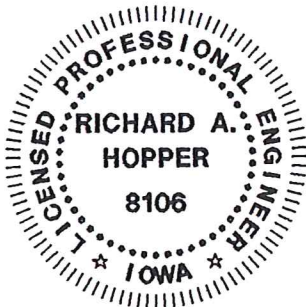


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**PRELIMINARY ENGINEERING REPORT**

**DRAINAGE DISTRICT NO. 50  
TILE IMPROVEMENTS  
DICKINSON COUNTY, IOWA  
PROJECT NO: 18107**



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 8/09/2019  
Richard A. Hopper, P.E., License number 8106  
My license renewal date is December 31, 2019  
Pages or sheets covered by this seal: Title, Pgs 1-3, Map

## **I. INTRODUCTION/HISTORY**

A petition for establishment of Drainage District No. 50 was filed, and the Board ordered the County Engineer to make a preliminary survey of the area on April 25, 1919. The engineer filed his report on July 9, 1919, recommending establishment of the Drainage District. On August 15, 1919, the Board established the Drainage District which was comprised of approximately 380 acres, and set a bid date of August 30, 1919.

After examination, the Board rejected all bids submitted on that date, and directed the Auditor to publish notice to bidders for contract letting September 19, 1919.

On September 19, 1919, bids for the proposed project were opened and awarded by the Board of Supervisors. The contract for material was awarded to the Cement Products Co., Spencer in the amount of \$2,914.65, and the contract for labor was awarded to Hans Hviid in the amount of \$5,550.00.

On November 9, 1920, the Board had a resolution that the labor contractor, Hans Hviid, begin and continue operations on Drainage District No. 50 to the full satisfaction of the Engineer within ten days and in the event that said labor is not commenced and continued in accordance to the directions of the Engineer, the Engineer shall notify the County Auditor in writing and upon written statement of the engineer to the County that said labor contractor is not continuing the labor on Drainage District No. 50, the County Auditor shall cash the certified checks now held as security and place the funds to the credit of Drainage District No. 50 and the Board of Supervisors shall cause the uncomplete work to be done as by law provided. On November 29, 1920, the bondsman of Hans Hviid, the Iowa State Trust and Savings Bank, took over the uncompleted work on Drainage District No. 50 and ordered all money due now or to become due for Drainage District No. 50 be paid to Theo Strathman.

The final report of Drainage District No. 50 was filed by the Engineer. On January 4, 1921, the Board met and levied assessments for the project in the amount of \$8,150.00.

Most recently a petition was filed requesting improvement to the Drainage District No. 50 tile commencing at the tile outlet near the bike trail and running northerly to 28<sup>th</sup> Street near Okoboji Village. This appears to include the main tile up to Branch 33 and Branch 33 itself.

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

The main of the district has its starting point 1300 feet north and 900 feet east of the center of Section 6-98-36 in the stream which provides an outlet to the Gar Lakes. The approximate course of the main, beginning at the source and proceeding to the source is as follows: From the outlet thence in a westerly direction to a point 1300 feet north and 800 feet west of the center of Section 6-98-36, thence northwesterly to a point 650 feet south of the northwest corner of section 6-98-36, thence north approximately 300 feet at which point the main tile begins.

Branch 33 outlets at Station 33+00 of the main, a point located 950 feet south and 450 feet east of the northwest corner of Section 6-98-36, thence northeast to a point 150 feet south and 1040 feet east of the northwest corner of Section 6-98-36 before turning north 240 feet where Branch 33 tile began.

## **III. EXISTING IMPROVEMENTS**

The existing main tile system consists of tile that ranges in size from 6" to 18". It does not appear there have been any major improvements done in the district since it was established 100 years ago.

The city of Milford did a storm sewer improvement project on the north side of town in 1989. As part of that project they installed a new 78" tile that outlets on the east side of the old railroad tracks which is now the bike trail. An open ditch was constructed from the 78" outlet to the stream that provides an outlet to Lower Gar. It appears this follows a similar path of the Drainage District No. 50 tile, but there is no mention on the 1989 storm sewer plans regarding the Drainage District No. 50 tile, or any information in the Drainage District records.

