



JACOBSON-WESTERGARD & ASSOCIATES, INC.
Consulting Engineers & Land Surveyors

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PRELIMINARY ENGINEERING REPORT

**DRAINAGE DISTRICT NO. 15 CLEANOUT
DICKINSON COUNTY, IOWA**
JWA PROJECT NO: E20079

OWNER: Dickinson County Board of Supervisors

William Leupold
Steve Clark
Tim Fairchild
Kim Wermersen
Jeffrey Thee

Lori Pedersen, Auditor



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Richard A. Hopper Date 3/22/2021
Richard A. Hopper, P.E., License Number 8106
My license renewal date is December 31, 2021
Pages or sheets covered by this seal: Title, pg 1-3, drawing

I. INTRODUCTION/HISTORY

A petition for the establishment of the drainage district was filed January 21, 1911. An engineer was appointed and the preliminary engineering report was dated March 30, 1911. It was recommended that the district be established.

Bids for the project were opened and the construction awarded on June 27, 1911. The Engineer's Report on Permanent Survey of Drainage District No. 15 was filed June 27, 1911. The Engineer's final report dated February 10, 1914, noted that in the fall of 1912 it was discovered a considerable number of tile as laid on the main drain had partially disintegrated under the action of some chemical solvent. The contractor replaced the defective tile and the engineer recommended the Board accept the work with the condition that the contractor furnish a five-year guarantee bond covering a percentage of the value of the tile laid.

In 1928 an engineer was appointed to investigate the district. He reported that the district was in need of extensive repairs, some land was left out that should not have been and most of the main tile is too small. He recommended annexing in the land that was left out of the district but there is no record as to board action.

In 1966 the board entered into a group enterprise agreement with the Dickinson County Soil Conservation District on Drainage District No. 15. There is a preliminary engineering report done by the SCS engineer in 1969. It stated the capacity of the existing tile varied from adequate to one-fifth the capacity required for good agricultural drainage. It recommended installing a relief tile parallel to the existing tile, with a 38-inch tile being the largest tile size required. It does not appear this project was constructed.

A bid letting on the cleanout of Drainage District No. 15 was held on November 20, 1979. The board accepted the bid of Estherville Sand and Gravel in the amount of \$2,757.60.

In 1980 there was correspondence with the IDOT regarding some Drainage District No. 15 tile that was removed due to a box culvert that was constructed when the county road was relocated in 1970. It appears the IDOT was going to work with the County to reconnect the tile.

On July 12, 1984, the county dug up and took some shots on the Drainage District No. 15 main located in the SW $\frac{1}{4}$ of Section 3, Excelsior Township. According to a 1980 private tile map of this area in the County Engineer's office, there are two county 22" mains with the good tile located 15 feet to 20 feet west of the old main. When the County dug up the tile in 1984, their drawing does not indicate there are two mains.

Recently the Iowa Department of Natural Resources Great Lakes Wildlife Unit requested permission to complete a small wetlands project within the Drainage District No. 15 watershed. The proposed wetland restoration is on the tile Branch 0, where the 10-inch tile will outlet into the wetland basin. Construction was intended to be done in the summer or fall of 2017.

A petition was filed that a drainage study be conducted to improve drainage from the existing tile outlet in Section 9 of Excelsior Township north and easterly to benefit drainage in Sections 3, 4 and 10 of Excelsior Township. Dickinson County employees investigated the existing tile main this fall and noted there were two mains north of the acreage located in the NW $\frac{1}{4}$ of Section 10, of said Township, but only one of the mains is operational. One had been abandoned. Following submittal of the engineering report and extensive meetings, it was determined that remonstrance of the project would be met and the improvements were ultimately abandoned.

On May 19, 2020 the Dickinson County Board of Supervisors accepted the submittal of a petition regarding the condition of the existing D.D. 15 Main Open Ditch. The Board assigned Rick Hopper of Jacobson-Westergard to investigate and survey the existing ditch and its outlet for potential repairs. The following report summarizes these engineering findings.

II. STARTING POINT, ROUTE AND TERMINUS

Drainage District No. 15 Main Open Ditch outlets to natural creek on U.S. Fish and Wildlife Lands at a point 400 feet south and 275 feet east of the west quarter corner of Section 10-99-38. The outlet creek meanders southeast through the conservation lands to the southern line of said section before joining into Dugout Creek. From its outlet D.D. 15 Main Open Ditch runs northwest 480 feet to the 140th Ave (County Road M27) crossing at the west line of said section, before crossing into Section 9-99-38 at a point 300 feet south of the east quarter corner of the section. From this point the ditch runs northwest an additional 1150 feet before veering north and extending 385 feet to its end. The upstream end of D.D. 15 Main Open Ditch is notable for its headwall/notch weir above the Main Tile outlet, which is located at a point 775 feet north and 850 feet west of the east quarter corner of Section 9-99-38. From this point natural ditch outlets and meanders nearly 8500 feet to the west into Osceola County, all of which drains into D.D. 15 Main Open Ditch.

