



**JACOBSON-WESTERGARD & ASSOCIATES, INC.**  
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**PRELIMINARY ENGINEERING REPORT**

**PROPOSED  
DRAINAGE DISTRICT NO. 92  
DICKINSON COUNTY, IOWA**

**JWA PROJECT NO: E16109**



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 1/16/17

Richard A. Hopper, P.E., License number 8106

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: Title, Pg 1-4, location map

## **I. INTRODUCTION/HISTORY**

A petition was filed July 26, 2016 calling for the establishment of a drainage district commencing in Section 29 of Okoboji Township and running thence north and easterly to Section 18 of Okoboji Township.

Installation of a tile system would be accomplished by following the Code of Iowa as it relates to the establishment of a drainage district. This district would be called Drainage District No. 92 (DD#92), Dickinson County.

There are no existing drainage districts close to the proposed drainage district.

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

The starting point for improvements being studied is approximately 822 feet north of the southwest corner of Section 16-98-37. The route would then go slightly northeast 1433 feet before turning south, southeast approximately 3,326 feet to a point located 403 feet north and 675 feet west of Section 21-98-37.

The route then goes approximately 668 feet slightly northeast before turning 1164 feet southeast, then 1106 feet directly south before turning back 810 feet southwest to a point 1845 feet south of the center of said Section 21. The route will continue south approximately 1710 feet, while crossing 240<sup>th</sup> Street before it turns back southwest 1708 feet to a point located 1338 feet south and 1033 feet east of the northwest corner of Section 28-98-37. It will then turn south approximately 1327 feet before again turning southwest approximately 4300 feet and outletting into an existing intermittent stream at a location 2700 feet west and 670 feet north of the southwest corner of said Section 28.

## **III. EXISTING SYSTEM**

All drainage in the proposed drainage district is now provided by surface flow to an existing waterway. The drainage is very inadequate. The proposed improvements would improve drainage.

## **IV. PROPOSED IMPROVEMENTS**

The proposed improvements have been designed for a 1/2" and 1" drainage coefficient. Cost estimates for both options follow in this report. See the enclosed plan and profile sheets for the lengths and sizes of the pipe.

## **V. RIGHT OF WAY**

Right-of-way must be obtained for the proposed improvements to be constructed. The right-of-way will include both temporary construction right-of-way and permanent right-of-way. The permanent right-of-way will be a 30 foot wide easement where most of the construction will occur. The temporary easement will be the overall width of the crop destroyed during construction. We have estimated this area to be 100 feet wide for the purpose of this report. See the enclosed drawings for ownership and the right of way required in each 40-acre tract.

## VI. COST ESTIMATES

The first estimate will be for a 1/2" drainage coefficient system.

### OPTION NO. 1 – 1/2" DRAINAGE COEFFICIENT

ITEM NO.	ITEM DESCRIPTION	QUANTITY & UNIT	UNIT PRICE	TOTAL PRICE
1.	48" RCP Apron with splash blocks, guard and riprap	1 Each	\$ 3,500.00	\$ 3,500.00
2.	48" RCP, 1500D	2,555 L.F.	\$ 75.00	\$ 191,625.00
*3.	36" RCP, 2000D	66 L.F.	\$ 50.00	\$ 3,300.00
4.	36" RCP, 1500D	6,444 L.F.	\$ 45.00	\$ 289,980.00
5.	33" RCP, 1500D	5,405 L.F.	\$ 45.00	\$ 243,225.00
*6.	30" RCP, 2000D	132 L.F.	\$ 38.00	\$ 5,016.00
7.	30" RCP, 1500D	1,024 L.F.	\$ 33.00	\$ 33,792.00
8.	27" RCP, 1500D	2,875 L.F.	\$ 30.00	\$ 86,250.00
9.	Tile Connections	30 Each	\$ 250.00	\$ 7,500.00
*10.	Granular Surfacing	80 Ton	\$ 18.00	\$ 1,440.00
11.	Exploratory Excavation	24 Hours	\$ 200.00	\$ 4,800.00
12.	Trench Stabilization	80 Ton	\$ 25.00	\$ 2,000.00
13.	36" Intake	2 Each	\$ 2,500.00	\$ 5,000.00
14.	Area Drain	10 Each	\$ 750.00	\$ 7,500.00
<b>ESTIMATED SUBTOTAL CONSTRUCTION COST</b>				<b>\$ 884,928.00</b>
<b>ESTIMATED TOTAL CONSTRUCTION DISTRICT COST</b>				<b>\$ 869,112.00</b>
<b>CONTINGENCIES</b>				<b>\$ 86,911.00</b>
<b>ENGINEERING, LEGAL, PUBLICATION</b>				<b>\$ 98,000.00</b>
<b>CLASSIFICATION</b>				<b>\$ 10,500.00</b>
<b>WETLANDS (5 Acres @ \$15,000 @ 50%)</b>				<b>\$ 37,500.00</b>
<b>PERMANENT EASEMENT (12.7 Acres @ \$2500)</b>				<b>\$ 31,750.00</b>

