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PRELIMINARY ENGINEERING REPORT

**DRAINAGE DISTRICT NO. 25
TILE IMPROVEMENTS
DICKINSON COUNTY, IOWA
PROJECT NO: 17053**



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 1/8/2018
Richard A. Hopper, P.E., License Number 8106
My license renewal date is December 31, 2019
Pages or sheets covered by this seal: All

I. INTRODUCTION/HISTORY

A petition for the establishment of Drainage District No. 25 was filed June 1, 1914. The preliminary engineering report recommended the district be established and included lands in Sections 2, 3, 4, 5, 8, 9 and 10 of Milford Township (98-36) and Sections 33 through 36 of Center Grove Township (99-36) containing a total of 3120 acres in the district. The Board of Supervisors established the district on December 3, 1915. On October 1, 1917, the engineer noted that no outlet had been provided to a pond located in the southeast corner of the SENW, Section 9-98-36. The engineer recommended branch 48-34+50 be extended in a westerly direction beginning at STA 23 of said branch and would consist of 590 feet of 6" tile. The original assessment amount for the entire project was for \$43,503.00.

In 1988, a drainage petition was filed for Branch 48-34+50, located in the NWSE Section 9-98-36, that it be constructed westerly and northwesterly and terminating at the SENW Section 9-98-36. After investigating, Richard Hopper, determined Branch 48-34+50 was never extended as far as it was originally proposed. He recommended the county extend the 6" tile approximately 700 lineal feet. Work was to be finished late November 1988.

Most recently a petition was filed May 17, 2017, that improvements be considered in Drainage District No. 25 commencing at the junction of the main tile and Branch 48 in the southeast corner of Section 4-98-36, Milford Township and running to the outlet of the main tile.

II. STARTING POINT, ROUTE AND TERMINUS

The main of the district has its starting point 2180 feet north of the southeast corner of Section 34-99-36 thence southwesterly, westerly and southwesterly through SE $\frac{1}{4}$ of Section 34 crossing 210th Street 780 feet east of the N $\frac{1}{4}$ corner of Section 3-98-36 through NE $\frac{1}{4}$ of Section 3 southwesterly entering NW $\frac{1}{4}$ of Section 3 at a point 815 feet north of center of Section 3 thence through NW $\frac{1}{4}$ of Section 3 southwesterly and southerly entering SW $\frac{1}{4}$ of Section 3 at a point 480 feet west of center of Section 3; thence through SW $\frac{1}{4}$ of Section 3 south westerly, northwesterly and westerly, crossing 250th Avenue and entering SE $\frac{1}{4}$ of Section 4 at a point 325 feet south of east quarter corner of Section 3; thence through SE $\frac{1}{4}$ westerly, southerly, westerly, northwesterly and northerly entering NE $\frac{1}{4}$ of Section 4 at a point 1052 feet east of center Section 4; thence through NE $\frac{1}{4}$ of Section 4, northerly, northwesterly, southwesterly, northerly, northwesterly entering NW $\frac{1}{4}$ of Section 4 at a point 1295 feet south of north quarter corner of 4-98-36 thence through NW $\frac{1}{4}$ of Section 4 northwesterly, northerly, northwesterly to a point 19 feet north of north side of 210th Street, and 440 feet west of north quarter corner of Section 4, which is the terminus of the main of said district.

III. EXISTING IMPROVEMENTS

The existing main tile system consists of tile that ranges in size from 7" to 30". It does not appear there have been any major improvements done in the district since it was established over 100 years ago. The existing drainage coefficient is mainly around 1/4". The last 500 feet of tile before outletting into the open ditch is 1/8".

IV. PROPOSED IMPROVEMENTS

The proposed improvements include two options.

The first option would be a new parallel tile with a 1/2-inch drainage coefficient. The pipe for this option would range in size from 18-inch to 54-inch pipe. A cost estimate for this option can be seen following in this report.

The second option would be a new parallel tile with a 1-inch drainage coefficient. The pipe for this option would range in size from 18-inch to 66-inch. A cost estimate for this option can be seen following in this report.

V. RIGHT OF WAY

Since the main tile improvements will be offset from the existing main tile, additional right-of-way will be required. This will be permanent right-of-way. The permanent right-of-way will be a 30-foot wide easement where most excavation will occur. There may also be crop damage to pay for, but the extent of this is unknown at this time.

