

AGENDA

Drainage District 14 Continuation Of Public Hearing On Engineer's Report On Repairs Or Improvements To The Main Tile Of DD 14

Wednesday, June 08, 2022, 10:00 A.M.

This meeting will be held electronically and in-person.

To access the meeting call: 1-(312)-626-6799, when prompted enter meeting ID code: 820 7567 2007

1. Reconvene Meeting
2. Approve Agenda
3. Introductions/Attendance
4. DD 14 WO 290 - Televising Results

Documents:

[DD 14 DRAINAGE INVESTIGATION CCTV SUMMARY.PDF](#)

5. DD 14 WO 290 - Engineer's Report On Repairs Or Improvements To Main Tile & Engineer's Opinion Of Probable Construction Costs W Upsized Tile

Documents:

[DD-14 WO 290 - ENGINEERS REPORT ON REPAIRS OR IMPROVEMENTS.PDF](#)
[DD 14 - ADDL COSTS 0.5 AND 1.PDF](#)

6. Comments/Discussion
7. Close Public Hearing
8. Possible Action
9. Other Business
10. Adjourn Meeting

Drainage District:

#14

Investigation/Repair Summary:

- Per District Trustees' request at hearing, CCTV inspection of the Main tile was conducted for approximately 1900'. Downstream limit was the south side of County Highway D41 (existing access point) at approximately ¼ mile west of intersection of County Highways D41 and S27. Upstream limit was east side of County Highway S27 approximately ¼ mile north of intersection of County Highways D41 and S27. See attached map for exact locations and attached CCTV reports for defects found.
- Access points where 14" VCP was cut (along with 8" tile) were repaired with dual wall HDPE with ¾ concrete collars at connections with existing VCP tile.

Contractor Time and Materials (spent while CGA was on-site):

See attached tabulation.

Additional Actions Recommended:

Although the CCTV has revealed that the existing VCP is cracked and there is evidence of previous spot repairs, the majority of the VCP appears stable and round (see attached CCTV reports for list of defects found). Most concerning of the defects would be the spot repair that was performed with single wall HDPE that is now deformed and has a protruding tap connection at it. This would be followed by the rusty CMP and the multiple longitudinal fractures in VCP. It is our recommendation that at least the deformed single wall HDPE and protruding tap connection be repaired and the timing/necessity of repair of the remaining defects prioritized by the District Trustees.



Total

Polyline GPS Point Range	501-508	508-700	700-530
Approximate Pipe Size	14" VCP	14" VCP	14" VCP
Total Length Televised	0+00-2+90	2+90-9+55	9+55-18+96
Date:	4/18/2022	4/18/2022	4/18/2022
CCTV Survey Number	118	119	120

Top Longitudinal Crack (ft)	185.5	42.5	134.8	8.2
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Multiple Longitudinal cracks (ft)	5.1	5.1		
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O/S Joints soils visible (#)	3	1	2	
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Intruding Tap with deformed SW HDPE (#)	1	1		
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Rusty CMP, (ft)	62	62		
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Multiple Longitudinal Fractures in Pipe (ft)	18.8	18.8		
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Camera Underwater (ft)	119.1	100.4	18.7	
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Top and Bottom Longitudinal crack (ft)	3.9	3.9		
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Offset joints (#)	5	3	1	1
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Possible Hole in Pipe(#)	1	1		
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Single Wall or Dual Wall HDPE (ft.)	12.1	5	4.3	2.8
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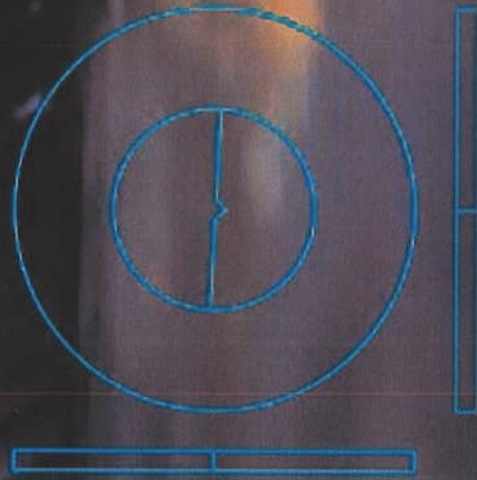
09:50:12 04-18-2022

