



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

105 South 6th Street  
Estherville IA 51334  
Phone (712) 362-2647  
www.jacobson-westergard.com

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**PRELIMINARY ENGINEERING REPORT**

**DRAINAGE DISTRICT NO. 92  
MAIN OPEN DITCH IMPROVEMENT  
WINNEBAGO COUNTY, IOWA**

**PROJECT NO: E22075**

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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.

*Collin Klingbeil*

Date 8/24/22

Collin J. Klingbeil, P.E.

License number 24741

My license renewal date is December 31, 2023

Pages or sheets covered by this seal:  
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## **I. INTRODUCTION/HISTORY**

### **A. Scope**

A petition was filed in Drainage District No. 92 (DD103) of Winnebago County, Iowa with the Board of Supervisors on December 30<sup>th</sup>, 2021. The petition requests the removal of approximately 450 feet of 48" concrete pipe that is located in Section 26 of Norway Township (T-100-N, R-23-W). The Main Open Ditch of DD92 exists both upstream and downstream of the pipe. The pipe is thought to restrict flow through the ditch. The Board appointed Jacobson-Westergard & Associates, Inc. to complete the necessary survey, study, plan, and report. This report addresses the petition.

### **B. History**

A full history of this large drainage district, with over twenty ditch and tile facilities is not relevant to this project. A brief history relating to this project is discussed below.

A petition for the establishment of Drainage District No. 92 was filed June 17<sup>th</sup>, 1919, and the Winnebago County Board of Supervisors appointed O. N. Gjellefald as engineer. The Engineer's Report was filed on February 6<sup>th</sup>, 1920 recommending the district be established and the drains be constructed. However, although the district was established, all bids for the work proposed were rejected. Another petition was filed on November 8, 1943 and O. G. Rislow was appointed as the engineer for the district. The plan was accepted, the drains were constructed, and right-of-way was acquired. The plan included installation of 372 feet of 48" reinforced concrete pipe for a portion of the Main Open Ditch.

## **II. EXISTING DITCH STARTING POINT, ROUTE AND TERMINUS**

**The Main Open Ditch** for DD92 outlets into a marsh in the Hogsback Wildlife Management Area (WMA) in Section 21 of Norway Township (T-100-N, R-23-W). From its outlet it extends approximately 9,200 feet generally southeast prior to reaching the area of the 48" diameter reinforced concrete pipe. The ditch has a design bottom width of 6 feet, with a side (bank) slope of one foot to one foot. The Main Open Ditch continues upstream from the 48" diameter pipe.

## **III. INVESTIGATION**

A survey was made of the area of the 48" pipe in Drainage District No. 92 (DD92) in June 2022. In addition, drainage district meeting minutes, Engineer's reports, plats, plans, and profiles, etc. were reviewed.

The design standard for an agricultural open ditch is water level at least 1 foot below fields after a 2-year 48-hr storm. We estimate that the area draining to the existing 48" diameter pipe is 2,955 acres. Based on charts in the Iowa Drainage Manual, the 2-year 48-hr flow in the ditch is 90 cubic feet per second (cfs). Based on regression equations developed by the United States Geological Survey (USGS), the 2-year 24-hr storm flow in the ditch is 102 cfs.

Based on survey data acquired, it appears as though the grade of the pipe is approximately 0.13%. Under gravity flow the pipe capacity is thus 61 cfs. In order to pass the much higher design ditch flows, the water levels on the upstream side of the culvert must increase to push the water through. We estimate that under design flow conditions the water depth would need to be at least 7 feet deep in the ditch on the upstream side of the culvert. This backs water further up the ditch, negatively affecting drainage.

## **IV. PROPOSED IMPROVEMENTS**

We recommend replacement of the approximately 450 ft reach of existing 48" diameter reinforced concrete pipe with open ditch.

For the open ditch, we recommend a bottom width of 6 feet, consistent with the remainder of the DD92 Main Open Ditch. We recommend bank slopes of two feet (horizontal) to one foot (vertical), consistent with the Iowa Regional Conditions for Nationwide Permits for newly constructed channels. The banks will also be required to be seeded with a native grass mixture.

Excavating an open ditch will result in a significant amount of spoils. The spoils can be used to fill a portion of the existing ditch at the north end of the work area, at the downstream end of the existing 48" culvert. It is our understanding that the remaining spoils are to be spread and leveled in designated areas, rather than leveling the spoils along the ditch (and creating a berm). All disturbed areas on existing grasslands will be re-seeded with a native grass mix. We note that hauling and leveling the spoils in this nature will add significant expense to the project (over \$20,000).

