



**BOLTON  
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Engineer's Report for

**Outlet Relief - Pilot Creek Repairs  
Joint Drainage District No. 63  
Pocahontas and Palo Alto County, Iowa  
2021**

**Submitted by:**

Bolton & Menk, Inc.  
218 11<sup>th</sup> St SW Plaza  
Spencer, IA 51301  
P: 712-580-5075

**RECEIVED**

**JUN 24 2022**

COUNTY AUDITOR  
COMMISSIONER OF ELECTIONS

# Certification

Engineer's Report

for

Proposed Repairs

Joint Drainage District No. 63  
Pocahontas and Palo Alto County, Iowa  
P12.121151

2021



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, 2022.

By: Jonathan P. Rosengren  
Jonathan P. Rosengren, P.E.  
License No. 21661

Date: June 21, 2022

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## I. INTRODUCTION

### A. Scope of Work

A petition for drainage relief in Branch C of Joint Drainage District No. 63 (JDD63) was filed with the Board of Supervisors of Pocahontas County on October 15, 2018. The Board appointed Bolton & Menk, Inc. to provide an initial study of conditions of Branch C of Joint Drainage District No. 63. An informational meeting was held on December 17, 2019 to discuss the results of the study. At that meeting several landowners expressed concern that the flow of water in the Main Open Ditch of Joint Drainage District No. 63 is being restricted downstream and beyond the boundary of the district. The Board then ordered a preliminary investigation of the outlet of the Main Open Ditch.

An informational meeting was held on April 7, 2020 to discuss the results of the preliminary investigation of the outlet of the Main Open Ditch. A cleanout and tree clearing were discussed. Several landowners supported moving forward with a full Engineer's Report to determine repairs or improvements needed to bring drainage relief to the lands in the district. The Board appointed Bolton & Menk, Inc. to complete the necessary survey, study, plan, and report.

### B. Location

The watershed of JDD63 covers an area of approximately 41,500 acres in Palo Alto and Pocahontas County, in Iowa. Roughly half of the joint district lies in each county. The downstream end of the Main Open Ditch of JDD63 terminates at the Section 25 & 26 line of Powhatan Township (T-93-N, R-32-W) at the 270<sup>th</sup> Ave crossing. Downstream of JDD63, the ditch is known as Pilot Creek and runs generally East and South, through the town of Rolfe, and outlets to the Des Moines River. This report will focus on the approximately 2.65 mile reach of Pilot Creek between the downstream end of JDD63 and the western city limits of Rolfe.

### C. Brief History

1907	Petition filed for drainage relief
1910	Original engineer's report filed
1911 – 1915	Construction of original district facilities; Pocahontas DD 5 benefit area divided between JDD 63 and DD 60
1919	Joint Drainage District No. 63 established
1964	Full ditch repair considered but not completed, only trees cleared off ditch
1983	Reclassification Report of Joint Drainage District No. 63
1995	Repair/clean out of entire Main Open Ditch

## II. INVESTIGATION

As part of the preliminary investigation, a survey was conducted at road crossings along the Main Open Ditch of JDD63 and Pilot Creek from Plover to Rolfe, Iowa. Additional survey was completed on Pilot Creek and the lower mile of JDD63 Main Open Ditch in April 2020. In addition to the survey, review of Engineer's reports and plans on file with the district was conducted.

#### A. Pilot Creek

The lower 4 miles of JDD63 Main Open Ditch was designed to have a 16 ft channel bottom and 0.0486% grade. Beyond the end of JDD63 Main Open Ditch, Pilot Creek is not a drainage district facility, but historical imagery shows that its channel was artificially straightened prior to 1939 from the end of JDD63 to the west limits of the town of Rolfe.

Based on survey and best fit cross sections it appears as though beyond JDD63 Pilot Creek has a grade of 0.07% and a bottom width of 25 – 30 ft. This will be set as the basis for a repair vs. improvement for any work proposed to be completed.

Existing Pilot Creek Channel Design		
Stations	Cross Section	Grade
0+00 to 64+50	30' Base 1.5:1 Side Slopes	0.07%
64+50 to 139+64	25' Base 1.5:1 Side Slopes	0.07%

Silt has accumulated to a depth of 1 to 2 feet in portions of Pilot Creek, in some areas the creek has re-meandered, and in some areas the bank is eroded. Particularly, the first ½ mile west of Rolfe has re-meandered, but it appears as though some riprap has been placed over the years in an attempt to stabilize the bank.

#### B. Trees Along Pilot Creek

Trees line the banks of Pilot Creek downstream from the end of the Main Open Ditch of JDD63 starting at the 450<sup>th</sup> St crossing and extending approximately 1.5 miles downstream. Not many trees or branches were found to be in the channel, although some are growing on the bank itself.

Particularly under elevated flow conditions, the trees growing on the bank will slow the flow of water. A tree count was completed, that shows that 80% of the trees are less than 12" in diameter. The trees will continue to cause more issues, and become a much more expensive problem to fix with every year that goes by. The trees will continue to grow, and it's only a matter of time before large trees and branches end up in the channel.





### III. FARM PROGRAM COMPLIANCE

#### A. Conservation Reserve Program (CRP) Damage Waivers

The destruction of CRP vegetation by construction activities places the landowner in technical violation of farm program conservation rules. The penalties can include loss of the CRP contract, forfeiture of back CRP payments and financial penalties. To avoid these penalties, landowners are advised to request a waiver from the USDA Farm Service Agency (FSA) County Committee. The county committee will grant waivers for ditch or tile work if CRP vegetation restoration, in compliance with NRCS requirements, is timely done after the work is complete. If the project is authorized, all CRP owners in the path of construction must independently seek the FSA County Committee waivers. This process should be initiated immediately if the project is authorized.

#### B. Nesting Season Restrictions

The CRP rules also restrict disturbances during the primary nesting season, which covers the period of May 15<sup>th</sup> to August 1<sup>st</sup> in Pocahontas County. Recent relaxations of this rule, although specific to drainage district maintenance of open ditches having CRP buffers, likely would now favor allowing tile installation work without penalty on CRP during the primary nesting season. It makes no sense for a drainage district to wait for up to 3 months during ideal work weather. This is another situation where only the landowner can seek and secure the needed waiver.

### IV. PROPOSED WORK

The investigation has confirmed the need for drainage relief. It is necessary to clean out the channel bottom, remove meanders, remove the trees on the spoil banks, and repair the ditch side slopes.

We recommend a two-sided clean out of the first approximately 8,500 feet of Pilot Creek below the Main Open Ditch of JDD63. This work will include the uniform excavation of the ditch banks to a 1.5 (horizontal) to 1 (vertical) slope. We also recommend tree clearing for the entire reach between the end of JDD63 Main Open Ditch, and the west city limits of Rolfe, IA (290<sup>th</sup> Ave).

It is recommended that the newly exposed open ditch banks be fertilized and seeded. NRCS research indicates that broadcasting the seed and fertilizer at the end of each day's work is the best way to secure good growth, and because additional seedbed work is not needed, the cost is more reasonable than for other methods. Economically successful seeding remains a difficult goal for drainage ditches, it being so dependent upon favorable weather. Typically, the best that is achieved is a sparse growth that supplements and aids the progress of natural revegetation.

The spoil material is recommended to be uniformly leveled and shaped to a typical cross section with a fairly flat top (2% slope) about 16 feet wide, adjacent to the ditch with a 10 to 1 back slope pushed out onto the adjacent land. The leveled spoil will then be deep tilled by the contractor and exposed rocks and debris are to be gathered and disposed of. The leveling of the spoil banks will allow that area to be used for row crop production. This will make the spoil bank tillable. The landowner will have beneficial use rights. As a requirement of the Iowa Department of Natural Resources floodplain permit, several low bank overflow elevations must not be raised. These low bank locations were required by the permit in order to demonstrate that the spoil banks do not function as confining levees for the channel.

We found only 5 surface drain pipes and 19 tile outlet extensions in need of replacement in the proposed work area during the survey. There are undoubtedly several drain tile outlets that were missed during the survey. In order to protect the functional life of the restored open ditch, it is recommended that the entire set of drain tile extension pipes and surface drain pipes be individually evaluated and be placed or replaced as found necessary during the course of the ditch restoration work.

This repair work would cost about \$455,600 or \$11.50 per assessed acre in the watershed. A complete opinion of probable cost is included in Appendix C.

1. Utilities

Overhead power lines and other utility lines likely parallel or cross the ditch at various locations. Extra care will need to be taken when working under or near these utility lines. The contractor will be responsible to use Iowa One Call to notify utility companies and to cooperate in the locating, marking, and protection of these facilities.

2. Permitting

Dredging and filling of water of the United States (WOTUS) is regulated under Section 404 of the Clean Water Act. Repairs and maintenance of drainage ditches is exempt to permit requirements under section 404(f)1 of the Clean Water Act, and under Iowa Administrative Code 567 Chapter 71 Section 11(1)(d).

The proposed repairs are in a channel that is not a drainage district facility, thus the exemption does not apply. An application for a permit for the proposed repairs was submitted to the Iowa Department of Natural Resources (IDNR) and United States Army Corps of Engineers (USACE) in March of 2021. Although it took time, as of early November 2021 we have received the required permits to complete the work.

3. Right-of-Way (ROW)

The reach of creek investigated is not currently part of JDD63, or any other drainage district, therefore no right-of-way currently exists. However, Iowa Code 468.146 allows for JDD63 to purchase downstream right-of-way in order to obtain a satisfactory outlet.

Historically, it has been assumed in Iowa that right-of-way has been the width of the open ditch and the original unlevelled spoil bank. We estimate the appropriate right-of-way to be 100 feet in width, centered on the channel.

It is recommended that right-of-way be purchased along the open ditch be consistent with county practices and to facilitate future access. It is recommended that the district acquire a uniform permanent right-of-way of 100 feet in width within which to maintain the open ditch. It is estimated that approximately 30 acres of right-of-way would need to be acquired.

Drainage district open ditch rights-of-way are exempt from real estate taxes (IAC 427.2) and drainage assessments (IAC 468.49). Under Iowa law, landowners have the right to the beneficial use of the spoil bank in the right-of-way subject only to the district's use of the right-of-way to protect and maintain the open ditch (IAC 468.152).

Because landowners may use the right-of-way in this manner, drainage districts may acquire the easement at much below land market values. If right-of-way is to be acquired, an appraisal commission, made up of two landowners from the county and the engineer, is appointed to recommend fair payment. The right-of-way appraisers' report is considered at a public hearing prior to adoption.

4. Work Area

The permanent right-of-way is not intended to be wide enough to accommodate construction activities associated with major repairs or improvements. The district will need a larger area within which to perform the excavation and to dispose of the spoil. The work limits on the open ditch will typically be out to 100 feet from the open ditch centerline on the side or sides in which work will be done. Landowners will also be entitled to compensation for damages in the work area outside the right-of-way both



now and in the future. Within the permanent right-of-way, future construction-related damages will not be compensated (IAC 468.27.2). It is recommended that whenever possible, a landowner should not crop the work area and instead should request fair rent for the land. Compensation for use of and damages within the temporary work area is normally determined at the project completion hearing.

## V. ASSESSMENT SCHEDULE REVIEW

There are currently 39,143.66 acres within JDD63, in both Palo Alto and Pocahontas Counties. JDD63 was reclassified in 1983, where district facilities were split into separate assessment schedules.

The proposed work would benefit all of JDD63. Additionally, it would benefit the lands that drain into Pilot Creek between the downstream end of JDD63 Main Open Ditch and the west city limits of Rolfe, IA. Four drainage districts outlet to Pilot Creek in this reach including DD56, DD15-45, DD106, & DD113. One option would be to annex these lands into JDD63, approximately 3,700 acres. A separate Annexation Report and hearing would be required to further analyze the lands and give final recommendations. Then, through re-classification the lands would be assessed for their portion of the relative benefit for the proposed repairs.

Another option would be to do a common outlet assessment for the drainage districts that outlet into Pilot Creek. However, Iowa Code requires that in order for a common outlet assessment the districts involved must be adjacent and contiguous. DD15-45 is adjacent to and contiguous with JDD63, but the other three benefited drainage districts are not. For either of these options, comparative classification using the typical reclassification method on the newly annexed lands could allow for the new lands to be equitably added to the existing assessment schedule, without the need for full reclassification of the district.

A third option would be that the work is paid for solely by the lands now in JDD63 under the existing assessment schedule of the Main Open Ditch.

Appendix B contains a map showing the existing benefited units assessed per acre and classification for each parcel in the currently assessed area of JDD 63.

Discussion of the

## VI. DISCUSSIONS & RECOMMENDATIONS

This report confirms that JDD63 needs outlet relief through repair of Pilot Creek. The work described herein can accomplish that repair. The estimated assessable cost of the recommended work is \$455,600. We find that the proposed project will be practicable, feasible, and beneficial to the public. We recommend that these repairs be made.

**Annexation Recommended.** Approximately 9% (3,728 acres) of the lands which will be served by the extension of the Branch Main of JDD 63 are not currently assessed for benefits derived from the facility. In order for these lands to now be assessed to help pay for future maintenance it is necessary to bring them into the JDD 63 Branch Main benefited area. The lands benefited by the proposed improvements, but not currently assessed are shown on a map included in Appendix B of this report.

Annexation is expected to cost approximately \$5,000. In order for these lands to be assessed to help pay for the proposed improvements and for future maintenance there would be no better time to bring them into the district. It is recommended that procedures to annex lands outside of JDD 63 Branch Main which benefit from district facilities be initiated.

**Installment Payments.** Iowa drainage district law provides that large improvement assessments

may be paid in no less than ten nor more than twenty annual installments at the discretion of the Board of Supervisors. We anticipate that the board will spread assessments of the magnitude contemplated in this report over ten years. If we assume that the board will allow twenty annual installments at 5% interest, the recommended improvement costs for benefited lands would be about \$1.34 per acre per year. Please be reminded that assessments are based upon benefits and that following reclassification some highly benefited parcels will bear up to 2 to 2 ½ times the average assessments.

It is recommended that the Boards' of Supervisors of Palo Alto & Pocahontas County, acting as trustees for JDD 63, take appropriate action with legal guidance to accomplish the following:

- Tentatively approve this engineer's report.
- Direct the engineer to contact owners of reported farmed wetlands and to assist with appeals where judged likely beneficial to the district.
- Schedule and conduct a public hearing on the proposed repairs including discussions regarding annexation and reclassification.
- Adopt the recommended repair plan, modified as deemed appropriate to satisfy the needs of the district.
- Direct the engineer to prepare the necessary plans and specifications and to proceed toward a bid letting.
- Initiate procedures to annex benefited lands.
- Initiate procedures for classification of newly annexed lands.

Respectfully submitted,

**Bolton & Menk, Inc.**



**Jonathan P. Rosengren, P.E.**

Project Manager

## Appendix A: 2020 Letter Report



Real People. Real Solutions.

218 11th Street SW Plaza  
Spencer, IA 51301

Ph: (712) 580-5075  
Bolton-Menk.com

March 20, 2020

Board of Supervisors  
Pocahontas County Courthouse  
99 Courthouse Square  
Pocahontas, IA 50574

RE: Joint Drainage District No. 63  
Preliminary Main Open Ditch Outlet Investigation  
Pocahontas County  
Project No.: P12.117963

Dear Supervisors:

A petition for drainage relief in Branch C of Joint Drainage District No. 63 (JDD63) was filed with the Board of Supervisors of Pocahontas County on October 15, 2018. The Board appointed Bolton & Menk, Inc. to provide an initial study of conditions of Branch C of Joint Drainage District No. 63.

An informational meeting was held on December 17, 2019 to discuss the results of the study. At that meeting several landowners expressed concern that the flow of water in the Main Open Ditch of Joint Drainage District No. 63 is being restricted downstream from (outside) the district. The Board ordered a preliminary investigation of the outlet of the Main Open Ditch, which is addressed in this letter. Please note this is not a full Engineer's Report, but is intended to provide both the landowners and the Board with information useful in determining whether to proceed with a full study.

A survey was conducted during the week of February 24, 2020 at road crossings along the Main Open Ditch of JDD63 and downstream Pilot Creek, starting south of Plover and ending at the western city limits of Rolfe, Iowa. The survey included channel bottom and bottom of silt shots upstream and downstream of each road crossing.

Pilot Creek near Rolfe:

Pilot Creek from Rolfe, Iowa to the juncture with the Des Moines River is highly meandered and grown up to trees. A concern at the Branch C informational hearing was that the slow water caused by these restrictions would back up water in JDD63 Main Open Ditch and impact Branch C drainage.

The survey found that the channel bottom elevation drops approximately 12 feet from the Branch C tile outlet to the western limits of Rolfe, over 4 ¼ miles. It would take among the largest flood events ever recorded for Pilot Creek at Rolfe to cause any backwater effects on Branch C. The channel elevation drops approximately 9 feet from the end of the Main Open Ditch to the

western limits of Rolfe. A large storm event would be needed to cause any backwater effects on the lands of JDD63. Thus, no action is needed on Pilot Creek within and downstream of Rolfe.

#### Trees NW of Rolfe:

The Main Open Ditch of JDD63 ends at the Section 25 & 26 line of Powhatan Township (T-93-N, R-32-W), approximately 1.6 miles downstream from the Branch C tile outlet. Beyond the limits of JDD63, the stream is known as Pilot Creek. From the end of JDD63 to the western limits of Rolfe (2.65 miles), Pilot Creek appears to have been artificially straightened (prior to the 1930's). In the same stretch, trees now completely or partially cover the banks of nearly 1.5 miles. Trees in the channel would slow the flow water flow, causing the water level to rise. This would create a backwater effect, likely restricting drainage for Branch C during periods of high flow. The trees could be removed, at a rough cost estimate of \$75,000.

#### Pilot Creek Cleanout:

The lower 4 miles of JDD63 Main Open Ditch was designed to have a 16 ft channel bottom and 0.0486% grade. A preliminary investigation of the design adequacy shows the ditch cross section is adequate, assuming it is free from obstruction. Based on channel survey, there appears to be an opportunity to allow water to flow more efficiently through the channel by cleaning out accumulated sediment and deepening the ditch (1-3 ft) at a uniform steeper grade on the existing alignment, thus providing a better outlet for lands both within JDD63 and downstream. We roughly estimate the quantity of cleanout to be 17,000 CY at an estimated construction cost of \$150,000.

#### Right-of-Way Acquisition:

Based on Iowa Code 468.146, JDD63 may complete work in the downstream Pilot Creek in order to provide an outlet for the lands within the district, and also has the power to purchase right-of-way. The district should permanently control any downstream ditch extension. We would therefore recommend that for any downstream work right-of-way be purchased by the district for the purpose of future maintenance. The ROW would be exempted from real estate taxes and drainage assessments.

For lands already within the stream channel, the cost of ROW acquisition should be minimal as the lands are not currently productive and they will have the benefit of no longer paying taxes. For lands outside the top of bank within the ROW, the landowner would continue to have beneficial use, subject to the needs of the district. Due to these factors, drainage districts may acquire ROW at much below land market values.

If ROW is to be acquired, an appraisal commission, made up of two landowners from the county and the engineer, is appointed to recommend fair payment. The right-of-way appraisers' report is considered at a public hearing prior to adoption.