III. EXISTING SYSTEM

Drainage District No. 15 Main Open Ditch was designed with a 8-foot bottom width and side slopes of 1.5:1. The bottom slope is noted as 0.03% for the entirety of the ditch west of the 140th Ave (M27) road crossing, with no flowline grade noted for the 480 feet east of said crossing on the U.S. Fish and Wildlife Federal lands. It appears that proposed work was not previously completed on these federal lands, according to previous design plans.

The existing D.D. 15 Main Open Ditch is in varying states of disrepair. The upstream portion of the ditch, west of the county road crossing, has been recently cleaned out and the repairs are reflected in its current condition. The existing flowline through this stretch contains sediment ranging from 1 – 3 feet above the design grade. The side slopes and bottom width through this section are in good condition and would need minimal, if any, repairs.

East of the county road crossing, where the ditch runs through federal conservation lands, appears to be undisturbed from its natural state. This portion of the ditch is extremely narrow with nearly vertical side slopes and riddled with natural debris. The creek beyond the ditch outlet is in a similar state to that previously described and both stretches through the federal lands are in desperate need of repairs.

IV. PROPOSED REPAIRS

The proposed repairs to the D.D. 15 Main Open Ditch would include a cleanout of the entire system to meet original design capacities.

The upstream portion of the existing ditch west of the county road crossing would need minimal repairs consisting of primarily dipping out the ditch bottom flowline.

The portion downstream of the road crossing will require much more repairs to meet its designed capacity, and well as its outlet downstream. This portion would include cleaning out the bottom to design grade for a full 8-foot bottom and shallowing the side slopes to meet the design side slopes of 1.5:1. This work is also proposed for the ditch outlet downstream for a stretch of 570 feet, where the natural creek runs relatively straight through the federal lands.

The noted repairs would restore the D.D. 15 Main Open Ditch system to its originally designed drainage capacities and give it an unobstructed outlet downstream to meet the watershed's existing needs.

V. RIGHT OF WAY

Since this project is a repair which follows the existing course of the open ditch, no additional right-of-way will be required.

VI. COST ESTIMATES

MAIN DITCH & OUTLET REPAIR/CLEANOUT

ITEM No.	ITEM DESCRIPTION	QUANTITY	& UNIT	UNIT PRICE	TOTAL PRICE
1.	DITCH EXCAVATION	3222	C.Y.	\$9.00	\$28,998.00
2.	F&P 24" X 40' CMP SURFACE INLET	6	EACH	\$2,000.00	\$12,000.00
3.	HYDROSEEDING - DITCH SLOPE	1	ACRES	\$4,000.00	\$4,000.00

ESTIMATED TOTAL CONSTRUCTION COST	\$44,998.00
CONTINGENCIES (10%)	\$4,499.80
ENGINEERING, LEGAL, PUBLICATION	\$12,000.00
CLASSIFICATION & ANNEXATION	\$14,000.00
INTEREST	\$2,250.00
ESTIMATED TOTAL DISTRICT COST	<u>\$77,747.80</u>

AVERAGE COST PER ACRE:	\$16.20 / Acre (Based on 4800 Acres)
	\$1.30 / Acre / Year (Based on 20 years)
	\$2.10 / Acre / Year (Based on 10 years)

VII. CONCLUSION/RECOMMENDATION

As previously noted, the proposed repairs to the D.D. 15 Main Open Ditch to include a cleanout of the entire system to meet original design capacities would be our engineering recommendation.

The upstream portion of the existing ditch west of the county road crossing would need minimal excavation repairs consisting of primarily dipping out the ditch bottom flowline.

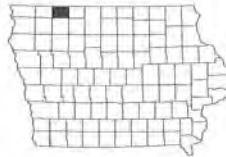
The portion downstream of the road crossing will require much more repairs to meet its designed capacity, and well as its outlet downstream. This portion would include cleaning out the bottom to design grade for a full 8-foot bottom and shallowing the side slopes to meet the design side slopes of 1.5:1. This work is also proposed for the ditch outlet downstream for a stretch of 570 feet, where the natural creek runs relatively straight through the federal lands. This repair would maximize upstream drainage capacities as well as minimizing erosion due to side slope failure that can lead to flow obstruction.

The noted repairs would restore the D.D. 15 Main Open Ditch system to its originally designed drainage capacities and give it an unobstructed outlet downstream to meet the watershed's existing needs. These proposed repairs would also greatly minimize in-channel erosion for the ditch portion located east of the county road and improve water quality downstream.