We recommend crushing the existing 48" pipe in place. Abandoning it outside the proposed alignment of the new ditch channel would be cheaper and is also an option.

The proposed channel cuts through an existing parking lot for the Larson-Tweed Wildlife Area. As part of this project we recommend re-locating the parking lot, and constructing a new access lane. It would be located approximately 825 feet east of the intersection of 470<sup>th</sup> St and County Road R74 (220<sup>th</sup> Ave) on the north side of 470<sup>th</sup> St. Another access lane would be needed approximately 240 feet north of the 60" diameter culvert under County Road R74 (220<sup>th</sup> Ave) to allow access to the property.

We did not do an extensive survey of the open ditch, but we note significant siltation just downstream from this site. Over 3 feet of silt was found about 100 feet west of County Road R74 (220<sup>th</sup> Ave). The improvements associated with replacing the 48" culvert with an open ditch will be minimal if the remainder of the ditch is not in a good state of repair.

## **V. RIGHT-OF-WAY**

Right-of-way will need to be acquired for the proposed open ditch. Lands within drainage district right-of-way are not subject to real estate taxes or drainage district assessments, but are not eligible for damage reimbursement for damages within the right-of-way. Any damages caused in the process of maintenance, repair, improvement, or inspection outside the right-of-way is eligible for damage reimbursement.

We recommend acquiring a 100 ft width of right-of-way, centered on the proposed open ditch channel. We estimate the area of right-of-way needed to be approximately 1 acre, owned by Winnebago County. There are procedures in Iowa Code for acquisition of right-of-way in drainage districts, that includes appointing three appraisers to assess damages, a report, and a hearing. Instead, in this case we are hopeful that a voluntary right-of-way acquisition agreement with Winnebago County can be reached, which would lower project costs.

## **VI. COST ESTIMATE**

### **SECTION 1: CONSTRUCTION ASSESSABLE TO PRIVATE LANDS**

<b>ITEM NO.</b>	<b>ITEM DESCRIPTION</b>	<b>QUANTITY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL PRICE</b>
1	Open Ditch Excavation	7,075	CY	\$3.00	\$21,225
2	Spoil Transport & Leveling	7,075	CY	\$4.00	\$28,300
3	Seed Open Ditch, Native Grass Mix	6	STA	\$300	\$1,800
4	Seed Spoil Disposal Areas, Native Grass & Forb Mix	1.25	AC	\$3,000	\$3,750
5	Crush in Place, 48" RCP Culvert	440	LF	\$35	\$15,400
6	Construct/Improve Access Lane	2	EA	\$3,000	\$6,000
7	Access Lane Culverts, 15" Dia, CMP	70	LF	\$40	\$1,600
8	Granular Surfacing	40	TN	\$30	\$1,200
9	Mobilization	1	LS	\$3,000	\$,3000

ESTIMATED SECTION 1 COST: \$84,000

**ESTIMATED SUBTOTAL CONSTRUCTION COST: \$84,000**

**CONSTRUCTION CONTINGENCIES \$8,000**

**ESTIMATED TOTAL CONSTRUCTION COST \$92,000**

<b>NON-CONSTRUCTION COSTS</b>	
ENGINEERING – (REPORT, HEARINGS, PERMITS, PLANS & SPECS, BID LETTING, CONSTRUCTION INSPECTION & ADMINISTRATION, COMPLETION)	\$20,000
LEGAL, PUBLICATIONS, MAILINGS, ETC.	\$1,000
RIGHT-OF-WAY ACQUISITION	\$0
INTEREST	\$6,000

**ESTIMATED TOTAL DISTRICT COST      \$119,000**

AVG COST PER ACRE FOR DD92 (BASED ON 3,152.71 ACRES & \$240,000):      \$37.75

AVERAGE COST PER ACRE PER YEAR AT 5% INTEREST FOR 10 YEARS:      \$4.89

AVERAGE COST PER ACRE PER YEAR AT 5% INTEREST FOR 20 YEARS:      \$3.03

**VII. ASSESSMENT SCHEDULE REVIEW**

The existing Main Open Ditch assessment schedule of Drainage District No. 92 includes a total of 3,152.71 acres of land in Winnebago County, Iowa. The district was re-classified in 2019. The costs of this proposed improvement should be assessed against the existing Main Open Ditch schedule of Drainage District No. 92.

