



Real People. Real Solutions.

Engineer's Report

# Drainage District No. 1

## Tile Repairs

Cerro Gordo County

Filed: February 12, 2024

**Submitted by:**

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

Proj. No. 0T7.131386

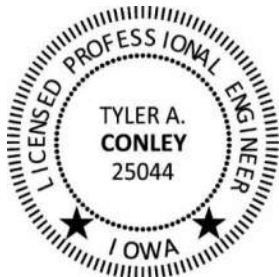
# Certification

Engineer's Report

for

Tile Repairs  
Drainage District No. 1  
Cerro Gordo County, Iowa

February 12, 2024



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, 2025.

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

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

Date: 2/12/2024

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## I. INTRODUCTION

### A. SCOPE OF WORK

The purpose of this report is to provide information relative to drainage relief requested by a landowner of Drainage Districts No. 1, Cerro Gordo County, Iowa (DD1). 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 Main Tile of DD1. This report examines the conditions that would be necessary to restore the drainage efficiency of the Main Tile to the original planned conditions. Copies of the drainage petitions are attached with this report in Appendix A.

### B. LOCATION & DISTRICT FACILITIES

The watershed of DD1 lies within Cerro Gordo County, south of the City of Ventura. The watershed of DD1 is located in Sections 20, 28, 29, 32, and 33 of Clear Lake Township (T-96-N, R-22-W). As documented in the Original Engineer's Report there are 1,067.74 acres assessed for benefit within the DD1 watershed of the drainage district.

The original district facilities of DD1 consist of an Open Ditch, the Main Tile that originally had a distinction between an Upper and Lower Main, nine Lateral Tiles, and eight Branch Lateral Tiles. In 2006, the Majority of the Lower Main Tile was replaced with a Conservation Reserve Enhancement Program (CREP) Wetland that intersected and brought to the surface for outlet the remaining Upper Main Tile, Lateral B, and Lateral C. The CREP Wetland still utilizes the original Main Open Ditch of DD1 that outlets into a series of marshes before eventually draining to Clear Lake. Appendix D contains a preliminary plan set that includes a site plan that outlines the facility locations of DD1.

### C. HISTORY SUMMARY

An investigation was conducted based on records found in the Cerro Gordo County Courthouse online database. This information was gathered in order to better understand the drainage district's history. A summary of events based on these records is as follows:

September 7, 1904	Petition for the establishment of DD1 is filed and an engineer is appointed to evaluate the benefited lands.
November 20, 1905	DD1 is formally established.
September 14, 1908	The engineer file the construction completion report for the Open Ditch of DD1. The report finds that the ditch has not been constructed sufficiently deep enough to serve as an outlet for tile facilities.
April 18, 1949	There is a resolution adopting an engineer's report that determines the feasibility of constructing a tile district.
November 7, 1949	An engineer's report is filed for the progress of the construction of the Main Tile and Lateral Tile.
June 6, 1951	Engineer recommends that the work be accepted.
May 4, 1987	Report filed that recommends tile repairs and an open ditch

cleanout.

2003-2006

CREP Project is examined and eventually completed that replaces the Lower Main with a permanent wetland.

## II. INVESTIGATION

### A. SURVEY & INVESTIGATION

During the summer and fall of 2023, a field review and preliminary survey were performed for the DD1 Main Tile. Topographic data and tile flowlines were gathered along portions of the tile to determine the existing ground cover and current tile slopes. This survey information was used to determine the existing condition of the tile and the extent of the needed repair. Additionally, plans from the 2006 CREP project were utilized to determine the extent of the Main Tile that was replaced as a part of that project.

### B. CAPACITY ANALYSIS

From the information gathered in the field investigation, the history search, and from the CREP plans the capacity of the current system could be determined and compared to the capacity of the original system. 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. Appendix C displays the calculated tile capacities for the Main Tile.

Based on the original drainage district profiles the drainage coefficient of the system ranges from 0.28 inches per day to 0.54 inches per day. For consideration of the entire system, by today's standards, the Main Tile of DD1 would be undersized. The standard drainage coefficient at the time of construction would have been between  $\frac{1}{8}$ " and  $\frac{1}{4}$ " per day, however today's drainage standard is  $\frac{1}{2}$ " per day with good surface drainage and up to 1" per day for depressional areas. Additionally, because the theoretical drainage coefficient is calculated using the size, grade, and drainage area, the actual capacity of the tile systems could be considerably less due to factors such as material age, tile damage, tile blockages, sedimentation and joint displacement.

These calculated capacities are also important for the comparison between the original system and the current system. Due to the CREP project the original first three segments of the Main Tile are no longer contributing to the drainage of the whole system. The Upper Main Tile, Lateral B, and Lateral C were bisected by excavation work that allowed for free outlets into the wetland pool. Based on the request of the petition, the Upper Main Tile capacity in the current configuration was calculated. Additionally, in the capacity calculations in Appendix C, there are highlighted values that compare the original capacity to the current capacity. To summarize the findings, in 2006 approximately 400 feet of the Upper Main Tile that was an 18-inch pipe at a 1.16% grade was replaced with an 18-inch pipe at a 0.10% grade. This change in pipe grade calculates in a theoretical reduction in capacity of 8.01 cubic feet of water per second or just over 70% of the total capacity reduced for the lower 400 feet of tile system. In order to preserve the capacity of the system to the original design capacity using the next commercially available tile size, the 18-inch pipe at 0.10% grade would need to be replaced with a 30-inch pipe.

### **III. PROPOSED REPAIR**

#### **A. REPAIR SUMMARY**

The investigation has confirmed the need for drainage relief in the district. In addition to the reduction in capacity due to the change in system grade in 2006, there are portions of the Main Tile that are failing and sections that have completely failed. Additionally, there are areas of standing water that are not being sufficiently removed from the system due to the poor quality of the in-situ tile system. It is recommended that the replaced portion of the Upper Main Tile that has had the grade changed be replaced with the appropriately sized tile to conserve the original designed capacity and that the damaged and shallow portions of the Upper Main Tile be replaced to the original planned capacity to restore the overall functionality of the district system to a point where an adequate connection with the remaining system can be achieved near 235<sup>th</sup> Street. It is recommended to have a minimum of 3-feet of ground cover atop the Upper 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 late Summer and Fall of 2024. 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.

### **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 \$505,000.00

## V. SUMMARY & DISCUSSION

This report has confirmed the need for drainage relief for Drainage District No. 1. 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. 1. It is recommended that the damaged and shallow portions of the Main Tile be repaired to the original planned grade and capacity and the portion of the Main Tile that was replaced in 2006 be replaced with the appropriate sized tile to preserve the original planned capacity. The repaired tile should 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 between ten to twenty years at the discretion of the Board of Supervisors. Typically, the board would spread assessments of the magnitude contemplated in this report over ten years. Be reminded that final individual assessments are based upon benefits and that some parcels will likely bear two to three times the average per acre costs.

#### **Recommended Steps**

It is recommended that the Board of Supervisors acting as trustees for Drainage District No. 1 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





**County Auditor**  
**Cerro Gordo County Courthouse**

---

220 N Washington Ave  
Mason City, IA 50401  
www.cerrogordoauditor.org

Adam Wedmore, Auditor  
641-421-3034  
awedmore@cgcounty.org

Date: June 15, 2023  
To: Board of Supervisors  
Re: Drainage District 1

---

On March 29, 2023 Dean Josten submitted a work order reporting standing water in drainage district 1. Rodney was assigned to investigate and reported back that he and Corey Lambertsen discovered approximately 1,000 feet tile ranging from 22 inch to 24 inch that was damaged and in need of replacement. Rodney stated there were wetland ponds and numerous trees in the area and the area was currently underwater. Initial cost estimates to replace the tile exceeded \$100,000. Per Iowa Code Chapter 468 repairs that exceed a cost of \$50,000 require a public hearing to be held.

Our staff reviewed the history of this district and found that a Conservation Reserve Enhancement Program (CREP) project exists within this drainage district near the reported problem and that a Wetland Restoration Project (WEP) also exists in the vicinity. These projects complicate the matter as they have additional agreements and easements of their own and have altered the function of the drainage district from as it was designed.

The estimated cost of the repair alone requires a public hearing be held to allow landowners to provide additional information before any repairs are completed. Before the public hearing can be held additional information about the district and what options exist must be obtained. The existence of the established wetland programs complicates the matter and requires expertise from drainage professionals. It is my recommendation that the trustees for drainage district 1 appoint an engineer and attorney to review the situation and make recommendations for how to proceed.

A handwritten signature in blue ink, appearing to read "Adam Wedmore".