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.	54" RCP, 1500D	500 L.F.	\$ 95.00	\$ 47,500.00
2.	42" RCP, 1500D	1300 L.F.	\$ 60.00	\$ 78,000.00
3.	36" RCP, 1500D	2100 L.F.	\$ 50.00	\$ 105,000.00
4.	18" RCP, 1500D	60 L.F.	\$ 26.00	\$ 1,560.00
5.	Junction Box	4 Each	\$ 5,000.00	\$ 20,000.00
6.	Tee – 30" x 30" x 18"	2 Each	\$ 900.00	\$ 1,800.00
7.	Tile Connections	12 Each	\$ 350.00	\$ 4,200.00
8.	Exploratory Excavation	12 Hours	\$ 200.00	\$ 2,400.00
9.	Trench Stabilization	100 Ton	\$ 40.00	\$ 4,000.00
10.	Area Drain	2 Each	\$ 1,250.00	\$ 2,500.00
ESTIMATED TOTAL DISTRICT CONSTRUCTION COST				\$ 266,960.00
CONTINGENCIES				\$ 26,960.00
ENGINEERING, LEGAL, PUBLICATION				\$ 35,500.00
CLASSIFICATION				\$ 15,000.00
PERMANENT EASEMENT (2.7 Acres @ \$2125)				\$ 5,737.50
TEMPORARY EASEMENT (9 Acres @ \$1000)				\$ 9,000.00
INTEREST				\$ 13,500.00
ESTIMATED TOTAL DISTRICT COST				<u>\$ 372,657.50</u>

AVERAGE COST PER ACRE: \$119.44 acre (Based on 3120 Acres)
 (\$9.58/acre/year for 20 years)
 (\$15.47/acre/year for 10 years)

*Secondary Road Costs

The second option is for a parallel 1" coefficient system.

OPTION NO. 2 – 1" DRAINAGE COEFFICIENT

ITEM NO.	ITEM DESCRIPTION	QUANTITY & UNIT	UNIT PRICE	TOTAL PRICE
1.	66" RCP, 1500D	500 L.F.	\$ 135.00	\$ 67,500.00
2.	48" RCP, 1500D	3400 L.F.	\$ 78.00	\$ 265,200.00
3.	18" RCP, 1500D	60 L.F.	\$ 22.00	\$ 1,320.00
4.	Junction Box	4 Each	\$ 5,000.00	\$ 20,000.00
5.	Tee – 30" x 30" x 18"	2 Each	\$ 900.00	\$ 1,800.00
6.	Tile Connections	12 Each	\$ 350.00	\$ 4,200.00
7.	Exploratory Excavation	12 Hours	\$ 200.00	\$ 2,400.00
8.	Trench Stabilization	100 Ton	\$ 40.00	\$ 4,000.00
9.	Area Drain	2 Each	\$ 1,250.00	\$ 2,500.00

ESTIMATED TOTAL DISTRICT CONSTRUCTION COST	\$ 368,920.00
CONTINGENCIES	\$ 36,892.00
ENGINEERING, LEGAL, PUBLICATION	\$ 35,500.00
CLASSIFICATION	\$ 15,000.00
PERMANENT EASEMENT (2.7 Acres @ \$2125)	\$ 5,737.50
TEMPORARY EASTMENT (9 Acres @ \$1000)	\$ 9,000.00
INTEREST	\$ 18,500.00
ESTIMATED TOTAL DISTRICT COST	<u>\$ 489,549.50</u>

AVERAGE COST PER ACRE: \$156.91/acre (Based on 3120 Acres)
 (\$12.59/acre/year for 20 years)
 (\$20.32/acre/year for 10 years)

*Secondary Road Costs

VII. CONCLUSION/RECOMMENDATION

The proposed improvements include systems with 1/2-inch and 1-inch drainage coefficients. Either of the options will provide greatly improved drainage in the main of the drainage district.

The minimum improvement we would recommend is the 1/2-inch coefficient system.

The Board of Supervisors, as trustees, for DD#25, should accept this report and set a date for a public hearing.

At the hearing, the trustees should seek input from landowners regarding which options to pursue. More than one option could be bid with the final decision on which one to construct coming after the bid.