PRELIMINARY ENGINEERING REPORT DRAINAGE DISTRICT No. 15 MAIN DITCH/OUTLET REPAIR

Dickinson County, Iowa

Vicinity Map
Not to Scale



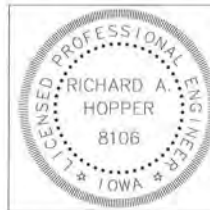
BOARD OF SUPERVISORS:

William Leupold
Steve Clark
Tim Fairchild
Kim Wermersen
Jeffery Thee

Lori Pederson, Auditor
Jordan Moyer, Drainage Clerk

INDEX OF SHEETS

SHEET A.01 - TITLE
SHEET A.02 - SITE PLAN
SHEETS D.01-D.04 - PLAN & PROFILE



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Richard A. Hopper Date 3/19/2021
Richard A. Hopper, P.E.
License number 8106
My license renewal date is December 31, 2021
Pages or sheets covered by this seal:
A.01, A.02, D.01 - D.04

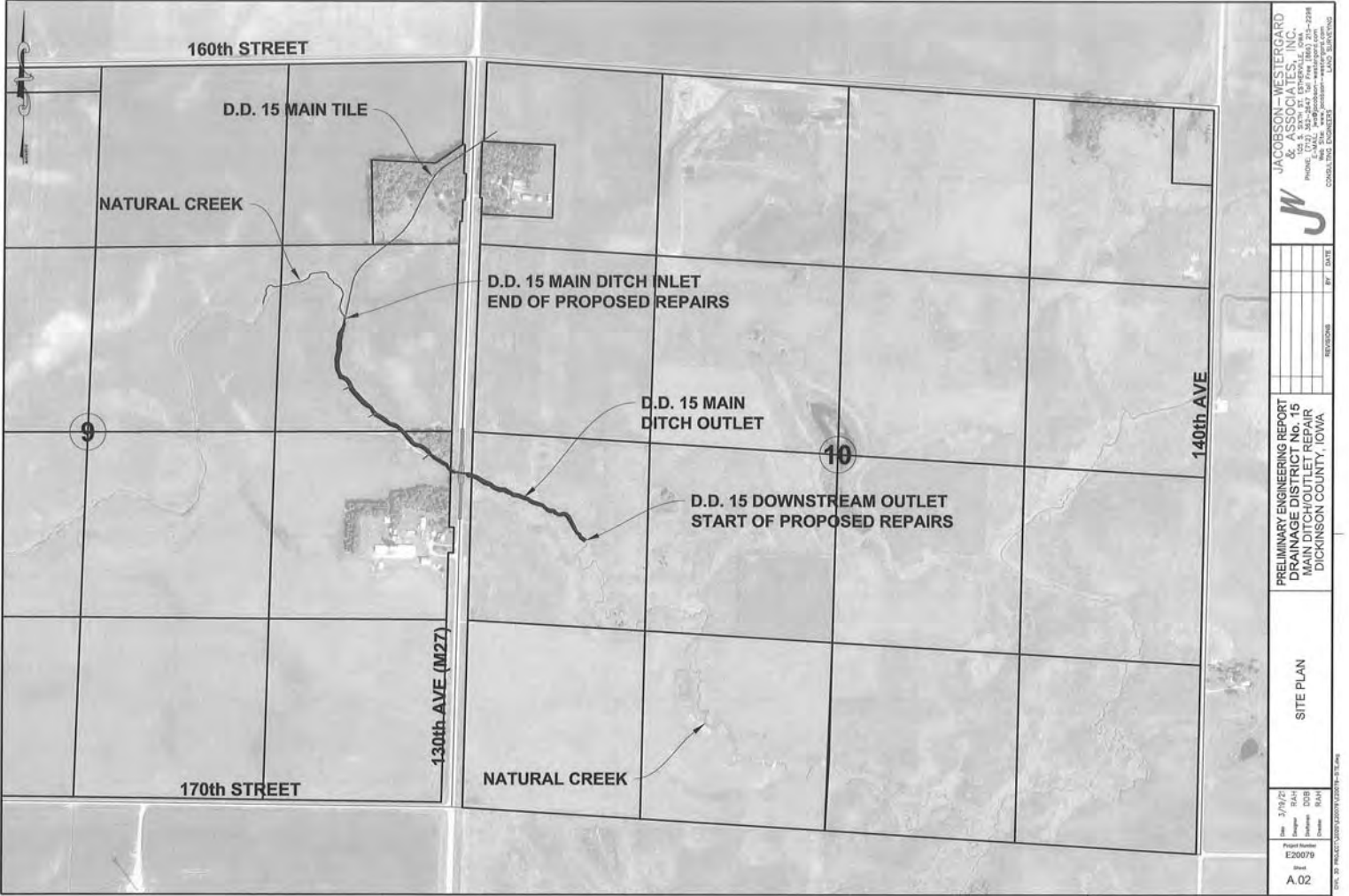
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CONSULTING ENGINEERS



