THIS NOTE CONTRACTOR IS REQUIRED TO DESCRIBE TO ENGINEER AT THE PRE-CONSTRUCTION CONFERENCE HOW TOPSOIL WILL BE MANAGED.  
  
WHERE NOTED ON THE PLANS, CONTRACTOR IS REQUIRED TO STRIP 18" OF TOPSOIL. THE WIDTH NOTED FROM THE TOP OF THE PIPE TRENCH, STOCKPILE NEAR THE WORK LIMITS AND RESPREAD OVER COMPLETED TILE TRENCH. WHERE TRENCH DEPTHS EXCEED 13 FEET THE TOPSOIL STRIPPING WIDTH IS BASED UPON THE ASSUMPTION THAT CONTRACTOR WILL OBSERVE OSHA TRENCH EXCAVATION STANDARD 1926.652(B)(1). IF AN ALTERNATIVE IS OBSERVED THE TOPSOIL STRIPPING WILL BE CORRESPONDINGLY CHANGED.
13.

**OPEN CUT SECONDARY ROAD RIGHT OF WAY CROSSINGS.** UNDER SECTION II CONTRACTOR SHALL NOTIFY AND COMPLY WITH THE REQUIREMENTS OF PALO ALTO COUNTY ENGINEER. EACH STEEL CASING PIPE SHALL BE JACKED AND BORED UNDER THE ROADWAY IN ACCORDANCE WITH SUDAS AND SPECIFICATION SECTION 2553 OF THE IOWA DOT STANDARD SPECIFICATIONS, AND WITH PLAN DETAILS. NECESSARY SIGNAGE SHALL BE SECURED, INSTALLED AND MAINTAINED BY CONTRACTOR. WHER PIPES CROSS OVER DUG BORE PIT THE PIPE SHALL BE SUPPORTED ON TRENCH CRADLING ROCK BEDDING. SLIGHTLY MOUND BACKFILL, NOT TO EXCEED 3 INCHES IN HEIGHT, OVER THE BORE PITS AND PIPE TRENCHES TO ALLOW FOR ANTICIPATED MINOR SETTLEMENT. DISTURBED AREAS IN ROAD DITCHES SHALL BE COVERED WITH MINIMUM 3 INCHES TOPSOIL. EXCESS EXCAVATION MAY BE BLENDED INTO TRENCH BACKFILL ON ADJACENT LANDS. CONNECTIONS TO PIPE SHALL BE ENCASED IN A CONTINUOUS REINFORCED P.C. CONCRETE COLLAR TYPE PC-2, STANDARD ROAD PLAN SW-211.
14.

**OPEN CUT SECONDARY ROAD RIGHT OF WAY CROSSING.** UNDER SECTION III CONTRACTOR SHALL NOTIFY AND COMPLY WITH THE REQUIREMENTS OF PALO ALTO COUNTY ENGINEER. AFTER PLACING PIPE SECTIONS IN THE OPENED ROAD GRADE USING TYPE 4 TRENCH INSTALLATION, BACKFILL TO ONE FOOT BELOW THE TRAVELED ROAD SURFACE PLUS TWO FEET WITH APPROVED EXCAVATED MATERIALS PLACED AND MECHANICALLY COMPACTED IN UNIFORM SHALLOW LIFTS IN A BOUNDED ZONE BETWEEN 1:1 DOWNWARD SLOPES PROJECTED INSIDE NORMAL TRENCH FROM EDGES OF DETERMINED TOP WIDTH. NO DENSITY TESTS REQUIRED. EXCESS EXCAVATED ROAD GRADE MATERIAL SHALL BE LOADED IN PALO ALTO COUNTY TRUCKS FOR DISPOSAL BY COUNTY. PALO ALTO WILL DO FINAL GRADING. NO PIPE JOINT SEAL OR TIES ARE REQUIRED. ROAD SHALL BE CLOSED TO TRAFFIC DURING CONSTRUCTION. CONSTRUCTION SHALL BE SUBSTANTIALLY COMPLETED DURING DAYLIGHT HOURS AND THE ROAD OPENED TO TRAFFIC IN ONE WORKING DAY. BARRICADES AND SIGNING SHALL BE SECURED, INSTALLED AND MAINTAINED BY CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY ENGINEER. DISTURED AREAS IN ROAD DITCHES SHALL BE COVERED WITH MINIMUM 3 INCHES OF TOPSOIL AND SHALL BE FERTILIZED AND RESEEDED PER CONSTRUCTION NOTES. EXCESS ROAD DITCH EARTH MATERIAL MAY BE BLENDED INTO TRENCH BACKFILL ON ADJACENT LANDS.