Adam Wedmore  
Cerro Gordo County Auditor

**CERRO GORDO COUNTY  
DRAINAGE WORK ORDER**

To: Cerro Gordo County Board of Supervisors

Date: 3-29-2023

It is hereby requested that repairs be made on:

Drainage District: #1  
 Lateral: \_\_\_\_\_  
 Assessable District: \_\_\_\_\_  
 Station: \_\_\_\_\_  
 Township: Clear Lake  
 Section: 29  
 1/4 - 1/4: SF SW + SW SE

Requested by:  
 Name: Dean Josten

Owner    Tenant    Other

Address: 2410 230th St. Ventura, Ia 50482

Phone: 641-828-3276

Cell Phone: 641-355-3642

Landowner's name, if not provided above: Broken tile is on Woodford Ashland Lone Tree Farm

Problem: Water not draining

Same Problem last year but water went down late May and I thought it got fixed. But it is not. Thanks

Signature of person reporting the problem: \_\_\_\_\_

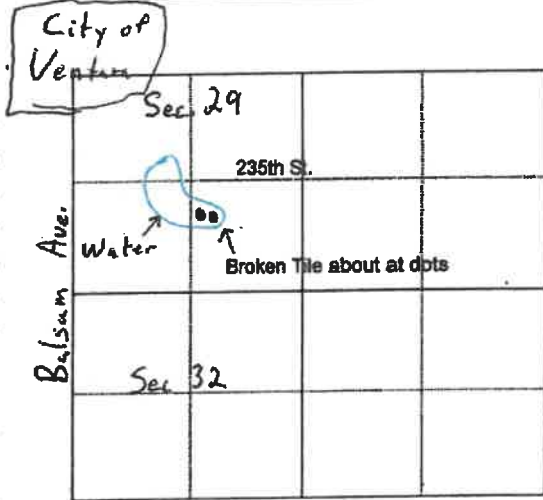
Chairman's Signature: \_\_\_\_\_

McKinney Field Review: \_\_\_\_\_

Contractor Assigned by Rodney McKinney: \_\_\_\_\_

Estimated Completion Date: \_\_\_\_\_

Estimated Cost of Repair: \_\_\_\_\_



9:50 am

4/5/23 - was able to get a hold of Tom Lovell (641-357-2-  
CLTel) for a verbal confirmation to go onto his land  
(parcel 05-29-400-003-00) to assess drainage tile. hay

5/22/23 Corey Lambertson called Re:

235<sup>th</sup> St and Balsam

- this will be a much larger project than originally thought; a 22-24" tile  
(maybe as much as 1,000 feet) will need to be replaced; in this area there are wetland  
ponds, the tile is full of willows; Corey said there may be a location to insert a  
camera; but it is currently all underwater; Corey will figure an estimate of  
costs to repair → then due to size of problem (\$) will visit w/ the board

5/23/23 Corey called + estimated the cost will be around  
\$100k to repair.

Map X

051940000100 IOWA STATE CONSERVATION COMM

051940000500 IOWA STATE CONSERVATION COMM

053020000100 OLSON, ROSWIT

053020000200 OLSON, KEVIN J

053020000300 ROBERTS, JOHN C

053040000500 SKENE, ROBERT

053040000700 SKENE, ROBERT

053040000800 SKENE, ROBERT

053040000900 SKENE, ROBERT

053120000100 MEYER HOME FARM CO

053120000200 MEYER HOME FARM CO

052035100300 WILSON, MARK E

052910001200 WILSON, MARK E

052910001300 PETERSON, DANIEL

052910000700 OWES, TWIRELESS IOWA LLC

052910000800 WOODFORD ASHLAND LONE TREE FARM INC

052910000500 WOODFORD ASHLAND LONE TREE FARM INC

0529930000100 JOSTEN, ELLAD

0529930000600 JOSTEN, ELLAD

0529930000800 JOSTEN, DEANA

053210000100 MEYER HOME FARM CO

053210000200 MEYER HOME FARM CO

052037600200 DAWSON, STEVEN K

052910000300 WILSON, MARK E

052920000100 WOODFORD ASHLAND LONE TREE FARM INC

052920000200 WOODFORD ASHLAND LONE TREE FARM INC

052920000300 WOODFORD ASHLAND LONE TREE FARM INC

052920000400 WOODFORD ASHLAND LONE TREE FARM INC

052940000100 WOODFORD ASHLAND LONE TREE FARM INC

052940000200 WOODFORD ASHLAND LONE TREE FARM INC

052940000300 WOODFORD ASHLAND LONE TREE FARM INC

053220000100 ROSENDAL, DAVID D

053220000200 ROSENDAL, DAVID D

052040000400 WOODFORD ASHLAND LONE TREE FARM INC

052920000200 WOODFORD ASHLAND LONE TREE FARM INC

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052920000400 WOODFORD ASHLAND LONE TREE FARM INC

052920000500 WOODFORD ASHLAND LONE TREE FARM INC

052940000200 WOODFORD ASHLAND LONE TREE FARM INC

052940000300 WOODFORD ASHLAND LONE TREE FARM INC

052940000400 WOODFORD ASHLAND LONE TREE FARM INC

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053220000200 ROSENDAL, DAVID D

052130000100 WOODFORD ASHLAND LONE TREE FARM INC

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052830000100 PETERS, JOHN G

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052830000700 PETERS, JOHN G

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052930000100  
Gross Acres = 40  
JOSTEN, ELLA D

052930000600  
Gross Acres = 35  
JOSTEN, DEAN A

052940000100  
Gross Acres = 40  
WOODFORD ASHLAND LONE TREE FARM, INC.

052940000200  
Gross Acres =  
WOODFORD ASHLAND LONE

330

052930000000  
Gross Acres = 10  
JOSTEN, ELLA D

052930000300  
Gross Acres = 40  
JOSTEN, ELLA D

052930000800  
Gross Acres = 35  
JOSTEN, DEAN A

052940000300  
Gross Acres = 40  
WOODFORD ASHLAND LONE TREE FARM, INC.

052940000400  
Gross Acres =  
WOODFORD ASHLAND LONE

29

# Clear Lake

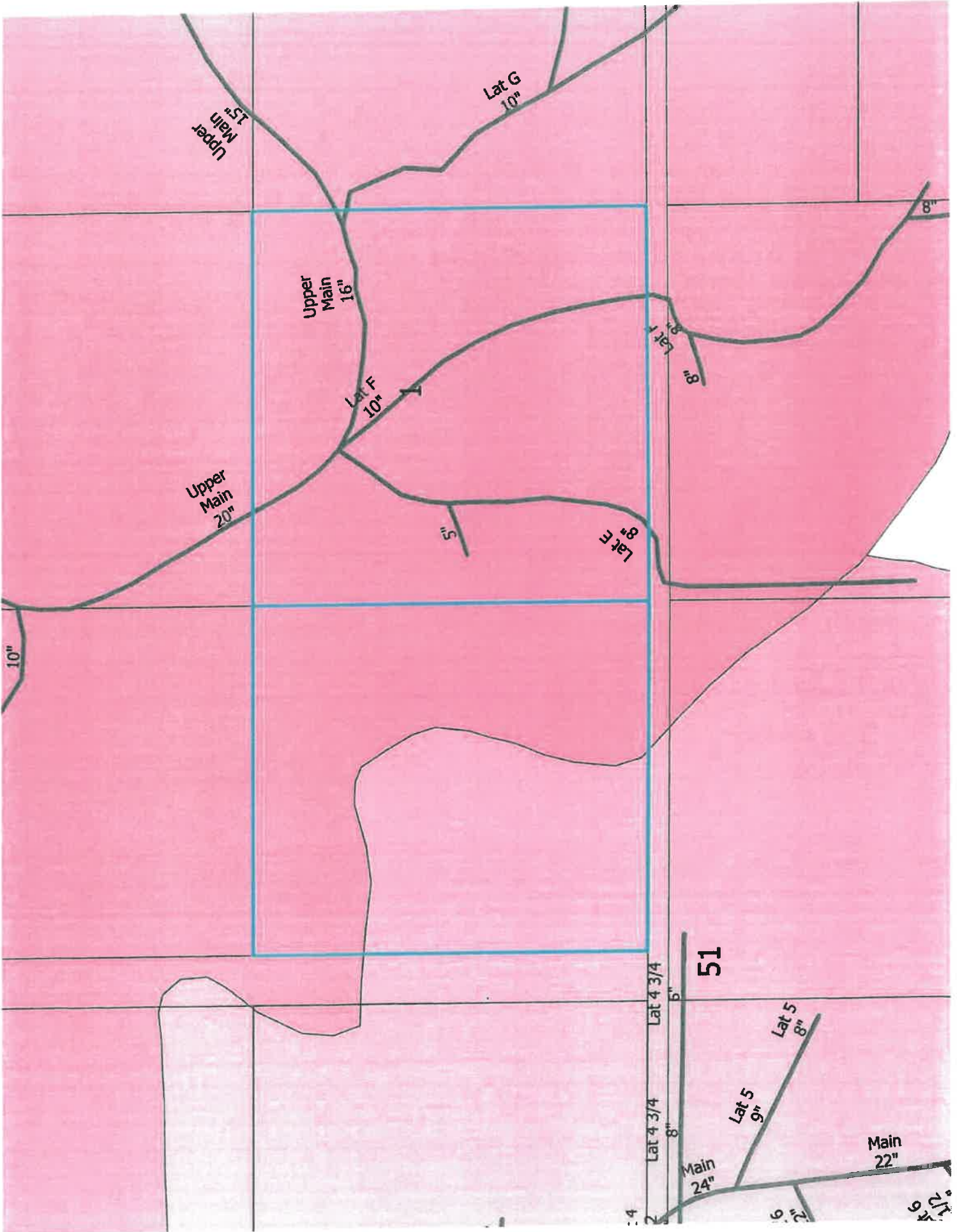
053210000100  
Gross Acres = 40  
EYER HOME FARM CO

053210000200  
Gross Acres =  
JOSTEN, CALVIN F

053220000100  
Gross Acres = 40  
ROSENDAHL, DAVID D

053220000000  
Gross Acres =  
ROSENDAHL, D

32





CERRO GORDO COUNTY  
DRAINAGE WORK ORDER

To: Cerro Gordo County Board of Supervisors

Date:

4/28/22

It is hereby requested that repairs be made on:

Drainage District: DD1

Lateral: latD 10" tile

Assessable District: \_\_\_\_\_

Station: \_\_\_\_\_

Township: Clear Lake

Section: 29

1/4 - 1/4: NE SW


Requested by:

Name: Dean Josten

Owner  Tenant  Other

Address \_\_\_\_\_

Phone: \_\_\_\_\_

Cell Phone: 641-355-3642

Landowner's name, if not provided above: \_\_\_\_\_

Problem: Plug tile - latD 10" its in CRP ground.

