

HARDIN COUNTY, IOWA



2020



**SUPPLEMENT TO
ENGINEER'S
REPORT
ON REPAIRS TO
UPPER END OF
MAIN TILE OF
DRAINAGE
DISTRICT NO. 143
HARDIN COUNTY**



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

Lee O. Gallentine, P.E. *Jan 8, 2020*
LEE O. GALLENTINE, P.E. DATE

LICENSE NUMBER: 15745
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2020
PAGES OR SHEETS COVERED BY THIS SEAL:
SHOWN ON TABLE OF CONTENTS



CLAPSADDLE-GARBER ASSOCIATES OFFICE LOCATIONS

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1523 S. Bell Avenue, Suite 101 | Ames, IA 50010
5106 Nordic Drive | Cedar Falls, IA 50613
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Supplement to Engineer's Report on Repairs to Upper End of Main Tile of Drainage District No. 143, Hardin County, Iowa

| | |
|---|----------|
| Table of Contents | Pg. 1 |
| Report | |
| Introduction | Pg. 2 |
| Repair Methods | Pgs. 3-4 |
| Opinion of Probable Construction Costs | Pg. 5 |
| Recommendations | Pg. 5 |
| Appendices | |
| Summary for Subsequent Investigations | App. A |
| Table of Spot Repair Defects | App. B |
| Repair General Route and Location Map | App. C |
| Opinion of Probable Construction Costs – Full Tile Lining | App. D |
| Opinion of Probable Construction Costs – Partial Tile Lining | App. E |
| Opinion of Probable Construction Costs – Tile Cleaning and Tree Removal | App. F |
| Opinion of Probable Construction Costs – Offset Tile Replacement | App. G |

Supplement to Engineer's Report on Repairs to Upper End of Main Tile of Drainage District No. 143, Hardin County, Iowa

1. INTRODUCTION

- SCOPE OF WORK – The Hardin County Board of Supervisors, acting as District Trustees, requested Clapsaddle-Garber Associates to investigate and report concerning repairs to the upper end of the main tile of Drainage District No. 143. At the hearing held on August 16, 2017 and several landowner meetings since, the original Engineer's Report, subsequent investigation results (copy included in Appendix A for reference), and subsequent repair results were discussed and reviewed by the District Trustees. As a result, at the landowner meeting held on April 24, 2019 the District Trustees requested Clapsaddle-Garber Associates to move ahead with this supplement for additional options to reinstate the capacity of the Main tile along Ionia Street.

2. REPAIR METHODS – To repair the issues discussed in the original report along Ionia Street that haven't already been repaired, there are several options, but the following are some of the ones discussed at the above mentioned hearings and meetings:

Full Tile Lining

- Remove tree roots and debris from the existing Main tile by either jet cleaning or mechanical cutting.
- Prevent roots from infiltrating the existing Main tile again by installing a CIPP liner.
- For reference, the general route and location of said cutting and lining are shown on the map included in Appendix C.

Partial Tile Lining

- Remove tree roots and debris from the existing Main tile by either jet cleaning or mechanical cutting. This would be only where tree root infiltration has previously been identified (assumed to be $\frac{1}{3}$ of length of the full tile lining length based on April 24, 2019 meeting minutes).
- Prevent roots from infiltrating the existing Main tile again by installing a CIPP liner in this same length.
- For reference, the general route and location of said cutting and lining are shown on the map included in Appendix C.

Tile Cleaning and Tree Removal

- Remove tree roots and debris from the existing Main tile by either jetting cleaning or mechanical cutting.
- Remove trees identified as problematic within 50 feet of either side of the existing Main tile. For reference, they are highlighted yellow in subsequent investigation results included in Appendix A.
- For reference, the general route and location of said cutting are shown on the map included in Appendix C.

Offset Tile Replacement

- Install a new Main tile on either the north side or south side of Ionia Street pavement (depending upon number of existing utilities at these locations). The offset Main tile would connect to the existing Main tile in the golf course and would connect back into the existing Main tile west of May Street.
- Remove trees within 50 feet of either side of the rerouted Main tile.
- For reference, the general route and location of said replacement is shown on the map included in Appendix C.

With the above-mentioned repairs, the following should be noted:

- All of the above options would only remove obstructions in the Main tile at locations of proposed work. Any obstructions at other locations would remain in the existing Main tile.
- All private connections repairs would be reconnected to the Main tile after repairs.
- Repair of any of the key issues identified under the discussions and conclusions of the original report (except roots and rock/soil) on the existing Main tile have either been

completed are not necessary for cleaning and/or lining. For reference, a table stating said spot locations is included in Appendix B.

- All options would require installation of access manholes in the area of repair.
- The Offset Tile Replacement option would abandon the existing Main tile in place.
- All options except the Full Tile Lining option would require future monitoring for additional tree growth and root infiltration.
- The Offset Tile Replacement option would not provide for reconnection of any private connections on the opposite side of Ionia Street that the offset Main tile is installed (assumed number of private connections to be half of total for other options).
- The Tile Cleaning and Tree Removal option would involve removing trees outside of the existing right of way of Ionia Street.
- The pipe sizes used are those that are currently manufactured that most closely meet or exceed the current main tile size.
- It is our understanding of Iowa Code that the removal of hedges, trees, and obstructions is a power given to the Drainage District Trustees through Iowa Code Chapter 468.138 and 468.139.
- 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 office to verify the existence of said jurisdictional wetlands and that there will be no impact on them.

Per Iowa Code Chapter 468.126, the above actions would be considered a repair. As such, Subsection 1, paragraph c of Chapter 468.126 states "If the estimated cost of the repair does not exceed fifty thousand dollars, the board may order the work done without conducting a hearing on the matter. Otherwise, the board shall set a date for a hearing. . ." The opinion of probable construction cost contained in the Opinion of Probable Construction Costs section of this report exceeds said \$50,000 limit. Therefore, a hearing will be required. Per Iowa Code Chapter 468.126.1.g, the right of remonstrance does not apply to the proposed repairs.