TEMPORARY EASEMENT (42.5 Acres @ \$1,200)	\$ 51,000.00
INTEREST	\$ 52,000.00
<b>ESTIMATED TOTAL DISTRICT COST</b>	<b><u>\$1,236,773.00</u></b>

AVERAGE COST PER ACRE \$585.60: (BASED ON 2112 ACRES)  
(\$76/acre/year for 10 years)  
(\$47/acre/year for 20 years)

The second estimate will be for a 1" drainage coefficient system.

**OPTION NO. 2 – 1" DRAINAGE COEFFICIENT**

ITEM NO.	ITEM DESCRIPTION	QUANTITY & UNIT	UNIT PRICE	TOTAL PRICE
1.	60" RCP Apron with splash blocks, guard and riprap	1 Each	\$ 4,000.00	\$ 4,000.00
2.	60" RCP, 1500D	2,555 L.F.	\$ 110.00	\$ 281,050.00
*3.	48" RCP, 2000D	66 L.F.	\$ 80.00	\$ 5,280.00
4.	48" RCP, 1500D	6,444 L.F.	\$ 75.00	\$ 483,300.00
*5.	42" RCP, 2000D	132 L.F.	\$ 65.00	\$ 8,580.00
6.	42" RCP, 1500D	6,429 L.F.	\$ 60.00	\$ 385,740.00
*7.	36" RCP, 2000D	66 L.F.	\$ 50.00	\$ 3,300.00
8.	36" RCP, 1500D	2,809 L.F.	\$ 45.00	\$ 126,405.00
9.	Tile Connections	30 Each	\$ 250.00	\$ 7,500.00
*10.	Granular Surfacing	80 Ton	\$ 18.00	\$ 1,440.00
11.	Exploratory Excavation	24 Hours	\$ 200.00	\$ 4,800.00
12.	Trench Stabilization	80 Ton	\$ 25.00	\$ 2,000.00
13.	36" Intake	2 Each	\$ 2,500.00	\$ 5,000.00
14.	Area Drain	10 Each	\$ 750.00	\$ 7,500.00
<b>ESTIMATED SUBTOTAL CONSTRUCTION COST</b>				<b>\$1,325,895.00</b>
<b>ESTIMATED TOTAL CONSTRUCTION DISTRICT COST</b>				<b>\$1,307,295.00</b>

CONTINGENCIES	\$ 130,730.00
ENGINEERING, LEGAL, PUBLICATION	\$ 98,000.00
CLASSIFICATION	\$ 10,500.00
WETLANDS (5 Acres @ \$15,000 @ 50%)	\$ 37,500.00
PERMANENT EASEMENT (12.7 Acres @ \$2500)	\$ 31,750.00
TEMPORARY EASEMENT (42.5 Acres @ \$1,200)	\$ 51,000.00
INTEREST	\$ 65,500.00
ESTIMATED TOTAL DISTRICT COST	<u>\$1,732,275.00</u>

AVERAGE COST PER ACRE \$820.21: (BASED ON 2112 ACRES)  
(\$106/acre/year for 10 years)  
(\$66/acre/year for 20 years)

## **VI. CONCLUSION/RECOMMENDATION**

The proposed improvements include systems with 1/2" and 1" drainage coefficients. The project would provide greatly improved drainage in the proposed drainage district.

We recommend that the Board, as Trustees for the district, take bids on all options. The decision on which option to construct can be made based on input from landowners. It is of course always an option to not build any improvements. We would recommend that once a bid date is set, the Trustees notify the landowners that there will be an informal hearing following the letting to discuss the options and the costs for each.