Water ~~is~~ not going down & coming out into farm ground.

Seeback ->

Signature of person reporting the problem: \_\_\_\_\_

Chairman's Signature: Chris [Signature]

McKinney Field Review: Rodney said 11/18/202-

Johnson went up there & saw no problem

Contractor Assigned by Rodney McKinney: Tony Johnson - Johnson Tilley

Estimated Completion Date: \_\_\_\_\_

Estimated Cost of Repair: \_\_\_\_\_

## **Summary of CREP Project in DD #1**

### March 21, 2003 – Memo from Larry Phearman to BOS & Auditor

Concerning a wetlands project in DD #1, Larry Phearman and Jim Witt visited with a representative from the NRCS office in Mason City and learned that preliminary field work has been done and that preliminary plans are available. The majority of the area is under one ownership, who is the applicant. The applicant, Woodford Ashland Lone Tree Farms, owns the majority of the area. Phearman & Witt recommend waiting until a final plan and proposal are available to “render an evaluation of the project”.

### August 19, 2003 Regular Session Board Supplemental Minutes

“Chairman Amosson stated that the SCS Office wants to introduce the CREP program in Drainage District 1, in Sections 20 and 29 in Clear Lake Township. Supervisor Amosson motioned, with Supervisor Dougherty seconding, to approve the CREP Program in DD 1. Motion passed unanimously.”

### August 21, 2003 Letter from County Auditor to District Landowners

On behalf of the board of supervisors, the deputy county Auditor sent a letter to property owners in DD #1 to inform them of proposed changes for the surface outlet and outlet Lateral C-1 in sections 20 and 29 of Clear Lake Township. A spreadsheet of owner names is attached, and presumably is the list to which the letter was sent.

### September 24, 2003 Informal Meeting of BOS with District Landowners

An informal meeting (one in which the board was not officially in session) was held with Tony Moore and landowners from the District. The meeting was listed on the board's weekly agenda, but no specific meeting agenda and no minutes are of record. There is no record of how landowners were informed of this meeting. There is an undated sign-up sheet that appears to be from this meeting.

### December 5, 2003 Letter from Larry Phearman to Calvin Josten

On November 3, 2003 Calvin Josten requested to clean the outlet ditch of DD #1. This area is being designed for a wetland project in the CREP program. After discussions with representatives from NRCS and Yaggy Colby, the conclusion was to wait until after Thanksgiving when the design was finished. On December 3, 2003, Phearman was told that plans had been sent to Des Moines for approval by the State. At that time NRCS told Phearman that they expected the project to be done in the fall of 2004. It was Phearman's opinion that to clean the ditch would cost \$8,000 to \$10,000 and would be a waste of money if the outlet of the main is plugged, a dam structure is placed near the outlet and the laterals are surface outlet. Phearman states that when Yaggy was doing field work they found two tile holes that he gave to Bruce Ries to repair.

### December 9, 2003 Regular Session Board Supplemental Minutes

“The Board considered plugging and removing portions of laterals C, C-2, and C-3 in Drainage District 1. The NRCS Office is introducing the CREP Program in Drainage District 1. Chairman Amosson stated that everything has been checked over. Supervisor Dougherty stated that he visited the site and saw two caterpillars on the site. Supervisor Dougherty motioned, with Supervisor Urdahl seconding, to approve



the plugging and removal of portions of laterals C, C-2, and C-3 in Drainage District 1 for the CREP Program. Motion passed unanimously.”

August 27, 2004 Letter from Supervisor Amosson to Mike Borland

“Last year in August, we met concerning Drainage District #1 and the Wetlands CREP program, we had an engineers study on what it would do the district. You asked at that time if we could have another meeting next year to see how the project is going and to see if there are changes of what was being done. We agreed that we would have this meeting and we have scheduled the meeting for September 16, 2004 at 10:00 a.m. in the boardroom of the Cerro Gordo County Supervisors. We will have the appropriate people there to answer any questions you may have.” Stapled to our unsigned copy of the letter is a spreadsheet listing landowners in the district dated the same day, which possibly was included as a courtesy to Borland, or possibly because copies may have been sent to district landowners, although there is nothing to clearly indicate either.

September 16, 2004 Informal Meeting of BOS with District Landowners

There was an informal meeting on this date; however, there was no listing on the board’s weekly agenda, no specific meeting agenda was posted, and no minutes were kept. There is a sign-up sheet that appears to be from this meeting.

October 7, 2004 Letter from Iowa Dept of Ag and Land Stewardship

The Iowa Dept of Ag and Land Stewardship sent a letter dated October 7, 2004 concerning CREP and requesting permission from the Board to remove a portion of the tile from DD 1. The letter indicates that landowners have signed an IP-1 form expressing interest in enrolling a portion of their property into the CREP. Yaggy Colby Associates was contracted by the Division for engineering services and has completed their design for this project. At that point in time, they have not had a CREP involving a drainage district tile. They indicated that they have been working closely with the Iowa Drainage District Association to develop guidelines that could be followed by a drainage district and enclosed a copy of a current draft resolution. The letter included their recommendation to have some agreement made between the benefited landowners of the district and the district on behalf of others within the district.

February 1, 2005 Site Plan Filed with County Auditor

Deputy Auditor Shonka received revised Site Plan for the CREP program from Jay Waddingham of Yaggy Colby Associates. No final plans or specifications have been prepared or filed as of this date. Shonka’s notes indicate that Yaggy Colby is waiting on approval to continue finalizing things with landowners to determine easement boundaries. No construction has been done yet.

February 3, 2005 Letter from Attorney Jim Hudson

At the request of the county auditor, drainage attorney Jim Hudson wrote a letter recommending that the Iowa Department of Ag and Land Stewardship file detailed plans and specifications for the proposed work to establish and maintain the CREP wetland with the district. Following that, the Board would set a hearing date and serve notice upon landowners. He added that there is nothing in Chapter 468 of the Code of Iowa which speaks in terms of a drainage district establishing or maintaining a wetland under federal regulations. He recommended that the Board take a long look at the proposed resolution for cooperation between the drainage district and wetland

people for the establishment and maintenance of wetlands in the district. He added that there is no provision in the current drainage statute as to how the supervisors would maintain and improve any wetland which was established in the district.

July 21, 2005 Letter from Larry Phearman to Calvin Josten

On July 13, 2005 Calvin Josten requested the district clean 1,000' of the outlet ditch. Phearman's letter in response stated that he had talked with Tony Moore and that the CREP project was "still a go", and that his opinion was that "cleaning the ditch at this time would be a waste of money for the district". However, according to Supervisor Amosson in a conversation with Deputy Auditor Shonka February 16, 2006, some cleaning of the lower ditch was done based on the recommendation of County Engineer Jim Witt. Amosson said he authorized the cleaning based on that recommendation, and a claim of \$2,160 was paid to Iowa Drainage in September 2005.

January 30, 2006 Letter from William Mathis ES Viken LLC to County Auditor  
County auditor received letter asking for a formal investigation to locate "\$3,700 in 2004 documentation warrants".

February 17, 2006 Meeting with Yaggy Colby

County auditor initiated a meeting with himself, Yaggy Colby engineers, Supervisor Amosson, and Deputy Auditor Shonka. Yaggy is working on detailed plans and specifications and will file those with county auditor when complete. No construction has been done yet. Engineers stated they believed a Wetland Restoration Project (WRP) had been completed in recent years on property adjoining to the immediate east of the proposed CREP project, and speculated that Mathis' letter might be referring to that WRP project. Yaggy people gave the county auditor a photocopy of minutes of the September 16, 2004 informal meeting taken by Jay Waddingham of Yaggy Colby from Yaggy Colby engineers. Yaggy also gave a copy of a Site Plan for the CREP project.

