

March 24, 2015

Osceola County Board of Supervisors
300 7th Street
Sibley, IA 51249



**RE: Drainage District No. 26, Osceola
Petition of Brett Young and Duane Dake**

SCOPE OF STUDY:

In the fall of 2014, the Osceola County Board of Supervisors, acting as the Trustee for Drainage District No. 26 (DD26), received a petition (Appendix A) from District landowners, Brett Young and Duane Dake. The petition states the District tile should be studied for possible improvement. In November of 2014, the Board of Supervisors directed I+S Group, Inc. (ISG) to conduct a preliminary investigation and report our findings. This letter report will summarize those findings and provide recommendations.

To complete our preliminary study, we researched the records of the District and compiled data using existing district plats, aerial photography, soils and topographical maps.

DISTRICT HISTORY:

A petition for establishment of DD26 was filed on August 12, 1915. An Engineer's Report dated February 1, 1916 was filed recommending the installation of various tile lines. On April 4, 1916, a resolution to establish DD26 was approved. On May 1, 1917, the Board directed the Engineer to make a survey for the proposed tile lines. A Report filed September 10, 1917 outlined the construction of 300 linear feet of open ditch and the installation of 23,700 LF of tile main and 31 branch tile lines for a total of 57,230 linear feet of tile installation, contract for the tile work was signed on July 16, 1918. Contractor, Crowley was dismissed on September 17, 1918, with work rebid on May 12, 1921. All bids were rejected with new bids received on October 27, 1921, bid from Herman Larson of Sioux Rapids, Iowa was accepted. Work was completed with final acceptance on February 20, 1923.

A Notice of Assessments was published on June 3, 1918. After completion of the project, a notice of additional assessments was published on April 6, 1925.

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The record reflects that additional repairs and assessments continued through 1925.

In 1985, the Board appointed Siouxland Engineering Associates, P.C. to prepare a preliminary report for drainage relief to DD26. Siouxland Engineering Associates, P.C. filed their report on April 30, 1985 recommending a formal investigation and report be prepared for drainage relief of the tile system. The Board of Supervisors chose to not move forward with a full report concerned about wetland mitigation.

DESCRIPTION OF FACILITY:

The watershed of DD26 consists of approximately 2,939 acres (4.6 square miles) located within parts of Sections 13, 23, 24, 25, 26, 27, 34, and 35 of Horton Township, and Sections 18, 19, and 30 of Fairview Township. The facilities of DD26 consists of 23,700 feet of tile main serving as an outlet to 31 branch tile lines consisting of an additional 33,230 linear feet of subsurface tile. The tile main line outlets through a concrete headwall to an unnamed tributary of Osterman Creek in the NE1/4 of NW1/4 of Section 34, Horton Township. The record shows that the channel was improved for a distance of 300 feet below the headwall. The tile then traverses in a northeasterly direction for 16,400 LF across Section 27, 26, 25 and 24 of Horton before bearing north for 1,900 LF in Section 19 of Fairview Twp. The tile main then turns back to the northeast traversing across the NE1/4 of Section 24 of Horton and then crosses into Section 13 ending at Station 240+00 in the SE1/4 of SW1/4 of Section 13, Horton Township.

The lands in the lower 45% of the watershed have surface drainage relief available to them while the lands in the upper plus 50% of the watershed rely on the tile main to serve as their outlet for both surface and subsurface water. Refer to Sheet A.02 of the preliminary plans for a plat of DD26.

TILE CAPACITY EVALUATION:

We have prepared a profile of the existing ground surface over the tile main alignment using Light Detection And Ranging (LiDAR) elevation data. Then we plotted the existing main profile based on slope and depth of cover data found in the District records. None of this data has been field verified but provided adequate data for analysis of the capacity of the main. Please refer to the Profile Sheets D.01 through D.07.

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Standards for good agricultural drainage recommend a tile facility to be sized to drain 1/2 inch of runoff from the lands in the watershed in a 24 hour period when the lands in the watershed do not have sufficient surface drainage. For lands with surface drainage, the tile system is recommended to be sized based on a 3/8 inch drainage coefficient. For our investigation we have broken the watershed down into 6 major sub-watersheds based on surface and non-surface drainage. Our investigation concluded the lands in the upper portion of the watershed, above Station 104+00, do not have adequate surface drainage. Therefore, the recommended design capacity of this tile system was calculated using a 1/2 inch drainage coefficient for 1,553 acres of land in the upper portion of the District and 3/8 inch drainage coefficient for the lower 1,386 acres. The results of this evaluation are summarized within Table 1 of this report.