PRELIMINARY ENGINEERING REPORT
DRAINAGE DISTRICT No. 15
MAIN DITCH/OUTLET REPAIR
DICKINSON COUNTY, IOWA

TITLE
A.01

DATE: 03/19/2021 09:52:34 AM



JACOBSON - WESTERGARD & ASSOCIATES, INC.
 PROFESSIONAL ENGINEERS
 PROJECT: 130th AVE DITCH/OUTLET REPAIR
 130th AVE, WESTGARD, IOWA 50478-1008
 PHONE: 515.338.4477
 FAX: 515.338.4478
 WWW: www.jacobson-westergard.com

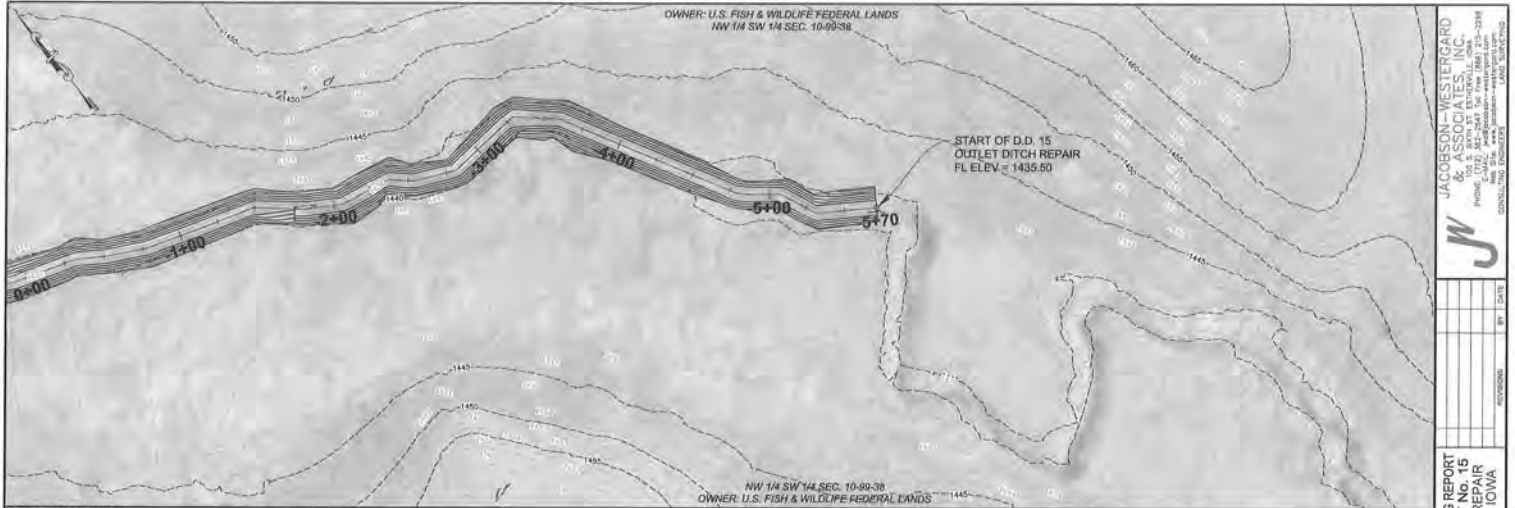
BY: DATE	REVISIONS

PRELIMINARY ENGINEERING REPORT
 DRAINAGE DISTRICT NO. 15
 MAIN DITCH/OUTLET REPAIR
 DICKINSON COUNTY, IOWA

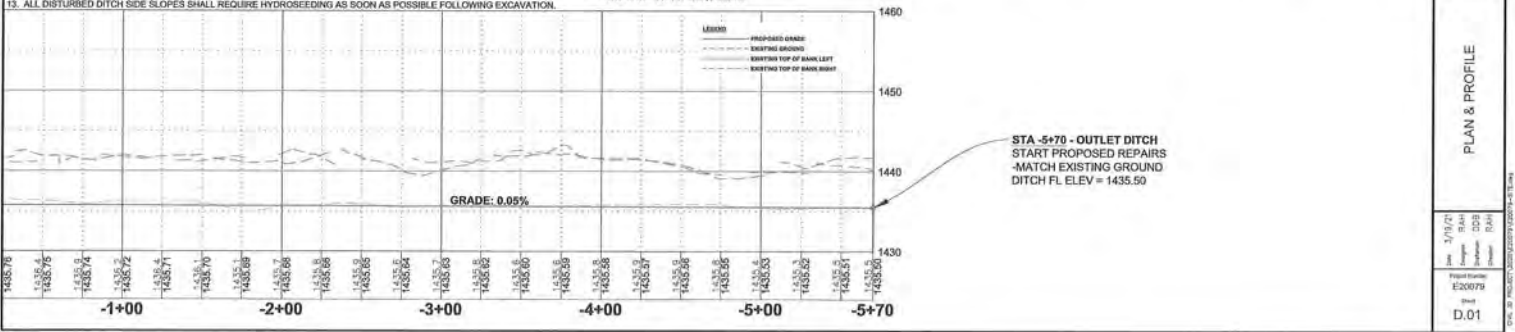
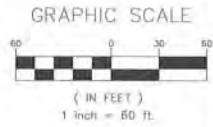
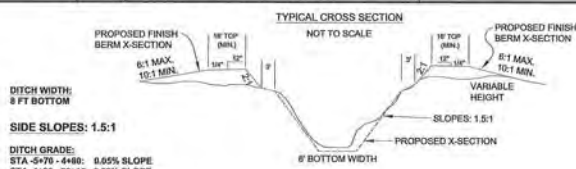
SITE PLAN

DATE: 8/17/10
 DRAWN BY: R.A.H.
 CHECKED BY: D.O.B.
 PROJECT NUMBER: E29079
 SHEET: A.02

APP. OF PLAN: 130th AVE DITCH/OUTLET REPAIR



- DITCH EXCAVATION NOTES:**
- EXCAVATION INCLUDES THE REMOVAL OF SPOILS FROM ALL STRUCTURES IN THE PROPOSED OPEN DITCH.
 - THE CONTRACTOR IS RESPONSIBLE FOR MAKING ALL "ONE-CALL" REQUIREMENTS FOR THIS PROJECT.
 - CONTRACTOR REQUIRED TO ACQUIRE AND CARRY SPECIAL USE PERMIT FOR WORK ON FEDERAL LANDS AND MUST NOTIFY ED MEENDERING (PH: 515-928-2523) OR CHRIS LARUE (PH: 712-330-4543) A MINIMUM OF TWO DAYS PRIOR TO WORK.