NOTICE OF HEARING ON PROPOSED WETLAND RESTORATION EASEMENT  
CERRO GORDO DRAINAGE DISTRICT NO. 1

TO ALL LANDOWNERS AND PERSONS INTERESTED IN DRAINAGE DISTRICT NO. 1,  
CERRO GORDO COUNTY, IOWA

YOU ARE HEREBY NOTIFIED that there is proposed wetlands restoration easement report for  
Drainage District No. 1 on file in the Auditor's office, Cerro Gordo County, Iowa.

YOU ARE FURTHER NOTIFIED that the Board of Supervisors acting as trustees for said  
Drainage District has set September 13, 2016 at 10:15 o'clock a.m. in the Cerro Gordo Courthouse,  
Mason City, 1<sup>st</sup> Floor, Board of Supervisors Meeting Room as the date, time and place for hearing  
on said proposed easement.

YOU ARE FURTHER NOTIFIED that persons interested in the proposed easement may file  
objections to said proposed easement and submit any evidence tending to show that said easement  
should not be accepted at or before the time fixed for hearing and that said objections shall be in  
writing and may be filed in the office of the Cerro Gordo County Auditor at or before the time  
fixed for hearing.

YOU ARE FURTHER NOTIFIED that the Trustees will consider the request for easement and  
any objections at this hearing. Further, the Trustees may act on said request by approving, denying,  
or modifying the request for easement.

PUBLISHED BY ORDER OF THE BOARD OF SUPERVISORS ACTING AS TRUSTEES FOR  
DRAINAGE DISTRICT NO. 1, CERRO GORDO COUNTY, IOWA

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KEN KLINE  
CERRO GORDO COUNTY AUDITOR

Proposed timeline:

Public Hearing:	September 13, 2016
Notice to newspapers by:	August 12, 2016
Public Notice:	August 17 and 18, 2016
Mail Notice to property owners:	August 23, 2016



**County Auditor  
Cerro Gordo County Courthouse**

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220 N Washington Ave  
Kenneth W. Kline, Auditor

Mason City, IA 50401-3254

(641) 421-3028  
FAX (641) 421-3139

October 5, 2016

Janet A Connell Lovell  
Marcia A Connell  
Trustees of the Marcia A Connell Revocable Trust  
545 N Shore Drive  
Clear Lake, IA 50428

Re: Drainage District 1

Dear property owners:

The Board of Supervisors acting as Trustees of Drainage District I approved the enclosed Wetland Development Drainage Agreement on Tuesday, October 4, 2016. I have enclosed two copies of the agreement, one for each party.

This agreement ensures that the wetlands proposed for construction on your property within Drainage District 1 will not reduce the coefficient of drainage for any landowner in the district. The agreement states that the Owner shall maintain drainage and flow in conveyance from the Drainage District I tile outlets through the Wetland Reserve Easement, including tree and brush removal of the tile, in perpetuity, or as long as the Drainage District deems necessary.

Once you have executed this agreement, please return one to our office in the enclosed envelope. If you have any questions about this agreement you may contact the Trustees of Drainage District 1 at 641-421-3021.

Sincerely,

Sandy Shonka, Deputy Auditor  
Cerro Gordo County

Enclosure

**WETLAND DEVELOPMENT  
DRAINAGE AGREEMENT**

This agreement is made between *Janet A. Connell Lovell, Trustee of the Marcia A. Connell Revocable Trust* and Drainage District #1 of Cerro Gordo County. *Janet A. Connell Lovell, Trustee of the Marcia A. Connell Revocable Trust* is the owners of the real property described as: see Exhibit "A", in Cerro Gordo County, Iowa.

*Janet A. Connell Lovell, Trustee of the Marcia A. Connell Revocable Trust* has entered into a perpetual easement (recorded document 2015-7211) of the Agricultural Conservation Easement Program – Wetland Reserve Easement (WRE) program with the United States of America, thru the Commodity Credit Corporation, to restore wetlands by replacing existing drainage district tile with non-perforated dual-wall tile, as well as the construction of several shallow water excavations per plans developed by the USDA Natural Resources Conservation Service. The purpose of the wetland restoration is to enhance habitat for fish and wildlife, improve water quality, retain flood water, recharge groundwater, and provide aesthetic values and environmental education.

*Janet A. Connell Lovell, Trustee of the Marcia A. Connell Revocable Trust* are hereinafter referred to as OWNER.

Drainage District #1 is a duly established drainage district according to the laws of the State of Iowa located in Cerro Gordo County, hereinafter referred to as DISTRICT.

The OWNER, in cooperation with the USDA Natural Resources Conservation Service, desires to restore wetlands on the parcel described as part of the Wetland Reserve Easement (WRE). The wetland restoration has been designed and will be constructed in accordance with the **USDA-NRCS requirements**. The DISTRICT has reviewed the engineering and construction plans and do not oppose this project provided the project is built in accordance with the plans and the following conditions are met, but has made no determination the restoration will perform as proposed.

1. The restoration of the wetlands shall not reduce the coefficient of drainage for any landowner within the Drainage District.
2. The wetland shall retain the classification for assessments and shall be subject to all future assessments as established by Section 468.40 (Code of Iowa).
3. Ownership, control, and maintenance of facilities constructed to convey waters of the District shall be the District's. Owners will allow the District free and unrestricted access to the new tile lines for observation, maintenance, and repair.
4. The Owner shall maintain drainage and flow in conveyance from the Drainage District tile outlets through the Wetland Reserve Easement (WRE), including tree & brush removal

over the drainage district tile, in perpetuity, or as long as the Drainage District deems necessary.


The Drainage District assumes no responsibility for any malfunction of the planned wetland restoration that results in crop damage, erosion, or any other injury that is caused by the failure of the planned wetland restoration.

5. If the Owner fails to perform maintenance activities as required under this agreement, the Drainage District may enter the property and perform maintenance seven or more days after giving notice to the landowner to do the maintenance. If the Trustees deem the maintenance to be an emergency, the District may immediately perform the maintenance. The costs thereof shall be assessed to the landowner.

6. The provisions of this agreement shall apply to any and all future owners, including landowners, government agencies, and non-profit entities, the Owner's real property described as: see Exhibit "A", in Cerro Gordo County, Iowa.

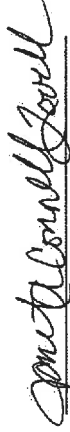
This agreement is executed as of the last date indicated below:

DISTRICT

  
Chairman, Casey Callanan  
Board of Supervisors

10/4/10  
Date

OWNER

  
Janet A. Connell Lovell, Trustee of the  
Marcia A Connell Revocable Trust

10-11-10  
Date

ATTEST:

  
Kenneth W. Kline  
County Auditor

—  
Marcia A. Connell, Trustee of the  
Marcia A. Connell Revocable Trust

(Deceased)  
Date

Plot of Survey

**NRCS Conservation Easement in the SE 1/4 of Section 29 - T96N - R22W, Cerro Gordo County, Iowa.**

**Easement Description:**

NRCS Conservation Easement in the Southeast Quarter of Section 29, Township 96 North, Range 22 West of the 5th P.M., Cerro Gordo County, Iowa, and more particularly described as follows:

Commencing at the South Quarter Corner of said Section 29;

Thence North 00°13'57" East, 33.00 feet along the West Line of said Quarter Section to the North Right-of-Way Line of 230th Street and the Point of Beginning;

Thence continuing North 00°13'57" East, 2572.45 feet along said West Line to the South Right-of-Way Line of 235th Street;

Thence South 89°59'24" East, 1453.35 feet along said South Right-of-Way Line of 235th Street;

Thence South 00°09'32" East, 643.00 feet;

Thence South 89°59'24" East, 356.00 feet;

Thence North 00°09'32" West, 311.00 feet;

Thence South 89°59'24" East, 460.00 feet;

Thence South 00°09'32" East, 311.00 feet;

Thence South 89°59'24" East, 323.00 feet to the West Right-of-Way Line of Cardinal Avenue;

Thence South 00°09'32" East, 1918.06 feet along said West Right-of-Way Line to the North Right-of-Way Line of 230th Street;

Thence South 89°45'37" West, 3608.90 feet along said North Right-of-Way Line to the Point of Beginning;

Containing 139.70 Acres, subject to any other easements recorded or unrecorded.

Exhibit A

Geomatics Report			
Point No.	Northing	Easting	Description
14	3865627.25	4928891.51	Easement Corner
15	3865627.50	4921344.86	Easement Corner
16	3864984.50	4933344.64	Easement Corner
17	3864984.44	4921701.64	Easement Corner
18	3865199.45	4917701.78	Easement Corner
19	3865195.35	4932163.78	Easement Corner
20	3864984.35	4922167.64	Easement Corner
21	3864984.30	4932066.64	Easement Corner
23	3863055.33	4928811.00	Easement Corner
24	3863066.24	4924853.91	Easement Corner

See the plat(s) attached to this original easement description.



**County Auditor  
Cerro Gordo County Courthouse**

220 N Washington Ave  
Kenneth W. Kline, Auditor

Mason City, IA 50401-3254

(641) 421-3028  
FAX (641) 421-3139

February 22, 2006

William J. Mathis, General Partner  
E. S. Viken, LLC  
PO Box 283  
Vincent IA 50594-0283

Mr. Mathis:

I am writing in response to your letter of January 27, 2006 in which you refer to \$3,700 spent in 2004 in Drainage District #1, and you request "a formal investigation to locate the missing warrants, billing statements, and map changes" to the district.