258.9ft -2.6%



10:02:06 04-18-2022

265.6ft 1.6%

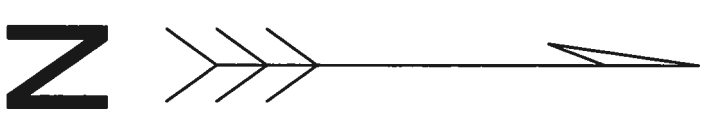
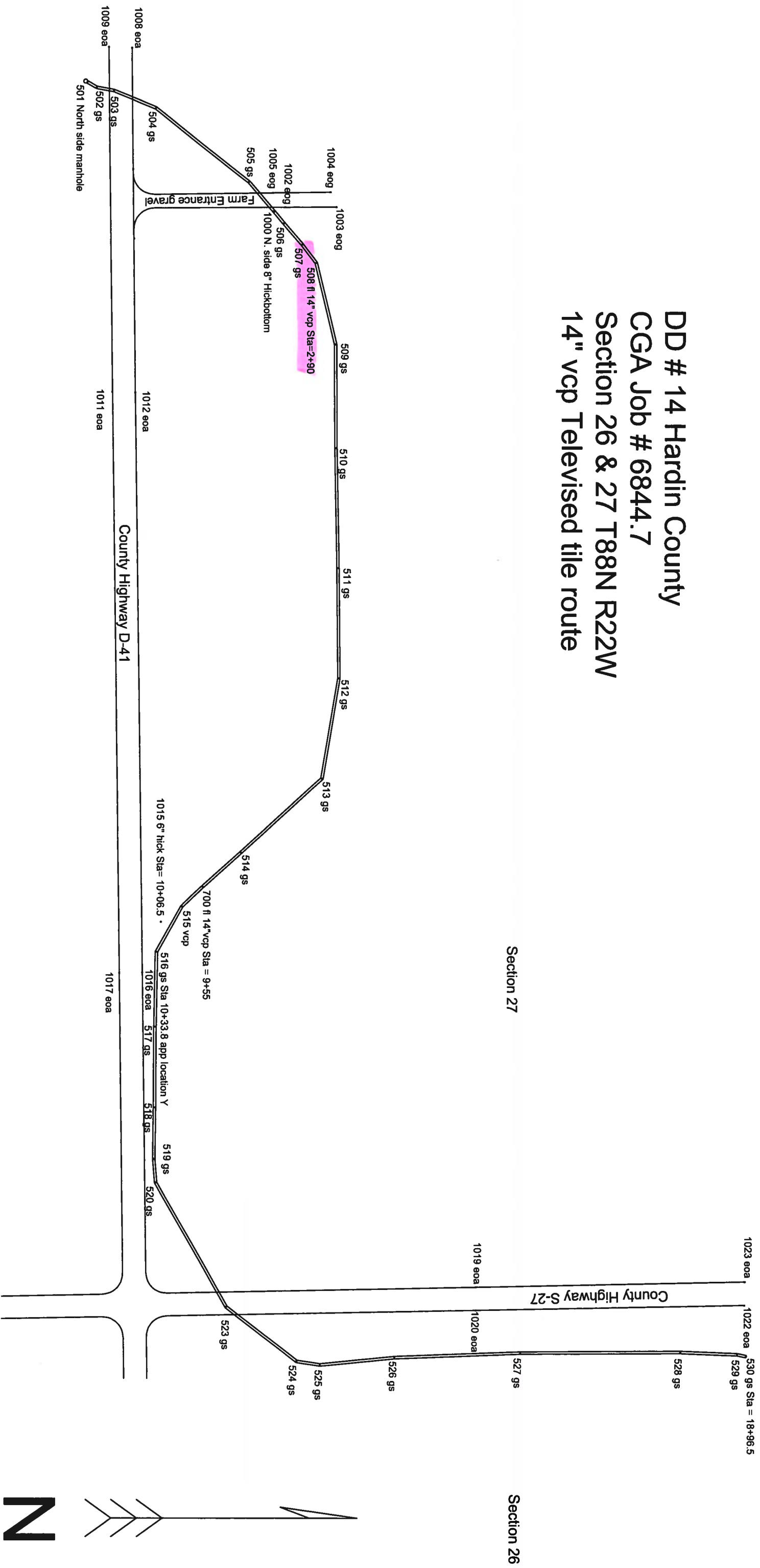


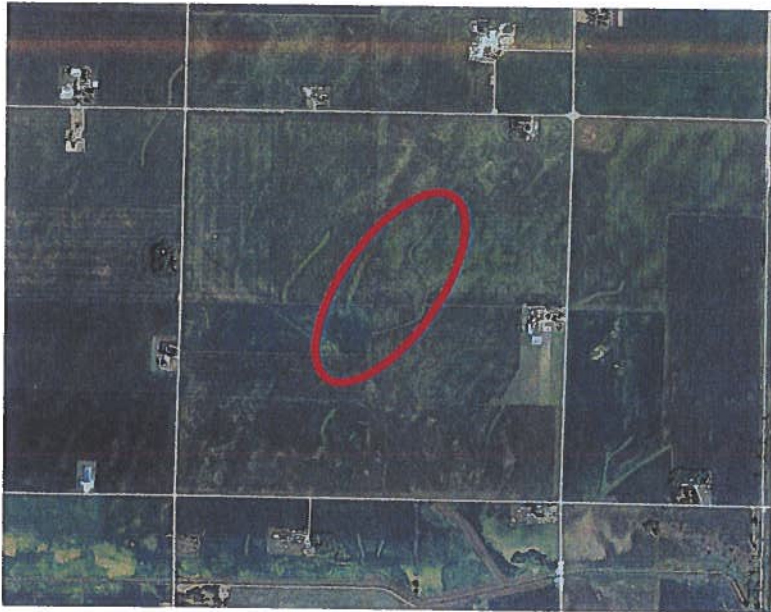
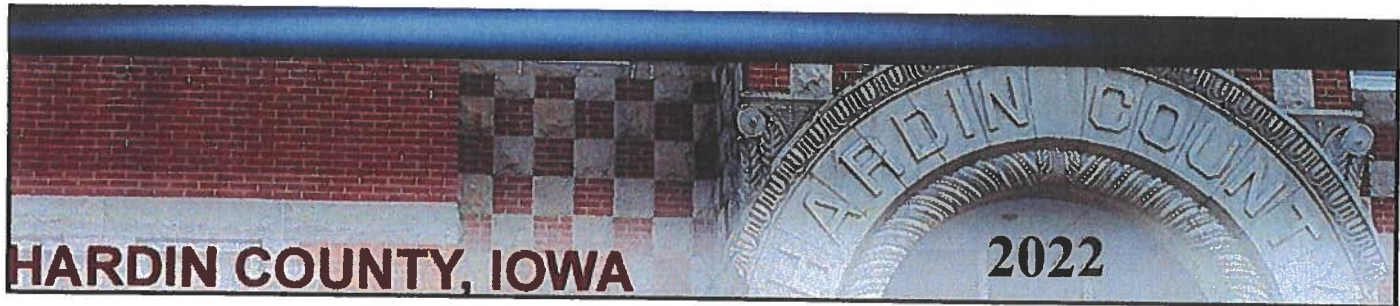
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30

DD # 14 Hardin County
CGA Job # 6844.7
Section 26 & 27 T88N R22W
14" vcp Televised tile route





**ENGINEER'S REPORT
ON REPAIRS OR
IMPROVEMENTS TO
THE MAIN TILE
DRAINAGE DISTRICT
NO. 14
HARDIN COUNTY,
IOWA**

	<p>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</p>
	<p><i>Zeb J. Stanbrough</i> PE 1-17-2022 ZEB J. STANBROUGH, P.E. DATE</p> <p>LICENSE NUMBER: 19957 MY LICENSE RENEWAL DATE IS DECEMBER 31, 2023 PAGES OR SHEETS COVERED BY THIS SEAL: SHOWN ON TABLE OF CONTENTS</p>