#### Benefited Lands Outside JDD63:

Several drainage districts have tile outlets into Pilot Creek in the reach specified for possible tree clearing and cleanout/deepening including DD15-45, DD106, and DD56. The work would benefit the lands of these districts by providing a better outlet. A portion of the cost of the work

Name: Pocahontas County Board of Supervisors

Date: March 20, 2020

Page: 3

could be assessed to each district relative to the benefits derived. This could be accomplished either by annexation of the lands into JDD63 along with reclassification, or by special common outlet classification. This could be more thoroughly addressed in an Engineer's Report.

Additionally, lands that are not currently part of a drainage district, but utilize Pilot Creek as an outlet, would benefit from cleanout/deepening and tree removal. These lands could either be left alone, or annexed into JDD63 at the direction of the Board.

Recommendations:

We recommend scheduling an informational meeting with landowners Branch C of JDD63 to discuss our findings. If interest exists, a petition should be filed by one or more landowners within JDD63 before the Board would likely move forward with a full Engineer's Report.

Sincerely,

**Bolton & Menk, Inc.**



**Collin Klingbeil, P.E.**

Project Engineer

CC: *Palo Alto County Auditor*  
*James C Hudson, Attorney*

Encl. *Map*  
*Table of Survey Shots*



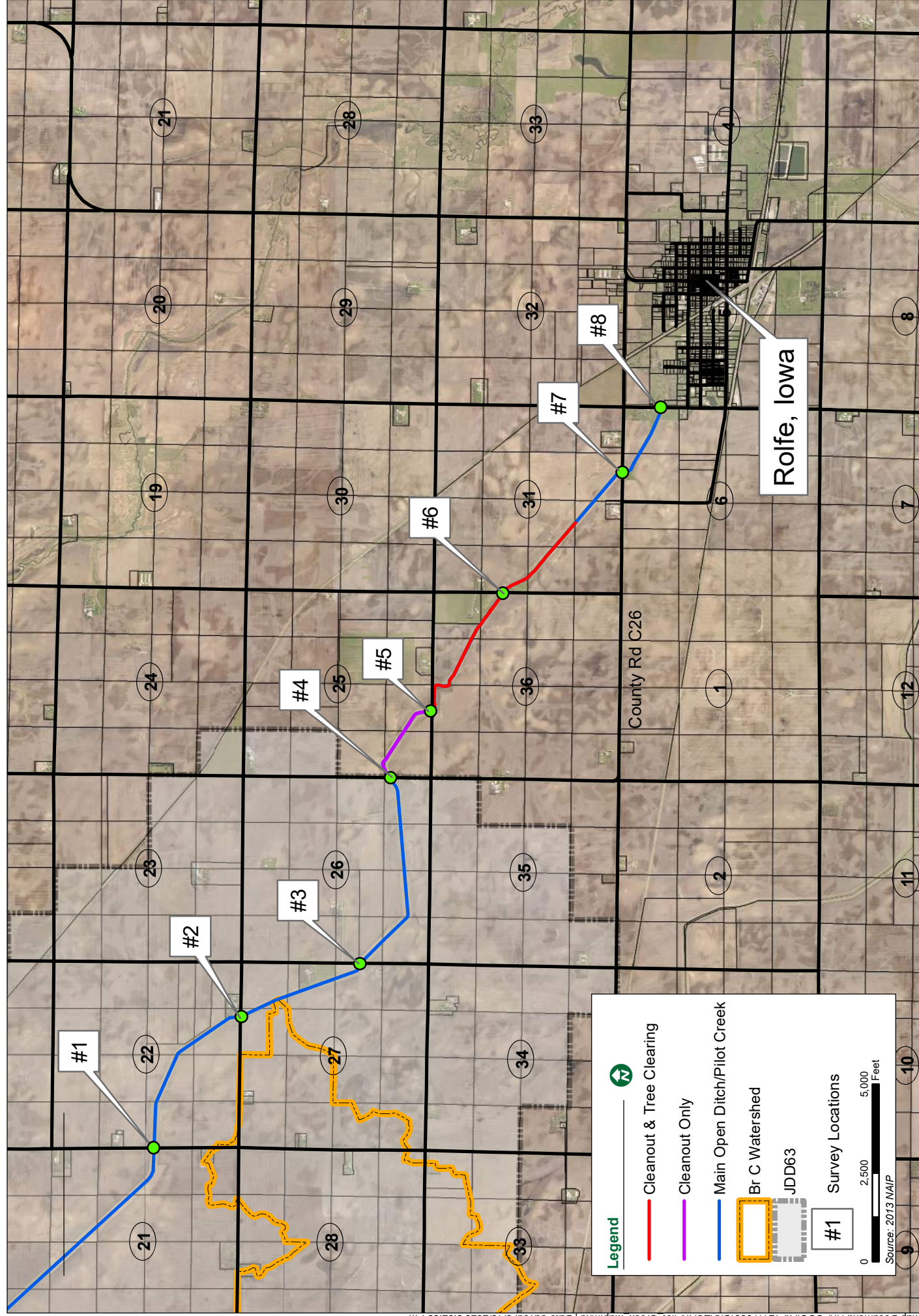
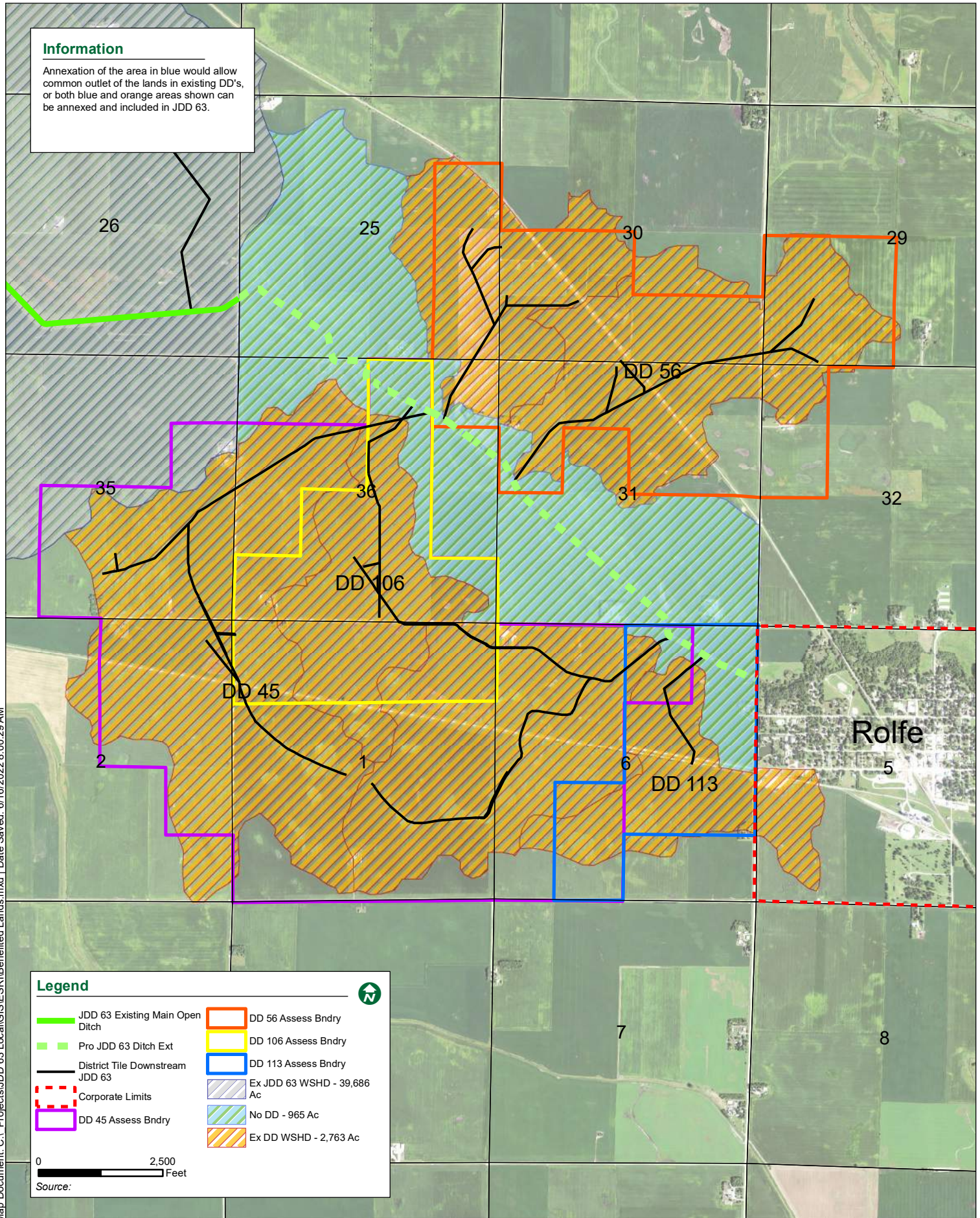


Table of Survey Shots			
Survey Location*	Side of Road Crossing	Silt Depth	Excavation Depth
1	Upstream	0.6	0.0
	Downstream	0.4	
2	Upstream	0.7	
	Downstream	0.3	
3	Upstream	0.3	0.6
	Downstream	0.5	1.9
4	Upstream	0.5	1.5
	Downstream	0.9	2.3
5	Upstream	0.0	1.4
	Downstream	1.4	1.4
6	Upstream	0.4	0.0
	Downstream	0.5	
7	Upstream	0.7	
	Downstream	0.4	
8	Upstream	0.0	

\* See enclosed map for survey locations

## Appendix B: Benefited Lands Map; ROW Tabulation; Existing Assessment Review Map





# APPENDIX B

## RIGHT-OF-WAY TABULATION PROPOSED PILOT CREEK OUTLET IMPROVEMENTS JOINT DRAINAGE DISTRICT NO. 63 POCAHONTAS & PALO ALTO COUNTIES, IOWA 2022

Landowner	Pin	S-T-R	Legal Description	Existing Right-of-Way (ac)	Right-of-Way Required (100') (ac)	Right-of-Way to be Acquired (ac)
Kiburz, Kent	0325300004	25-93-32	SE SW	3.00	2.36	-0.64
Kiburz, Kent	0325300001	25-93-32	NW SW		0.53	0.53
Kiburz, Kent	0325300003	25-93-32	SW SW	4.00	2.91	-1.09
						<b>-1.20</b>
Munson, Sarah Marie, Sindt, Stephanie Munson, Munson, Gabriel	0431100003	31-93-31	SW NW		1.83	<b>1.83</b>
Olerich, Jon F, Olerich, Helen M	0431400005	31-93-31	SW SE N & E OF CREEK		1.14	<b>1.14</b>
Wagner Family Farms LLC	0431400007	31-93-31	SW SE SW OF CREEK (EXC W 25' S 455')	0.50	1.42	0.92
Wagner Family Farms LLC	0431300007	31-93-31	SE SW(EX E500' S455)	0.50	1.87	1.37
Wagner Family Farms LLC	0431300002	31-93-31	NE SW	0.50	2.04	1.54
Wagner Family Farms LLC	0431300001	31-93-31	NW SW	0.50	2.61	2.11
						<b>5.94</b>
Fehr, Ashton James, Fehr, Raiann Elizabeth	0336200001	36-93-32	NW NE N OF DD	1.91	2.03	0.12
Fehr, Ashton James, Fehr, Raiann Elizabeth	0336200008	36-93-32	W 11.25 AC NE NE N OF DD	0.55	0.56	0.01



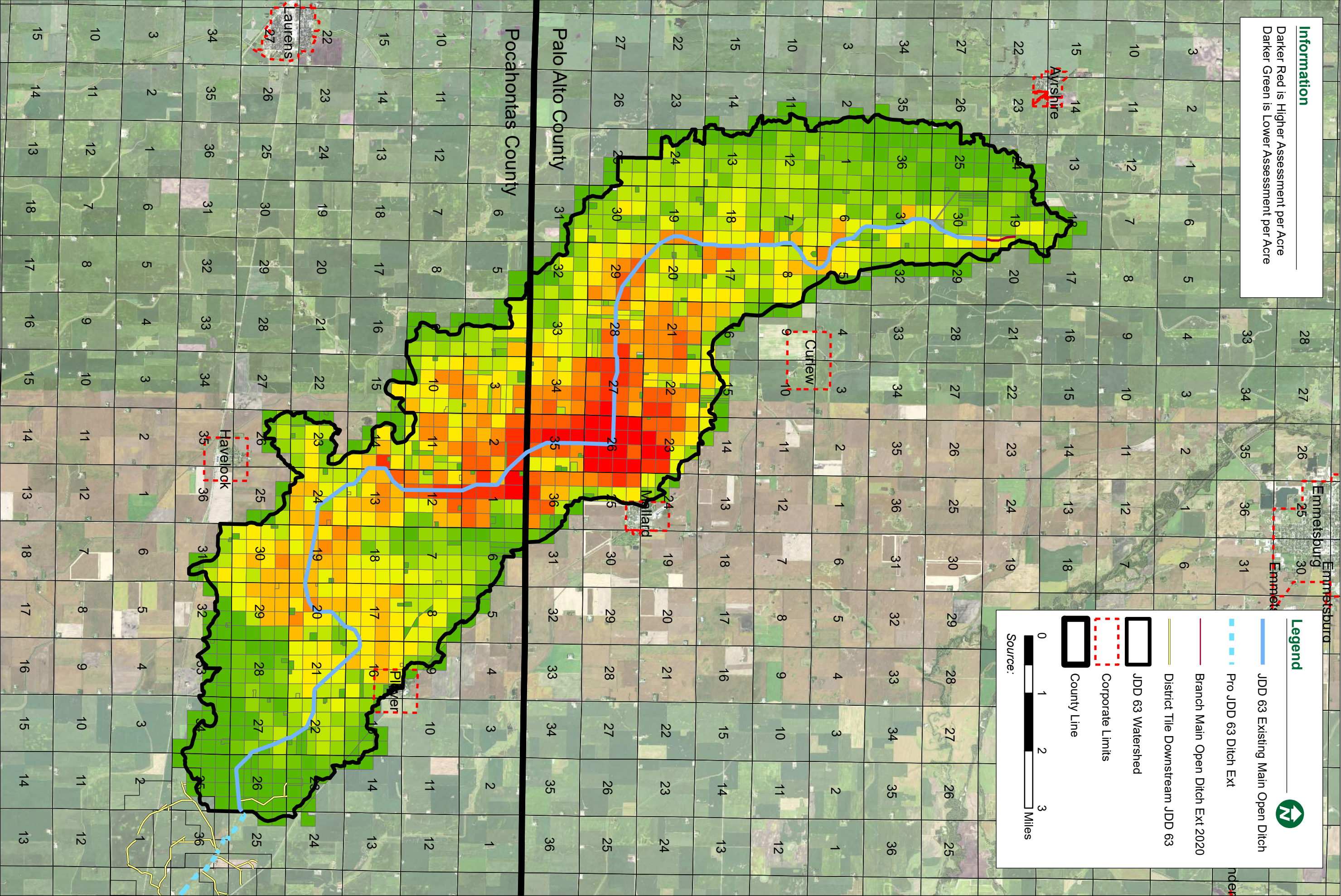
# APPENDIX B

## RIGHT-OF-WAY TABULATION PROPOSED PILOT CREEK OUTLET IMPROVEMENTS JOINT DRAINAGE DISTRICT NO. 63 POCAHONTAS & PALO ALTO COUNTIES, IOWA

2022

Landowner	Pin	S-T-R	Legal Description	Existing Right-of-Way (ac)	Right-of-Way Required (100') (ac)	Right-of-Way to be Acquired (ac)
Fehr, Ashton James, Fehr, Raiann Elizabeth	0336200009	36-93-32	NE NE N OF DD(EXC W 11.25 AC)	0.06	0.03	-0.03
Fehr, Ashton James, Fehr, Raiann Elizabeth	0336200006	36-93-32	SE NE N OF DD	1.21	1.17	-0.04
						<u>0.06</u>
Grethen Family Trust	0336100002	36-93-32	NE NW	2.41	2.30	-0.11
Kerns, Clairys J	0336200002	36-93-32	NW NE S OF DD	1.75	1.66	-0.09
Kerns, Clairys J	0336200005	36-93-32	NE NE S OF DD	0.70	0.51	-0.19
Kerns, Clairys J	0336200007	36-93-32	SE NE S OF DD	1.25	1.34	0.09
						<u>-0.19</u>
Olerich, Jon F, Olerich, Helen M	0806200002	6-92-31	NE NE		3.20	3.20
Olerich, Jon F, Olerich, Helen M	0806200001	6-92-31	NW NE		1.58	1.58
						<u>4.78</u>
TOTAL RIGHT-OF-WAY TO BE ACQUIRED						13.75 ac







## Appendix C: Permits Received



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS, ROCK ISLAND DISTRICT**  
**PO BOX 2004 CLOCK TOWER BUILDING**  
**ROCK ISLAND, ILLINOIS 61204-2004**

August 30, 2021

Regulatory Division

SUBJECT: CEMVR-RD-2021-1151

Kelly Jepsen  
Joint Drainage District No. 63  
99 Court Square, Suite 7  
Pocahontas, Iowa 50574

Dear Ms. Jepsen:

Our office reviewed your application received August 9, 2021, concerning your proposed Pilot Creek Repairs project. This project is located in Section 31, Township 93N, and Range 31W, Pocahontas County, Iowa.

Your project is authorized under Nationwide Permit No. 41, provided you meet the Nationwide Permit terms and conditions. The IA fact sheets that include all information regarding Nationwide Permits for projects occurring within the Rock Island District, the Iowa Regional Conditions, and the Section 401 Water Quality Certification issued by the Iowa Department of Natural Resources can be found on the MVR Regulatory webpage: <https://www.mvr.usace.army.mil/Missions/Regulatory.aspx>. Any special conditions associated with this permit will be listed below and must also be adhered to.

The Corps has made a determination of no effect on federally threatened and endangered species or critical habitat. The decision regarding this action is based on information found in the administrative record, which documents the District's decision-making process, the basis for the decision, and the final decision.

Please contact our office if the project plans change and there are different impacts caused by the discharge of dredged or fill material into Corps' regulated waters. This may require modification of your Department of the Army 404 authorization.

This verification is valid until March 18, 2022, unless the nationwide permit is modified, reissued or revoked. It is your responsibility to remain informed of changes to the nationwide permit program. We will issue a public notice announcing any changes if and when they occur. Furthermore, if you commence or are under contract to commence this activity before the date the nationwide permit is modified or revoked, you will have twelve months from this date to complete your activity under the present terms and conditions of this nationwide permit.

This authorization does not eliminate the requirement that you must still obtain other applicable Federal, state, and local permits. If you have not already coordinated your project with the IADNR, please contact them by telephone 866/849-0321 to determine if a floodplain development permit is required for your project. You should also contact Mr. Seth Moore, in writing or telephone 515/330-6432 to determine if a sovereign lands construction permit is required or if this project may adversely impact Iowa threatened or endangered species or their habitat.

You are required to complete and return the enclosed "Completed Work Certification" form upon completion of your project in accordance with General Condition No. 30 of the nationwide permits.

