

**AGENDA**  
**DD 56 LANDOWNERS MEETING**  
**WEDNESDAY, JULY 8, 2020 10:00 AM**  
**Hardin County Emergency Operations Center (EOC)**  
**1031 Edgington, Ave., Eldora, IA**

**This meeting will be open to the public for in-person attendance at the EOC building, attendance is also available electronically either by conference call or online.** You may call at 10:00 am to access the meeting by following these instructions: To access the meeting call: 1-(312)-626-6799, when prompted enter meeting ID code: 662 016 552.

You can also access the meeting online at: <https://zoom.us/j/662016552>.

If attending the meeting in-person, please practice social distancing due to Covid - 19 concerns.

Regular Drainage Meeting for July 8, 2020 will immediately follow the DD 56 Landowners Meeting.

1. Open Meeting
2. Approve Agenda
3. Introductions/Attendance
4. DD 56 - Discuss Improvement Options & Reclassification  
This Landowner Meeting is to discuss improvement options and reclassification as presented at the Public Hearings on the Engineer's Report (Including Revision & Supplement) on Improvements to Main Tile for DD 56 and the Reclassification Commission Report for The Main Tile of Drainage District 56 (East and West).

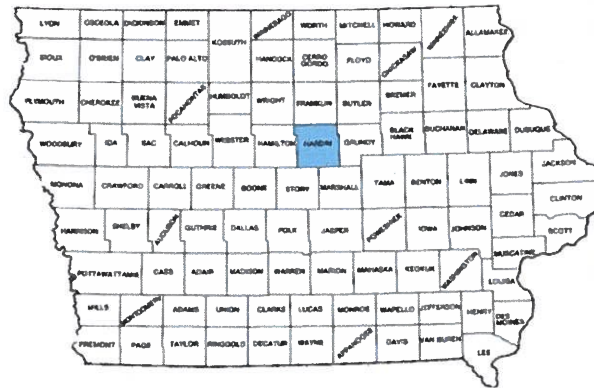
Documents:

[DD 56 RECLASSIFICATION REPORT DD 56 EAST AND WEST 2\\_17\\_20.PDF](#)  
[DD 56 6830.1 - ENGINEERS REPORT.PDF](#)  
[DD 56 6830.1 SUPP TO ENGINEERS REPORT.PDF](#)  
[DD 56 6830.1 REVISED APP V - ENGINEERS REPORT.PDF](#)

5. Comments/Discussion
6. Possible Action
7. Other Business
8. Adjourn Meeting

**HARDIN COUNTY, IOWA**

**2020**



**RECLASSIFICATION  
COMMISSION REPORT  
FOR  
DRAINAGE DISTRICT  
56 EAST AND 56 WEST  
HARDIN COUNTY,  
IOWA**



**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  
Phone: 641-847-3273  
Fax: 641-847-2303

# **Reclassification Commission Report for Drainage District 56 East and 56 West Hardin County, Iowa**

|                                       |          |
|---------------------------------------|----------|
| <b>Table of Contents</b>              | Pg. 1    |
| <b>Report</b>                         |          |
| Introduction                          | Pg. 2    |
| Background Information                | Pg. 3    |
| Evaluations                           | Pgs. 4-5 |
| Exceptions                            | Pg. 5    |
| Conclusion                            | Pg. 5    |
| <b>Appendices</b>                     |          |
| Certificates of Oath of Commissioners | App. A   |
| West Boundary Map                     | App. B   |
| West Reclassification Sheets          | App. C   |
| East Boundary Map                     | App. D   |
| East Reclassification Sheets          | App. E   |

# **Reclassification Commission Report for Drainage District 56 East and 56 West Hardin County, Iowa**

- 1.0 **INTRODUCTION** - The District Trustees appointed a Reclassification Commission to reclassify and split the lands within the District boundaries of Drainage District 56 for the Main tile only. For reference, the Certificates of Oath of Commissioners are included in Appendix A. This action by the District Trustees was based on potentially splitting the district into 2 separate districts by installing a separate Main tile outlet for the upstream stretches of the district. This report will summarize the background information gathered and the evaluation process used by the Commissioners to reclassify said lands and present the resulting reclassification.

2.0 **BACKGROUND INFORMATION** - In addition to reviewing lands within the district, the Reclassification Commission also looked at the following supporting documents supplied by Clapsaddle Garber Associates:

- Existing classification for Drainage District 56 from the Hardin County Drainage Clerk.
- Soil Surveys from USDA website.
- Map of District Boundaries and Facilities from the Hardin County Drainage Clerk.
- Aerial/Tract Maps from the Hardin County GIS website.
- Recorded Boundary Surveys from the Hardin County Recorder's office.
- LIDAR elevation data.

Using the above information, the Reclassification Commission gathered the following background information:

- 2.1 **Boundary Generation** - This step involved generation of the boundary between the East and West portions of the district based on the proposed location of the separate Main tile outlet. Using CAD, LIDAR elevation data, and Maps of District Boundaries, the internal boundary was determined for the East and West portions of the district.
- 2.2 **Tract Verification** - This step involved verification that each tract number from the existing classification was within the District boundary and was appropriately sized (i.e. 40 acres or less according to recognized or legal divisions).
- 2.3 **Acreage Verification** - This step involved verification of the acreages contained within the existing classification for Drainage District No. 56. For the tracts that previously had acreages stated and were totally contained within the District boundary, the acreage was compared to that available from the GIS website or recorded boundary surveys and corrected as necessary.
- 2.4 **Acreage Generation** - This step involved generation of the acreages for all the remaining tracts (i.e. those without acreages previously stated in the existing classification, those created in the Tract Verification process above or those that were not totally contained within the mapped District 56 East and 56 West boundaries). For lands whose tracts were partially contained within the mapped District 56 East and 56 West boundaries, the acreage was measured from a composite overlay of the maps of District boundaries with the linework from the GIS website. For reference, copies of the Boundary Maps for 56 West and 56 East are included in Appendices B and D respectively.
- 2.5 **Soils Type Determination** - This step involved differentiation of the soil types based on their properties (i.e. very poorly drained, poorly drained, well drained, and excessively well drained), and the percentage of each within each tract. This was measured from a composite overlay of the soil surveys with linework from the GIS website.
- 2.6 **Proximity Determination** - This step involved determination of the proximity or distance to the District facilities (i.e. Main tile). All distances were measured from the approximate centroid of each tract along the shortest straight-line route to the District facilities. This was measured from a composite overlay of the maps of District facilities with linework from the GIS website.

3.0 EVALUATIONS - Using the above background information, the Reclassification Commission evaluated and determined benefits using the following method:

3.1 Soil Factor - This factor was calculated as an indication of the "need" for the District facilities based upon the natural soil characteristics for each tract. It was the weighted total of the soil types after placing the following percentage values upon each soil type:

- Very Poorly Drained = 85%
- Poorly Drained = 55%
- Well Drained = 10%

These percentages were based upon the Reclassification Commission's determination that the Well Drained soils typically need very little of the District facilities to be productive, and the Poorly Drained and Very Poorly Drained soils typically rely heavily on the District facilities to be productive.

3.2 Facility Proximity Factor - This factor was calculated as an indication of "availability" of the district facilities (Main tile) based upon the distance of each tract from said facilities. Since there was a large range in the distances measured (7± feet to 3,863± feet for 56 East and 25± feet to 3,678± feet for 56 West), this factor was necessary to compare the tract distances relative to each other. Therefore, the tract which had the farthest measured distance received a Facility Proximity Factor of 10 and the tract which had the closest measured distance received a Facility Proximity Factor of 100. All other tracts received a Facility Proximity Factor calculated in proportion to this range based upon their measured distance.

3.3 Combined Factor - This factor was the composite of the above two factors (i.e. Soil Factor and Facility Proximity Factor). The Combined Factor was calculated as follows:

$$\text{Facility Proximity Factor} \times \text{Soil Factor}$$

Once the Combined Factor was determined, it was used as an indication of benefit received (i.e. the tract with the highest Combined Factor was the closest to the District facilities and had the soils in most need of the District facilities).

3.4 % Benefit - This is the benefit each tract receives using the Combined Factor based on a scale of 100 (i.e. the highest Combined Factor is 100 and all other Combined Factors are calculated in ratio to such).

3.5 Units Assessed - This combines the amount of benefit along with the land area that is benefitted. For each tract this is calculated as:

$$\% \text{ Benefit} \times \text{Number of Acres} \times 100$$

3.6 % Units Assessed - This is the percentage of units assessed for each tract as a portion of the total units assessed for the District facility. Unlike the % Benefit which was a percentage comparing each tract to the most benefitted tract, the % Units Assessed compares each tract to the total of the District facility.

3.7 Percent Levy - This is an indication of the levy amount necessary to pay for a project. For this report, it is at 100%, but will be adjusted as needed in the future by the Drainage Clerk to pay for future bills.

- 3.8 Assessment for Project (entire tract basis) - This is the amount that each tract must pay in total to cover 100% of the levy. It is important to note that it has been calculated using a sample cost of \$425,000 each for both 56 West and 56 East. This is based on the Reclassification Commission's determination that both 56 West and 56 East will equally benefit from the proposed separate Main tile outlet. 56 West will have its own outlet instead of relying on the existing undersized Main tile outlet and 56 East will have a significant amount of drainage load removed from the Main tile. For each tract this is calculated as:

$$\% \text{ Units Assessed} \times \$425,000$$

- 3.9 Assessment for Project (per acre basis) - This is the amount that each tract must pay per acre to cover 100% of the levy. Although this was not used in an active role by the Reclassification Commission, some landowners find it to be valuable information. It is important to note that it is calculated using a sample cost of \$425,000. For each tract this is calculated as:

$$\text{Assessment for Project (entire tract basis)} / \text{Number of Acres}$$

- 4.0 **EXCEPTIONS:** - With any process there are inevitably exceptions, and this reclassification was no different. While the above method was used for the majority of the tracts, the following are exceptions to the above process:
- 4.1 For tract numbers which are highly irregular in shape (i.e. long narrow pieces of land) or do not have accurate soil maps available, Proximity and Soil Factors were not calculated. Instead, the average Combined Factor for all the other tract numbers was used. The only tract numbers to which this applies are roadways along with current and former railroads and are highlighted pink on the reclassification sheets contained in the appendices (i.e. tract numbers 1 and 2 for 56 West and tract numbers 1, 2, and 3 for 56 East).
- 4.2 The District Trustees also requested that the Reclassification Commission determine the appropriate classification if the proposed separate Main tile outlet was installed at approximately 2 feet deeper than the existing Main tile. The Reclassification Commission determined that if the proposed separate Main tile outlet is installed at any depth greater than the existing Main tile at the connection point of the two, this would solely benefit 56 West and not 56 East.
- 5.0 **CONCLUSION:** - Using all the above, the Reclassification Commission generated reclassification sheets for the 56 West Main tile and 56 East Main tile. For reference, copies are included in Appendix C and E respectively. It is recommended moving forward that the District Trustees, should take action to accomplish the following:
- Approve the Reclassification Commission Report.
  - Hold the required hearing.
  - Adopt the Reclassification Commission Report as the basis for the proposed separate Main tile outlet project only if it is constructed.
  - If the separate Main tile outlet is installed deeper than the existing Main tile at the connection point of the two, the additional cost for a deeper installation should be paid solely by 56 West.
  - Split 56 West and 56 East into separate districts and adopt the Reclassification Commission Report as the basis for future repairs and improvements for each only if the proposed separate Main tile outlet project is constructed.




# CERTIFICATE

Lee Gallentine, a Professional Engineer of the State of Iowa, hereby certify:

That I, along with the other reclassification commissioners for Drainage District No. 56, have personally examined and inspected lands within the Drainage District, have reviewed original maps of the Drainage District, aerial maps of the lands within the Drainage District, and soil maps showing soil types for the lands within the Drainage District.

That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, completed the reclassification of the lands within the Drainage District. Said reclassification has fixed the percentages of benefits in tracts according to the recognized and legal divisions of 40 acres or less using a graduated scale of benefits, numbered according to the benefit to be received, with the lands receiving the greatest benefit marked on a scale of 100 and those benefited in a less degree marked with such percentage of one hundred as the benefit received is in proportion to.

That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, performed said reclassification in accordance with Chapter 468, Code of Iowa, to the best of my ability, skill, and judgment. The attached list is the final determination of reclassification and assessment for each tract of land in the Drainage District 56 for all repairs and future improvements to the facilities in the Drainage District. That this report is a true and correct transcript of said reclassification of lands and apportionments of benefits made by said reclassification commission.

|   |   |
|---|---|
|  | <p>I hereby certify that this land surveying document was prepared and the related survey work was performed by me or under my direct personal supervision and that I am a duly licensed Land Surveyor under the laws of the State of Iowa.</p> <p><i>Lee O. Gallentine, P.E.</i><br/>Lee O. Gallentine, P.E..</p> <p>DATE: <i>Feb 11, 2020</i> License Number: 15745</p> <p>My License Renewal Date is December 31, 2020<br/>Page or sheets covered by this seal: <i>As shown on Table of Contents</i></p> |
|---|---|

# CERTIFICATE

Dennis Prohaska, a resident freeholder of Hardin County, Iowa, hereby certify:

That I, along with the other reclassification commissioners for Drainage District No. 56, have personally examined and inspected lands within the Drainage District, have reviewed original maps of the Drainage District, aerial maps of the lands within the Drainage District, and soil maps showing soil types for the lands within the Drainage District.

That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, completed the reclassification of the lands within the Drainage District. Said reclassification has fixed the percentages of benefits in tracts according to the recognized and legal divisions of 40 acres or less using a graduated scale of benefits, numbered according to the benefit to be received, with the lands receiving the greatest benefit marked on a scale of 100 and those benefited in a less degree marked with such percentage of one hundred as the benefit received is in proportion to.

That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, performed said reclassification in accordance with Chapter 468, Code of Iowa, to the best of my ability, skill, and judgment. The attached list is the final determination of reclassification and assessment for each tract of land in the Drainage District 56 for all repairs and future improvements to the facilities in the Drainage District. That this report is a true and correct transcript of said reclassification of lands and apportionments of benefits made by said reclassification commission.

COMMISSIONER:

  
Date: 2/11/20

Dennis Prohaska  
22849 170th Street  
Iowa Falls, IA 50126

# CERTIFICATE

Chuck Walters, a resident freeholder of Hardin County, Iowa, hereby certify:

That I, along with the other reclassification commissioners for Drainage District No. 56, have personally examined and inspected lands within the Drainage District, have reviewed original maps of the Drainage District, aerial maps of the lands within the Drainage District, and soil maps showing soil types for the lands within the Drainage District.

That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, completed the reclassification of the lands within the Drainage District. Said reclassification has fixed the percentages of benefits in tracts according to the recognized and legal divisions of 40 acres or less using a graduated scale of benefits, numbered according to the benefit to be received, with the lands receiving the greatest benefit marked on a scale of 100 and those benefited in a less degree marked with such percentage of one hundred as the benefit received is in proportion to.

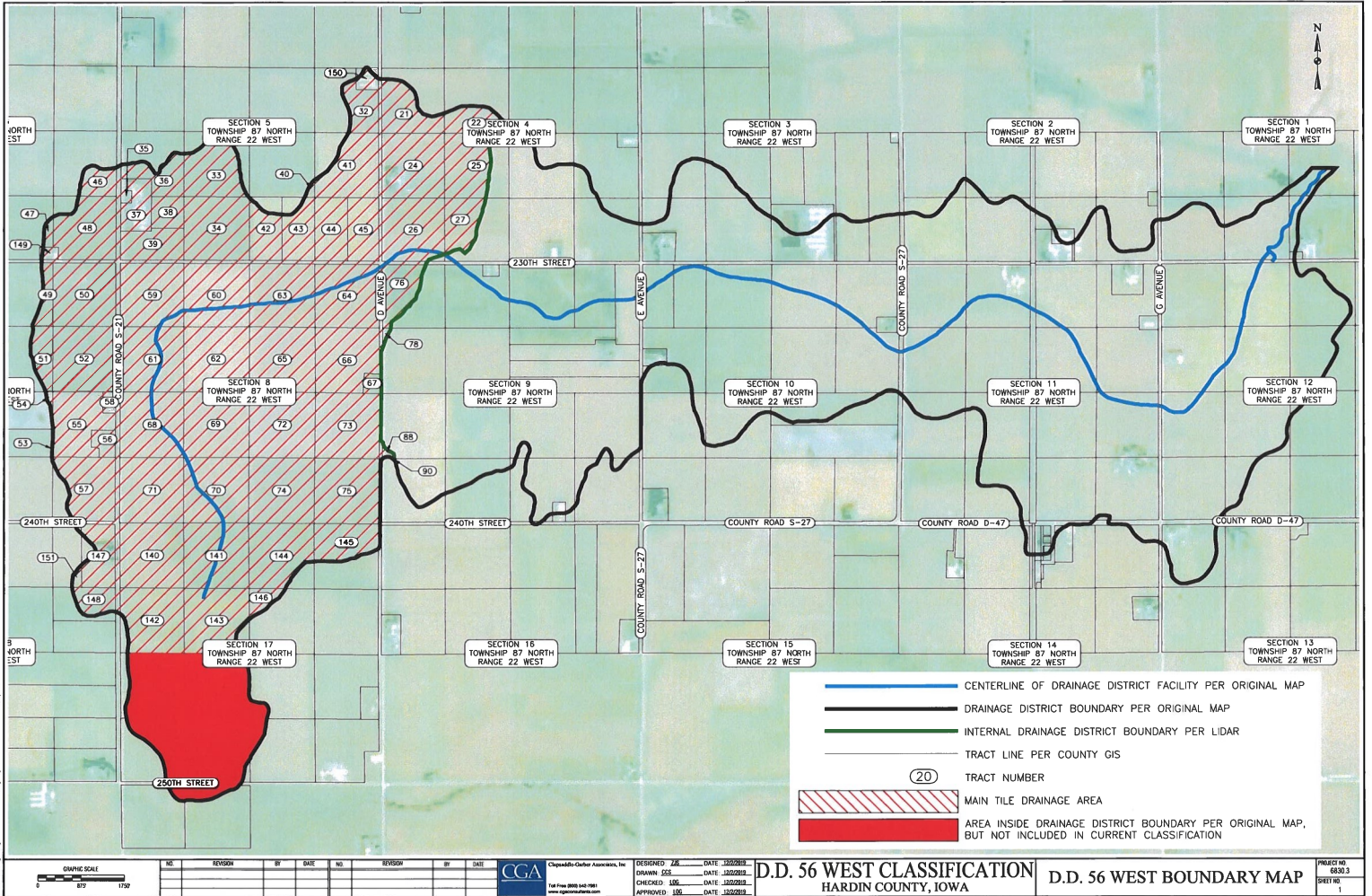
That I, along with the other reclassification commissioners for Hardin County Drainage District No. 56, performed said reclassification in accordance with Chapter 468, Code of Iowa, to the best of my ability, skill, and judgment. The attached list is the final determination of reclassification and assessment for each tract of land in the Drainage District 56 for all repairs and future improvements to the facilities in the Drainage District. That this report is a true and correct transcript of said reclassification of lands and apportionments of benefits made by said reclassification commission.

COMMISSIONER:

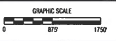


Date: 2-11-20

Chuck Walters  
34122 230th Street  
Eldora, IA 50627



I:\GIS\2024\Projects\56 West Classification\56 West Classification.aprx, 01/13/24, 11:58am, 1250m



| NO. | REVISION | BY | DATE | NO. | REVISION | BY | DATE |
|-----|----------|----|------|-----|----------|----|------|
|     |          |    |      |     |          |    |      |



DESIGNED: JAK DATE: 1/22/2024  
 DRAWN: SES DATE: 1/22/2024  
 CHECKED: JLG DATE: 1/22/2024  
 APPROVED: JLG DATE: 1/22/2024

**D.D. 56 WEST CLASSIFICATION**  
HARDIN COUNTY, IOWA

**D.D. 56 WEST BOUNDARY MAP**

PROJECT NO: 66803  
 SHEET NO: 1

Drainage Real Estate

Classification of Lands for Drainage Benefits - Auditor (by name)

| West Tract | Taxing District | Parcel       | West Entity                                      | Sec-Twp-Rng | Legal  | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|--|-------------|--|-------|-----------|----------------|------------------|-----------------|---|---|
| 1          | DD 56           | 15           | Hardin County Roads                              |             | ROADS  | 18.90 | 36.59%    | 691.63         | 1.054%           | 100             | \$4,478.06                                  | \$236.93                                |
| 2          | DD 56           | 16           | Sherman Township Roads                           |             | ROADS  | 24.46 | 36.59%    | 895.09         | 1.364%           | 100             | \$5,795.42                                  | \$236.93                                |
| 22         | DD 56           | 872204100004 | Radland Farms, Inc                               | 4-87-22     | SE NW 4-87-22  | 14.02 | 20.09%    | 281.70         | 0.429%           | 100             | \$1,823.90                                  | \$130.09                                |
| 24         | DD 56           | 872204300001 | Bostrom, Michael B Bostrom, Candy S              | 4-87-22     | NW SW 4-87-22  | 39.00 | 40.63%    | 1584.43        | 2.414%           | 100             | \$10,258.70                                 | \$263.04                                |
| 25         | DD 56           | 872204300002 | Bostrom, Michael B Bostrom, Candy S              | 4-87-22     | NE SW 4-87-22  | 28.11 | 35.13%    | 987.50         | 1.504%           | 100             | \$6,393.78                                  | \$227.46                                |
| 26         | DD 56           | 872204300003 | Radland Farms, Inc                               | 4-87-22     | SW SW 4-87-22  | 37.32 | 57.31%    | 2138.63        | 3.258%           | 100             | \$13,846.95                                 | \$371.03                                |
| 27         | DD 56           | 872204300004 | Radland Farms, Inc                               | 4-87-22     | SE SW 4-87-22  | 17.15 | 52.21%    | 895.33         | 1.364%           | 100             | \$5,796.97                                  | \$338.02                                |
| 32         | DD 56           | 872205200006 | Runge, Jack                                      | 5-87-22     | SE NE EX 4.50A TR 5-87-22  | 12.12 | 18.80%    | 227.91         | 0.347%           | 100             | \$1,475.65                                  | \$121.75                                |
| 33         | DD 56           | 872205300005 | Luhman, Dean E                                   | 5-87-22     | NE SW 5-87-22  | 21.00 | 22.66%    | 475.90         | 0.725%           | 100             | \$3,081.30                                  | \$146.73                                |
| 34         | DD 56           | 872205300006 | Luhman, Dean E                                   | 5-87-22     | SE SW 5-87-22  | 39.00 | 38.06%    | 1484.42        | 2.261%           | 100             | \$9,611.16                                  | \$246.44                                |
| 35         | DD 56           | 872205300008 | Luhman, Michael Luhman, Lisa                     | 5-87-22     | COM SW COR N1191'POB N494'E170'S247'E85' S247'W255'POB 5-87-22             | 1.79  | 12.45%    | 22.28          | 0.034%           | 100             | \$144.23                                    | \$80.58                                 |
| 36         | DD 56           | 872205300009 | Luhman, Dean E                                   | 5-87-22     | NW SW EX TRACTS 5-87-22  | 14.26 | 23.18%    | 330.55         | 0.504%           | 100             | \$2,140.18                                  | \$150.08                                |
| 37         | DD 56           | 872205300010 | Krause, Brian J Krause, Christine J              | 5-87-22     | COM SW COR N622' POB N569' E255'N247'W85' N247'E482'S1063'W652 POB 5-87-22 | 12.78 | 22.55%    | 288.17         | 0.439%           | 100             | \$1,865.80                                  | \$145.99                                |
| 38         | DD 56           | 872205300011 | Luhman, Oma L                                    | 5-87-22     | N 1/2 SW SW EX TRACTS 5-87-22  | 10.12 | 35.73%    | 361.61         | 0.551%           | 100             | \$2,341.33                                  | \$231.36                                |
| 39         | DD 56           | 872205300012 | Luhman, Oma L                                    | 5-87-22     | S 1/2 SW SW EX 1.07A TR 5-87-22  | 17.64 | 35.80%    | 631.51         | 0.962%           | 100             | \$4,088.80                                  | \$231.79                                |
| 40         | DD 56           | 872205400001 | Luhman, Dean E Luhman, Oma L                     | 5-87-22     | NW SE 5-87-22  | 2.00  | 40.16%    | 80.31          | 0.122%           | 100             | \$519.99                                    | \$259.99                                |
| 41         | DD 56           | 872205400002 | Radland Farms, Inc                               | 5-87-22     | NE SE 5-87-22  | 30.00 | 43.47%    | 1303.98        | 1.987%           | 100             | \$8,442.89                                  | \$281.43                                |
| 42         | DD 56           | 872205400003 | Radland Farms, Inc                               | 5-87-22     | W 1/2 SW SE 5-87-22  | 13.09 | 54.26%    | 710.33         | 1.082%           | 100             | \$4,599.13                                  | \$351.35                                |
| 43         | DD 56           | 872205400004 | Kolden, Kathy D - Trust Kolden, Robert A - Trust | 5-87-22     | E 1/2 SW SE 5-87-22  | 13.91 | 49.70%    | 691.39         | 1.053%           | 100             | \$4,476.52                                  | \$321.82                                |
| 44         | DD 56           | 872205400005 | Kolden, Kathy D - Trust Kolden, Robert A - Trust | 5-87-22     | W 1/2 SE SE 5-87-22  | 19.50 | 62.16%    | 1212.19        | 1.847%           | 100             | \$7,848.52                                  | \$402.49                                |



| West Tract | Taxing District | Parcel       | West Entity   | Sec-Twp-Rng | Legal  | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|---|-------------|--|-------|-----------|----------------|------------------|-----------------|---|---|
| 45         | DD 56           | 872205400006 | Armstrong, Susan R 1/2 & Radland Farms, Inc 1/2                       | 5-87-22     | E 1/2 SE SE 5-87-22                            | 18.50 | 48.66%    | 900.22         | 1.371%           | 100             | \$5,828.62                                  | \$315.06                                |
| 46         | DD 56           | 872206400002 | Appelgate, Harold & Angie Trust                                       | 6-87-22     | NE SE 6-87-22                                  | 9.27  | 10.82%    | 100.33         | 0.153%           | 100             | \$649.62                                    | \$70.08                                 |
| 47         | DD 56           | 872206400005 | Sheldahl, L O - Etal  | 6-87-22     | SW SE EX TR SE COR 6-87-22                     | 3.81  | 9.91%     | 37.76          | 0.058%           | 100             | \$244.50                                    | \$64.17                                 |
| 48         | DD 56           | 872206400006 | Sheldahl, L O - Etal  | 6-87-22     | SE SE EX .61A TR 6-87-22                       | 29.73 | 16.29%    | 484.24         | 0.738%           | 100             | \$3,135.29                                  | \$105.46                                |
| 49         | DD 56           | 872207200001 | Johnson Family Ltd Partnership  | 7-87-22     | NW NE 7-87-22                                  | 9.83  | 10.68%    | 104.98         | 0.160%           | 100             | \$679.70                                    | \$69.15                                 |
| 50         | DD 56           | 872207200002 | Johnson Family Ltd Partnership  | 7-87-22     | NE NE 7-87-22                                  | 37.34 | 27.90%    | 1041.69        | 1.587%           | 100             | \$6,744.60                                  | \$180.63                                |
| 51         | DD 56           | 872207200003 | Johnson Family Ltd Partnership  | 7-87-22     | SW NE 7-87-22                                  | 10.00 | 22.73%    | 227.29         | 0.346%           | 100             | \$1,471.61                                  | \$147.16                                |
| 52         | DD 56           | 872207200004 | Johnson Family Ltd Partnership  | 7-87-22     | SE NE 7-87-22                                  | 38.33 | 33.85%    | 1297.34        | 1.976%           | 100             | \$8,399.88                                  | \$219.15                                |
| 53         | DD 56           | 872207300004 | SWS Farms, LLP  | 7-87-22     | PARCEL D IN FRL S1/2 7-87-22                   | 0.07  | 18.19%    | 1.27           | 0.002%           | 100             | \$8.24                                      | \$117.77                                |
| 54         | DD 56           | 872207400001 | Handsaker, James E & Judith A Handsaker, Roger, Sandra, Paul & Bonnie | 7-87-22     | NW SE EX PT PARCEL D 7-87-22                   | 0.93  | 31.51%    | 29.30          | 0.045%           | 100             | \$189.71                                    | \$203.99                                |
| 55         | DD 56           | 872207400002 | Spindler, Ragene - 1/4, Del Rina Kae - 1/4 Spindler, Scott K - 1/2    | 7-87-22     | NE SE (INCL PARCEL A) EX PARCELS B & C 7-87-22 | 33.23 | 26.05%    | 865.73         | 1.319%           | 100             | \$5,605.30                                  | \$168.68                                |
| 56         | DD 56           | 872207400003 | Spindler, Dana Spindler, Tami   | 7-87-22     | PARCEL B IN NE SE 7-87-22                      | 2.64  | 25.44%    | 67.17          | 0.102%           | 100             | \$434.87                                    | \$164.72                                |
| 57         | DD 56           | 872207400005 | Stensland, W Bradley  | 7-87-22     | SE SE 7-87-22                                  | 29.69 | 29.29%    | 869.51         | 1.325%           | 100             | \$5,629.82                                  | \$189.62                                |
| 58         | DD 56           | 872207400007 | Spindler Pork, LLC  | 7-87-22     | PARCEL C IN NE SE 7-87-22                      | 2.46  | 52.26%    | 128.56         | 0.196%           | 100             | \$832.39                                    | \$338.37                                |
| 59         | DD 56           | 872208100001 | Krause, Marjorie K - LE Krause, John H - LE                           | 8-87-22     | NW NW 8-87-22                                  | 37.33 | 64.27%    | 2399.09        | 3.655%           | 100             | \$15,533.34                                 | \$416.11                                |
| 60         | DD 56           | 872208100002 | Kamenetzky, Michele   | 8-87-22     | NE NW 8-87-22                                  | 39.00 | 64.78%    | 2526.30        | 3.849%           | 100             | \$16,356.99                                 | \$419.41                                |
| 61         | DD 56           | 872208100003 | Krause, Marjorie K - LE Krause, John H - LE                           | 8-87-22     | SW NW 8-87-22                                  | 38.33 | 50.11%    | 1920.63        | 2.926%           | 100             | \$12,435.49                                 | \$324.43                                |
| 62         | DD 56           | 872208100004 | Kamenetzky, Michele   | 8-87-22     | SE NW 8-87-22                                  | 40.00 | 31.04%    | 1241.54        | 1.891%           | 100             | \$8,038.59                                  | \$200.96                                |
| 63         | DD 56           | 872208200001 | Kuhfus, Paula A Living Trust  | 8-87-22     | NW NE 8-87-22                                  | 39.00 | 62.64%    | 2443.02        | 3.722%           | 100             | \$15,817.77                                 | \$405.58                                |
| 64         | DD 56           | 872208200002 | Kuhfus, Paula A Living Trust  | 8-87-22     | NE NE 8-87-22                                  | 38.00 | 62.83%    | 2387.43        | 3.637%           | 100             | \$15,457.87                                 | \$406.79                                |
| 65         | DD 56           | 872208200003 | Kuhfus, Paula A Living Trust  | 8-87-22     | SW NE 8-87-22                                  | 40.00 | 39.71%    | 1588.38        | 2.420%           | 100             | \$10,284.28                                 | \$257.11                                |
| 66         | DD 56           | 872208200004 | Kuhfus, Paula A Living Trust  | 8-87-22     | SE NE EX TRACT 8-87-22                         | 36.00 | 53.82%    | 1937.38        | 2.952%           | 100             | \$12,543.90                                 | \$348.44                                |