I have completed a thorough review of the records for this district, including claims, warrants, and minutes of the board of supervisors' meetings. I hereby certify to you that the only drainage district funds spent in this district in 2004 was a single warrant payable to Larry Phearman. This warrant was issued to pay a claim in the amount of \$84.00 to investigate a problem reported by Calvin Josten in Section 29 of Clear Lake Township. You will find in the attached Exhibit "A" a list of all warrants issued for work and materials in the district for the past ten years.

I am unable to find any basis in the district records of your statement regarding \$3,700 in missing warrants. No similar amount has been spent from drainage district funds in the past ten years. The best that I can conclude is that you may be referring to one of two projects, neither of which has used any district funds.

The first project is the Conservation Reserve Enhancement Project (CREP) which is in the planning stages, according to County Supervisor Bob Amosson, Tony Moore, and the Monte Appelgate of Yaggy Colby Associates. Since no work has yet been done there are no claims that have been paid, no warrants that have been issued, and no changes that have been made to district tile lines or ditches as a result of this project. It is my understanding in talking with each of these people that 1) detailed plans and specifications will be prepared and filed by Yaggy Colby, and 2) the county supervisors will notify all district landowners of the date, time, and place of a public hearing on the detailed plans and specifications. Further, it is my understanding that there will be no cost to the district from this project if it does proceed. Assuming it goes forward, there will be no warrants paid from district funds, although any changes to district tile lines or ditches would need to be entered into the official district files.



The second project is a wetlands restoration project (WRP) in the northeast quarter of Section 29, according to information filed in the district records by Tony Moore. However, no claims for this WRP project were paid from district funds.

Also in your letter you refer to a "videotape of the engineering plans for the 2004 project, the 30-inch diameter tile was to have been broken at the bend leading west into the open ditch" and "the bulk of the \$4,500 original cost was to have been spent excavating a 10 acre pond north of the break and to pay for rock fill leading from the break down the slope to the pond". In talking with Tony Moore, I believe you are referring to the above CREP project. Since no final plans and specifications have been filed as part of the district record, there is no way that I can confirm that information or answer questions you have on these issues. I suggest you direct those questions to Yaggy Colby or Tony Moore.

I hope this is helpful. Please let me know if we can be of further service.

Sincerely,

Kenneth W. Kline  
Cerro Gordo County Auditor

cc: Bob Amosson, Cerro Gordo County Supervisor District II  
Paul Martin, Cerro Gordo County Attorney  
Tony Moore, NRCS  
Monte Appelgate, Yaggy Colby Associates

## Exhibit "A"

### List of Warrants Work & Materials Drainage District #1 01-01-96 thru 02-17-06

<b>Claim #</b>	<b>Date</b>	<b>Amount</b>	<b>Vendor Name / Description</b>
45830	12-09-97	\$195.00	Ries Tiling / Check tile Sec 29 L. Edna Mathis
46328	12-22-97	49.40	John Nichols / Investigation Oct 97
53228	08-31-98	15.00	John Nichols / Investigation July 98
55138	11-11-98	260.00	Ries Tiling / Tile repair Sec 29 Edna Mathis
57177	01-18-99	15.00	Larry Phearman / Investigation Dec 98
57185	01-18-99	949.80	Ries Tiling / Tile repair Sec 20
58328	03-01-99	137.45	John Nichols / Investigation Nov 98
62816	08-03-99	30.00	Larry Phearman / Investigation June 99
64442	09-28-99	30.00	Larry Phearman / Investigation July 99
66083	11-23-99	45.00	Larry Phearman / Investigation Oct 99
66870	12-20-99	15.00	Larry Phearman / Investigation Dec 99
76563	12-05-00	236.30	Ries Tiling / Repair hole in 8" tile
87685	01-02-02	320.00	Ries Tiling / Repair 4 holes in 30" tile Sec 29 Bob Wilson
87693	01-02-02	15.00	Larry Phearman / Investigation Dec 01
103382	07-01-03	30.00	Larry Phearman / Investigation N 1/2 Sec 29
108801	12-20-03	469.40	Ries Tiling / Repair 2 blowouts Sec 20 Calvin Josten
109257	01-13-04	84.00	Larry Phearman / Investigation Sec 20 Calvin Josten
127717	10-25-05	2,160.00	Iowa Drainage Inc. / Repair & materials Sec 20



**County Auditor**  
**Cerro Gordo County Courthouse**  
**Internal Memorandum**

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TO: Board of Supervisors

FROM: Sandy Shonka

SUBJECT: Proposed CREP Project in Drainage District 16 and Drainage District 1

DATE: September 18, 2006

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Mike Bourland with the Iowa Department of Agriculture and Land Stewardship (IDALS) has submitted Final Plans for a Conservation Reserve Enhancement Program (CREP) in Drainage District 1 and Drainage District 16. I have reviewed Jim Hudson's legal opinion, of which is attached, and have determined that the following proceedings need to take place. I have attached copies of the letters from Mr. Bourland and maps of DD 1 and DD 16 for your benefit.

The Board of Supervisors is trustees for DD 16. Drainage District 16 Main serves as an outlet for Jt Drainage District 113/123 with Hancock County. Whether these CREP plans impact the Main in DD 16 needs to be determined by an Engineer. The next step for the Board is to have a licensed Engineer review the Final Plans and prepare a written report on the project and its impact on the district. Upon receipt of detailed plans and specifications for the project, the Trustees of the district need to schedule a hearing and serve notice upon landowners by publication in a newspaper and a written notice by ordinary mail to all landowners in the district. Depending on the outcome of the public hearing, the Trustees should take formal action to allow or disallow a CREP project within DD 16 as well as consider an agreement between the Trustees and property owner(s) similar to the one adopted in Drainage District 11.

The Board also serves as trustees for Drainage District 1. I have attached a summary of correspondence, board action and meetings that have occurred since March of 2003 concerning a proposed CREP in DD 1. It does not appear that an Engineer has prepared a written report concerning Final Plans, nor has a public hearing been held. Regardless of any action taken thus far concerning a CREP in DD 1, I recommend the same proceedings suggested for a CREP in DD 16 be followed for a CREP in DD 1.

I am suggesting that the Board of Supervisor's consider hiring an Engineer to review CREP plans for DD 1 and DD 16 at the next Board meeting.

DD and CREP programs  
January 24, 2007

Present: Mike Bourland, Monty Applegate, Bob Amosson, Mary Kelly, Sandy Shonka and Bob Largett

Bourland – The goal of the county is to make sure drainage is protected and maintained. The state's goal is to see this program proceed. WHKS was asked by Kelly to comment on the plans that were prepared by Yaggy Colby Associates. The plan for today is to review the letter from WHKS. Some are a matter of differences as to how consultants approach a project.

Bourland stated that they have applied for a DNR permit and the hydraulics have been reviewed through that process. WHKS should have addressed what benefit or concern they had about this project. There was no comment on how this design is impacting the drainage tile. Was WHKS asked to do that?

Kelly stated that she told WHKS to look for impacts - will it cause a negative impact ups team or downstream. Bourland stated that some of those things were addressed but it was not stated that it was going to be ok. Kelly surmised that WHKS meant that if these things are addressed, then it will be ok.

Amosson stated that we want to hear that this will work and that there will be no adverse impact to the drainage tiles. He endorses CREP sites and thinks we need them. He stated that he wants to be able to say at the hearing that if they do this, it will not hinder the district, but it will help it. We need someone at the hearing to back it up.

Kelly expressed a concern for the plans affecting DD 16, the Nieman/Coe project. She stated that WHKS shows an existing 24-inch tile going under the road (believes within Ventura City limits) – but the county map shows an 18-inch and a 10-inch goes down into an 18 inch. She wants to make sure that the 10-inch pipe will be addressed. The plans call for a 24 inch. Largett stated that Jay did some excavation and probed to ascertain where the intercept point would be. He also used the county maps and called it a 24-inch tile. It does outlet as a 24-inch tile. Applegate stated that they will look at this matter and see what they can find out.

DD 1 - (Wilson/Brandt)

The letter from WHKS was reviewed.

Largett stated that these are not the normal storm water retention pond – that these are full-flow structures. There is virtually no decrease in the storm that passes by the structure. We are creating a pool behind it for nitrate treatment. It is a shallow pool with a wide weir. There is minimal reduction of the flow maybe only 5-10%.

Amosson stated that this CREP in particular will help the CLEAR Project. It was stated that any project like this will help the water shed.

Bourland – The main purpose is to capture the tile flow and reduce the nitrates. We want the storm water – surface runoff to pass through quickly.

Pool Elevation – we could add the 10-year design is elevation and 100 year comes up to another dimension. It is not required in a review project  
Kelly stated that when WHKS reviewed the plans it may have been useful. Kelly stated that a note would not hurt, it would be nice.

The design criteria of the State of Iowa and federal government – if you are passing the flow you don't need an auxiliary spill. This is a personal note, it is not part of the criteria. This is just a draw down pipe. There will be zero flow in normal conditions. Bourland stated that it is a drawdown to help vegetation get started.