 - ALL WORK ON FEDERAL LANDS SHALL BE DONE FROM ONE SIDE OF DITCH, WHEREVER FEASIBLE.
 - CONTRACTOR SHALL SEED ALL DISTURBED GROUNDS OUTSIDE OF DITCH SLOPES ON FEDERAL LANDS WITH BROME GRASSES FOLLOWING EXCAVATION AND LEVELING.
 - ANY DAMAGES TO EXISTING PIPELINES, UTILITY OR DRAIN TILE SHALL BE RESPONSIBILITY OF CONTRACTOR.
 - WORK ON FEDERAL LANDS SHALL NOT TAKE PLACE MAY 15 THROUGH AUGUST 1.
 - EXCAVATED SPOILS SHALL BE USED TO CREATE A LEVELED BERM ALONG EACH SIDE OF DITCH.
 - SURROUNDING SURFACES SHALL BE SHAPED TO OUTLET INTO ALL SURFACE INLETS.
 - ALL LEVELED SPOILS WILL REQUIRE A MINIMUM OF SIX INCHES OF TOPSOIL SPREAD AT SURFACE.
 - ALL DITCH EXCAVATION MUST BE DONE IN A MANNER TO MINIMIZE EROSION OF THE PROPOSED DITCH.
 - DISSIMILAR TYPES OF PIPE SHALL BE CONNECTED WITH A DP COUPLER, FROM MANHOLE OR PRE-APPROVED EXCAVATION.
 - ALL DISTURBED DITCH SIDE SLOPES SHALL REQUIRE HYDROSEEDING AS SOON AS POSSIBLE FOLLOWING EXCAVATION.



OWNER: U.S. FISH & WILDLIFE FEDERAL LANDS
NW 1/4 SW 1/4 SEC. 10-00-38

START OF D.D. 15
OUTLET DITCH REPAIR
FL ELEV = 1435.60

NW 1/4 SW 1/4 SEC. 10-00-38
OWNER: U.S. FISH & WILDLIFE FEDERAL LANDS

J
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PRELIMINARY ENGINEERING REPORT
DRAINAGE DISTRICT NO. 15
MAIN DITCH/OUTLET REPAIR
DICKINSON COUNTY, IOWA