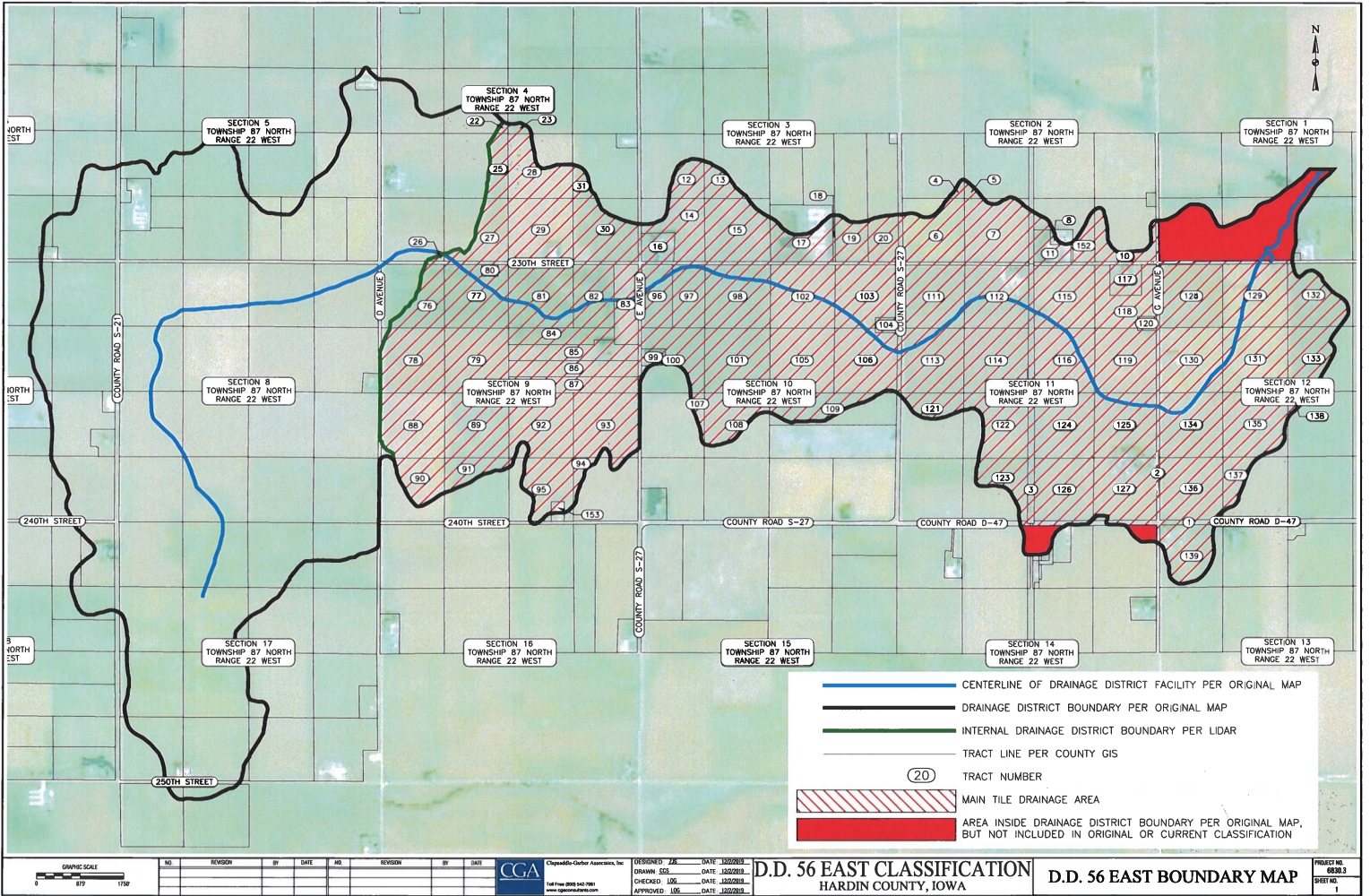
| West Tract | Taxing District | Parcel       | West Entity  | Sec-Twp-Rng | Legal   | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|--|-------------|---|-------|-----------|----------------|------------------|-----------------|---|---|
| 67         | DD 56           | 872208200005 | Birchmier, Cole D & Knudson, Kayla S                             | 8-87-22     | PARCEL IN SE NE (COM E1/4 COR N392' W344' S406.32' E376.5' POB) 8-87-22 | 3.00  | 21.11%    | 63.33          | 0.096%           | 100             | \$410.05                                    | \$136.68                                |
| 68         | DD 56           | 872208300001 | EL Investments LLC   | 8-87-22     | NW SW 8-87-22   | 38.33 | 79.45%    | 3045.35        | 4.639%           | 100             | \$19,717.71                                 | \$514.42                                |
| 69         | DD 56           | 872208300002 | EL Investments LLC   | 8-87-22     | NE SW 8-87-22   | 40.00 | 55.36%    | 2214.55        | 3.374%           | 100             | \$14,338.52                                 | \$358.46                                |
| 70         | DD 56           | 872208300003 | EL Investments LLC   | 8-87-22     | SE SW 8-87-22   | 40.00 | 75.89%    | 3035.71        | 4.625%           | 100             | \$19,655.29                                 | \$491.38                                |
| 71         | DD 56           | 872208300004 | EL Investments LLC   | 8-87-22     | SW SW 8-87-22   | 38.33 | 58.07%    | 2225.72        | 3.391%           | 100             | \$14,410.84                                 | \$375.97                                |
| 72         | DD 56           | 872208400001 | Sheldahl Brothers Partnership                                    | 8-87-22     | NW SE 8-87-22   | 40.00 | 31.46%    | 1258.42        | 1.917%           | 100             | \$8,147.88                                  | \$203.70                                |
| 73         | DD 56           | 872208400002 | Sheldahl Brothers Partnership                                    | 8-87-22     | NE SE 8-87-22   | 39.00 | 20.53%    | 800.60         | 1.220%           | 100             | \$5,183.65                                  | \$132.91                                |
| 74         | DD 56           | 872208400003 | Sheldahl Brothers Partnership                                    | 8-87-22     | SW SE 8-87-22   | 40.00 | 35.38%    | 1415.08        | 2.156%           | 100             | \$9,162.21                                  | \$229.06                                |
| 75         | DD 56           | 872208400004 | Sheldahl Brothers Partnership                                    | 8-87-22     | SE SE 8-87-22   | 39.00 | 24.57%    | 958.12         | 1.460%           | 100             | \$6,203.50                                  | \$159.06                                |
| 76         | DD 56           | 872209100001 | Skeie, Inc   | 9-87-22     | NW NW 9-87-22   | 18.21 | 38.82%    | 706.86         | 1.077%           | 100             | \$4,576.67                                  | \$251.33                                |
| 78         | DD 56           | 872209100003 | Holechek, Lynn P Holechek, Sarah M                               | 9-87-22     | SW NW 9-87-22   | 0.78  | 12.24%    | 9.55           | 0.015%           | 100             | \$61.83                                     | \$79.26                                 |
| 88         | DD 56           | 872209300001 | Kuhfus, Jon & William; Holechek, Sarah                           | 9-87-22     | NW SW 9-87-22   | 0.89  | 2.33%     | 2.08           | 0.003%           | 100             | \$13.44                                     | \$15.10                                 |
| 90         | DD 56           | 872209300003 | Kuhfus, Jon & William; Holechek, Sarah                           | 9-87-22     | SW SW 9-87-22   | 0.01  | 1.41%     | 0.01           | 0.000%           | 100             | \$0.08                                      | \$9.16                                  |
| 140        | DD 56           | 872217100001 | Fosseen, Dwayne  | 17-87-22    | NW NW 17-87-22  | 38.33 | 40.59%    | 1555.63        | 2.370%           | 100             | \$10,072.21                                 | \$262.78                                |
| 141        | DD 56           | 872217100002 | Sheldahl Brothers Partnership                                    | 17-87-22    | NE NW 17-87-22  | 40.00 | 100.00%   | 4000.00        | 6.094%           | 100             | \$25,898.74                                 | \$647.47                                |
| 142        | DD 56           | 872217100003 | JoEtta DuBois McClintock LLC - 2/3 McClintock Family Trust - 1/3 | 17-87-22    | SW NW 17-87-22  | 38.36 | 42.32%    | 1623.22        | 2.473%           | 100             | \$10,509.84                                 | \$273.98                                |
| 143        | DD 56           | 872217100004 | JoEtta DuBois McClintock LLC - 2/3 McClintock Family Trust - 1/3 | 17-87-22    | SE NW 17-87-22  | 35.00 | 58.29%    | 2040.15        | 3.108%           | 100             | \$13,209.34                                 | \$377.41                                |
| 144        | DD 56           | 872217200001 | Sheldahl Brothers Partnership                                    | 17-87-22    | NW NE 17-87-22  | 33.00 | 39.70%    | 1310.11        | 1.996%           | 100             | \$8,482.53                                  | \$257.05                                |
| 145        | DD 56           | 872217200002 | Sheldahl Brothers Partnership                                    | 17-87-22    | NE NE 17-87-22  | 19.62 | 30.39%    | 596.23         | 0.908%           | 100             | \$3,860.37                                  | \$196.76                                |
| 146        | DD 56           | 872217200003 | Sheldahl Brothers Partnership                                    | 17-87-22    | SW NE 17-87-22  | 13.00 | 31.28%    | 406.70         | 0.620%           | 100             | \$2,633.25                                  | \$202.56                                |
| 147        | DD 56           | 872218200003 | Fosseen, Dwayne  | 18-87-22    | E1/2 NE NE 18-87-22   | 14.96 | 18.97%    | 283.76         | 0.432%           | 100             | \$1,837.25                                  | \$122.81                                |
| 14         |                 |              | Janes, Lindell Janes, Meshell                                    | 18-87-22    | N 1/2 SE NE 18-87-22  | 9.36  | 14.91%    | 139.59         | 0.213%           | 100             | \$903.83                                    | \$96.56                                 |



| West Tract | Taxing District | Parcel       | West Entity                   | Sec-Twp-Rng | Legal   | Acres          | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|-------------------------------|-------------|---|----------------|-----------|----------------|------------------|-----------------|---|---|
| 149        | DD 56           | 872206400007 | Sheldahl Brothers Partnership | 6-87-22     | COM SE COR SEC 6 W1203.40' POB W380' N250' E380' S250'POB | 1.02           | 15.93%    | 16.24          | 0.025%           | 100             | \$105.17                                    | \$103.11                                |
| 150        | DD 56           | 872205200005 | Compass Farms, Inc.           | 5-87-22     | BEG NE COR SE NE S433' W486' N433' E486' POB PARCEL "A"   | 3.04           | 9.76%     | 29.68          | 0.045%           | 100             | \$192.19                                    | \$63.22                                 |
| 151        | DD 56           | 872218200002 | Marcy M. Chaussee             | 18-87-22    | W1/2 NE NE 18-87-22                                       | 1.75           | 5.46%     | 9.56           | 0.015%           | 100             | \$61.91                                     | \$35.38                                 |
|            |                 |              |                               |             | <b>Averages</b>   |                |           | <b>979.71</b>  |                  |                 |   | <b>\$231.40</b>                         |
|            |                 |              |                               |             | <b>Totals</b>   | <b>1504.65</b> |           |                | <b>100.000%</b>  |                 | <b>\$425,000.00</b>                         |   |







| East Tract | Taxing District | Parcel       | East Entity   | Sec-Twp-Rng | Legal   | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|---|-------------|---|-------|-----------|----------------|------------------|-----------------|---|---|
| 1          | DD 56           | 15           | Hardin County Roads   |             | ROADS   | 16.36 | 38.84%    | 635.38         | 0.710%           | 100             | \$3,016.44                                  | \$184.38                                |
| 2          | DD 56           | 16           | Sherman Township Roads  |             | ROADS   | 43.21 | 38.84%    | 1678.17        | 1.875%           | 100             | \$7,967.01                                  | \$184.38                                |
| 3          | DD 56           | 32           | Midwestern Railroad Properties  |             | RAILROAD  | 15.98 | 38.84%    | 620.62         | 0.693%           | 100             | \$2,946.37                                  | \$184.38                                |
| 4          | DD 56           | 872202300001 | Eller, Loren L  | 2-87-22     | NW SW 2-87-22   | 2.00  | 32.39%    | 64.77          | 0.072%           | 100             | \$307.49                                    | \$153.75                                |
| 5          | DD 56           | 872202300002 | M Farms, Inc  | 2-87-22     | NE SW 2-87-22   | 2.00  | 30.09%    | 60.19          | 0.067%           | 100             | \$285.74                                    | \$142.87                                |
| 6          | DD 56           | 872202300003 | Worland, Carol E  | 2-87-22     | SW SW 2-87-22   | 28.01 | 53.05%    | 1485.83        | 1.660%           | 100             | \$7,053.87                                  | \$251.83                                |
| 7          | DD 56           | 872202300004 | Kumrow, Dan V - 1/3 (Contract 2/3) Kumrow, Tammy S - 1/3 (Contract 2/3) | 2-87-22     | SE SW 2-87-22   | 37.00 | 41.40%    | 1531.78        | 1.711%           | 100             | \$7,272.04                                  | \$196.54                                |
| 8          | DD 56           | 872202400003 | Kumrow, Dan Kumrow, Tamara  | 2-87-22     | COM S1/4 COR E796' BEG N390' W415' N300.8'E455' S690' W40' TO BEG 2-87-22     | 1.31  | 31.72%    | 41.56          | 0.046%           | 100             | \$197.28                                    | \$150.60                                |
| 10         | DD 56           | 872202400006 | Kumrow, Dan V - 1/3 (Contract 2/3) Kumrow, Tammy S - 1/3 (Contract 2/3) | 2-87-22     | SE SE EX CEM. 2-87-22   | 8.37  | 29.99%    | 251.03         | 0.280%           | 100             | \$1,191.73                                  | \$142.38                                |
| 11         | DD 56           | 872202400008 | Kumrow, Dan Kumrow, Tamara  | 2-87-22     | W836.1' S690.8' SW SE EX TR & EX RR 2-87-22                                   | 6.74  | 46.83%    | 315.64         | 0.353%           | 100             | \$1,498.49                                  | \$222.33                                |
| 12         | DD 56           | 872203300001 | Lickteig Land, LLC  | 3-87-22     | NW SW 3-87-22   | 10.00 | 44.86%    | 448.62         | 0.501%           | 100             | \$2,129.79                                  | \$212.98                                |
| 13         | DD 56           | 872203300002 | Lickteig Land, LLC  | 3-87-22     | NE SW 3-87-22   | 3.00  | 36.76%    | 110.29         | 0.123%           | 100             | \$523.59                                    | \$174.53                                |
| 14         | DD 56           | 872203300003 | Lickteig Land, LLC  | 3-87-22     | SW SW EX PARCEL A 3-87-22   | 18.58 | 65.50%    | 1216.96        | 1.359%           | 100             | \$5,777.45                                  | \$310.95                                |
| 15         | DD 56           | 872203300004 | Lickteig Land, LLC  | 3-87-22     | SE SW 3-87-22   | 35.00 | 56.74%    | 1985.74        | 2.218%           | 100             | \$9,427.17                                  | \$269.35                                |
| 16         | DD 56           | 872203300005 | Maakestad, Mark C   | 3-87-22     | PARCEL "A" IN SW SW 3-87-22   | 8.84  | 42.97%    | 379.82         | 0.424%           | 100             | \$1,803.16                                  | \$203.98                                |
| 17         | DD 56           | 872203400003 | Iowa Select Farms, LP   | 3-87-22     | BEG SW COR SE1/4 N1183.79' E1287.90' S1183.79' W1287.90' POB IN SW SE 3-87-22 | 19.14 | 25.00%    | 478.53         | 0.535%           | 100             | \$2,271.81                                  | \$118.69                                |
| 18         | DD 56           | 872203400007 | Thomas, Betty   | 3-87-22     | PT PARCEL C IN E1/2 W1/2 SE 3-87-22   | 0.86  | 15.10%    | 12.98          | 0.015%           | 100             | \$61.63                                     | \$71.67                                 |
| 19         | DD 56           | 872203400008 | Ferris, Brock R   | 3-87-22     | PT PARCEL C-W1/2 SE SE 3-87-22  | 12.67 | 29.38%    | 372.27         | 0.416%           | 100             | \$1,767.33                                  | \$139.49                                |
| 20         | DD 56           | 872203400009 | Thomas, Betty   | 3-87-22     | PT PARCEL C-E1/2 SE SE 3-87-22  | 12.84 | 31.86%    | 409.04         | 0.457%           | 100             | \$1,941.89                                  | \$151.24                                |
| 22         | DD 56           | 872204100004 | Radland Farms, Inc  | 4-87-22     | SE NW 4-87-22   | 0.98  | 19.08%    | 18.70          | 0.021%           | 100             | \$88.79                                     | \$90.60                                 |
| 23         | DD 56           | 872204200003 | Kiburz, Kent  | 4-87-22     | SW NE 4-87-22   | 2.00  | 27.04%    | 54.08          | 0.060%           | 100             | \$256.72                                    | \$128.36                                |



| East Tract | Taxing District | Parcel       | East Entity                                   | Sec-Twp-Rng | Legal  | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|---|-------------|--|-------|-----------|----------------|------------------|-----------------|---|---|
| 25         | DD 56           | 872204300002 | Bostrom, Michael B Bostrom, Candy S           | 4-87-22     | NE SW 4-87-22  | 11.89 | 45.69%    | 543.28         | 0.607%           | 100             | \$2,579.18                                  | \$216.92                                |
| 26         | DD 56           | 872204300003 | Radland Farms, Inc                            | 4-87-22     | SW SW 4-87-22  | 0.68  | 100.00%   | 68.00          | 0.076%           | 100             | \$322.83                                    | \$474.74                                |
| 27         | DD 56           | 872204300004 | Radland Farms, Inc                            | 4-87-22     | SE SW 4-87-22  | 21.85 | 55.92%    | 1221.91        | 1.365%           | 100             | \$5,800.94                                  | \$265.49                                |
| 28         | DD 56           | 872204400001 | Holechek, Lynn P Holechek, Sarah M            | 4-87-22     | NW SE 4-87-22  | 26.00 | 37.76%    | 981.83         | 1.097%           | 100             | \$4,661.16                                  | \$179.28                                |
| 29         | DD 56           | 872204400003 | Holechek, Lynn P Holechek, Sarah M            | 4-87-22     | SW SE 4-87-22  | 39.00 | 48.07%    | 1874.59        | 2.094%           | 100             | \$8,899.50                                  | \$228.19                                |
| 30         | DD 56           | 872204400004 | McCartney, Michael W McCartney, Cynthia J     | 4-87-22     | SE SE 4-87-22  | 29.42 | 43.62%    | 1283.45        | 1.434%           | 100             | \$6,093.08                                  | \$207.11                                |
| 31         | DD 56           | 872204400005 | McCartney, Michael W McCartney, Cynthia J     | 4-87-22     | NE SE EX PARCEL A 4-87-22  | 4.00  | 23.10%    | 92.41          | 0.103%           | 100             | \$438.70                                    | \$109.68                                |
| 76         | DD 56           | 872209100001 | Skeie, Inc                                    | 9-87-22     | NW NW 9-87-22  | 19.79 | 41.60%    | 823.17         | 0.920%           | 100             | \$3,907.96                                  | \$197.47                                |
| 77         | DD 56           | 872209100002 | Skeie, Inc                                    | 9-87-22     | NE NW EX PARCEL A 9-87-22  | 37.45 | 59.60%    | 2232.16        | 2.493%           | 100             | \$10,597.03                                 | \$282.96                                |
| 78         | DD 56           | 872209100003 | Holechek, Lynn P Holechek, Sarah M            | 9-87-22     | SW NW 9-87-22  | 38.22 | 42.68%    | 1631.04        | 1.822%           | 100             | \$7,743.26                                  | \$202.60                                |
| 79         | DD 56           | 872209100004 | Holechek, Lynn P Holechek, Sarah M            | 9-87-22     | SE NW 9-87-22  | 40.00 | 48.07%    | 1922.98        | 2.148%           | 100             | \$9,129.23                                  | \$228.23                                |
| 80         | DD 56           | 872209100005 | Young, Donald R Young, Sheri L                | 9-87-22     | PARCEL A IN NE NW (COM N1/4 COR W205' POB W334' S267' E334' N267' POB) 9-87-22 | 1.80  | 27.17%    | 48.91          | 0.055%           | 100             | \$232.20                                    | \$129.00                                |
| 81         | DD 56           | 872209200001 | Skeie, Inc                                    | 9-87-22     | NW NE 9-87-22  | 39.00 | 68.23%    | 2660.93        | 2.972%           | 100             | \$12,632.59                                 | \$323.91                                |
| 82         | DD 56           | 872209200002 | Skeie, Inc                                    | 9-87-22     | W 1/2 NE NE & W4A E 1/2 NE NE 9-87-22  | 23.40 | 50.04%    | 1170.94        | 1.308%           | 100             | \$5,558.98                                  | \$237.56                                |
| 83         | DD 56           | 872209200003 | Spindler, Ragene Spindler, Del Rina Kae       | 9-87-22     | LOT 1 FJELLAND'S SUBDIVISION IN NE 1/4 9-87-22                                 | 18.16 | 66.91%    | 1215.17        | 1.357%           | 100             | \$5,768.95                                  | \$317.67                                |
| 84         | DD 56           | 872209200004 | Skeie, Inc                                    | 9-87-22     | N1/4 S1/2 NE EX E3.34A & EX TRACT BEG SE COR W24RDS N92RDS E420' S6RDS 9-87-22 | 15.30 | 52.27%    | 799.77         | 0.893%           | 100             | \$3,796.85                                  | \$248.16                                |
| 85         | DD 56           | 872209200005 | Radland Farms, Inc                            | 9-87-22     | LOT 2 FJELLAND'S SUBDIV IN NE1/4 9-87-22                                       | 20.64 | 56.42%    | 1164.51        | 1.301%           | 100             | \$5,528.45                                  | \$267.85                                |
| 86         | DD 56           | 872209200006 | Fjelland, Bradley A & Lorna J Revocable Trust | 9-87-22     | FJELLAND'S SUBDIV LOT 3 IN NE1/4 SEC 9-87-22                                   | 19.75 | 47.40%    | 936.08         | 1.046%           | 100             | \$4,443.99                                  | \$225.01                                |
| 87         | DD 56           | 872209200007 | Armstrong, Susan R                            | 9-87-22     | FJELLANDS-LOT 4 IN NE 9-87-22  | 19.75 | 45.14%    | 891.50         | 0.996%           | 100             | \$4,232.32                                  | \$214.29                                |
| 88         | DD 56           | 872209300001 | Kuhfus, Jon & William; Holechek, Sarah        | 9-87-22     | NW SW 9-87-22  | 38.11 | 25.38%    | 967.12         | 1.080%           | 100             | \$4,591.34                                  | \$120.48                                |
| 89         | DD 56           | 872209300002 | Kuhfus, Jon & William; Holechek, Sarah        | 9-87-22     | NE SW 9-87-22  | 40.00 | 29.33%    | 1173.03        | 1.310%           | 100             | \$5,568.86                                  | \$139.22                                |



| East Tract | Taxing District | Parcel       | East Entity   | Sec-Twp-Rng | Legal  | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|---|-------------|--|-------|-----------|----------------|------------------|-----------------|---|---|
| 90         | DD 56           | 872209300003 | Kuhfus, Jon & William; Holeczek, Sarah  | 9-87-22     | SW SW 9-87-22  | 20.99 | 5.40%     | 113.38         | 0.127%           | 100             | \$538.24                                    | \$25.64                                 |
| 91         | DD 56           | 872209300004 | Kuhfus, Jon & William; Holeczek, Sarah  | 9-87-22     | SE SW 9-87-22  | 13.00 | 9.58%     | 124.56         | 0.139%           | 100             | \$591.35                                    | \$45.49                                 |
| 92         | DD 56           | 872209400001 | Swenson, Laverna I Trust 1/2 & Swenson, Randy & Terry 1/2                             | 9-87-22     | NW SE 9-87-22  | 36.00 | 34.39%    | 1238.18        | 1.383%           | 100             | \$5,878.15                                  | \$163.28                                |
| 93         | DD 56           | 872209400002 | Swenson, Laverna I Trust 1/2 & Swenson, Randy & Terry 1/2                             | 9-87-22     | NE SE 9-87-22  | 38.14 | 38.32%    | 1461.33        | 1.632%           | 100             | \$6,937.59                                  | \$181.90                                |
| 94         | DD 56           | 872209400004 | Swenson, Laverna I Trust 1/2 & Swenson, Randy & Terry 1/2                             | 9-87-22     | SE SE 9-87-22  | 6.00  | 14.28%    | 85.66          | 0.096%           | 100             | \$406.66                                    | \$67.78                                 |
| 95         | DD 56           | 872209400005 | Swenson, Laverna I Trust 1/2 & Swenson, Randy & Terry 1/2                             | 9-87-22     | SW SE EX TRACT 9-87-22   | 26.35 | 11.94%    | 314.55         | 0.351%           | 100             | \$1,493.31                                  | \$56.67                                 |
| 96         | DD 56           | 872210100001 | McCartney, Michael W McCartney, Cynthia J   | 10-87-22    | W1/2 NW NW 10-87-22  | 18.50 | 63.16%    | 1168.41        | 1.305%           | 100             | \$5,546.94                                  | \$299.83                                |
| 97         | DD 56           | 872210100002 | McCartney, Michael W McCartney, Cynthia J   | 10-87-22    | E1/2 NW NW 10-87-22  | 19.50 | 43.98%    | 857.61         | 0.958%           | 100             | \$4,071.43                                  | \$208.79                                |
| 98         | DD 56           | 872210100003 | McCartney, Michael W McCartney, Cynthia J   | 10-87-22    | NE NW 10-87-22   | 39.00 | 68.59%    | 2675.01        | 2.988%           | 100             | \$12,699.40                                 | \$325.63                                |
| 99         | DD 56           | 872210100004 | Maakestad, Jon C Maakestad, Annette   | 10-87-22    | PARCEL "A" IN SW NW 10-87-22   | 3.11  | 36.23%    | 112.68         | 0.126%           | 100             | \$534.94                                    | \$172.00                                |
| 100        | DD 56           | 872210100005 | McCartney, Michael W McCartney, Cynthia J   | 10-87-22    | SW NW EX PARCEL A 10-87-22   | 21.11 | 39.84%    | 840.93         | 0.939%           | 100             | \$3,992.24                                  | \$189.12                                |
| 101        | DD 56           | 872210100006 | McCartney, Michael W McCartney, Cynthia J   | 10-87-22    | SE NW 10-87-22   | 40.00 | 39.45%    | 1578.07        | 1.763%           | 100             | \$7,491.80                                  | \$187.30                                |
| 102        | DD 56           | 872210200001 | Wellman, Charles Alan   | 10-87-22    | NW NE 10-87-22   | 39.00 | 81.99%    | 3197.44        | 3.572%           | 100             | \$15,179.60                                 | \$389.22                                |
| 103        | DD 56           | 872210200002 | Wellman, Charles Alan   | 10-87-22    | NE NE EX TRACT 10-87-22  | 36.32 | 43.42%    | 1576.91        | 1.761%           | 100             | \$7,486.29                                  | \$206.12                                |
| 104        | DD 56           | 872210200003 | Bishop, Donna M   | 10-87-22    | COM NE COR S1099.22' BEG W508.8' S313.2' E508.8' N313.2' TO BEG NE NE 10-87-22 | 3.33  | 50.35%    | 167.66         | 0.187%           | 100             | \$795.95                                    | \$239.02                                |
| 105        | DD 56           | 872210200004 | Wellman, Charles Alan   | 10-87-22    | SW NE 10-87-22   | 40.00 | 36.78%    | 1471.35        | 1.644%           | 100             | \$6,985.13                                  | \$174.63                                |
| 106        | DD 56           | 872210200005 | Wellman, Charles Alan   | 10-87-22    | SE NE EX TR 10-87-22   | 37.73 | 38.43%    | 1449.91        | 1.620%           | 100             | \$6,883.34                                  | \$182.44                                |
| 107        | DD 56           | 872210300001 | Topp, David B Topp, Carole A  | 10-87-22    | NW SW 10-87-22   | 5.00  | 19.78%    | 98.89          | 0.110%           | 100             | \$469.49                                    | \$93.90                                 |
| 108        | DD 56           | 872210300002 | Topp, David B Topp, Carole A  | 10-87-22    | NE SW 10-87-22   | 27.00 | 17.60%    | 475.25         | 0.531%           | 100             | \$2,256.23                                  | \$83.56                                 |
| 109        | DD 56           | 872210400001 | Bahr, Harold E Jr   | 10-87-22    | N1/2 N1/2 SE 10-87-22  | 23.00 | 46.44%    | 1068.04        | 1.193%           | 100             | \$5,070.43                                  | \$220.45                                |
| 111        | DD 56           | 872211100001 | Federwitz, DuWayne Joint Revocable Trust<br>Federwitz, Virginia Joint Revocable Trust | 11-87-22    | NW NW 11-87-22   | 37.64 | 46.64%    | 1755.53        | 1.961%           | 100             | \$8,334.25                                  | \$221.42                                |