Table 1 – Drainage District 26 – Original Design Tile Capacities

Station	Size (in)	Slope (ft/ft)	A (ft ²)	P (ft)	R (ft/ft)	n	DA		Original Q (cfs)	Original Q/Recom. Q (%)
							Ac. 1/2"	Ac. 3/8"		
DD 26, MAIN TILE										
Main 0+00	30	0.002	4.909	7.854	0.625	0.0108	1553 1386	32.61 21.83	22.08	40.6%
Main 57+00	28	0.0015	4.276	7.330	0.583	0.0108	1553 788	32.61 12.41	15.91	35.3%
Main 104+00	24	0.0015	3.142	6.283	0.500	0.0108	1553	32.61	10.55	32.3%
Main 116+00	22	0.0015	2.640	5.760	0.458	0.0108	925	19.43	8.36	43.1%
Main 150+00	20	0.0012	2.182	5.236	0.417	0.0108	592	12.43	5.80	46.7%
Main 183+00	16	0.0015	1.396	4.189	0.333	0.0108	365	7.67	3.58	46.7%

As indicated by the table, the most restrictive segment is between Stations 57+00 to 104+00. Therefore, the available capacity to the majority of the land is only 32% of the recommended capacity making the tile system severely under capacity for the lands above Tyler Avenue that do not have surface drainage relief.

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The petition filed is for drainage relief due to this lack of capacity of the tile outlet system. From our preliminary study we have found the existing main to be undersized for current cropping practices and the acres served. The District would benefit from an improvement project that would increase the size of the tile.

REPAIR/IMPROVEMENT DISCUSSION:

The Board of Supervisors acting as Trustees of the District are responsible to see to the maintenance of the District facilities. If the facilities are found to be in a poor state of repair and not providing the original design capacity, repairs to the system are required by Iowa Drainage Law. In the case of DD26, we do not know of any failures of the tile system, however, as part of any evaluation of improvement options, ISG also provides a cost of replacing the existing tile system to provide the landowners a means of evaluating the true additional cost of the improvements.

We have evaluated two (2) improvement options for increasing the drainage capacity of the tile main to the recommend levels for good agricultural drainage; one being the complete replacement of the tile main with a new large tile system. The second improvement option would be using a parallel relief tile system in conjunction with the existing tile main. Included as Appendix C, are preliminary estimates of probable costs for the Repair/Replacement, Improvement Replacement and Improvement Relief options. A summary of the option and cost is provided below:

1. Repair/Replacement – This assumes the existing tile system needs to be replaced in its entirety to maintain the original drainage capacity of the main tile system. The estimated construction cost subtotal would be \$884,485.00.
2. Improvement Replacement Option – This proposes increasing the capacity of the tile system by replacing the existing tile main with a larger tile. Using the same 1/2 inch drainage coefficient standard described previously, the proposed Main Tile would be increased from 30 inch diameter to 42 inch at its outlet to Station 104+00 followed by 36 inch tile to Station 116+00. 30 inch tile will be used between Stations 116+00 and 150+00, and the last 5,700 linear feet is planned for 24 inch,

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although when moving upstream from Station 183+00, the tile size may be analyzed in smaller watersheds resulting in smaller tile sizes when deciding final plans. The estimated construction cost subtotal would be \$1,676,800.00. The capacities are summarized below in Table 2.

Table 2 – Drainage District 26 – Proposed Improvement Tile Capacities

Station	Recom. Size (in)	Recom. Slope (ft/ft)	Recom. A (ft ²)	Recom. P (ft)	Recom. R (ft/ft)	Recom. n	DA Ac. 1/2" Ac. 3/8"	Rec. Q Ac. 1/2" Ac. 3/8"	Total Recom. Q (cfs)	Proposed Q (cfs)	Proposed Q/Recom. Q (%)
DD 26, MAIN TILE											
Main 0+00	42	0.002	9.62	11.00	0.88	0.0108	1553 1386	32.61 21.83	54.44	54.16	99.5%
Main 57+00	42	0.0015	9.62	11.00	0.88	0.0108	1553 788	32.61 12.41	45.02	46.90	104.2%
Main 104+00	36	0.0015	7.07	9.43	0.75	0.0108	1553	32.61	32.61	31.09	95.3%
Main 116+00	30	0.0015	4.91	7.85	0.63	0.0108	925	19.43	19.43	19.12	98.4%
Main 150+00	30	0.0012	4.91	7.85	0.63	0.0108	592	12.43	12.43	17.10	137.6%
Main 183+00	24	0.0015	3.14	6.28	0.50	0.0108	365	7.67	7.67	10.55	137.6%