Kelly stated that the only issue is the velocity – sometimes on the open ditches we end up having to replace them. Largett stated that they are both corrugated. Largett stated that he would go ahead with the plastic outlet. Kelly stated that as long as you feel the flow of the ponding area won't erode the soil.

Containment berm should be higher – Largett doesn't see why. We are not overtopping. We do provide for drainage behind the containment dike. There is a small drainage area that comes down to the site. It will handle a ten year event without surcharging. We will be removing more water out of there than under current conditions. So, in essence we are improving the situation.

Bourland's staff met with Steve Dawson and explained the benefits of the program. We got the DNR to help pay for the isolation berm/tile. We don't want to pay extra money to isolate landowners. Instead we will look for alternate sources of funding.

Largett addressed the concern about going over the easement boundary. Owners negotiated this easement with the State. We have an agreement with the owner next to Dawson to get in there and grade his embankment to make the site work. We show the dollars/cents easement and not necessary the construction easements.

Concern about the width (somewhere). Largett said it should be enough room to maintain grass and look at the tile if needed. Kelly did not see a problem with that.

Design overflow route should be provided. Largett stated that if we had an overflow route we wouldn't need a tile. We can't provide an overland emergency overflow and we don't need it because we are in excess of the normal tile \_\_.

Settlement – lack of detail. Largett stated that they don't do a lot of soil testing, etc. The rule of thumb is at least 5% height. We have a 2 to 1 factor of safety there. We are providing a ½ foot for settlement. It is addressed, but apparently not in this set of plans.

The specs cover the next matter. They will add detail, any overland flow gets diverted. Erosion control is part of the specifications. (item 12)

Existing fencing – the xs are easement boundaries and they may have thought it was a fence.

Sheet 3 – containment dike – there is a 10-foot wide waive berm. On the main outlet it only appears at the outlet weir because the existing ground is as high or higher. There is no need for a wave embankment because we are within 1-3 feet above the standing pool.

Improvements will slow flow rates down – Largett says it won't. The design peeks may keep erosion down. Sediment occurs upstream of the structure, not downstream.

Bourland – because federal money is involved, you have to get everyone's approval. We have a 404 permit.

Bourland – concerning the Wilson/Brandt project – thinks the work we will do is a very positive thing to the DD. The cover over the main is decreasing and will need repairs. If we do this it will eliminate the need for those future repairs. And there is a benefit to the lake. Largett stated it will probably decrease some of the head loss. This will reduce back pressure.

Bourland – want to have landowners sign by April 1<sup>st</sup> – they can sign up six months ahead of time. It will allow us to do the bidding process and have construction in the summer. We get better bids when the construction occurs in the summer. Amosson would like to have the hearing the first part of March. YC representatives think they will have all of these issues addressed/resolved by then.

Bourland – when all the changes are made, they will be sent to Kelly for review. Amosson's main concern is to answer the questions of the property owners. Bourland proposed that it be explained that the plans were reviewed by WHKS and we have addressed all of the issues that were raised and explain how this project will benefit the land and the district.

Applegate asked if the county wants a response letter on all of the questions in both drainage districts. Bourland suggested that YC could offer a letter with an updated set of plans and a general statement that the matters/issues were addressed. Kelly could put in writing to the DALs that all of her concerns were addressed.

Largett – re the 10 inch tile. He would like to put another arrow on the plan set – a note on the plans so that when they excavate, if they find the tile they will reconnect it. We will have room within the easement to make the connection.

Bourland stated that district tile will be coming in at a higher elevation. There will be a little bit of water backed up in the ditch. Kelly stated that it is in the city limits – the ditch where there will be a bit of water back up. However, there is question as to whether

it is in the City of Ventura. Bourland stated if we need to we will talk with the City of Ventura. We will be backing a little bit of water up to the box culvert. Largett stated that the drainage coming to the culvert is 3.3 feet above our pool level. This is all surface water.

Amosson asked that Largett and Bourland be at the public hearing. We will do two public hearings back to back. Amosson wants to do the DD 1 (Wilson/Brand) one first. Mary Kelly was asked by Amosson to be there for both hearings.

DD 16 has some involvement with Joint DD 123/113 with Hancock County – Amosson stated that he will visit with Hancock County and have a joint public hearing. Amosson imagined that they will bring somebody over to the hearing.

Proposed date for public hearing – Amosson suggested March 8 for 10:00 DD 1 and DD 15 at 1:00 p.m. – The alternate date is March 15<sup>th</sup>

Amosson will call Hancock County on Monday or Tuesday to inform them of the CREP and their involvement.

# Appendix B: Opinions of Probable Costs



**Engineer's Opinion of Probable Cost  
Proposed Main Tile Repair  
Drainage District No. 1  
Cerro Gordo County, Iowa  
2024**

**Main Tile Repair**

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1	Lateral Tile Connections, 10" Dia. Or Smaller	EA	12	\$400	\$4,800
2	Lateral Tile Connections, 12" Dia. Or Larger	EA	3	\$600	\$1,800
3	30" Dia. R.C.P. Elbow Section, Fabrication Only	EA	3	\$1,000	\$3,000
4	24" Dia. R.C.P. Elbow Section, Fabrication Only	EA	6	\$950	\$5,700
5	18" Dia. R.C.P. Elbow Section, Fabrication Only	EA	2	\$900	\$1,800
6	Spot Tile Exploration	HR	16	\$200	\$3,200
7	Trench Foundation Stone	TN	245	\$35	\$8,575
8	Drain Tile, Trenched, Class III R.C.P. 30" Dia.	LF	400	\$100	\$40,000
9	Drain Tile, Trenched, Class III R.C.P. 24" Dia.	LF	2,700	\$75	\$202,500
10	Drain Tile, Trenched, Class III R.C.P. 18" Dia.	LF	400	\$60	\$24,000
11	Crush Tile In Place	LF	3,500	\$5	\$17,500
12	Fence Cuts	EA	3	\$200	\$600
13	Mobilization	LS	1	\$15,700	\$15,700
14	Construction Contingency	LS	1	\$30,825	\$30,825

**Total Estimate Construction Costs      \$360,000**

**Non-Construction Costs**

Construction Related Damages	\$5,000
Basic Engineering Services	
Survey, Study & Report. Meetings & Hearing	\$45,000
Construction Plans, Specifications, & Bid Letting	\$40,000
Construction Engineering Services, Staking, and Inspection	\$30,000
Legal Services, Publications, Mailings, Etc..	\$3,400
Finance, Interest & Contingency	<u>\$21,600</u>

**Estimated Total Non-Construction Costs      \$145,000**

<b>Estimated Total Project Cost 0.5" Main Tile Improvements</b>	<b>\$505,000</b>
Estimated Average Cost Per Benefited Acre (1067.74)	\$473
Estimated Average Cost Per Acre Per Year (10 years, 6% interest)	\$60.62
Estimated Average Cost Per Acre Per Year (20 years, 6% interest)	\$38.90

# Appendix C: District Facility Capacity

**DISTRICT FACILITY CAPACITY  
DRAINAGE COEFFICIENT COMPARISON  
DRAINAGE DISTRICT NO. 1  
CERRO GORDO COUNTY, IOWA**

**Original Main Tile**

Segment	Station Start	Station End	Length (ft)	Size (in)	Grade (%)	n	S (ft/ft)	A (ft)	P (ft)	R (ft)	Flow Capacity (cfs)	Drainage Area	Drainage Coefficient (in/day)	% of 1/2" Coefficient
1	10+00	16+00	600	30	0.100	0.013	0.0010	4.91	7.85	0.63	13.01	775	0.399	79.9%
2	16+00	23+00	700	28	0.100	0.013	0.0010	4.28	7.33	0.58	10.82	692	0.372	74.4%
3	23+00	25+00	200	24	0.100	0.013	0.0010	3.14	6.28	0.5	7.17	500	0.341	68.3%
4	25+00	33+00	800	18	1.160	0.013	0.0116	1.77	4.71	0.38	11.34	498	0.542	108.4%
5	33+00	37+50	450	24	0.100	0.013	0.0010	3.14	6.28	0.5	7.17	493	0.346	69.3%
6	37+50	67+00	2950	22	0.100	0.013	0.0010	2.64	5.76	0.46	5.69	465	0.291	58.2%
7	67+00	80+50	1350	20	0.100	0.013	0.0010	2.18	5.24	0.42	4.41	318	0.330	66.0%
8	80+50	85+00	450	16	0.100	0.013	0.0010	1.40	4.19	0.33	2.43	206	0.281	56.2%
9	85+00	97+00	1200	14	0.100	0.013	0.0010	1.07	3.67	0.29	1.70	142	0.286	57.1%
10	97+00	103+50	650	12	0.100	0.013	0.0010	0.79	3.14	0.25	1.13	80	0.336	67.2%