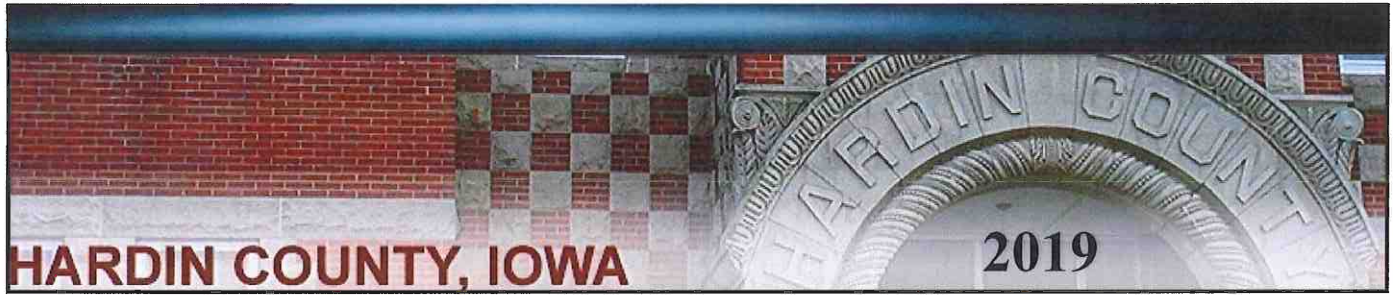


| East Tract | Taxing District | Parcel       | East Entity   | Sec-Twp-Rng | Legal  | Acres | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|---|-------------|--|-------|-----------|----------------|------------------|-----------------|---|---|
| 112        | DD 56           | 872211100002 | Topp, Robert M  | 11-87-22    | NE NW 11-87-22   | 39.00 | 59.96%    | 2338.51        | 2.612%           | 100             | \$11,101.91                                 | \$284.66                                |
| 113        | DD 56           | 872211100003 | Topp, Robert M  | 11-87-22    | SW NW 11-87-22   | 38.64 | 50.62%    | 1955.86        | 2.185%           | 100             | \$9,285.31                                  | \$240.30                                |
| 114        | DD 56           | 872211100004 | Topp, Robert M  | 11-87-22    | SE NW 11-87-22   | 40.00 | 31.54%    | 1261.74        | 1.409%           | 100             | \$5,990.00                                  | \$149.75                                |
| 115        | DD 56           | 872211200001 | Kumrow, Clarice - Trust   | 11-87-22    | NW NE EX R.R. 11-87-22   | 36.13 | 44.34%    | 1602.18        | 1.790%           | 100             | \$7,606.23                                  | \$210.52                                |
| 116        | DD 56           | 872211200002 | Kumrow, Clarice - Trust   | 11-87-22    | SW NE EX R.R. 11-87-22   | 36.79 | 38.34%    | 1410.44        | 1.576%           | 100             | \$6,695.98                                  | \$182.01                                |
| 117        | DD 56           | 872211200003 | Kumrow, Dan Kumrow, Tamara  | 11-87-22    | COM @ NE COR W329FT BEG W648FT S650FT E648FT N650FT BEG 11-87-22             | 9.18  | 28.01%    | 257.16         | 0.287%           | 100             | \$1,220.83                                  | \$132.99                                |
| 118        | DD 56           | 872211200006 | Kumrow, Clarice - Trust   | 11-87-22    | NE NE EX TRACTS 11-87-22   | 26.77 | 27.46%    | 735.14         | 0.821%           | 100             | \$3,490.03                                  | \$130.37                                |
| 119        | DD 56           | 872211200007 | Kumrow, Clarice - Trust   | 11-87-22    | SE NE EX TR 11-87-22   | 38.57 | 36.26%    | 1398.61        | 1.562%           | 100             | \$6,639.80                                  | \$172.15                                |
| 120        | DD 56           | 872211200008 | Magnum Alliance, LLC  | 11-87-22    | BEG SE COR NE1/4 N 232.89' W416' S282' E416' N49.11' POB PARCEL "B" 11-87-22 | 2.48  | 28.79%    | 71.40          | 0.080%           | 100             | \$338.97                                    | \$136.68                                |
| 121        | DD 56           | 872211300001 | Topp, Robert Topp, Lori   | 11-87-22    | NW SW 11-87-22   | 12.00 | 54.45%    | 653.42         | 0.730%           | 100             | \$3,102.07                                  | \$258.51                                |
| 122        | DD 56           | 872211300002 | Topp, Robert Topp, Lori   | 11-87-22    | NE SW 11-87-22   | 31.00 | 32.47%    | 1006.63        | 1.124%           | 100             | \$4,778.91                                  | \$154.16                                |
| 123        | DD 56           | 872211300004 | Topp, David B Topp, Carole A  | 11-87-22    | SE SW 11-87-22   | 18.82 | 27.80%    | 523.29         | 0.585%           | 100             | \$2,484.26                                  | \$132.00                                |
| 124        | DD 56           | 872211400001 | Topp, David   | 11-87-22    | NW SE EX R.R. 11-87-22   | 36.38 | 35.21%    | 1281.00        | 1.431%           | 100             | \$6,081.48                                  | \$167.17                                |
| 125        | DD 56           | 872211400002 | Topp, David   | 11-87-22    | NE SE 11-87-22   | 39.00 | 39.57%    | 1543.34        | 1.724%           | 100             | \$7,326.91                                  | \$187.87                                |
| 126        | DD 56           | 872211400003 | Topp, David   | 11-87-22    | SW SE EX R.R. 11-87-22   | 34.72 | 39.05%    | 1355.84        | 1.515%           | 100             | \$6,436.76                                  | \$185.39                                |
| 127        | DD 56           | 872211400004 | Topp, David   | 11-87-22    | SE SE 11-87-22   | 36.84 | 35.67%    | 1314.00        | 1.468%           | 100             | \$6,238.12                                  | \$169.33                                |
| 128        | DD 56           | 872212100001 | Kumrow, Clarice - Trust   | 12-87-22    | NW NW 12-87-22   | 38.00 | 46.87%    | 1780.93        | 1.989%           | 100             | \$8,454.85                                  | \$222.50                                |
| 129        | DD 56           | 872212100002 | Federwitz, DuWayne Joint Revocable Trust<br>Federwitz, Virginia Joint Revocable Trust | 12-87-22    | NE NW 12-87-22   | 39.00 | 41.88%    | 1633.39        | 1.825%           | 100             | \$7,754.43                                  | \$198.83                                |
| 130        | DD 56           | 872212100003 | Topp, Robert Topp, Lori   | 12-87-22    | SW NW 12-87-22   | 39.00 | 42.64%    | 1663.08        | 1.858%           | 100             | \$7,895.37                                  | \$202.45                                |
| 131        | DD 56           | 872212100004 | Topp, Robert Topp, Lori   | 12-87-22    | SE NW 12-87-22   | 40.00 | 41.46%    | 1658.40        | 1.853%           | 100             | \$7,873.13                                  | \$196.83                                |
| 132        | DD 56           | 872212200001 | The McCartney Family Trust  | 12-87-22    | NW NE 12-87-22   | 24.92 | 29.31%    | 730.38         | 0.816%           | 100             | \$3,467.45                                  | \$139.14                                |




| East Tract | Taxing District | Parcel       | East Entity  | Sec-Twp-Rng | Legal  | Acres          | % Benefit | Units Assessed | % Units Assessed | Percent of Levy | Assessment for Project (entire tract basis) | Assessment for Project (per acre basis) |
|------------|-----------------|--------------|--|-------------|--|----------------|-----------|----------------|------------------|-----------------|---|---|
| 133        | DD 56           | 872212200003 | The McCartney Family Trust   | 12-87-22    | SW NE 12-87-22   | 25.00          | 22.73%    | 568.35         | 0.635%           | 100             | \$2,698.19                                  | \$107.93                                |
| 134        | DD 56           | 872212300001 | Topp, David B Topp, Carole A   | 12-87-22    | NW SW 12-87-22   | 39.00          | 31.76%    | 1238.47        | 1.383%           | 100             | \$5,879.53                                  | \$150.76                                |
| 135        | DD 56           | 872212300002 | Topp, David B Topp, Carole A   | 12-87-22    | NE SW 12-87-22   | 35.00          | 38.22%    | 1337.78        | 1.494%           | 100             | \$6,351.00                                  | \$181.46                                |
| 136        | DD 56           | 872212300003 | Topp, Carole A   | 12-87-22    | SW SW 12-87-22   | 36.67          | 32.91%    | 1206.98        | 1.348%           | 100             | \$5,730.06                                  | \$156.26                                |
| 137        | DD 56           | 872212300004 | Topp, Carole A   | 12-87-22    | SE SW 12-87-22   | 9.00           | 34.38%    | 309.43         | 0.346%           | 100             | \$1,469.01                                  | \$163.22                                |
| 138        | DD 56           | 872212400001 | McCartney, Michael W & Cynthia J 2/3; Strutz, Theo 1/3   | 12-87-22    | NW SE 12-87-22   | 4.00           | 12.49%    | 49.95          | 0.056%           | 100             | \$237.11                                    | \$59.28                                 |
| 139        | DD 56           | 872213100001 | Topp, LaVonne S - Trust  | 13-87-22    | NW NW 13-87-22   | 26.42          | 21.47%    | 567.14         | 0.634%           | 100             | \$2,692.45                                  | \$101.91                                |
| 152        | DD 56           | 872202400007 | Heuer, Sandra Kumrow -2/3 Kumrow, Reginald - 2/3 (Deed) Kumrow Dan V - 1/3 (Contract 2/3) Kumrow, Tammy S - 1/3 (Contract 2/3) | 2-87-22     | SW SE EX R.R. & EX TRS                                       | 8.68           | 41.48%    | 360.01         | 0.402%           | 100             | \$1,709.14                                  | \$196.91                                |
| 153        | DD 56           | 872209400006 | PLA Enterprises, LLC   | 9-87-22     | COM S1/4 COR E851' POB E262' N426' W262 S426' POB PARCEL "A" | 1.50           | 2.07%     | 3.11           | 0.003%           | 100             | \$14.76                                     | \$9.84                                  |
|            |                 |              |  |             | <b>Averages</b>  |                |           | <b>973.03</b>  |                  |                 |   | <b>\$185.12</b>                         |
|            |                 |              |  |             | <b>Totals</b>  | <b>2162.33</b> |           |                | <b>100.000%</b>  |                 | <b>\$425,000.00</b>                         |   |





**ENGINEER'S REPORT  
ON  
IMPROVEMENTS  
TO  
MAIN TILE  
DRAINAGE DISTRICT  
NO. 56  
HARDIN COUNTY,  
IOWA**



|  |   |
|--|---|
| A circular professional engineer seal for Lee O. Gallentine, License 15745, Iowa. The seal features the text "LICENSED PROFESSIONAL ENGINEER" around the top, "LEE O. GALLENTINE 15745" in the center, and "IOWA" at the bottom. | <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> P.E. Feb 8, 2019<br/>LEE O. GALLENTINE, P.E. DATE</p> <p>LICENSE NUMBER: 15745<br/>MY LICENSE RENEWAL DATE IS DECEMBER 31, 2020<br/>PAGES OR SHEETS COVERED BY THIS SEAL:<br/>SHOWN ON TABLE OF CONTENTS</p> |
|--|---|

|   |   |  |
|---|---|--|
| The logo for CGA Engineers & Land Surveyors, featuring the letters "CGA" in a large, stylized font above the text "ENGINEERS • LAND SURVEYORS". | <p><b>CLAPSADDLE-GARBER ASSOCIATES OFFICE LOCATIONS</b></p> <p>16 East Main Street, PO Box 754   Marshalltown, IA 50158<br/>1523 S. Bell Avenue, Suite 101   Ames, IA 50010<br/>5106 Nordic Drive   Cedar Falls, IA 50613<br/>739 Park Avenue   Ackley, IA 50601<br/>511 Bank Street   Webster City, IA 50595</p> | <p><b>Project Office</b><br/>739 Park Avenue<br/>Ackley, IA. 50601<br/>Phone: 641-847-3273<br/>Fax: 641-847-2303</p> |
|---|---|--|

# **Engineer's Report on Improvements to Main Tile, Drainage District No. 56 Hardin County, Iowa**

|  |           |
|--|-----------|
| <b>Table of Contents</b>                                       | Pg. 1     |
| <br>   |           |
| <b>Report</b>  |           |
| Introduction   | Pg. 2     |
| District History   | Pgs. 3-7  |
| Investigation  | Pg. 8     |
| Discussion and Conclusions                                     | Pg. 8     |
| Improvement Methods  | Pgs. 9-10 |
| Opinion of Probable Construction Costs                         | Pg. 11    |
| Ownership and Classifications                                  | Pg. 11    |
| Recommendations  | Pg. 12    |
| <br>   |           |
| <b>Appendices</b>  |           |
| Landowner Meeting Minutes                                      | App. L    |
| Work Order #204  | App. M    |
| Investigation Limits Map                                       | App. N    |
| Upper Main Tile Outlet Map                                     | App. O    |
| Upper Main Tile Outlet Capacities Chart                        | App. P    |
| Main Tile Improvement Map                                      | App. Q    |
| Single Tile Upsizing Capacities Chart                          | App. R    |
| Dual Tile Upsizing Capacities Chart                            | App. S    |
| Parallel Tile Upsizing Capacities Chart                        | App. T    |
| Open Ditch Construction Capacities Chart                       | App. U    |
| Upper Main Tile Outlet Opinion of Probable Construction Costs  | App. V    |
| Single Tile Upsizing Opinion of Probable Construction Costs    | App. W    |
| Dual Tile Upsizing Opinion of Probable Construction Costs      | App. X    |
| Parallel Tile Upsizing Opinion of Probable Construction Costs  | App. Y    |
| Open Ditch Construction Opinion of Probable Construction Costs | App. Z    |



# **Engineer's Report on Improvements to Main Tile, Drainage District No. 56 Hardin County, Iowa**

## 1.0 INTRODUCTION

- SCOPE OF WORK – The Hardin County Board of Supervisors, acting as District Trustees, requested Clapsaddle-Garber Associates to investigate and report concerning improvements to the Main tile of Drainage District No. 56. This report will summarize the history of repairs, investigate the necessity and feasibility of said improvements, and present opinions of probable construction costs associated with said improvements. At the Landowner's Meeting held on March 28, 2018, Work Order #204 was discussed and reviewed by the District Trustees. For reference, a copy of the meeting minutes is included in Appendix L and a copy of Work Order #204 is included in Appendix M. As a result of this meeting, the District Trustees requested Clapsaddle-Garber Associates to move ahead with an investigation and report concerning improvements to the Main tile.
  
- LOCATION – The area of investigation was the entire length of the Main tile. Said Main tile is located in Sections 1, 4, 7, 8, 9, 10, 11, 12, and 17, Township 87 North (T87N), Range 22 West (R22W), Hardin County, Iowa. Specifically, the downstream limit of investigation is in Section 1 where the Main tile outlets into the Main Open Ditch a few hundred feet north of 230<sup>th</sup> Street at approximately ½ mile east of G Avenue. Going upstream, the tile then crosses 230<sup>th</sup> Street and enters Section 12. It proceeds southwest across Section 12 and enters Section 11 when it crosses G Avenue at approximately ½ mile south of 230<sup>th</sup> Street. It then proceeds west, northwest, and southwest, and enters Section 10 when it crosses County Highway S27 at approximately ⅜ mile south of 230<sup>th</sup> Street. From here, it proceeds northwest and southwest across Section 10 and enters Section 9 when it crosses E Avenue at approximately ⅛ mile south of 230<sup>th</sup> Street. It then continues southwest and northwest and enters Section 4 when it crosses 230<sup>th</sup> Street at approximately ¼ mile east of D Avenue. In Section 4, it continues northwest and southwest and reenters Section 9 briefly at the intersection of D Avenue and 230<sup>th</sup> Street. From there it enters Section 8, where it proceeds southwest until it is approximately ⅜ mile south of 230<sup>th</sup> Street and approximately ⅜ mile east of County Highway S21. At that point, it turns south and southeast and enters Section 17 at approximately ⅜ mile east of County Highway S21. From there it continues south and ends at approximately ⅜ mile east and approximately ¼ south of the intersection of County Highway S21 and 240<sup>th</sup> Street. For reference, a map showing the limits of investigation is included in Appendix I.

2.0 DISTRICT HISTORY – The following is a summary of the pertinent history of Drainage District No. 56 as obtained from the Hardin County Auditor’s drainage minutes and records.

- 1914, April 2      Petition for the establishment of a drain starting in Section 11 and terminating in Section 17.
- 1915, Feb 2      Report filed by S.B Gardner, Engineer, for the establishment of a drainage district. It included an estimate of the materials for the construction of a Main and Laterals.
- 1915              Notice of hearing for the petition. Hearing to take place on March 12th.
- 1915, Mar 12     Hearing on the establishment of a drainage district held. Further hearing to take place on March 24th.
- 1915, Mar 24     Hearing on the establishment of a drainage district held. Lacking a quorum, meeting was adjourned, and meeting continued.
- 1915, July 13     Revision to the Engineer’s report recommending the elimination of Laterals 12, 14, 23, 24, 25, 26, 27, 36, 39, and 37. It also recommended that the Main tile not be constructed from Sta. 0+00 to 16+50 and that the bulkhead be constructed at Sta. 16+50.
- 1915, July 14     Drainage district established as specified in the report of E.W. Edwards, Engineer, and it was to be construction per the plans and specifications. E.W. Edwards appointed as engineer on the construction and the County Auditor instructed to advertise for bids for material and for labor for the construction. Said construction was to be completed by January 1, 1917.
- 1915, July        Notice to contractors for the bid letting. Bids to be received until August 9th.
- 1915, Aug 9      Contract awarded to Evens & Howard Fire Brick Company of St. Louis.
- 1915, Dec 15     E.W. Edwards resigns as Drainage Engineer for construction.
- 1915, Dec 17     W.S. Porter appointed as Drainage Engineer for construction.
- 1917, Mar 20     NW¼ NW¼ Section 20; NE¼ NW¼ Section 20; SE¼ SW¼ Section 17; SW¼ SW¼ Section 17; SW¼ SE¼ Section 17, NW¼ SE¼ Section 17; NE¼ SW¼ Section 17; and NW¼ SW¼ of Section 17 exempted from assessments.
- 1918, Mar 19     Approval of Engineer’s letter recommending that the Main tile be constructed of cement 8” sewer pipe at Sta. 684+00 due to sand pockets found during construction.
- 1918, Nov 11     Bill for filling of ditch.
- 1918, Nov 18     Engineer’s report recommended a 2,500 feet long 12” relief tile beginning at Sta. 625 on the Main tile.
- 1919, May 5      Engineer’s report stated that Lateral 3 was found crushed at the connection to the Main tile and had been repaired.
- 1921, June 20     Engineer reported that the tile just above the outlet had never been filled and recommended that the four hundred feet be filled.
- 1929, Oct 15     3 bills for work done.
- 1929, Dec 17     Bill for work done.

|                           |   |
|---------------------------|---|
| 1936, Nov 16              | 3 bills for work done.                                  |
| 1937, Apr 26              | 2 bills for work done to Main drain.                    |
| 1937, Aug 13              | Bill for work done.                                     |
| 1938, July 25             | 2 bills for work done.                                  |
| 1939, May 29              | 6 bills for work done.                                  |
| 1939, July 17             | Bill for work done.                                     |
| 1941, May 6 <sup>th</sup> | 6 bills for work done.                                  |
| 1943, June 14             | 3 bills for work done.                                  |
| 1943, Nov 16              | 8 bills for work done.                                  |
| 1944, June 16             | Bill for work done.                                     |
| 1944, Sept 5              | Bill for work done.                                     |
| 1944, Oct 24              | Bill for work done.                                     |
| 1944, Nov 21              | 3 bills for work done.                                  |
| 1945, Oct 2               | Bill for work done.                                     |
| 1946, Dec 3               | 2 bills for work done.                                  |
| 1947, Jan 21              | 21 bills for work done.                                 |
| 1947, Feb                 | 5 bills for work done.                                  |
| 1947, Mar                 | Bill for work done.                                     |
| 1947, Apr 8               | 4 bills for work done.                                  |
| 1947, May 6               | 3 bills for work done.                                  |
| 1947, June 3              | Bill for work done.                                     |
| 1948, Feb 24              | 4 bills for work done.                                  |
| 1948, Apr                 | 4 bills for work done.                                  |
| 1948, May 5               | 2 bills for work done.                                  |
| 1949, Feb 1               | 4 bills for work done.                                  |
| 1949, May 2               | 3 bills for work done.                                  |
| 1949, Aug 15              | Bill for work done.                                     |
| 1950, Sept                | 5 bills for work done.                                  |
| 1950, Dec 21              | 5 bills for work done.                                  |
| 1951, Mar 19              | Bill for work done.                                     |
| 1951, June 27             | 5 bills for work done.                                  |
| 1953, Jan                 | 3 bills for work done.                                  |
| 1953, Jan 28              | Bill for work done in NE¼ Section 8 and NW¼ Section 12. |
| 1953, May                 | Bill for work done.                                     |

1953, May 11-13 Repair in SE $\frac{1}{4}$  Section 11 and NW $\frac{1}{4}$  Section 12.

1953, May 18 Repair to 32" Main tile in SE $\frac{1}{4}$  Section 11.

1953, June 1<sup>h</sup> Bill for work done.

1953, June 30 3 bills for work done.

1953, Nov Bill for work done.

1954, Jan 14 Bill for repair in SE $\frac{1}{4}$  Section 11 and NW $\frac{1}{4}$  Section 12.

1955, Jan 14 Bill for repair in NW $\frac{1}{4}$  Section 12.

1955, Aug 11 Repair to tile in NW $\frac{1}{4}$  Section 11.

1955, Nov 15 Repair to riser in NE $\frac{1}{4}$  Section 11.

1959, Apr 18 Bill for work done in N $\frac{1}{2}$  Section 11.

1959, May 13 Bill for repair to 30" Main tile in SE $\frac{1}{4}$  Section 11.

1959, July 20 Bill for repair to 32" Main tile in E $\frac{1}{2}$  Section 11.

1961, May 11 Bill for work done in NE $\frac{1}{4}$  Section 11.

1962, May 2 Bill for work done in Section 4.

1963, Aug 8 Repaired 32" Main tile in NW $\frac{1}{4}$  Section 12.

1964, Oct 23 Repair to 18" Main tile in NW $\frac{1}{4}$  Section 8.

1965, Oct 11 Work done in Section 12.

1965, Dec 15 Repair in NE $\frac{1}{4}$  Section 8.

1966, Apr 14 Repair in Section 8.

1969, May 12 Repair in Section 8.

1969, Sept 24 Bill for work done in Section 1.

1969, Dec 1 Repair to Main tile in Section 11.

1971, Feb 2 Large tile reported broken in two places in Section 8.

1971, Dec 7 Bill for work done in Section 10.

1973, May 31 Bill for work done in Section 11.

1974, May 1 Repair to Main tile in Section 8

1974, June 4 Repair in Section 8.

1975, June 3 Repair to broken intake and tile in road ditch in Section 9.

1975, Sept 12 Bill for work done in Sections 11 and 12.

1976, June 2 Repair to Main tile in NW $\frac{1}{4}$  Section 12.

1976, June 15 Engineer authorized to make preliminary report concerning cleanout and repair the Main drain.

1976, Dec 16 Request for cleanout of Main Open Ditch from Main tile outlet to Tipton Creek and creation of surface drain on west side of railroad in Section 11.

1977, Mar 11 Report on proposed improvement, repairs, and outlet extension submitted by Phil Haefner, engineer. Report included repairs to the Main tile, improvement to Main Open Ditch, and open channel extension from the Main tile outlet to Tipton Creek.

1977, Mar 16 Preliminary report by Phil Haefner tentatively accepted. Hearing date set for April 26, 1977.

1977, Mar 28 Notice of hearing for the proposed repairs, improvements and extension of outlet. Hearing is to take place April 26, 1977.

1977, Apr 26 Hearing for proposed repairs and improvement. Engineer's report approved.

1977, May 11 Repair to Main tile in NE $\frac{1}{4}$  Section 8.

1977, May 31 Engineer's report (including 450 feet of tile repairs) approved and bid opening date set for July 19th. Suggested commencement date set for October 30th and completion date set for May 1, 1978.

1977, June 25 Specifications for construction of drainage improvements and repairs submitted by Phil Haefner.

1977, July 19 Bid letting with bid from B & B Excavating of Parkersburg, Iowa accepted. Also, the design for the surface drain beneath the railroad was modified.

1977, Aug 3 Bill for repair to tile in Section 8.

1978, Apr 21 Request for extension of completion date granted due to weather.

1978, May 18 Modifications to proposed outlet extension due railroad pilings.

1978, June 26 Modifications to proposed outlet extension due to boulders.

1978, June 27 Engineer ordered to prepare report showing modifications to proposed outlet extension.

1978, Oct 16 Engineer submitted letter of completion.

1978, Oct 17 Engineer's report on completion accepted and hearing date set for November 9th.

1978, Nov 9 Repair and improvement accepted as completed by District Trustees.

1980, June 9 Repair to 12" tile in SW $\frac{1}{4}$  Section 8.

1980, Aug 13 Bill for repair to 12" tile in Section 8.

1981, July 21<sup>st</sup> Tile that outlets on surface reported washed out in SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 1. Secondary Road Department authorized to repair.

1981, Oct 21 Bill for repair of washed out tile in Section 1.

1982, July 12 Tile reported washed out in Section 11.

1983, May 2 36" Main tile reported broken in Section 12.

1983, Oct 24 Previously reported broken Main tile found to not be broken, but instead outlet needed repaired.

1984, Apr 24 Request for repair to broken 30" Main tile in NE $\frac{1}{4}$  Section 9.

1984, Apr 30 Blowout/sinkhole reported where tile is broken in Section 9.

1984, Oct 8 Blowout over 28" Main tile reported in Section 9.

|               |  |
|---------------|--|
| 1984, Oct 23  | Bill for repair of broken 30" Main tile in NE $\frac{1}{4}$ Section 9.                                   |
| 1985, June 17 | Bill for repair of broken 28" Main tile in NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 9.                  |
| 1986, May 7   | Request for repair of broken tile in NW $\frac{1}{4}$ Section 9.   |
| 1986, May 14  | Broken tile reported in Section 9.   |
| 1986, June 18 | Bill for repair of broken 30" Main tile in NW $\frac{1}{4}$ Section 9.                                   |
| 1986, Sept 8  | Bill for replacement of 400 feet of 12" cement tile in SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 8.      |
| 1990, June 13 | Bill for repair of broken intake and tile in NW $\frac{1}{4}$ Section 11.                                |
| 1990, July 24 | Request for repair to tile in NE $\frac{1}{4}$ Section 9 with crew to verify that tile is district tile. |
| 1990, Aug 29  | Request for repair with crew directed to check on condition of the Main tile.                            |
| 1990, Oct 1   | Bill for repair of broken tile in Section 9.   |
| 1991, Oct 30  | Request for repair approved for broken tile in NE $\frac{1}{4}$ Section 9.                               |
| 1992, Apr 14  | Crew directed to verify and repair tile as requested in Section 10.                                      |
| 1992, Apr 15  | Bill for repair to broken tile in NE $\frac{1}{4}$ Section 9.  |
| 1992, May 15  | Bill for repair to broken tile in SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10.                          |
| 1994, May 11  | Request for repair approved for broken tile in Section 8.  |
| 1994, May 23  | Bill for repair of broken tile in NW $\frac{1}{4}$ and SW $\frac{1}{4}$ Section 8.                       |
| 1998, July 15 | Crew directed to verify and repair Main tile as requested in NE $\frac{1}{4}$ Section 9.                 |
| 1998, Nov 16  | Request for repair approved for two broken tiles in NW $\frac{1}{4}$ Section 10.                         |
| 1999, July 21 | Bill for repair to broken tile in NE $\frac{1}{4}$ Section 9.  |
| 2001, Dec 3   | Request for repair to broken tile in NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 11.                       |
| 2001, Dec     | Bill for repair to broken tile in Section 11.  |
| 2008, June 9  | Bill for repair to two broken tiles in SW $\frac{1}{4}$ Section 8.                                       |
| 2009, Apr 15  | Repairs to tile intake approved in NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8.                          |
| 2009, May 20  | Repairs approved for Lateral 29 connection to Main tile in NW $\frac{1}{4}$ Section 8.                   |
| 2010, Apr 21  | Request for repair to sinkhole/blowout and broken tile approved in NE $\frac{1}{4}$ Section 10.          |
| 2010, June 11 | Bill for repair of broken Main tile in NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10.                     |

3.0 INVESTIGATION – For the investigation portion of this report, field observations and office investigations were performed. The field observation for this report was limited to determining a possible route for an upper Main tile outlet near E Avenue from the existing Main tile to the Main Open Ditch of Drainage District 26. Said observation was limited to visual observation (without excavation) and preliminary field survey of the same.

Office investigation started with a review of district history. Said review shows that there were repairs requested within 15 years after the initial construction of the Main tile. This is probably an indication of poor workmanship during construction, usage of inferior materials, or inadequate design. Since then, repairs have been pretty common with over 100 repairs during the last 90 years. Many details of these repairs have been lost to time, but it appears many of them have consisted of tile replacements due to blowouts and sinkholes. In addition, these repairs have been fairly consistent in their occurrence and do not appear to have accelerated over recent years.

All other office investigations were limited to office calculations and records research. Using this information, calculations were performed to determine the drainage coefficient for the length of the existing Main tile. It appears that the Main tile was designed to provide a drainage coefficient of 0.07 inches per day at the downstream and upstream ends, with the length of the Main tile varying from 0.03 to 0.22 inches per day.

4.0 DISCUSSION AND CONCLUSIONS – Based on the above, it is apparent that the Main tile has issues which warrant corrective actions. First, the Main tile has a history of failure based on the sheer number of repairs. In many drainage districts, repairs are attributable to physical deterioration as the tile reaches the end of its lifecycle. Although this may be true in this district also, the regularity of the repairs over the last 90 years indicates that something else is at play. These historic repairs are probably due to a combination of overloading of the tile, poor soil conditions, lack of soil over, or differential drainage capacity along the length of the Main tile. As mentioned in the Investigation section above, all of these can probably be attributed to poor workmanship during construction, usage of inferior materials, or inadequate design. Finally, the capacity of the existing Main tile is far below that of modern preferred drainage coefficients of ½ inch per day to 1 inch per day.

If some corrective action is not undertaken, the physical failures of the Main tile will accelerate. This will allow soil to enter the tile and the physical failures will manifest themselves as more sinkholes and soil infiltration. Also, if said corrective action does not increase the drainage capacity, the Main tile will continue to provide less than desirable drainage performance at best and in some locations continue the pattern of almost annual failures. When all the issues are combined, it will lead to further reduced drainage and liability exposure by the drainage district.

- 5.0 IMPROVEMENT METHODS – To improve the drainage capacity for the existing Main tile, the following options are the most straightforward available:

Upper Main Tile Outlet

- Sever the existing Main tile, install a new outlet to the Main Open Ditch of Drainage District 26, and divert flows from the upper portion of the Main tile to the new outlet. For reference, a chart with the required tile sizes and capacities is included in Appendix P.
- The point of severing and the new outlet would be at approximately ¼ mile east of E Avenue and run in a northerly direction (following the lower points of the land) until reaching the Main Open Ditch of Drainage District 26. For reference, the general route is shown on the map included in Appendix O.

Single Tile Upsizing

- For the entire length of the Main tile, remove and replace the existing Main tile with a single new Main tile of greater capacity. For reference, a chart with the required tile sizes and capacities is included in Appendix R.
- Typically, the replacement Main tile would be in the same location as the existing Main tile in order to locate and reconnect private tile and lateral connections. For reference, the general route is shown on the map included in Appendix Q.

Dual Tile Upsizing

- For the entire length of the Main tile, remove and replace the existing Main tile with two new Main tiles of greater combined capacity with interconnections for flow equalization. For reference, a chart with the required tile sizes and capacities is included in Appendix S.
- Typically, the replacement Main tiles would be in the same location as the existing Main tile in order to locate and reconnect private tile and lateral connections. For reference, the general route is shown on the map included in Appendix Q.

Parallel Tile Upsizing

- For the entire length of the Main tile, leave the existing Main tile in place and install a new parallel Main tile for greater combined capacity. For reference, a chart with the required tile sizes and capacities is included in Appendix T.
- Typically, the supplemental Main tile would be near the location of the existing Main tile in order to locate and reconnect private tile and lateral connections and interconnect the two for flow equalization. For reference, the general route is shown on the map included in Appendix Q.

Open Ditch Construction

- For the entire length of the Main tile, remove and replace the existing Main tile with a Main Open Ditch. For reference, a chart with the open ditch depths and capacities is included in Appendix U.
- Typically, the Main Open Ditch would be in the same location and same depth as the existing Main tile in order to locate and outlet private tile and lateral connections. For reference, the general route is shown on the map included in Appendix Q.

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

- Due to the soil types and soil cover, all tile will have rock bedding for additional stability and strength.
- The existing ground elevations shown in the original design are still accurate.