PLAN & PROFILE

Date: 1/19/07
By: BAA
Checked: DDB
Reviewed: BAA

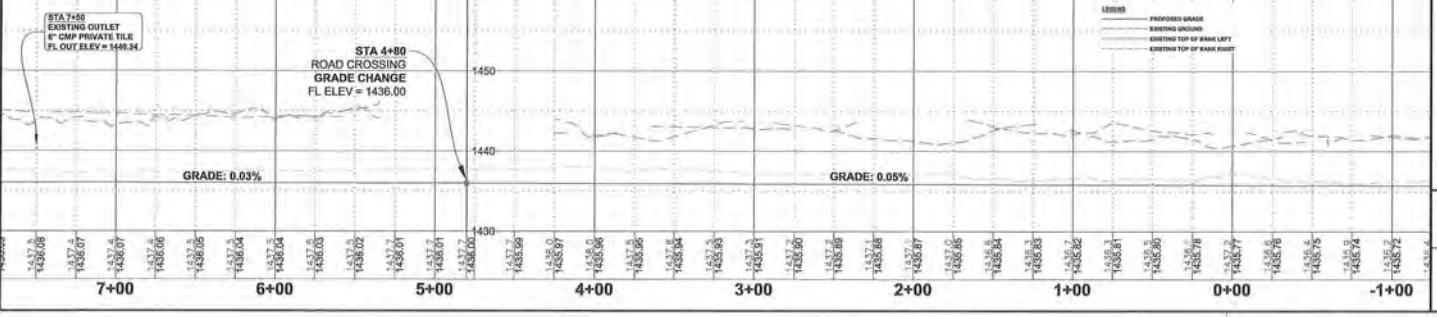
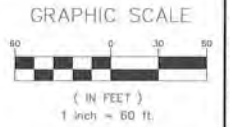
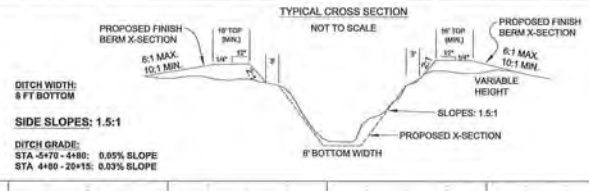
Project Number:
E20079

Sheet:
D.01

DATE: 01/19/07 10:52:59 AM 10/20/06 10:32:04 AM



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 - ALL DISTURBED DITCH SIDE SLOPES SHALL REQUIRE HYDROSEEDING AS SOON AS POSSIBLE FOLLOWING EXCAVATION.