3. OPINION OF PROBABLE CONSTRUCTION COSTS – Using the above methods of repair, an itemized list of project quantities and associated opinions of probable construction costs was compiled and is included in Appendices D, E, F and G of this report. A summary of said costs (to the nearest dollar) are as follows:

| METHOD | DRAINAGE COEFF. | TOTAL COST |
|--------------------------------|----------------------------|-------------------|
| Full Tile Lining | Existing | \$ 455,366 |
| Partial Tile Lining | Existing | \$ 270,944 |
| Tile Cleaning and Tree Removal | Existing | \$ 342,616 |
| Offset Tile Replacement | Existing | \$ 455,022 |

It should be noted that said costs include materials, labor, and equipment supplied by the contractor to complete the necessary improvement and includes 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.

4. RECOMMENDATIONS – There is a definite need to perform one of the repairs from the original report or this supplement. The repair would remove some or all of the current restrictions to the Main tile and extend the life span of the Main tile. Therefore, it is recommended that the Hardin County Board of Supervisors, acting as District Trustees, should take action to accomplish the following:
- Approve the Supplement to Engineer’s Report as prepared by Clapsaddle-Garber Associates.
 - Hold the required hearing or hearings on the proposed repair.
 - Adopt one of the recommendations of the Original Report or Supplement to Engineer’s Report.
 - Direct Clapsaddle-Garber Associates to prepare plans and specifications for the proposed repair.
 - Direct Clapsaddle-Garber Associates to proceed with receiving bids from interested contractors.
 - Award contract to the lowest responsible contractor.
 - If desired or required by Iowa Code, proceed with reclassification proceedings.

Drainage District:

143

Investigation Summary:

- At the Hearing on Engineer's Report for Repairs to Upper End of Main Tile, the District Trustees requested an investigation of who owned the fiber optic utilities that were bored through the Main Tile.
- Based on information from the Iowa One-Call service, it appeared that the most likely utility at issue was Radcliffe Telephone Company.
- Contacted Radcliffe Telephone Company via telephone on November 11, 2018 and they indicated that they use orange conduit for their fiber optic line.
- Attached photographs (Pic #1 and Pic #2) from CCTV inspection clearly show that conduit bored through the Main Tile is orange. The locations of said fiber optic lines being bored through the Main Tile are shown on the attached CCTV Investigation Map.

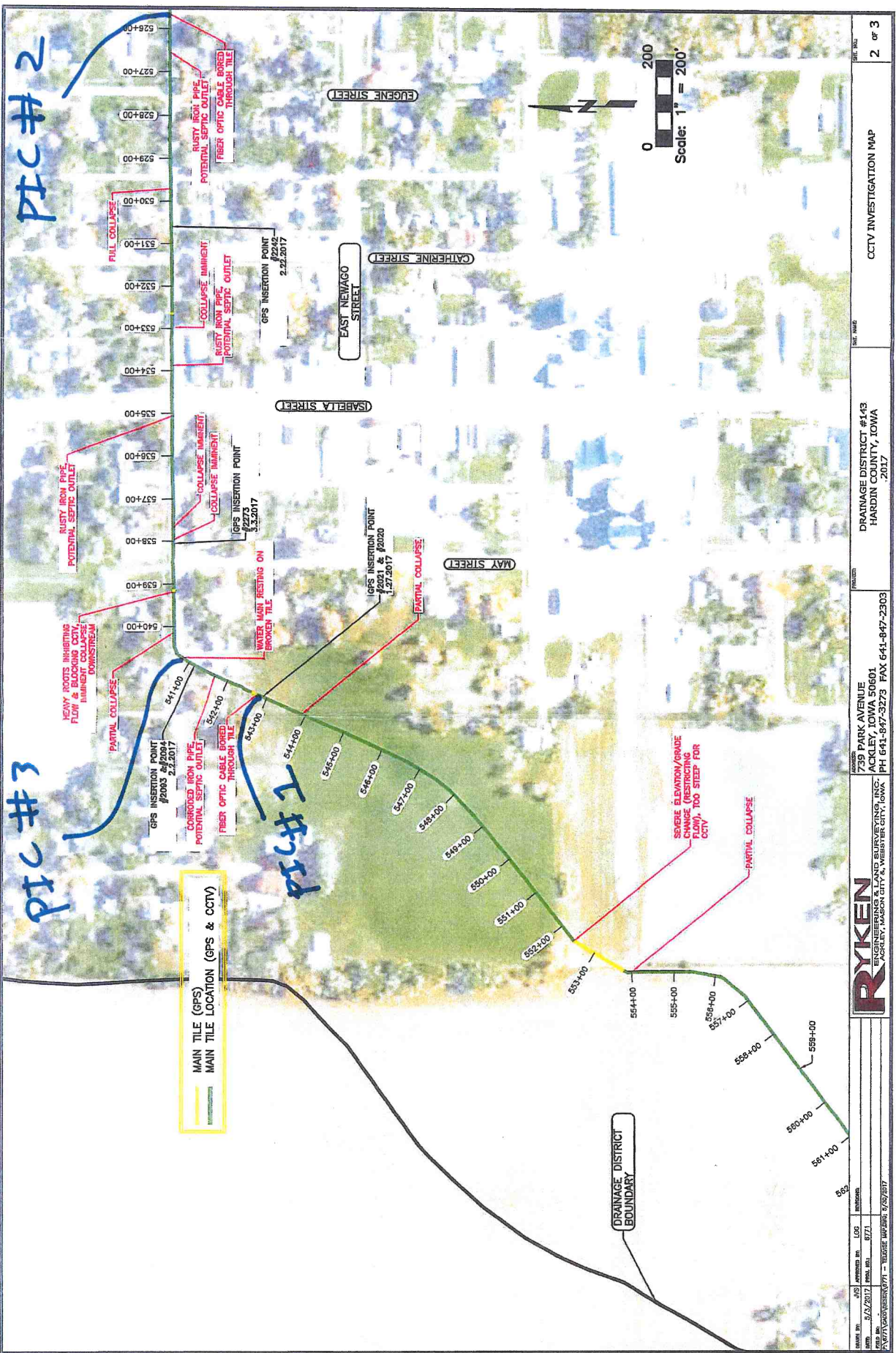
Contractor Time and Materials (spent while CGA was on-site):

None as only investigation was performed.