- The only tiles being improved are the tiles identified in Appendices P, R, S, and T. The remainder of the tiles are not being improved or modified in any manner.
- The proposed pipe sizes shown in Appendices P, R, S, and T are those that are currently manufactured that meet or exceed the ½” or 1” drainage coefficient.
- The proposed and existing capacities shown in Appendices P, R, S, and T are based on the assumptions that the Main tile is installed per the original design and that it is functioning at full capacity (i.e. are not collapsed, broken, plugged, etc).
- The proposed and existing pipe sizes and capacities shown in Appendices P, R, S, and T are those to serve the lands within the existing District boundaries and not any discharges from other lands outside the District boundaries.
- Portions of the Single Tile Upsizing, Dual Tile Upsizing, and Parallel Tile Upsizing options may prohibit farming over the proposed Main tile at certain areas due to a lack of soil cover and may even require mounding of soil above the proposed Main tile.
- The Single Tile Upsizing, Dual Tile Upsizing, and Open Ditch Construction options would allow for lower maintenance costs in the future as the entire Main is new.
- The Upper Main Tile Outlet and Parallel Tile Upsizing options would require higher maintenance costs in the future as the remaining portions of the existing Main tile are left in service and are over 100 years old.
- The Upper Main Tile Outlet and Open Ditch Construction options would require the taking of right of way, which is not included in the opinion of probable construction costs contained in the next section of this report
- The Upper Main Tile Outlet option does not increase drainage capacity for those portions of the Main tile upstream of the upper main tile outlet. It just shortens the length of restrictions between that point and the Main Open Ditch of Drainage District 26.
- The Upper Main Tile Outlet option does increase drainage capacity for those portions of the Main tile downstream of the upper main tile outlet as a large portion of the Drainage District drainage area has been removed from the Main tile.
- The Upper Main Tile Outlet option would turn the drainage area upstream of the Upper Main Tile Outlet into a separate Drainage District.
- The Upper Main Tile Outlet option can freely discharge into the Main Open Ditch of Drainage District 26 without charge.
- The proposed tile on the Upper Main Tile Outlet would be installed at some large depths (20'±).
- The Upper Main Tile Outlet option may require annexation to extend the district boundary to the north to allow for installation of the proposed tile.
- 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 office to determine the existence of said jurisdictional wetlands and what said impact may be on them.

Per Iowa Code Chapter 468.126, the above actions would be considered an improvement. As such, Subsection 4, paragraph c of Chapter 468.126 states "If the estimated cost of the improvement 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 on whether to construct the proposed improvement and whether there shall be a reclassification of benefits for the cost of the proposed improvement." The opinion of probable construction costs contained in the next section of this report exceeds said \$50,000 limit. Therefore, a hearing will be required. Per Iowa Code Chapter 468.126.4.e, the right of remonstrance may apply to the proposed improvements.

6.0 OPINION OF PROBABLE CONSTRUCTION COSTS – Using the above methods of improvement, an itemized list of project quantities and associated opinions of probable construction cost for each option were compiled and are included in Appendices V, W, X, Y and Z of this report. A summary of said costs are as follows:

| METHOD                  | DRAINAGE COEFF. | DISTRICT COST   | ROAD CROSSING COST |
|-------------------------|-----------------|-----------------|--------------------|
| Upper Main Tile Outlet  | Varies          | \$ 468,625.00   | \$ 22,281.25       |
| Single Tile Upsizing    | ½”              | \$ 5,641,191.60 | \$206,353.13       |
|                         | 1”              | \$ 7,803,417.60 | \$236,971.88       |
| Dual Tile Upsizing      | ½”              | \$ 7,448,733.60 | \$281,318.75       |
|                         | 1”              | \$10,681,413.60 | \$326,384.38       |
| Parallel Tile Upsizing  | ½”              | \$ 4,769,397.60 | \$193,990.63       |
|                         | 1”              | \$ 7,471,305.60 | \$225,903.13       |
| Open Ditch Construction | Varies          | \$ 1,989,504.00 | \$862,125.00       |

It should be noted that said costs include materials, labor, and equipment supplied by the contractor to complete the necessary 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, right of way acquisition, 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.

7.0 OWNERSHIP AND CLASSIFICATIONS – Any and all information concerning ownership of lands and classifications of said lands within Drainage District No. 56 can be obtained from the Hardin County Auditor’s office.

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.

8.0 RECOMMENDATIONS – There is a definite need to perform one of the above mentioned actions. The improvements would remove the current restrictions and impediments to the Main tile, extend the lifespan of the same, even out the capacity . Therefore, it is recommended that the Hardin County Board of Supervisors, acting as 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 improvements.
- Adopt one of the recommendations of the Engineer’s Report.
- If the Upper Main Tile Outlet option is selected:
  - Confirm that Drainage District 56 should be split into two separate districts.
  - Confirm that the upper Main tile outlet can discharge freely into the Main Open Ditch of Drainage District 26 without charge.
  - Confirm if annexation is necessary to extend the the upper Main tile outlet to the north.
- Direct plans and specifications for the proposed improvements be prepared by Clapsaddle-Garber Associates.
- Proceed with receiving bids from interested contractors by Clapsaddle-Garber Associates.
- Award contract to the lowest responsible contractor.
- Seek legal advice whether reclassification is required.
- If desired or required by Iowa Code, proceed with reclassification proceedings.



**DRAINAGE DISTRICT 56  
LANDOWNER MEETING**

3/28/2018 - Minutes

1. Open Meeting

Hardin County Board of Supervisors Co-Chairperson, Renee McClellan, opened the meeting. Also present was Hardin County Supervisor, Lance Granzow; Landowner, Matt Topp, Bob Topp, Betty Thomas, Kevin Sheldahl, Lynn Holechek, Jon Kuhfus, Mike Bostrom, Brad Fjelland, Brian Krause, Ben Krause, Harold Bahr Jr, Marjorie Krause, Jacob Handsaker and Mike McCartney; Lee Gallentine and Heather Thomas with Clapsaddle-Garber Associates (CGA); Drainage Clerk, Tina Schlemme. Absent: BJ Hoffman.

2. Approve Agenda

Granzow moved, McClellan seconded to approve the agenda as presented. All ayes. Motion carried.

3. Attendance/Introductions

Introductions were made and attendance verified.

4. Explanation Of Landowner Request

Schlemme explained that a landowner had requested that his drainage west of E Avenue be improved. There were a couple possibilities mentioned to him that included upsizing the tile lying west of E Avenue or severing the tile from DD 56 and draining north into DD 26 open ditch.

5. Comments/Discussion

There was much discussion between landowners and the Trustees. Gallentine stated that a project this size would more than likely not be less than \$500,000. Landowners asked approximately how much an engineer's report cost to produce, in which Gallentine answered roughly \$3,000 to \$5,000. It was discussed that this project would probably be considered an improvement so a reclassification would need completed, in which Gallentine estimated another \$3,000 to \$6,000 for the reclass report.

Other options were discussed, such as not severing the tile but adding a tile that would go north along E Avenue and pay an outlet fee to DD 26. Replacing all tile in the district with larger tile, an open ditch and installing a parallel tile were also discussed. When Trustees asked for a show of hands from landowners who supported the engineer creating a report, all hands were raised.

6. Possible Action

Granzow moved, McClellan seconded for CGA to research the district and create an engineer's report with multiple options, as discussed. (1. Install tile to the north along E Avenue so all water from the west would flow north. 2. Replace all tile in the district with larger tile. 3. Install two new parallel tiles. 4. Install an open ditch. 5. Parallel the old tile with a new.) All ayes. Motion carried.

7. Other Business

None.

8. Adjourn Meeting

Granzow moved, McClellan seconded to adjourn the meeting. All ayes. Motion carried.





# Drainage Work Order Request For Repair

## Hardin County

Date 3/1/2018 Work Order # 204  
District # 56 Lateral \_\_\_\_\_ Fund # 51087  
Township Sherman Section 9 Twp 87 Rge 22 Qtr Sec NW1/4

Repair Requested By Lynn Holechek  
Address lynn.holechek@gmail.com Phone (515) 460-1425

Landowner same  
Address \_\_\_\_\_ Phone \_\_\_\_\_

Request Taken By Tina Schlemme

Available for Repair Now?  Yes Date Available \_\_\_\_\_

Problem Description Lynn would like more drg capacity for his land. Sheldahl Bros believe it best to sever the tile west of E Ave & annex into DD 26 to drain to Tipton Creek. The land east of E Ave, that's flat, would benefit from not taking all the water from the west.

|  |  |
|--|--|
|  |  |
|  |  |

Repair labor, materials and equipment \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

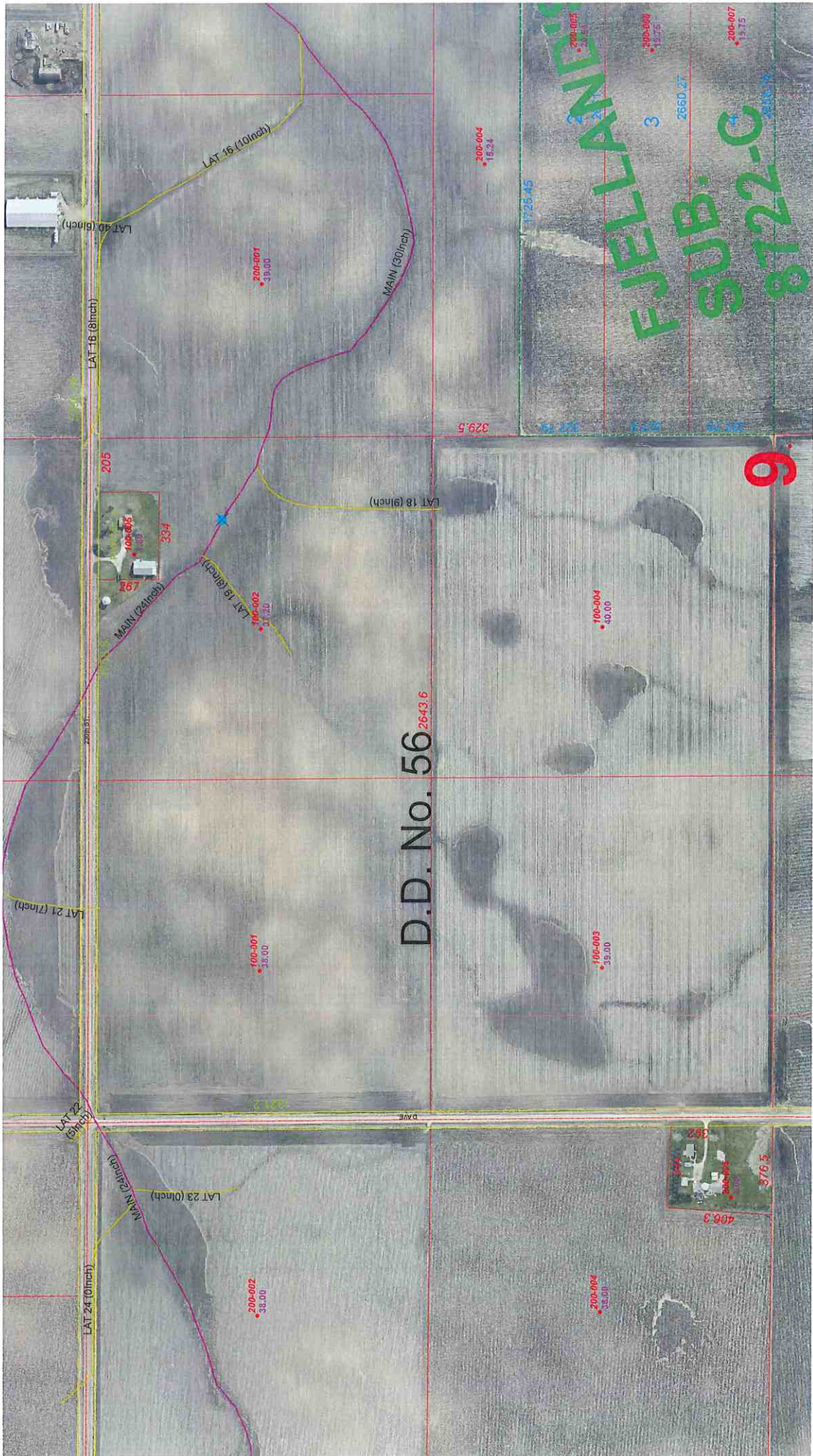
Potential Wetlands?  Yes-Repair existing tile only  No-Repair and maintain tile

Repaired By: \_\_\_\_\_  
Date: \_\_\_\_\_

Please send statement for services to:  
Hardin County Auditor's Office  
Attn: Tina Schlemme  
1215 Edgington Ave, Suite 1  
Eldora, IA 50627  
Phone (641) 939-8111  
Fax (641) 939-8245

For Office Use Only

Approved: \_\_\_\_\_ Date: \_\_\_\_\_



D.D. No. 56 2643.6

FJELLAND  
SUB. 8722-C

9

LAT 16 (8incht)

LAT 16 (10incht)

LAT 18 (9incht)

LAT 15 (9incht)

LAT 21 (7incht)

LAT 22 (6incht)

MAIN (24incht)

LAT 23 (0incht)

LAT 24 (0incht)

MAIN

MAIN (30incht)

1725-45

2650-27

205

334

406-3

376.5

200-001  
39.00

100-001  
36.00

200-002  
35.00

100-002  
41.20

100-003  
39.00

200-004  
35.00

100-004  
40.00

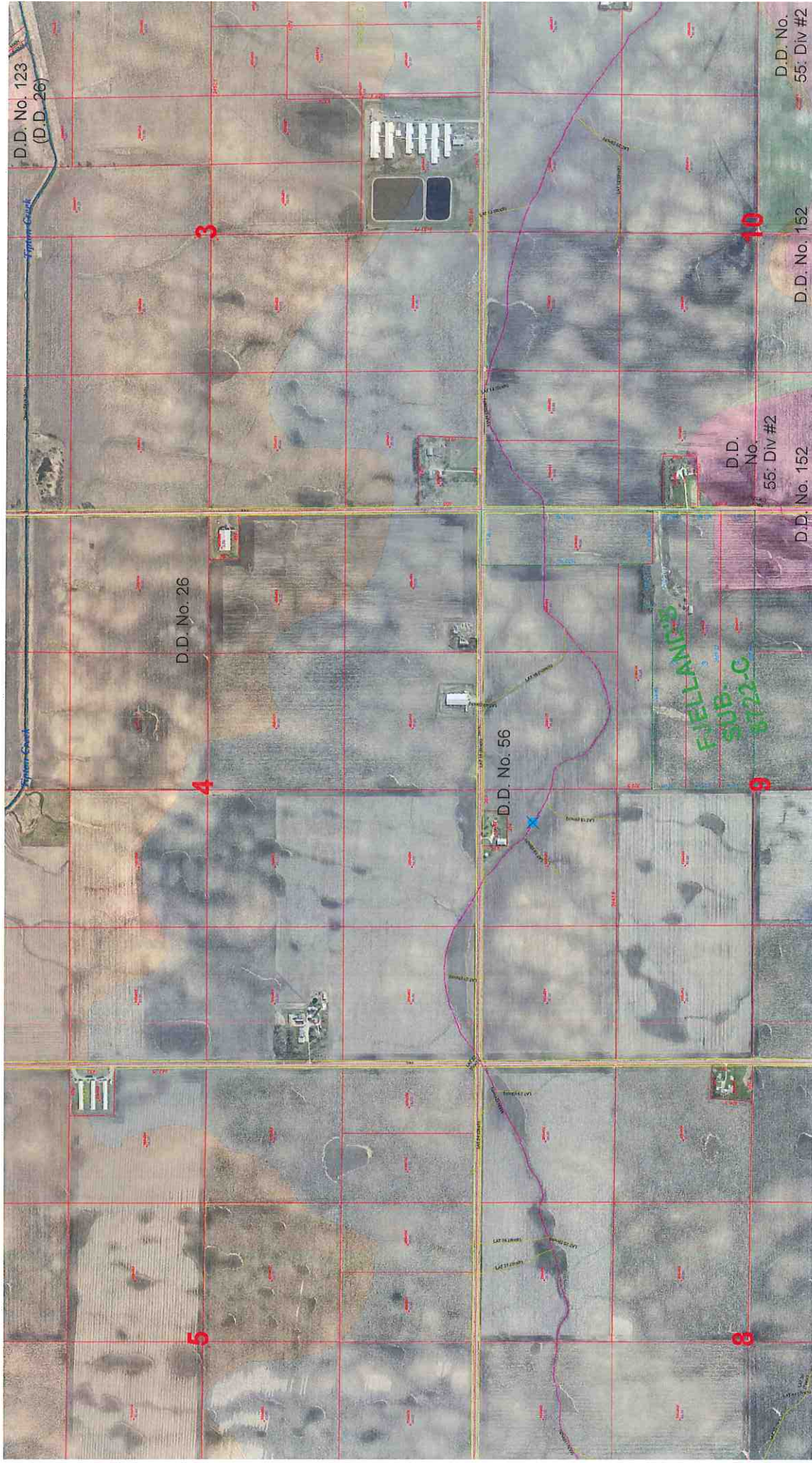
200-004  
15.24

200-005  
2.81

200-006  
14.55

200-007  
5.15





D.D. No. 123  
(D.D. 26)

D.D. No. 26

D.D. No. 56

D.D. No.  
55: Div #2

D.D. No. 152

D.D. No. 152

FIELDWIND  
SUB-8722-C

3

4

5

10

9

8

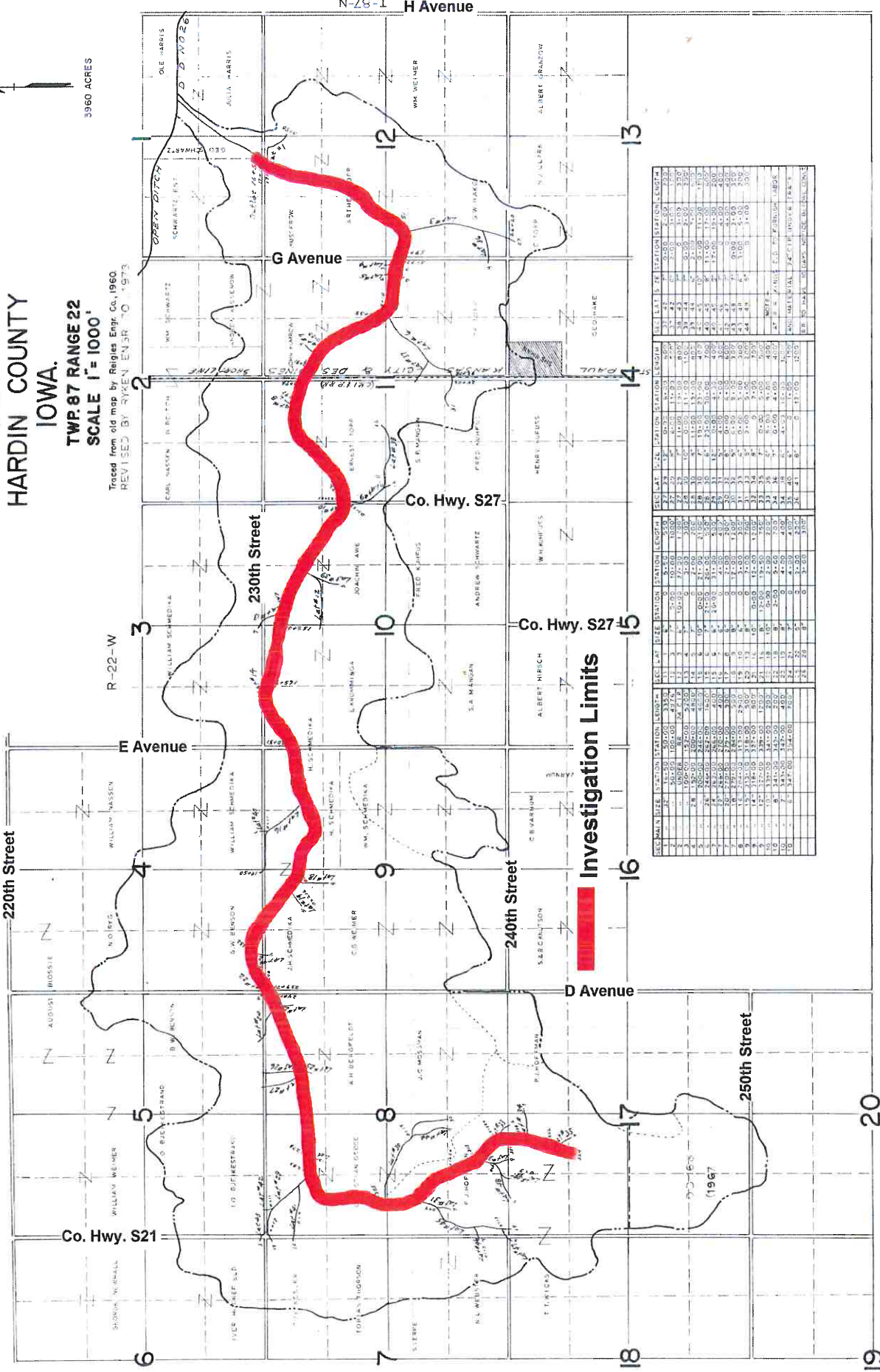


# PLAT OF WICKS DRAINAGE DISTRICT NO. 56 HARDIN COUNTY IOWA.

TWP. 87 RANGE 22  
SCALE 1" = 1000'

3960 ACRES

Traced from old map by Religies Engr. Co., 1960  
REVISED BY RYKEN ENGR. CO. 1973



**Investigation Limits**

| SECTION | AREA   | STATION | STATION | LENGTH | AREA   | STATION | STATION | LENGTH | AREA   |
|---------|--------|---------|---------|--------|--------|---------|---------|--------|--------|
| 1       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 2       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 3       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 4       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 5       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 6       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 7       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 8       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 9       | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 10      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 11      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 12      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 13      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 14      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 15      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 16      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 17      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 18      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 19      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |
| 20      | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 | 0+00    | 0+100   | 100.00 | 100.00 |









By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Upper Main Tile Outlet for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

**IMPROVED - DOWNSTREAM OF UPPER MAIN TILE OUTLET**

| DOWNSTREAM OF UPPER MAIN TILE OUTLET (IMPROVEMENT) | STA    | EXISTING DESCRIPTION                                | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | IMPROVED TILE CAPACITY (cfs) | IMPROVED TILE CAPACITY (in/day) |
|--|--------|---|--------------------------|-------------------------------|----------------------------------|------------------------------|---------------------------------|
|  | 16+50  | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | 12.0                         | 0.19                            |
|  | 28+00  | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | 20.7                         | 0.37                            |
|  | 51+00  | Lateral 3   | 32                       | 20.7                          | 0.14                             | 20.7                         | 0.44                            |
|  | 70+00  | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | 18.3                         | 0.53                            |
|  | 100+00 | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | 16.9                         | 0.64                            |
|  | 122+76 | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | 16.9                         | 0.98                            |
|  | 152+00 | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | 18.1                         | 3.01                            |
|  | 168+50 | Lateral 14/End of Lower Stretch                     | 28                       | 18.1                          |                                  | 18.1                         |                                 |



By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

Project: **Upper Main Tile Outlet** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

**IMPROVED - UPSTREAM OF UPPER MAIN TILE OUTLET**

| STA          | EXISTING DESCRIPTION                                | INSTALLED         | INSTALLED                 | INSTALLED                    | IMPROVED          | IMPROVED                  | IMPROVED                     |
|--------------|---|-------------------|---------------------------|------------------------------|-------------------|---------------------------|------------------------------|
|              |   | TILE SIZE<br>(in) | TILE<br>CAPACITY<br>(cfs) | TILE<br>CAPACITY<br>(in/day) | TILE SIZE<br>(in) | TILE<br>CAPACITY<br>(cfs) | TILE<br>CAPACITY<br>(in/day) |
| 0+00         | Proposed Main tile empties into D.D. 26 Open Ditch  |                   |                           |                              | 48                | 70.6                      | 0.68                         |
| 19+40/168+50 | Lateral 14, Grade change: 0.24% - 0.28%             | 28                | 18.1                      | 0.18                         |                   |                           |                              |
| 180+00       | Grade change: 0.28% - 0.24%                         | 28                | 16.8                      | 0.17                         |                   |                           |                              |
| 190+00       | Grade change: 0.24% - 0.22%                         | 28                | 16.0                      | 0.17                         |                   |                           |                              |
| 200+00       | Grade change: 0.22% - 0.18%                         | 28                | 14.5                      | 0.17                         |                   |                           |                              |
| 220+00       | Grade change 0.18% - 0.14%                          | 28                | 12.8                      | 0.18                         |                   |                           |                              |
| 230+00       | Grade change 0.14% - 0.10%                          | 28                | 10.8                      | 0.17                         |                   |                           |                              |
| 246+00       | Size change: 28" - 26"                              | 28/26             | 8.9                       | 0.17                         |                   |                           |                              |
| 260+00       | Grade change: 0.10% - 0.16%                         | 26                | 11.2                      | 0.22                         |                   |                           |                              |
| 262+00       | Size change: 26" - 24"                              | 26/24             | 9.1                       | 0.19                         |                   |                           |                              |
| 266+00       | Size change: 24" - 22"                              | 24/22             | 7.2                       | 0.17                         |                   |                           |                              |
| 270+00       | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20             | 7.1                       | 0.17                         |                   |                           |                              |
| 279+00       | Size change: 20" - 18"                              | 20/18             | 5.4                       | 0.14                         |                   |                           |                              |
| 284+00       | Size change: 18" - 16"                              | 18/16             | 3.9                       | 0.13                         |                   |                           |                              |
| 286+00       | Grade change: 0.26% - 0.18%                         | 16                | 3.3                       | 0.11                         |                   |                           |                              |
| 308+00       | Grade change: 0.18% - 0.10%                         | 16                | 2.4                       | 0.10                         |                   |                           |                              |
| 313+00       | Size change: 16" - 15"                              | 16/15             | 2.0                       | 0.09                         |                   |                           |                              |
| 318+00       | Size change: 15" - 14"                              | 15/14             | 1.7                       | 0.10                         |                   |                           |                              |
| 327+00       | Size change: 14" - 12"                              | 14/12             | 1.1                       | 0.07                         |                   |                           |                              |
| 339+00       | Size change: 12" - 10"                              | 12/10             | 0.7                       | 0.06                         |                   |                           |                              |
| 341+00       | Size change: 10" - 8"                               | 10/8              | 0.4                       | 0.04                         |                   |                           |                              |
| 343+00       | Size change: 8" - 7"                                | 8/7               | 0.3                       | 0.03                         |                   |                           |                              |
| 347+00       | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6               | 0.4                       | 0.05                         |                   |                           |                              |
| 351+00       | Grade change: 0.48% - 0.90%                         | 6                 | 0.5                       | 0.07                         |                   |                           |                              |
| 354+00       | End of Main tile                                    | 6                 |                           |                              |                   |                           |                              |





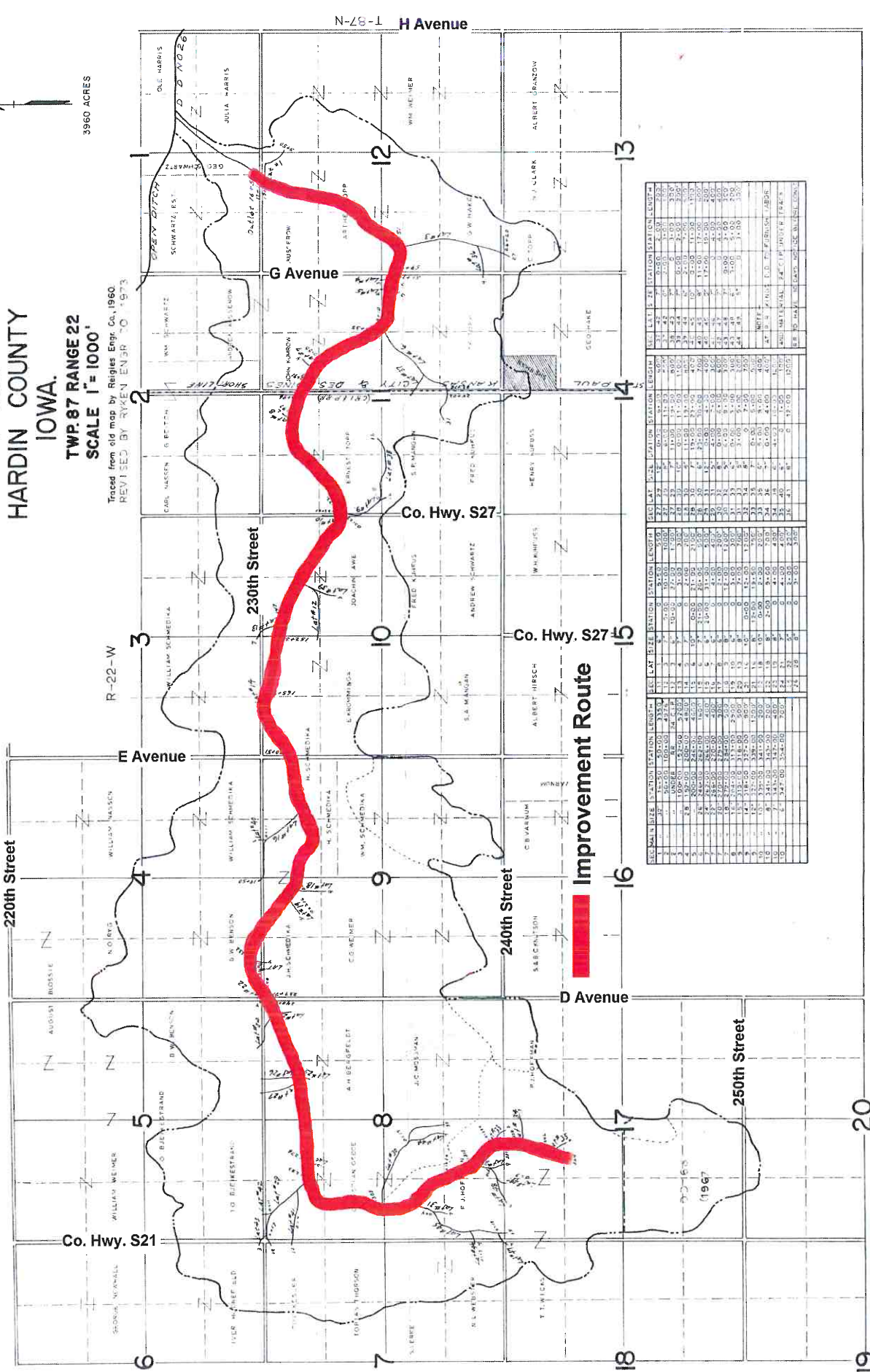
PLAT  
OF  
WICKS DRAINAGE DISTRICT  
NO. 56  
HARDIN COUNTY  
IOWA.