15.

**ROAD CROSSING DETAILS.** CONTRACTOR IS REQUIRED TO USE SEPARATE STOCKPILES AND PROVIDE SEPARATE WEIGH TICKETS OF TRENCH STABILIZATION ROCK AND PIPE BEDDING MATERIAL. SURPLUS ROCK MAY BE SHIFTED TO OTHER AREAS OF WORK WITH PRIOR CALCULATION BY ENGINEER OF THE WEIGHT OF THE MATERIAL TRANSFERRED. ENGINEER RESERVES OPTION TO REPLACE IMPORTED BACKFILL WITH THE EXCAVATED MATERIAL . EXTRA LABOR NEGOTIATED.  
  
ROAD CROSSING WORK INCLUDES SECURING AND MAINTAINING ROAD WORK SIGNAGE FOR THE PLACEMENT OF FILL, GRADING AND SEEDING IN THE ROAD DITCHES.  
  
THE COUNTY ENGINEER WILL MAKE FINAL SIGNING DECISIONS. SIGNING REQUIREMENTS ARE IN ACCORDANCE WITH THE CURRENT SIGNING STANDARDS OF THE COUNTY.
16.

**ROAD DITCH SEEDING.** DISTURBED AREAS IN THE ROAD DITCHES SHALL BE FERTILIZED AND RESEEDED AS PER SUDAS SPECIFICATION NO MULCH OR COVER CROP REQUIRED. SEEDING AND FERTILIZING ALL PERMANENTLY VEGETATED AREAS SHALL BE INCIDENTAL TO THE WORK. 9010 SUBSECTION 304 EXCEPT AS MODIFIED HEREIN. THE ALLOWED SEEDING PERIODS ARE MARCH 1 THROUGH MAY 31 AND AUGUST 10 THROUGH SEPTEMBER 30.  
  
FERTILIZER AND SEED RATES: MIXES AND TYPES AREA AS FOLLOWS. CONTRACTOR MUST CONFIRM CALCULATION OF REQUIRED QUANTITIES WITH ENGINEER.  
  
FERTILIZER - 50 LBS. OF 13-13-13 OR EQUIVALENT CHEMICALLY COMBINED COMMERCIAL FERTILIZER PER ACRE.  
  
SEED - PURE, LIVE AS PER GERMINATION TESTS LESS THAN ONE YEAR OLD.  

|                      |              |
|----------------------|--------------|
| FESCUE, KY 31        | 25 LBS./ACRE |
| RYEGRASS, PERENNIAL; | 10 LBS./ACRE |
| OATS                 | 5 LBS./ACRE  |
| SWITCHGRASS          | 5 LBS./ACRE  |
| BIRDSFOOT TREFOIL    | 5 LBS./ACRE  |

17.

**SEDIMENT CONTROL.** CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY SILT FENCES AT LOCATIONS DESIGNATED BY ENGINEER AND IN COMPLIANCE WITH THE STORMWATER EROSION MANAGEMENT PLAN. IN ROAD DITCHES PLACE A SILT FENCE ACROSS THE DITCH BOTTOM ON THE SIDE OF THE SITE TOWARD WHICH SURFACE RUNOFF FLOWS. CONTRACTOR IS REQUIRED TO MAINTAIN THE SILT FENCES IN PROPER WORKING ORDER, INCLUDING CLEANING, REPAIRING OR REPLACING THROUGHOUT THE CONTRACT PERIOD. CONTRACTOR SHALL REMOVE THE FENCE AT THE END OF THE CONTRACT PERIOD.
18.