CLAPSADDLE-GARBER ASSOCIATES OFFICE LOCATIONS

16 East Main Street, PO Box 754 | Marshalltown, IA 50158
1523 S. Bell Avenue, Suite 101 | Ames, IA 50010
5106 Nordic Drive | Cedar Falls, IA 50613
739 Park Avenue | Ackley, IA 50601
511 Bank Street | Webster City, IA 50595

Project Office
739 Park Avenue
Ackley, IA, 50601
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Engineer's Report on Repairs or Improvements to the Main Tile, Drainage District No. 14 Hardin County, Iowa

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Engineer's Report on Repairs or Improvements To the Main Tile, Drainage District No. 14 Hardin County, Iowa

1.0 INTRODUCTION

- SCOPE OF WORK – The Hardin County Board of Supervisors acting as District Trustees, requested Clapsaddle-Garber Associates to prepare a report concerning repairs or improvements to the Main Tile of Drainage District No. 14. This report will detail the feasibility of said repairs or improvements, and present opinions of probable construction costs associated with said repairs or improvements. At the landowner meeting held on February 2, 2021, the District Trustees requested Clapsaddle-Garber Associates to move ahead with a report concerning repairs or improvements to the lower portion of the Main tile.
- LOCATION – The area of investigation was limited to the lower 2,900 feet of the existing Main tile. Said Main tile is located in Section 34, Township 88 North (T88N), Range 22 West (R22W), Hardin County, Iowa. Specifically, the downstream limit of the investigation for the Main tile is where the Main tile outlets into Drainage District No. 123 in said Section 34, approximately ½ mile east of E Avenue and ¾ mile north of 220th Street. Going upstream, the tile then proceeds northeasterly across Section 34, with the upstream limits of the investigation being approximately ¼ mile south of County Highway D41/210th Street and ¼ mile west of County Highway S27/F Avenue. For reference, maps showing the Main tile are included in Appendices B and C.

2.0 DISTRICT HISTORY – The following is a brief summary of the pertinent history of Drainage District No. 14 as obtained from the Hardin County Auditor’s drainage minutes and records.

- 1909, Aug. 19 Petition for Drainage District No. 14 drainage bonds
- 1909, Aug. 20 Petition for drainage improvement. Said petition indicated a main tile with 2 laterals should be installed. Specifically, it indicated the main should start in part of the NE ¼ of Sec. 27, part of the SE ¼ Sec. 27, part of the SW ¼ of Sec. 27, part of the NW ¼ of Sec. 26, part of the SW ¼ of Sec. 26, part of the NE ¼ of Sec. 34.
- 1909, Dec. 5 Engineer’s Report by S.B. Gardner was filed. It called for 9600 feet of main tile (15 inch diameter to 5 inch diameter), 2240 feet of Lateral 1 tile (8 inch diameter to 5 inch diameter), 1200 feet of Lateral 2 tile (8 inch diameter to 6 inch diameter), 800 feet of Lateral 3 tile (8 inch diameter) and a 4 cubic yard concrete bulkhead. The estimated total cost of construction was \$3790.00.
- 1910, Jan. 25 Richard Vierkandt filed a claim for damages in the amount of \$400. Claim was investigated by appraisers H.W. Utech and A.B. Baxter and denied.
- 1910, Mar. 7 Notice to Contractors for construction of Tile Drain.
- 1910, Mar. 7 Construction Contract with Schriver and Thomas for \$2235.10 for labor for placing and laying of tile.
- 1910, May 2 Tile Contract with Eldora Pipe and Tile Co. of Eldora for \$1,759.10 for supplying tile was entered.
- 1910, Dec. 5 Engineer’s recommendation to Trustees for final payment to Shriver and Thomas for work completed.
- 1915, Jun. 14 Completed repairs, 21 bad places caused by the tile not being laid close together by R.S. Cornell. No amount stated.
- 1915, Apr. 21 Approval of needed repair by W.E. Welden. John Wird entered complaint of needed repairs was directed to employ necessary help to repair same.
- 1917, Jul. 24 Request for repair to bulkhead at outlet and for several broken tile along half mile of said district.
- 1953, Jan. 28 Bill for Machine Rental for repair located in the NE ¼ Sec. 34.
- 1955, Dec. 2 Bill for tile repair located in the NE ¼ Sec. 34.
- 1955, Dec. 2 Bill for tile repair located in the NE ¼ Sec. 34.
- 1956, Jan. 19 Bill for machine rental and materials located in the NE ¼ - NW ¼ of Sec. 34, and SW ¼ Sec. 26.
- 1958, Dec. 12 Bill for repair work located in the SW ¼ - NE ¼ Sec. 34.
- 1960, Mar. 30 Bill to prepare assessment and trace old blueprint.
- 1960, Jun. 1 Bill for repair located in the NE ¼ Sec. 34.
- 1961, Nov. 1 Bill to clean tile located in SW ¼ Sec. 26.
- 1969, Dec. 5 Bill for tile repair located in Sec. 34 and Sec. 26.
- 1975, May 16 Bill for tile repair located in Sec. 34.
- 1983, Aug. 1 Bill for tile repair located in Sec. 34.
- 1983, Dec. 19 Bill for tile repair located in the NE ¼ Sec. 34.
- 1989, May 10 Bill to repair broken tile located in the NE ¼ Sec. 34.
- 1991, Oct. 9 Bill to repair broken tile located in the NE ¼ Sec. 34.
- 1991, Nov. 13 Bill to repair broken tile located in the SW ¼ Sec. 34.
- 1997, July 1 Bill to repair broken tile located in the NE ¼ Sec. 34.
- 2001, April 3 Engineer’s Report was filed by Ryken Engineering. It reviewed D.D. No. 14 and recommended construction of a new tile parallel to the existing tile consisting of 300 feet of 21 inch tile, 5100 feet of 18 inch tile, and 2000 feet of 15 inch tile for a total cost of \$144,500.
- 2001, Jun. 28 Bill for repair located in the NE ¼ Sec. 34.