Should you have any questions, please contact our Regulatory Division by letter, telephone Sean Dillard at 309/794-5379, or email [sean.m.dillard@usace.army.mil](mailto:sean.m.dillard@usace.army.mil).

Sincerely,

*matthew a zehr*

Matthew A. Zehr  
Chief, Western Branch  
Regulatory Division

When the structure(s) or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s), of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

\_\_\_\_\_  
Transferee

\_\_\_\_\_  
Date

Copies Furnished:

Ms. Christine Schwake  
Iowa Department of Natural Resources  
[Christine.schwake@dnr.iowa.gov](mailto:Christine.schwake@dnr.iowa.gov)

Kelly Jepsen  
Joint Drainage District No. 63  
[kjepsen@pocahontascounty.iowa.gov](mailto:kjepsen@pocahontascounty.iowa.gov)

Collin Klingbeil  
Bolton & Menk, Inc.  
[collin.klingbeil@bolton-menk.com](mailto:collin.klingbeil@bolton-menk.com)

## COMPLETED WORK CERTIFICATION

Permit Number: CEMVR-RD-2021-1151

Name of Permittee: Joint Drainage District No. 63

County/State: Pocahontas / Iowa

Date of Issuance: August 30, 2021

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Engineer District, Rock Island  
ATTN: Regulatory Division  
Clock Tower Building  
Post Office Box 2004  
Rock Island, Illinois 61204-2004

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above reference permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

\_\_\_\_\_  
Signature of Permittee

\_\_\_\_\_  
Date

SD



11/5/2021

JOINT DRAINAGE DISTRICT NO. 63  
C/O COLLIN KLINGBEIL  
BOLTON & MENK, INC.  
218 11TH STREET SW PLAZA  
SPENCER, IA 51301

Project Description: Channel Change – Proposed channel change along approximately 1.7 miles of Pilot Creek, northwest of the City of Rolfe and outside of the drainage district ditch boundary of drainage district 63. In accordance with the approved plans. (Pilot Creek)

Project Latitude / Longitude Location(s): Channel Changes 42.8269/-94.5578; Pocahontas County  
Excavations 42.8269/-94.5578; Pocahontas County  
Other Structures, Obstructions, Fill, Spoil, Deposits 42.8269/-94.5578; Pocahontas County

*Iowa DNR Project Tracking Number: 2021-0407*

Dear Collin Klingbeil,

The application for an Iowa DNR Flood Plain Development Permit for the above referenced project has been approved. Flood Plain Development Permit Number 2021-0407FP-01 and an approved copy of the Iowa DNR Approved Plans are enclosed. You may download additional copies, or verify the Iowa DNR Flood Plain and Dam Safety Section (Department) official response document(s) for this project at the Iowa DNR Flood Plain PERMT website using the tracking number above. (PERMT Website Address: <https://programs.iowadnr.gov/permt/>)

Please review all permit conditions. If you don't agree with any of the permit conditions, you have 30 days from the date of mailing of the permit to appeal. If you wish to appeal, it is suggested that you contact David Scott at 319-653-2135, Iowa DNR Legal Services Bureau, within 15 days to determine the correct procedure and format. Also, you should be aware of the fact that any person can appeal the issuance of this permit within the same 30 day period.

Within 30 days of the completion of construction, proper completion of construction notice shall be provided to the Department. Notice may be provided through the Department PERMT website <https://programs.iowadnr.gov/permt/>, or by certified mail. Certified mail requirements are provided in permit document post construction condition section.

The project may require a local flood plain development permit(s) from Pocahontas County. If you have not yet done so, please contact the following local Flood Plain Manager(s) for assistance in applying for the local flood plain permit(s):

- Pocahontas County: Gary Atherton, Pocahontas County, 99 Court Sq, Ste 4, Pocahontas, IA, 50574, [gatherton@pocahontascoia.us](mailto:gatherton@pocahontascoia.us), 712-335-3532

No land or water, under the jurisdiction of the State of Iowa, is involved in the project area; therefore, a Sovereign Lands Construction Permit pursuant to Chapter 461A of the Iowa Code will not be required for this project.



The permittee is responsible for complying with all other local, state, and federal statutes, ordinances, rules, and permit requirements applicable to the construction, operation, and maintenance of the approved works. Approval through the Corps of Engineers Section 404 Permit Program may be required for this project. The Corps of Engineers will contact you separately regarding their approval. Questions can be directed to the Corps by phone at 309-794-5376 or by email at [iowaregulatory@usace.army.mil](mailto:iowaregulatory@usace.army.mil).

Please contact me by phone at 515-725-8368 or by email at [graham.young@dnr.iowa.gov](mailto:graham.young@dnr.iowa.gov) with any questions.

Sincerely,

Graham Young  
Iowa DNR, Flood Plain Management and Dam Safety Section

CC: Kelly Jepsen; Joint Drainage District No. 63, 99 Court Square, Suite 7, Pocahontas, IA, 50574,  
[kjepsen@pocahontascounty.iowa.gov](mailto:kjepsen@pocahontascounty.iowa.gov)  
Pocahontas County: Gary Atherton, Pocahontas County, 99 Court Sq, Ste 4, Pocahontas, IA, 50574,  
[gatherton@pocahontascoia.us](mailto:gatherton@pocahontascoia.us)

Attachments



## Iowa Department of Natural Resources

### Flood Plain Development Permit

- I. Permit Number 2021-0407FP-01
- II. Project Latitude / Longitude Channel Changes 42.8269/-94.5578; Pocahontas County  
Location(s) Excavations 42.8269/-94.5578; Pocahontas County  
Other Structures, Obstructions, Fill, Spoil, Deposits 42.8269/-94.5578; Pocahontas County
- III. Approved Activity Channel Change – Proposed channel change along approximately 1.7 miles of Pilot Creek, northwest of the City of Rolfe and outside of the drainage district ditch boundary of drainage district 63. In accordance with the approved plans. (Pilot Creek)
- IV. Applicant(s) / Permittee(s) KELLY JEPSEN  
Company(s) JOINT DRAINAGE DISTRICT NO. 63  
Address(s) 99 COURT SQUARE, SUITE 7  
City State Zip POCAHONTAS, IA 50574
- V. Authorized Agent COLLIN KLINGBEIL  
Company BOLTON & MENK, INC.  
Address 218 11TH STREET SW PLAZA  
City State Zip SPENCER, IA 51301
- VI. Basis for Issuance The decision to issue this permit was based on a staff review of the project with respect to relevant approval criteria contained in 567 IAC 72 and applicable provisions of Iowa Code Sections 455B.262, .264, .275 and .277.
- VII. General Permit Conditions
- a. Responsibility No legal or financial responsibility arising from the construction or maintenance of the approved works shall attach to the state of Iowa or the agency due to the issuance of a permit, order, or administrative waiver.
  - b. Lands The permittee shall be responsible for obtaining such government licenses, permits, and approvals, and lands, easements, and rights-of-way which are required for the construction, operation, and maintenance of the authorized works prior to construction.
  - c. Change in plans No material change from the plans and specifications approved by the Department shall be made unless authorized by the Department.
  - d. Revocation of order A Department permit may be revoked if construction is not completed within the permit construction period of time specified in the Department permit, or extended by official post permit response letter from this Department.
  - e. Appeal of Initial Decision Per 567 IAC 70.5(4), this permit represents the initial decision of the Department. You have 30 days from the date of mailing of the permit to appeal. If you wish to appeal, it is suggested that you contact our Legal Services Section within 15 days to determine the correct procedure and format. Also, you should be aware of the fact that any person can appeal the issuance of this permit within the same 30 day period.

VIII. Permit Special Construction Conditions

a. Permit Construction Period Covered 11/5/2021 to 11/5/2024

b. Temporary Flood Plain Obstruction Requirement All temporary flood plain obstructions to be used during construction shall comply with all sections of 567 IAC 72.1(6).

c.

d.

e.

IX. Permit Post Construction Conditions

a. Certification of Completion of Construction Requirement The permittee is required to provide notice to the Iowa DNR that construction of the project authorized by the Iowa Department of Natural Resources was completed in accordance with Iowa DNR Approved Plans and specifications.

1. This notice may be provided on the Iowa DNR PERMT Website  
Iowa DNR PERMT Website (use Permit Number)  
<https://programs.iowadnr.gov/permt/>

2. If computer access is unavailable, the permittee shall submit a signed certification of project construction completion. The certification(s) shall be submitted to:

FLOOD PLAIN PERMITS  
IOWA DNR  
502 E 9TH ST  
DES MOINES IA 50319

b. General Maintenance and Storm Damage Restoration Requirement The permittee, and any successor, in interest to the real estate on which the permitted project or activity is located shall be responsible for proper maintenance of the project until this permit is revoked, or replaced with a new permit. The required maintenance shall include, but is not limited to, the restoration of the project back to the permit condition shown on the enclosed Iowa DNR Approved Plan document.

c.

d.

e.

X. Permit Issued By:

Graham Young; Iowa DNR, Flood Plain Management and Dam Safety Section  
Date: 11/5/2021

## Appendix C: Engineer's Opinion of Probable Costs

# ENGINEER'S OPINION OF PROBABLE COSTS

PILOT CREEK OUTLET IMPROVEMENTS  
JOINT DRAINAGE DISTRICT NO. 63  
POCAHONTAS & PALO ALTO COUNTIES, IOWA  
BMI PROJECT NO. P12.121151



Date: 6/21/2022

Item No.	Item	Notes	Estimated Quantity	Unit	Unit Price	Total Amount
<b>SECTION 1 - NEW OPEN DITCH IMPROVEMENT</b>						
101	Excavation		28,489	CY	\$3.25	\$92,589.25
102	Spoil Leveling (Both Sides)		85	STA	\$175.00	\$14,875.00
103	Seed & Fertilize Banks		85	STA	\$100.00	\$8,500.00
104	Tree Clearing & Grubbing		6,955	UNIT	\$3.50	\$24,342.50
105	Tile Extension- 12" CMP Pipe		400	LF	\$35.00	\$14,000.00
106	Tile Extension- 15" CMP Pipe		60	LF	\$40.00	\$2,400.00
107	Tile Extension- 18" CMP Pipe		20	LF	\$45.00	\$900.00
108	Tile Extension- 24" CMP Pipe		20	LF	\$55.00	\$1,100.00
109	Surface Drain- 15" CMP Pipe		120	LF	\$40.00	\$4,800.00
110	Surface Drain- 18" CMP Pipe		120	LF	\$50.00	\$6,000.00
111	Surface Drain- 24" CMP Pipe		120	LF	\$60.00	\$7,200.00
112	Surface Drain- 30" CMP Pipe		180	LF	\$48.00	\$8,640.00
113	Surface Drain- 36" CMP Pipe		60	LF	\$95.00	\$5,700.00
114	Erosion Management Plan		1	LS	\$3,000.00	\$3,000.00
115	Mobilization		1	LS	\$9,700.00	\$9,700.00

**ESTIMATED CONSTRUCTION COSTS TOTAL: \$203,700.00**

**CONSTRUCTION CONTINGENCY \$10,200.00**

## NOTES:

### Associated Project Costs

RIGHT-OF-WAY ACQUISITION	\$110,000.00
DAMAGES	\$15,000.00

### Basic Engineering Services

SURVEY, STUDY & REPORT THOROUGH HEARINGS	\$45,000.00
WETLAND AND ENVIRONMENTAL COMPLIANCE	\$5,000.00
CONSTRUCTION PLANS, SPECIFICATIONS & BID LETTING	\$10,000.00
CONSTRUCTION ENGINEERING SERVICES	\$30,000.00
LEGAL SERVICES, PUBLICATIONS, MAILINGS, ETC.	\$5,000.00
FINANCE & INTEREST	\$21,700.00

**ESTIMATED ASSOCIATED PROJECT COSTS TOTAL: \$241,700.00**

**TOTAL ESTIMATED COST ASSESSED TO LANDOWNERS : \$455,600.00**

Estimated Average Cost Per Currently Assessed Acre (39,686 ac)	\$	11.48
Estimated Average Cost Per Acre Per Year (10 years)	\$	1.46
Estimated Average Cost Per Acre Per Year (20 years)	\$	0.88
Estimated Average Cost Per Benefited Acre (43,414 ac)	\$	10.49
Estimated Average Cost Per Acre Per Year (10 years)	\$	1.34
Estimated Average Cost Per Acre Per Year (20 years)	\$	0.80

## Proposed Plans



## PRELIMINARY PLANS FOR

11-05-2021

SHEET LIST TABLE	
SHEET NUMBER	TITLE SHEET
A.01	LANDOWNER PLAT
B.01	OPEN DITCH PIPE WORK TABLE
B.02 - B.03	TYPICAL DITCH DETAILS
B.04	BANK GAP DETAIL
B.05	BANK GAP LOCATIONS
D.02 - D.05	PLAN & PROFILE - OPEN DITCH IMPROVEMENTS
G.01	ALIGNMENT GEOMETRY - OPEN DITCH
X.03 - X.07	CROSS SECTIONS - OPEN DITCH

**GOVERNING SPECIFICATIONS**

ILLINOIS DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", SERIES 2015 AND ALL CURRENT GENERAL SUPPLEMENTAL SPECIFICATIONS AND MATERIALS MEMORANDUM SHALL GOVERN AS REFERENCED.

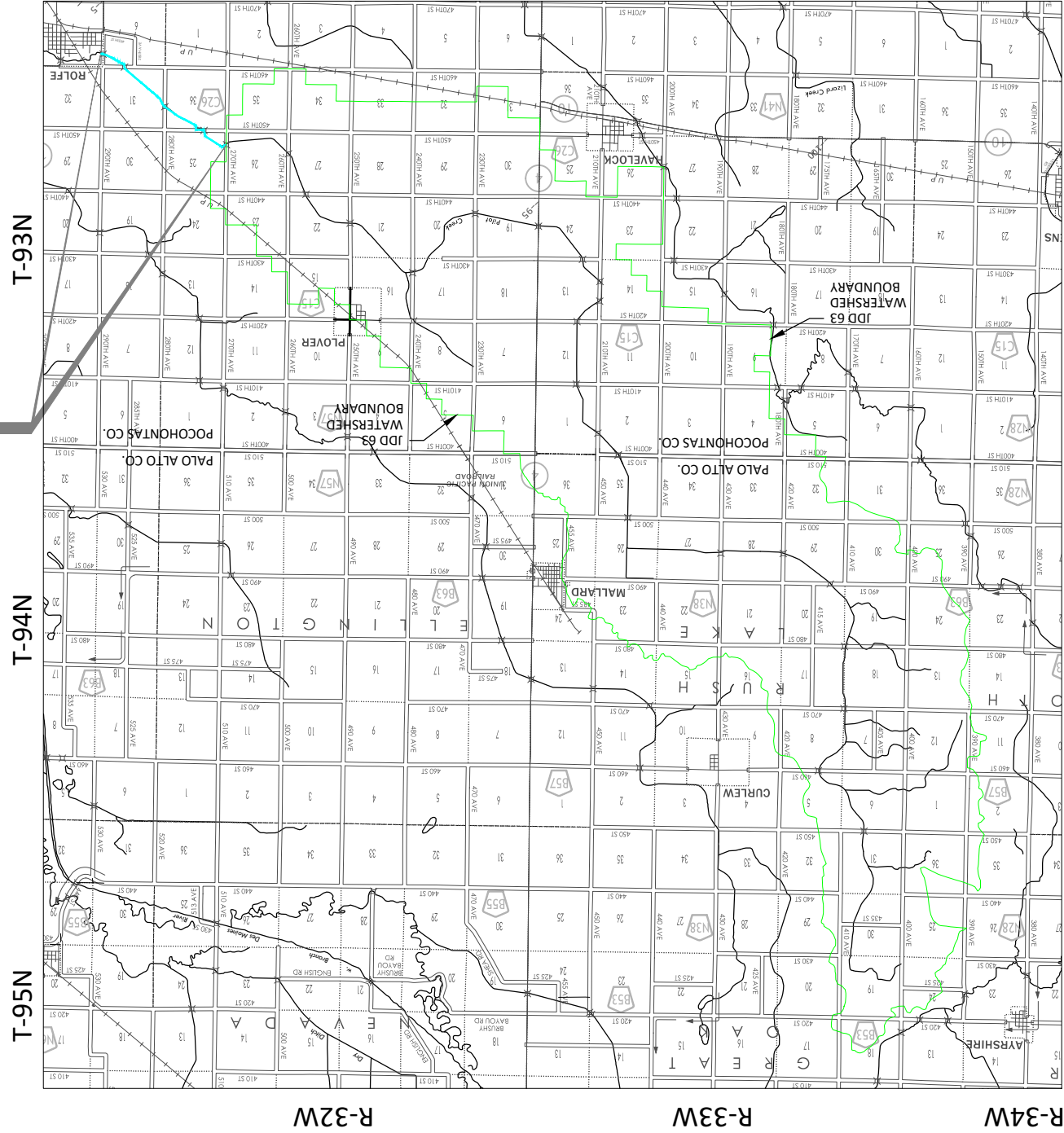
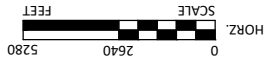
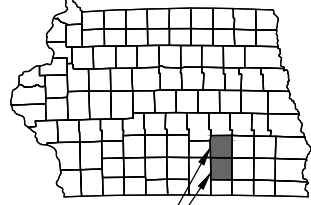
ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES  
WILL BE COMPLIED WITHIN THE CONSTRUCTION OF THIS PROJECT.



NOTE: THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY IOWA ONE CALL, 811 OR 1-800-292-8989.

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

PALO ALTO &amp; POCAHONTAS COUNTIES



## PROJECT LOCATION

PROJECT DATUM: STATE PLANE  
HORIZONTAL: IOWA NORTH

A circular professional engineer seal for the State of Iowa. The outer ring contains the text "IOWA" at the top, "LICENSED PROFESSIONAL ENGINEER" around the bottom, and two stars on the left and right sides. The inner circle contains the text "COLLIN J. KLINGBEIL," and "24741" below it.

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS  
 PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION  
 AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER  
 UNDER THE LAWS OF THE STATE OF IOWA.

---

COLLIN J. KLINGBEIL, P.E.