Additional Actions Recommended:

Radcliffe Telephone Company should remove their fiber optic lines from the Main Tile and repair the Main Tile at these two locations. The repair should be observed, documented, and performed to applicable Drainage District standards. It is CGA's opinion that this should be done at no cost to the drainage district unless there is an agreement or Iowa Code section that states otherwise.





PIC # 2

PIC # 3

MAIN TILE (GPS)
MAIN TILE LOCATION (GPS & CCTV)



| | | | |
|-----------------|--|-----------------|--|
| DATE: 5/10/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | DATE: 5/22/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| DATE: 5/10/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | DATE: 5/22/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| DATE: 5/10/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | DATE: 5/22/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| DATE: 5/10/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | DATE: 5/22/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| DATE: 5/10/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | DATE: 5/22/2017 | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |
| ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | ISSUED BY: JES | PROJECT: DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 |

739 PARK AVENUE
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RYKEN
ENGINEERING & LAND SURVEYING, INC.
ACKLEY, MASON CITY & WEBSTER CITY, IOWA

DRAINAGE DISTRICT #143
HARDIN COUNTY, IOWA
2017

CCTV INVESTIGATION MAP

2 of 3

PIC # 2

2/2/2017

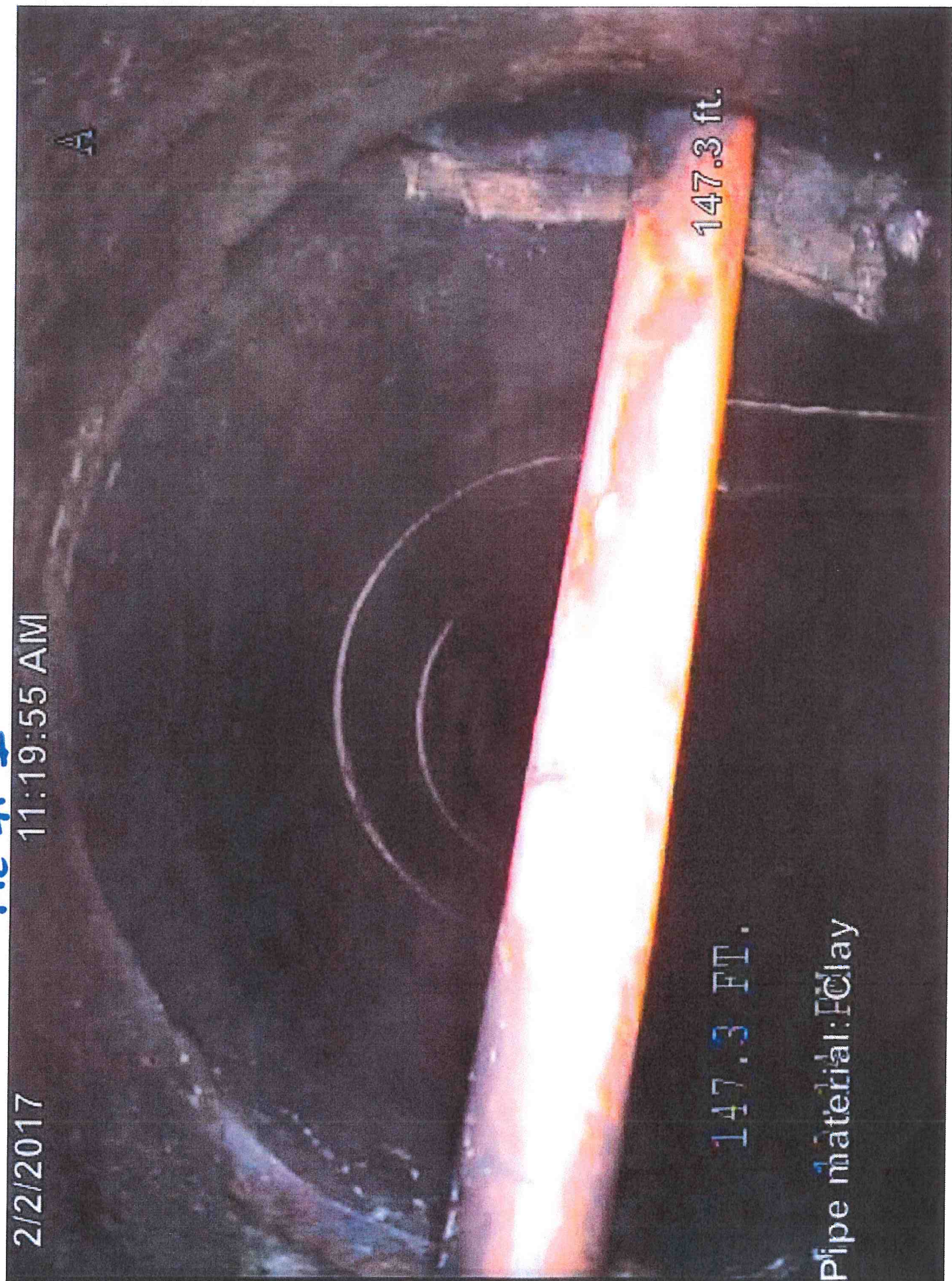
11:19:55 AM

A

147.3 ft.