- 2006, Aug. 7 Bill for repair located in the NE ¼ Sec. 34.
- 2011, Mar. 14 Bill for repair located in Sec. 34.
- 2012, Jan. 16 Bill for repair located in Sec. 34.
- 2017, Feb. 15 Approval for tile repair in the NE ¼ Sec. 34.
- 2017, Feb. 15 Engineer's repair summary was filed by Ryken Engineering reporting work done to repair tile issues and cost of time and materials used in repair of main in the NE ¼ of Sec. 34.
- 2017, Feb. 15 Engineer's repair summary was filed by Ryken Engineering reporting additional repair work done and cost of time and materials used in repair in the NE ¼ Sec. 34.
- 2017, Apr. 12 Engineer's repair summary was filed by Ryken Engineering reporting work done to repair tile, and cost of time and materials used in the NE ¼ Sec. 34.
- 2017, Jul. 17 Engineer's investigation summary of CCTV of tile main in the NE ¼ of Sec. 34.

3.0 INVESTIGATION – Review of the district history indicates that the Main tile of Drainage District No. 14 has had over 40 repairs within Section 34. 21 of those repairs were completed within the first 5 years after the original construction of the Main tile. Said investigation was limited to courthouse research and previous repair/investigation summaries by Clapsaddle-Garber Associates and Ryken Engineering. During the previous investigation from 2020, 26 locations were found where the Main tile was either partially or imminently collapsing over the course of approximately 1,900 feet. For reference, a partial copy of the previous investigation summary is included in Appendix A.

4.0 DISCUSSION AND CONCLUSIONS – Based on the above, it is obvious that the existing Main tile in the area of investigation is in various states of collapse which is restricting drainage capacity in the area. It is not clear if those collapses are due to the age of the tile or continuation of the original installation issues. However, if repairs or improvements are not performed, the Main tile will continue to have poor drainage performance, the upstream landowners will continue to experience overland flow, ponding, and additional sinkholes will form over the Main tile. This will continue to affect productivity of the farmed ground upstream of these issues and it will get worse as the tile ages. When all these issues are combined, it will lead to further reduced drainage capacity and liability exposure by the drainage district.

5.0 **REPAIR METHODS** – To repair the existing Main tile, the following options are the most straightforward available:

Partial Tile Replacement – Lower 500 feet

- Remove and replace the lower 500 feet of the existing Main tile within the investigation limits with new Main tile of equal or comparable size.
- Typically, the replacement Main tile would be in the same location or near proximity as the existing Main tile in order to locate and reconnect private tile and district lateral tile. For reference, the route and locations are shown on the map included in Appendix B.

Partial Tile Replacement – Lower 2,900 feet

- Remove and replace the lower 2,900 feet of the existing Main tile for the entire investigation limits with new Main tile of equal or comparable size.
- Typically, the replacement Main tile would be in the same location or near proximity as the existing Main tile in order to locate and reconnect private tile. For reference, the route and locations are shown on the map included in Appendix C.

With the above-mentioned repair methods, the following should be noted:

- The pipe sizes used are those that are currently manufactured that most closely meet or exceed the current Main tile size.
- The Partial Tile Replacement option would allow for lower maintenance costs in those areas in the future as the entire Main tile is new.
- The Partial Tile Replacement option would remove all soil and debris in the existing Main tile in those areas.
- The only portion of the Main tile which is being replaced would be as detailed in the above. No other portions of the Main tile were investigated or proposed for replacement.
- The Partial Tile Replacement would use rock bedding and backfill for strength due to soil characteristics in the area of replacement.
- The Partial Tile Replacement would use slopes/grades that match or closely meet the original design.
- The Partial Tile Replacement will not significantly increase the drainage capacity of the Main tile beyond its original design of 0.10 inches per day at the outlet.
- The Partial Tile Replacement would outlet into both the original Main tile and the supplemental Main tile of Drainage District No. 123
- Repairs have historically been viewed as not having an impact on jurisdictional wetlands. As such, individual landowners should consult with applicable staff at the Hardin County NRCS offices to verify the existence of said jurisdictional wetlands and that there will be no impact on them.

Per Iowa Code Chapter 468.126, any of the above actions that do not intend to increase capacity would be considered a repair. Per Iowa Code Chapter 468.126.1.g, the right of remonstrance does not apply to the proposed repairs

6.0 **IMPROVEMENT METHODS** – To improve the drainage capacity for the existing Main tile, the following options are the most straight forward available:

Upsized Tile Replacement – Upsizing Lower 500 feet

- Remove and replace the lower 500 feet of the existing Main tile within the investigation limits with new Main tile of a larger size.
- Typically, the replacement Main tile would be in the same location or near proximity as the existing Main tile in order to locate and reconnect private tile. For reference, the route and locations are shown on the map included in Appendix B.

Upsized Tile Replacement – Upsizing Lower 2,900 feet

- Remove and replace the lower 2,900 feet of the existing Main tile within the investigation limits with new Main tile of a larger size.
- Typically, the replacement Main tile would be in the same location or near proximity as the existing Main tile in order to locate and reconnect private tile. For reference, the route and locations are shown on the map included in Appendix C.

With the above-mentioned possible improvement, the following should be noted in addition to the notes in repair methods section:

- The replacement of the Main tile with an Upsized Main tile would allow for lower maintenance cost in those areas in the future as the lower main tile is new.
- The replacement of the Main tile with an Upsized Main tile increases drainage capacity, which has traditionally fit the Iowa Code definition of improvement.
- The Upsized Tile Replacement option would remove all soil and debris in the existing Main tile in those areas.
- The only portion of the Main Tile which is being replaced would be as detailed in the above. No other portions of the Main tile were investigated or proposed for replacement.
- The Upsized Tile Replacement would use rock bedding and backfill for strength due to soil characteristics in the area of replacement.
- The Upsized Tile Replacement would use slopes/grades that match or closely meet the original design. Except the lower 300 feet which would be at a steeper grade due to the supplemental main tile of Drainage District 123 being deeper than the original Main tile of Drainage District 123.
- The Upsized Tile Replacement will increase the drainage capacity of the Main tile beyond to 0.34 inches per day at the outlet.
- The Upsized Tile Replacement would outlet into both the original Main tile and the supplemental Main tile of Drainage District No. 123
- Improvements have historically been viewed as having an impact on jurisdictional wetlands. As such, individual landowners should consult with applicable staff at the Hardin County NRCS offices to verify the existence of said jurisdictional wetlands and what said impact may be on them.