3960 ACRES

TWP. 87 RANGE 22  
SCALE 1" = 1000'

Toned from old map by Reigles Engr. Co., 1960  
REVISED BY RYKEN ENGR. CO., 1973



| SECTION | SECTION 1 |            | SECTION 2 |            | SECTION 3 |            | SECTION 4 |            | SECTION 5 |            | SECTION 6 |            | SECTION 7 |            | SECTION 8 |            | SECTION 9 |            | SECTION 10 |            | SECTION 11 |            | SECTION 12 |            | SECTION 13 |            | SECTION 14 |            | SECTION 15 |            | SECTION 16 |            | SECTION 17 |            | SECTION 18 |            | SECTION 19 |            | SECTION 20 |         |
|---------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------|
|         | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES     | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET | ACRES      | FRONT FEET |            |         |
| 1       | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50    | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00    | 162.50     | 1000.00 |





By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

Project: **Single Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| STA    | EXISTING DESCRIPTION                                | EXISTING                 |                               |                                  | IMPROVEMENT                                |                           |                              |                                 |                         |                              |                                 |
|--------|---|--------------------------|-------------------------------|----------------------------------|--|---------------------------|------------------------------|---------------------------------|-------------------------|------------------------------|---------------------------------|
|        |   | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | PROPOSED DESCRIPTION                       | 1/2" DRAINAGE COEFFICIENT |                              |                                 | 1" DRAINAGE COEFFICIENT |                              |                                 |
|        |   |                          |                               |                                  |  | IMPROVED TILE SIZE (in)   | IMPROVED TILE CAPACITY (cfs) | IMPROVED TILE CAPACITY (in/day) | IMPROVED TILE SIZE (in) | IMPROVED TILE CAPACITY (cfs) | IMPROVED TILE CAPACITY (in/day) |
| 16+50  | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | Existing Main tile empties into open ditch | 66                        | 82.5                         | 0.50                            | 90                      | 188.6                        | 1.15                            |
| 28+00  | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | Grade change: 0.06% - 0.18%                | 66/54                     | 83.7                         | 0.53                            | 90/72                   | 180.2                        | 1.14                            |
| 51+00  | Lateral 3   | 32                       | 20.7                          | 0.14                             | Lateral 3                                  | 54                        | 83.7                         | 0.56                            | 72                      | 180.2                        | 1.21                            |
| 70+00  | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | Grade change: 0.18% - 0.14%                | 54                        | 73.8                         | 0.54                            | 72                      | 158.9                        | 1.17                            |
| 100+00 | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | Grade change: 0.14% - 0.12%                | 54                        | 68.3                         | 0.53                            | 72                      | 147.1                        | 1.15                            |
| 122+76 | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | West side Co Hwy S27                       | 54                        | 68.3                         | 0.57                            | 72                      | 147.1                        | 1.24                            |
| 152+00 | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | Grade change: 0.12% - 0.28%                | 54/48                     | 76.2                         | 0.71                            | 72/60                   | 138.2                        | 1.28                            |
| 168+50 | Lateral 14  | 28                       | 18.1                          | 0.18                             | Lateral 14                                 | 48                        | 76.2                         | 0.75                            | 60                      | 138.2                        | 1.36                            |
| 180+00 | Grade change: 0.28% - 0.24%                         | 28                       | 16.8                          | 0.17                             | Grade change: 0.28% - 0.24%                | 48                        | 70.6                         | 0.72                            | 60                      | 127.9                        | 1.30                            |
| 190+00 | Grade change: 0.24% - 0.22%                         | 28                       | 16.0                          | 0.17                             | Grade change: 0.24% - 0.22%                | 48                        | 67.6                         | 0.70                            | 60                      | 122.5                        | 1.27                            |
| 200+00 | Grade change: 0.22% - 0.18%                         | 28                       | 14.5                          | 0.17                             | Grade change: 0.22% - 0.18%                | 48                        | 61.1                         | 0.72                            | 60                      | 110.8                        | 1.31                            |
| 220+00 | Grade change 0.18% - 0.14%                          | 28                       | 12.8                          | 0.18                             | Grade change 0.18% - 0.14%                 | 48                        | 53.9                         | 0.75                            | 60                      | 97.7                         | 1.36                            |
| 230+00 | Grade change 0.14% - 0.10%                          | 28                       | 10.8                          | 0.17                             | Grade change 0.14% - 0.10%                 | 48                        | 45.5                         | 0.70                            | 60                      | 82.6                         | 1.27                            |
| 246+00 | Size change: 28" - 26"                              | 28/26                    | 8.9                           | 0.17                             |  | 48/42                     | 31.9                         | 0.62                            | 60/54                   | 62.4                         | 1.22                            |
| 260+00 | Grade change: 0.10% - 0.16%                         | 26                       | 11.2                          | 0.22                             | Grade change: 0.10% - 0.16%                | 42/36                     | 26.8                         | 0.53                            | 54/48                   | 57.6                         | 1.14                            |
| 262+00 | Size change: 26" - 24"                              | 26/24                    | 9.1                           | 0.19                             |  | 36                        | 26.8                         | 0.56                            | 48                      | 57.6                         | 1.21                            |
| 266+00 | Size change: 24" - 22"                              | 24/22                    | 7.2                           | 0.17                             |  | 36                        | 26.8                         | 0.63                            | 48                      | 57.6                         | 1.35                            |
| 270+00 | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                    | 7.1                           | 0.17                             | Grade change: 0.16% - 0.26%                | 36                        | 34.1                         | 0.81                            | 48/42                   | 51.4                         | 1.21                            |
| 279+00 | Size change: 20" - 18"                              | 20/18                    | 5.4                           | 0.14                             |  | 36/30                     | 21.0                         | 0.54                            | 42                      | 51.4                         | 1.32                            |
| 284+00 | Size change: 18" - 16"                              | 18/16                    | 3.9                           | 0.13                             |  | 30                        | 21.0                         | 0.71                            | 42                      | 51.4                         | 1.75                            |
| 286+00 | Grade change: 0.26% - 0.18%                         | 16                       | 3.3                           | 0.11                             | Grade change: 0.26% - 0.18%                | 30                        | 17.4                         | 0.59                            | 42                      | 42.8                         | 1.46                            |
| 308+00 | Grade change: 0.18% - 0.10%                         | 16                       | 2.4                           | 0.10                             | Grade change: 0.18% - 0.10%                | 30                        | 13.0                         | 0.52                            | 42                      | 31.9                         | 1.27                            |
| 313+00 | Size change: 16" - 15"                              | 16/15                    | 2.0                           | 0.09                             |  | 30                        | 13.0                         | 0.58                            | 42                      | 31.9                         | 1.42                            |
| 318+00 | Size change: 15" - 14"                              | 15/14                    | 1.7                           | 0.10                             |  | 30/27                     | 9.8                          | 0.59                            | 42/36                   | 21.1                         | 1.27                            |
| 327+00 | Size change: 14" - 12"                              | 14/12                    | 1.1                           | 0.07                             |  | 27                        | 9.8                          | 0.63                            | 36                      | 21.1                         | 1.36                            |
| 339+00 | Size change: 12" - 10"                              | 12/10                    | 0.7                           | 0.06                             |  | 27/24                     | 7.2                          | 0.63                            | 36/30                   | 13.0                         | 1.13                            |
| 341+00 | Size change: 10" - 8"                               | 10/8                     | 0.4                           | 0.04                             |  | 24/21                     | 5.0                          | 0.52                            | 30/27                   | 9.8                          | 1.02                            |
| 343+00 | Size change: 8" - 7"                                | 8/7                      | 0.3                           | 0.03                             |  | 21                        | 5.0                          | 0.52                            | 27                      | 9.8                          | 1.02                            |
| 347+00 | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                      | 0.4                           | 0.05                             | Grade change: 0.10% - 0.48%                | 21/15                     | 4.5                          | 0.55                            | 27/21                   | 11.0                         | 1.36                            |
| 351+00 | Grade change: 0.48% - 0.90%                         | 6                        | 0.5                           | 0.07                             | Grade change: 0.48% - 0.90%                | 15                        | 6.1                          | 0.80                            | 21/18                   | 10.0                         | 1.30                            |
| 354+00 | End of Main tile                                    | 6                        |                               |                                  | End of Main tile                           | 15                        |                              |                                 | 18                      |                              |                                 |

SINGLE TILE UPSIZING (IMPROVEMENT)





By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Dual Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

**DUAL TILE UPSIZING (IMPROVEMENT)**

| STA    | EXISTING  |                          |                               |                                  | IMPROVEMENT                                |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
|--------|---|--------------------------|-------------------------------|----------------------------------|--|--------------------------------|--------------------------------|------------------------------------|---------------------------------------|--------------------------------|--------------------------------|------------------------------------|---------------------------------------|
|        | EXISTING DESCRIPTION                                | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | PROPOSED DESCRIPTION                       | 1/2" DRAINAGE COEFFICIENT      |                                |                                    |                                       | 1" DRAINAGE COEFFICIENT        |                                |                                    |                                       |
|        |   |                          |                               |                                  |  | IMPROVED PIPE 1 TILE SIZE (in) | IMPROVED PIPE 2 TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) | IMPROVED PIPE 1 TILE SIZE (in) | IMPROVED PIPE 2 TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) |
| 16+50  | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | Existing Main tile empties into open ditch | 51                             | 51                             | 82.9                               | 0.51                                  | 72                             | 60                             | 168.0                              | 1.02                                  |
| 28+00  | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | Grade change: 0.06% - 0.18%                | 51/42                          | 51/42                          | 85.6                               | 0.54                                  | 72/54                          | 60/54                          | 167.3                              | 1.06                                  |
| 51+00  | Lateral 3   | 32                       | 20.7                          | 0.14                             | Lateral 3                                  | 42                             | 42                             | 85.6                               | 0.58                                  | 54                             | 54                             | 167.3                              | 1.13                                  |
| 70+00  | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | Grade change: 0.18% - 0.14%                | 42                             | 42                             | 75.5                               | 0.55                                  | 54                             | 54                             | 147.6                              | 1.08                                  |
| 100+00 | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | Grade change: 0.14% - 0.12%                | 42                             | 42                             | 69.9                               | 0.54                                  | 54                             | 54                             | 136.6                              | 1.06                                  |
| 122+76 | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | West side Co Hwy S27                       | 42                             | 42                             | 69.9                               | 0.59                                  | 54                             | 54                             | 136.6                              | 1.15                                  |
| 152+00 | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | Grade change: 0.12% - 0.28%                | 42/36                          | 42/30                          | 57.2                               | 0.53                                  | 54/48                          | 54/36                          | 111.6                              | 1.04                                  |
| 168+50 | Lateral 14  | 28                       | 18.1                          | 0.18                             | Lateral 14                                 | 36                             | 30                             | 57.2                               | 0.56                                  | 48                             | 36                             | 111.6                              | 1.10                                  |
| 180+00 | Grade change: 0.28% - 0.24%                         | 28                       | 16.8                          | 0.17                             | Grade change: 0.28% - 0.24%                | 36                             | 30                             | 52.9                               | 0.54                                  | 48                             | 36                             | 103.3                              | 1.05                                  |
| 190+00 | Grade change: 0.24% - 0.22%                         | 28                       | 16.0                          | 0.17                             | Grade change: 0.24% - 0.22%                | 36                             | 30                             | 50.7                               | 0.52                                  | 48                             | 36                             | 98.9                               | 1.02                                  |
| 200+00 | Grade change: 0.22% - 0.18%                         | 28                       | 14.5                          | 0.17                             | Grade change: 0.22 - 0.18%                 | 36                             | 30                             | 45.8                               | 0.54                                  | 48                             | 36                             | 89.5                               | 1.06                                  |
| 220+00 | Grade change 0.18% - 0.14%                          | 28                       | 12.8                          | 0.18                             | Grade change 0.18% - 0.14%                 | 36                             | 30                             | 40.4                               | 0.56                                  | 48                             | 36                             | 78.9                               | 1.10                                  |
| 230+00 | Grade change 0.14% - 0.10%                          | 28                       | 10.8                          | 0.17                             | Grade change 0.14% - 0.10%                 | 36                             | 30                             | 34.2                               | 0.53                                  | 48                             | 36                             | 66.7                               | 1.03                                  |
| 246+00 | Size change: 28" - 26"                              | 28/26                    | 8.9                           | 0.17                             | Size change: 28" - 26"                     | 36/30                          | 30                             | 26.0                               | 0.51                                  | 48/42                          | 36                             | 53.0                               | 1.04                                  |
| 260+00 | Grade change: 0.10% - 0.16%                         | 26                       | 11.2                          | 0.22                             | Grade change: 0.10% - 0.16%                | 30                             | 30/27                          | 28.9                               | 0.57                                  | 42/36                          | 36                             | 53.5                               | 1.06                                  |
| 262+00 | Size change: 26" - 24"                              | 26/24                    | 9.1                           | 0.19                             |  | 30/27                          | 27                             | 24.8                               | 0.52                                  | 36                             | 36                             | 53.5                               | 1.13                                  |
| 266+00 | Size change: 24" - 22"                              | 24/22                    | 7.2                           | 0.17                             |  | 27                             | 27/24                          | 21.5                               | 0.50                                  | 36                             | 36/30                          | 43.2                               | 1.01                                  |
| 270+00 | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                    | 7.1                           | 0.17                             | Grade change: 0.16% - 0.26%                | 27/24                          | 24                             | 23.1                               | 0.55                                  | 36                             | 30                             | 55.1                               | 1.30                                  |
| 279+00 | Size change: 20" - 18"                              | 20/18                    | 5.4                           | 0.14                             |  | 24                             | 24                             | 23.1                               | 0.59                                  | 36/30                          | 30                             | 41.9                               | 1.08                                  |
| 284+00 | Size change: 18" - 16"                              | 18/16                    | 3.9                           | 0.13                             |  | 24                             | 24                             | 23.1                               | 0.78                                  | 30                             | 30                             | 41.9                               | 1.42                                  |
| 286+00 | Grade change: 0.26% - 0.18%                         | 16                       | 3.3                           | 0.11                             | Grade change: 0.26% - 0.18%                | 24                             | 24                             | 19.2                               | 0.66                                  | 30                             | 30                             | 34.9                               | 1.19                                  |
| 308+00 | Grade change: 0.18% - 0.10%                         | 16                       | 2.4                           | 0.10                             | Grade change: 0.18% - 0.10%                | 24                             | 24                             | 14.3                               | 0.57                                  | 30                             | 30                             | 26.0                               | 1.04                                  |
| 313+00 | Size change: 16" - 15"                              | 16/15                    | 2.0                           | 0.09                             |  | 24                             | 24                             | 14.3                               | 0.64                                  | 30                             | 30                             | 26.0                               | 1.16                                  |
| 318+00 | Size change: 15" - 14"                              | 15/14                    | 1.7                           | 0.10                             |  | 24                             | 24/18                          | 10.5                               | 0.63                                  | 30/27                          | 30/27                          | 19.6                               | 1.18                                  |
| 327+00 | Size change: 14" - 12"                              | 14/12                    | 1.1                           | 0.07                             |  | 24                             | 18                             | 10.5                               | 0.67                                  | 27                             | 27/24                          | 17.0                               | 1.09                                  |
| 339+00 | Size change: 12" - 10"                              | 12/10                    | 0.7                           | 0.06                             |  | 24/18                          | 18                             | 6.7                                | 0.58                                  | 27/24                          | 24                             | 14.3                               | 1.25                                  |
| 341+00 | Size change: 10" - 8"                               | 10/8                     | 0.4                           | 0.04                             |  | 18                             | 18/15                          | 5.4                                | 0.56                                  | 24/21                          | 24/21                          | 10.0                               | 1.04                                  |
| 343+00 | Size change: 8" - 7"                                | 8/7                      | 0.3                           | 0.03                             |  | 18                             | 15                             | 5.4                                | 0.56                                  | 21                             | 21                             | 10.0                               | 1.05                                  |
| 347+00 | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                      | 0.4                           | 0.05                             | Grade change: 0.10% - 0.48%                | 18/12                          | 15/12                          | 5.0                                | 0.61                                  | 21/15                          | 21/15                          | 9.0                                | 1.11                                  |
| 351+00 | Grade change: 0.48% - 0.90%                         | 6                        | 0.5                           | 0.07                             | Grade change: 0.48% - 0.90%                | 12/10                          | 12/10                          | 4.2                                | 0.54                                  | 15                             | 15                             | 12.3                               | 1.60                                  |
| 354+00 | End of Main tile                                    | 6                        |                               |                                  | End of Main tile                           | 10                             | 10                             |                                    |                                       | 15                             | 15                             |                                    |                                       |





By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Parallel Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| STA    | EXISTING  |                          |                               |                                  | IMPROVEMENT                                |                                  |                                    |                                       |                                  |                                    |                                       |
|--------|---|--------------------------|-------------------------------|----------------------------------|--|----------------------------------|------------------------------------|---------------------------------------|----------------------------------|------------------------------------|---------------------------------------|
|        | EXISTING DESCRIPTION                                | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | PROPOSED DESCRIPTION                       | 1/2" DRAINAGE COEFFICIENT        |                                    |                                       | 1" DRAINAGE COEFFICIENT          |                                    |                                       |
|        |   |                          |                               |                                  |  | IMPROVED PARALLEL TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) | IMPROVED PARALLEL TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) |
| 16+50  | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | Existing Main tile empties into open ditch | 66                               | 94.4                               | 0.58                                  | 90                               | 200.6                              | 1.22                                  |
| 28+00  | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | Grade change: 0.06% - 0.18%                | 66/48                            | 81.8                               | 0.52                                  | 90/66                            | 163.6                              | 1.03                                  |
| 51+00  | Lateral 3   | 32                       | 20.7                          | 0.14                             | Lateral 3                                  | 48                               | 81.8                               | 0.55                                  | 66                               | 163.6                              | 1.10                                  |
| 70+00  | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | Grade change: 0.18% - 0.14%                | 48                               | 72.2                               | 0.53                                  | 66                               | 144.3                              | 1.06                                  |
| 100+00 | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | Grade change: 0.14% - 0.12%                | 48                               | 66.8                               | 0.52                                  | 66                               | 133.6                              | 1.04                                  |
| 122+76 | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | West side Co Hwy S27                       | 48                               | 66.8                               | 0.56                                  | 66                               | 133.6                              | 1.12                                  |
| 152+00 | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | Grade change: 0.12% - 0.28%                | 48/42                            | 71.5                               | 0.66                                  | 66/54                            | 122.4                              | 1.14                                  |
| 168+50 | Lateral 14  | 28                       | 18.1                          | 0.18                             | Lateral 14                                 | 42                               | 71.5                               | 0.70                                  | 54                               | 122.4                              | 1.20                                  |
| 180+00 | Grade change: 0.28% - 0.24%                         | 28                       | 16.8                          | 0.17                             | Grade change: 0.28% - 0.24%                | 42                               | 66.2                               | 0.67                                  | 54                               | 113.4                              | 1.15                                  |
| 190+00 | Grade change: 0.24% - 0.22%                         | 28                       | 16.0                          | 0.17                             | Grade change: 0.24% - 0.22%                | 42                               | 63.4                               | 0.65                                  | 54                               | 108.5                              | 1.12                                  |
| 200+00 | Grade change: 0.22% - 0.18%                         | 28                       | 14.5                          | 0.17                             | Grade change: 0.22 - 0.18%                 | 42                               | 57.3                               | 0.68                                  | 54                               | 98.2                               | 1.16                                  |
| 220+00 | Grade change 0.18% - 0.14%                          | 28                       | 12.8                          | 0.18                             | Grade change 0.18% - 0.14%                 | 42                               | 50.5                               | 0.70                                  | 54                               | 86.6                               | 1.21                                  |
| 230+00 | Grade change 0.14% - 0.10%                          | 28                       | 10.8                          | 0.17                             | Grade change 0.14% - 0.10%                 | 42                               | 42.7                               | 0.66                                  | 54                               | 73.2                               | 1.13                                  |
| 246+00 | Size change: 28" - 26"                              | 28/26                    | 8.9                           | 0.17                             | Size change: 28" - 26"                     | 42/36                            | 30.0                               | 0.59                                  | 54/48                            | 54.4                               | 1.07                                  |
| 260+00 | Grade change: 0.10% - 0.16%                         | 26                       | 11.2                          | 0.22                             | Grade change: 0.10% - 0.16%                | 36/30                            | 27.7                               | 0.55                                  | 48/42                            | 51.6                               | 1.03                                  |
| 262+00 | Size change: 26" - 24"                              | 26/24                    | 9.1                           | 0.19                             |  | 30                               | 25.5                               | 0.54                                  | 42                               | 49.4                               | 1.04                                  |
| 266+00 | Size change: 24" - 22"                              | 24/22                    | 7.2                           | 0.17                             |  | 30                               | 23.6                               | 0.55                                  | 42                               | 47.5                               | 1.11                                  |
| 270+00 | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                    | 7.1                           | 0.17                             | Grade change: 0.16% - 0.26%                | 30                               | 28.1                               | 0.66                                  | 42                               | 58.6                               | 1.38                                  |
| 279+00 | Size change: 20" - 18"                              | 20/18                    | 5.4                           | 0.14                             |  | 30                               | 26.3                               | 0.68                                  | 42                               | 56.8                               | 1.46                                  |
| 284+00 | Size change: 18" - 16"                              | 18/16                    | 3.9                           | 0.13                             |  | 30                               | 24.9                               | 0.84                                  | 42                               | 55.4                               | 1.88                                  |
| 286+00 | Grade change: 0.26% - 0.18%                         | 16                       | 3.3                           | 0.11                             | Grade change: 0.26% - 0.18%                | 30                               | 20.7                               | 0.71                                  | 42                               | 46.1                               | 1.57                                  |
| 308+00 | Grade change: 0.18% - 0.10%                         | 16                       | 2.4                           | 0.10                             | Grade change: 0.18% - 0.10%                | 30                               | 15.4                               | 0.62                                  | 42                               | 34.3                               | 1.37                                  |
| 313+00 | Size change: 16" - 15"                              | 16/15                    | 2.0                           | 0.09                             |  | 30                               | 15.1                               | 0.67                                  | 42/36                            | 23.2                               | 1.03                                  |
| 318+00 | Size change: 15" - 14"                              | 15/14                    | 1.7                           | 0.10                             |  | 30/24                            | 8.9                                | 0.53                                  | 36                               | 22.9                               | 1.37                                  |
| 327+00 | Size change: 14" - 12"                              | 14/12                    | 1.1                           | 0.07                             |  | 24                               | 8.3                                | 0.53                                  | 36                               | 22.3                               | 1.43                                  |
| 339+00 | Size change: 12" - 10"                              | 12/10                    | 0.7                           | 0.06                             |  | 24                               | 7.9                                | 0.69                                  | 36/30                            | 13.7                               | 1.19                                  |
| 341+00 | Size change: 10" - 8"                               | 10/8                     | 0.4                           | 0.04                             |  | 24/21                            | 5.4                                | 0.56                                  | 30/27                            | 10.2                               | 1.06                                  |
| 343+00 | Size change: 8" - 7"                                | 8/7                      | 0.3                           | 0.03                             |  | 21                               | 5.3                                | 0.55                                  | 27                               | 10.1                               | 1.05                                  |
| 347+00 | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                      | 0.4                           | 0.05                             | Grade change: 0.10% - 0.48%                | 21/15                            | 4.9                                | 0.60                                  | 27/21                            | 11.4                               | 1.41                                  |
| 351+00 | Grade change: 0.48% - 0.90%                         | 6                        | 0.5                           | 0.07                             | Grade change: 0.48% - 0.90%                | 15/12                            | 3.9                                | 0.51                                  | 21/18                            | 10.5                               | 1.37                                  |
| 354+00 | End of Main tile                                    | 6                        |                               |                                  | End of Main tile                           | 12                               |                                    |                                       | 18                               |                                    |                                       |

PARALLEL TILE UPSIZING (IMPROVEMENT)







By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Open Ditch Construction for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| OPEN DITCH CONSTRUCTION (IMPROVEMENT) | EXISTING |   |                          |                               |                                  | IMPROVEMENT                  |                               |                                    |                                       |
|---------------------------------------|----------|---|--------------------------|-------------------------------|----------------------------------|------------------------------|-------------------------------|------------------------------------|---------------------------------------|
|                                       | STA      | EXISTING DESCRIPTION                                | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | PROPOSED DESCRIPTION         | OPEN DITCH                    |                                    |                                       |
|                                       |          |   |                          |                               |                                  |                              | APPROX. OPEN DITCH DEPTH (ft) | IMPROVED OPEN DITCH CAPACITY (cfs) | IMPROVED OPEN DITCH CAPACITY (in/day) |
|                                       | 16+50    | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | Start of Proposed Open Ditch | 6                             | 276.7                              | 1.69                                  |
|                                       | 28+00    | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | Grade change: 0.06% - 0.18%  | 6                             | 479.3                              | 3.03                                  |
|                                       | 51+00    | Lateral 3   | 32                       | 20.7                          | 0.14                             | Lateral 3                    | 6                             | 479.3                              | 3.22                                  |
|                                       | 70+00    | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | Grade change: 0.18% - 0.14%  | 6                             | 422.7                              | 3.11                                  |
|                                       | 100+00   | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | Grade change: 0.14% - 0.12%  | 7                             | 562.5                              | 4.38                                  |
|                                       | 122+76   | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | West side Co Hwy S27         | 7                             | 562.5                              | 4.73                                  |
|                                       | 152+00   | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | Grade change: 0.12% - 0.28%  | 6                             | 597.7                              | 5.54                                  |
|                                       | 168+50   | Lateral 14  | 28                       | 18.1                          | 0.18                             | Lateral 14                   | 5                             | 392.0                              | 3.85                                  |
|                                       | 180+00   | Grade change: 0.28% - 0.24%                         | 28                       | 16.8                          | 0.17                             | Grade change: 0.28% - 0.24%  | 5                             | 362.9                              | 3.70                                  |
|                                       | 190+00   | Grade change: 0.24% - 0.22%                         | 28                       | 16.0                          | 0.17                             | Grade change: 0.24% - 0.22%  | 5                             | 347.5                              | 3.59                                  |
|                                       | 200+00   | Grade change: 0.22% - 0.18%                         | 28                       | 14.5                          | 0.17                             | Grade change: 0.22 - 0.18%   | 5                             | 314.3                              | 3.73                                  |
|                                       | 220+00   | Grade change 0.18% - 0.14%                          | 28                       | 12.8                          | 0.18                             | Grade change 0.18% - 0.14%   | 5                             | 277.2                              | 3.86                                  |
|                                       | 230+00   | Grade change 0.14% - 0.10%                          | 28                       | 10.8                          | 0.17                             | Grade change 0.14% - 0.10%   | 6                             | 357.2                              | 5.50                                  |
|                                       | 246+00   | Size change: 28" - 26"                              | 28/26                    | 8.9                           | 0.17                             |                              | 6                             | 357.2                              | 7.00                                  |
|                                       | 260+00   | Grade change: 0.10% - 0.16%                         | 26                       | 11.2                          | 0.22                             | Grade change: 0.10% - 0.16%  | 5                             | 296.3                              | 5.89                                  |
|                                       | 262+00   | Size change: 26" - 24"                              | 26/24                    | 9.1                           | 0.19                             |                              | 5                             | 296.3                              | 6.23                                  |
|                                       | 266+00   | Size change: 24" - 22"                              | 24/22                    | 7.2                           | 0.17                             |                              | 5                             | 296.3                              | 6.94                                  |
|                                       | 270+00   | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                    | 7.1                           | 0.17                             | Grade change: 0.16% - 0.26%  | 6                             | 576.0                              | 13.60                                 |
|                                       | 279+00   | Size change: 20" - 18"                              | 20/18                    | 5.4                           | 0.14                             |                              | 6                             | 576.0                              | 14.81                                 |
|                                       | 284+00   | Size change: 18" - 16"                              | 18/16                    | 3.9                           | 0.13                             |                              | 6                             | 576.0                              | 19.55                                 |
|                                       | 286+00   | Grade change: 0.26% - 0.18%                         | 16                       | 3.3                           | 0.11                             | Grade change: 0.26% - 0.18%  | 6                             | 479.3                              | 16.34                                 |
|                                       | 308+00   | Grade change: 0.18% - 0.10%                         | 16                       | 2.4                           | 0.10                             | Grade change: 0.18% - 0.10%  | 7                             | 513.5                              | 20.50                                 |
|                                       | 313+00   | Size change: 16" - 15"                              | 16/15                    | 2.0                           | 0.09                             |                              | 7                             | 513.5                              | 22.91                                 |
|                                       | 318+00   | Size change: 15" - 14"                              | 15/14                    | 1.7                           | 0.10                             |                              | 7                             | 513.5                              | 30.81                                 |
|                                       | 327+00   | Size change: 14" - 12"                              | 14/12                    | 1.1                           | 0.07                             |                              | 7                             | 513.5                              | 32.96                                 |
|                                       | 339+00   | Size change: 12" - 10"                              | 12/10                    | 0.7                           | 0.06                             |                              | 7                             | 513.5                              | 44.77                                 |
|                                       | 341+00   | Size change: 10" - 8"                               | 10/8                     | 0.4                           | 0.04                             |                              | 6                             | 357.2                              | 36.95                                 |
|                                       | 343+00   | Size change: 8" - 7"                                | 8/7                      | 0.3                           | 0.03                             |                              | 6                             | 357.2                              | 37.19                                 |
|                                       | 347+00   | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                      | 0.4                           | 0.05                             | Grade change: 0.10% - 0.48%  | 6                             | 782.6                              | 96.62                                 |
|                                       | 351+00   | Grade change: 0.48% - 0.90%                         | 6                        | 0.5                           | 0.07                             | Grade change: 0.48% - 0.90%  | 5                             | 702.8                              | 91.35                                 |
|                                       | 354+00   | End of Main tile                                    | 6                        |                               |                                  | End of Open Ditch            | 4                             |                                    |                                       |





By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Upper Main Tile Outlet** for D.D. #56

Location: Sections 3 & 10 T87N, R22W Hardin County, Iowa

| UPPER MAIN TILE OUTLET (IMPROVEMENT)    | ITEM #                             | DESCRIPTION                        | Unit Cost    | Units | Quantity | Units                            | Total Cost    |  |
|---|------------------------------------|------------------------------------|--------------|-------|----------|----------------------------------|---------------|--|
|   | <b>DISTRICT CONSTRUCTION COSTS</b> |                                    |              |       |          |                                  |               |  |
|   | 1                                  | 54" CMP TILE OUTLET                | \$ 140.00    | LF    | 40       | LF                               | \$ 5,600.00   |  |
|   | 2                                  | 48" TRIPLE WALL PPE or RCP TILE    | \$ 150.00    | LF    | 1900     | LF                               | \$ 285,000.00 |  |
|   | 3                                  | 54" RODENT GUARD                   | \$ 1,000.00  | EA    | 1        | EA                               | \$ 1,000.00   |  |
|   | 4                                  | JUNCTION STRUCTURE                 | \$ 10,000.00 | EA    | 1        | EA                               | \$ 10,000.00  |  |
|   | 5                                  | BANK STABILIZATION                 | \$ 50.00     | TON   | 50       | TON                              | \$ 2,500.00   |  |
|   | 6                                  | PLUG EXISTING DOWNSTREAM MAIN TILE | \$ 1,000.00  | LOC   | 1        | LOC                              | \$ 1,000.00   |  |
|   | 7                                  | CONCRETE COLLAR                    | \$ 600.00    | EA    | 1        | EA                               | \$ 600.00     |  |
|   | 8                                  | PRIVATE TILE CONNECTIONS           | \$ 1,000.00  | EA    | 20       | EA                               | \$ 20,000.00  |  |
| 9                                       | TILE LOCATION                      | \$ 150.00                          | STA          | 2     | STA      | \$ 300.00                        |               |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 326,000.00 |  |
|   |                                    |                                    |              |       |          | Contingency (15%)                | \$ 48,900.00  |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 374,900.00 |  |
|   |                                    |                                    |              |       |          | Engr. & Const. Observation (25%) | \$ 93,725.00  |  |
|   |                                    |                                    |              |       |          | <b>TOTAL COST</b>                | \$ 468,625.00 |  |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |                                    |                                    |              |       |          |                                  |               |  |
| 10                                      | 48" TILE - OPEN CUT (230TH STREET) | \$ 250.00                          | LF           | 30    | LF       | \$ 7,500.00                      |               |  |
| 11                                      | HICKENBOTTOM INTAKE                | \$ 2,000.00                        | EA           | 2     | EA       | \$ 4,000.00                      |               |  |
| 12                                      | PERMANENT SEEDING AND WARRANTY     | \$ 2,000.00                        | LOC          | 1     | LOC      | \$ 2,000.00                      |               |  |
| 13                                      | TRAFFIC CONTROL                    | \$ 2,000.00                        | LOC          | 1     | LOC      | \$ 2,000.00                      |               |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 15,500.00  |  |
|   |                                    |                                    |              |       |          | Contingency (15%)                | \$ 2,325.00   |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 17,825.00  |  |
|   |                                    |                                    |              |       |          | Engr. & Const. Observation (25%) | \$ 4,456.25   |  |
|   |                                    |                                    |              |       |          | <b>TOTAL COST</b>                | \$ 22,281.25  |  |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense





By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Single Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