---

REG. NO. 24741

---

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2021

---

PAGES OR SHEETS COVERED BY THIS SEAL:

TITLE SHEET

PALO ALTO & POCAHONTAS COUNTIES, IOWA

## PILOT CREEK OUTLET RELIEF

## A.01

133

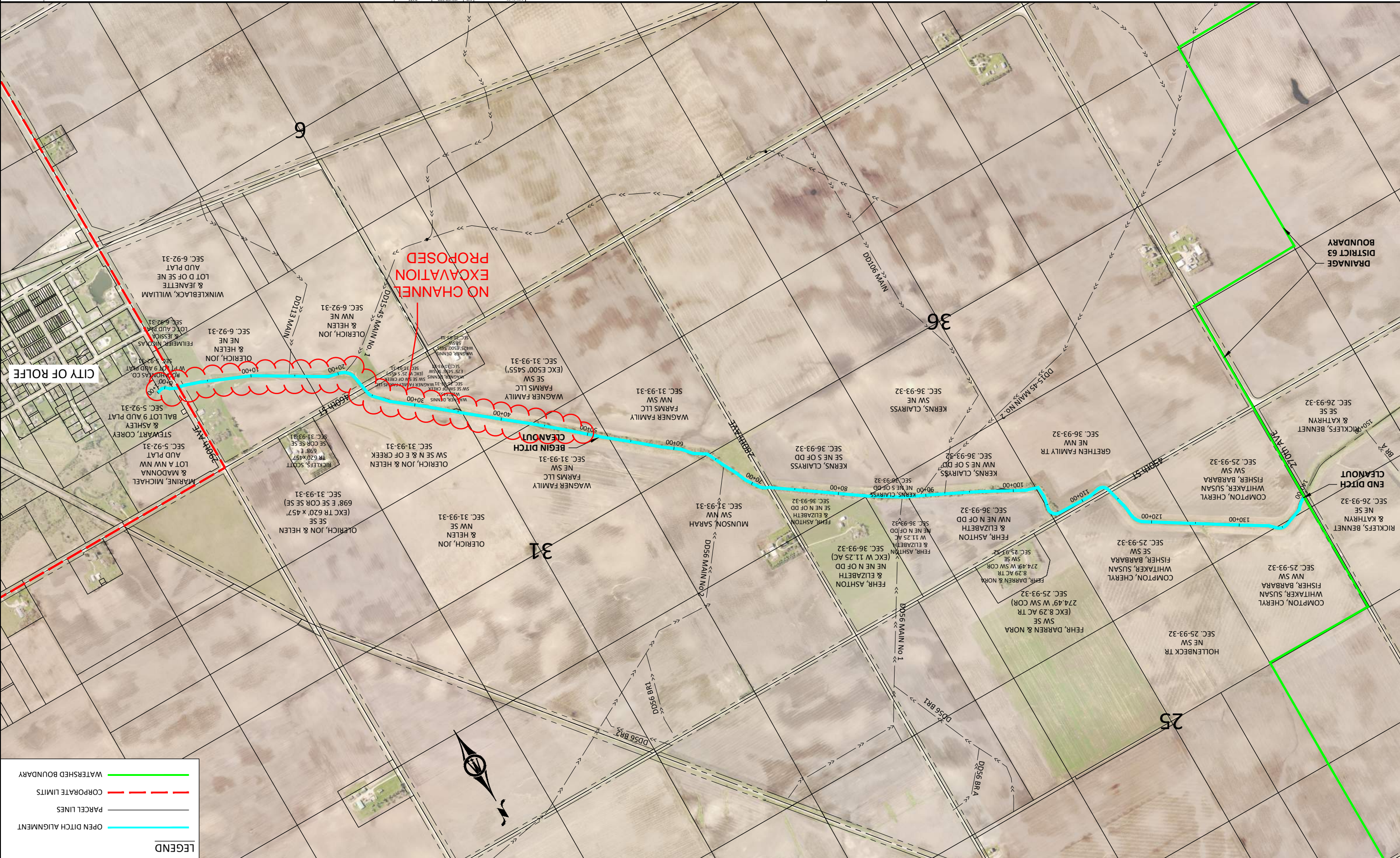
218 11TH STREET SW PLAZA  
SPENCER, IOWA 51301  
Phone: (712) 580-5075  
Email: [Spencer@bolton-menk.com](mailto:Spencer@bolton-menk.com)  
[www.bolton-menk.com](http://www.bolton-menk.com)



**BOLTON & MENK**

NO.	ISSUED FOR	DATE









**BOLTON & MENK**

218 11TH STREET SW PLAZA  
SPENCER, IOWA 51301  
Phone: (712) 580-5075  
Email: [spencer@bolton-menk.com](mailto:spencer@bolton-menk.com)  
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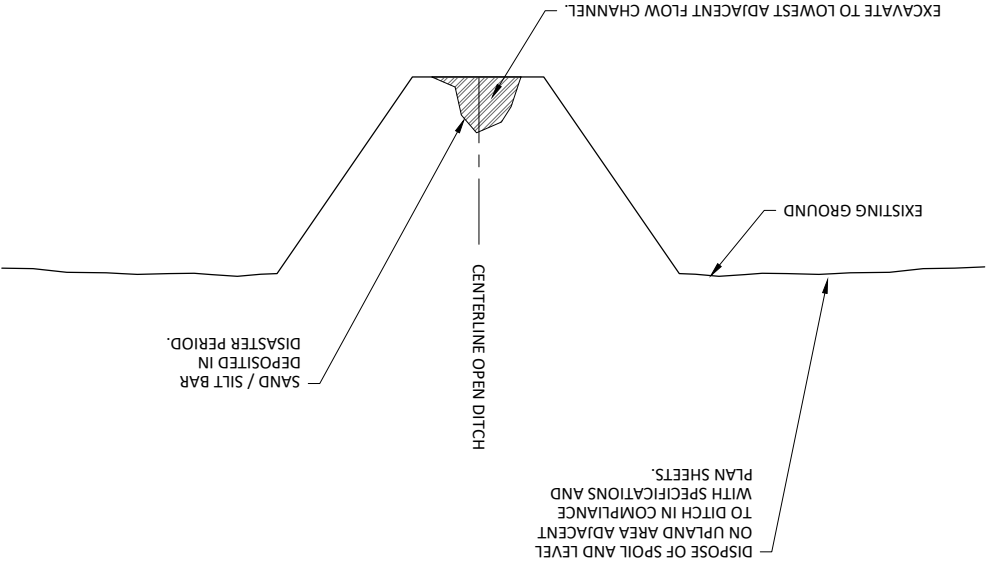
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			CLH	JPR
NO.	DESIGNED FOR	GATE		

PILOT CREEK OUTLET RELIEF  
PALO ALTO & POCAHONTAS COUNTIES, IOWA  
OPEN DITCH PIPE WORK TABLE

B.01  
SHEET

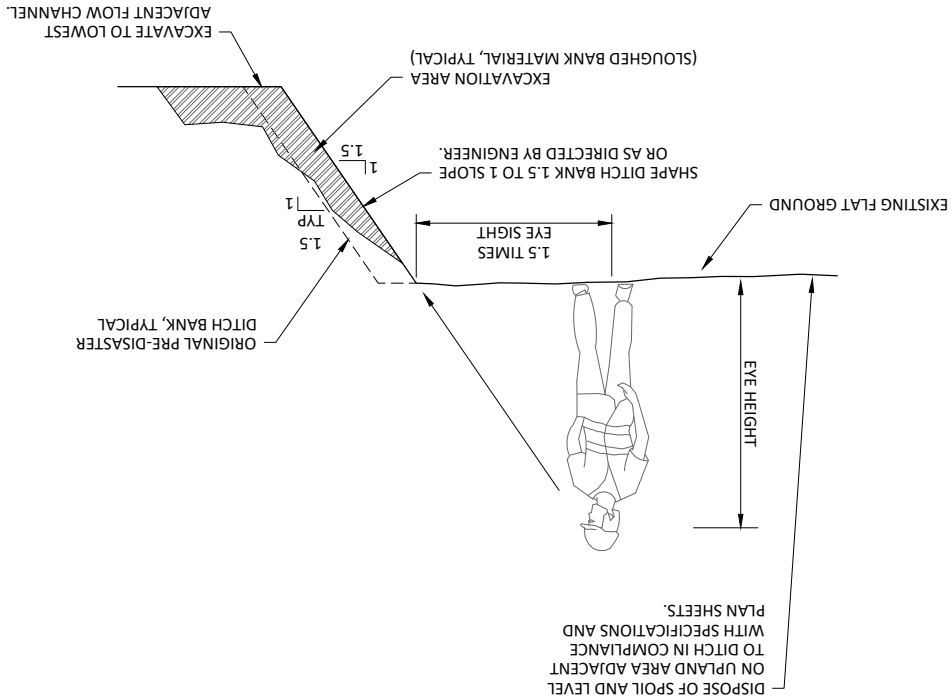
PIPE WORK TABLE											
STATION	BANK	TYPE	DIAMETER	LENGTH	MATERIAL	INSTRUCTION	EXISTING		NEW		NOTES
							REASON TO REPLACE		DIAMETER	LENGTH	
			</								

TYPICAL OPEN DITCH CHANNEL EXCAVATION



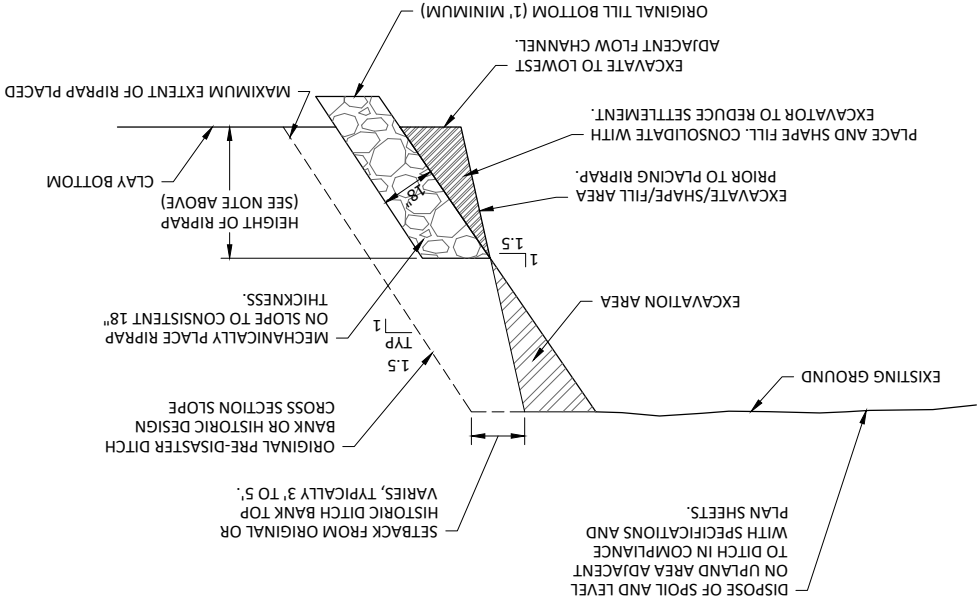
ENGINEER SHALL MARK THE BEGINNING AND THE END OF ALL CHANNEL EXCAVATION REACHES. ALL SEDIMENT MUST BE COMPLETELY REMOVED DOWN TO THE LOWEST ADJACENT FLOW CHANNEL. THIS BID ITEM SHALL BE PAID PER LINEAL FOOT. THIS BID ITEM. CONTRACTOR SHALL PROPERLY DISPOSE OF ALL ROCKS AND OTHER DEBRIS EXPOSED BY THIS OPERATION WHICH SHALL BE CONSIDERED INCIDENTAL TO THIS BID ITEM.

OPEN DITCH BANK SHAPING



ENGINEER SHALL MARK THE BEGINNING AND END OF ALL BANK SHAPING REACHES. CHANNEL EXCAVATION AND BANK SHAPING SHALL NOT BE IN SAME AREA UNLESS STAKED AS SUCH BY ENGINEER. THIS BID ITEM SHALL BE PAID BY THE LINEAL FOOT. EXCAVATED SPOIL THAT IS PLACED ON THE TOP OF BANK SHALL BE SHAPED TO BE DRAINED AND FARMABLE. IT SHALL NOT BE PLACED TO FUNCTION AS A LEVEE. THIS SHALL BE CONSIDERED INCIDENTAL TO THIS BID ITEM. CONTRACTOR SHALL PROPERLY DISPOSE OF ALL ROCKS AND OTHER DEBRIS EXPOSED BY THIS OPERATION WHICH SHALL BE CONSIDERED INCIDENTAL TO THIS BID ITEM.

TYPICAL OPEN DITCH BANK SHAPING



ENGINEER WILL MARK THE BEGINNING AND THE END OF ALL REACHES WHERE RIPRAP WILL BE PLACED. DESIGN PROVIDES THAT NONE OF THE RIPRAP OR FILL WILL ENCROACH ON THE PRE-DISASTER CROSS SECTION OR THE HISTORIC DESIGN CROSS SECTION SLOPE. THE BOTTOM OF THE RIPRAP MUST BE PLACED ON TILL OR A MINIMUM OF ONE FOOT BELOW EXISTING LOWEST FLOW CHANNEL. CONTRACTOR SHALL BE PAID FOR BANK SHAPING WHERE RIPRAP IS PLACED. HEIGHT OF RIPRAP IS FIVE TO SIX FEET WHERE ONE TON IS PLACED PER LINEAL FOOT OF DITCH AND EIGHT TO NINE FEET WHERE ONE AND ONE HALF TONS IS PLACED PER LINEAL FOOT OF DITCH. THIS BID ITEM SHALL BE PAID BY THE TON.

CONTRACTOR MUST SUPPLY ROCK TICKETS FOR EACH SITE WITH THE SITE NUMBER HAND WRITTEN ON EACH TICKET. CONTRACTOR SHALL PROVIDE AND PLACE 95% OF PLANNED RIPRAP REVEMENT BUT NOT OVER 105% PER SITE. ANY RIPRAP INSTALLED OVER 105% SHALL BE CONSIDERED DONE AT CONTRACTOR'S EXPENSE AND WILL NOT BE PAID FOR BY THE DRAINAGE DISTRICT.

SOURCE OF FILL BEHIND RIPRAP SHALL BE FROM ON SITE SPOIL BANKS TAKE SHALLOW LIFTS FROM THE SPOIL BANK ON THE SAME SIDE OF THE OPEN DITCH AND WITHIN 300 FEET OF THE RIPRAP AREA. RESHAPE SPOIL PILE SURFACE. THIS WORK IS INCIDENTAL TO THIS BID ITEM. SPOIL THAT IS PLACED ON TOP OF BANK BECAUSE OF THIS OPERATION, SHALL TO BE SHAPED TO BE DRAINED AND FARMABLE. IT SHALL NOT BE PLACED TO FUNCTION AS A LEVEE. THIS WORK IS INCIDENTAL TO THIS BID ITEM. CONTRACTOR SHALL DISPOSE OF ALL ROCKS AND OTHER DEBRIS EXPOSED BY THIS OPERATION. THIS WORK IS INCIDENTAL TO THIS BID ITEM.

RIPRAP

TYPICAL DITCH DETAILS

PALO ALTO & POCAHONTAS COUNTIES, IOWA

PILOT CREEK OUTLET RELIEF

B.02

SHEET

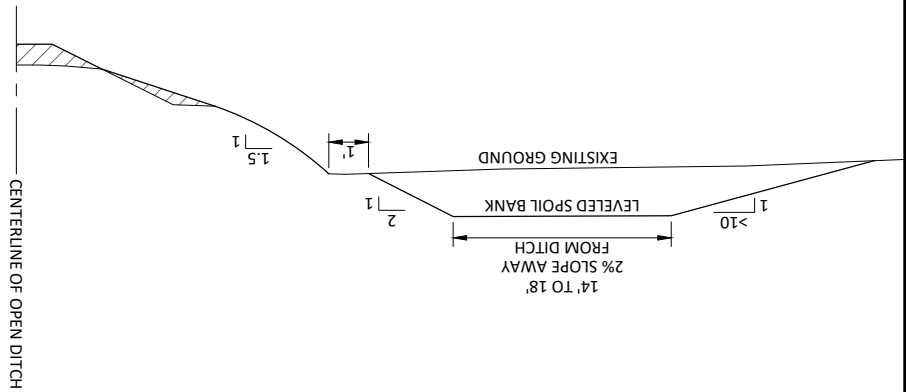


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www.bolton-menk.com

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DATE

TYPICAL OPEN DITCH EXCAVATION & SPOIL LEVELLING



EXCAVATION AND BANK SHAPING IS REQUIRED TO BE CARRIED OUT FROM BOTH SIDES OF THE OPEN DITCH, UNLESS OTHERWISE SPECIFIED ON PLANS. ARE TO BE PLACED ON BOTH SIDES OF THE DITCH, UNLESS OTHERWISE SPECIFIED ON PLANS.

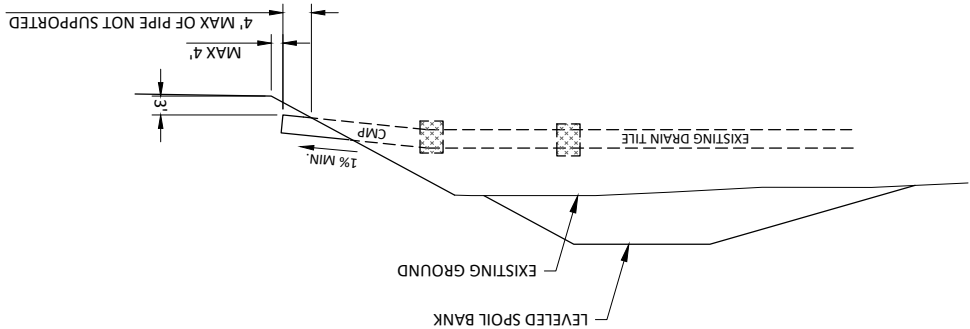
CONTRACTOR SHALL LIMIT, AS MUCH AS PRACTICAL, DISTURBANCE OF STABLE VEGETATED BANKS WHICH LIE OUTSIDE THE DESIGN CROSS SECTION, WHERE THE DITCH IS WIDER THAN THE DESIGN CROSS SECTION, CONTRACTOR SHALL EXCAVATE AS REQUIRED TO SHAPE BOTTOM TO BASE OF SIDE SLOPES.

SPOIL BANK LEVELLING

THE TOP 8 INCHES OF ALL LEVELED AND SHAPED SPOIL, OLD AND NEW, SHALL BE THOROUGHLY TILLED BY CONTRACTOR WITH A CHISEL PLOW OR SIMILAR IMPLEMENT. DISPOSE OF ROCKS AND OTHER DEBRIS EXPOSED BY THIS OPERATION. ENTIRE SOIL SURFACE SHALL BE SHAPED TO DRAIN AWAY FROM THE DITCH AND SHALL BE GENERALLY LEVEL WITH GENTLE UNDULATIONS ON A LINE PARALLEL TO DITCH. CHISELING AND FINISH GRADING ARE INCIDENTAL TO THE SPOIL BANK LEVELLING BID ITEM.

MINOR SURFACE GRADING TO DRAIN SMALL IMPOUNDED AREAS AND THE CONSTRUCTION OF TEMPORARY FIELD ENTRANCES OR SURFACE WATER CONTROL DIKES IN THE PUBLIC ROAD DITCHES ARE INCIDENTAL TO THE SPOIL BANK LEVELLING BID ITEM.