Per Iowa Code Chapter 468.126, any of the above actions that intend to increase capacity would be considered an improvement. Per Iowa Code Chapter 468.126.4.e, the right of remonstrance does apply to the proposed repairs.

7.0 OPINION OF PROBABLE CONSTRUCTION COSTS – Using the above methods of repair or improvement, an itemized list of project quantities and associated opinions of probable construction cost for each option were compiled and are included in Appendices D and E of this report. A summary of said costs are as follows:

METHOD PARTIAL TILE REPLACEMENT	TOTAL COST
Repair – Lower 500 feet	\$62,400.00
Repair – Lower 2,900 feet	\$288,000.00
Improvement – Upsizing Lower 500 feet	\$73,650.00
Improvement – Upsizing Lower 2,900 feet	\$353,250.00

It should be noted that said costs include materials, labor, and equipment supplied by the contractor to complete the necessary repair or improvement and include applicable engineering, construction observation, and project administration fees by Clapsaddle-Garber Associates. However, said costs do not include any interest, legal fees, county administrative fees, crop damages, other damages, previous repairs, engineering fees to date, wetland mitigation fees, or reclassification fees (if applicable). As always, all costs shown are opinions of Clapsaddle-Garber Associates based on previous lettings on other projects. Said costs are just a guideline and are not a guarantee of actual costs.

8.0 OWNERSHIP AND CLASSIFICATIONS – Any and all information concerning ownership of lands and classifications of said lands within Drainage District No. 14 can be obtained from the Hardin County Auditor’s office.

It should be noted that Iowa Code Chapter 468.65 states “When, after a drainage . . . district has been established . . .” and “. . . a repair . . . has become necessary, the board may consider whether the existing assessments are equitable as a basis for payment of the expense of . . . making the repair . . .” and “If they find the same to be inequitable in any particular . . . they shall . . . order a reclassification . . .” Based on this, it is our opinion that a reclassification may be need if the repair were to move forward.

It should also be noted that Iowa Code Chapter 468.131 states “When an assessment for improvements . . . exceeds twenty-five percent of the original assessment and the original or subsequent assessment . . . 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 . . .” Based on this, it appears that a reclassification separating laterals may be required if any of the above options were deemed to be an improvement, said improvement were to move forward, and the laterals had not already been separated. Since the proposed project does not involve the laterals, it is not clear if this portion of code is applicable, and it is our recommendation that the District Trustees seek advice from their legal counsel.

9.0 **RECOMMENDATIONS** – There is a definite need to perform one of the above-mentioned actions. The actions would remove the current restrictions to the Main tile and extend the lifespan of the same. Therefore, it is recommended that the District Trustees, should take action to accomplish the following:

- Approve the Engineer's Report as prepared by Clapsaddle-Garber Associates.
- Hold the required hearing on the proposed repair or improvement.
- Adopt one of the recommendations of the Engineer's Report.
- Direct plans and specifications for the proposed repair or improvement be prepared by Clapsaddle-Garber Associates.
- Proceed with receiving bids from interested contractors by Clapsaddle-Garber Associates.
- Award contract to the lowest responsible contractor.
- If desired or required by Iowa Code, proceed with reclassification proceedings after seeking legal advice concerning the same.

Drainage District:

#14

Investigation Summary:

- Per the earlier recommendations and authorization, CCTV inspected the 15-inch VCP Main Tile starting at existing 3 feet diameter blowout located in the grass waterway approximately 1900 feet east of County Highway S27 and approximately 2650 feet south of County Highway D41.
- Televised 884.9 feet upstream (to the north) from said existing tile blowout and found 17 locations of partial/imminent collapse. (see attached Tabulated Defects sheet)
- Televised 995 feet downstream (to the south) from said existing tile blowout and found 9 locations of partial/imminent collapse. (see attached Tabulated Defects sheet)
- Temporarily repaired 4 tile locations, 2 north and 2 south (1 was at tenant's request) from the start location of the CCTV with 15" Dual Wall HDPE tile with fabric wrapped joints and backfilled the areas with on-site soil.

Contractor Time and Materials (spent while CGA was on-site):

See attached Tabulated Contractor Time and Materials Tabulated Defects sheet.

Additional Actions Recommended:

It is obvious that the Main tile is in disrepair and needs to be repaired based on the CCTV results and the history of repairs in the area. If nothing is done, the tile's condition will only continue to deteriorate which will result in future blowouts and sinkholes that will impact the drainage capacity of the Main tile. Therefore, we would recommend doing at least 6 spot repairs which would consist of replacing approximately 570 feet of existing tile. It is our opinion that the total construction cost would be \$35,000-\$45,000. This cost is low enough that neither a hearing nor Engineer's Report would be required. Alternatively, the District Trustees could pursue replacement of the Main tile for its entire length of CCTV, the cost of which would exceed \$50,000 and require a hearing and Engineer's Report.



Tabulated Contractor Time and Materials

Date	Totals	5/14/2020
Workman (hrs)	18.75	18.75
Mini Excavator (hrs)	6.25	6.25
UTV with camera Equipment (hrs)	6.25	6.25
18" Dual Wall HDPE Tile (ft.)	19.9	19.9
CCTV inspection (ft.)	1878.3	1878.3



Tabulated Defects

	Total	GPS #177 UPSTREAM	GPS #178 DOWNSTREAM
Total Length Televised (ft)	1879.9	884.9	995
Date:		5/14/2020	5/14/2020
Top crack (ft)	805.3	338.5	466.8
Side crack (ft)	161.4	69.2	92.2
Bottom crack (ft)	805.3	338.5	466.8
Partial or imminent collapse (#)	26	17	9
Full collapse (#)	0	0	0
Debris (ft)	3	3	0
Offset Joint (#)	6	5	1
Soil/voids visible in offset joint (#)	5	4	1
Single Wall HDPE (non-deformed) (ft)	6.2	1.5	4.7
Dual Wall HDPE (ft)	0	0	0
CMP (rusty) (ft)	49.8	34.3	15.5
Holes (non-fixed) (#)	0	0	0
Holes (fixed) (#)	0	0	0
Alligator Cracks (ft)	261.4	0	261.4
Radial Cracks (# of tile)	2	0	2