- Improvement Relief Option - The capacity of the outlet tile is improved by adding a parallel relief tile line. This was a recommendation of Siouxland Engineering Associates P.C. in their 1985 preliminary report. Using the same 1/2 inch drainage coefficient standard described above, the proposed parallel relief tile would be sized to 36 inch diameter at its outlet to Station 104+00. 24 inch tile will be used between 104+00 and 150+00 and the final 4,140 feet will be 18 inch tile. The estimated construction cost subtotal would be \$1,301,717.00. Refer to Table 3 for a summary of the drainage capacity associated with this relief option.

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Table 3 – Drainage District 26 – Proposed Parallel Relief Improvement Capacities

Station	Size (in)	Recom. Size (in)	Slope (ft/ft)	DA Acres 1/2" Acres 3/8"	Recom. Q (cfs) Acres 1/2" Acres 3/8"	Total Recom. Q (cfs)	Original Q (cfs)	Relief Q (cfs)	Total Original and Relief Q (cfs)	Proposed Q /Recom. Q (%)
DD 26, MAIN TILE										
Main 0+00	30	36	0.002	1553 1386	32.61 21.83	54.443	22.08	35.90	57.98	106.5%
Main 57+00	28	36	0.0015	1553 788	32.61 12.41	45.024	15.91	31.09	47.00	104.4%
Main 104+00	24	36	0.0015	1553	32.61	32.613	10.55	31.09	41.64	127.7%
Main 116+00	22	24	0.0015	925	19.43	19.425	8.36	10.55	18.91	97.3%
Main 150+00	20	24	0.0012	592	12.43	12.432	5.80	9.43	15.23	122.5%
Main 183+00	16	18	0.0015	365	7.67	7.665	3.58	4.90	8.47	110.6%

ANNEXATION/RECLASSIFICATION DISCUSSION:

As part of our field investigation, we have mapped the watershed boundary of the entire District using LiDAR data and aerial photography to determine the lands that drain by surface or subsurface into the District. From this review, (Please refer to Sheet A.02 of the drawings) it became apparent that there are approximately 365 acres of land draining to facilities of DD26 that are not included in the original assessment boundary of the overall District. In addition, approximately 115 acres of land originally included in the assessment schedule were discovered to have been dropped from assessment. This appears to have occurred by mistake when a property sell necessitated a split of a full quarter-quarter parcel. The original assessment should have been split between the parcel splits weighted in acres. Therefore, the Auditor's Record should be corrected and these landowners treated as being in the District and included in all future assessments.

It should also be noted that when this District was originally established, all of the facilities of the District were paid for under one assessment schedule. The District has not been reclassified since its original assessment schedule was

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adopted in 1918. Therefore, when work is done on any branch of the district facilities, all landowners in the District pay for this work even if they receive no benefit. Section 468.131 of the Iowa Code states, "When an assessment for improvements as provided in Section 468.126, exceeds twenty-five percent of the original assessment and the original or subsequent assessment or report of the benefit commission as confirmed did not designate separately the amount each tract should pay for the main ditch and tile lateral drains then the board shall order a reclassification in accordance with the principles and rules set forth in Section 468.41."

Therefore, even if the improvement project does not proceed we would recommend the additional lands benefitting from the facilities of the District be annexed and the District reclassified to designate separately the amount each tract should pay for the upkeep and maintenance of the Branch tile systems and to redistribute the benefits to all lands in the District with the incorporation of the annexed lands.

