ENGINEER'S REPORT ON IMPROVEMENTS TO THE MAIN TILES DRAINAGE DISTRICT NO. 120 HARDIN COUNTY, IOWA

JAMES V. SWEENEY LICENSED 2442541 IOWA PROFESSIONAL ENGINEER

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

JAMES V. SWEENEY, P.E. — DATE: 04/23/2021

LICENSE NUMBER: P2442541
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2021
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Engineer's Report on Improvements to the Main Tiles, Drainage District No. 120 Hardin County, Iowa

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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 repairs or improvements to the Main tiles of Drainage District No. 120 (Ext. No. 5). This report will detail the feasibility of said repairs or improvements, and present opinions of probable construction costs associated with said repairs or improvements. At the Landowner's Meeting held on June 24, 2020, the investigation summary for Work Order #298 was discussed and reviewed by the District Trustees. For reference, a copy of the meeting minutes is included in Appendix Q and a copy of the Investigation Summary for Work Order #298 is included in Appendix R. As a result of this meeting, the District Trustees requested Clapsaddle-Garber Associates to move ahead with an investigation and report concerning repairs or improvements to the Main tiles.

- LOCATION – The area of investigation was limited to the lower end of the original 1908 Main tile (Sta. 0+00 to Sta. 68+00) and the entirety of the 1922 Parallel Main tile (Sta. 12+73 to Sta. 76+00). The Stations listed for each of the Mains correspond with a relatively similar path and length, the exception of which being the lower end of the original main being shorter, and the upper end of the 1922 Main being straighter. Said Main tiles are located in Sections 4, 9 and 16, Township 89 North (T89N), Range 20 West (R20W), Hardin County, Iowa. Specifically, the downstream limit of investigation for both Main tiles is at their outlets at an open channel just south of the section line between Sections 9 and 16 at approximately ½ mile west of County Highway S45. Going upstream, the tiles then proceed north and enter Section 9 at approximately ½ mile west of County Highway S45. The tiles then proceed north, crossing 115th Street in the middle of Section 9 at approximately ¾ mile west of County Highway S45. Both tiles then proceed north, where the original Main arcs approximately 700 feet West and then back east, while the 1922 Main continues in a northerly direction. Both Main tiles meet again and travel northerly, with the upstream limits of investigation being at the ¼ section line at approximately 2/3 mile West of County Highway S45. For reference, a map showing the limits of investigation is included in Appendix S.

2.0 DISTRICT HISTORY – The following is a brief summary of the pertinent history of Drainage District No. 120 (Ext. No. 5) as obtained from the Hardin County Engineer's Field Books and the Hardin County Auditor's drainage minutes and records.

1908	Engineer's records and maps contain notes for design and construction of the original district facilities, including the Main tile.
1922, Sep.	Engineer's Report submitted for the construction of the parallel Main tile.
1922, Dec.	Pay estimates and Engineer's letter show delivery of tile and beginning of construction of the parallel Main tile.
1924, Aug.	Final pay estimate shows the construction of the parallel Main tile being near completion.

3.0 INVESTIGATION – Most field investigation for this report was performed as part of the Investigation Summary for Work Order #298. Said investigation was limited to visual observation (without excavation) gathered during said investigation. For reference, a copy of the Investigation Summary is included in Appendix R. In addition, an observation of the tile outlet area was conducted to determine the condition of such. Said observation was limited to visual observation (without excavation) and picture recording. Those pictures are also included in Appendix R after the Investigation Summary. It should be noted that outlet is assumed to be to the downstream of the railroad crossing. This is due to the field observation finding an outlet at that location with a tile closely resembling the size and material of the recorded 1922 main tile, its orientation being downstream of the original main tile outlet, and the creek that is flowing through the remainder of the district facility path.

A limited review of district history was conducted to determine the dates, locations, and sizes of the two Main tiles as they were installed. A more detailed review of the district history was not completed as it was not within the limited scope of this report.

All other investigations were limited to office and records research as mentioned. Calculations were performed to determine the drainage coefficients and capacities for the length of the existing Main tiles. The drainage capacities of the tiles were calculated using historical maps of the tiles and not that of field observation or measurements. These drainage capacities may be negatively affected by several factors that were not included in this analysis including, but not limited to, breakages in the tile, improper installation, vegetative root infiltration, settling, sediment infiltration, and deposits.

4.0 DISCUSSION AND CONCLUSIONS – Based on the calculations conducted, it appears that for their combined capacity, the Main tiles were designed to provide a drainage coefficient of 0.1 to 0.36 inches per day, with the highest of these being at the outlet, and the lowest of these being located over the approximately 1100 feet upstream of 115th Street. Individually, the original Main tile varies in capacity from 0.06 to 0.12 inches per day, and the 1922 Main tile varies in capacity from 0.03 to 0.24 inches per day.