147.3 FT.

Pipe material: FClay



PEC # 2

2/22/2017

11:09:44 AM

F

491.7 FT.

Pipe material: EClay

491.7 ft.



PEC # 3

9:35:31 AM

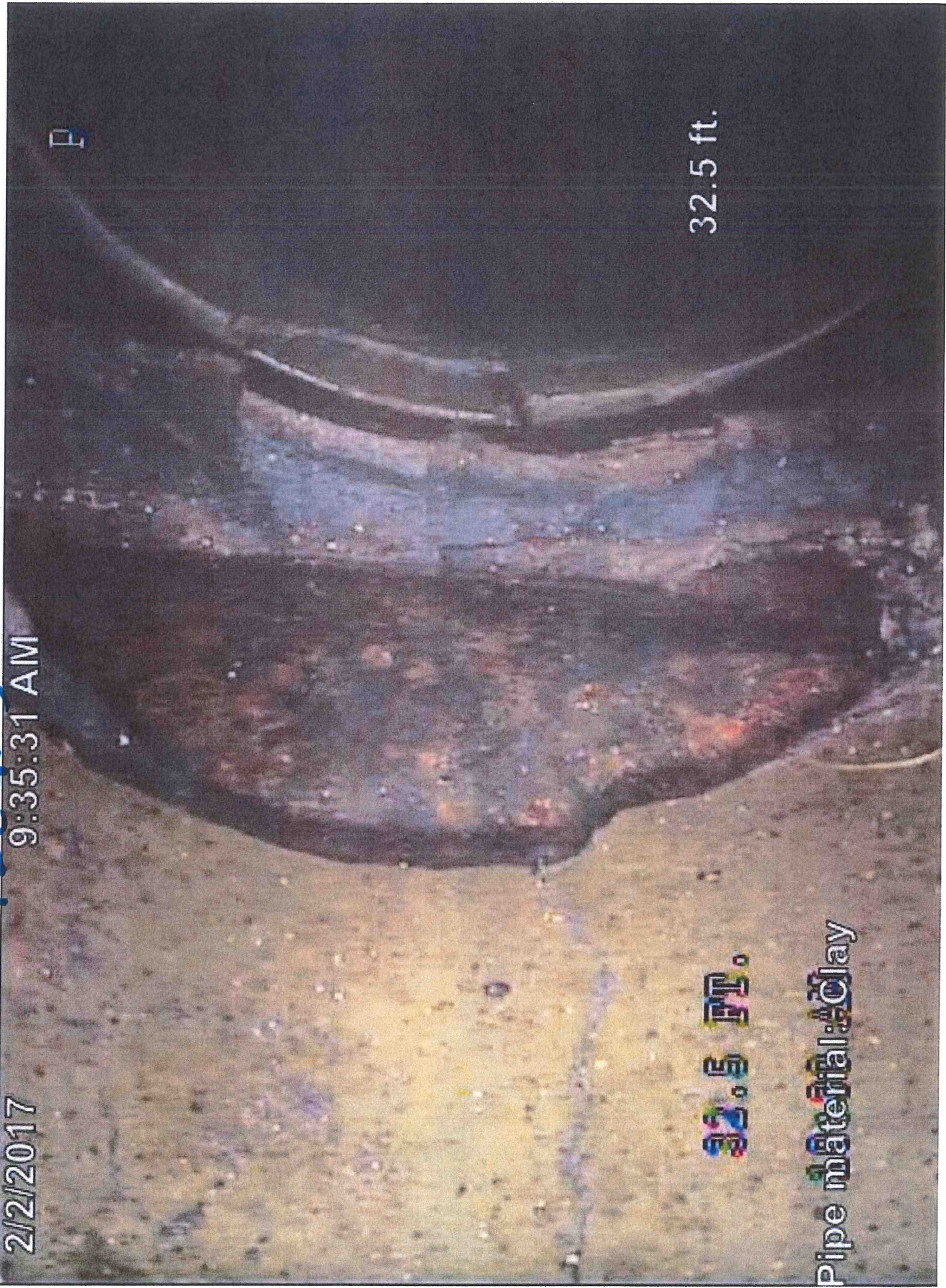
2/2/2017

F

32.5 ft.

32.5 FT.

Pipe material: Clay



Drainage District:

143

Investigation Summary:

- At the Hearing on Engineer's Report for Repairs to Upper End of Main Tile, the District Trustees requested an inventory of trees within the 50' of the Main Tile from the west end of town to the east end of town (i.e. west side of the golf course) be performed.
- CGA staff performed a site visit along the Main Tile route and found the following trees within 50' of the Main Tile (unless noted otherwise):
 - 3 Walnuts (28"-36")
 - 1 Buckeye (12")
 - 3 Oak (6"-36")
 - 12 Brush or Brush Lines
 - 1 Cedar (24")
 - 4 Blue Spruce (8"-15")
 - 13 Apple (2"-24")
 - 2 Honey Locusts (24"-36")
 - 10 Ash (10"-48")
 - 4 River Birch (24"-36")
 - 22 Soft Maple (2"-48")
 - 12 Hard Maple (8"-48")
 - 3 Mulberry (6")
 - 1 Boxelder (24")
 - 1 Sycamore (48") at 54' from tile

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

None as only investigation was performed

Additional Actions Recommended:

Although all trees are capable of producing tree roots which can negatively impact tile, the above yellow highlighted trees species are some that we typically find majorly impacting tile negatively. If the District Trustees do not pursue lining the Main tile, they may wish to pursue removal of at least the yellow highlighted trees as it is CGA's opinion that they will eventually (or may already be) negatively impacting the Main Tile. It is also our opinion that the cost of removal of just these trees would be over \$50,000. This cost is high enough that a hearing and engineer's report would be required.