WETLANDS DISCUSSION:

The USDA farm Program has long included wetland conservation compliance "swampbuster" provisions administrated by the Natural Resources Conservation Service (NRCS). These rules and policies require that the lost functions, values and area of each converted (better drained) farmed wetland be replaced (mitigated). Under Part 12 of Title 7 of the Federal Regulations, "activities of a Water Resource District, Drainage District, or similar entity will be attributed to all persons within the jurisdiction of the District or other entity who are assessed for the activities of the district or entity. Accordingly, where a person's wetland is converted due to the actions of the District or entity, the person shall be considered to have caused or permitted the drainage." However, Drainage Districts in Iowa have the right to maintain the existing drainage capacity of their facilities for there is no additional impact to any wetlands in the watershed by repairs.

The US Army Corps of Engineers (USACE), in conjunction with the US Environmental Protection Agency (USEPA), also have jurisdiction to wetlands under the Federal Clean Water Act Section 404. However, for the wetlands to be jurisdictional they have to be connected to waters of the United States and not isolated wetlands. For wetlands to be considered connected, they would need to be adjacent and surface connected to the proposed open ditch.

Therefore, if an improvement option is approved that increases the capacity of the tile system, impacts to wetlands will need to be considered both under the

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Farm Bill and Clean Water Act. To determine if wetlands will be impacted, the NRCS requires that all lands in the watershed must have a wetland determination completed prior to any construction by the District. The landowners or their tenants are the only individuals that can request this determination. If a landowner does not request a certified wetland determination and the District proceeds with an improvement project, the landowner may be found to be in violation of the farm program rules and not eligible for program benefits. Additionally, the USDA could file claim for refund of farm program payments. Therefore, if any of the proposed improvement options are approved, we will encourage all landowners within the watershed boundary to request a certified wetland determination from the NRCS. Please note the NRCS will only provide determinations on agricultural lands producing a commodity crop. For other lands, a consultant will need to be hired to make the wetland determination. If a landowner refuses to sign up for a determination, we will recommend the Board approves hiring a consultant to make the wetland determination assessment for review by the NRCS.

The US Fish & Wildlife Service provides information regarding a wetland inventory. This data base was evaluated to estimate the acres of farmed wetlands within the watershed of DD26. Approximately 19.5 acres of potential farmed wetlands have been identified that would be traversed by the proposed improvements. Therefore, if either improvement option was constructed and these 19.5 acres of potential wetland were determined to be farmed wetland, the drainage impact to these acres would have to be avoided or mitigated. Mitigation costs are estimated at \$20,000/acre and included in the improvement cost estimates as a separate line item. The cost of this mitigation would need to be considered by the Landowners of these wetlands and the Trustees of the District.

RECOMMENDATIONS:

It is apparent from our investigation that the current tile facility is undersized and does not provide the drainage recommended for current day agricultural crop production. When this tile system begins to fail, it only makes sense to improve the capacity of the system to meet the needs of modern day agriculture. The true estimated improvement cost (difference between the improvement project and repair project) for the Replacement Improvement Option, is \$1,059,315. For the Relief Improvement Option the true estimated improvement cost is \$560,602.

The estimated cost of a parallel relief tile (without mitigation cost) averaged over the watershed acres of 2,939 acres is approximately \$624/acre. In using a

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relief line you are still relying on the use of the existing 100 year tile system. However, this system would not probably fail all at once and the segments of poor quality tile would be replaced over time.

If the full replacement improvement option was chosen the estimated cost (without mitigation cost) averaged over the watershed acres of 2,939 acres is approximately \$793/acre.

Therefore, we recommend that an informal public meeting be held with the landowners of this district to consider a possible tile main improvement project and the costs, including possible wetland mitigation, for this project. We also, recommend the lands identified for annexation be invited to this meeting.

Sincerely,



Ivan D. Droessler, P.E.
Civil Engineering Group
I+S Group

enc: Appendix A - Petition of Landowners within the District
Appendix B - History Outline
Appendix C - Estimates of Probable Costs
Preliminary Plan Set

c: Charles Bechtold, P.E., Osceola County Engineer

APPENDIX A:

LANDOWNERS' PETITION

DRAINAGE DISTRICT NO. 26

OSCEOLA COUNTY

Brett Young

DRAINAGE PETITION

TO THE BOARD OF SUPERVISORS OF Oscawola COUNTY, IOWA;

The undersigned ask that a drainage Improvement / Study
commencing at 5 1/2 of Section 13 Horton twp DD #26

and running thence S + W

and terminating at Section 34 Horton twp

be _____

Your petitioners further state that the lands situated in DD #26

are subject to overflow (or are too wet for cultivation or subject to erosion or flood danger), and the public benefit, utility, health, convenience and welfare will be promoted by the above mentioned project.