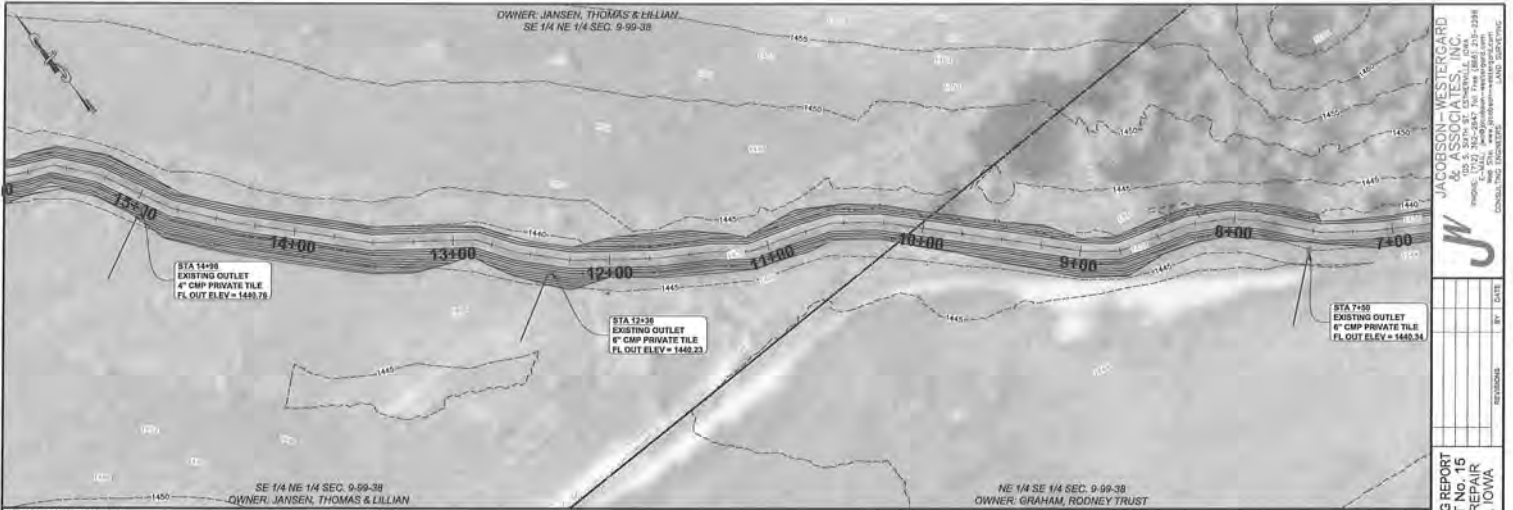


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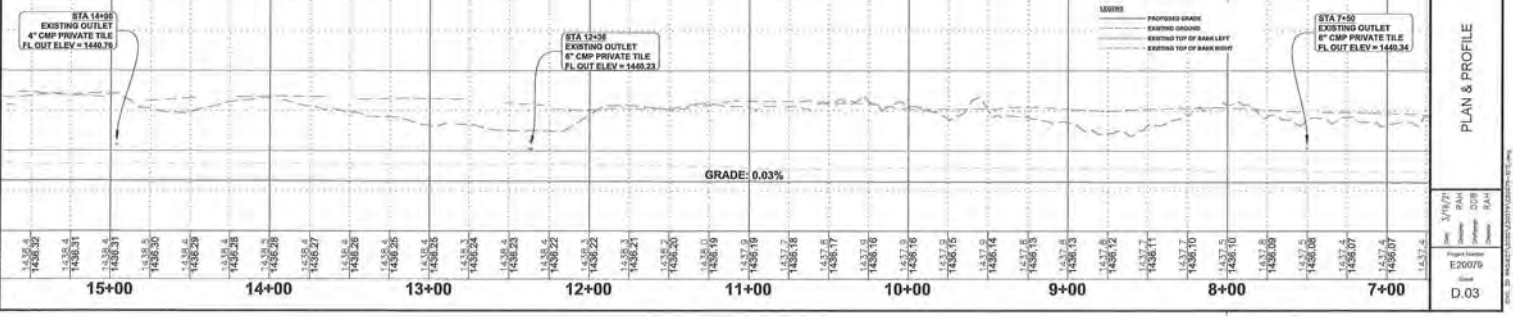
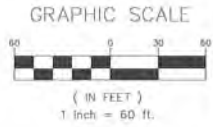
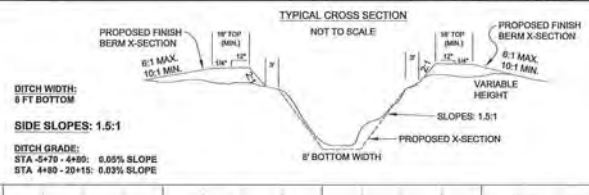
PRELIMINARY ENGINEERING REPORT
DRAINAGE DISTRICT NO. 15
MAIN DITCH/OUTLET REPAIR
DICKINSON COUNTY, IOWA

PLAN & PROFILE

Date: 11/11/07
Scale: 3/4" = 1'-0"
Drawing No: D.02
Sheet: 002
Project Number: E20079
By: [Signature]
Checked: RAJ
Title: [Signature]