**SAFETY.** CONTRACTOR IS COMPLETELY RESPONSIBLE FOR SAFETY ON THE WORK SITE INCLUDING THE BRACING OF, SHORING OF, SHAPING OF, AND /OR USE OF A TRENCH BOX IN THE EXCAVATIONS. THIS INCLUDES KNOWLEDGE OF AND COMPLIANCE WITH ALL RULES AND REGULATIONS INTENDED TO PROTECT THE HEALTH OF THE CONTRACTOR'S, ENGINEER'S, AND OWNER'S PERSONNEL.
19.

**FENCE CUTS.** EXISTING FENCES IN POOR CONDITION ARE TO BE REMOVED TO THE WIDTH NECESSARY TO DO THE WORK PROPERLY. CUT, DETACH AND FLATTEN WIRE AND PULL POSTS. BURY ON SITE. FENCES IN GOOD CONDITION ARE TO BE CUT AND THE WIRES PULLED BACK. FENCE POST PULLED AND STORED BY OPENING.FENCE RESTORATION NOT REQUIRED.
20.

**TRAFFIC CONTROL.** IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL NECESSARY TRAFFIC CONTROL SIGNS, DEVICES, ETC. AS SPECIFIED OR ALLOWED, AND TO PLACE, MAINTAIN, AND REMOVE SAME AS CONSTRUCTION COMMENCES AND IS COMPLETED IN ACCORDANCE WITH THE CURRENT COUNTY STANDARDS. FAILURE TO COMPLY WITH THIS PORTION OF THE SPECIFICATIONS WILL RESULT IN SUSPENSION OF WORK UNTIL THE SITUATION IS CORRECTED. A REDUCTION IN THE LUMP SUM PAID WILL BE MADE FOR EXCESSIVE NONCOMPLIANCE WITH REQUIRED TRAFFIC CONTROL. NO WORK SHALL COMMENCE IN ANY GIVEN AREA UNTIL ALL APPROPRIATE TRAFFIC CONTROL IS IN PLACE.
21.

**MANUFACTURED PIPE FIXTURES.** SHALL BE BUILT IN CONFORMANCE WITH THE FOLLOWING IDOT STANDARD SPECIFICATIONS.  
  
ELBOW = DR-141  
  
PIPE CAP = DR-142  
  
TEE = DR-142
22.

**REDUCERS.** NOTE THAT SEVERAL REDUCERS ARE NOT DESIGNED WITH THE TWO ADJOINING PIPES CROWN TO CROWN. IN ORDER TO ACHIEVE THE PLAN ELEVATION FOR THE SMALLER UPSTREAM PIPE THE REDUCER MAY BE SLIGHTLY ROTATED ABOUT THE CENTRAL AXIS OF THE LARGER DIAMETER SEGMENT.
23.

**CORRUGATED POLYETHYLENE DRAINAGE TUBING.** SHALL BE INSTALLED IN ACCORDANCE WITH ASTM 449. THE DETAILS ON SHEET B.02 APPLY TO THIS MATERIAL USED IN CONNECTIONS.
24.

**WORK TURBINE ELECTRIC CABLE.** APPROXIMATE LOCATION OF WIND TURBINE ELECTRICAL AND FIBER OPTIC CABLE SPLICES ARE SHOWN ON PLAN SHEETS, WHERE NEAR THE NEW TILE ALIGNMENT. SPLICES ARE WITHIN A HANDHOLE ENCLOSURE OFFSET FROM MAIN CABLE RUN SEE APPENDIX TO PROJECT MANUAL FOR CABLE SPLICE DETAIL. COORDINATE WITH MIDAMERICAN ENERGY TO HAVE THE SPLICE ENCLOSURES LOCATED PRIOR TO WORK COMMENCING IN THE AREA. SPLICES ARE APPROXIMATELY 5 FEET UNDERGROUND WITH RED WARNING TAPE AT 3.5 FT TYPICAL DEPTH. DO NOT EXCAVATE WITHIN 30 FEET OF SPLICE ENCLOSURE AND MINIMIZE EQUIPMENT TRAFFIC.