**VIII. FARM PROGRAM WETLAND COMPLIANCE**

If any farmed wetlands exist on your property within Drainage District No. 92, the proposed project is not likely to be (but could be) considered by the NRCS to be a conversion and place you in jeopardy of being in violation of farm program rules and may be required to forfeit and/or refund farm program payments received after the work commences.

If the improvements are constructed and you have farmed wetlands that are converted, your options are to either cease farming the wetland acres or purchase mitigation credits through a wetland mitigation bank. The current fee is approximately \$15,000 - \$20,000 per acre. If you believe the wetland determination to be in error, you may request a review by the NRCS.

It is solely the responsibility of the landowner to keep themselves in farm program compliance.

A wetland determination in the project area has been completed, and we will ensure that no spoils are placed in wetlands.

**IX. PERMITTING**

A permit may be required by the Iowa Department of Natural Resources (DNR) and/or the United States Army Corps of Engineers (USACE). A permit application was submitted to both agencies on August 3<sup>rd</sup>, 2022. We have since been informed that a DNR floodplain permit is not required. We do not anticipate any major issues in obtaining a USACE permit, if necessary.

**X. CONCLUSION/RECOMMENDATIONS**

This report confirms that the replacement of the 48” diameter reinforced concrete pipe with open ditch would be a benefit to the lands in the district, and we recommend moving forward with the proposed improvement.

We also recommend proceeding with the acquisition of right-of-way required for the new reach of Main Open Ditch. This may be done voluntarily, or through the procedures outlined in Iowa Code Chapter 468, which includes the appointment of appraisers, a report, and a hearing. We recommend to proceed with right-of-way acquisition.

The Board of Supervisors, as trustees, for Drainage District No. 92, should tentatively approve this report and set a date for a public hearing. At the hearing, the trustees should seek input from landowners. Once modifications to the report are made, if any, the proposed improvement project should be approved, the engineer should be directed to develop plans and specifications and proceed toward bid letting, and the engineer should be directed to proceed with right-of-way acquisition.

Sincerely,

**JACOBSON-WESTERGARD & ASSOCIATES INC.**



Collin J. Klingbeil, P.E.

Encl.   Petition  
          Preliminary Plans

**PETITION FOR REPAIRS**

DATE: 12-30-21

I wish to call your attention to the necessity for  
necessity for repair to Drainage District

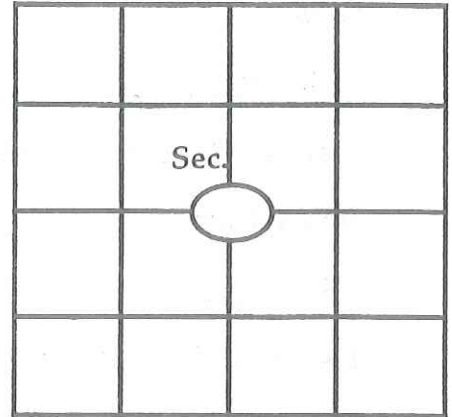
No. 92 Lat. No. Main Ditch

which is located in Section 26

Township Norway, Range \_\_\_\_\_

Owner/Tenant: Gorden Anderson Jr

Phone: 641-590-2118



Location: \_\_\_\_\_

Removal of 48" Concrete Pipe  
Repair Requested:

Approved by Supervisor: \_\_\_\_\_

**MATERIALS USED**

Quantity	Item	Size	Source

**LABOR**

Man Hours: \_\_\_\_\_ Machine Hours: \_\_\_\_\_

Repaired by: \_\_\_\_\_ Date Completed: \_\_\_\_\_

**OFFICE USE ONLY**

\_\_\_\_\_ Update Inventory

\_\_\_\_\_ To be billed

\_\_\_\_\_ Completed

\_\_\_\_\_ No Charge

Location:

Section \_\_\_\_\_ Township \_\_\_\_\_

1/4 Sec \_\_\_\_\_ Flagged yes  no

Has One Call been contacted? yes  no

If yes, Date \_\_\_\_\_ Confirm# \_\_\_\_\_

\* Soil type A  B  C

Depth of Excavation \_\_\_\_\_ FT

Length of Trench \_\_\_\_\_ FT

Number of Exits \_\_\_\_\_

Safety Plan  Slope sides

Shoring

Shoring Plan \_\_\_\_\_

Slope Plan Type A - 3/4:1

Type B - 1:1

Type C - 1-1/2:1

*Brad Hotwell*

*Dave Hanson*

*Al Flynn*

*David Helgeson*

*Mike Helgeson*

*Jim Lytle*

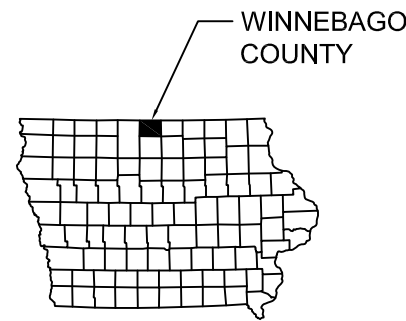
*David Hanson*





# 2022 DRAINAGE DISTRICT No. 92 REPLACE CULVERT WITH CHANNEL

Winnebago County, Iowa



**BOARD OF SUPERVISORS:**

Susan Smith  
Terry Durby  
Bill Jensvold

Karla Weiss, Auditor  
Kris Oswald, Drainage Clerk

**INDEX OF SHEETS**

SHEET A.01 - TITLE  
SHEET D.01 - PLAN & PROFILE - OPEN DITCH  
SHEET D.02 - PLAN - ACCESS LANE



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.

*Collin Klingbeil*

Date *8/24/22*

Collin J. Klingbeil, P.E.  
License number 24741  
My license renewal date is December 31, 2023

PROJECT DATUM: NAD 1983 UTM ZONE 15N

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Web Site: [www.jacobson-westergard.com](http://www.jacobson-westergard.com)  
CONSULTING ENGINEERS LAND SURVEYING