Drainage District:

143

Investigation Summary:

At the Hearing on Engineer's Report for Repairs to Upper End of Main Tile, the District Trustees requested an opinion of probable construction cost to line the existing Main tile from the west end of town to the east end of town (i.e. west side of the golf course).

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

None as only investigation was performed

Additional Actions Recommended:

Based on conversations with some lining companies and recent bid letting for sanitary sewer lining, CGA drafted the attached Engineer's Opinion of Probable Construction Costs. Said opinion is just below \$500,000. This cost is high enough that a hearing and engineer's report would be required.





By: Z.J.S.
 Date: 11/21/2018
 Checked By: L.O.G.
 Date: 11/21/2018

Engineer's Opinion of Probable Construction Costs

Project: Main Tile for D.D. #143

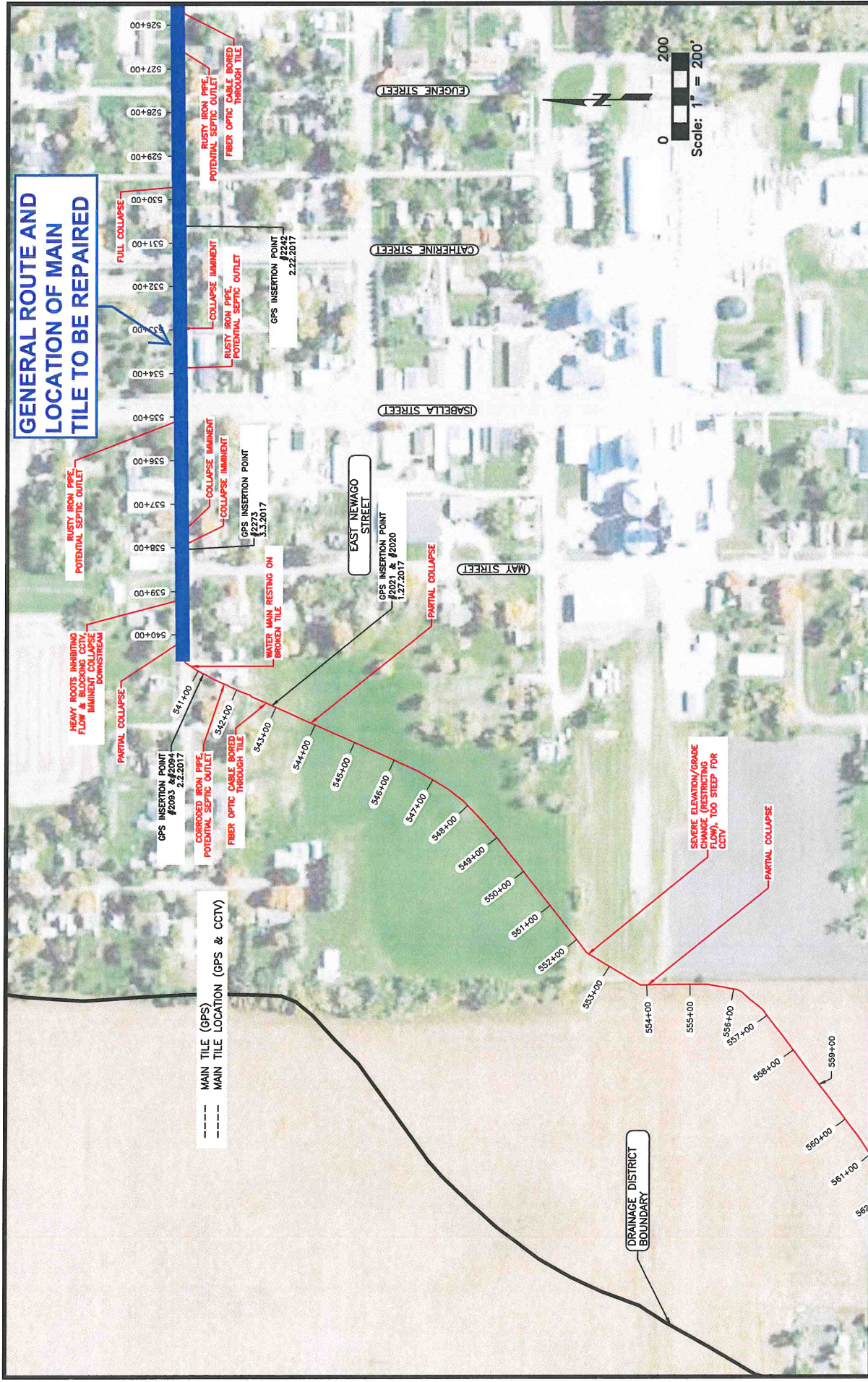
Location: City of Radcliffe, Hardin County, Iowa