**SINGLE TILE UPSIZING - IMPROVEMENT (1/2")**

| ITEM #                                  | DESCRIPTION   | Unit Cost   | Units | Quantity | Units | Total Cost      |
|---|---|-------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |             |       |          |       |                 |
| 101                                     | 72" CMP TILE OUTLET                                   | \$ 175.00   | LF    | 40       | LF    | \$ 7,000.00     |
| 102                                     | 66" RCP TILE  | \$ 200.00   | LF    | 1080     | LF    | \$ 216,000.00   |
| 103                                     | 54" TRIPLE WALL PPE or RCP TILE                       | \$ 150.00   | LF    | 12230    | EA    | \$ 1,834,500.00 |
| 104                                     | 48" TRIPLE WALL PPE or RCP TILE                       | \$ 110.00   | LF    | 9270     | EA    | \$ 1,019,700.00 |
| 105                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00    | LF    | 1400     | LF    | \$ 126,000.00   |
| 106                                     | 36" TRIPLE WALL PPE or RCP TILE                       | \$ 75.00    | LF    | 1900     | LF    | \$ 142,500.00   |
| 107                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00    | LF    | 3900     | LF    | \$ 234,000.00   |
| 108                                     | 27" DUAL WALL PPE or RCP TILE                         | \$ 50.00    | LF    | 2100     | EA    | \$ 105,000.00   |
| 109                                     | 24" DUAL WALL PPE or RCP TILE                         | \$ 40.00    | LF    | 200      | LF    | \$ 8,000.00     |
| 110                                     | 21" DUAL WALL PPE or RCP TILE                         | \$ 32.50    | LF    | 600      | LF    | \$ 19,500.00    |
| 111                                     | 15" DUAL WALL PPE or RCP TILE                         | \$ 27.50    | LF    | 700      | LF    | \$ 19,250.00    |
| 112                                     | 54" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,400.00 | LF    | 100      | LF    | \$ 140,000.00   |
| 113                                     | 66" x 54" REDUCER                                     | \$ 4,000.00 | EA    | 1        | EA    | \$ 4,000.00     |
| 114                                     | 54" x 48" REDUCER                                     | \$ 3,500.00 | EA    | 1        | EA    | \$ 3,500.00     |
| 115                                     | 48" x 42" REDUCER                                     | \$ 3,000.00 | EA    | 1        | EA    | \$ 3,000.00     |
| 116                                     | 42" x 36" REDUCER                                     | \$ 2,500.00 | EA    | 1        | EA    | \$ 2,500.00     |
| 117                                     | 36" x 30" REDUCER                                     | \$ 2,000.00 | EA    | 1        | EA    | \$ 2,000.00     |
| 118                                     | 30" x 27" REDUCER                                     | \$ 1,800.00 | EA    | 1        | EA    | \$ 1,800.00     |
| 119                                     | 27" x 24" REDUCER                                     | \$ 1,600.00 | EA    | 1        | EA    | \$ 1,600.00     |
| 120                                     | 24" x 21" REDUCER                                     | \$ 1,400.00 | EA    | 1        | EA    | \$ 1,400.00     |
| 121                                     | 21" x 15" REDUCER                                     | \$ 1,200.00 | EA    | 1        | EA    | \$ 1,200.00     |
| 122                                     | 72" RODENT GUARD                                      | \$ 2,000.00 | EA    | 1        | EA    | \$ 2,000.00     |
| 123                                     | BANK STABILIZATION                                    | \$ 50.00    | TON   | 75       | TON   | \$ 3,750.00     |
| 124                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$25,000.00 | EA    | 1        | EA    | \$ 25,000.00    |
| 125                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00 | EA    | 22       | EA    | \$ 22,000.00    |
| 126                                     | CONCRETE COLLAR                                       | \$ 600.00   | EA    | 2        | EA    | \$ 1,200.00     |
| 127                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00   | EA    | 200      | EA    | \$ 100,000.00   |
| 128                                     | TILE LOCATION   | \$ 150.00   | STA   | 334.2    | STA   | \$ 50,130.00    |
| 129                                     | TILE ABANDONMENT                                      | \$ 100.00   | LF    | 100      | LF    | \$ 10,000.00    |
| 130                                     | TILE REMOVAL  | \$ 5.00     | LF    | 33420    | LF    | \$ 167,100.00   |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 4,273,630.00 |
| Contingency (10%)                       |   |             |       |          |       | \$ 427,363.00   |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 4,700,993.00 |
| Engr. & Const. Observation (20%)        |   |             |       |          |       | \$ 940,198.60   |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 5,641,191.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |             |       |          |       |                 |
| 131                                     | 54" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,400.00 | LF    | 40       | LF    | \$ 56,000.00    |
| 132                                     | 66" TILE - OPEN CUT (230TH STREET)                    | \$ 250.00   | LF    | 30       | LF    | \$ 7,500.00     |
| 133                                     | 54" TILE - OPEN CUT (G AVENUE)                        | \$ 200.00   | LF    | 30       | LF    | \$ 6,000.00     |
| 134                                     | 48" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 155.00   | LF    | 130      | LF    | \$ 20,150.00    |
| 135                                     | TILE ABANDONMENT                                      | \$ 100.00   | LF    | 40       | LF    | \$ 4,000.00     |
| 136                                     | TILE REMOVAL  | \$ 10.00    | LF    | 190      | LF    | \$ 1,900.00     |
| 137                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00 | EA    | 12       | EA    | \$ 24,000.00    |
| 138                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00 | LOC   | 6        | LOC   | \$ 12,000.00    |
| 139                                     | TRAFFIC CONTROL                                       | \$ 2,000.00 | LOC   | 6        | LOC   | \$ 12,000.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 143,550.00   |
| Contingency (15%)                       |   |             |       |          |       | \$ 21,532.50    |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 165,082.50   |
| Engr. & Const. Observation (25%)        |   |             |       |          |       | \$ 41,270.63    |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 206,353.13   |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Single Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

SINGLE TILE UPSIZING - IMPROVEMENT (1)

| ITEM #                                  | DESCRIPTION   | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 201                                     | 90" CMP TILE OUTLET                                   | \$ 200.00    | LF    | 40       | LF    | \$ 8,000.00     |
| 202                                     | 90" RCP TILE  | \$ 250.00    | LF    | 1080     | LF    | \$ 270,000.00   |
| 203                                     | 72" RCP TILE  | \$ 200.00    | LF    | 12230    | EA    | \$ 2,446,000.00 |
| 204                                     | 60" TRIPLE WALL PPE or RCP TILE                       | \$ 175.00    | LF    | 9270     | EA    | \$ 1,622,250.00 |
| 205                                     | 54" TRIPLE WALL PPE or RCP TILE                       | \$ 150.00    | LF    | 1400     | EA    | \$ 210,000.00   |
| 206                                     | 48" TRIPLE WALL PPE or RCP TILE                       | \$ 110.00    | LF    | 1000     | LF    | \$ 110,000.00   |
| 207                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00     | LF    | 4800     | LF    | \$ 432,000.00   |
| 208                                     | 36" TRIPLE WALL PPE or RCP TILE                       | \$ 75.00     | LF    | 2100     | LF    | \$ 157,500.00   |
| 209                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00     | LF    | 200      | EA    | \$ 12,000.00    |
| 210                                     | 27" DUAL WALL PPE or RCP TILE                         | \$ 50.00     | LF    | 600      | LF    | \$ 30,000.00    |
| 211                                     | 21" DUAL WALL PPE or RCP TILE                         | \$ 32.50     | LF    | 400      | LF    | \$ 13,000.00    |
| 212                                     | 18" DUAL WALL PPE or RCP TILE                         | \$ 30.00     | LF    | 300      | LF    | \$ 9,000.00     |
| 213                                     | 72" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,600.00  | LF    | 100      | LF    | \$ 160,000.00   |
| 214                                     | 90" x 72" REDUCER                                     | \$ 5,000.00  | EA    | 1        | EA    | \$ 5,000.00     |
| 215                                     | 72" x 60" REDUCER                                     | \$ 4,500.00  | EA    | 1        | EA    | \$ 4,500.00     |
| 216                                     | 60" x 54" REDUCER                                     | \$ 4,000.00  | EA    | 1        | EA    | \$ 4,000.00     |
| 217                                     | 54" x 48" REDUCER                                     | \$ 3,500.00  | EA    | 1        | EA    | \$ 3,500.00     |
| 218                                     | 48" x 42" REDUCER                                     | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 219                                     | 42" x 36" REDUCER                                     | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 220                                     | 36" x 30" REDUCER                                     | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 221                                     | 30" x 27" REDUCER                                     | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 222                                     | 27" x 21" REDUCER                                     | \$ 1,500.00  | EA    | 1        | EA    | \$ 1,500.00     |
| 223                                     | 21" x 18" REDUCER                                     | \$ 1,200.00  | EA    | 1        | EA    | \$ 1,200.00     |
| 224                                     | 90" RODENT GUARD                                      | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 225                                     | BANK STABILIZATION                                    | \$ 50.00     | TON   | 100      | TON   | \$ 5,000.00     |
| 226                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$ 25,000.00 | EA    | 1        | EA    | \$ 25,000.00    |
| 227                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00  | EA    | 22       | EA    | \$ 22,000.00    |
| 228                                     | CONCRETE COLLAR                                       | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 229                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00    | EA    | 200      | EA    | \$ 100,000.00   |
| 230                                     | TILE LOCATION   | \$ 150.00    | STA   | 334.2    | STA   | \$ 50,130.00    |
| 231                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 300      | LF    | \$ 30,000.00    |
| 232                                     | TILE REMOVAL  | \$ 5.00      | LF    | 33420    | LF    | \$ 167,100.00   |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 5,911,680.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 591,168.00   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 6,502,848.00 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 1,300,569.60 |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 7,803,417.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 233                                     | 72" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,600.00  | LF    | 40       | LF    | \$ 64,000.00    |
| 234                                     | 90" TILE - OPEN CUT (230TH STREET)                    | \$ 325.00    | LF    | 30       | LF    | \$ 9,750.00     |
| 235                                     | 72" TILE - OPEN CUT (G AVENUE)                        | \$ 265.00    | LF    | 30       | LF    | \$ 7,950.00     |
| 236                                     | 60" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 225.00    | LF    | 130      | LF    | \$ 29,250.00    |
| 237                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 40       | LF    | \$ 4,000.00     |
| 238                                     | TILE REMOVAL  | \$ 10.00     | LF    | 190      | LF    | \$ 1,900.00     |
| 239                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00  | EA    | 12       | EA    | \$ 24,000.00    |
| 240                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| 241                                     | TRAFFIC CONTROL                                       | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 164,850.00   |
| Contingency (15%)                       |   |              |       |          |       | \$ 24,727.50    |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 189,577.50   |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 47,394.38    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 236,971.88   |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense







By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Dual Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

DUAL TILE UPSIZING - IMPROVEMENT (1/2")

| ITEM #                                  | DESCRIPTION   | Unit Cost   | Units | Quantity | Units | Total Cost      |
|---|---|-------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |             |       |          |       |                 |
| 301                                     | 60" CMP TILE OUTLET                                   | \$ 110.00   | LF    | 80       | LF    | \$ 8,800.00     |
| 302                                     | 54" TRIPLE WALL PPE or RCP TILE                       | \$ 150.00   | LF    | 2160     | LF    | \$ 324,000.00   |
| 303                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00    | LF    | 24460    | EA    | \$ 2,201,400.00 |
| 304                                     | 36" TRIPLE WALL PPE or RCP TILE                       | \$ 75.00    | LF    | 9270     | EA    | \$ 695,250.00   |
| 305                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00    | LF    | 12270    | EA    | \$ 736,200.00   |
| 306                                     | 27" DUAL WALL PPE or RCP TILE                         | \$ 50.00    | LF    | 1400     | LF    | \$ 70,000.00    |
| 307                                     | 24" DUAL WALL PPE or RCP TILE                         | \$ 40.00    | LF    | 12100    | LF    | \$ 484,000.00   |
| 308                                     | 18" DUAL WALL PPE or RCP TILE                         | \$ 30.00    | LF    | 3100     | LF    | \$ 93,000.00    |
| 309                                     | 15" DUAL WALL PPE or RCP TILE                         | \$ 27.50    | LF    | 600      | EA    | \$ 16,500.00    |
| 310                                     | 12" DUAL WALL PPE or RCP TILE                         | \$ 25.00    | LF    | 800      | LF    | \$ 20,000.00    |
| 311                                     | 10" DUAL WALL PPE or RCP TILE                         | \$ 22.50    | LF    | 600      | LF    | \$ 13,500.00    |
| 312                                     | 42" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,200.00 | LF    | 200      | LF    | \$ 240,000.00   |
| 313                                     | 54" x 42" REDUCER                                     | \$ 3,250.00 | EA    | 2        | EA    | \$ 6,500.00     |
| 314                                     | 42" x 36" REDUCER                                     | \$ 2,500.00 | EA    | 1        | EA    | \$ 2,500.00     |
| 314                                     | 42" x 30" REDUCER                                     | \$ 2,500.00 | EA    | 1        | EA    | \$ 2,500.00     |
| 315                                     | 36" x 30" REDUCER                                     | \$ 2,000.00 | EA    | 1        | EA    | \$ 2,000.00     |
| 316                                     | 30" x 27" REDUCER                                     | \$ 1,800.00 | EA    | 2        | EA    | \$ 3,600.00     |
| 317                                     | 27" x 24" REDUCER                                     | \$ 1,600.00 | EA    | 2        | EA    | \$ 3,200.00     |
| 318                                     | 24" x 18" REDUCER                                     | \$ 1,400.00 | EA    | 2        | EA    | \$ 2,800.00     |
| 319                                     | 18" x 15" REDUCER                                     | \$ 1,000.00 | EA    | 1        | EA    | \$ 1,000.00     |
| 320                                     | 18" x 12" REDUCER                                     | \$ 800.00   | EA    | 1        | EA    | \$ 800.00       |
| 321                                     | 15" x 12" REDUCER                                     | \$ 600.00   | EA    | 1        | EA    | \$ 600.00       |
| 322                                     | 12" x 10" REDUCER                                     | \$ 400.00   | EA    | 2        | EA    | \$ 800.00       |
| 323                                     | FLOW EQUALIZATION STRUCTURE                           | \$10,000.00 | EA    | 33       | EA    | \$ 330,000.00   |
| 324                                     | 54" RODENT GUARD                                      | \$ 1,500.00 | EA    | 2        | EA    | \$ 3,000.00     |
| 325                                     | BANK STABILIZATION                                    | \$ 50.00    | TON   | 100      | TON   | \$ 5,000.00     |
| 326                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$25,000.00 | EA    | 1        | EA    | \$ 25,000.00    |
| 327                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00 | EA    | 22       | EA    | \$ 22,000.00    |
| 328                                     | CONCRETE COLLAR                                       | \$ 600.00   | EA    | 3        | EA    | \$ 1,800.00     |
| 329                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00   | EA    | 200      | EA    | \$ 100,000.00   |
| 330                                     | TILE LOCATION   | \$ 150.00   | STA   | 334.2    | STA   | \$ 50,130.00    |
| 331                                     | TILE ABANDONMENT                                      | \$ 100.00   | LF    | 100      | LF    | \$ 10,000.00    |
| 332                                     | TILE REMOVAL  | \$ 5.00     | LF    | 33420    | LF    | \$ 167,100.00   |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 5,642,980.00 |
| Contingency (10%)                       |   |             |       |          |       | \$ 564,298.00   |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 6,207,278.00 |
| Engr. & Const. Observation (20%)        |   |             |       |          |       | \$ 1,241,455.60 |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 7,448,733.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |             |       |          |       |                 |
| 333                                     | 42" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,200.00 | LF    | 80       | LF    | \$ 96,000.00    |
| 334                                     | 54" TILE - OPEN CUT (230TH STREET)                    | \$ 200.00   | LF    | 60       | LF    | \$ 12,000.00    |
| 335                                     | 42" TILE - OPEN CUT (G AVENUE)                        | \$ 130.00   | LF    | 60       | LF    | \$ 7,800.00     |
| 336                                     | 36" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 110.00   | LF    | 130      | LF    | \$ 14,300.00    |
| 337                                     | 30" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 90.00    | LF    | 130      | LF    | \$ 11,700.00    |
| 338                                     | TILE ABANDONMENT                                      | \$ 100.00   | LF    | 40       | LF    | \$ 4,000.00     |
| 339                                     | TILE REMOVAL  | \$ 10.00    | LF    | 190      | LF    | \$ 1,900.00     |
| 340                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00 | EA    | 12       | EA    | \$ 24,000.00    |
| 341                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00 | LOC   | 6        | LOC   | \$ 12,000.00    |
| 342                                     | TRAFFIC CONTROL                                       | \$ 2,000.00 | LOC   | 6        | LOC   | \$ 12,000.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 195,700.00   |
| Contingency (15%)                       |   |             |       |          |       | \$ 29,355.00    |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 225,055.00   |
| Engr. & Const. Observation (25%)        |   |             |       |          |       | \$ 56,263.75    |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 281,318.75   |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.  
 Date: 1/28/2019  
 Checked By: L.O.G.  
 Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

**Project: Dual Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

DUAL TILE UPSIZING - IMPROVEMENT (1")

| ITEM #                                  | DESCRIPTION   | Unit Cost    | Units | Quantity | Units | Total Cost       |
|---|---|--------------|-------|----------|-------|------------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                  |
| 401                                     | 84" CMP TILE OUTLET                                   | \$ 200.00    | LF    | 40       | LF    | \$ 8,000.00      |
| 402                                     | 72" CMP TILE OUTLET                                   | \$ 175.00    | LF    | 40       | LF    | \$ 7,000.00      |
| 403                                     | 72" RCP TILE  | \$ 200.00    | LF    | 1080     | LF    | \$ 216,000.00    |
| 404                                     | 60" TRIPLE WALL PPE or RCP TILE                       | \$ 175.00    | LF    | 1080     | LF    | \$ 189,000.00    |
| 405                                     | 54" TRIPLE WALL PPE or RCP TILE                       | \$ 150.00    | LF    | 24460    | LF    | \$ 3,669,000.00  |
| 406                                     | 48" TRIPLE WALL PPE or RCP TILE                       | \$ 110.00    | LF    | 9270     | EA    | \$ 1,019,700.00  |
| 407                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00     | LF    | 1400     | EA    | \$ 126,000.00    |
| 408                                     | 36" TRIPLE WALL PPE or RCP TILE                       | \$ 75.00     | LF    | 13170    | EA    | \$ 987,750.00    |
| 409                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00     | LF    | 9100     | EA    | \$ 546,000.00    |
| 410                                     | 27" DUAL WALL PPE or RCP TILE                         | \$ 50.00     | LF    | 3000     | LF    | \$ 150,000.00    |
| 411                                     | 24" DUAL WALL PPE or RCP TILE                         | \$ 40.00     | LF    | 1600     | LF    | \$ 64,000.00     |
| 412                                     | 21" DUAL WALL PPE or RCP TILE                         | \$ 32.50     | LF    | 1200     | LF    | \$ 39,000.00     |
| 413                                     | 15" DUAL WALL PPE or RCP TILE                         | \$ 27.50     | LF    | 1400     | EA    | \$ 38,500.00     |
| 414                                     | 54" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,400.00  | LF    | 200      | LF    | \$ 280,000.00    |
| 415                                     | 72" x 54" REDUCER                                     | \$ 4,500.00  | EA    | 1        | EA    | \$ 4,500.00      |
| 416                                     | 60" x 54" REDUCER                                     | \$ 4,000.00  | EA    | 1        | EA    | \$ 4,000.00      |
| 416                                     | 54" x 48" REDUCER                                     | \$ 3,500.00  | EA    | 1        | EA    | \$ 3,500.00      |
| 417                                     | 54" x 36" REDUCER                                     | \$ 3,250.00  | EA    | 1        | EA    | \$ 3,250.00      |
| 418                                     | 48" x 42" REDUCER                                     | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00      |
| 419                                     | 42" x 36" REDUCER                                     | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00      |
| 420                                     | 36" x 30" REDUCER                                     | \$ 2,000.00  | EA    | 2        | EA    | \$ 4,000.00      |
| 421                                     | 30" x 27" REDUCER                                     | \$ 1,800.00  | EA    | 2        | EA    | \$ 3,600.00      |
| 422                                     | 27" x 24" REDUCER                                     | \$ 1,600.00  | EA    | 2        | EA    | \$ 3,200.00      |
| 423                                     | 24" x 21" REDUCER                                     | \$ 1,400.00  | EA    | 2        | EA    | \$ 2,800.00      |
| 424                                     | 21" x 15" REDUCER                                     | \$ 1,200.00  | EA    | 2        | EA    | \$ 2,400.00      |
| 425                                     | FLOW EQUALIZATION STRUCTURE                           | \$ 10,000.00 | EA    | 33       | EA    | \$ 330,000.00    |
| 426                                     | 84" RODENT GUARD                                      | \$ 2,250.00  | EA    | 1        | EA    | \$ 2,250.00      |
| 427                                     | 72" RODENT GUARD                                      | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00      |
| 427                                     | BANK STABILIZATION                                    | \$ 50.00     | TON   | 100      | TON   | \$ 5,000.00      |
| 428                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$ 25,000.00 | EA    | 1        | EA    | \$ 25,000.00     |
| 429                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00  | EA    | 22       | EA    | \$ 22,000.00     |
| 430                                     | CONCRETE COLLAR                                       | \$ 600.00    | EA    | 3        | EA    | \$ 1,800.00      |
| 431                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00    | EA    | 200      | EA    | \$ 100,000.00    |
| 432                                     | TILE LOCATION   | \$ 150.00    | STA   | 334.2    | STA   | \$ 50,130.00     |
| 433                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 100      | LF    | \$ 10,000.00     |
| 434                                     | TILE REMOVAL  | \$ 5.00      | LF    | 33420    | LF    | \$ 167,100.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 8,091,980.00  |
| Contingency (10%)                       |   |              |       |          |       | \$ 809,198.00    |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 8,901,178.00  |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 1,780,235.60  |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 10,681,413.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                  |
| 435                                     | 54" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,400.00  | LF    | 80       | LF    | \$ 112,000.00    |
| 436                                     | 72" TILE - OPEN CUT (230TH STREET)                    | \$ 265.00    | LF    | 30       | LF    | \$ 7,950.00      |
| 437                                     | 60" TILE - OPEN CUT (230TH STREET)                    | \$ 225.00    | LF    | 30       | LF    | \$ 6,750.00      |
| 438                                     | 54" TILE - OPEN CUT (G AVENUE)                        | \$ 200.00    | LF    | 60       | LF    | \$ 12,000.00     |
| 439                                     | 48" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 155.00    | LF    | 130      | LF    | \$ 20,150.00     |
| 440                                     | 36" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 110.00    | LF    | 130      | LF    | \$ 14,300.00     |
| 441                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 40       | LF    | \$ 4,000.00      |
| 442                                     | TILE REMOVAL  | \$ 10.00     | LF    | 190      | EA    | \$ 1,900.00      |
| 443                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00  | EA    | 12       | EA    | \$ 24,000.00     |
| 444                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00     |
| 445                                     | TRAFFIC CONTROL                                       | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 227,050.00    |
| Contingency (15%)                       |   |              |       |          |       | \$ 34,057.50     |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 261,107.50    |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 65,276.88     |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 326,384.38    |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense





By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Parallel Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

PARALLEL TILE UPSIZING - IMPROVEMENT (1/2")

| ITEM #                                  | DESCRIPTION   | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 501                                     | 72" CMP TILE OUTLET                                   | \$ 175.00    | LF    | 40       | LF    | \$ 7,000.00     |
| 502                                     | 66" RCP TILE  | \$ 200.00    | LF    | 1080     | LF    | \$ 216,000.00   |
| 503                                     | 48" TRIPLE WALL PPE or RCP TILE                       | \$ 110.00    | LF    | 12230    | EA    | \$ 1,345,300.00 |
| 504                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00     | LF    | 9270     | LF    | \$ 834,300.00   |
| 505                                     | 36" TRIPLE WALL PPE or RCP TILE                       | \$ 75.00     | LF    | 1400     | LF    | \$ 105,000.00   |
| 506                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00     | LF    | 5800     | LF    | \$ 348,000.00   |
| 507                                     | 24" DUAL WALL PPE or RCP TILE                         | \$ 40.00     | LF    | 2300     | LF    | \$ 92,000.00    |
| 508                                     | 21" DUAL WALL PPE or RCP TILE                         | \$ 32.50     | LF    | 600      | LF    | \$ 19,500.00    |
| 509                                     | 15" DUAL WALL PPE or RCP TILE                         | \$ 27.50     | LF    | 400      | LF    | \$ 11,000.00    |
| 510                                     | 12" DUAL WALL PPE or RCP TILE                         | \$ 25.00     | LF    | 300      | LF    | \$ 7,500.00     |
| 511                                     | 48" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,300.00  | LF    | 100      | LF    | \$ 130,000.00   |
| 512                                     | 66" x 48" REDUCER                                     | \$ 3,750.00  | EA    | 1        | EA    | \$ 3,750.00     |
| 513                                     | 48" x 42" REDUCER                                     | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 514                                     | 42" x 36" REDUCER                                     | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 515                                     | 36" x 30" REDUCER                                     | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 516                                     | 30" x 24" REDUCER                                     | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 517                                     | 24" x 21" REDUCER                                     | \$ 1,400.00  | EA    | 1        | EA    | \$ 1,400.00     |
| 518                                     | 21" x 15" REDUCER                                     | \$ 1,200.00  | EA    | 1        | EA    | \$ 1,200.00     |
| 519                                     | 15" x 12" REDUCER                                     | \$ 600.00    | EA    | 1        | EA    | \$ 600.00       |
| 520                                     | FLOW EQUALIZATION STRUCTURE                           | \$ 10,000.00 | EA    | 33       | EA    | \$ 330,000.00   |
| 521                                     | 72" RODENT GUARD                                      | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 522                                     | BANK STABILIZATION                                    | \$ 50.00     | TON   | 100      | TON   | \$ 5,000.00     |
| 523                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$ 25,000.00 | EA    | 1        | EA    | \$ 25,000.00    |
| 524                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00  | EA    | 8        | EA    | \$ 8,000.00     |
| 525                                     | CONCRETE COLLAR                                       | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 526                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00    | EA    | 100      | EA    | \$ 50,000.00    |
| 527                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 100      | LF    | \$ 10,000.00    |
| 528                                     | TILE LOCATION   | \$ 150.00    | STA   | 334.2    | STA   | \$ 50,130.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 3,613,180.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 361,318.00   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 3,974,498.00 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 794,899.60   |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 4,769,397.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 529                                     | 48" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,300.00  | LF    | 40       | LF    | \$ 52,000.00    |
| 530                                     | 66" TILE - OPEN CUT (230TH STREET)                    | \$ 250.00    | LF    | 30       | LF    | \$ 7,500.00     |
| 531                                     | 48" TILE - OPEN CUT (G AVENUE)                        | \$ 155.00    | LF    | 30       | LF    | \$ 4,650.00     |
| 532                                     | 42" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 130.00    | LF    | 130      | LF    | \$ 16,900.00    |
| 533                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 40       | LF    | \$ 4,000.00     |
| 534                                     | TILE REMOVAL  | \$ 10.00     | LF    | 190      | LF    | \$ 1,900.00     |
| 535                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00  | EA    | 12       | EA    | \$ 24,000.00    |
| 536                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| 537                                     | TRAFFIC CONTROL                                       | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 134,950.00   |
| Contingency (15%)                       |   |              |       |          |       | \$ 20,242.50    |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 155,192.50   |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 38,798.13    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 193,990.63   |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Parallel Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

PARALLEL TILE UPSIZING - IMPROVEMENT (1')

| ITEM #                                  | DESCRIPTION   | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 601                                     | 90" CMP TILE OUTLET                                   | \$ 200.00    | LF    | 40       | LF    | \$ 8,000.00     |
| 602                                     | 90" RCP TILE  | \$ 250.00    | LF    | 1080     | LF    | \$ 270,000.00   |
| 603                                     | 66" RCP TILE  | \$ 200.00    | LF    | 12230    | LF    | \$ 2,446,000.00 |
| 604                                     | 54" TRIPLE WALL PPE or RCP TILE                       | \$ 150.00    | LF    | 9270     | EA    | \$ 1,390,500.00 |
| 605                                     | 48" TRIPLE WALL PPE or RCP TILE                       | \$ 110.00    | LF    | 1400     | LF    | \$ 154,000.00   |
| 606                                     | 42" TRIPLE WALL PPE or RCP TILE                       | \$ 90.00     | LF    | 5300     | LF    | \$ 477,000.00   |
| 607                                     | 36" DUAL WALL PPE or RCP TILE                         | \$ 75.00     | LF    | 2600     | LF    | \$ 195,000.00   |
| 608                                     | 30" DUAL WALL PPE or RCP TILE                         | \$ 60.00     | LF    | 200      | LF    | \$ 12,000.00    |
| 609                                     | 27" DUAL WALL PPE or RCP TILE                         | \$ 50.00     | LF    | 600      | LF    | \$ 30,000.00    |
| 610                                     | 21" DUAL WALL PPE or RCP TILE                         | \$ 32.50     | LF    | 400      | LF    | \$ 13,000.00    |
| 611                                     | 18" DUAL WALL PPE or RCP TILE                         | \$ 30.00     | LF    | 300      | LF    | \$ 9,000.00     |
| 612                                     | 66" TILE - JACK AND BORE (RAILROAD)                   | \$ 1,500.00  | LF    | 100      | LF    | \$ 150,000.00   |
| 613                                     | 90" x 66" REDUCER                                     | \$ 4,750.00  | EA    | 1        | EA    | \$ 4,750.00     |
| 614                                     | 66" x 54" REDUCER                                     | \$ 4,000.00  | EA    | 1        | EA    | \$ 4,000.00     |
| 615                                     | 54" x 48" REDUCER                                     | \$ 3,500.00  | EA    | 1        | EA    | \$ 3,500.00     |
| 616                                     | 48" x 42" REDUCER                                     | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 617                                     | 42" x 36" REDUCER                                     | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 618                                     | 36" x 30" REDUCER                                     | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 619                                     | 30" x 27" REDUCER                                     | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 620                                     | 27" x 21" REDUCER                                     | \$ 1,500.00  | EA    | 1        | EA    | \$ 1,500.00     |
| 621                                     | 21" x 18" REDUCER                                     | \$ 1,200.00  | EA    | 1        | EA    | \$ 1,200.00     |
| 622                                     | FLOW EQUALIZATION STRUCTURE                           | \$ 10,000.00 | EA    | 33       | EA    | \$ 330,000.00   |
| 623                                     | 90" RODENT GUARD                                      | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 624                                     | BANK STABILIZATION                                    | \$ 50.00     | TON   | 100      | TON   | \$ 5,000.00     |
| 625                                     | HEADWALL REMOVAL AND REPLACEMENT                      | \$ 25,000.00 | EA    | 1        | EA    | \$ 25,000.00    |
| 626                                     | LATERAL TILE CONNECTIONS                              | \$ 1,000.00  | EA    | 8        | EA    | \$ 8,000.00     |
| 627                                     | CONCRETE COLLAR                                       | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 628                                     | PRIVATE TILE CONNECTIONS                              | \$ 500.00    | EA    | 100      | EA    | \$ 50,000.00    |
| 629                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 100      | LF    | \$ 10,000.00    |
| 630                                     | TILE LOCATION   | \$ 150.00    | STA   | 334.2    | STA   | \$ 50,130.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 5,660,080.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 566,088.00   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 6,226,088.00 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 1,245,217.60 |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 7,471,305.60 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 631                                     | 66" TILE - JACK AND BORE (CO HWY S27)                 | \$ 1,500.00  | LF    | 40       | LF    | \$ 60,000.00    |
| 632                                     | 90" TILE - OPEN CUT (230TH STREET)                    | \$ 325.00    | LF    | 30       | LF    | \$ 9,750.00     |
| 633                                     | 66" TILE - OPEN CUT (G AVENUE)                        | \$ 250.00    | LF    | 30       | LF    | \$ 7,500.00     |
| 634                                     | 54" TILE - OPEN CUT (E AND D AVENUE AND 230TH STREET) | \$ 200.00    | LF    | 130      | LF    | \$ 26,000.00    |
| 635                                     | TILE ABANDONMENT                                      | \$ 100.00    | LF    | 40       | LF    | \$ 4,000.00     |
| 636                                     | TILE REMOVAL  | \$ 10.00     | LF    | 190      | LF    | \$ 1,900.00     |
| 637                                     | HICKENBOTTOM INTAKE                                   | \$ 2,000.00  | EA    | 12       | EA    | \$ 24,000.00    |
| 638                                     | PERMANENT SEEDING AND WARRANTY                        | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| 639                                     | TRAFFIC CONTROL                                       | \$ 2,000.00  | LOC   | 6        | LOC   | \$ 12,000.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 157,150.00   |
| Contingency (15%)                       |   |              |       |          |       | \$ 23,572.50    |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 180,722.50   |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 45,180.63    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 225,903.13   |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense

Faint, illegible text or markings on the left side of the page, possibly bleed-through from the reverse side.