NAMES
<i>Quinn Ray Duke</i>
<i>Jos Family Farmer by Brett Young Manager</i>

NAMES
<i>Repair only</i>

APPENDIX B:
HISTORY OUTLINE

HISTORY FROM DRAINAGE RECORDS FOR DD # 26 OSCEOLA COUNTY, IOWA

- Aug. 12, 1915 Petition filed for Drain # 26
- Feb. 1, 1916 Read Engineers (L A Wilson) report and recommendation on various size tiles to be installed.
- Feb.10, 1916 Published Notice of Hearing
- Feb. 24, 1916 Read letters of objections
- Mar. 1, 1916 Petition was filed again
- April 4, 1916 Resolution for new district
- April 23, 1917 Published for Public Hearing
- May 1, 1917 Board approved for Engineer to survey
- Sept. 10, 1917 Read Eng. Report
- Nov. 2, 1917 Bids opened, approved contract to Sibley Cement (tile only), Crowley (labor)
- Nov. 26, 1917 Sold bonds
- Jan. 4, 1918 Signed contract with Sibley Cement
- June 3, 1918 Published Notice of Assessments
- June 18 - July 30, 1918 Read written objection
- July 16, 1918 Signed Contract with Crowley
- July 16, 1918 Over ruled all objections except two
- Aug. 2, 1918 Filed Notice of assessments
- Aug. 5, 1918 Read appeal of others
- Aug. 6, 1918 Order Crowley to resume working, within 10 days
- Sept. 17, 1918 Dismissed Crowley
- Oct. 28, 1919 Published Notice for contracting bids
- Nov. 1919 Published Notice for contracting bids
- Nov. 7, 1919 Field injunction and restraining order against Crowley
- Dec. 15, 1920 Settled judgment with Crowley

May 3, 1921 Set hearing for re-bid

May 5, 1921 Published Notice to contractors

May 12, 1921 Opened bids, all rejected, will re-bid

Oct. 20, 1921 Published two Notices to contractors

Oct. 27, 1921 Open new bids, accepted bid from Herman Larson of Sioux Rapids, Iowa

Nov. 7, 1921 Signed contract with Larson

Feb. 20, 1923 Final acceptance of Larson's work

Nov. 24, 1924 Paid liens against Larson

April 6, 1925 Published Notice of additional assessments

June 9, 1925 Sold additional bonds

1925 – 1935 Additional assessments and repairs continue.

June 23, 1936 Published Notice of Refund of surplus monies from assessments

May 5, 1980 Heard request for additional assessment for repairs

April 30, 1985 Read preliminary report for assessments and improvements

July 16, 1985 Request additional assessments for improvements

Fall 2014 Petition received requesting an improvement study

Nov 2014 Board of Supervisors acting as Trustees for the District directed I&S Group to conduct a preliminary investigation and report the findings.

APPENDIX C:

PRELIMINARY ENGINEER'S ESTIMATE OF PROBABLE COSTS

**REPAIR/REPLACEMENT
IMPROVEMENT REPLACEMENT OPTION
IMPROVEMENT RELIEF OPTION**

**DRAINAGE DISTRICT 26 OSCEOLA COUNTY
PRELIMINARY ENGINEER'S ESTIMATE OF PROBABLE COSTS**



PROJECT NUMBER: 17364

REPAIR/REPLACEMENT

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	44,000.00	\$44,000.00
2.	Open Ditch Excavation	8.00	HRS	165.00	\$1,320.00
3.	Spoil Bank Leveling (Two Sided)	3.0	STA	70.00	\$210.00
4.	Non-Reinforced Concrete Pipe, 8" Dia.	500	LF	15.00	\$7,500.00
5.	Non-Reinforced Concrete Pipe, 10" Dia.	500	LF	15.00	\$7,500.00
6.	1500D Reinforced Concrete Pipe, 12" Dia.	1,600	LF	17.00	\$27,200.00
7.	1500D Reinforced Concrete Pipe, 14" Dia.	1,400	LF	18.00	\$25,200.00
8.	1500D Reinforced Concrete Pipe, 16" Dia.	1,700	LF	21.00	\$35,700.00
9.	1500D Reinforced Concrete Pipe, 18" Dia.	1,900	LF	24.00	\$45,600.00
10.	1500D Reinforced Concrete Pipe, 20" Dia.	3,100	LF	27.00	\$83,700.00
11.	1500D Reinforced Concrete Pipe, 22" Dia.	2,600	LF	30.00	\$78,000.00
12.	1500D Reinforced Concrete Pipe, 24" Dia.	2,300	LF	34.00	\$78,200.00
13.	1500D Reinforced Concrete Pipe, 26" Dia.	1,900	LF	38.00	\$72,200.00
14.	1500D Reinforced Concrete Pipe, 28" Dia.	3,000	LF	48.00	\$144,000.00
15.	1500D Reinforced Concrete Pipe, 30" Dia.	3,200	LF	48.00	\$153,600.00
16.	Alignment Turns				
a.	12" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	275.00	\$275.00
b.	16" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	325.00	\$325.00
c.	18" Dia. R.C.P. Elbow Section, Fabrication Only	2	EA	325.00	\$650.00
d.	20" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	425.00	\$425.00
e.	22" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	425.00	\$425.00
f.	24" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	425.00	\$425.00
g.	28" Dia. R.C.P. Elbow Section, Fabrication Only	1	EA	580.00	\$580.00
h.	30" Dia. R.C.P. Elbow Section, Fabrication Only	5	EA	580.00	\$2,900.00
17.	Lateral Tile Connections	22	EA	300.00	\$6,600.00
18.	Misc. Drain Tile Repairs & Connections	38	EA	300.00	\$11,400.00
19.	Topsoil Strip, Stockpile, Respread	11,000	CY	2.25	\$24,750.00
20.	Tile Trench Stabilization and Cradling Rock	396	TN	25.00	\$9,900.00
21.	Spot Tile Exploration	66	HR	165.00	\$10,890.00
22.	Open Ditch Fertilizing & Seeding	3.0	STA	65.00	\$6,760.00
23.	Fence Cuts	17	EA	250.00	\$4,250.00

CONSTRUCTION COST SUBTOTAL

\$884,485.00

Engineering Services:

Survey	\$6,500.00
Engineer Administration & Design Services	\$71,000.00
Research/Study/Engineering Report	\$35,500.00
Final Plans & Specs	\$26,500.00
Construction Admin/Staking/Observation	\$18,000.00

Legal & Auditor Services, Publication, Misc.

Damages (55.1 AC @ \$700/AC)	\$4,000.00
Contingencies	\$38,570.00
	<u>\$71,000.00</u>

REPLACEMENT PROJECT COST SUBTOTAL

\$1,155,555.00

Other Potential District Costs:

Annexation	\$4,000.00
Reclassification (2,939 AC)	\$25,000.00
Project Warrant Interest	\$89,000.00

TOTAL ESTIMATED PROJECT COST

\$1,273,555.00

Average Cost per Watershed Acre (2,939 AC)

\$433.33

Average Cost per Watershed Acre for 10 years

\$43.33

NON-DISTRICT COSTS

Secondary Roads: Jack and Bore

Furnish & Install 30" 3000D RCP, Tanager Ave.	100	LF	657.00	\$65,700.00
Furnish & Install 24" 3000D RCP, Tyler Ave.	100	LF	525.00	\$52,500.00

Secondary Roads: Open Trench

Furnish & Install 30" 3000D RCP, 140th St.	66	LF	69.00	\$4,554.00
Furnish & Install 24" 3000D RCP, 130th St.	66	LF	53.00	\$3,498.00
Furnish & Install 24" 3000D RCP, Van Buren Ave.	66	LF	53.00	\$3,498.00
Furnish & Install 18" 3000D RCP, Van Buren Ave.	66	LF	42.00	\$2,772.00
Furnish & Install 18" 3000D RCP, 120th St.	66	LF	42.00	\$2,772.00