TYPICAL TILE EXTENSION INSTALLATION



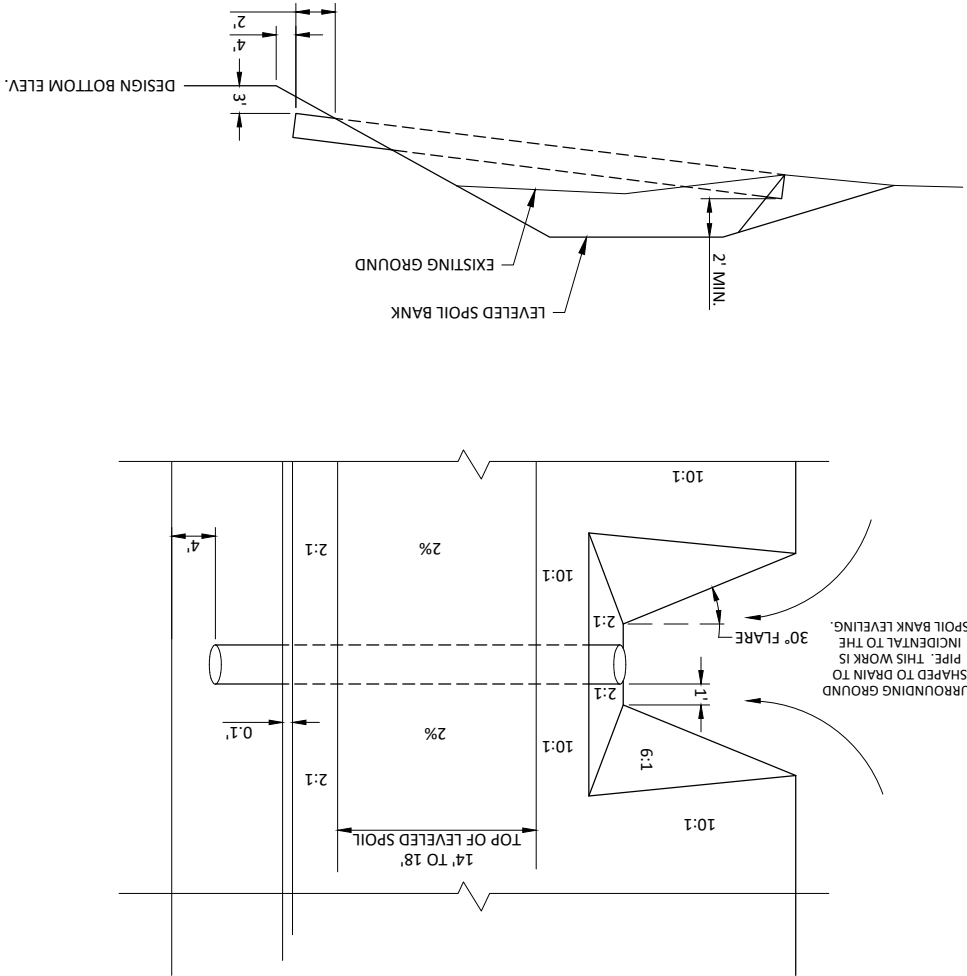
WHERE IT IS NECESSARY TO EXTEND OR RELAY TILE LINES, 12" OR LARGER IN DIAMETER TO REACH TILE EXTENSION PIPES, THE EXTENSION SHALL BE WITH CONCRETE OR SITE-SALVAGED DRAIN TILE SECTIONS IN A TRENCH WITH A MAXIMUM WIDTH 12" WIDER THAN THE TILE SECTIONS. USE NEW CLASS III CONCRETE DRAIN TILE WITH CLASS R-2 BEDDING. EXTEND ALL SMALLER TILE LINES WITH 10" DIAMETER SDR-35 PVC SEWER PIPE FITTED OVER TILE AND INTO OUTLET PIPE. NECESSARY EXTENSIONS OR RELAYS LESS THAN 20 FEET IN LENGTH MAY BE COMPLETED WHEN DISCOVERED. LONGER EXTENSIONS MUST BE FIRST APPROVED BY ENGINEER. CORRUGATED PLASTIC DRAIN TILE IS NOT PERMITTED.

WHEN A TILE LINE IS FOUND TO BE CRUSHED, CRACKED, OR FILLED WITH SEDIMENT, CONTRACTOR IS TO NOTIFY ENGINEER PRIOR TO DOING ADDITIONAL WORK. ENGINEER WILL DETERMINE IF REPLACEMENT OR ABANDONMENT IS WARRANTED. TILE REPLACEMENT WILL NOT EXTEND BEYOND THE WORK LIMITS.

CONTRACTOR IS REQUIRED TO MAINTAIN AND PROVIDE A LOG OF ALL DRAIN TILE LINE EXTENSION AND REPLACEMENT WORK RECORDING LOCATION, EXISTING TILE MATERIAL, SIZE, STRENGTH & LENGTH OF MATERIALS INSTALLED, OTHER WORK PERFORMED AND MACHINE AND LABOR TIME. LOG KEEPING IS SUBSIDIARY TO THE CONTRACT. ALL APPROVED DRAIN TILE WORK WILL BE CONSIDERED EXTRA WORK IF NOT COVERED BY A BID ITEM. FAILURE TO MAINTAIN AN ACCURATE LOG WILL RESULT IN CONTRACTOR HAVING TO UNCOVER HIS WORK FOR VERIFICATION AT HIS COST.

ALL CONNECTIONS OF DRAIN TILE TO EXTENSION PIPES OR TO SDR-35 PVC SEWER PIPES ARE TO BE ENCASED IN A PORTLAND CEMENT CONCRETE COLLAR AT LEAST 12" WIDE AND 6" THICK CONTINUOUS AROUND THE JOINT. THIS WORK IS INCIDENTAL TO THE DRAIN TILE EXTENSION PIPE BID ITEMS.

TYPICAL SURFACE DRAIN INSTALLATION



Standard Pipe Work Abbreviations

UAC = Use As Constructed RS&R = Remove, Salvage, & Reinstall

TE = Tile Extension SD = Surface Drain

AG = Animal Guard CMP = Corrugated Metal Pipe

FG = Flood Gate RCP = Reinforced Concrete Pipe



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DESIGNED  
CHK  
CLH  
JPR  
CLIENT PROJ. NO.

NO. ISSUED FOR  
DATE

TYPICAL DITCH DETAILS

PALO ALTO & POCAHONTAS COUNTIES, IOWA

PILOT CREEK OUTLET RELIEF

B.03

SHEET



**BOLTON & MENK**

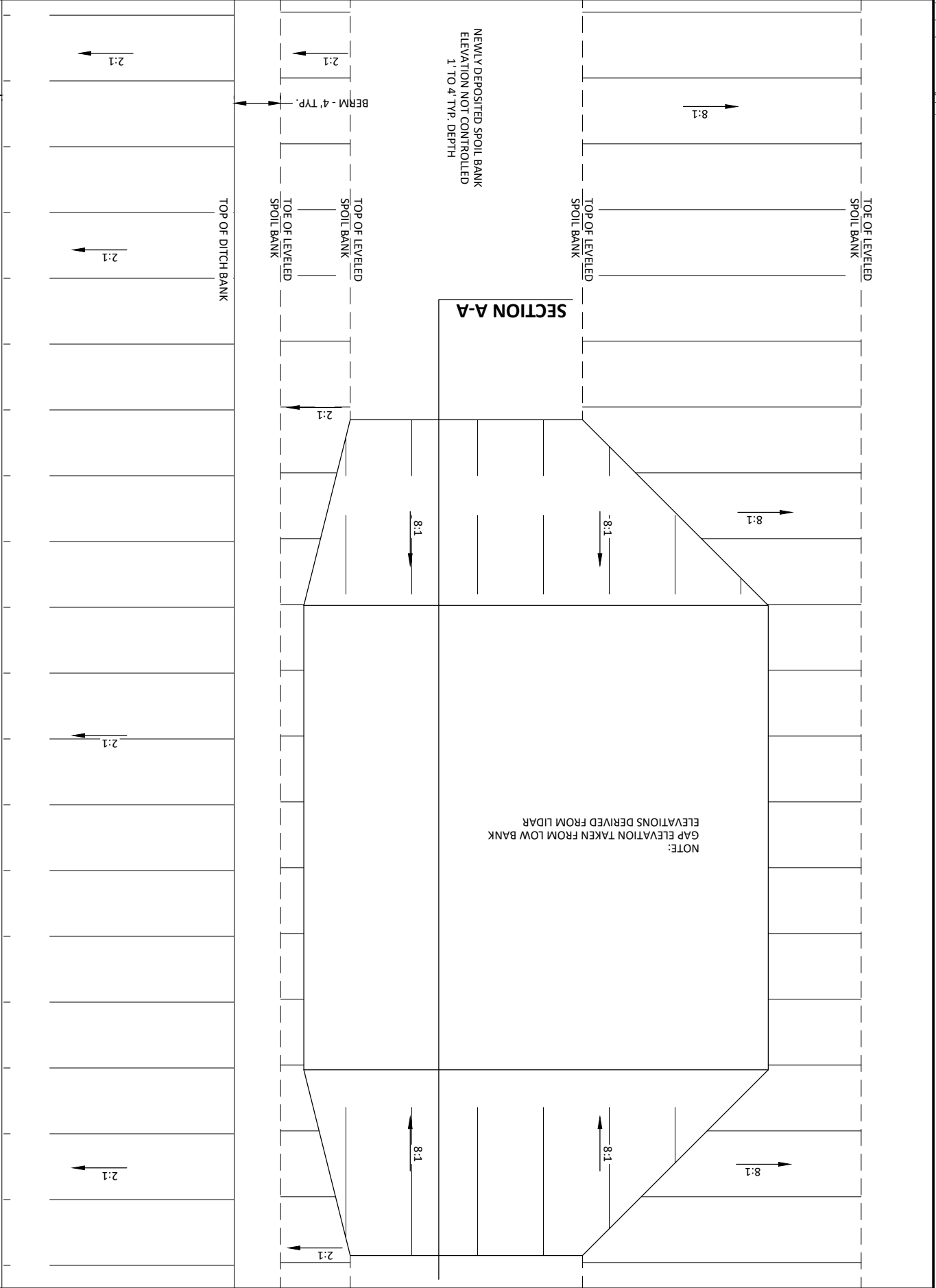
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Email: spencer@bolton-menk.com  
www.bolton-menk.com

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DRAWN	CLH
CHECKED	JPR
CLIENT PROJ. NO.	

NO.	DESIGNED FOR	GATE

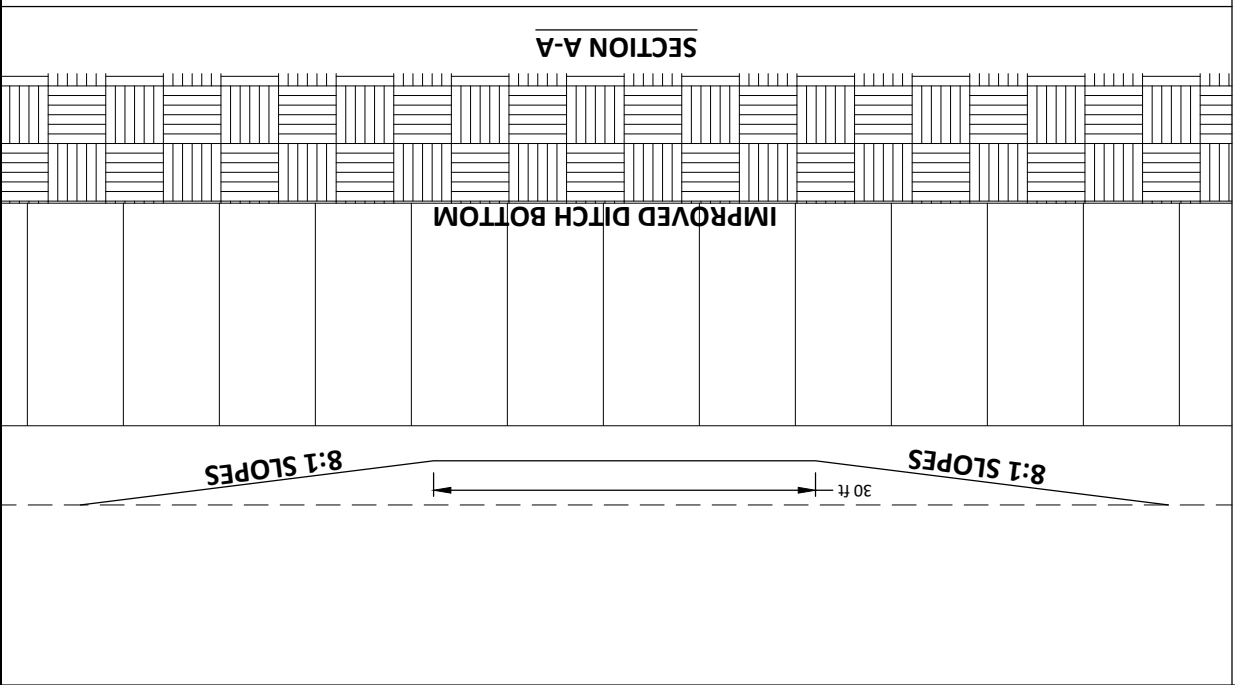
PILOT CREEK OUTLET RELIEF  
PALO ALTO & POCAHONTAS COUNTIES, IOWA  
BANK GAP DETAIL

B.04  
SHEET



LEFT BANK GAPS				
STA	SIDE	LOW BANK	Q25	Q100
138+97	L	1175.61	1176.54	1178.64
125+43	L	1173.84	1175.65	1177.75
120+40	L	1173.37	1175.32	1177.42
96+61	L	1174.81	1173.77	1175.87
90+56	L	1172.90	1173.37	1175.47
87+92	L	1172.07	1173.20	1175.30
75+04	L	1170.48	1172.36	1174.46
73+33	L	1170.03	1172.25	1174.35
84+19	R	1170.04	1172.96	1175.06
87+49	R	1171.37	1173.17	1175.27
90+49	R	1170.27	1173.37	1175.47
96+04	R	1171.69	1173.73	1175.83
116+39	R	1173.03	1175.06	1177.16
125+89	R	1170.30	1175.68	1177.78
130+41	R	1176.27	1175.98	1178.08
131+91	R	1174.67	1179.08	1178.18
135+82	R	1175.63	1176.33	1178.43

RIGHT BANK GAPS				
STA	SIDE	LOW BANK	Q25	Q100
84+19	R	1170.04	1172.96	1175.06
87+49	R	1171.37	1173.17	1175.27
90+49	R	1170.27	1173.37	1175.47
96+04	R	1171.69	1173.73	1175.83
116+39	R	1173.03	1175.06	1177.16
125+89	R	1170.30	1175.68	1177.78
130+41	R	1176.27	1175.98	1178.08
131+91	R	1174.67	1179.08	1178.18
135+82	R	1175.63	1176.33	1178.43