When conducting the field observation for Work Order #298, it was noted that the drainage performance of private tile located in the immediate upstream area of the upward limits of this investigation was lacking. Washouts and ponding were prevalent, which leads to the conclusion that there is a lack of drainage capacity in the downstream direction. More details from the Work Order #298 are included in Appendix R. During the additional site visit to the outlet, the original Main tile outlet was not found, but this is due to excess snow cover and lack of access to the railroad property, where it is historically located. Also, during said visit the lower approximately 200 feet of the 1922 Main tile was found to have been largely eroded, inundated with tree and brush growth, beavers have created a dam, and multiple tiles were found to be broken. Pictures from this observation are included in Appendix R.

Based on the above, it is obvious that the Main tiles have multiple issues that are contributing to the observed lack of drainage in the upstream reaches of the watershed. The area of poor capacity to the north of 115th Street creates a bottleneck for drainage coming from the upstream reaches of the Main tiles from the watershed. In addition, the significant amount of tree and brush growth within the flower 200 feet of the outlet are likely to have roots infiltrating the Main tile(s), further restricting drainage.

In addition to the current drainage issues being observed within the District, it should be noted that the newest of these tiles is nearly 100 years old. While there is no exact number of years that the VCP tile will last (due to the large number of variables affecting longevity), it is likely that the tile is nearing that time where more tile failures will begin to show up in the form of blowouts and sinkholes within the farmed fields.

Regardless of the cause of the lack of drainage performance, if improvements are not performed the Main tiles will continue to have poor drainage performance, and the upstream landowners will continue to experience overland flow and ponding. This will continue to affect productivity of the farmed ground upstream of these issues and may get worse as the tile ages and root plugging/infiltration worsens. When all these issues are combined, it will lead to further reduced drainage and liability exposure by the drainage district.

6.0 IMPROVEMENT METHODS – To improve the drainage capacity for the existing Main tiles, the following options are the most straightforward available:

Full Single Tile Upsizing

- For both of the Main tiles, remove and replace the existing tiles with a single new tile of greater capacity from the 1922 outlet to the upper limits of the investigation area following the route of the 1922 Main tile (Sta. 12+73 to Sta. 76+00). For reference, a chart with the required tile sizes and capacities is included in Appendix V.
- 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. However, since two Main tiles exist, the private tile connections will need to be found by removing the original Main tile as work progresses in addition to the excavation of the 1922 Main tile. For reference, the general route is shown on the map included in Appendix T.
- The 700-feet arc would be left intact and attached to the new Main tile at the downstream end. The furthest upstream 40-feet of the arc would be abandoned and capped.

Partial Single Tile Upsizing

- For both of the Main tiles, remove and replace the existing tiles with a single new tile of equal or greater capacity following the route of the 1922 Main tile from the 1922 outlet to 115th Street (Sta. 12+73 to Sta. 47+00). For reference, a chart with the required tile sizes and capacities is included in Appendix V.
- It should be noted that this method would not fix the issue of the bottleneck north of 115th Street. However, it would ensure that said bottleneck area has a more freely flowing outlet downstream and would fix the issues that exist at the Main tile outlets.
- 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. However, since two Main tile exist, the private tile connections will need to be found by removing the original Main tile as work progresses in addition to the excavation of the 1922 Main tile. For reference, the general route is shown on the map included in Appendix U.

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

- Due to the soil types and soil cover, all replacement tile will have rock bedding for additional stability and strength.
- The upsized Main tile may be shifted from its existing location or installed at a flatter grade to gain soil cover (if found to be lacking).
- The only tiles being improved are the tiles identified in Appendices T and U. The remainder of the tile(s) are not being repaired or modified in any manner.
- The proposed pipe sizes shown in Appendix V are those that are currently manufactured that meet or exceed the ½" or 1" drainage coefficient.
- The proposed and existing capacities shown in Appendix V are based on the assumptions that the existing Main tiles are both installed per their respective design and that they are functioning at full capacity (i.e. are not collapsed, broken, plugged, etc).
- The proposed and existing pipe sizes and capacities shown in Appendix V are those to serve the lands within the existing District boundaries and not any discharges from other lands outside the District boundaries.
- The stationing and distances shown in Appendices T, U, and V are based on the original district profiles. There is likely to be slight differences in quantities found as work progresses.