#### **IV. PROPOSED IMPROVEMENTS**

Several options were looked at to improve the drainage situation in the area.

One option was a detention pond on the north side of 28<sup>th</sup> Street in the cropland area north of the storage buildings. This option was dismissed because it would only be able to slow down the 10-15 acres of surface water from the cropland. The other drainage areas on the north side of the road would not be able to surface flow into the proposed detention pond. The soil survey also noted a very high water table in the area of the proposed pond, indicating the pond would basically be built above ground.

Instead of the detention pond, two alternative pipe routes with intakes were looked at to capture the surface runoff.

One option is to run new storm sewer along the west side of the existing Spine Bike Trail and then along the north side of 28<sup>th</sup> Street to the west side of the second entrance to Okoboji Village to capture runoff on the north side of 28<sup>th</sup> Street. After further review, this option was also dismissed because it was impractical to drain additional problem areas if the pipe was located on the east side of Lori's Subdivision.

The most feasible option is to run new storm sewer pipe on the east side of P Avenue and then along the south side of 28<sup>th</sup> Street to the low spot on the west side of the field driveway. The pipe was designed to carry the 100-year storm, because overland flow is not readily available to prevent damaging private property.

A cost estimate for the option is referenced in this report.

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

Construction of the storm sewer along P Avenue and 28<sup>th</sup> Street would be done within existing city right-of-way and would therefore not require any additional right-of-way.

#### **VI. COST ESTIMATE**

##### **STORM SEWER ALONG P AVENUE AND 28<sup>TH</sup> STREET**

<b>ITEM NO.</b>	<b>ITEM DESCRIPTION</b>	<b>QUANTITY &amp; UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL PRICE</b>
1.	48" RCP, 2000D	405 L.F.	\$ 125.00	\$ 50,625.00
2.	48" RCP, 1500D	515 L.F.	\$ 110.00	\$ 56,650.00
3.	42" RCP, 1500D	480 L.F.	\$ 85.00	\$ 40,800.00
4.	24" RCP, 1500D	150 L.F.	\$ 40.00	\$ 6,000.00
5.	Tees	6 Each	\$ 1,650.00	\$ 9,900.00
6.	Intakes	5 Each	\$ 2,500.00	\$ 12,500.00
7.	Pavement Removal & Replacement	350 S.Y.	\$ 80.00	\$ 28,000.00
8.	Granular Surfacing	150 Ton	\$ 20.00	\$ 3,000.00
9.	Crushed Stone Surfacing	185 Ton	\$ 30.00	\$ 5,550.00

10.	Tile Connections	5 Each	\$ 350.00	\$ 1,750.00
11.	Exploratory Excavation	8 Hours	\$ 250.00	\$ 2,000.00
12.	Trench Stabilization	20 Ton	\$ 40.00	\$ 800.00
<hr/>				
	ESTIMATED TOTAL DISTRICT CONSTRUCTION COST			\$ 217,575.00
	CONTINGENCIES			\$ 21,700.00
	ENGINEERING, LEGAL, PUBLICATION			\$ 32,500.00
	CLASSIFICATION			\$ 9,000.00
	INTEREST			\$ <u>12,000.00</u>
	<b>ESTIMATED TOTAL DISTRICT COST</b>			<b><u>\$ 292,775.00</u></b>

AVERAGE COST PER ACRE: \$7319.38/acre (Based on Branch No. 33 - 40 Acres)  
(\$587.30/acre/year for 20 years)  
(\$947.86/acre/year for 10 years)

**VII. CONCLUSION/RECOMMENDATION**

The option presented above will provide greatly improved drainage for Branch 33 of the drainage district.