| TILE LINING | ITEM # | DESCRIPTION | Unit Cost | Units | Quantity | Units | Total Cost | |
|----------------------------------|---------------------------|----------------------------|--------------|-------|----------|-------|---------------|--|
| | CONSTRUCTION COSTS | | | | | | | |
| | 101 | TILE CLEANING | \$ 5.00 | LF | 4609 | LF | \$ 23,045.00 | |
| | 102 | 14-INCH TILE LINING | \$ 35.00 | LF | 1315 | LF | \$ 46,025.00 | |
| | 103 | 18-INCH TILE LINING | \$ 50.00 | LF | 2558 | LF | \$ 127,900.00 | |
| | 104 | 20-INCH TILE LINING | \$ 60.00 | LF | 736 | LF | \$ 44,160.00 | |
| | 105 | ACCESS MANHOLES | \$ 10,000.00 | EA | 9 | EA | \$ 90,000.00 | |
| | 106 | REINSTATE TAP | \$ 200.00 | EA | 87 | EA | \$ 17,400.00 | |
| | 107 | REMOVE AND REPLACE ASPHALT | \$ 60.00 | SY | 150 | SY | \$ 9,000.00 | |
| | 108 | TRAFFIC CONTROL | \$ 5,000.00 | LS | 1 | LS | \$ 5,000.00 | |
| CONSTRUCTION SUBTOTAL | | | | | | | \$ 362,530.00 | |
| Contingency (10%) | | | | | | | \$ 36,253.00 | |
| CONSTRUCTION TOTAL | | | | | | | \$ 398,783.00 | |
| Engr. & Const. Observation (25%) | | | | | | | \$ 99,695.75 | |
| TOTAL DISTRICT COST | | | | | | | \$ 498,478.75 | |

Tabulated Defects

| | GPS #2273 Upstream | GPS #2273 Downstream | GPS #2242 Downstream | GPS #2242 Upstream | GPS #2094 Downstream | GPS #2074 Upstream | GPS #2000 Upstream |
|--|-----------------------|-------------------------|-------------------------|-----------------------|-------------------------|-----------------------|-----------------------|
| Total | 3508 | | | | | | |
| Total Length Televised (ft) | 108 | 538 | 804 | 198 | 194 | 931 | 735 |
| Date: | 3/3/2017 | 3/3/2017 | 2/22/2017 | 2/22/2017 | 2/2/2017 | 1/30/2017 | 1/24/2017 |
| Top crack (ft) | 63 | 286 | 552 | 29 | 122 | 484 | 164 |
| Side crack (ft) | 30 | 128 | 62 | 4 | 9 | 418 | 21 |
| Bottom crack (ft) | 53 | 0 | 0 | 8 | 0 | 423 | 6 |
| Partial or imminent collapse (#) | 4 | 10 | 9 | 0 | 3 | 22 | 4 |
| Debris (ft) | 4 | 20 | 0 | 0 | 195 | 69 | 597 |
| Offset Joint (#) | 8 | 14 | 15 | 15 | 8 | 232 | 45 |
| Soil/voids visible in offset joint (#) | 7 | 6 | 9 | 10 | 5 | 25 | 18 |
| Holes (non-fixed) (#) | 1 | 5 | 6 | 0 | 3 | 4 | 1 |
| Holes (fixed) (#) | 1 | 2 | 0 | 0 | 2 | 6 | 1 |
| Iron pipe, potentially septic outlet | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| Water main crushing | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

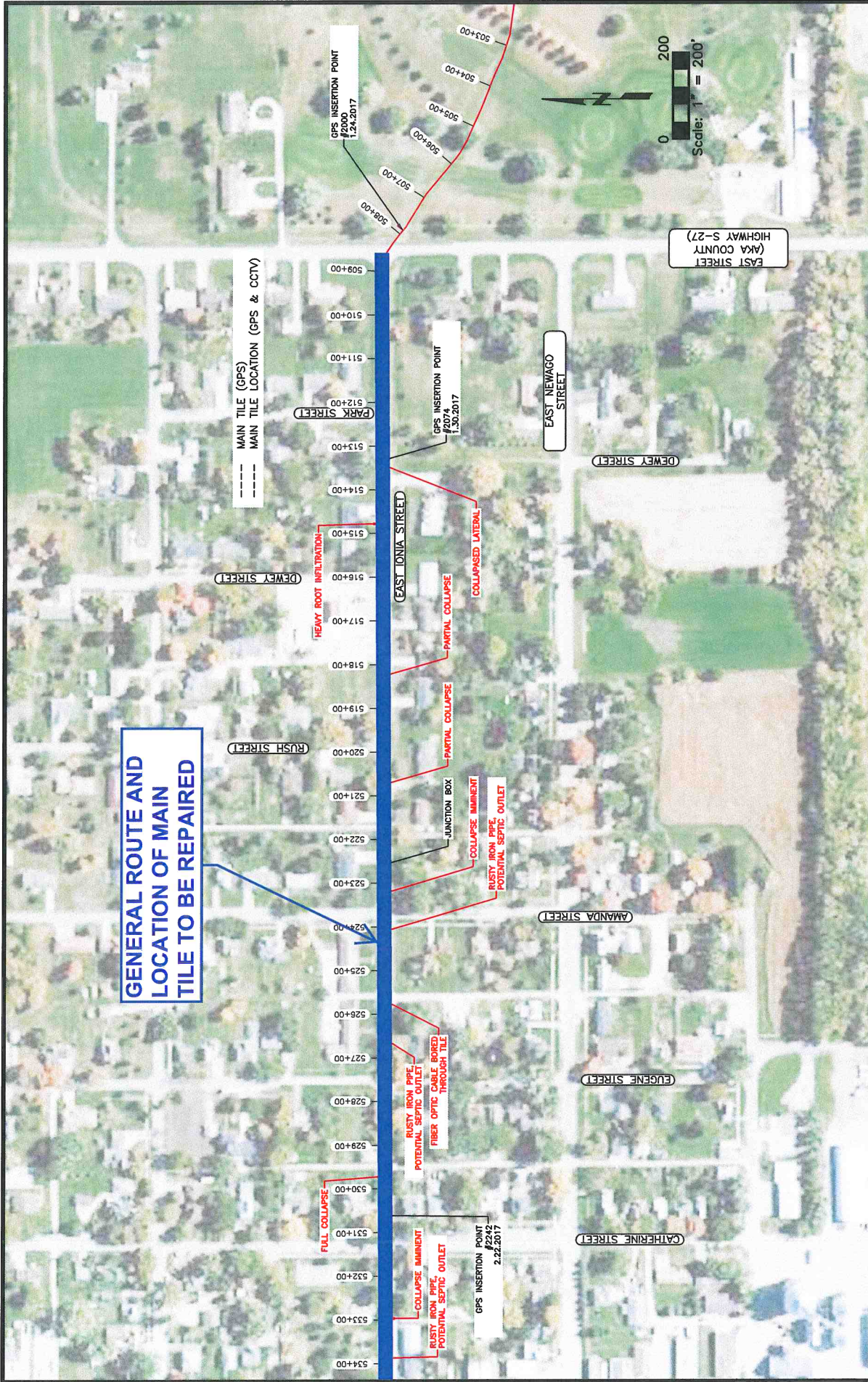
GENERAL ROUTE AND LOCATION OF MAIN TILE TO BE REPAIRED