COMMON ABBREVIATIONS USED IN PLANS AND SPECIFICATIONS:

RCP - REINFORCED CONCRETE PIPE  
CMP - CORRUGATED METAL PIPE  
HDPE - HIGH DENSITY POLYETHYLENE PIPE (DUAL WALL PLASTIC)  
CPDT - CORRUGATED POLYETHYLENE DRAINAGE TUBING (SINGLE WALL PLASTIC)  
DIA. - DIAMETER  
N - NORTHING  
E - EASTING  
EL. OR ELEV. - ELEVATION  
BM - BENCHMARK  
ROW - RIGHT OF WAY  
NO. - NUMBER  
IDOT - IOWA DEPARTMENT OF TRANSPORTATION  
DR-X - CURRENT IDOT STANDARD ROAD PLAN OR DETAIL  
RS&R - REMOVE SALVAGE AND RELAY  
F&I - FURNISH AND INSTALL  
SD - SURFACE DRAIN  
TE - TILE EXTENSION  
UAC - USE AS CONSTRUCTED

WORK LIMITS IN  
TOPSOIL STRIP AREAS

| CUT | WIDTH |
|-----|-------|
| 13' | 145'  |
| 14' | 150'  |
| 15' | 155'  |
| 16' | 160'  |
| 17' | 165'  |
| 18' | 170'  |
| 19' | 175'  |
| 20' | 180'  |
| 21' | 220'  |
| 22' | 230'  |
| 23' | 240'  |
| 24' | 250'  |
| 25' | 260'  |
| 26' | 270'  |

TOPSOIL STRIPPING  
REQUIREMENTS OVER  
TILE TRENCH

| CUT TO<br>FL (FT.) | STRIPPING<br>WIDTH (FT.) |
|--------------------|--------------------------|
| <13'               | NONE                     |
| 13'                | 23'                      |
| 14'                | 25'                      |
| 15'                | 27'                      |
| 16'                | 29'                      |
| 17'                | 31'                      |
| 18'                | 33'                      |
| 19'                | 35'                      |
| 20'                | 37'                      |
| 21'                | 56'                      |
| 22'                | 59'                      |
| 23'                | 62'                      |
| 24'                | 65'                      |
| 25'                | 68'                      |
| 26'                | 71'                      |



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| TAK              |     |             |      |
| DRAWN            |     |             |      |
| JKF/ALR          |     |             |      |
| CHECKED          |     |             |      |
| TAK/NRS          |     |             |      |
| CLIENT PROJ. NO. |     |             |      |
| OT7129778        |     |             |      |