**CREP Replaced Main Tile**

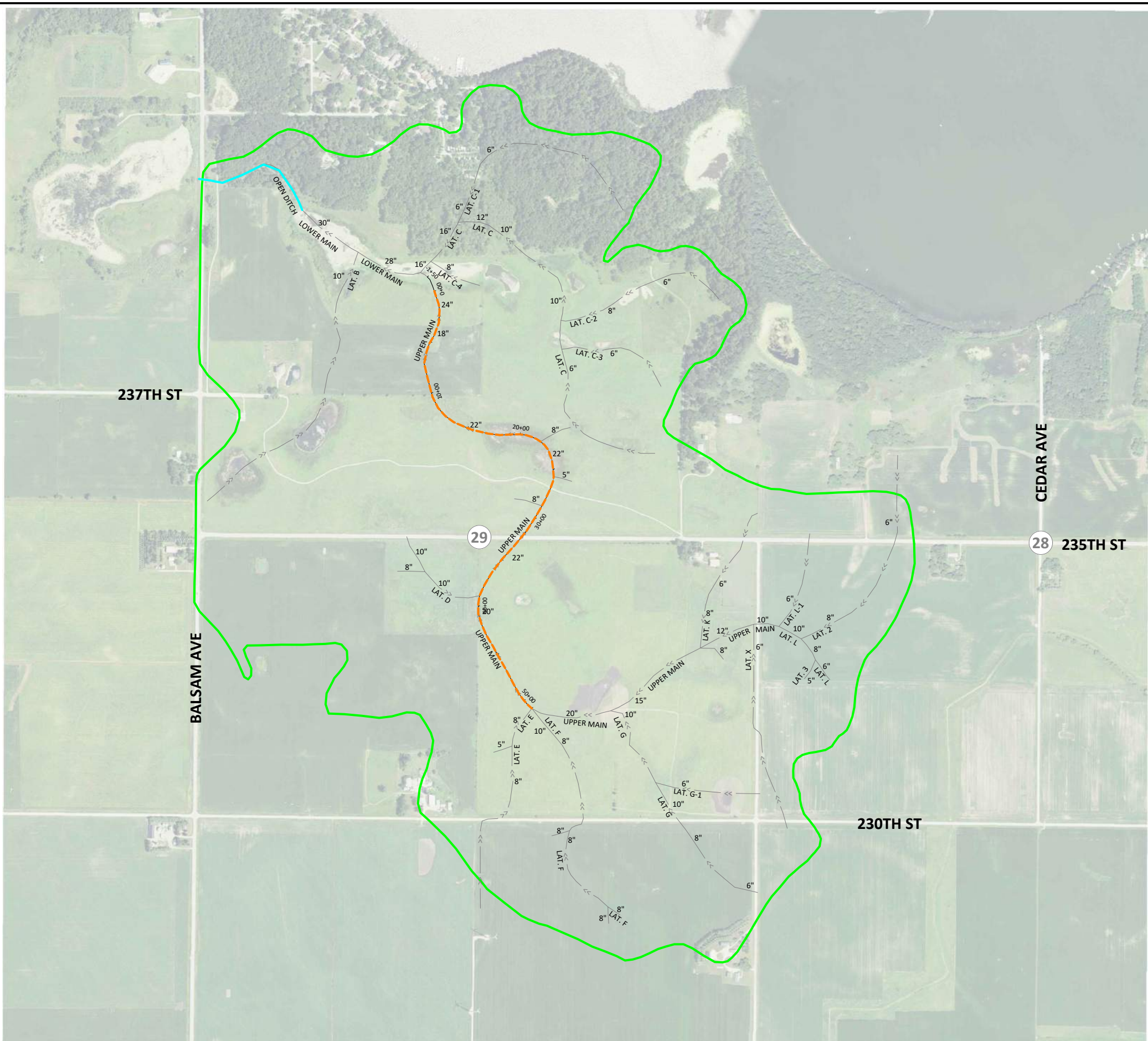
Segment	Station Start	Station End	Length (ft)	Size (in)	Grade (%)	n	S (ft/ft)	A (ft)	P (ft)	R (ft)	Flow Capacity (cfs)	Drainage Area	Drainage Coefficient (in/day)	% of 1/2" Coefficient
1	10+00	16+00	-	-	-	-	-	-	-	-	-	775	-	-
2	16+00	23+00	-	-	-	-	-	-	-	-	-	692	-	-
3	23+00	25+00	-	-	-	-	-	-	-	-	-	500	-	-
New	25+00	29+00	400	18	0.100	0.013	0.0010	1.77	4.71	0.38	3.33	498	0.159	31.8%
4	29+00	33+00	400	18	1.160	0.013	0.0116	1.77	4.71	0.38	11.34	498	0.542	108.4%
5	33+00	37+50	450	24	0.100	0.013	0.0010	3.14	6.28	0.5	7.17	493	0.346	69.3%
6	37+50	67+00	2950	22	0.100	0.013	0.0010	2.64	5.76	0.46	5.69	465	0.291	58.2%
7	67+00	80+50	1350	20	0.100	0.013	0.0010	2.18	5.24	0.42	4.41	318	0.330	66.0%
8	80+50	85+00	450	16	0.100	0.013	0.0010	1.40	4.19	0.33	2.43	206	0.281	56.2%
9	85+00	97+00	1200	14	0.100	0.013	0.0010	1.07	3.67	0.29	1.70	142	0.286	57.1%
10	97+00	103+50	650	12	0.100	0.013	0.0010	0.79	3.14	0.25	1.13	80	0.336	67.2%

**Recommended Replaced Main Tile**

Segment	Station Start	Station End	Length (ft)	Size (in)	Grade (%)	n	S (ft/ft)	A (ft)	P (ft)	R (ft)	Flow Capacity (cfs)	Drainage Area	Drainage Coefficient (in/day)	% of 1/2" Coefficient
1	10+00	16+00	-	-	-	-	-	-	-	-	-	775	-	-
2	16+00	23+00	-	-	-	-	-	-	-	-	-	692	-	-
3	23+00	25+00	-	-	-	-	-	-	-	-	-	500	-	-
New	25+00	29+00	400	30	0.100	0.013	0.0010	4.91	7.85	0.63	13.01	498	0.622	124.3%
4	29+00	33+00	400	18	1.160	0.013	0.0116	1.77	4.71	0.38	11.34	498	0.542	108.4%
5	33+00	37+50	450	24	0.100	0.013	0.0010	3.14	6.28	0.5	7.17	493	0.346	69.3%
6	37+50	60+00	2250	24	0.100	0.013	0.0010	3.14	6.28	0.5	7.17	465	0.367	73.4%

## Appendix D: Preliminary Plans





LEGEND	
	PROPOSED OPEN DITCH ALIGNMENT
	PROPOSED TILE ALIGNMENTS
	PARCEL LINES
	CORPORATE LIMITS
	WATERSHED BOUNDARY
	INTERIOR WATERSHED BOUNDARY
	ASSESSMENT BOUNDARY
	ANNEXATION AREA



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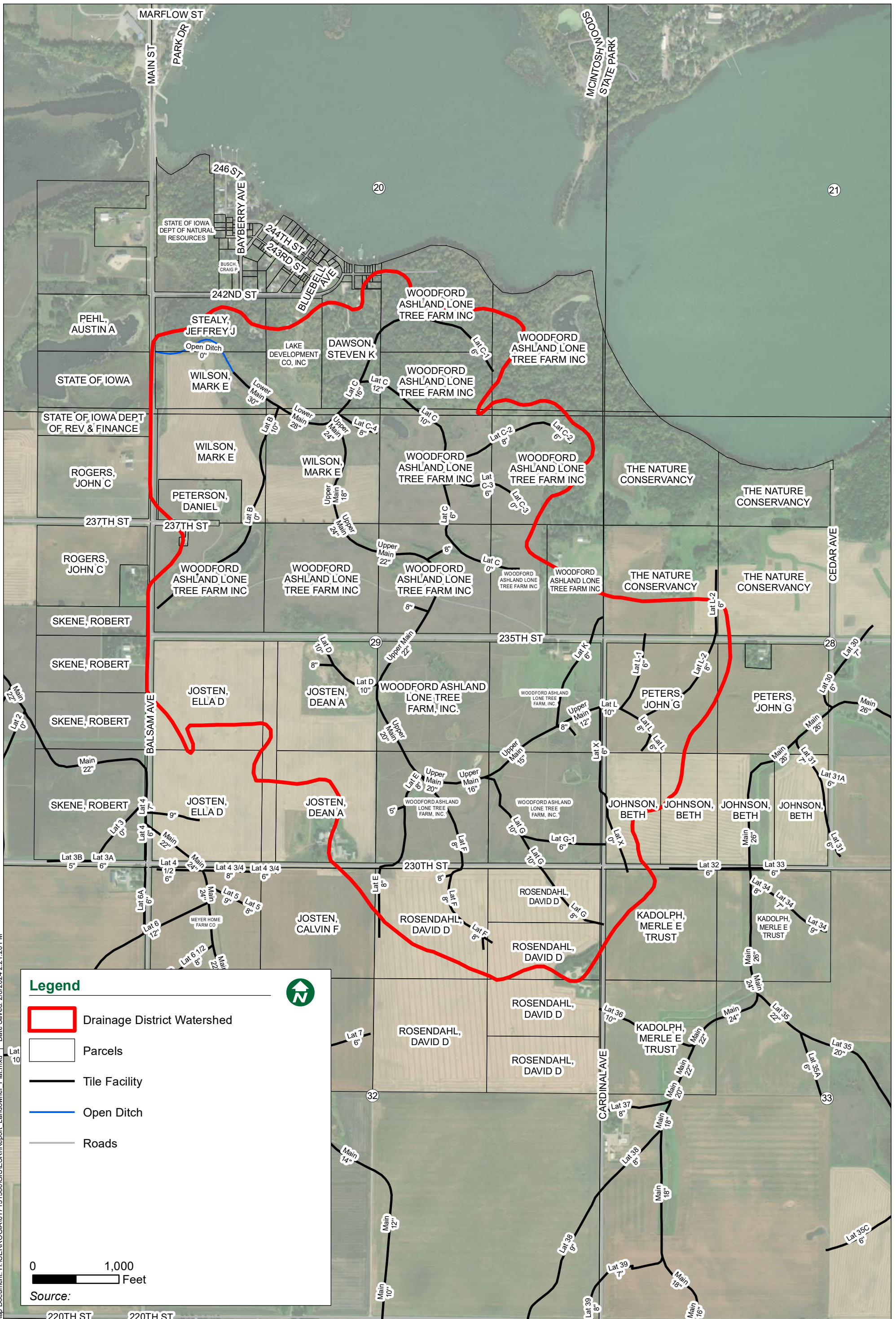
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CERRO GORDO COUNTY, IOWA  
 DD1 LOWER MAIN TILE REPAIR  
 SITE PLAN