TOTAL ESTIMATED NON-DISTRICT COSTS

\$135,294.00

DRAINAGE DISTRICT 26 OSLEOLA COUNTY
 PRELIMINARY ENGINEER'S ESTIMATE OF PROBABLE COSTS



PROJECT NUMBER: 17364

IMPROVEMENT REPLACEMENT OPTION

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	84,000.00	\$84,000.00
2.	Open Ditch Excavation	8.00	HRS	165.00	\$1,320.00
3.	Spoil Bank Leveling (Two Sided)	3.0	STA	70.00	\$210.00
4.	1500D Reinforced Concrete Pipe, 24" Dia.	5,700	LF	34.00	\$193,800.00
5.	1500D Reinforced Concrete Pipe, 30" Dia.	6,700	LF	48.00	\$321,600.00
6.	1500D Reinforced Concrete Pipe, 36" Dia.	1,200	LF	68.00	\$81,600.00
7.	1500D Reinforced Concrete Pipe, 42" Dia.	10,100	LF	90.00	\$909,000.00
8.	Alignment Turns				
	a. 24" Dia. R.C.P. Elbow Section, Fabrication Only	2	EA	425.00	\$850.00
	b. 30" Dia. R.C.P. Elbow Section, Fabrication Only	4	EA	580.00	\$2,320.00
	c. 42" Dia. R.C.P. Elbow Section, Fabrication Only	6	EA	700.00	\$4,200.00
9.	Lateral Tile Connections	22	EA	300.00	\$6,600.00
10.	Misc. Drain Tile Repairs & Connections	38	EA	300.00	\$11,400.00
11.	Topsoil Strip, Stockpile, Respread	12,000	CY	2.25	\$27,000.00
12.	Tile Trench Stabilization and Cradling Rock	440	TN	25.00	\$11,000.00
13.	Spot Tile Exploration	66	HR	165.00	\$10,890.00
14.	Open Ditch Fertilizing & Seeding	3.0	STA	65.00	\$6,760.00
15.	Fence Cuts	17	EA	250.00	\$4,250.00

CONSTRUCTION COST SUBTOTAL

\$1,676,800.00

Engineering Services:

Survey	\$6,500.00
Engineer Administration & Design Services	\$134,000.00
Research/Study/Engineering Report	\$67,000.00
Final Plans & Specs	\$50,000.00
Construction Admin/Staking/Observation	\$25,000.00

Legal & Auditor Services, Publication, Misc.

Damages (55.1 AC @ \$700/AC)	\$4,000.00
Contingencies	\$38,570.00
	<u>\$134,000.00</u>

REPLACEMENT PROJECT COST SUBTOTAL

\$2,135,870.00

Other Potential District Costs:

Annexation	\$4,000.00
Reclassification (2,939 AC)	\$25,000.00
Project Warrant Interest	\$168,000.00

TOTAL ESTIMATED PROJECT COST

\$2,332,870.00

Average Cost per Watershed Acre (2,939 AC)

\$793.76

Average Cost per Watershed Acre for 10 years

\$79.38

WETLAND MITIGATION (19.5 AC @ \$20,000/AC)

\$390,000.00

NON-DISTRICT COSTS

Secondary Roads: Jack and Bore

Furnish & Install 42" 3000D RCP, Tanager Ave.	100	LF	866.00	\$86,600.00
Furnish & Install 42" 3000D RCP, Tyler Ave.	100	LF	866.00	\$86,600.00

Secondary Roads: Open Trench

Furnish & Install 42" 3000D RCP, 140th St.	66	LF	150.00	\$9,900.00
Furnish & Install 30" 3000D RCP, 130th St.	66	LF	69.00	\$4,554.00
Furnish & Install 30" 3000D RCP, Van Buren Ave.	66	LF	69.00	\$4,554.00
Furnish & Install 30" 3000D RCP, Van Buren Ave.	66	LF	69.00	\$4,554.00
Furnish & Install 24" 3000D RCP, 120th St.	66	LF	53.00	\$3,498.00