REVISIONS	BY	DATE

DRAINAGE DISTRICT No. 92  
REPLACE CULVERT WITH CHANNEL  
WINNEBAGO COUNTY, IOWA

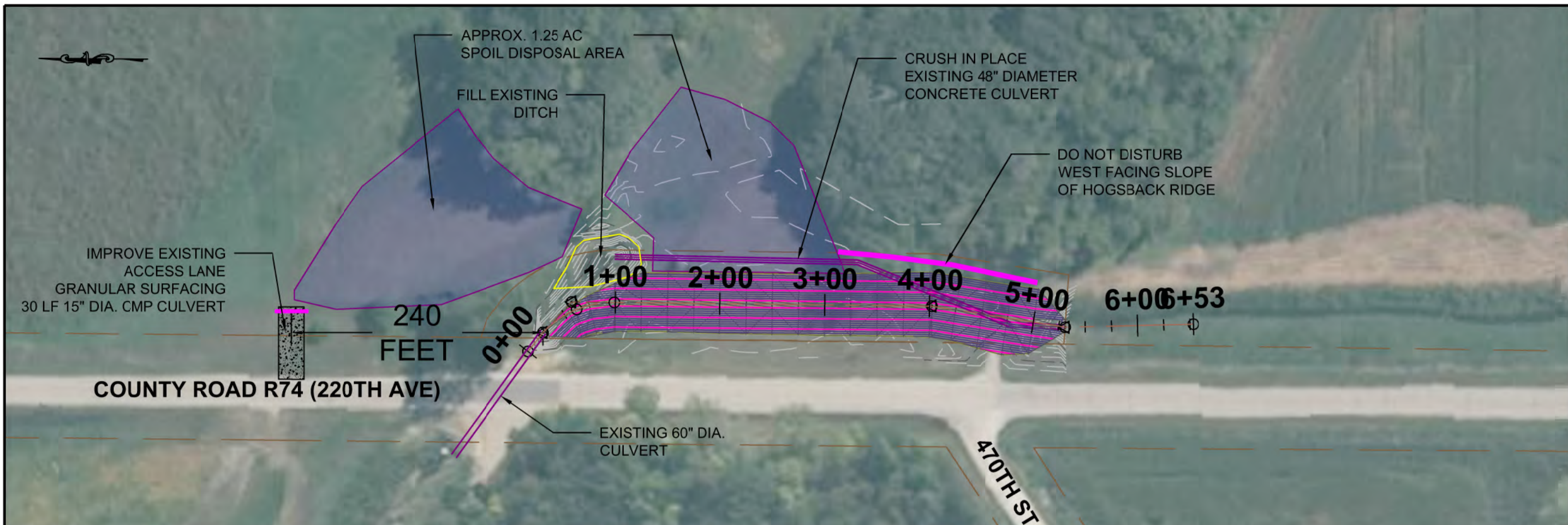
TITLE SHEET

Date	Designer	Checker
8/2/22	CKJ	CKJ

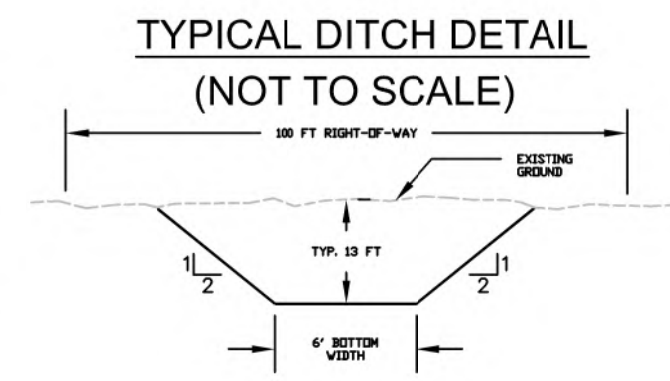
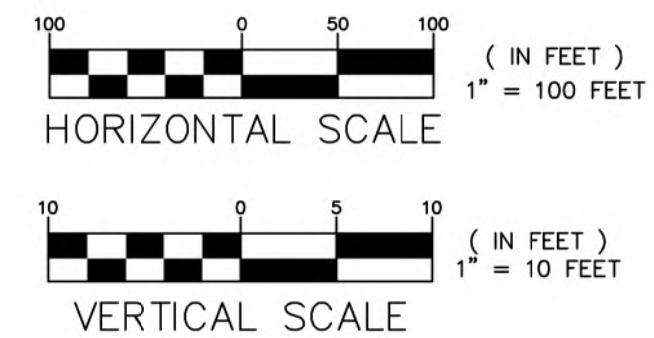
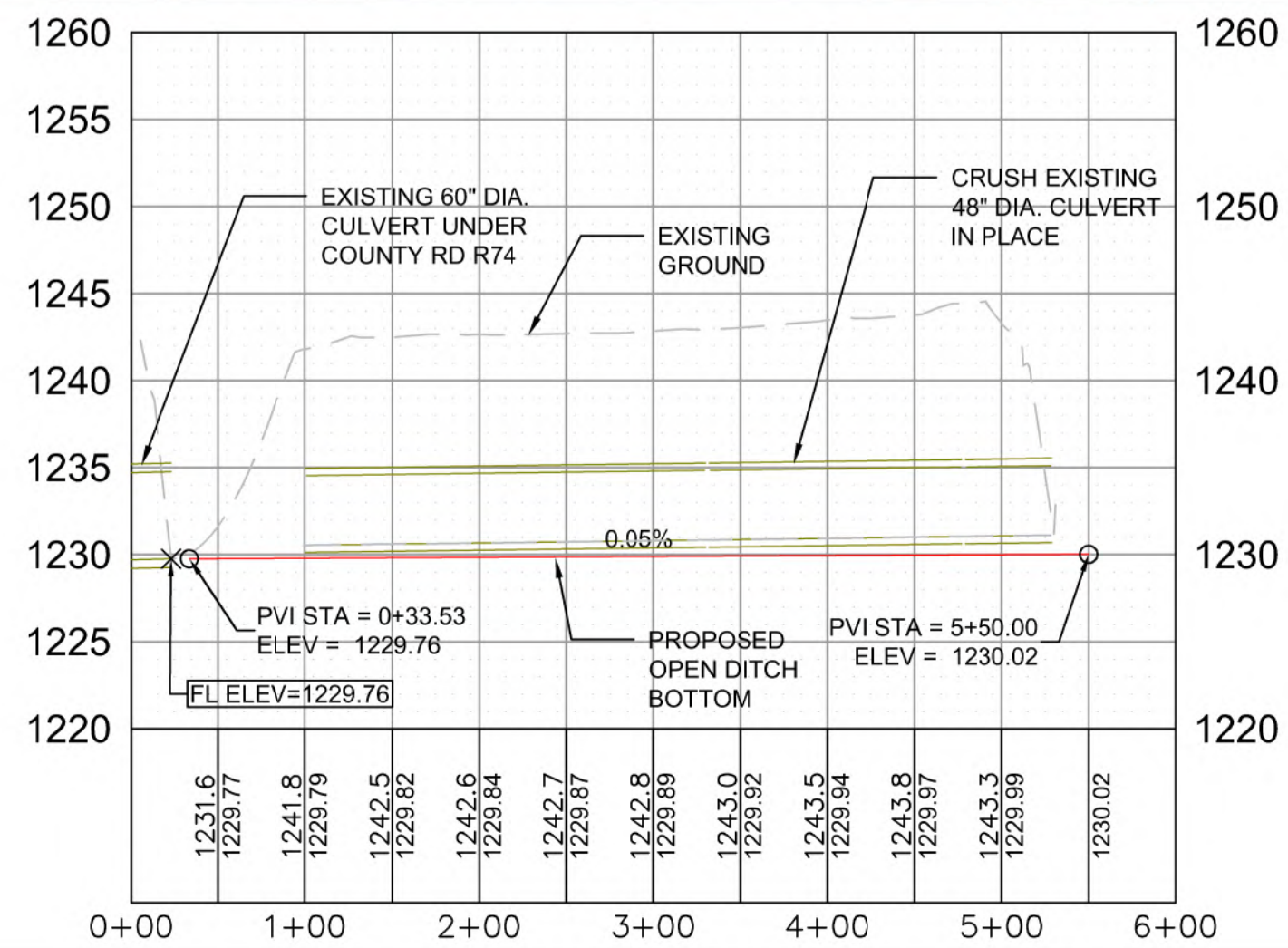
Project Number