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 - DISSIMILAR TYPES OF PIPE SHALL BE CONNECTED WITH A 90° COUPLER, FROM MARMAC OR PRE-APPROVED EQUAL.
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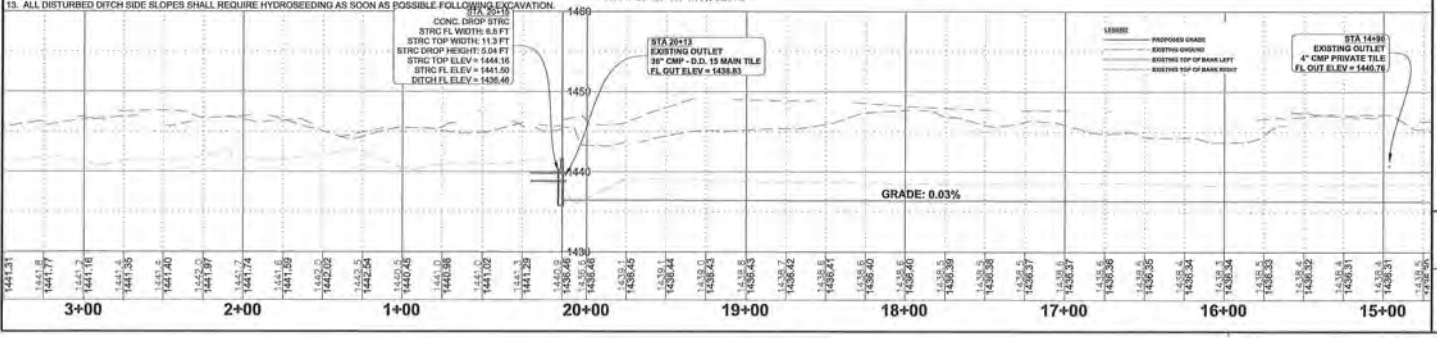
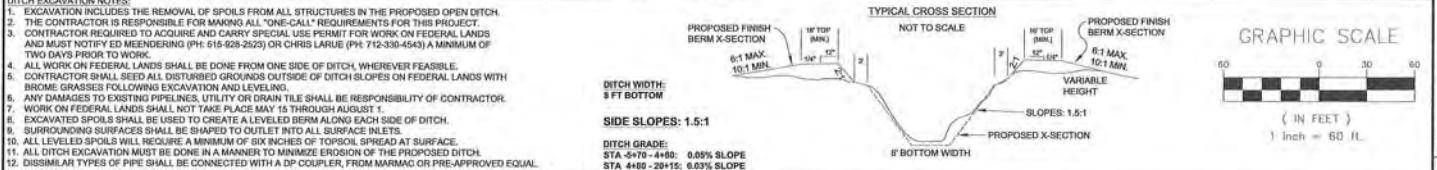
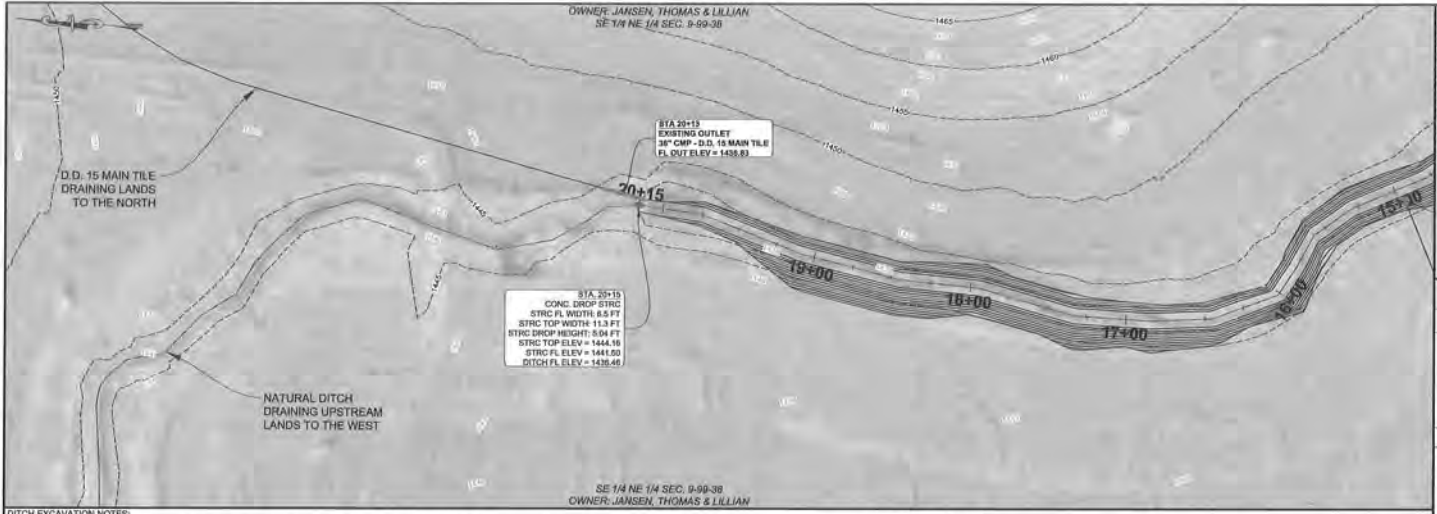


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PRELIMINARY ENGINEERING REPORT
DRAINAGE DISTRICT NO. 15
MAIN DITCH/OUTLET REPAIR
DICKINSON COUNTY, IOWA

DATE: 1/19/07
 DRAWN BY: BAW
 CHECKED BY: BAW
 IN CHARGE: BAW

PROJECT NO.: D.03



DITCH EXCAVATION NOTES:

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- DISSIMILAR TYPES OF PIPE SHALL BE CONNECTED WITH A 3" COUPLER FROM MARIANO OR PRE-APPROVED EQUAL.
- ALL DISTURBED DITCH SIDE SLOPES SHALL REQUIRE HYDROSEEDING AS SOON AS POSSIBLE FOLLOWING EXCAVATION.

LEGEND:

- PROPOSED GRADE
- EXISTING OPENING
- EXISTING TOP OF BANK LEFT
- EXISTING TOP OF BANK RIGHT

PROJECT INFORMATION:

Project Number: E20079
 Date: 03/27/2018
 Scale: 1" = 60'
 Sheet: 003
 Title: PLAN & PROFILE
 D.04

JW
JACOBSON-WESTERGARD & ASSOCIATES, INC.
 ENGINEERS, ARCHITECTS, PLANNERS
 1000 WEST 12TH STREET, SUITE 200
 DES MOINES, IOWA 50319
 PHONE: 515-281-1111 FAX: 515-281-1112
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BY: [Signature] DATE: [Date]
 CHECKED: [Signature]
 APPROVED: [Signature]

PRELIMINARY ENGINEERING REPORT
 DRAINAGE DISTRICT No. 15
 MAIN DITCH/OUTLET REPAIR
 DICKINSON COUNTY, IOWA