| | | | | |
|--|--|--|--|--|
| DRAWN BY: JWS DATE: 5/3/2017 PROJECT: 739 PARK AVENUE, ACKLEY, IOWA 50601 CLIENT: HARRISON CITY & WEAVER CITY, IOWA PHONE: PH 641-847-3373, FAX 641-847-2303 | PROJECT: DRAINAGE DISTRICT #143 HARRISON CITY, IOWA 2017 | DATE: 5/3/2017 DRAWN BY: JWS PROJECT: 739 PARK AVENUE, ACKLEY, IOWA 50601 CLIENT: HARRISON CITY & WEAVER CITY, IOWA PHONE: PH 641-847-3373, FAX 641-847-2303 | PROJECT: DRAINAGE DISTRICT #143 HARRISON CITY, IOWA 2017 | SHEET NO.: 2 OF 3 TITLE: CCTV INVESTIGATION MAP |
|--|--|--|--|--|



RYKEN
 ENGINEERS, ARCHITECTS, INC.
 1000 W. 13TH ST., SUITE 200
 HARRISON CITY, IOWA 50601
 PH 641-847-3373, FAX 641-847-2303



**GENERAL ROUTE AND
LOCATION OF MAIN
TILE TO BE REPAIRED**

--- MAIN TILE (GPS)
- - - MAIN TILE LOCATION (GPS & CCTV)

EAST STREET
(AKA COUNTY
HIGHWAY S-27)



| | | | | |
|---|--|---|---|---|
| DRAWN BY: JWS DATE: 5/3/2017 PLOT NO.: 1707120400000001 | APPROVED BY: LOS DATE: 5/3/2017 PLOT NO.: 1707120400000001 | PROJECT: 3939 PARK AVENUE AND SURVEYING, INC. ENGINEERS AND SURVEYORS HARSHEN CITY, IOWA PH 641-847-3373 FAX 641-847-2303 | DRAINAGE DISTRICT #143 HARDIN COUNTY, IOWA 2017 | SHEET NO.: 3 of 3 CCTV INVESTIGATION MAP |
|---|--|---|---|---|



By: L.O.G.
 Date: 1/7/2020
 Checked By: L.O.G.
 Date: 1/7/2020

Engineer's Opinion of Probable Construction Costs
Project: Main Tile for D.D. #143 (Ionia Street Only)
 Location: City of Radcliffe, Hardin County, Iowa

| FULL TILE LINING | ITEM # | DESCRIPTION | Unit Cost | Units | Quantity | Units | Total Cost | |
|----------------------------------|------------------------------|--------------------------------|--------------|-------|----------|-------|---------------|---------------|
| | CONSTRUCTION COSTS | | | | | | | |
| | 1000 | TILE CLEANING | \$ 5.00 | LF | 3275 | LF | \$ 16,375.00 | |
| | 1001 | 18-INCH OR 20-INCH TILE LINING | \$ 70.00 | LF | 2525 | LF | \$ 176,750.00 | |
| | 1002 | 22-INCH OR 24-INCH TILE LINING | \$ 95.00 | LF | 750 | LF | \$ 71,250.00 | |
| | 1003 | ACCESS MANHOLES | \$ 10,000.00 | EA | 4 | EA | \$ 40,000.00 | |
| | 1004 | PRIVATE CONNECTIONS | \$ 200.00 | EA | 60 | EA | \$ 12,000.00 | |
| | 1005 | REMOVE AND REPLACE ASPHALT | \$ 60.00 | SY | 80 | SY | \$ 4,800.00 | |
| | 1006 | TRAFIC CONTROL | \$ 10,000.00 | LS | 1 | LS | \$ 10,000.00 | |
| | CONSTRUCTION SUBTOTAL | | | | | | | \$ 331,175.00 |
| Contingency (10%) | | | | | | | \$ 33,117.50 | |
| CONSTRUCTION TOTAL | | | | | | | \$ 364,292.50 | |
| Engr. & Const. Observation (25%) | | | | | | | \$ 91,073.13 | |
| TOTAL CONSTRUCTION COST | | | | | | | \$ 455,365.63 | |