ENGINEERS • LAND SURVEYORS

By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

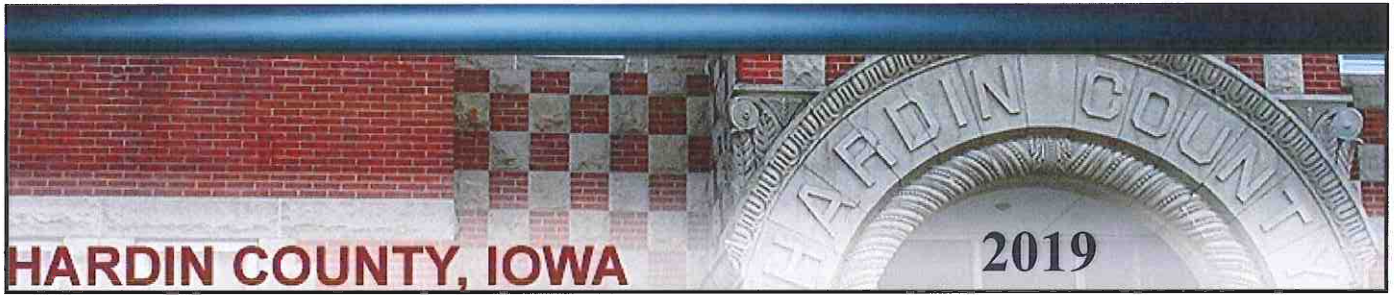
**Engineer's Opinion of Probable Construction Cost**

Project: **Open Ditch Construction** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa


| OPEN DITCH CONSTRUCTION (IMPROVEMENT)   | ITEM #                             | DESCRIPTION                        | Unit Cost   | Units | Quantity | Units                            | Total Cost      |  |
|---|------------------------------------|------------------------------------|-------------|-------|----------|----------------------------------|-----------------|--|
|   | <b>DISTRICT CONSTRUCTION COSTS</b> |                                    |             |       |          |                                  |                 |  |
|   | 701                                | OPEN DITCH EXCAVATION              | \$ 1,850.00 | STA   | 337.5    | STA                              | \$ 624,375.00   |  |
|   | 702                                | OPEN DITCH SEEDING                 | \$ 100.00   | STA   | 337.5    | STA                              | \$ 33,750.00    |  |
|   | 703                                | CULVERT - JACK AND BORE (RAILROAD) | \$ 2,500.00 | LF    | 50       | LF                               | \$ 125,000.00   |  |
|   | 704                                | SURFACE DRAINS                     | \$ 1,900.00 | EA    | 100      | EA                               | \$ 190,000.00   |  |
|   | 705                                | LATERAL TILE OUTLET                | \$ 1,350.00 | EA    | 22       | EA                               | \$ 29,700.00    |  |
|   | 706                                | PRIVATE TILE OUTLET                | \$ 1,350.00 | EA    | 200      | EA                               | \$ 270,000.00   |  |
|   | 707                                | HEADWALL REMOVAL                   | \$ 5,000.00 | EA    | 1        | EA                               | \$ 5,000.00     |  |
|   | 708                                | TILE LOCATION                      | \$ 150.00   | STA   | 337.5    | STA                              | \$ 50,625.00    |  |
| 709                                     | TILE ABANDONMENT                   | \$ 100.00                          | LF          | 100   | LF       | \$ 10,000.00                     |                 |  |
| 710                                     | TILE REMOVAL                       | \$ 5.00                            | LF          | 33750 | LF       | \$ 168,750.00                    |                 |  |
|   |                                    |                                    |             |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 1,507,200.00 |  |
|   |                                    |                                    |             |       |          | Contingency (10%)                | \$ 150,720.00   |  |
|   |                                    |                                    |             |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 1,657,920.00 |  |
|   |                                    |                                    |             |       |          | Engr. & Const. Observation (20%) | \$ 331,584.00   |  |
|   |                                    |                                    |             |       |          | <b>TOTAL COST</b>                | \$ 1,989,504.00 |  |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |                                    |                                    |             |       |          |                                  |                 |  |
| 711                                     | CULVERT - OPEN CUT (ALL ROADS)     | \$ 90,000.00                       | LOC         | 6     | LOC      | \$ 540,000.00                    |                 |  |
| 712                                     | TILE REMOVAL                       | \$ 10.00                           | LF          | 300   | LF       | \$ 3,000.00                      |                 |  |
| 713                                     | REVTMENT                           | \$ 50.00                           | TN          | 1200  | TN       | \$ 60,000.00                     |                 |  |
| 714                                     | PERMANENT SEEDING AND WARRANTY     | \$ 2,000.00                        | LOC         | 6     | LOC      | \$ 12,000.00                     |                 |  |
| 715                                     | TRAFFIC CONTROL                    | \$ 2,000.00                        | LOC         | 6     | LOC      | \$ 12,000.00                     |                 |  |
|   |                                    |                                    |             |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 627,000.00   |  |
|   |                                    |                                    |             |       |          | Contingency (10%)                | \$ 62,700.00    |  |
|   |                                    |                                    |             |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 689,700.00   |  |
|   |                                    |                                    |             |       |          | Engr. & Const. Observation (25%) | \$ 172,425.00   |  |
|   |                                    |                                    |             |       |          | <b>TOTAL COST</b>                | \$ 862,125.00   |  |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



**SUPPLEMENT TO  
ENGINEER'S REPORT  
ON  
IMPROVEMENTS  
TO  
MAIN TILE  
DRAINAGE DISTRICT  
NO. 56  
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>Lee O. Gallentine</i>, P.E.      P.E. Mark B. Ziegler<br/>LEE O. GALLENTINE, P.E.      DATE</p> <p>LICENSE NUMBER: 15745<br/>MY LICENSE RENEWAL DATE IS DECEMBER 31, 2020<br/>PAGES OR SHEETS COVERED BY THIS SEAL:<br/>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  
Phone: 641-847-3273  
Fax: 641-847-2303



**Supplement to Engineer's Report on  
Improvements to Main Tile,  
Drainage District No. 56  
Hardin County, Iowa**

|   |          |
|---|----------|
| <b>Table of Contents</b>  | Pg. 1    |
| <b>Report</b>   |          |
| Introduction  | Pg. 2    |
| Improvement Methods   | Pgs. 3-4 |
| Opinion of Probable Construction Costs  | Pg. 5    |
| Recommendations   | Pg. 5    |
| <b>Appendices</b>   |          |
| Upper Main Outlet Improvement Map   | App. A   |
| Upper Main Tile Outlet with Single Tile Upsizing Capacities Chart                         | App. B   |
| Upper Main Tile Outlet with Dual Tile Upsizing Capacities Chart                           | App. C   |
| Upper Main Tile Outlet with Parallel Tile Upsizing Capacities Chart                       | App. D   |
| Lower Main Tile Capacities Chart  | App. E   |
| Upper Main Tile Outlet with Single Tile Upsizing Opinion of Probable Construction Costs   | App. F   |
| Upper Main Tile Outlet with Dual Tile Upsizing Opinion of Probable Construction Costs     | App. G   |
| Upper Main Tile Outlet with Parallel Tile Upsizing Opinion of Probable Construction Costs | App. H   |

**Supplement to Engineer's Report on  
Improvements to Main Tile,  
Drainage District No. 56  
Hardin County, Iowa**

1.0 INTRODUCTION

- SCOPE OF WORK – The Hardin County Board of Supervisors, acting as District Trustees, requested Clapsaddle-Garber Associates to investigate and report concerning improvements to the Main tile of Drainage District No. 56. At the regular drainage meeting held on February 27, 2019, the original Engineer's Report was discussed and reviewed by the District Trustees. As a result of this meeting, the District Trustees requested Clapsaddle-Garber Associates to move ahead with a supplemental report concerning an alternative outlet and improvement to portions of the Main tile.

2.0 IMPROVEMENT METHODS – To improve the drainage capacity for the upper reaches of the existing Main tile, the following options are additional options available:

Upper Main Outlet with Single Tile Upsizing

- Sever the existing Main tile, install a new outlet to the Main Open Ditch of Drainage District 26, and divert flows from the upper portion of the Main tile to the new outlet.
- For the specified length of the Main tile, remove and replace the existing Main tile with a single new Main tile of greater capacity. For reference, a chart with the required tile sizes and capacities is included in Appendix B.
- The point of severing and the new outlet would be at approximately ¼ mile east of D Avenue and run in a northerly direction (following the lower points of the land) until reaching the Main Open Ditch of Drainage District 26. Typically, the replacement Main tile would be in the same location as the existing Main tile in order to locate and reconnect private tile and lateral connections. For reference, the general routes of both are shown on the map included in Appendix A.

Upper Main Outlet with Dual Tile Upsizing

- Sever the existing Main tile, install a new outlet to the Main Open Ditch of Drainage District 26, and divert flows from the upper portion of the Main tile to the new outlet.
- For the specified length of the Main tile, remove and replace the existing Main tile with two new Main tiles of greater capacity. For reference, a chart with the required tile sizes and capacities is included in Appendix C.
- The point of severing and the new outlet would be at approximately ¼ mile east of D Avenue and run in a northerly direction (following the lower points of the land) until reaching the Main Open Ditch of Drainage District 26. Typically, the replacement Main tiles would be in the same location as the existing Main tile in order to locate and reconnect private tile and lateral connections. For reference, the general routes of both are shown on the map included in Appendix A.

Upper Main Outlet with Parallel Tile Upsizing

- Sever the existing Main tile, install a new outlet to the Main Open Ditch of Drainage District 26, and divert flows from the upper portion of the Main tile to the new outlet.
- For the specified length of the Main tile, leave the existing Main tile in place and install a new parallel Main tile for greater combined capacity. For reference, a chart with the required tile sizes and capacities is included in Appendix D.
- Typically, the supplemental Main tile would be near the location of the existing Main tile in order to locate and reconnect private tile and lateral connections and interconnect the two for flow equalization. For reference, the general routes of both are shown on the map included in Appendix A.

With the aforementioned improvement methods, the following assumptions should be noted:

- Due to the soil types and soil cover, all tile will have rock bedding for additional stability and strength.
- The existing ground elevations shown in the original design are still accurate.
- The only tiles being improved are the tiles identified in Appendices B, C, and D. The remainder of the tiles are not being improved or modified in any manner.
- The proposed pipe sizes shown in Appendices B, C, and D are those that are currently manufactured that meet or exceed the ½” or 1” drainage coefficient and match upstream improvement sizes.

- The proposed and existing capacities shown in Appendices B, C, and D are based on the assumptions that the Main tile is installed per the original design and that it is functioning at full capacity (i.e. are not collapsed, broken, plugged, etc).
- The proposed and existing pipe sizes and capacities shown in Appendices B, C, and D are those to serve the lands within the existing District boundaries along with added areas due to the new outlet and not any discharges from other lands outside the District boundaries.
- Portions of the Single Tile Upsizing, Dual Tile Upsizing, and Parallel Tile Upsizing options may prohibit farming over the proposed Main tile at certain areas due to a lack of soil cover and may even require mounding of soil above the proposed Main tile.
- The Single Tile Upsizing and Dual Tile Upsizing options would allow for some lower maintenance costs in the future as the specified length of the Main tile is new.
- The Parallel Tile Upsizing option would require higher maintenance costs in the future as the specified portion of the existing Main tile is left in service and is over 100 years old.
- The options presented in this report would require the taking of right of way, which is not included in the opinion of probable construction costs contained in the next section of this report
- The options presented do not increase drainage capacity for those portions of the Main tile upstream of the specified improvement stretch. It just shortens the length of restrictions between that point and the Main Open Ditch of Drainage District 26.
- The options presented do increase drainage capacity for those portions of the Main tile downstream of the upper main tile outlet as a large portion of the Drainage District drainage area has been removed from the Main tile.
- The options presented would turn the drainage area upstream of the Upper Main Tile Outlet into a separate Drainage District.
- The options presented can freely discharge into the Main Open Ditch of Drainage District 26 without charge.
- The proposed new tile outlet route would be installed at some large depths (20'±).
- The options presented may require annexation to extend the district boundary to the north to allow for installation of the proposed tile.
- 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 office to determine the existence of said jurisdictional wetlands and what said impact may be on them.

Per Iowa Code Chapter 468.126, the above actions would be considered an improvement. As such, Subsection 4, paragraph c of Chapter 468.126 states "If the estimated cost of the improvement 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 on whether to construct the proposed improvement and whether there shall be a reclassification of benefits for the cost of the proposed improvement." The opinion of probable construction costs contained in the next section of this report exceeds said \$50,000 limit. Therefore, a hearing will be required. Per Iowa Code Chapter 468.126.4.e, the right of remonstrance may apply to the proposed improvements.

3.0 OPINION OF PROBABLE CONSTRUCTION COSTS – Using the above methods of improvement, an itemized list of project quantities and associated opinions of probable construction cost for each option were compiled and are included in Appendices F, G, and H of this report. A summary of said costs (to nearest dollar) are as follows:

| METHOD  | DRAINAGE COEFF. | DISTRICT COST | ROAD CROSSING COST |
|---|-----------------|---------------|--------------------|
| Upper Main Outlet with Single Tile Upsizing   | ½”              | \$ 1,367,445  | \$ 54,697          |
|   | 1”              | \$ 1,872,642  | \$ 64,041          |
| Upper Main Outlet with Dual Tile Upsizing     | ½”              | \$ 1,894,818  | \$ 64,975          |
|   | 1”              | \$ 2,433,147  | \$ 75,253          |
| Upper Main Outlet with Parallel Tile Upsizing | ½”              | \$ 1,218,087  | \$ 46,288          |
|   | 1”              | \$ 1,800,735  | \$ 59,369          |

It should be noted that said costs include materials, labor, and equipment supplied by the contractor to complete the necessary 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, right of way acquisition, 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.

4.0 RECOMMENDATIONS – There is a definite need to perform one of the above mentioned actions. The improvements would remove the current restrictions and impediments to the upper reaches of the Main tile, extend the lifespan of the same, and improve the capacity of both upper and lower reaches of the same. 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 on the proposed improvements.
- Adopt one of the recommendations of the Original or Supplement to Engineer’s Report.
- If one of the options from this supplemental report are selected:
  - Confirm that Drainage District 56 should be split into two separate districts.
  - Confirm that the upper Main tile outlet can discharge freely into the Main Open Ditch of Drainage District 26 without charge.
  - Confirm if annexation is necessary to extend the the upper Main tile outlet to the north.
- Direct plans and specifications for the proposed improvements be prepared by Clapsaddle-Garber Associates.
- Proceed with receiving bids from interested contractors by Clapsaddle-Garber Associates.
- Award contract to the lowest responsible contractor.
- Seek legal advice whether reclassification is required.
- If desired or required by Iowa Code, proceed with reclassification proceedings.

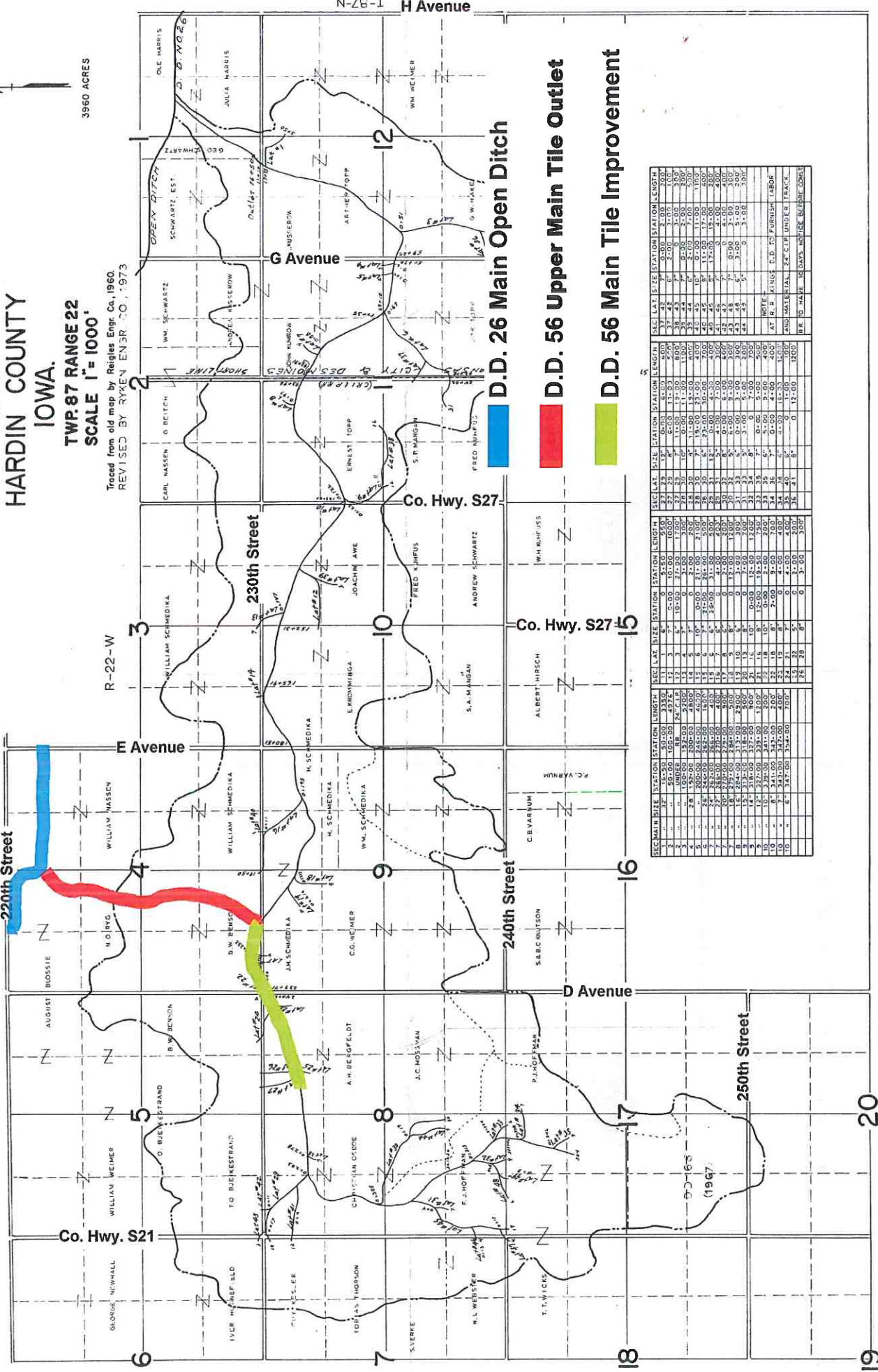


PLAT OF  
WICKS DRAINAGE DISTRICT  
NO. 56  
HARDIN COUNTY  
IOWA.

TWP. 87 RANGE 22  
SCALE 1" = 1000'

3960 ACRES

Traced from old map by Reigies Engr. Co., 1960.  
REVISED BY RYKEN ENGR. CO., 1973



**D.D. 26 Main Open Ditch**

**D.D. 56 Upper Main Tile Outlet**

**D.D. 56 Main Tile Improvement**

| SEC   | MAIN TILE |      | STATION |   | LENGTH |   | STATION |   | LENGTH |   | STATION |   | LENGTH |   |
|-------|-----------|------|---------|---|--------|---|---------|---|--------|---|---------|---|--------|---|
|       | NO.       | TYPE | 1       | 2 | 1      | 2 | 1       | 2 | 1      | 2 | 1       | 2 | 1      | 2 |
| 1     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 2     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 3     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 4     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 5     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 6     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 7     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 8     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 9     | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 10    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 11    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 12    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 13    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 14    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 15    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 16    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 17    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 18    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 19    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| 20    | 1         | 1    | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |
| TOTAL |           |      | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 | 0       | 0 | 0      | 0 |

NOTE: AT P.P. POINTS TO FURNISH LABOR AND MATERIAL FOR UNDER TRACKS. RE. TO HAVE 15 DAYS IN ADVANCE BEFORE COME.







By: J.V.S.  
 Date: 3/1/2019  
 Checked By: L.O.G.  
 Date: 3/11/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Upper Main Tile Outlet with Single Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| UPPER MAIN TILE OUTLET WITH SINGLE TILE UPSIZING<br>(IMPROVEMENT) | EXISTING     |   |                                |  | IMPROVEMENT                               |   |                               |                                       |  |                               |                                       |  |
|---|--------------|---|--------------------------------|--|---|---|-------------------------------|---------------------------------------|--|-------------------------------|---------------------------------------|--|
|   | STA          | EXISTING DESCRIPTION                                | INSTALLED<br>TILE SIZE<br>(in) | INSTALLED<br>TILE<br>CAPACITY<br>(cfs) | INSTALLED<br>TILE<br>CAPACITY<br>(in/day) | PROPOSED DESCRIPTION                      | 1/2" DRAINAGE COEFFICIENT     |                                       |  | 1" DRAINAGE COEFFICIENT       |                                       |  |
|   |              |   |                                |  |   |   | IMPROVED<br>TILE SIZE<br>(in) | IMPROVED<br>TILE<br>CAPACITY<br>(cfs) | IMPROVED<br>TILE<br>CAPACITY<br>(in/day) | IMPROVED<br>TILE SIZE<br>(in) | IMPROVED<br>TILE<br>CAPACITY<br>(cfs) | IMPROVED<br>TILE<br>CAPACITY<br>(in/day) |
|   | 0+00         | Tile empties into D.D. 26 Main Open Ditch           |                                |  |   | Tile empties into D.D. 26 Main Open Ditch | 48                            | 176.4                                 | 2.47                                     | 60                            | 319.8                                 | 4.48                                     |
|   | 11+00        | Grade change 1.5% - 0.20%                           |                                |  |   | Grade change 1.5% - 0.20%                 | 48                            | 64.4                                  | 0.91                                     | 60                            | 116.8                                 | 1.64                                     |
|   | 13+88        | Existing District Boundary                          |                                |  |   | Existing District Boundary                | 48                            | 64.4                                  | 0.91                                     | 60                            | 116.8                                 | 1.65                                     |
|   | 227+48/46+83 | Tile connects to new outlet                         | 28                             | 12.8                                   | 0.18                                      | Tile connects to new outlet               | 48                            | 53.9                                  | 0.75                                     | 60                            | 97.7                                  | 1.36                                     |
|   | 230+00       | Grade change 0.14% - 0.10%                          | 28                             | 10.8                                   | 0.17                                      | Grade change 0.14% - 0.10%                | 48                            | 45.5                                  | 0.70                                     | 60                            | 82.6                                  | 1.27                                     |
|   | 246+00       | Size change: 28" - 26"                              | 28/26                          | 8.9                                    | 0.17                                      |   | 48/42                         | 31.9                                  | 0.62                                     | 60/54                         | 62.4                                  | 1.22                                     |
|   | 260+00       | Grade change: 0.10% - 0.16%                         | 26                             | 11.2                                   | 0.22                                      | Grade change: 0.10% - 0.16%               | 42/36                         | 26.8                                  | 0.53                                     | 54/48                         | 57.6                                  | 1.14                                     |
|   | 262+00       | Size change: 26" - 24"                              | 26/24                          | 9.1                                    | 0.19                                      | End of Main Tile Improvement              | 36                            | 26.8                                  | 0.56                                     | 48                            | 57.6                                  | 1.21                                     |
|   | 266+00       | Size change: 24" - 22"                              | 24/22                          | 7.2                                    | 0.17                                      |   |                               |                                       |  |                               |                                       |  |
|   | 270+00       | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                          | 7.1                                    | 0.17                                      |   |                               |                                       |  |                               |                                       |  |
|   | 279+00       | Size change: 20" - 18"                              | 20/18                          | 5.4                                    | 0.14                                      |   |                               |                                       |  |                               |                                       |  |
|   | 284+00       | Size change: 18" - 16"                              | 18/16                          | 3.9                                    | 0.13                                      |   |                               |                                       |  |                               |                                       |  |
|   | 286+00       | Grade change: 0.26% - 0.18%                         | 16                             | 3.3                                    | 0.11                                      |   |                               |                                       |  |                               |                                       |  |
|   | 308+00       | Grade change: 0.18% - 0.10%                         | 16                             | 2.4                                    | 0.10                                      |   |                               |                                       |  |                               |                                       |  |
|   | 313+00       | Size change: 16" - 15"                              | 16/15                          | 2.0                                    | 0.09                                      |   |                               |                                       |  |                               |                                       |  |
|   | 318+00       | Size change: 15" - 14"                              | 15/14                          | 1.7                                    | 0.10                                      |   |                               |                                       |  |                               |                                       |  |
|   | 327+00       | Size change: 14" - 12"                              | 14/12                          | 1.1                                    | 0.07                                      |   |                               |                                       |  |                               |                                       |  |
|   | 339+00       | Size change: 12" - 10"                              | 12/10                          | 0.7                                    | 0.06                                      |   |                               |                                       |  |                               |                                       |  |
|   | 341+00       | Size change: 10" - 8"                               | 10/8                           | 0.4                                    | 0.04                                      |   |                               |                                       |  |                               |                                       |  |
|   | 343+00       | Size change: 8" - 7"                                | 8/7                            | 0.3                                    | 0.03                                      |   |                               |                                       |  |                               |                                       |  |
|   | 347+00       | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                            | 0.4                                    | 0.05                                      |   |                               |                                       |  |                               |                                       |  |
|   | 351+00       | Grade change: 0.48% - 0.90%                         | 6                              | 0.5                                    | 0.07                                      |   |                               |                                       |  |                               |                                       |  |
|   | 354+00       | End of Main tile                                    | 6                              |  |   |   |                               |                                       |  |                               |                                       |  |





By: J.V.S.  
 Date: 3/1/2019  
 Checked By: L.O.G.  
 Date: 3/11/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Upper Main Tile Outlet with Dual Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

UPPER MAIN TILE OUTLET WITH DUAL TILE UPSIZING (IMPROVEMENT)

| STA          | EXISTING DESCRIPTION                                | EXISTING                 |                               |                                  | PROPOSED DESCRIPTION                      | IMPROVEMENT                    |                                |                                    |                                       |                                |                                |                                    |                                       |
|--------------|---|--------------------------|-------------------------------|----------------------------------|---|--------------------------------|--------------------------------|------------------------------------|---------------------------------------|--------------------------------|--------------------------------|------------------------------------|---------------------------------------|
|              |   | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) |   | 1/2" DRAINAGE COEFFICIENT      |                                |                                    |                                       | 1" DRAINAGE COEFFICIENT        |                                |                                    |                                       |
|              |   |                          |                               |                                  |   | IMPROVED PIPE 1 TILE SIZE (in) | IMPROVED PIPE 2 TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) | IMPROVED PIPE 1 TILE SIZE (in) | IMPROVED PIPE 2 TILE SIZE (in) | TOTAL IMPROVED TILE CAPACITY (cfs) | TOTAL IMPROVED TILE CAPACITY (in/day) |
| 0+00         | Tile empties into D.D. 26 Main Open Ditch           |                          |                               |                                  | Tile empties into D.D. 26 Main Open Ditch | 36                             | 30                             | 132.3                              | 1.85                                  | 48                             | 36                             | 258.3                              | 3.62                                  |
| 11+00        | Grade change 1.5% - 0.20%                           |                          |                               |                                  | Grade change 1.5% - 0.20%                 | 36                             | 30                             | 48.3                               | 0.68                                  | 48                             | 36                             | 94.3                               | 1.33                                  |
| 13+88        | Existing District Boundary                          |                          |                               |                                  | Existing District Boundary                | 36                             | 30                             | 48.3                               | 0.68                                  | 48                             | 36                             | 94.3                               | 1.33                                  |
| 227+48/46+83 | Tile connects to new outlet                         | 28                       | 12.8                          | 0.18                             | Tile connects to new outlet               | 36                             | 30                             | 40.4                               | 0.62                                  | 48                             | 36                             | 78.9                               | 1.21                                  |
| 230+00       | Grade change 0.14% - 0.10%                          | 28                       | 10.8                          | 0.17                             | Grade change 0.14% - 0.10%                | 36                             | 30                             | 34.2                               | 0.53                                  | 48                             | 36                             | 66.7                               | 1.03                                  |
| 246+00       | Size change: 28" - 26"                              | 28/26                    | 8.9                           | 0.17                             |   | 36/30                          | 30                             | 26.0                               | 0.51                                  | 48/42                          | 36                             | 53.0                               | 1.04                                  |
| 260+00       | Grade change: 0.10% - 0.16%                         | 26                       | 11.2                          | 0.22                             | Grade change: 0.10% - 0.16%               | 30                             | 30/27                          | 28.9                               | 0.57                                  | 42/36                          | 36                             | 53.5                               | 1.06                                  |
| 262+00       | Size change: 26" - 24"                              | 26/24                    | 9.1                           | 0.19                             | End of Main Tile Improvement              | 30                             | 27                             | 24.8                               | 0.52                                  | 36                             | 36                             | 53.5                               | 1.13                                  |
| 266+00       | Size change: 24" - 22"                              | 24/22                    | 7.2                           | 0.17                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 270+00       | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                    | 7.1                           | 0.17                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 279+00       | Size change: 20" - 18"                              | 20/18                    | 5.4                           | 0.14                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 284+00       | Size change: 18" - 16"                              | 18/16                    | 3.9                           | 0.13                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 286+00       | Grade change: 0.26% - 0.18%                         | 16                       | 3.3                           | 0.11                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 308+00       | Grade change: 0.18% - 0.10%                         | 16                       | 2.4                           | 0.10                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 313+00       | Size change: 16" - 15"                              | 16/15                    | 2.0                           | 0.09                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 318+00       | Size change: 15" - 14"                              | 15/14                    | 1.7                           | 0.10                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 327+00       | Size change: 14" - 12"                              | 14/12                    | 1.1                           | 0.07                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 339+00       | Size change: 12" - 10"                              | 12/10                    | 0.7                           | 0.06                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 341+00       | Size change: 10" - 8"                               | 10/8                     | 0.4                           | 0.04                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 343+00       | Size change: 8" - 7"                                | 8/7                      | 0.3                           | 0.03                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 347+00       | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                      | 0.4                           | 0.05                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 351+00       | Grade change: 0.48% - 0.90%                         | 6                        | 0.5                           | 0.07                             |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |
| 354+00       | End of Main tile                                    | 6                        |                               |                                  |   |                                |                                |                                    |                                       |                                |                                |                                    |                                       |