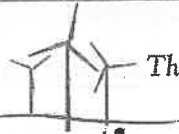
A reclassification will be required with either of the options.

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



Iowa Lakes Electric Cooperative

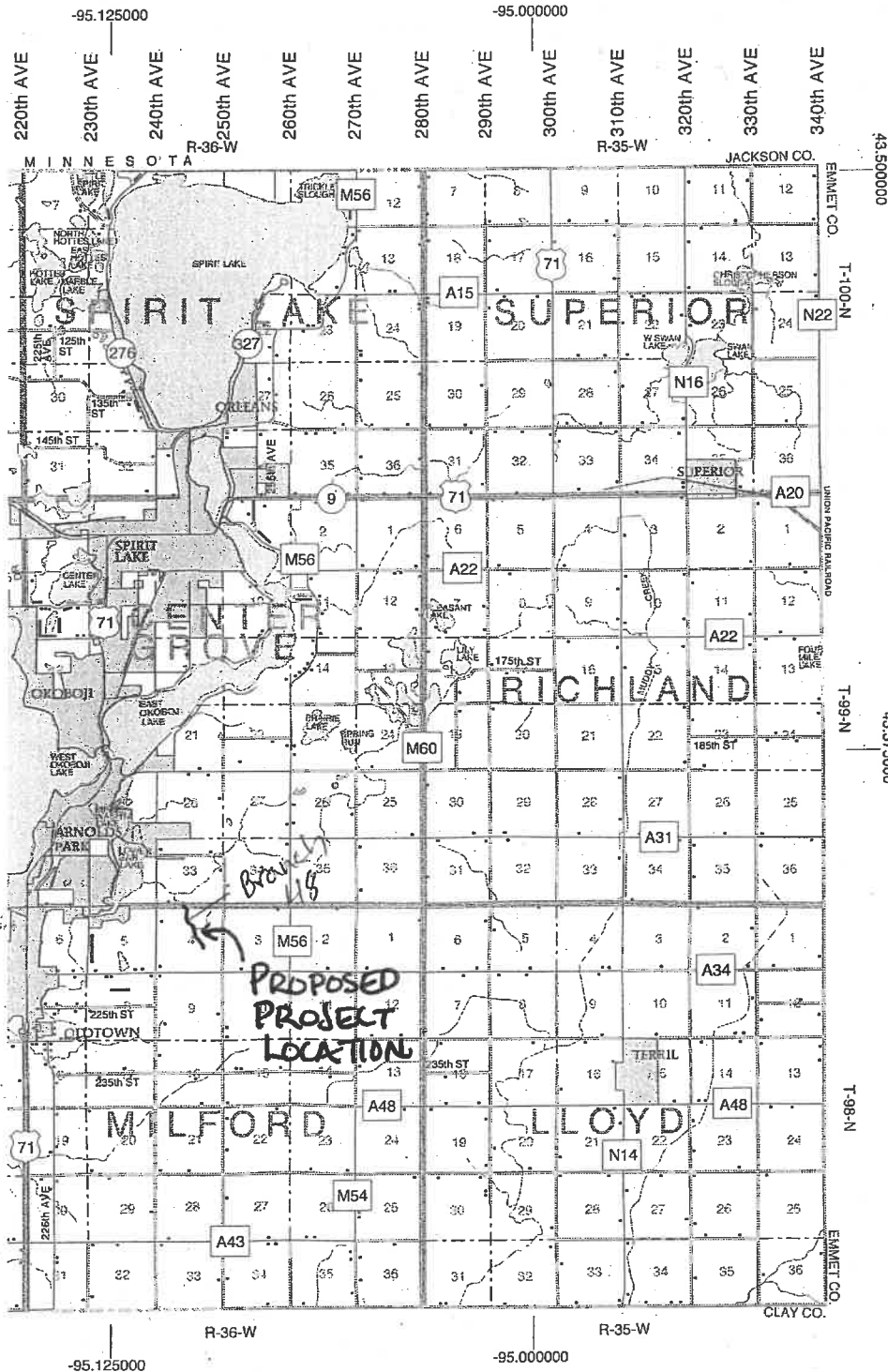
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COUNTY MAP