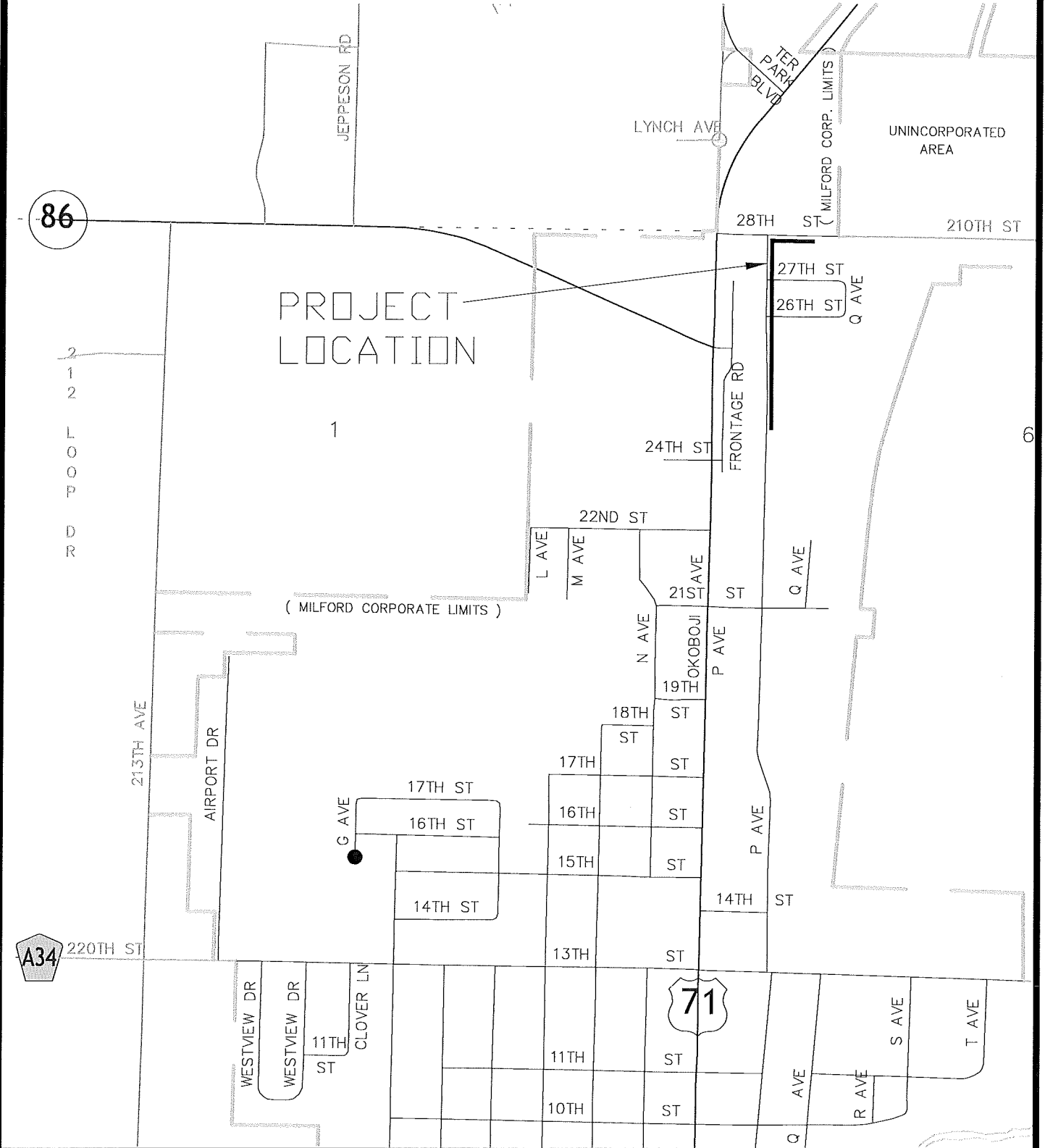
The Board of Supervisors, as trustees, for DD#50, should accept this report and set a date for a public hearing.

At the hearing, the trustees should seek input from landowners regarding the option presented.

A reclassification will be required with the option presented.

Improvements are drastically needed in this drainage district to prevent property damage and we strongly recommend proceeding with improvements.

# LOCATION MAP



**JACOBSON-WESTERGARD & ASSOCIATES, INC.**  
105 SOUTH SIXTH ST. ESTHERVILLE, IOWA