- 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 cost 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 W, X, Y, and Z of this report. A summary of said costs are as follows:

METHOD	DRAINAGE COEFF.	DISTRICT CONSTRUCTION COST	ROAD COUNSTRUCTION COST
Full Single Tile Upsizing – Improvement (½")	½"	$1,101,309.00	$26,490.00
Full Single Tile Upsizing – Improvement (1")	1"	$1,356,471.00	$30,452.50
Partial Tile Upsizing – Improvement (½")	½"	$701,523.00	$28,697.50
Partial Tile Upsizing – Improvement (1")	1"	$840,903.00	$30,452.50

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, 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. 120 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 improvement options 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 if the upstream landowners wish to maintain productivity of their land by reducing erosion and excess stormwater. The improvements would remove the current restrictions and impediments to the Main tiles, increase the capacity of the District facilities, and extend the lifespan 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 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.
- Direct plans and specifications for the proposed repairs or 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.
- If desired or required by Iowa Code, proceed with reclassification proceedings.

DD 120 LANDOWNERS MEETING MINUTES
Wednesday, June 24, 2020 11:00 AM
This meeting was held in-person and electronically due to Covid-19 concerns.

6/24/2020 - Minutes

1. Open Meeting
   Hardin County Drainage Chairperson Lance Granzow opened the meeting. Also present were Trustee BJ Hoffman; Trustee Renee McClellan; Landowners Kent Picht, Jordan Picht, Kevin Vierkandt; Lee Gallentine of Clapsaddle-Garber Associates; Michael Pearce, Network Specialist and Denise Smith, Drainage Clerk.

2. Approve Agenda
   Motion by McClellan to approve the agenda. Second by Hoffman. All ayes. Motion carried.

3. DD 120 - Discuss W Possible Action - Surcharged Intake Discharge

   The issue of the private tile intake being surcharged during heavy rains and discharging onto neighboring property creating ponding issues was discussed. Gallentine stated in what he understands is Picht did private tiling and installed an intake, which he has the right to do, and as Kevin Vierkandt reported in last week's meeting, when we have heavy rains, water comes out of the intake, and follows the slope of the ground and ends up in Vierkandt's ground. Picht agreed that is what happens, Kent Picht stated his 150 acres above Vierkandt flows into that area and Picht has a pond there every year, in speaking with the contractor the contractor stated an intake could be installed that would take care of that. Picht stated he put the intake in the fenceline so he did not have to farm around them, and would gladly move it back to the middle of the pond, but the fenceline is part of that ponding area. Gallentine asked if the pond in Vierkandt's ground was big enough that it goes up into Picht's ground as well. Picht stated we both share the same pond, and Vierkandt's is a little bit higher, when Picht's ponds up a little bit, it is so high it goes into Vierkandt's place because there is a huge amount of surface water that goes in there. Picht stated if he took the intake out now, the tile would probably blow out because the tile is only 2' to 2-1/2' deep, it is a 7" tile in Picht's field, and when it goes into Vierkandt's field it goes into a 10" tile. Picht stated he had a map when the intake was installed and thought the 7" tile going into a 10" tile should handle that flow ok, either it may not be a 10" in Vierkandt's field or Picht has so much pressure coming down that it discharges out the intake.

   Granzow stated that last week Vierkandt expressed we may need to increase the district tile size. Gallentine did calculations using the original design, and using the original design, the coefficient in that district varies from .23" per day to .03" per day, so the system is woefully undersized compared to what would be installed now. Granzow stated since Vierkandt is tenant on Jeff Hansen's land, the request for an improvement would have to come from a landowner. McClellan asked if a backflow preventer would be applicable in this case. Gallentine stated a backflow preventer has to have a certain amount of pressure to open it for the one way flow, so you would have to have some pressure to open it but the issue is if you have too much pressure in that system you will have blowouts. Gallentine stated Vierkandt acknowledged that but Vierkandt stated that is a sign we need a bigger tile. Gallentine stated if we put all that water through the tile, some of it goes by surface and leaves the district, it is still a coefficient of only 1/4" to .03" which is pretty slow. Picht stated he has two intakes west of his places in the ditch of HWY 57 that still has water coming out of them and creating ponds, and has two intakes east of his house, that are still discharging after several days of no rain, and is still receiving water from an intake blowing out on his neighbors, creating another pond for him. Picht has learned to live with it, if he takes an intake out, water seeps up out of the ground, if we put the intake in, at least it does drain and the ponds go out quicker, he does not like the ponding or the intakes, but if he does not put an intake in the ponds will sit there longer, there is no good solution other than huge drainage mains everywhere. Gallentine stated sometime they will put an intake in and shoot it off to the side of the main before coming up and that helps somewhat rather than being right up on top of the main but it will still discharge sometimes.