By: J.V.S.  
 Date: 3/1/2019  
 Checked By: L.O.G.  
 Date: 3/11/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Upper Main Tile Outlet with Parallel Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| UPPER MAIN TILE OUTLET WITH PARALLEL TILE<br>UPSIZING (IMPROVEMENT) | EXISTING     |   |                                |  | IMPROVEMENT                               |   |   |  |   |   |  |   |
|---|--------------|---|--------------------------------|--|---|---|---|--|---|---|--|---|
|   | STA          | EXISTING DESCRIPTION                                | INSTALLED<br>TILE SIZE<br>(in) | INSTALLED<br>TILE<br>CAPACITY<br>(cfs) | INSTALLED<br>TILE<br>CAPACITY<br>(in/day) | PROPOSED DESCRIPTION                      | 1/2" DRAINAGE COEFFICIENT                 |  |   | 1" DRAINAGE COEFFICIENT                   |  |   |
|   |              |   |                                |  |   |   | IMPROVED<br>PARALLEL<br>TILE SIZE<br>(in) | TOTAL<br>IMPROVED<br>TILE<br>CAPACITY<br>(cfs) | TOTAL<br>IMPROVED<br>TILE<br>CAPACITY<br>(in/day) | IMPROVED<br>PARALLEL<br>TILE SIZE<br>(in) | TOTAL<br>IMPROVED<br>TILE<br>CAPACITY<br>(cfs) | TOTAL<br>IMPROVED<br>TILE<br>CAPACITY<br>(in/day) |
|   | 0+00         | Tile empties into D.D. 26 Main Open Ditch           |                                |  |   | Tile empties into D.D. 26 Main Open Ditch | 42  | 123.6  | 1.73  | 54  | 241.5  | 3.38  |
|   | 11+00        | Grade change 1.5% - 0.20%                           |                                |  |   | Grade change 1.5% - 0.20%                 | 42  | 45.1   | 0.64  | 54  | 88.2   | 1.24  |
|   | 13+88        | Existing District Boundary                          |                                |  |   | Existing District Boundary                | 42  | 45.1   | 0.64  | 54  | 88.2   | 1.24  |
|   | 227+48/46+83 | Tile connects to new outlet                         | 28                             | 12.8                                   | 0.18                                      | Tile connects to new outlet               | 42  | 50.5   | 0.78  | 54  | 86.6   | 1.33  |
|   | 230+00       | Grade change 0.14% - 0.10%                          | 28                             | 10.8                                   | 0.17                                      | Grade change 0.14% - 0.10%                | 42  | 42.7   | 0.66  | 54  | 73.2   | 1.13  |
|   | 246+00       | Size change: 28" - 26"                              | 28/26                          | 8.9                                    | 0.17                                      |   | 42/36                                     | 30.0   | 0.59  | 54/48                                     | 54.4   | 1.07  |
|   | 260+00       | Grade change: 0.10% - 0.16%                         | 26                             | 11.2                                   | 0.22                                      | Grade change: 0.10% - 0.16%               | 36/30                                     | 27.7   | 0.55  | 48/42                                     | 51.6   | 1.03  |
|   | 262+00       | Size change: 26" - 24"                              | 26/24                          | 9.1                                    | 0.19                                      | End of Main Tile Improvement              | 30  | 25.5   | 0.54  | 42  | 49.4   | 1.04  |
|   | 266+00       | Size change: 24" - 22"                              | 24/22                          | 7.2                                    | 0.17                                      |   |   |  |   |   |  |   |
|   | 270+00       | Size change: 22" - 20", Grade change: 0.16% - 0.26% | 22/20                          | 7.1                                    | 0.17                                      |   |   |  |   |   |  |   |
|   | 279+00       | Size change: 20" - 18"                              | 20/18                          | 5.4                                    | 0.14                                      |   |   |  |   |   |  |   |
|   | 284+00       | Size change: 18" - 16"                              | 18/16                          | 3.9                                    | 0.13                                      |   |   |  |   |   |  |   |
|   | 286+00       | Grade change: 0.26% - 0.18%                         | 16                             | 3.3                                    | 0.11                                      |   |   |  |   |   |  |   |
|   | 308+00       | Grade change: 0.18% - 0.10%                         | 16                             | 2.4                                    | 0.10                                      |   |   |  |   |   |  |   |
|   | 313+00       | Size change: 16" - 15"                              | 16/15                          | 2.0                                    | 0.09                                      |   |   |  |   |   |  |   |
|   | 318+00       | Size change: 15" - 14"                              | 15/14                          | 1.7                                    | 0.10                                      |   |   |  |   |   |  |   |
|   | 327+00       | Size change: 14" - 12"                              | 14/12                          | 1.1                                    | 0.07                                      |   |   |  |   |   |  |   |
|   | 339+00       | Size change: 12" - 10"                              | 12/10                          | 0.7                                    | 0.06                                      |   |   |  |   |   |  |   |
|   | 341+00       | Size change: 10" - 8"                               | 10/8                           | 0.4                                    | 0.04                                      |   |   |  |   |   |  |   |
|   | 343+00       | Size change: 8" - 7"                                | 8/7                            | 0.3                                    | 0.03                                      |   |   |  |   |   |  |   |
|   | 347+00       | Size change: 7" - 6", Grade change: 0.10% - 0.48%   | 7/6                            | 0.4                                    | 0.05                                      |   |   |  |   |   |  |   |
|   | 351+00       | Grade change: 0.48% - 0.90%                         | 6                              | 0.5                                    | 0.07                                      |   |   |  |   |   |  |   |
|   | 354+00       | End of Main tile                                    | 6                              |  |   |   |   |  |   |   |  |   |





By: J.V.S.  
 Date: 3/1/2019  
 Checked By: L.O.G.  
 Date: 3/12/2019

**Engineer's Opinion of Main tile Capacities**

**Project: Upper Main Tile Outlet for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

**IMPROVED - DOWNSTREAM REACHES OF MAIN TILE**

| DOWNSTREAM OF UPPER MAIN TILE OUTLET (IMPROVEMENT) | STA                         | EXISTING DESCRIPTION                                | INSTALLED TILE SIZE (in) | INSTALLED TILE CAPACITY (cfs) | INSTALLED TILE CAPACITY (in/day) | IMPROVED TILE CAPACITY (cfs) | IMPROVED TILE CAPACITY (in/day) |
|--|-----------------------------|---|--------------------------|-------------------------------|----------------------------------|------------------------------|---------------------------------|
|  | 16+50                       | Existing Main tile empties into open ditch          | 32                       | 12.0                          | 0.07                             | 12.0                         | 0.13                            |
|  | 28+00                       | Grade change: 0.06% - 0.18%                         | 32                       | 20.7                          | 0.13                             | 20.7                         | 0.24                            |
|  | 51+00                       | Lateral 3   | 32                       | 20.7                          | 0.14                             | 20.7                         | 0.27                            |
|  | 70+00                       | Grade change: 0.18% - 0.14%                         | 32                       | 18.3                          | 0.13                             | 18.3                         | 0.28                            |
|  | 100+00                      | Grade change: 0.14% - 0.12%                         | 32                       | 16.9                          | 0.13                             | 16.9                         | 0.30                            |
|  | 122+76                      | West side Co Hwy S27                                | 32                       | 16.9                          | 0.14                             | 16.9                         | 0.35                            |
|  | 152+00                      | Size change: 32" - 28", Grade change: 0.12% - 0.28% | 32/28                    | 18.1                          | 0.17                             | 18.1                         | 0.49                            |
|  | 168+50                      | Lateral 14  | 28                       | 18.1                          | 0.18                             | 18.1                         | 0.59                            |
|  | 180+00                      | Grade change: 0.28% - 0.24%                         | 28                       | 16.8                          | 0.17                             | 16.8                         | 0.62                            |
| 190+00   | Grade change: 0.24% - 0.22% | 28  | 16.0                     | 0.17                          | 16.0                             | 0.62                         |                                 |
| 200+00   | Grade change: 0.22 - 0.18%  | 28  | 14.5                     | 0.17                          | 14.5                             | 1.09                         |                                 |
| 220+00   | Grade change 0.18% - 0.14%  | 28  | 12.8                     | 0.18                          | 12.8                             | 15.86                        |                                 |
| 227+48   | End of Lower Reaches        | 28  | 12.8                     |                               | 12.8                             |                              |                                 |







By: J.V.S.

Date: 3/1/2019

Checked By: L.O.G.

Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**

**Project: Upper Main Tile Outlet with Single Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| ITEM #                                  | DESCRIPTION                                     | Unit Cost   | Units | Quantity | Units | Total Cost      |
|---|---|-------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |             |       |          |       |                 |
| 1001                                    | 54" CMP TILE OUTLET                             | \$ 130.00   | LF    | 40       | LF    | \$ 5,200.00     |
| 1002                                    | 48" TRIPLE WALL PPE or RCP TILE                 | \$ 130.00   | LF    | 6365     | EA    | \$ 827,450.00   |
| 1003                                    | 42" TRIPLE WALL PPE or RCP TILE                 | \$ 90.00    | LF    | 1400     | LF    | \$ 126,000.00   |
| 1004                                    | 36" TRIPLE WALL PPE or RCP TILE                 | \$ 75.00    | LF    | 200      | LF    | \$ 15,000.00    |
| 1005                                    | 48" x 42" REDUCER                               | \$ 3,000.00 | EA    | 1        | EA    | \$ 3,000.00     |
| 1006                                    | 42" x 36" REDUCER                               | \$ 2,500.00 | EA    | 1        | EA    | \$ 2,500.00     |
| 1007                                    | 36" x 24" REDUCER                               | \$ 2,000.00 | EA    | 1        | EA    | \$ 2,000.00     |
| 1008                                    | 54" RODENT GUARD                                | \$ 1,500.00 | EA    | 1        | EA    | \$ 1,500.00     |
| 1009                                    | BANK STABILIZATION                              | \$ 50.00    | TON   | 50       | TON   | \$ 2,500.00     |
| 1010                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00 | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1011                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00 | EA    | 7        | EA    | \$ 7,000.00     |
| 1012                                    | CONCRETE COLLAR                                 | \$ 600.00   | EA    | 2        | EA    | \$ 1,200.00     |
| 1013                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00   | EA    | 40       | EA    | \$ 20,000.00    |
| 1014                                    | TILE LOCATION                                   | \$ 150.00   | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1015                                    | TILE REMOVAL                                    | \$ 5.00     | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 1,035,943.00 |
| Contingency (10%)                       |   |             |       |          |       | \$ 103,594.30   |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 1,139,537.30 |
| Engr. & Const. Observation (20%)        |   |             |       |          |       | \$ 227,907.46   |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 1,367,444.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |             |       |          |       |                 |
| 1016                                    | 48" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 175.00   | LF    | 130      | LF    | \$ 22,750.00    |
| 1017                                    | TILE REMOVAL                                    | \$ 10.00    | LF    | 130      | LF    | \$ 1,300.00     |
| 1018                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00 | EA    | 4        | EA    | \$ 8,000.00     |
| 1019                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00 | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1020                                    | TRAFFIC CONTROL                                 | \$ 3,000.00 | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 38,050.00    |
| Contingency (15%)                       |   |             |       |          |       | \$ 5,707.50     |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 43,757.50    |
| Engr. & Const. Observation (25%)        |   |             |       |          |       | \$ 10,939.38    |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 54,696.88    |

UPPER MAIN TILE OUTLET WITH SINGLE TILE UPSIZING - IMPROVEMENT (1/2")

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.

Date: 3/1/2019

Checked By: L.O.G.

Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Upper Main Tile Outlet with Single Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| ITEM #                                  | DESCRIPTION                                     | Unit Cost   | Units | Quantity | Units | Total Cost      |
|---|---|-------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |             |       |          |       |                 |
| 1101                                    | 72" CMP TILE OUTLET                             | \$ 175.00   | LF    | 40       | LF    | \$ 7,000.00     |
| 1102                                    | 60" TRIPLE WALL PPE or RCP TILE                 | \$ 175.00   | LF    | 6365     | EA    | \$ 1,113,875.00 |
| 1103                                    | 54" TRIPLE WALL PPE or RCP TILE                 | \$ 150.00   | LF    | 1400     | EA    | \$ 210,000.00   |
| 1104                                    | 48" TRIPLE WALL PPE or RCP TILE                 | \$ 110.00   | LF    | 200      | LF    | \$ 22,000.00    |
| 1105                                    | 60" x 54" REDUCER                               | \$ 4,000.00 | EA    | 1        | EA    | \$ 4,000.00     |
| 1106                                    | 54" x 48" REDUCER                               | \$ 3,500.00 | EA    | 1        | EA    | \$ 3,500.00     |
| 1107                                    | 48" x 24" REDUCER                               | \$ 3,000.00 | EA    | 1        | EA    | \$ 3,000.00     |
| 1108                                    | 72" RODENT GUARD                                | \$ 2,000.00 | EA    | 1        | EA    | \$ 2,000.00     |
| 1109                                    | BANK STABILIZATION                              | \$ 50.00    | TON   | 50       | TON   | \$ 2,500.00     |
| 1110                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00 | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1111                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00 | EA    | 7        | EA    | \$ 7,000.00     |
| 1112                                    | CONCRETE COLLAR                                 | \$ 600.00   | EA    | 2        | EA    | \$ 1,200.00     |
| 1113                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00   | EA    | 40       | EA    | \$ 20,000.00    |
| 1114                                    | TILE LOCATION                                   | \$ 150.00   | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1115                                    | TILE REMOVAL                                    | \$ 5.00     | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 1,418,668.00 |
| Contingency (10%)                       |   |             |       |          |       | \$ 141,866.80   |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 1,560,534.80 |
| Engr. & Const. Observation (20%)        |   |             |       |          |       | \$ 312,106.96   |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 1,872,641.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |             |       |          |       |                 |
| 1116                                    | 60" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 225.00   | LF    | 130      | LF    | \$ 29,250.00    |
| 1117                                    | TILE REMOVAL                                    | \$ 10.00    | LF    | 130      | LF    | \$ 1,300.00     |
| 1118                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00 | EA    | 4        | EA    | \$ 8,000.00     |
| 1119                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00 | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1120                                    | TRAFFIC CONTROL                                 | \$ 3,000.00 | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |             |       |          |       | \$ 44,550.00    |
| Contingency (15%)                       |   |             |       |          |       | \$ 6,682.50     |
| <b>CONSTRUCTION TOTAL</b>               |   |             |       |          |       | \$ 51,232.50    |
| Engr. & Const. Observation (25%)        |   |             |       |          |       | \$ 12,808.13    |
| <b>TOTAL COST</b>                       |   |             |       |          |       | \$ 64,040.63    |

UPPER MAIN TILE OUTLET WITH SINGLE TILE UPSIZING - IMPROVEMENT (1")

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense





By: J.V.S.

Date: 3/1/2019

Checked By: L.O.G.

Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**

Project: **Upper Main Tile Outlet with Dual Tile Upsizing** for D.D. #56

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

UPPER MAIN TILE OUTLET WITH DUAL TILE UPSIZING - IMPROVEMENT (1/2")

| ITEM #                                  | DESCRIPTION                                     | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 1201                                    | 42" CMP TILE OUTLET                             | \$ 110.00    | LF    | 40       | LF    | \$ 4,400.00     |
| 1202                                    | 36" CMP TILE OUTLET                             | \$ 90.00     | LF    | 40       | LF    | \$ 3,600.00     |
| 1203                                    | 36" TRIPLE WALL PPE or RCP TILE                 | \$ 90.00     | LF    | 6365     | EA    | \$ 572,850.00   |
| 1204                                    | 30" DUAL WALL PPE or RCP TILE                   | \$ 75.00     | LF    | 9365     | EA    | \$ 702,375.00   |
| 1205                                    | 27" DUAL WALL PPE or RCP TILE                   | \$ 50.00     | LF    | 200      | LF    | \$ 10,000.00    |
| 1206                                    | 36" x 30" REDUCER                               | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 1207                                    | 30" x 27" REDUCER                               | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 1208                                    | 27" x 24" REDUCER                               | \$ 1,600.00  | EA    | 1        | EA    | \$ 1,600.00     |
| 1209                                    | 30" x 24" REDUCER                               | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 1210                                    | FLOW EQUALIZATION STRUCTURE                     | \$ 10,000.00 | EA    | 8        | EA    | \$ 80,000.00    |
| 1211                                    | 42" RODENT GUARD                                | \$ 1,000.00  | EA    | 1        | EA    | \$ 1,000.00     |
| 1212                                    | 36" RODENT GUARD                                | \$ 750.00    | EA    | 1        | EA    | \$ 750.00       |
| 1213                                    | BANK STABILIZATION                              | \$ 50.00     | TON   | 50       | TON   | \$ 2,500.00     |
| 1214                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00  | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1215                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00  | EA    | 7        | EA    | \$ 7,000.00     |
| 1216                                    | CONCRETE COLLAR                                 | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 1217                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00    | EA    | 40       | EA    | \$ 20,000.00    |
| 1218                                    | TILE LOCATION                                   | \$ 150.00    | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1219                                    | TILE REMOVAL                                    | \$ 5.00      | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 1,435,468.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 143,546.80   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 1,579,014.80 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 315,802.96   |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 1,894,817.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 1220                                    | 36" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 125.00    | LF    | 130      | LF    | \$ 16,250.00    |
| 1221                                    | 30" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 105.00    | LF    | 130      | LF    | \$ 13,650.00    |
| 1222                                    | TILE REMOVAL                                    | \$ 10.00     | LF    | 130      | LF    | \$ 1,300.00     |
| 1223                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00  | EA    | 4        | EA    | \$ 8,000.00     |
| 1224                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1225                                    | TRAFFIC CONTROL                                 | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 45,200.00    |
| Contingency (15%)                       |   |              |       |          |       | \$ 6,780.00     |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 51,980.00    |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 12,995.00    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 64,975.00    |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.  
 Date: 3/1/2019  
 Checked By: L.O.G.  
 Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**  
**Project: Upper Main Tile Outlet with Dual Tile Upsizing for D.D #56**  
 Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| ITEM #                                  | DESCRIPTION                                     | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 1301                                    | 54" CMP TILE OUTLET                             | \$ 130.00    | LF    | 40       | LF    | \$ 5,200.00     |
| 1302                                    | 42" CMP TILE OUTLET                             | \$ 110.00    | LF    | 40       | LF    | \$ 4,400.00     |
| 1303                                    | 48" TRIPLE WALL PPE or RCP TILE                 | \$ 130.00    | LF    | 6365     | EA    | \$ 827,450.00   |
| 1304                                    | 42" TRIPLE WALL PPE or RCP TILE                 | \$ 90.00     | LF    | 1400     | EA    | \$ 126,000.00   |
| 1305                                    | 36" TRIPLE WALL PPE or RCP TILE                 | \$ 90.00     | LF    | 8165     | EA    | \$ 734,850.00   |
| 1306                                    | 48" x 42" REDUCER                               | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 1307                                    | 42" x 36" REDUCER                               | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 1308                                    | 36" x 24" REDUCER                               | \$ 2,000.00  | EA    | 2        | EA    | \$ 4,000.00     |
| 1309                                    | FLOW EQUALIZATION STRUCTURE                     | \$ 10,000.00 | EA    | 8        | EA    | \$ 80,000.00    |
| 1310                                    | 54" RODENT GUARD                                | \$ 1,500.00  | EA    | 1        | EA    | \$ 1,500.00     |
| 1311                                    | 42" RODENT GUARD                                | \$ 1,100.00  | EA    | 1        | EA    | \$ 1,100.00     |
| 1312                                    | BANK STABILIZATION                              | \$ 50.00     | TON   | 50       | TON   | \$ 2,500.00     |
| 1313                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00  | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1314                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00  | EA    | 7        | EA    | \$ 7,000.00     |
| 1315                                    | CONCRETE COLLAR                                 | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 1316                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00    | EA    | 40       | EA    | \$ 20,000.00    |
| 1317                                    | TILE LOCATION                                   | \$ 150.00    | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1318                                    | TILE REMOVAL                                    | \$ 5.00      | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 1,843,293.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 184,329.30   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 2,027,622.30 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 405,524.46   |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 2,433,146.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 1319                                    | 48" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 175.00    | LF    | 130      | LF    | \$ 22,750.00    |
| 1320                                    | 36" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 110.00    | LF    | 130      | LF    | \$ 14,300.00    |
| 1321                                    | TILE REMOVAL                                    | \$ 10.00     | LF    | 130      | LF    | \$ 1,300.00     |
| 1322                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00  | EA    | 4        | EA    | \$ 8,000.00     |
| 1323                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1324                                    | TRAFFIC CONTROL                                 | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 52,350.00    |
| Contingency (15%)                       |   |              |       |          |       | \$ 7,852.50     |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 60,202.50    |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 15,050.63    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 75,253.13    |

UPPER MAIN TILE OUTLET WITH DUAL TILE UPSIZING - IMPROVEMENT (1")

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense





By: J.V.S.

Date: 3/1/2019

Checked By: L.O.G.

Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**

**Project: Upper Main Tile Outlet with Parallel Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| ITEM #                                  | DESCRIPTION                                     | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 1401                                    | 48" CMP TILE OUTLET                             | \$ 120.00    | LF    | 40       | LF    | \$ 4,800.00     |
| 1402                                    | 42" TRIPLE WALL PPE or RCP TILE                 | \$ 110.00    | LF    | 6365     | LF    | \$ 700,150.00   |
| 1403                                    | 36" TRIPLE WALL PPE or RCP TILE                 | \$ 75.00     | LF    | 1400     | LF    | \$ 105,000.00   |
| 1404                                    | 30" DUAL WALL PPE or RCP TILE                   | \$ 60.00     | LF    | 200      | LF    | \$ 12,000.00    |
| 1405                                    | 42" x 36" REDUCER                               | \$ 2,500.00  | EA    | 1        | EA    | \$ 2,500.00     |
| 1406                                    | 36" x 30" REDUCER                               | \$ 2,000.00  | EA    | 1        | EA    | \$ 2,000.00     |
| 1407                                    | 30" x 24" REDUCER                               | \$ 1,800.00  | EA    | 1        | EA    | \$ 1,800.00     |
| 1408                                    | FLOW EQUALIZATION STRUCTURE                     | \$ 10,000.00 | EA    | 4        | EA    | \$ 40,000.00    |
| 1409                                    | 48" RODENT GUARD                                | \$ 1,250.00  | EA    | 1        | EA    | \$ 1,250.00     |
| 1410                                    | BANK STABILIZATION                              | \$ 50.00     | TON   | 50       | TON   | \$ 2,500.00     |
| 1411                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00  | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1412                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00  | EA    | 7        | EA    | \$ 7,000.00     |
| 1413                                    | CONCRETE COLLAR                                 | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 1414                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00    | EA    | 40       | EA    | \$ 20,000.00    |
| 1415                                    | TILE LOCATION                                   | \$ 150.00    | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1416                                    | TILE REMOVAL                                    | \$ 5.00      | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 922,793.00   |
| Contingency (10%)                       |   |              |       |          |       | \$ 92,279.30    |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 1,015,072.30 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 203,014.46   |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 1,218,086.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 1417                                    | 42" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 130.00    | LF    | 130      | LF    | \$ 16,900.00    |
| 1418                                    | TILE REMOVAL                                    | \$ 10.00     | LF    | 130      | LF    | \$ 1,300.00     |
| 1419                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00  | EA    | 4        | EA    | \$ 8,000.00     |
| 1420                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1421                                    | TRAFFIC CONTROL                                 | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 32,200.00    |
| Contingency (15%)                       |   |              |       |          |       | \$ 4,830.00     |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 37,030.00    |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 9,257.50     |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 46,287.50    |

UPPER MAIN TILE OUTLET WITH PARALLEL TILE UPSIZING - IMPROVEMENT (1/2")

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense



By: J.V.S.

Date: 3/1/2019

Checked By: L.O.G.

Date: 3/12/2019

**Engineer's Opinion of Probable Construction Cost**

**Project: Upper Main Tile Outlet with Parallel Tile Upsizing for D.D. #56**

Location: Sections 1, 4, 7, 8, 9, 10, 11, 12 & 17 T87N, R22W Hardin County, Iowa

| ITEM #                                  | DESCRIPTION                                     | Unit Cost    | Units | Quantity | Units | Total Cost      |
|---|---|--------------|-------|----------|-------|-----------------|
| <b>DISTRICT CONSTRUCTION COSTS</b>      |   |              |       |          |       |                 |
| 1501                                    | 60" CMP TILE OUTLET                             | \$ 140.00    | LF    | 40       | LF    | \$ 5,600.00     |
| 1502                                    | 54" TRIPLE WALL PPE or RCP TILE                 | \$ 170.00    | LF    | 6365     | EA    | \$ 1,082,050.00 |
| 1503                                    | 48" TRIPLE WALL PPE or RCP TILE                 | \$ 110.00    | LF    | 1400     | LF    | \$ 154,000.00   |
| 1504                                    | 42" TRIPLE WALL PPE or RCP TILE                 | \$ 90.00     | LF    | 200      | LF    | \$ 18,000.00    |
| 1505                                    | 54" x 48" REDUCER                               | \$ 3,500.00  | EA    | 1        | EA    | \$ 3,500.00     |
| 1506                                    | 48" x 42" REDUCER                               | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 1507                                    | 42" x 24" REDUCER                               | \$ 3,000.00  | EA    | 1        | EA    | \$ 3,000.00     |
| 1508                                    | FLOW EQUILIZATION STRUCTURE                     | \$ 10,000.00 | EA    | 4        | EA    | \$ 40,000.00    |
| 1509                                    | 60" RODENT GUARD                                | \$ 1,750.00  | EA    | 1        | EA    | \$ 1,750.00     |
| 1510                                    | BANK STABILIZATION                              | \$ 50.00     | TON   | 50       | TON   | \$ 2,500.00     |
| 1511                                    | PLUG EXISTING DOWNSTREAM MAIN TILE              | \$ 1,000.00  | LOC   | 1        | LOC   | \$ 1,000.00     |
| 1512                                    | LATERAL TILE CONNECTIONS                        | \$ 1,000.00  | EA    | 7        | EA    | \$ 7,000.00     |
| 1513                                    | CONCRETE COLLAR                                 | \$ 600.00    | EA    | 2        | EA    | \$ 1,200.00     |
| 1514                                    | PRIVATE TILE CONNECTIONS                        | \$ 500.00    | EA    | 40       | EA    | \$ 20,000.00    |
| 1515                                    | TILE LOCATION                                   | \$ 150.00    | STA   | 33.22    | STA   | \$ 4,983.00     |
| 1516                                    | TILE REMOVAL                                    | \$ 5.00      | LF    | 3322     | LF    | \$ 16,610.00    |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 1,364,193.00 |
| Contingency (10%)                       |   |              |       |          |       | \$ 136,419.30   |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 1,500,612.30 |
| Engr. & Const. Observation (20%)        |   |              |       |          |       | \$ 300,122.46   |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 1,800,734.76 |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |   |              |       |          |       |                 |
| 1517                                    | 54" TILE - OPEN CUT (D AVENUE AND 230TH STREET) | \$ 200.00    | LF    | 130      | LF    | \$ 26,000.00    |
| 1518                                    | TILE REMOVAL                                    | \$ 10.00     | LF    | 130      | LF    | \$ 1,300.00     |
| 1519                                    | HICKENBOTTOM INTAKE                             | \$ 2,000.00  | EA    | 4        | EA    | \$ 8,000.00     |
| 1520                                    | PERMANENT SEEDING AND WARRANTY                  | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| 1521                                    | TRAFFIC CONTROL                                 | \$ 3,000.00  | LOC   | 1        | LOC   | \$ 3,000.00     |
| <b>CONSTRUCTION SUBTOTAL</b>            |   |              |       |          |       | \$ 41,300.00    |
| Contingency (15%)                       |   |              |       |          |       | \$ 6,195.00     |
| <b>CONSTRUCTION TOTAL</b>               |   |              |       |          |       | \$ 47,495.00    |
| Engr. & Const. Observation (25%)        |   |              |       |          |       | \$ 11,873.75    |
| <b>TOTAL COST</b>                       |   |              |       |          |       | \$ 59,368.75    |

UPPER MAIN TILE OUTLET WITH PARALLEL TILE UPSIZING - IMPROVEMENT (1")

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense





By: J.V.S.

Date: 1/28/2019

Checked By: L.O.G.

Date: 2/4/2019

Revised By: L.O.G.

Date: 3/21/2019

**Revised Engineer's Opinion of Probable Construction Cost**

Project: **Upper Main Tile Outlet** for D.D. #56

Location: Sections 3 & 10 T87N, R22W Hardin County, Iowa

| UPPER MAIN TILE OUTLET (IMPROVEMENT)    | ITEM #                             | DESCRIPTION                        | Unit Cost    | Units | Quantity | Units                            | Total Cost      |  |
|---|------------------------------------|------------------------------------|--------------|-------|----------|----------------------------------|-----------------|--|
|   | <b>DISTRICT CONSTRUCTION COSTS</b> |                                    |              |       |          |                                  |                 |  |
|   | 1                                  | 54" CMP TILE OUTLET                | \$ 140.00    | LF    | 40       | LF                               | \$ 5,600.00     |  |
|   | 2                                  | 48" TRIPLE WALL PPE or RCP TILE    | \$ 150.00    | LF    | 4900     | LF                               | \$ 735,000.00   |  |
|   | 3                                  | 54" RODENT GUARD                   | \$ 1,000.00  | EA    | 1        | EA                               | \$ 1,000.00     |  |
|   | 4                                  | JUNCTION STRUCTURE                 | \$ 10,000.00 | EA    | 1        | EA                               | \$ 10,000.00    |  |
|   | 5                                  | BANK STABILIZATION                 | \$ 50.00     | TON   | 50       | TON                              | \$ 2,500.00     |  |
|   | 6                                  | PLUG EXISTING DOWNSTREAM MAIN TILE | \$ 1,000.00  | LOC   | 1        | LOC                              | \$ 1,000.00     |  |
|   | 7                                  | CONCRETE COLLAR                    | \$ 600.00    | EA    | 1        | EA                               | \$ 600.00       |  |
|   | 8                                  | PRIVATE TILE CONNECTIONS           | \$ 1,000.00  | EA    | 20       | EA                               | \$ 20,000.00    |  |
| 9                                       | TILE LOCATION                      | \$ 150.00                          | STA          | 2     | STA      | \$ 300.00                        |                 |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 776,000.00   |  |
|   |                                    |                                    |              |       |          | Contingency (15%)                | \$ 116,400.00   |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 892,400.00   |  |
|   |                                    |                                    |              |       |          | Engr. & Const. Observation (20%) | \$ 178,480.00   |  |
|   |                                    |                                    |              |       |          | <b>TOTAL COST</b>                | \$ 1,070,880.00 |  |
| <b>ROAD CROSSING CONSTRUCTION COSTS</b> |                                    |                                    |              |       |          |                                  |                 |  |
| 10                                      | 48" TILE - OPEN CUT (230TH STREET) | \$ 250.00                          | LF           | 30    | LF       | \$ 7,500.00                      |                 |  |
| 11                                      | HICKENBOTTOM INTAKE                | \$ 2,000.00                        | EA           | 2     | EA       | \$ 4,000.00                      |                 |  |
| 12                                      | PERMANENT SEEDING AND WARRANTY     | \$ 2,000.00                        | LOC          | 1     | LOC      | \$ 2,000.00                      |                 |  |
| 13                                      | TRAFFIC CONTROL                    | \$ 2,000.00                        | LOC          | 1     | LOC      | \$ 2,000.00                      |                 |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION SUBTOTAL</b>     | \$ 15,500.00    |  |
|   |                                    |                                    |              |       |          | Contingency (15%)                | \$ 2,325.00     |  |
|   |                                    |                                    |              |       |          | <b>CONSTRUCTION TOTAL</b>        | \$ 17,825.00    |  |
|   |                                    |                                    |              |       |          | Engr. & Const. Observation (25%) | \$ 4,456.25     |  |
|   |                                    |                                    |              |       |          | <b>TOTAL COST</b>                | \$ 22,281.25    |  |

Note: Per Iowa Code, road crossings (highlighted red) are not typically district expense