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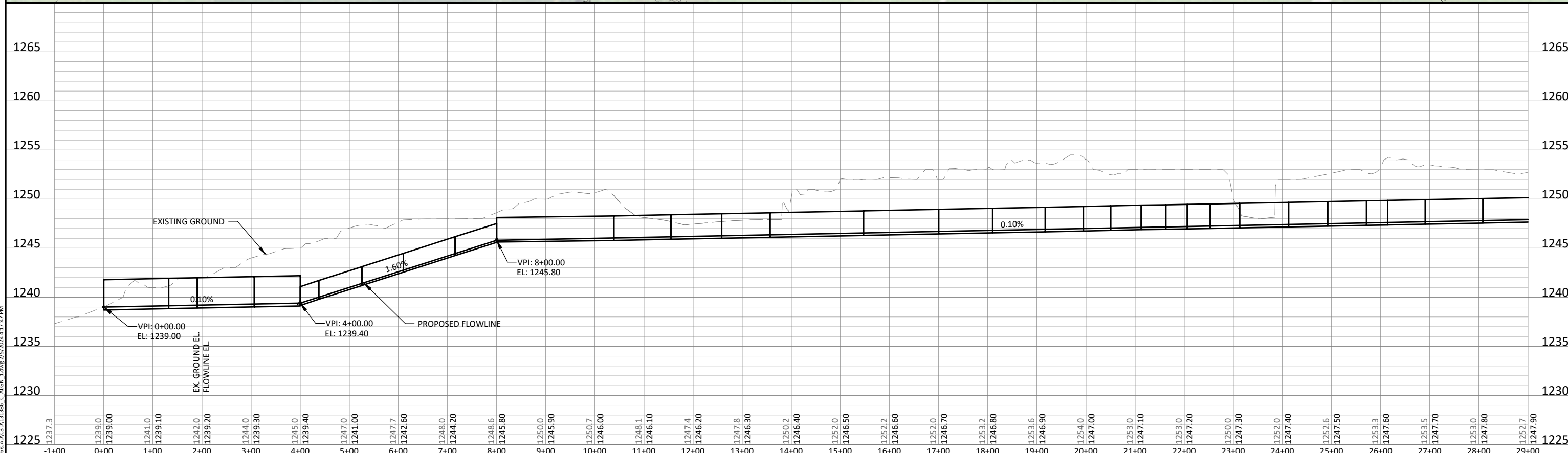
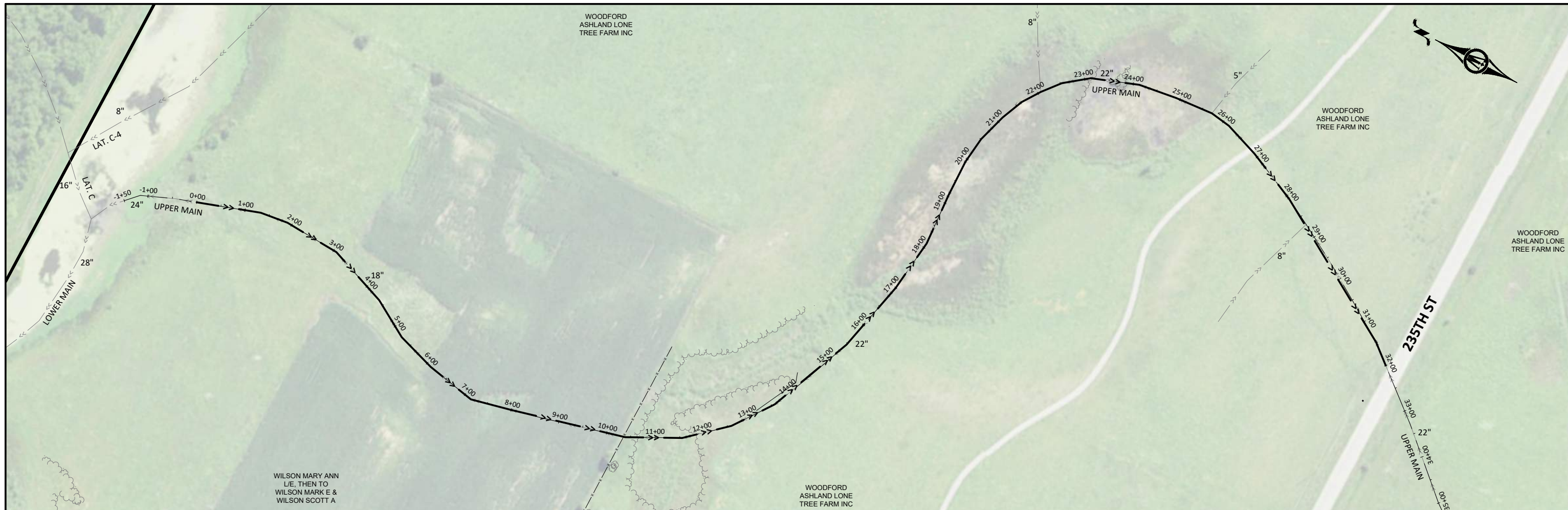
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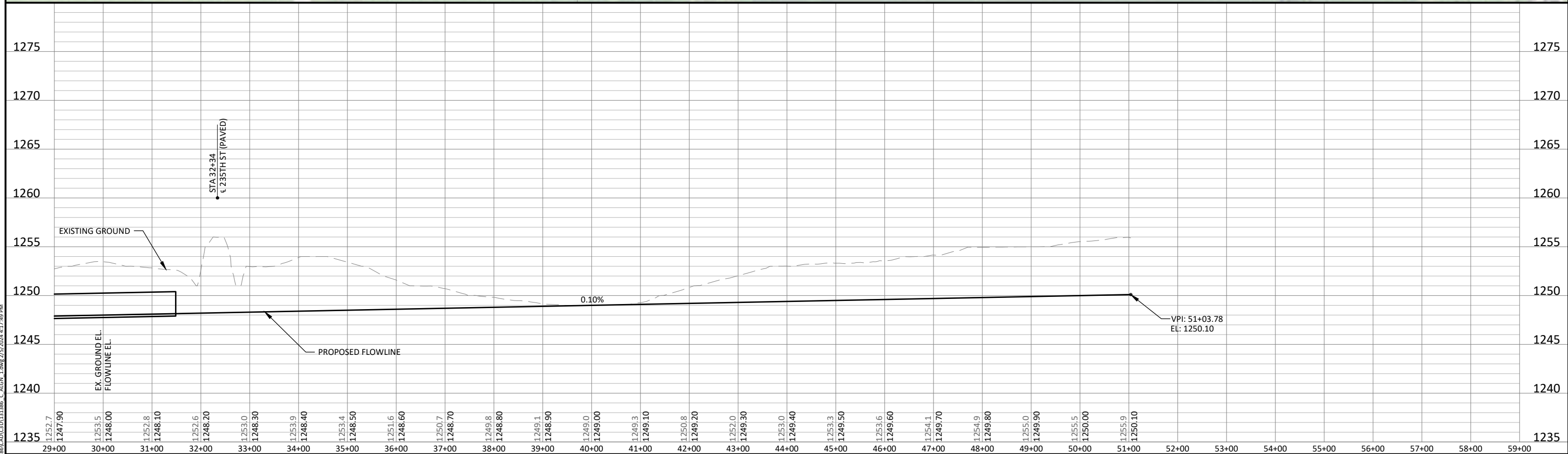
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CERRO GORDO COUNTY, IOWA  
 DD1 LOWER MAIN TILE REPAIR

PLAN AND PROFILE

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CERRO GORDO COUNTY, IOWA  
DD1 LOWER MAIN TILE REPAIR

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