   Gallentine stated if you do an upsized project, unless it is an open ditch, you will probably get 1/2" per day

max of coefficient, and with the heavy rains we have been having if you get 2" of rain, it will take 4 days to drain out. Vierkandt was called into the meeting and the original design coefficients were reviewed. Granzow stated if you would like to request an improvement or an upsize in tile, the request needs to come from a landowner. Vierkandt stated it definitely needs to be upsized. Granzow asked if Picht was willing to make that request. Picht stated he and Vierkandt had already discussed what Picht was willing to do, Picht stated he would upsize part of it to take the pressure of the upper end, possibly run a supplemental main beside of the old main that jumps up to a bigger tile, it is supposed to jump up to an 18" tile later. Gallentine stated you would jump up to a .2" coefficient with an 18" tile. Picht wouldn't mind sharing the cost on that just to take off the pressure on the top. Gallentine asked if Picht would go all the way down to the outlet. Picht stated it depends on what size the outlet is, and noted it is a long ways away. Gallentine stated yes it is a long way, and the the last little bit of tile before the outlet is a 20" which is running a .25" coefficient. Picht would be willing to help run supplemental private tile to the larger part of the main if that would help. Granzow stated that can be done without the Trustees. Picht agreed and stated that was what he had told Vierkandt, as the main is on Vierkandt's land. Granzow stated what would come from the Trustees is if a landowner would come forward with a request to do an improvement. Vierkandt stated if the outlet down on the bottom was only good for 1/4" a day and is way less on the upper end, he was unsure what the cost for an improvement would be, but he would like to know the cost for an improvement or to lay another main beside it to increase the capacity. Vierkandt asked if we can bring that excess water all the way down there, and the outlet is only good for 1/4" a day, Vierkandt does not think that will help us that much.

Picht stated he knew the land that would have to go through, and it gets really deep, and would also have to go under an active railroad track, and it would be a major project. Gallentine stated the original tile was planned at the railroad tracks for a depth of 7', Picht said there are places that are deeper than that. Gallentine stated with a tract excavator, 7' is not that bad. Gallentine did note it was a Canadian National line, and it is a 20" tile right before it goes under the railroad. Gallentine stated right at the railroad tracks is where it starts steeping up a bit to get to that 1/4" coefficient, upstream of the railroad tracks it flattens out and that is about .2" coefficient. Picht asked what it would cost for study on an improvement. Gallentine stated studies have been running $5,000 to $7,000. Picht asked if it would just be billed to these two landowners. Gallentine stated it would be billed to and split amongst all the landowners in the district. Picht asked if that was ok with Vierkandt. Vierkandt stated his landowner would be ok with that. Picht was ok with that as well.

Granzow stated we have to have a request from a landowner, and with this kind of drainage coefficient, thats not bad to just have a single landowner request. Gallentine stated he was surprised there has not been a request before when he saw the .03" coefficient, and it was no wonder they have ponding. Picht stated he would like to get rid of the ponding as they plant it and always get something out of it but would like the ponding gone and something done for the top end too, which would send more water down there. McClellan asked if Picht would submit a request in writing to the Drainage Clerk, Picht stated he would provide a written request to Smith today. McClellan stated we could act on the written request next week. Picht asked how long a study would take. Gallentine stated they usually take about a month, and once adopted the Engineer's Report is valid for 10 years, and it would cover multiple options, one option would be putting in one lager tile, one could be putting a new tile beside the old tile, the problem with that is you are still paying on the new tile while trying to maintain the old tile. Gallentine stated we would also include an open ditch option. Granzow stated the parallel tile option means the tile is flowing in both old and new tiles, but as soon as the 100 year old tile breaks, will we be putting in a new one, or build it once the first time the improvement is done. Gallentine stated it is tough to figure out how much life is left in a 100 year old system. Granzow stated it would be nice to say we abandoned the old system and built a new one, Gallentine stated we typically do remove the old tile. Granzow stated we need to understand that if abandoned it will no longer be district tile if it breaks. Gallentine stated the nice thing about removing the old district tile is that we can find and restore all the private connections when we remove the tile. Gallentine stated the report will provide several options with expected costs for each so you can have an idea of what costs may be. Picht asked if it was very expensive to remove the old tile. Gallentine stated we usually see costs of $3 to $5 per foot, it is pulled off and trucked out, sometimes it is used as fill in a road crossing.