PLAT

OF THE

WIRDS

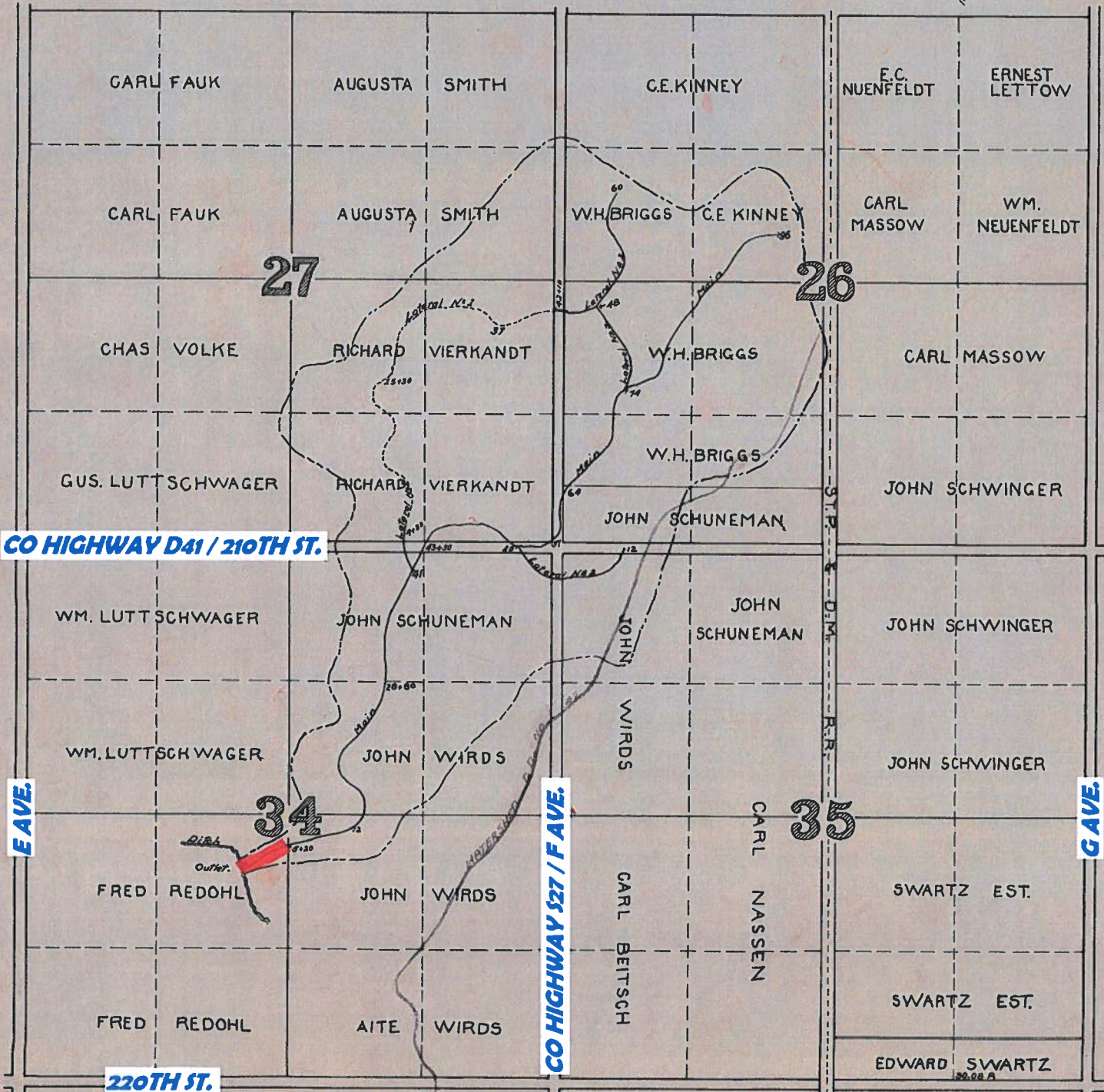
DRAINAGE DISTRICT No 14

REPAIR / IMPROVEMENT

REFERENCE	
Ditch	
Railroad	
Boundary of District	
Proposed Improvement	
Not Recommended	

HARDIN COUNTY IOWA
CONTAINING 495 ACRES
S.B.GARDNER, ENGR. 1909 ELDORA IOWA.

SCALE
1 in. = 600 FT.



CO HIGHWAY D41 / 210TH ST.

E AVE.

CO HIGHWAY S27 / F AVE.

G AVE.

220TH ST.