DRAINAGE DISTRICT No. 129

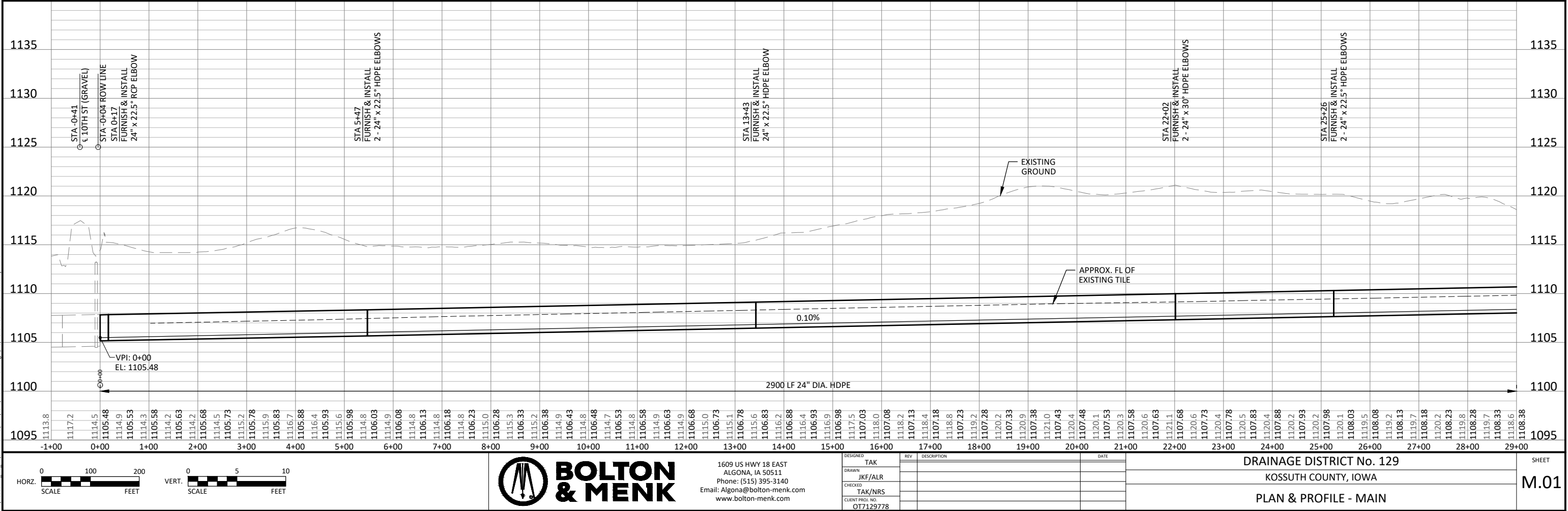
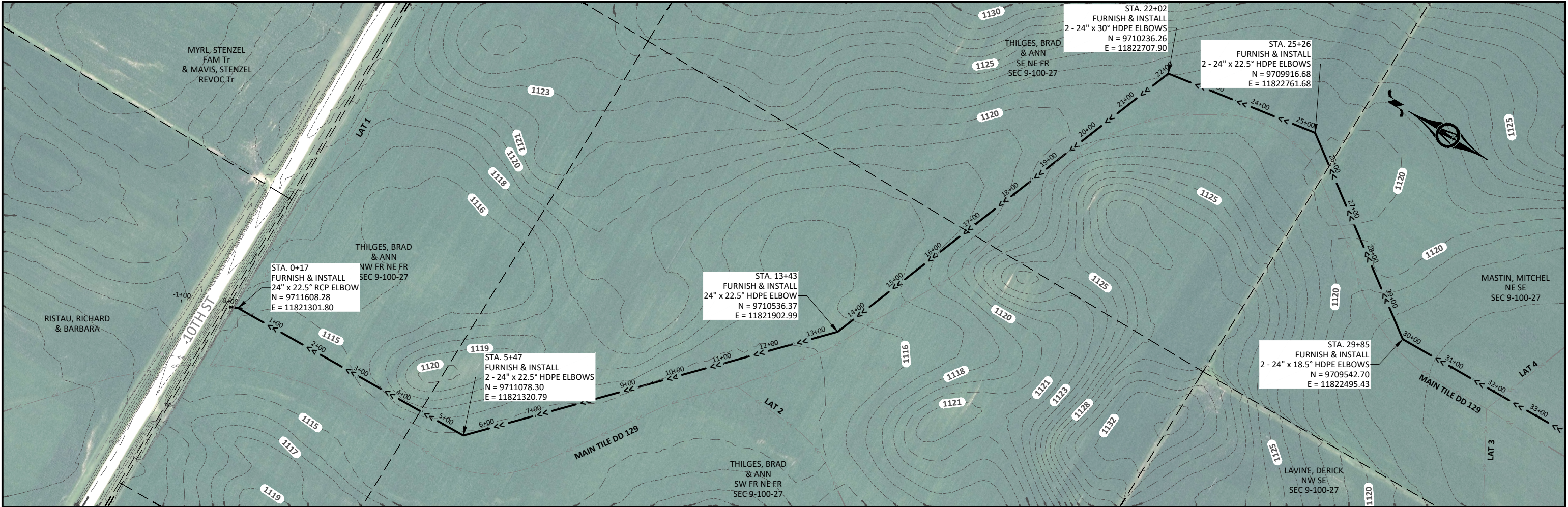
KOSSUTH COUNTY, IOWA