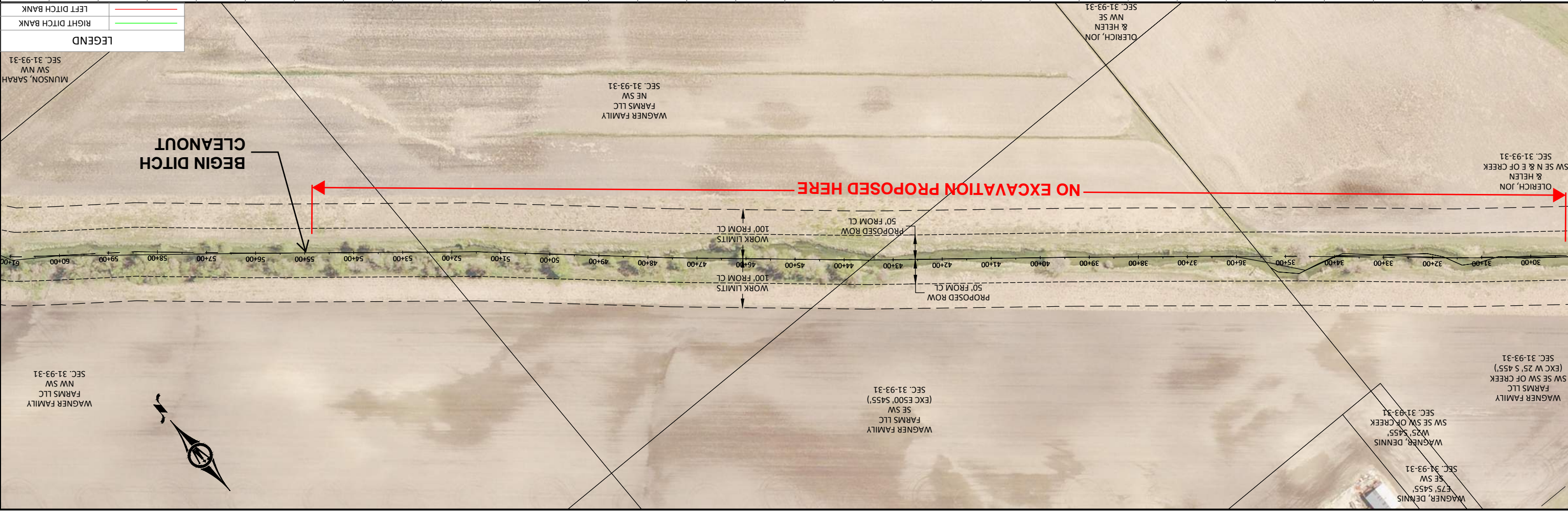




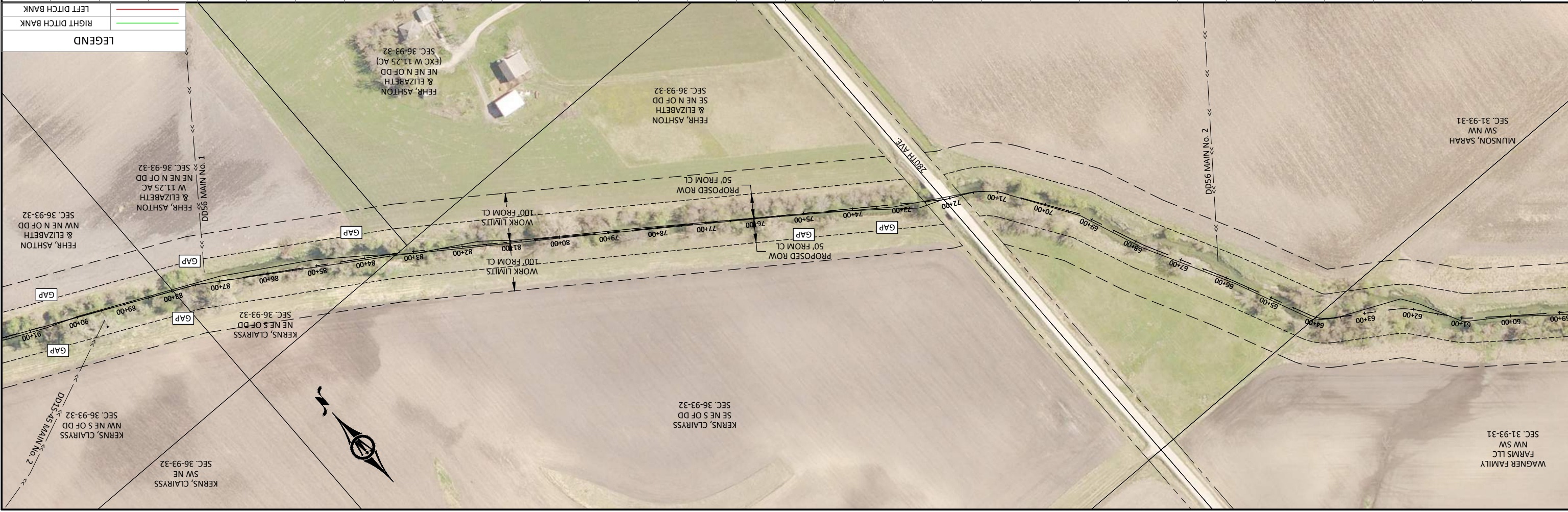
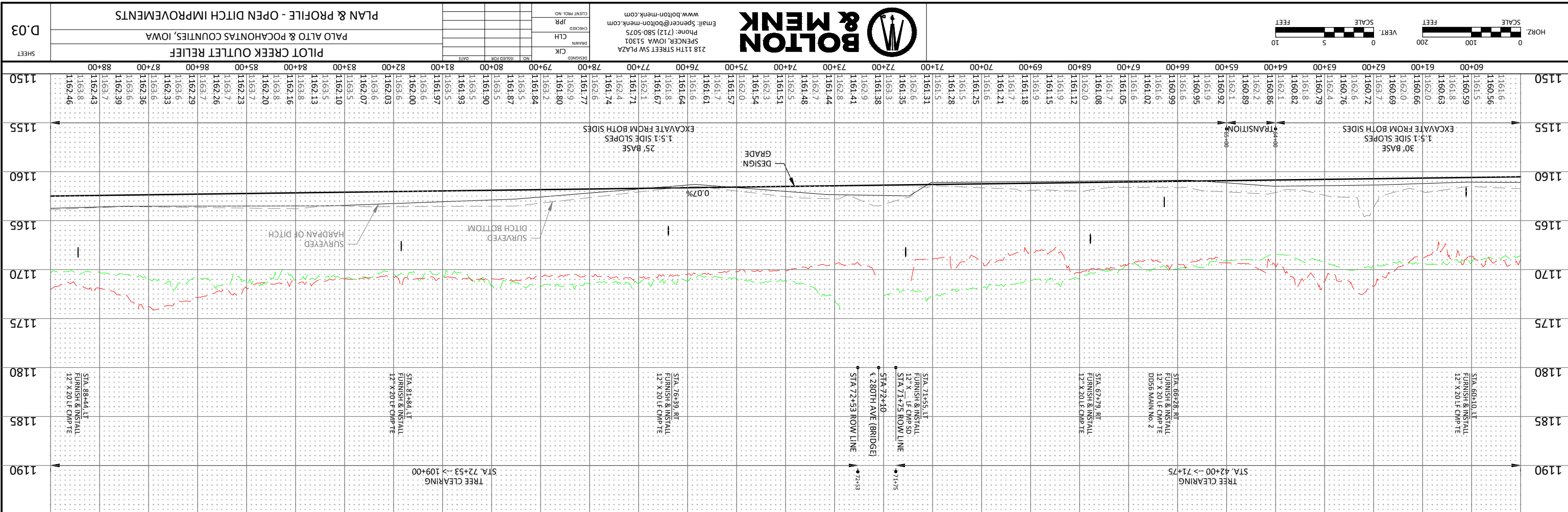
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DRAWN	CLH			
CHECKED	JPR			
CLIENT PROJ. NO.				



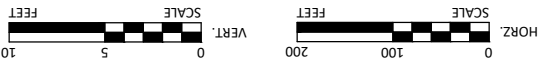










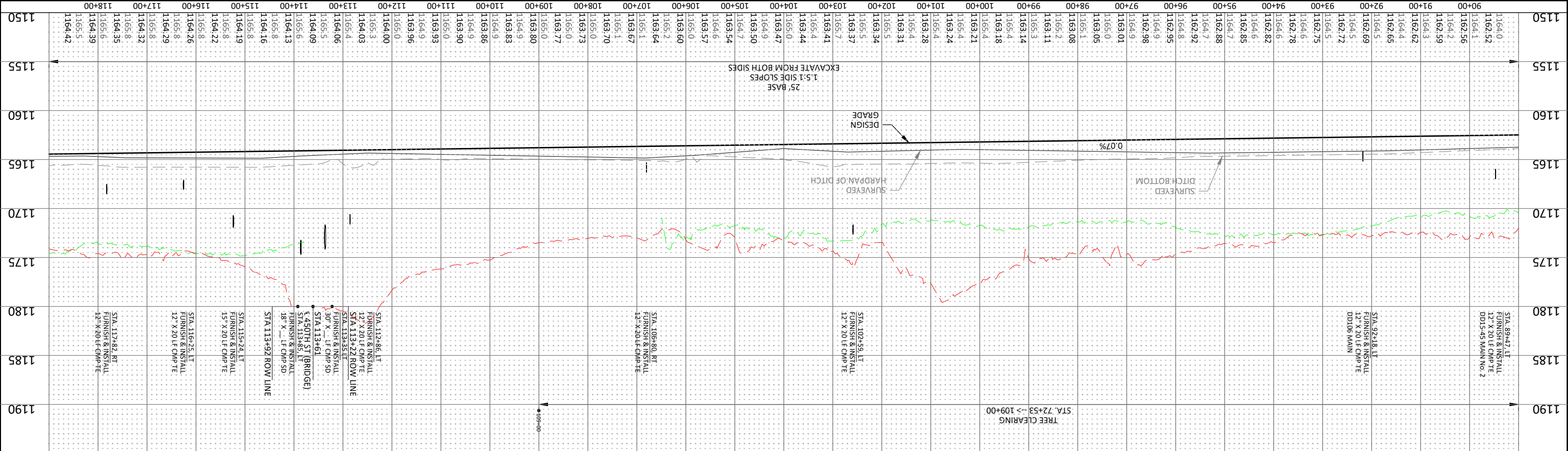


218 11TH STREET SW PLAZA  
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Phone: (712) 580-5075  
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DESIGNED	CHK	CLH	JPR
NO.	NO.	NO.	NO.
DATE	DATE	DATE	DATE

PLAN & PROFILE - OPEN DITCH IMPROVEMENTS  
PALO ALTO & POCAHONTAS COUNTIES, IOWA

D.04  
SHEET





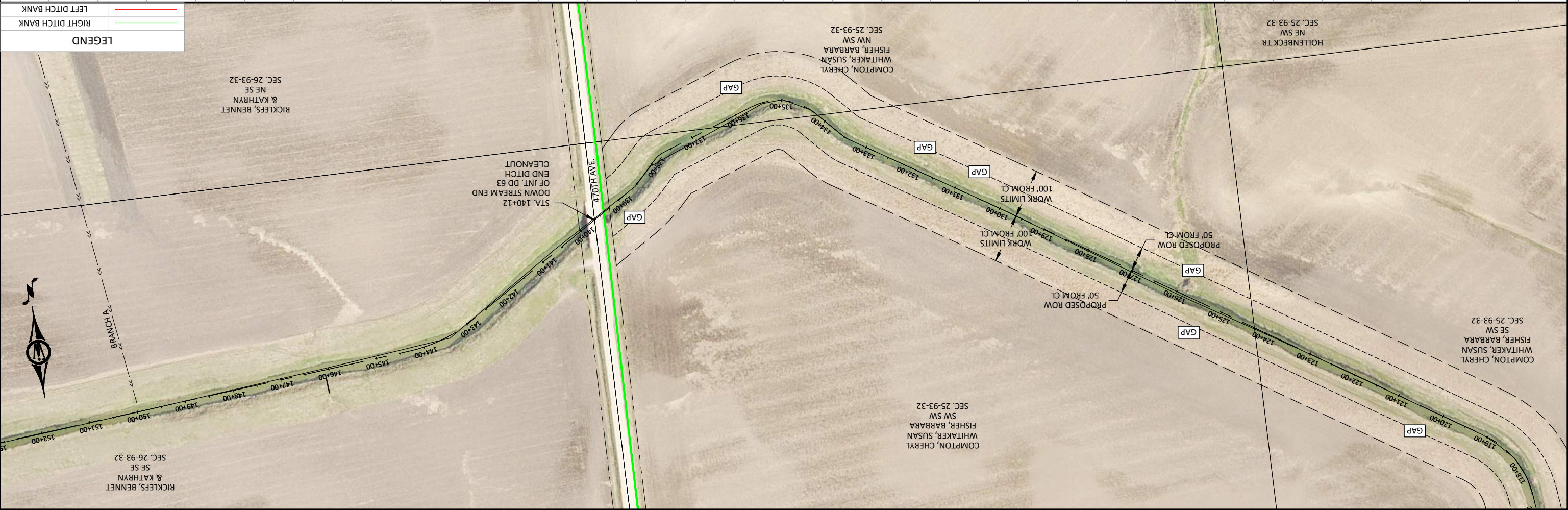
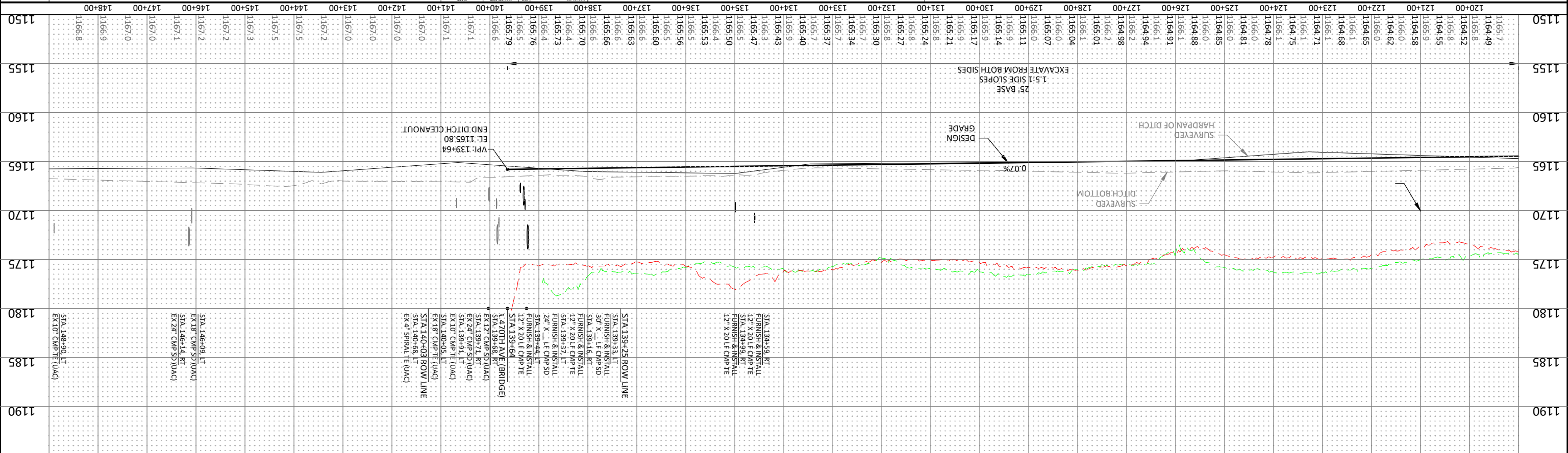


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PLAN & PROFILE - OPEN DITCH IMPROVEMENTS  
PALO ALTO & POCAHONTAS COUNTIES, IOWA  
PILOT CREEK OUTLET RELIEF

D.05  
SHEET





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DRAWN	CLH
CHECKED	JPR
CLIENT PROJ. NO.	
NO.	ISSUED FOR
	GATE

PILOT CREEK OUTLET RELIEF	
PALO ALTO & POCAHONTAS COUNTIES, IOWA	
ALIGNMENT GEOMETRY - OPEN DITCH	

No.	Type	Length	Radius	Start Station	End Station	Start E-N	End E-N	Pass Through PT E-N
1	Line	60.78'		-0+00'	E4642000.81,N3762658.19'	E4642000.81,N3762699.00'	E4641923.29,N3762735.64'	
2	Line	85.75'		0+60.78'	E4642000.81,N3762699.00'	E4641923.29,N3762735.64'	E4641909.05,N3762736.69'	
3	Line	14.27'		1+60.80'	E4641923.29,N3762736.69'	E4641909.05,N3762736.69'	E4641821.34,N3762755.45'	E4641864.55',N3762743.06'
4	Curve	89.98'	328.65'	2+50.78'	E4641909.05,N3762736.69'	E4641821.34,N3762755.45'	E4641662.95,N3762812.82'	
5	Line	168.46'		2+50.78'	E4641821.34,N3762812.82'	E4641662.95,N3762812.82'	E4641411.16,N3763053.09'	E4641118.13,N3763052.38'
6	Line	593.72'		4+19.24'	E4641662.95,N3762812.82'	E4641411.16,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
7	Curve	2.87'	21.15'	10+12.96'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
8	Line	852.76'		10+15.83'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
9	Curve	22.43'	76.58'	18+68.59'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
10	Line	138.02'		18+91.03'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
11	Curve	170.94'	151.79'	20+29.04'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
12	Line	60.68'		21+99.98'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
13	Line	183.87'		22+60.66'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
14	Curve	53.54'	92.74'	24+44.53'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
15	Line	212.14'		24+98.08'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
16	Line	444.23'		27+10.21'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
17	Line	306.63'		31+54.44'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
18	Line	474.37'		34+61.08'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
19	Line	415.91'		39+35.44'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
20	Line	401.28'		43+51.35'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
21	Line	393.83'		47+52.63'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
22	Line	449.18'		51+46.46'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
23	Line	249.01'		55+46.46'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
24	Line	162.46'		58+44.65'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
25	Line	77.32'		60+84.42'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
26	Curve	126.67'	100.00'	61+07.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
27	Line	88.85'		61+07.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
28	Curve	46.99'	150.00'	62+42.93'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
29	Line	127.41'		63+70.34'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
30	Curve	41.98'	75.00'	64+12.32'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
31	Line	182.94'		65+95.26'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
32	Line	187.39'		67+82.64'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
33	Line	139.66'		69+22.30'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
34	Line	159.39'		70+81.70'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
35	Curve	82.44'	155.00'	71+64.13'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
36	Line	45.93'		72+10.06'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
37	Line	1120.19'		83+30.25'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
38	Line	418.43'		87+48.68'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
39	Line	418.31'		91+66.98'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
40	Line	457.82'		96+24.80'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
41	Line	495.00'		101+19.80'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
42	Curve	38.82'	200.00'	101+56.62'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
43	Line	95.56'		101+56.62'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
44	Curve	59.43'	50.00'	102+52.18'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
45	Line	69.76'		103+11.61'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
46	Curve	39.40'	143.90'	104+20.77'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
47	Line	123.57'		105+44.34'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
48	Curve	156.58'	90.00'	107+00.92'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
49	Line	365.09'		110+66.02'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
50	Curve	55.71'	240.00'	111+21.73'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
51	Line	19.18'		112+18.91'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
52	Curve	133.38'	87.57'	113+52.28'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
53	Line	254.55'		116+06.83'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
54	Curve	38.00'	300.00'	117+46.29'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
55	Line	101.46'		117+46.29'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
56	Curve	160.98'	180.58'	119+07.27'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
57	Line	1095.80'		130+03.07'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
58	Line	329.71'		133+32.77'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
59	Curve	27.09'	105.14'	133+32.77'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
60	Line	63.62'		133+32.77'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
61	Curve	141.24'	121.44'	134+23.49'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
62	Line	201.65'		135+64.73'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
63	Curve	22.96'	50.00'	137+66.38'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
64	Line	36.47'		138+25.81'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
65	Curve	62.47'	250.00'	139+63.83'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'
66	Line	75.55'		139+63.83'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641116.88,N3763053.09'	E4641118.13,N3763052.38'