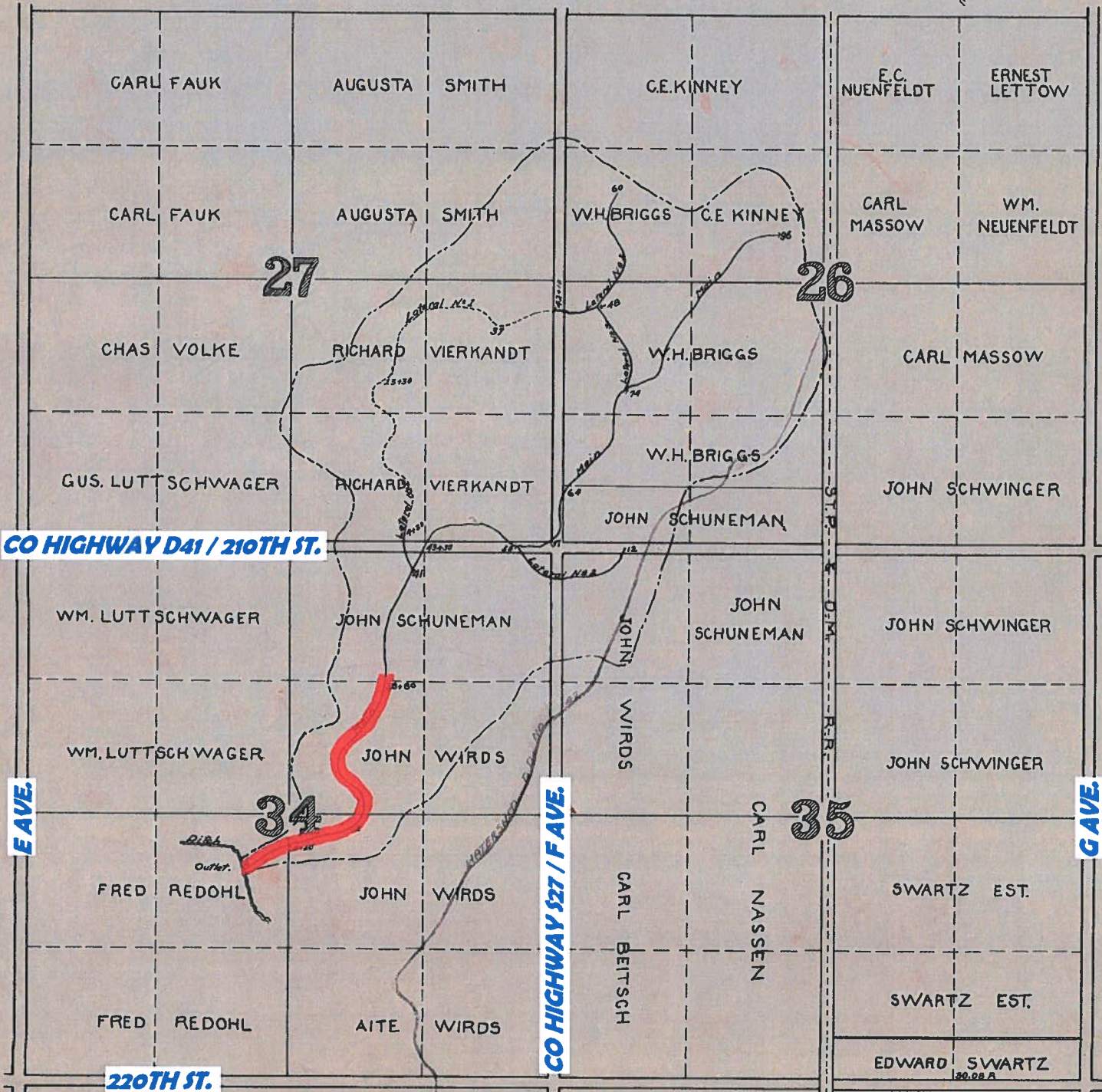
PLAT OF THE WIRDS DRAINAGE DISTRICT No 14

REPAIR / IMPROVEMENT

REFERENCE	
Ditch	
Railroad	
Boundary of District	
Proposed Improvement	
Not Recommended	

HARDIN COUNTY IOWA
CONTAINING 495 ACRES
S.B.GARDNER, ENGR. 1909 ELDORA IOWA.

SCALE
1 in. = 600 ft.



BUCKEYE TOWNSHIP
88-22



By: Z.J.S.
 Date: 1/10/2022
 Checked By: L.O.G.
 Date: 1/10/2022

Engineer's Opinion of Probable Construction Cost

Project: Main tile Repair for D.D. #14

Location: Section 34, T82N, R22W, Hardin County, Iowa

	ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost
	PARTIAL TILE REPLACEMENT (LOWER - 500 FEET)	CONSTRUCTION COSTS					
101		15" RCP OR DUAL WALL TILE	\$ 50.00	LF	500	LF	\$ 25,000.00
102		INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00
103		PRIVATE TILE CONNECTIONS	\$ 800.00	EA	1	EA	\$ 800.00
104		CONCRETE COLLARS	\$ 400.00	EA	2	EA	\$ 800.00
105		LOCATE EXISTING TILE	\$ 3.00	LF	500	LF	\$ 1,500.00
106		REMOVAL OF EXISTING TILE	\$ 7.00	LF	500	LF	\$ 3,500.00
CONSTRUCTION SUBTOTAL						\$ 41,600.00	
Contingency (20%)						\$ 8,320.00	
CONSTRUCTION TOTAL						\$ 49,920.00	
Engr. & Const. Observation (25%)						\$ 12,480.00	
TOTAL COST						\$ 62,400.00	
PARTIAL TILE REPLACEMENT (LOWER - 2,900 FEET)	CONSTRUCTION COSTS						
	201	15" RCP OR DUAL WALL TILE	\$ 50.00	LF	2900	LF	\$ 145,000.00
	202	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00
	203	PRIVATE TILE CONNECTIONS	\$ 800.00	EA	8	EA	\$ 6,400.00
	204	CONCRETE COLLARS	\$ 400.00	EA	4	EA	\$ 1,600.00
	205	LOCATE EXISTING TILE	\$ 3.00	LF	2900	LF	\$ 8,700.00
	206	REMOVAL OF EXISTING TILE	\$ 7.00	LF	2900	LF	\$ 20,300.00
	CONSTRUCTION SUBTOTAL						\$ 192,000.00
	Contingency (20%)						\$ 38,400.00
	CONSTRUCTION TOTAL						\$ 230,400.00
Engr. & Const. Observation (25%)						\$ 57,600.00	
TOTAL COST						\$ 288,000.00	



By: Z.J.S.
 Date: 1/10/2022
 Checked By: L.O.G.
 Date: 1/10/2022

Engineer's Opinion of Probable Construction Cost
Project: Main tile Improvement for D.D. #14
 Location: Section 34, T82N, R22W, Hardin County, Iowa

	ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost	
	UPSIZED TILE REPLACEMENT (LOWER - 500 FEET)	CONSTRUCTION COSTS						
101		24" RCP OR DUAL WALL TILE	\$ 65.00	LF	500	LF	\$ 32,500.00	
102		INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
103		PRIVATE TILE CONNECTIONS	\$ 800.00	EA	1	EA	\$ 800.00	
104		CONCRETE COLLARS	\$ 400.00	EA	2	EA	\$ 800.00	
105		LOCATE EXISTING TILE	\$ 3.00	LF	500	LF	\$ 1,500.00	
106		REMOVAL OF EXISTING TILE	\$ 7.00	LF	500	LF	\$ 3,500.00	
CONSTRUCTION SUBTOTAL						\$	49,100.00	
Contingency (20%)						\$	9,820.00	
CONSTRUCTION TOTAL						\$	58,920.00	
Engr. & Const. Observation (25%)						\$	14,730.00	
TOTAL COST						\$	73,650.00	
UPSIZED TILE REPLACEMENT (LOWER - 2,900 FEET)	CONSTRUCTION COSTS							
	201	24" RCP OR DUAL WALL TILE	\$ 65.00	LF	2900	LF	\$ 188,500.00	
	202	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
	203	PRIVATE TILE CONNECTIONS	\$ 800.00	EA	8	EA	\$ 6,400.00	
	204	CONCRETE COLLARS	\$ 400.00	EA	4	EA	\$ 1,600.00	
	205	LOCATE EXISTING TILE	\$ 3.00	LF	2900	LF	\$ 8,700.00	
	206	REMOVAL OF EXISTING TILE	\$ 7.00	LF	2900	LF	\$ 20,300.00	
	CONSTRUCTION SUBTOTAL						\$	235,500.00
	Contingency (20%)						\$	47,100.00
	CONSTRUCTION TOTAL						\$	282,600.00
Engr. & Const. Observation (25%)						\$	70,650.00	
TOTAL COST						\$	353,250.00	



By: Z.J.S.
 Date: 6/3/2022
 Checked By: L.O.G.
 Date: 6/6/2022

Engineer's Opinion of Probable Construction Cost
Project: Main tile (½" Drainage Capacity) Improvement for D.D. #14
 Location: Section 34, T82N, R22W, Hardin County, Iowa

	ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost	
UPSIZED TILE REPLACEMENT (LOWER - 500 FEET)	CONSTRUCTION COSTS							
	201	18" RCP OR DUAL WALL TILE	\$ 70.00	LF	500	LF	\$ 35,000.00	
	202	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
	203	PRIVATE TILE CONNECTIONS	\$ 700.00	EA	1	EA	\$ 700.00	
	204	CONCRETE COLLARS	\$ 700.00	EA	2	EA	\$ 1,400.00	
	205	LOCATE EXISTING TILE	\$ 4.00	LF	500	LF	\$ 2,000.00	
	206	REMOVAL OF EXISTING TILE	\$ 10.00	LF	500	LF	\$ 5,000.00	
	CONSTRUCTION SUBTOTAL						\$	54,100.00
	Contingency (10%)						\$	5,410.00
	CONSTRUCTION TOTAL						\$	59,510.00
Engr. & Const. Observation (25%)						\$	14,877.50	
TOTAL COST						\$	74,387.50	
UPSIZED TILE REPLACEMENT (LOWER - 2,900 FEET)	CONSTRUCTION COSTS							
	301	18" RCP OR DUAL WALL TILE	\$ 70.00	LF	2900	LF	\$ 203,000.00	
	302	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
	303	PRIVATE TILE CONNECTIONS	\$ 700.00	EA	8	EA	\$ 5,600.00	
	304	CONCRETE COLLARS	\$ 700.00	EA	4	EA	\$ 2,800.00	
	205	LOCATE EXISTING TILE	\$ 4.00	LF	2900	LF	\$ 11,600.00	
	206	REMOVAL OF EXISTING TILE	\$ 10.00	LF	2900	LF	\$ 29,000.00	
	CONSTRUCTION SUBTOTAL						\$	262,000.00
	Contingency (10%)						\$	26,200.00
	CONSTRUCTION TOTAL						\$	288,200.00
Engr. & Const. Observation (25%)						\$	72,050.00	
TOTAL COST						\$	360,250.00	



By: Z.J.S.
 Date: 6/3/2022
 Checked By: L.O.G.
 Date: 6/6/2022

Engineer's Opinion of Probable Construction Cost
Project: Main tile (1" Drainage Capacity) Improvement for D.D. #14
 Location: Section 34, T82N, R22W, Hardin County, Iowa

	ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost	
UPSIZED TILE REPLACEMENT (LOWER - 500 FEET)	CONSTRUCTION COSTS							
	401	24" RCP OR DUAL WALL TILE	\$ 80.00	LF	500	LF	\$ 40,000.00	
	402	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
	403	PRIVATE TILE CONNECTIONS	\$ 700.00	EA	1	EA	\$ 700.00	
	404	CONCRETE COLLARS	\$ 700.00	EA	2	EA	\$ 1,400.00	
	405	LOCATE EXISTING TILE	\$ 4.00	LF	500	LF	\$ 2,000.00	
	406	REMOVAL OF EXISTING TILE	\$ 10.00	LF	500	LF	\$ 5,000.00	
			CONSTRUCTION SUBTOTAL					\$ 59,100.00
			Contingency (10%)					\$ 5,910.00
			CONSTRUCTION TOTAL					\$ 65,010.00
		Engr. & Const. Observation (25%)					\$ 16,252.50	
		TOTAL COST					\$ 81,262.50	
UPSIZED TILE REPLACEMENT (LOWER - 2,900 FEET)	CONSTRUCTION COSTS							
	501	24" RCP OR DUAL WALL TILE	\$ 80.00	LF	2900	LF	\$ 232,000.00	
	502	INTERCONNECTION WITH DD-123 (OUTLET)	\$ 10,000.00	EA	1	EA	\$ 10,000.00	
	503	PRIVATE TILE CONNECTIONS	\$ 700.00	EA	8	EA	\$ 5,600.00	
	504	CONCRETE COLLARS	\$ 700.00	EA	4	EA	\$ 2,800.00	
	205	LOCATE EXISTING TILE	\$ 4.00	LF	2900	LF	\$ 11,600.00	
	206	REMOVAL OF EXISTING TILE	\$ 10.00	LF	2900	LF	\$ 29,000.00	
			CONSTRUCTION SUBTOTAL					\$ 291,000.00
			Contingency (10%)					\$ 29,100.00
			CONSTRUCTION TOTAL					\$ 320,100.00
		Engr. & Const. Observation (25%)					\$ 80,025.00	
		TOTAL COST					\$ 400,125.00	