Sheet  
A.01





- NOTES:**
- 7,075 CY OF CHANNEL EXCAVATION, INCLUDING 6" OVERDIG TO ACCOMMODATE FOR INITIAL SILTATION.
  - EXCAVATE CHANNEL TO ELEVATIONS SHOWN IN PROFILE AND DIMENSIONS SHOWN IN TYPICAL DITCH DETAIL
  - FILL DITCH SECTION SHOWN IN PLAN VIEW, APPROX. 600 CY.
  - SPOILS TO BE EVENLY SPREAD IN AREAS DESIGNATED SHOWN, OR AS OTHERWISE APPROVED BY THE ENGINEER.
  - BANKS OF NEW CHANNEL TO BE SEEDED WITH NATIVE GRASS MIX.  
 SWITCHGRASS = 2 LB/AC PLS  
 BIG BLUESTEM = 4 LB/AC PLS  
 LITTLE BLUESTEM = 3 LB/AC PLS  
 CANADA WILD RYE = 4 LB/AC PLS  
 INDIAN GRASS = 4 LB/AC PLS  
 NURSE CROP = 50 LB/AC  
 (OATS APR 1 - JUL 15, WINTER WHEAT JUL 16 - FROZEN GROUND)
  - AREAS OF SPOIL DISPOSAL TO BE RE-SEEDED WITH IA CP42 LEOPOLD #1 POLLINATOR 10/30 MIX OR OTHER MIX APPROVED BY WINNEBAGO COUNTY CONSERVATION.



**J**

**JACOBSON - WESTERGARD & ASSOCIATES, INC.**  
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 Web Site: www.jacobson-westergard.com  
 CONSULTING ENGINEERS LAND SURVEYING