By: L.O.G.
 Date: 1/7/2020
 Checked By: L.O.G.
 Date: 1/7/2020

Engineer's Opinion of Probable Construction Costs
Project: Main Tile for D.D. #143 (Ionia Street Only)
 Location: City of Radcliffe, Hardin County, Iowa

| PARTIAL TILE LINING | ITEM # | DESCRIPTION | Unit Cost | Units | Quantity | Units | Total Cost | |
|----------------------------------|------------------------------|--------------------------------|--------------|-------|----------|-------|---------------|---------------|
| | CONSTRUCTION COSTS | | | | | | | |
| | 2000 | TILE CLEANING | \$ 20.00 | LF | 1100 | LF | \$ 22,000.00 | |
| | 2001 | 18-INCH OR 20-INCH TILE LINING | \$ 100.00 | LF | 850 | LF | \$ 85,000.00 | |
| | 2002 | 22-INCH OR 24-INCH TILE LINING | \$ 125.00 | LF | 250 | LF | \$ 31,250.00 | |
| | 2003 | ACCESS MANHOLES | \$ 10,000.00 | EA | 4 | EA | \$ 40,000.00 | |
| | 2004 | REINSTATE TAP | \$ 200.00 | EA | 20 | EA | \$ 4,000.00 | |
| | 2005 | REMOVE AND REPLACE ASPHALT | \$ 60.00 | SY | 80 | SY | \$ 4,800.00 | |
| | 2006 | TRAFIC CONTROL | \$ 10,000.00 | LS | 1 | LS | \$ 10,000.00 | |
| | CONSTRUCTION SUBTOTAL | | | | | | | \$ 197,050.00 |
| Contingency (10%) | | | | | | | \$ 19,705.00 | |
| CONSTRUCTION TOTAL | | | | | | | \$ 216,755.00 | |
| Engr. & Const. Observation (25%) | | | | | | | \$ 54,188.75 | |
| TOTAL CONSTRUCTION COST | | | | | | | \$ 270,943.75 | |



By: L.O.G.
 Date: 1/7/2020
 Checked By: L.O.G.
 Date: 1/7/2020

Engineer's Opinion of Probable Construction Costs
Project: Main Tile for D.D. #143 (Ionia Street Only)
 Location: City of Radcliffe, Hardin County, Iowa

| TILE CLEANING AND TREE REMOVAL | ITEM # | DESCRIPTION | Unit Cost | Units | Quantity | Units | Total Cost | |
|----------------------------------|------------------------------|----------------------------|--------------|-------|----------|-------|---------------|---------------|
| | CONSTRUCTION COSTS | | | | | | | |
| | 3000 | TILE CLEANING | \$ 5.00 | LF | 3275 | LF | \$ 16,375.00 | |
| | 3001 | TREE REMOVAL | \$ 3,000.00 | EA | 48 | EA | \$ 144,000.00 | |
| | 3002 | SEEDING AND RESTORATION | \$ 500.00 | EA | 48 | EA | \$ 24,000.00 | |
| | 3003 | ACCESS MANHOLES | \$ 10,000.00 | EA | 4 | EA | \$ 40,000.00 | |
| | 3004 | PROTRUDING TAP GRINDING | \$ 1,000.00 | EA | 10 | EA | \$ 10,000.00 | |
| | 3005 | REMOVE AND REPLACE ASPHALT | \$ 60.00 | SY | 80 | SY | \$ 4,800.00 | |
| | 3006 | TRAFFIC CONTROL | \$ 10,000.00 | LS | 1 | LS | \$ 10,000.00 | |
| | CONSTRUCTION SUBTOTAL | | | | | | | \$ 249,175.00 |
| Contingency (10%) | | | | | | | \$ 24,917.50 | |
| CONSTRUCTION TOTAL | | | | | | | \$ 274,092.50 | |
| Engr. & Const. Observation (25%) | | | | | | | \$ 68,523.13 | |
| TOTAL CONSTRUCTION COST | | | | | | | \$ 342,615.63 | |



By: L.O.G.
 Date: 1/7/2020
 Checked By: L.O.G.
 Date: 1/7/2020

Engineer's Opinion of Probable Construction Costs

Project: Main Tile for D.D. #143 (Ionia Street Only)

Location: City of Radcliffe, Hardin County, Iowa

| OFFSET TILE REPLACEMENT | ITEM # | DESCRIPTION | Unit Cost | Units | Quantity | Units | Total Cost | |
|----------------------------------|---------------------------|--|--------------|-------|----------|--------------|---------------|--|
| | CONSTRUCTION COSTS | | | | | | | |
| | 4000 | 24" DUAL WALL POLYPROPYLENE OR RCP TILE | \$ 55.00 | LF | 750 | LF | \$ 41,250.00 | |
| | 4001 | 18" DUAL WALL POLYPROPYLENE OR RCP TILE | \$ 45.00 | LF | 2525 | LF | \$ 113,625.00 | |
| | 4002 | 24" x 18" POLYPROPYLENE OR RCP REDUCER | \$ 650.00 | EA | 1 | EA | \$ 650.00 | |
| | 4003 | CONCRETE COLLAR | \$ 400.00 | EA | 2 | EA | \$ 800.00 | |
| | 4004 | PRIVATE CONNECTIONS | \$ 500.00 | EA | 30 | EA | \$ 15,000.00 | |
| | 4005 | SEEDING AND RESTORATION | \$ 20,000.00 | LS | 1 | LS | \$ 20,000.00 | |
| | 4006 | DRIVEWAY OR SIDEWALK REMOVAL & REPLACEMENT | \$ 2,000.00 | EA | 15 | EA | \$ 30,000.00 | |
| | 4007 | REMOVE AND REPLACE ASPHALT | \$ 80.00 | SY | 620 | SY | \$ 49,600.00 | |
| 4008 | ACCESS MANHOLES | \$ 10,000.00 | EA | 4 | EA | \$ 40,000.00 | | |
| 4009 | TRAFFIC CONTROL | \$ 20,000.00 | LS | 1 | LS | \$ 20,000.00 | | |
| CONSTRUCTION SUBTOTAL | | | | | | | \$ 330,925.00 | |
| Contingency (10%) | | | | | | | \$ 33,092.50 | |
| CONSTRUCTION TOTAL | | | | | | | \$ 364,017.50 | |
| Engr. & Const. Observation (25%) | | | | | | | \$ 91,004.38 | |
| TOTAL CONSTRUCTION COST | | | | | | | \$ 455,021.88 | |