A classification will be required with any option since this will be a new drainage district.

T-98-N

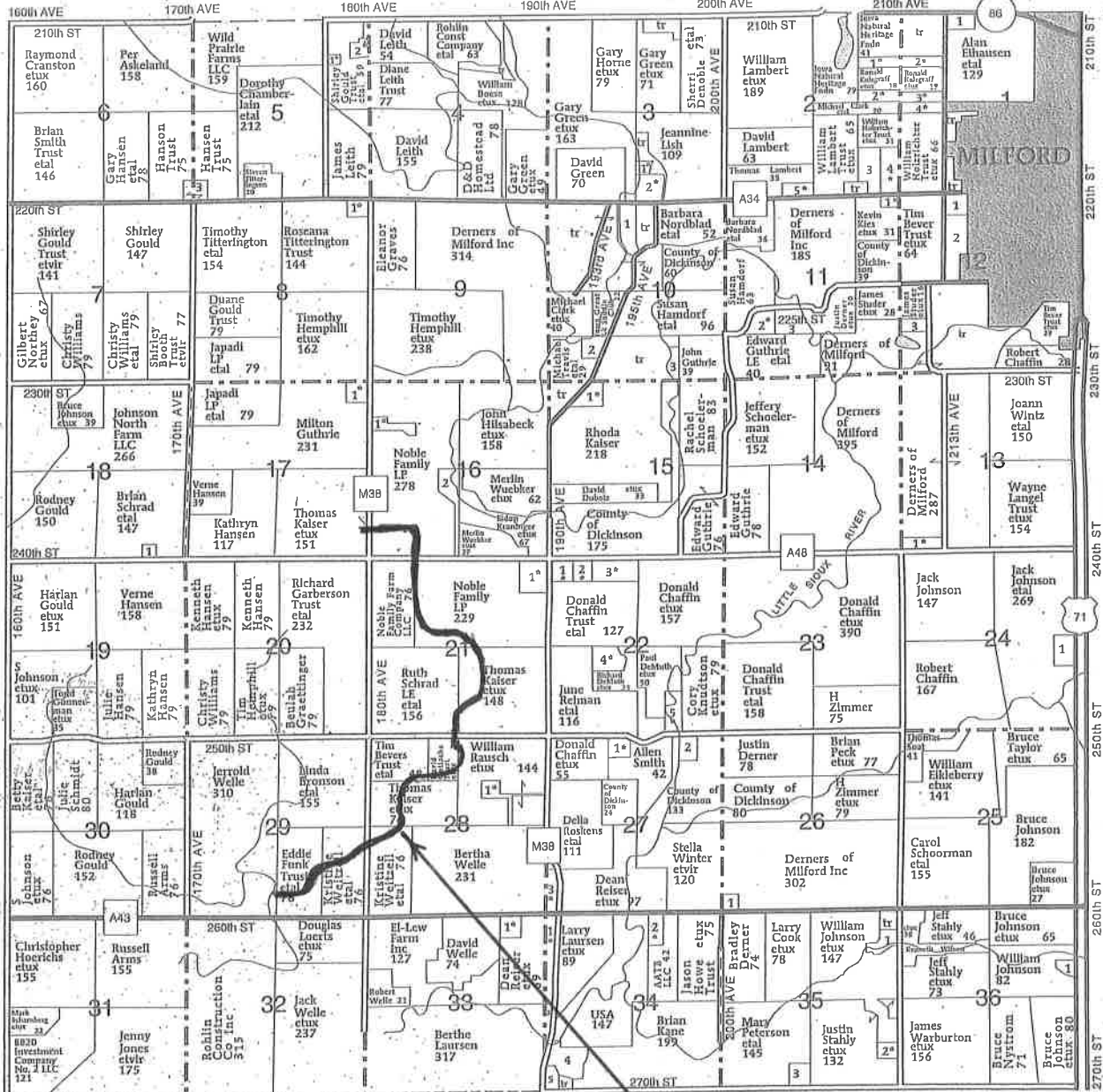
# OKOBOJI PLAT

(Landowners)

R-37-W



LAKEVILLE TWP.  
180th AVE



WEST PORT TWP.

MILFORD TWP.

CLAY CO.

## PROJECT LOCATION