TOTAL ESTIMATED NON-DISTRICT COSTS

\$200,260.00

DRAINAGE DISTRICT 73 OSCEOLA COUNTY
 PRELIMINARY ENGINEER'S ESTIMATE OF PROBABLE COSTS



PROJECT NUMBER: 17364

IMPROVEMENT RELIEF OPTION

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	65,000.00	\$65,000.00
2.	Open Ditch Excavation	8.00	HRS	165.00	\$1,320.00
3.	Spoil Bank Leveling (Two Sided)	3.0	STA	70.00	\$210.00
4.	Parallel Relief Tile				
	1500D Reinforced Concrete Pipe, 18" Dia.	4,140	LF	24.00	\$99,360.00
	1500D Reinforced Concrete Pipe, 24" Dia.	7,575	LF	34.00	\$257,550.00
	1500D Reinforced Concrete Pipe, 36" Dia.	11,590	LF	68.00	\$788,120.00
5.	Alignment Turns				
a.	18" Dia. R.C.P. Elbow Section, Fabrication Only	3	EA	325.00	\$975.00
b.	24" Dia. R.C.P. Elbow Section, Fabrication Only	10	EA	425.00	\$4,250.00
c.	36" Dia. R.C.P. Elbow Section, Fabrication Only	8	EA	650.00	\$5,200.00
6.	Junction Structures	3	EA	5,000.00	\$15,000.00
7.	Tile End Caps				
a.	6" Dia., Fabrication Only	2	EA	70.00	\$140.00
b.	7" Dia., Fabrication Only	3	EA	70.00	\$210.00
c.	8" Dia., Fabrication Only	2	EA	70.00	\$140.00
d.	10" Dia., Fabrication Only	3	EA	70.00	\$210.00
e.	IDOT DR-142 RCP, 12" Dia.	1	EA	70.00	\$70.00
f.	IDOT DR-142 RCP, 15" Dia.	1	EA	77.00	\$77.00
8.	Lateral Tile Connections	12	EA	300.00	\$3,600.00
9.	Misc. Drain Tile Repairs & Connections	37	EA	300.00	\$11,100.00
10.	Topsoil Strip, Stockpile, Respread	10,000	CY	2.25	\$22,500.00
11.	Tile Trench Stabilization and Cradling Rock	330	TN	25.00	\$8,250.00
12.	Spot Tile Exploration	45	HR	165.00	\$7,425.00
13.	Open Ditch Fertilizing & Seeding	3.0	STA	65.00	\$6,760.00
14.	Fence Cuts	17	EA	250.00	\$4,250.00

CONSTRUCTION COST SUBTOTAL

\$1,301,717.00

Engineering Services:

Survey	\$6,500.00
Engineer Administration & Design Services	\$104,000.00
Research/Study/Engineering Report	\$52,000.00
Final Plans & Specs	\$39,000.00
Construction Admin/Staking/Observation	\$25,000.00

Legal & Auditor Services, Publication, Misc.

Damages (54.6 AC @ \$700/AC)	\$4,000.00
Contingencies	\$37,940.00
	<u>\$104,000.00</u>

REPLACEMENT PROJECT COST SUBTOTAL

\$1,674,157.00

Other Potential District Costs:

Annexation	\$4,000.00
Reclassification (2,939 AC)	\$25,000.00
Project Warrant Interest	\$131,000.00

TOTAL ESTIMATED PROJECT COST

\$1,834,157.00

Average Cost per Watershed Acre (2,939 AC)

\$624.08

Average Cost per Watershed Acre for 10 years

\$62.41

WETLAND MITIGATION (19.5 AC @ \$20,000/AC)

\$390,000.00

NON-DISTRICT COSTS

Secondary Roads: Jack and Bore

Furnish & Install 36" 3000D RCP, Tanager Ave.	100	LF	660.00	\$66,000.00
Furnish & Install 36" 3000D RCP, Tyler Ave.	100	LF	660.00	\$66,000.00

Secondary Roads: Open Trench

Furnish & Install 36" 3000D RCP, 140th St.	66	LF	86.00	\$5,676.00
Furnish & Install 24" 3000D RCP, 130th St.	66	LF	53.00	\$3,498.00
Furnish & Install 24" 3000D RCP, Van Buren Ave.	66	LF	53.00	\$3,498.00
Furnish & Install 24" 3000D RCP, Van Buren Ave.	66	LF	53.00	\$3,498.00
Furnish & Install 18" 3000D RCP, 120th St.	66	LF	42.00	\$2,772.00

TOTAL ESTIMATED NON-DISTRICT COSTS

\$150,942.00

PRELIMINARY PLAN SET

A.01	TITLE SHEET
A.02	DISTRICT PLAT
A.03	FLOWPATH MAP
D.01 – D.10	TILE PLAN & PROFILE