CONSTRUCTION NOTES

SHEET

C.02





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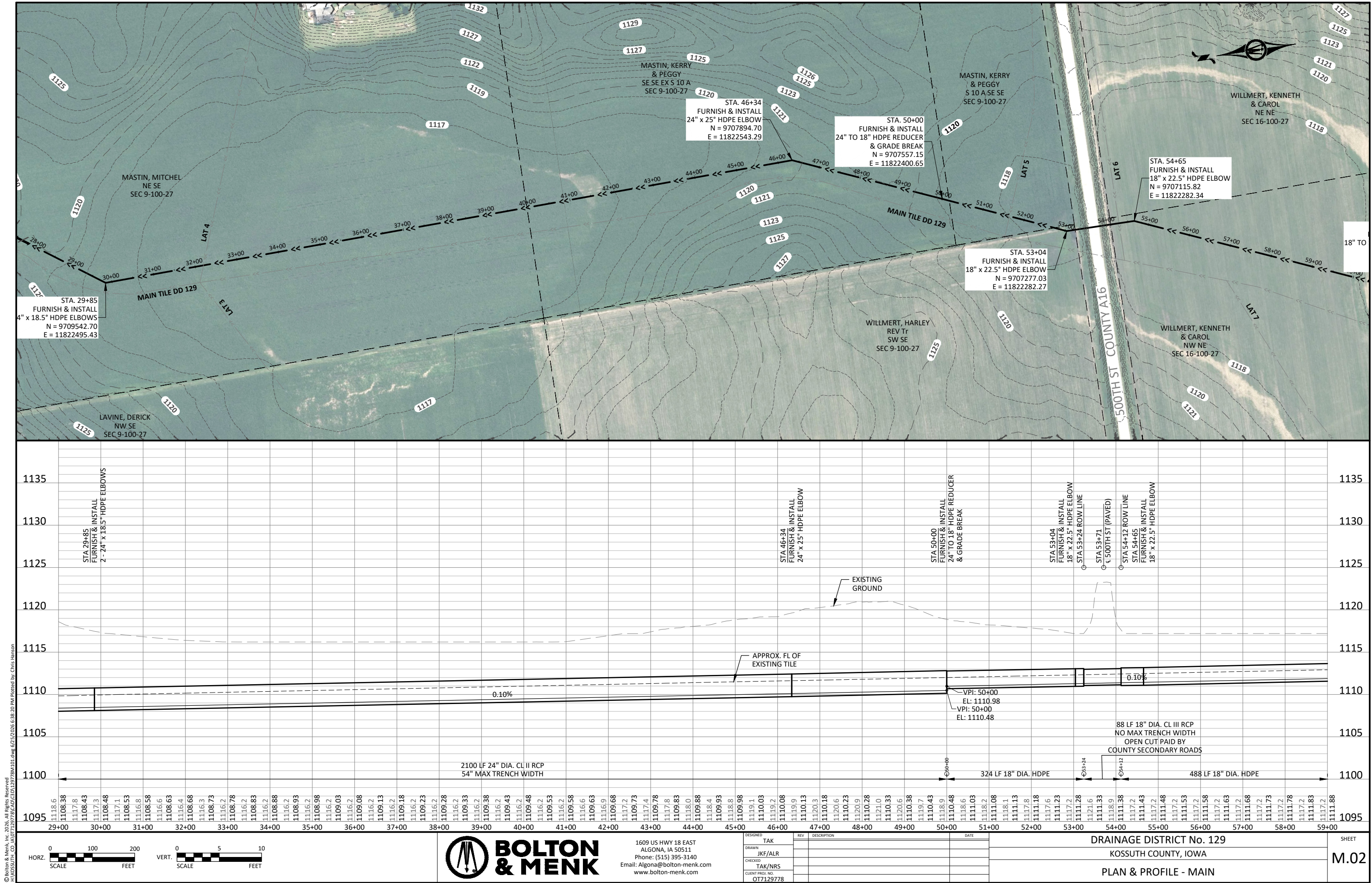
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| DESIGNED         | TAK       | REV | DESCRIPTION | DATE |
|------------------|-----------|-----|-------------|------|
| DRAWN            | JKF/ALR   |     |             |      |
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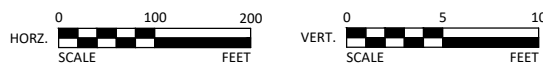
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PLAN & PROFILE - MAIN