NO.	REVISIONS	BY	DATE

DRAINAGE DISTRICT No. 92  
 REPLACE CULVERT WITH CHANNEL  
 WINNEBAGO COUNTY, IOWA

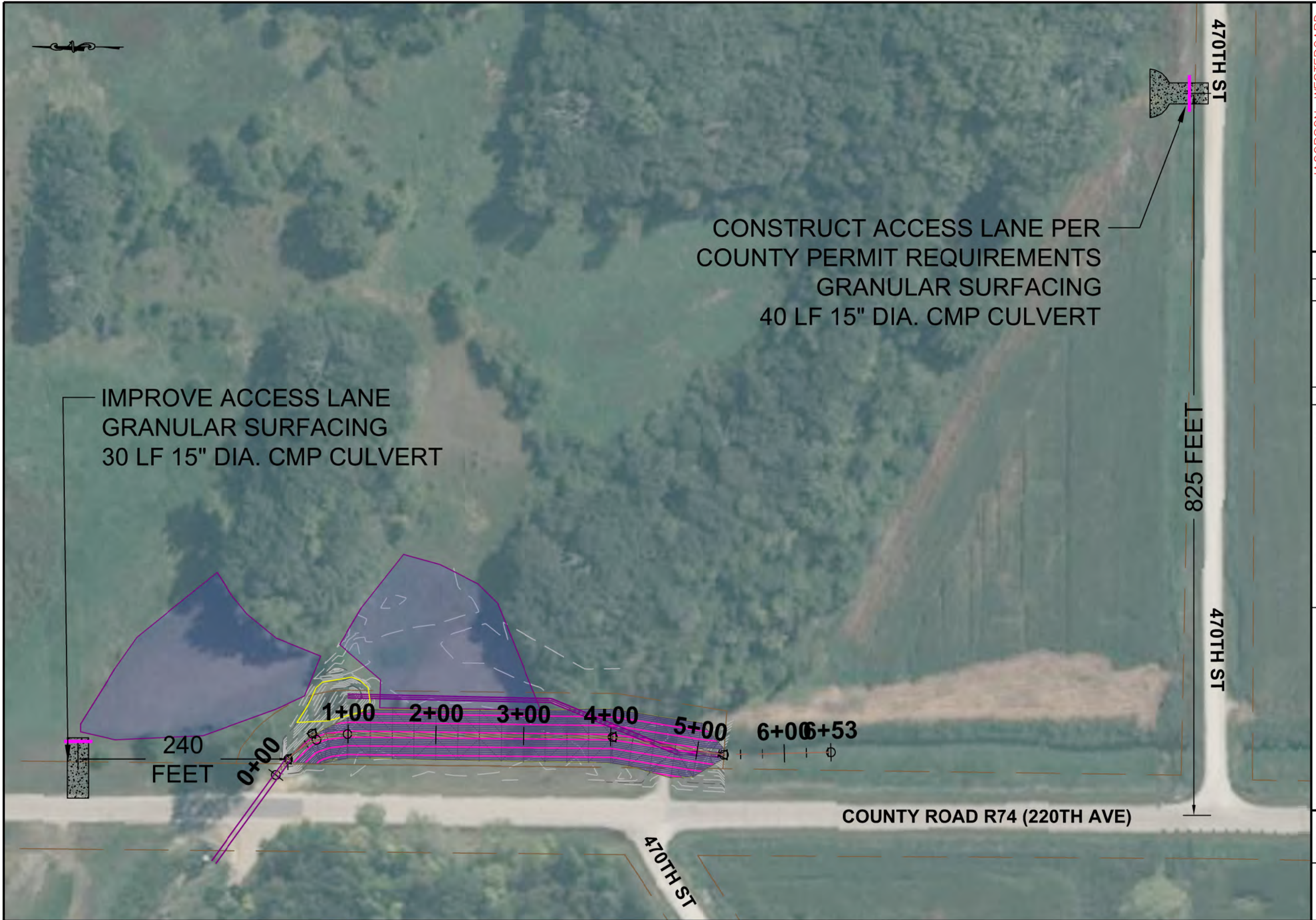
PLAN & PROFILE - OPEN DITCH

Date	8/13/22
Designer	CJK
Draftsman	CJK
Checker	CJK

Project Number  
 E22075  
 Sheet  
 D.01

S:\CH 30 Project\2022\E22075\22075\_BASE2.dwg





IMPROVE ACCESS LANE  
 GRANULAR SURFACING  
 30 LF 15" DIA. CMP CULVERT

CONSTRUCT ACCESS LANE PER  
 COUNTY PERMIT REQUIREMENTS  
 GRANULAR SURFACING  
 40 LF 15" DIA. CMP CULVERT

240  
 FEET

0+00 1+00 2+00 3+00 4+00 5+00 6+00 6+53

825 FEET

COUNTY ROAD R74 (220TH AVE)

470TH ST

470TH ST

**JW**  
**JACOBSON - WESTERGARD & ASSOCIATES, INC.**  
 105 S. SIXTH ST. ESTHERVILLE, IOWA  
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 CONSULTING ENGINEERS LAND SURVEYING

REVISIONS	BY	DATE

DRAINAGE DISTRICT No. 92  
 REPLACE CULVERT WITH CHANNEL  
 WINNEBAGO COUNTY, IOWA

PLAN - ACCESS LANES

Date	8/3/22
Designer	CJK
Draftsman	CJK
Checker	CJK

Project Number  
 E22075  
 Sheet  
 D.02