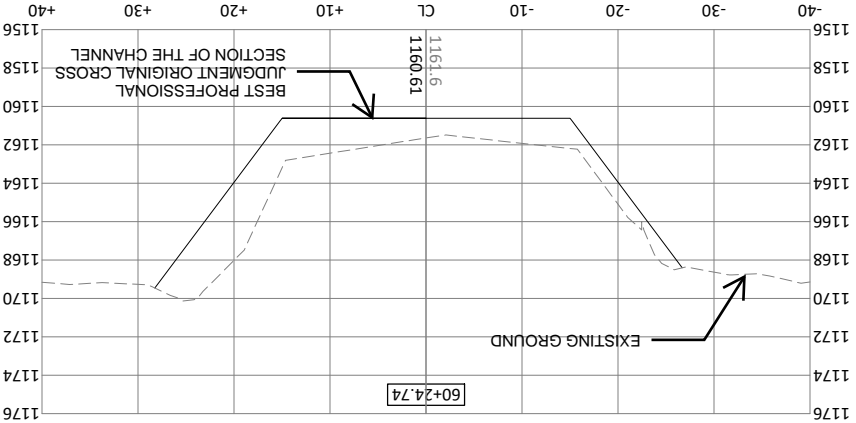
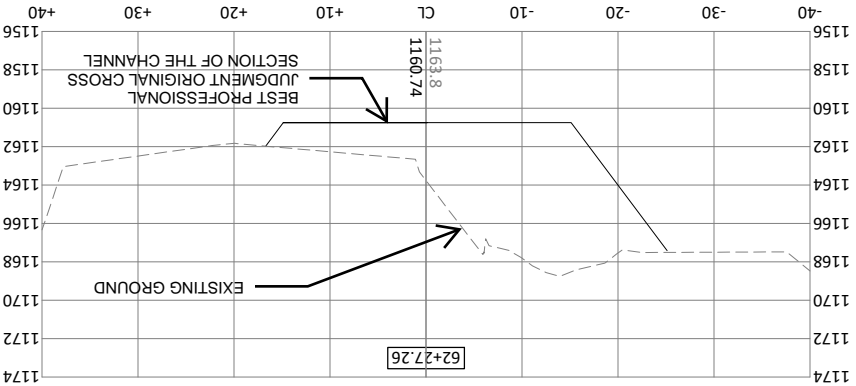
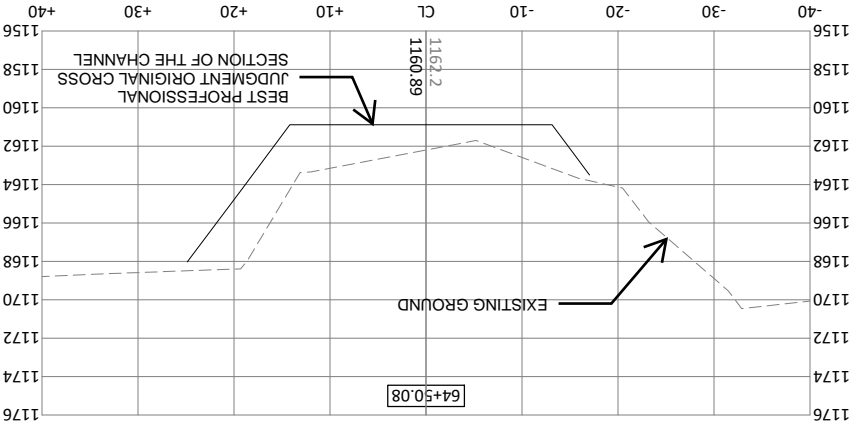
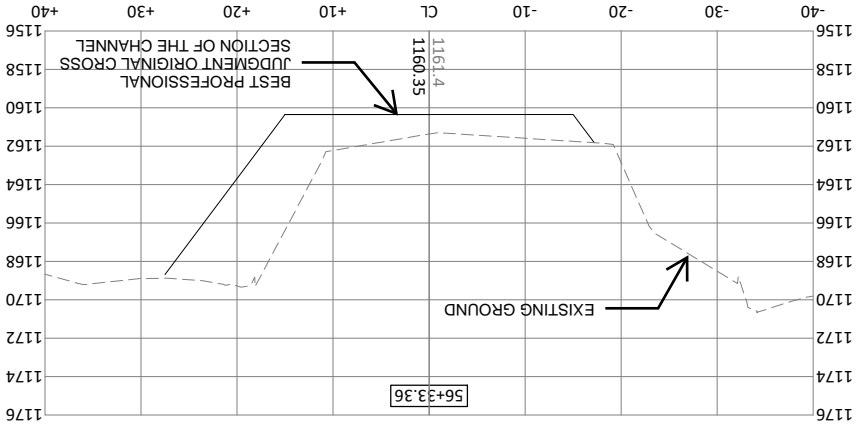
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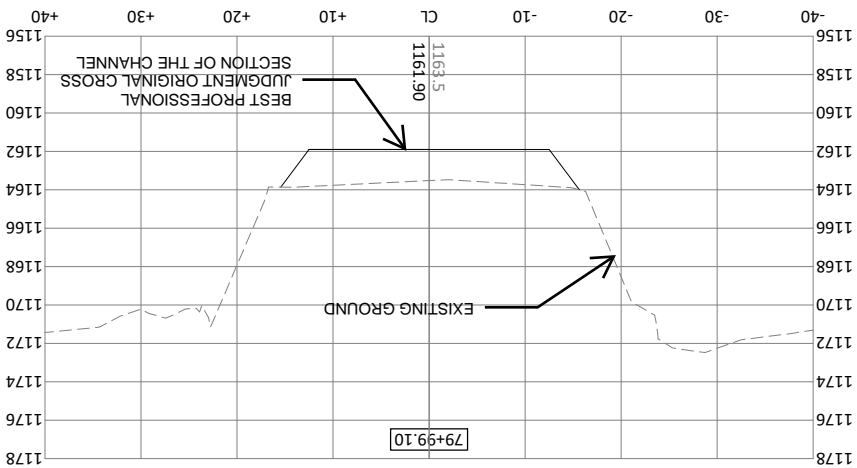
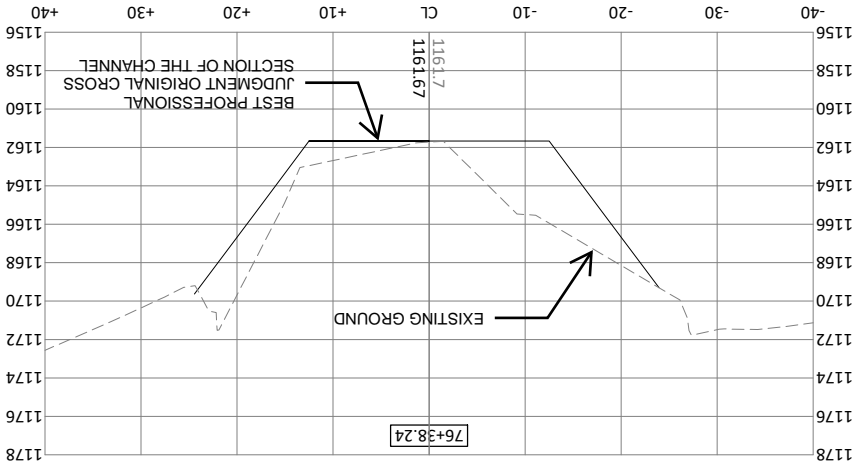
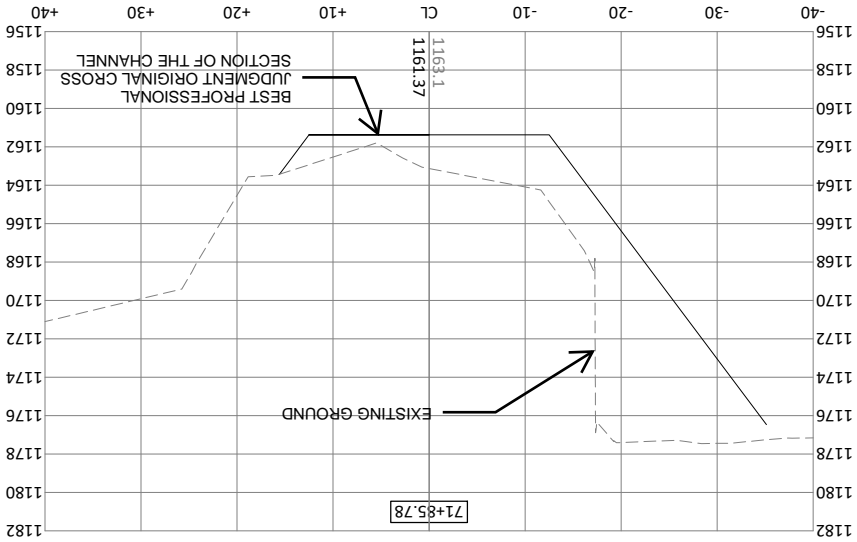
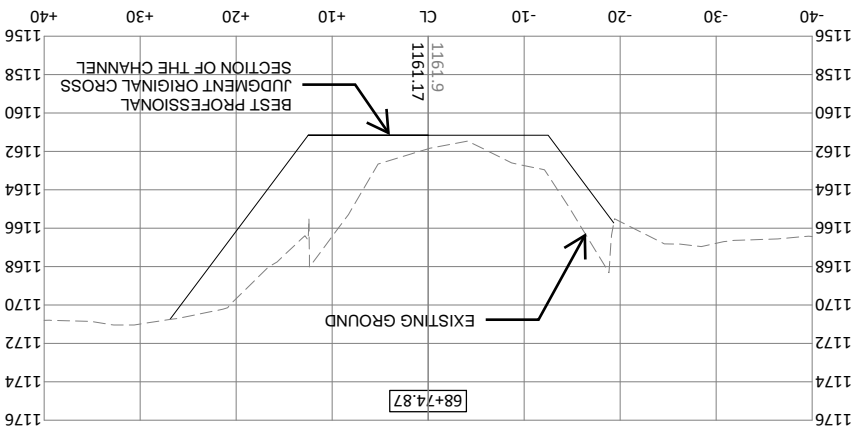
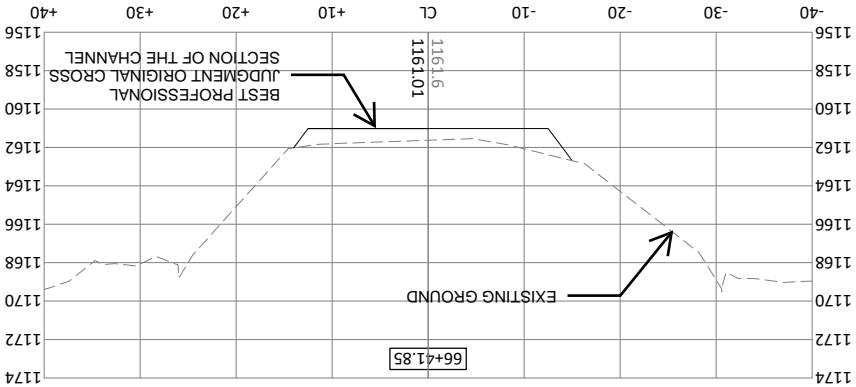
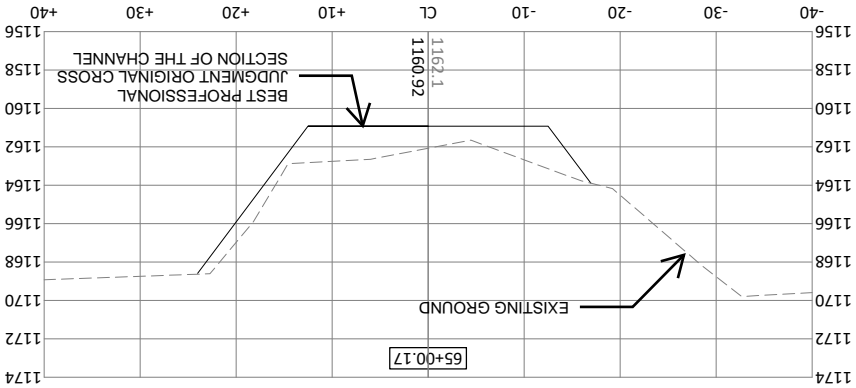
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DESIGNED	CJK
DRAWN	CLH
CHECKED	JPR
CLIENT PROJ. NO.	
NO.	RESERVED FOR GATE

PILOT CREEK OUTLET RELIEF  
PALO ALTO & POCAHONTAS COUNTIES, IOWA  
OPEN DITCH CROSS SECTIONS

X.03  
SHEET





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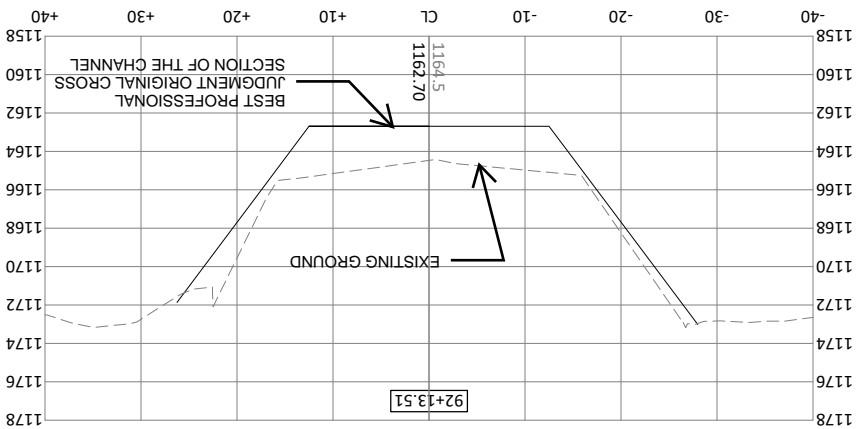
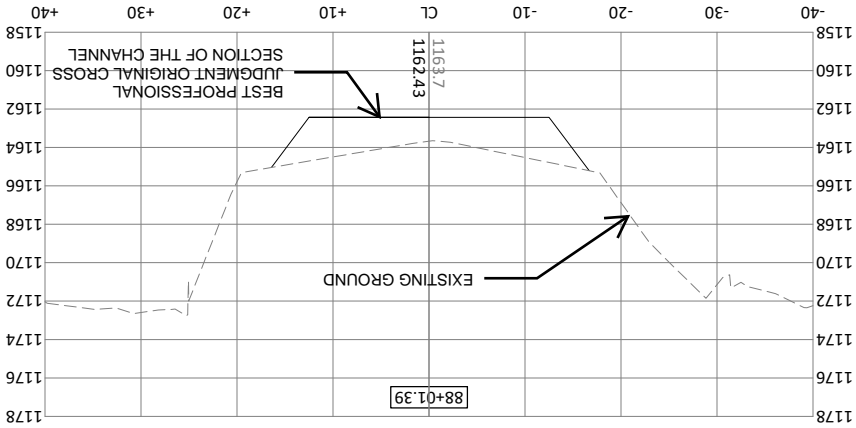
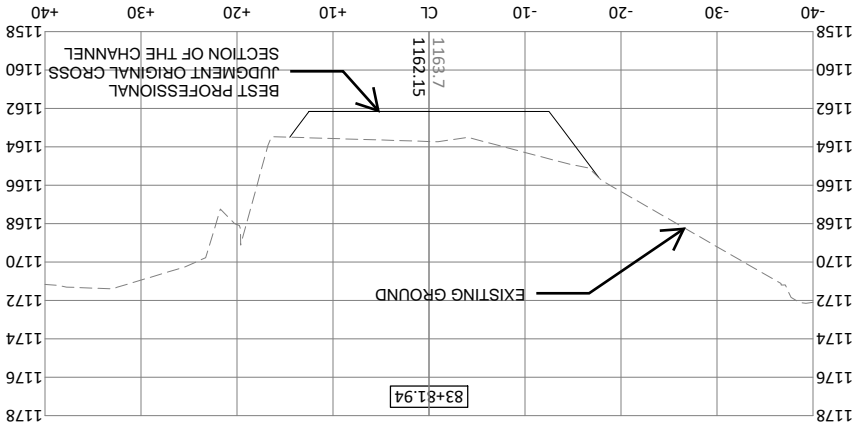


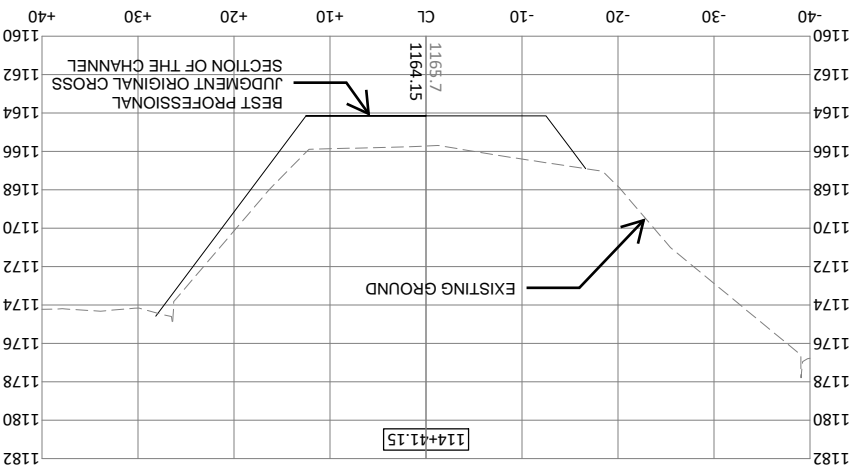
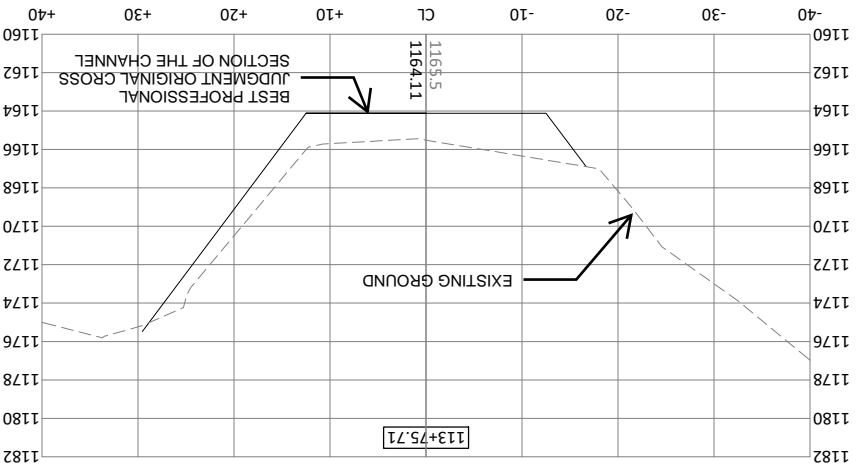
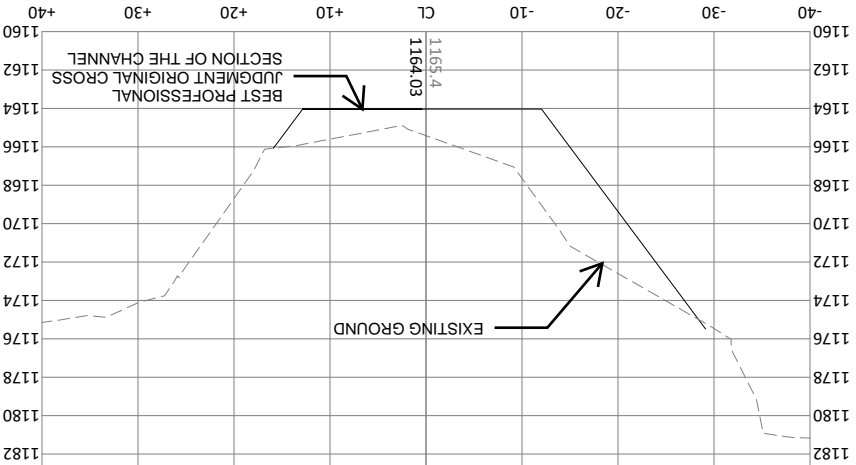
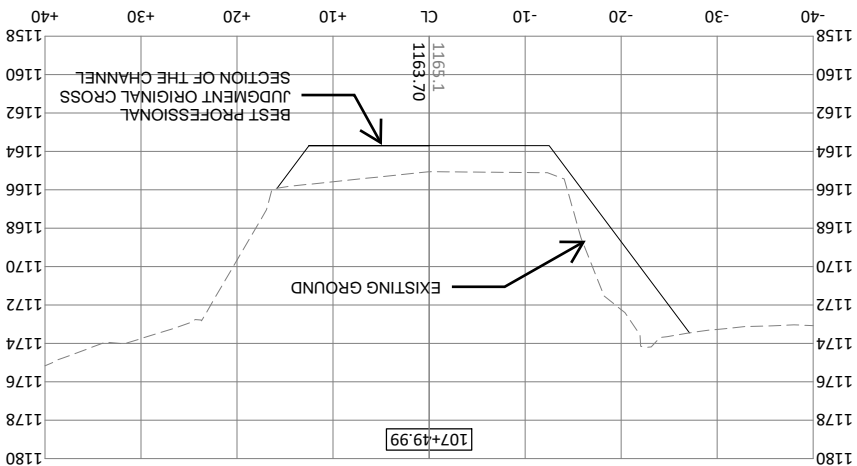
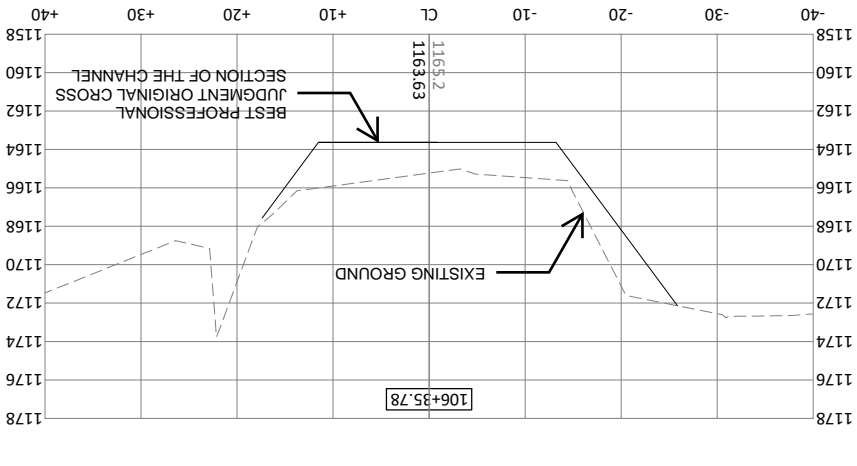
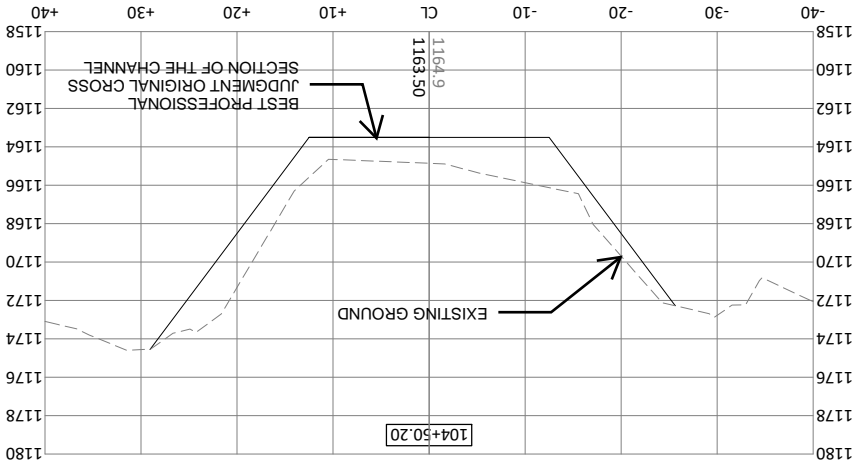
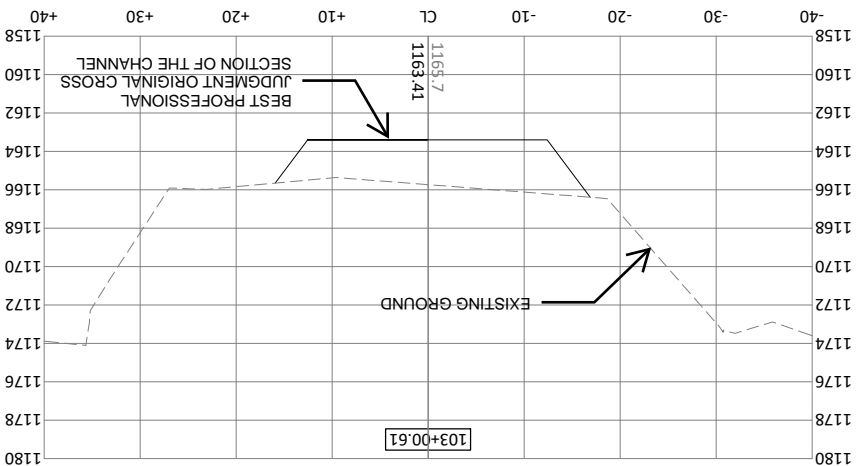
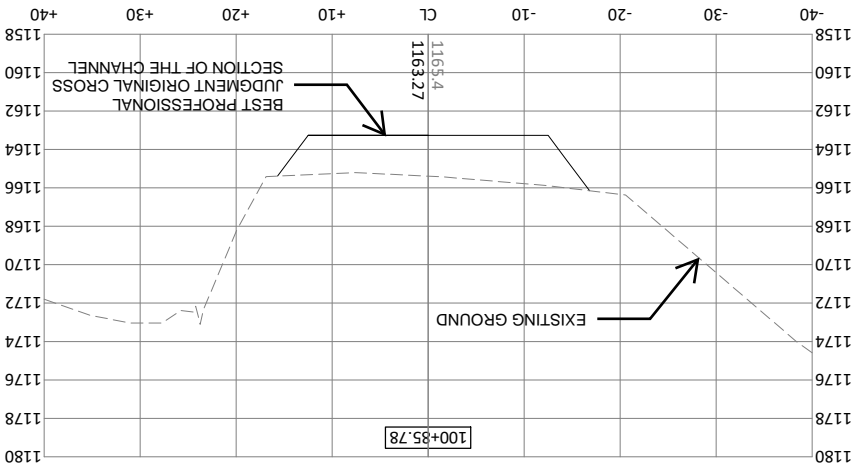
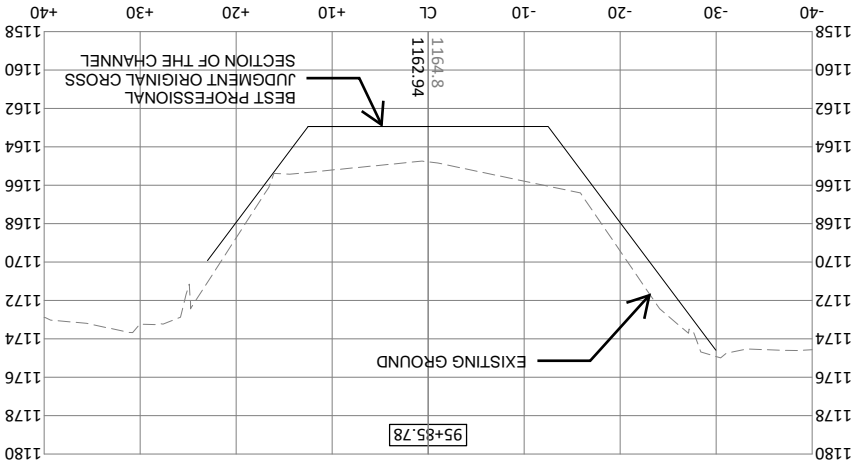
DESIGNED BY: CLH  
CHECKED BY: JPR  
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PILOT CREEK OUTLET RELIEF  
PALO ALTO & POCAHONTAS COUNTIES, IOWA