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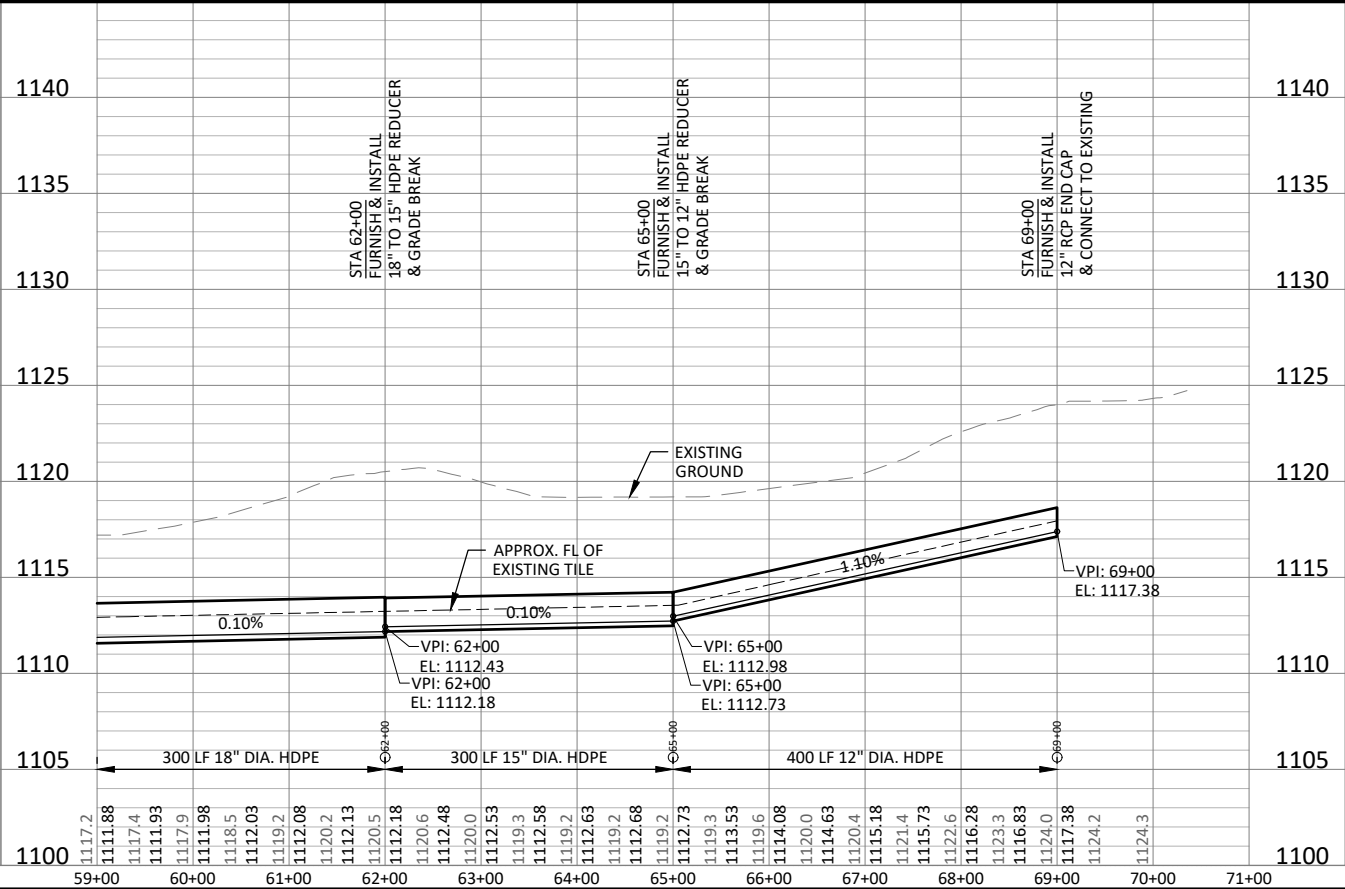
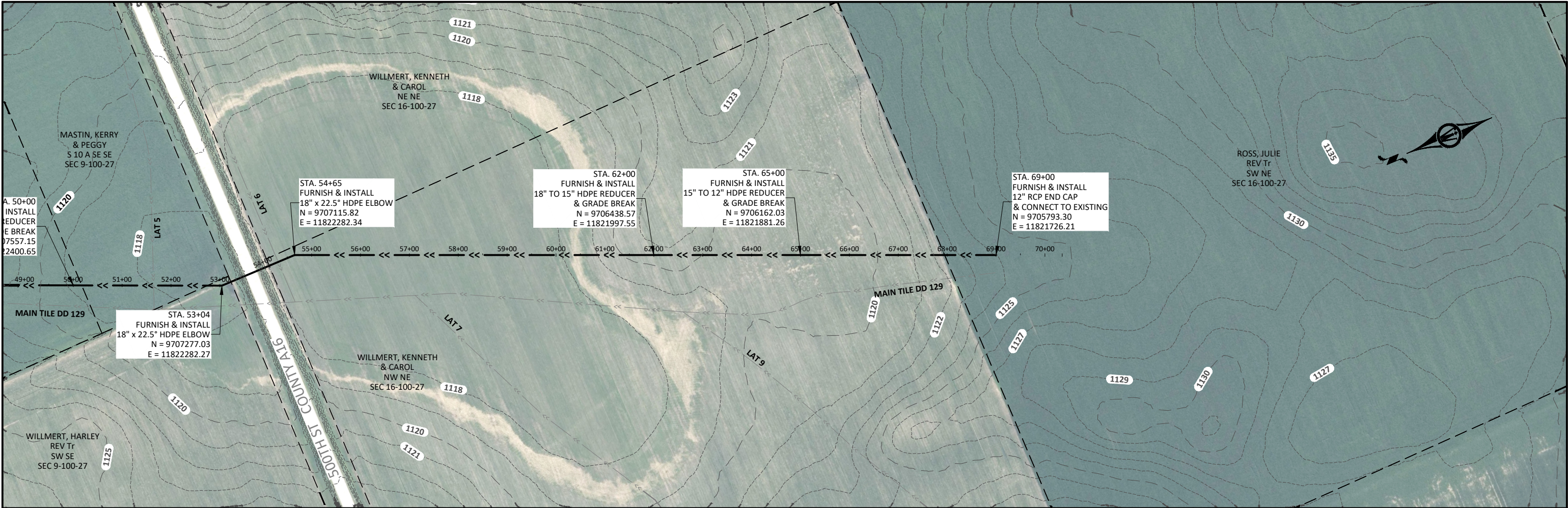
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| DRAWN            | JKF/ALR   |     |             |      |
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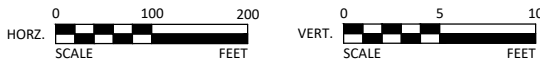
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| CHECKED          | TAK/NRS   |     |             |      |
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