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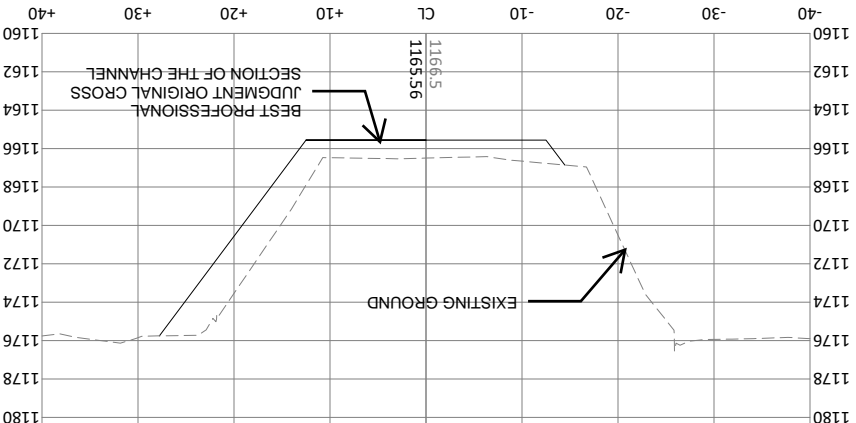
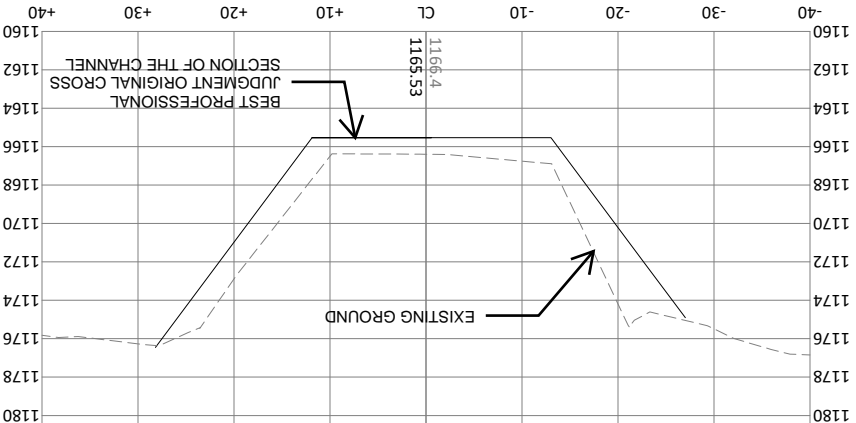
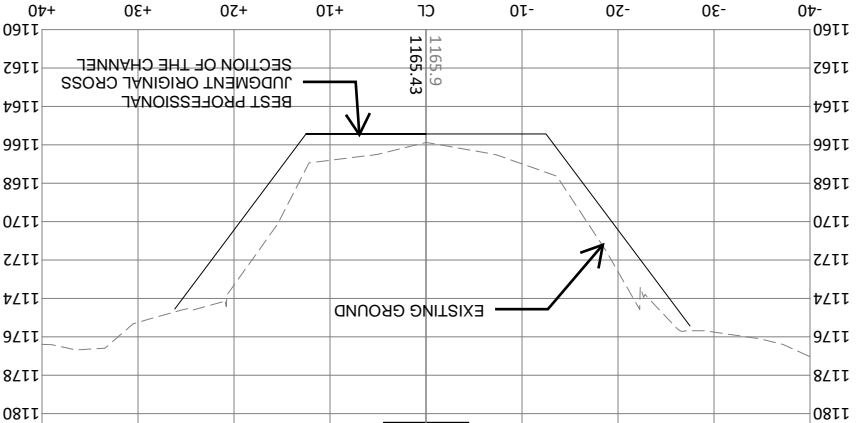
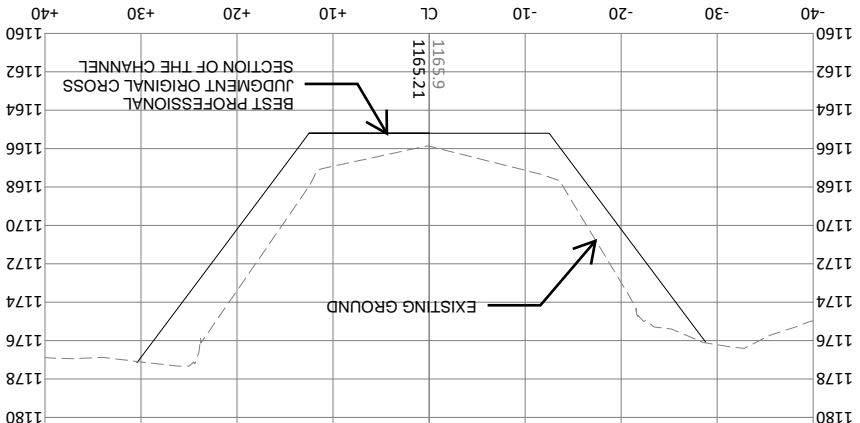
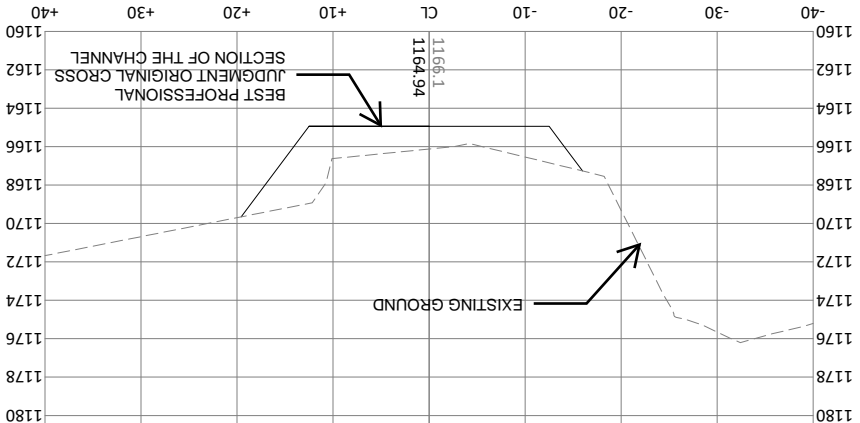
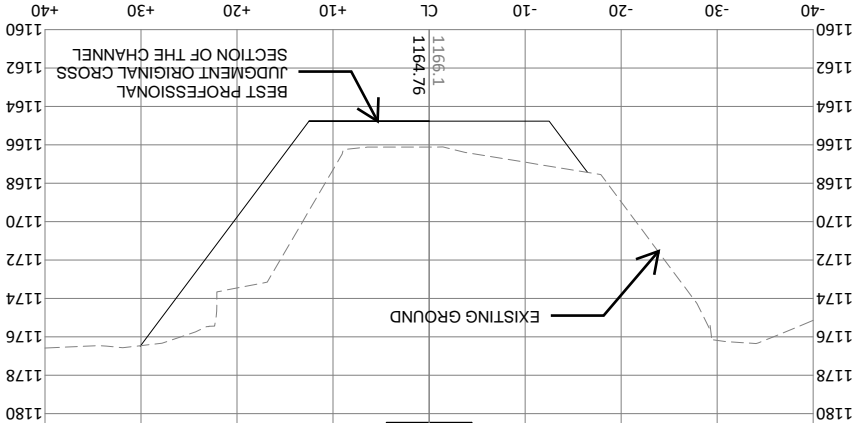
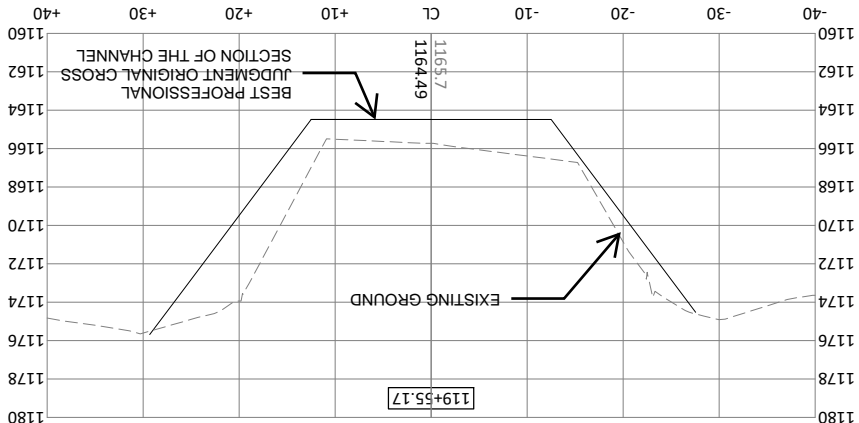
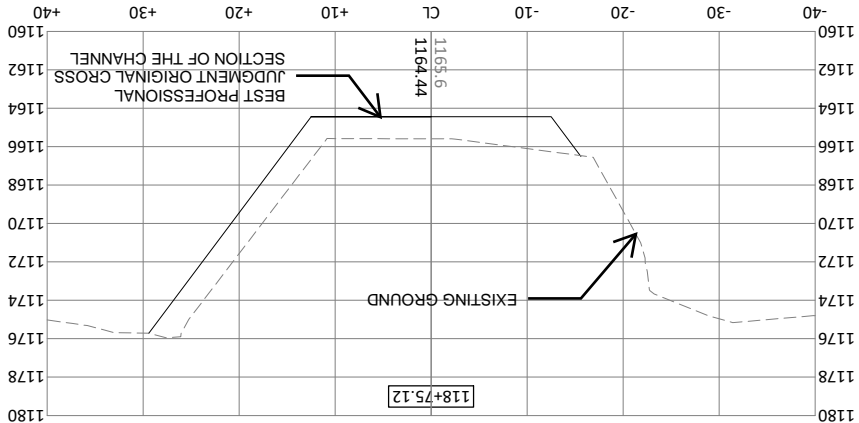
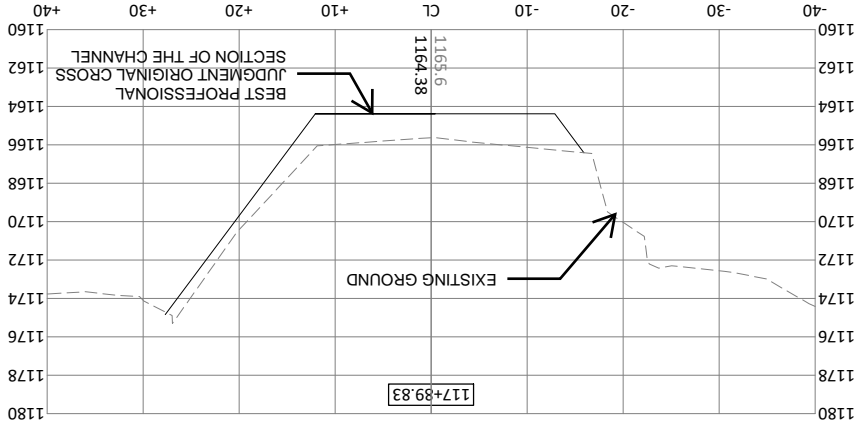
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OPEN DITCH CROSS SECTIONS





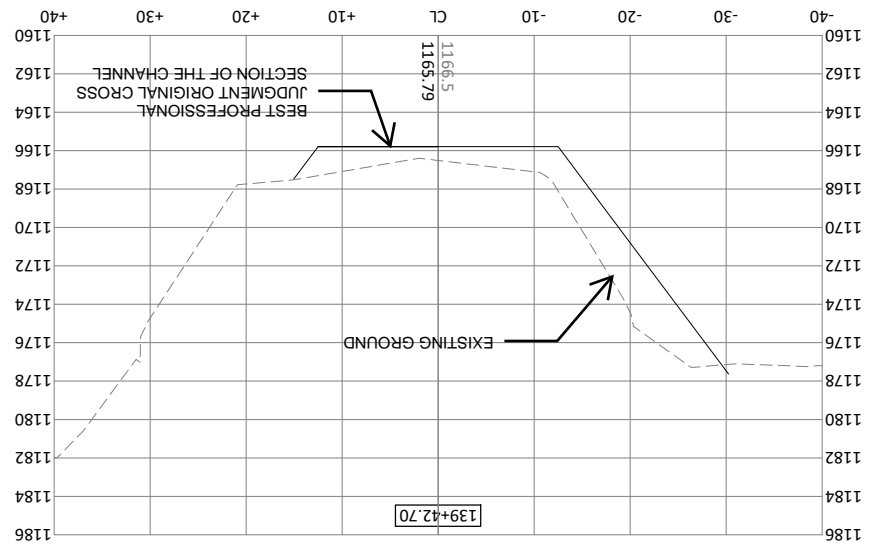
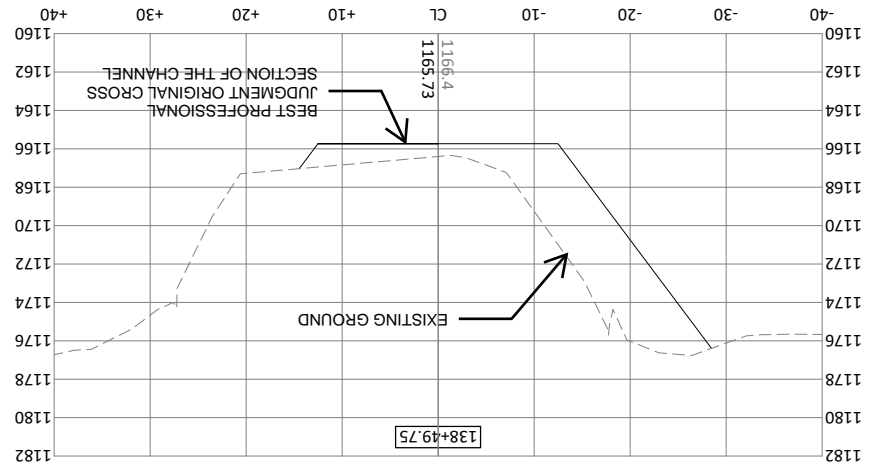
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NO.	ISSUED FOR	DATE				

## OPEN DITCH CROSS SECTIONS

PALO ALTO & POCAHONTAS COUNTIES, IOWA

## PILOT CREEK OUTLET RELIEF

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