Granzow stated so what we have so far is a request from landowner Picht for a report to do an improvement, along with that we are going to make sure the landowners have a wetland determination done by the NRCS. Granzow went on that the landowners are the only ones that can request a wetland determination, the

Trustees can not do this. Picht asked if the landowners would all be notified and come in and vote on the improvement. Granzow stated the Trustees are the only ones that vote, the Trustees will take a paper ballot as input from the landowners and try to come to a consensus, but the Trustees have the final say. Picht stated all the other landowners may not show interest as they have higher ground and drain fine. Gallentine stated once the report is done, it will be on file with the Drainage Clerk who will send out notifications of a hearing to discuss the improvement options in the report. Granzow stated the classifications may show what Picht describes as well. Gallentine stated that if the majority of the landowners who own 70% of the ground in the district file a Remonstrance, saying no, then nothing moves forward. Granzow stated then the Trustees are done and it becomes a dead issue. Hoffman stated if Picht would step up to the Drainage Clerk's office, he could submit a request in writing, Hoffman noted that the district could also submit a petition for Private Trustee control.

Hoffman stated it is hard for the Trustees to say that we have to tell you here is the report and classification and we are spending your money, and knowing the current commodity prices and the world's uncertainty, telling someone that they will have to spend this much money is difficult. Picht stated he will try and talk Vierkandt into putting in just a short supplemental tile to a bigger tile so that may help the blowout. Picht stated the blowout does not amount to that much when you look at the amount of surface water that Picht's land takes. Picht stated the blowout quits after you get to a certain level, when Picht has watched the blowout it goes out into Vierkandt's field about 100 yard, the water disappears and is soaking in somewhere. Picht stated he will try to work something out with Vierkandt. Granzow asked if he would like to do that before we request the report. Picht stated no he would request the report today, as they will not get it fixed before next year now that crops are in.

4. Other Business

5. Adjourn Meeting
   Motion by Hoffman to adjourn. Second by McClellan. All ayes. Motion carried.

Drainage District:

#120

Investigation/Repair Summary:

- Tenant in the S½ SW¼ Section 4, Township 89 North Range 20 West and NW¼ Section 9, Township 89 North Range 20 West reported that an upstream landowner in N½ SW¼ Section 4, Township 89 North Range 20 West had installed an intake on district tile to act as a pressure relief point for the tile system and graded the area to "drain" to his field. As a result, water was flowing overland and collecting on the north side of 115th Street (no intake visible in the road ditches on either side of the 115th Street). At 115th Street and throughout the flow path, crops were either drown out or washed away.
- Visual observations (with and without tenant) found:
  - Drown out/washed out areas as tenant described (115th Street and flow paths).
  - Wet drown out area in neighbor's field on the north side of tenant's fenceline.
  - Woven portion of said fenceline appears to have cut.
  - Sod "fenceline hump" is no longer in place allowing the free flow of surface water.
  - Yellow wire topped intake is just north of fenceline on neighbor's property and not in the low point of the neighbor's wet area.
- A review of the original district maps (Drainage District 5) indicates that the tile at said fenceline is not district tile as the Main tile (highlighted yellow on the attached maps) runs northwest as it moves upstream through the S½ SW¼ Section 4, Township 89 North Range 20 West and never enters the N½ SW¼ Section 4, Township 89 North Range 20 West.
- A review of the reconstruction district map (Drainage District 120) shows multiple "lines" on the drawing, but the only one identified as the district tile is the Main tile (highlighted pink on the attached map) and it does not enter the N½ SW¼ Section 4, Township 89 North Range 20 West.

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

None recorded as only visual observation was performed.

Additional Actions Recommended:

The immediate problem at the fenceline between the S½ SW¼ Section 4, Township 89 North Range 20 West and the N½ SW¼ Section 4, Township 89 North Range 20 West appears to be on a private tile and not a district facility based on the above review. If desired, a detailed record search could be performed to verify that the maps accurately represent the district facilities. If the tile is private, then the primary solution that the district could offer for the immediate area would be to construct a lateral from the Main tile to the N½ SW¼ Section 4, Township 89 North Range 20 West.

A secondary issue is the ponding at 115th Street. Preliminary calculations indicate that the existing Main tile lacks drainage capacity at this point and there are no means for standing water to enter the Main tile. These both could be remedied by a drainage district project, but this would not prevent the crop loss along the flow paths from 115th Street to the N½ SW¼ Section 4, Township 89 North Range 20 West. Alternatively, secondary roads could be contacted to upsize the roadway culvert at 115th Street, but this would just push the problem to the south.

Drainage Work Order Request For Repair
Hardin County

Date: 7/6/2020

Work Order #: WO00000298

Drainage District: DDs\DD 120 (51135)

Sec-Twp-Rge: 09-89-20 **Qtr Sec:** NE NW

Location/GIS: 89-20-09-100-002

Requested By: Kevin Vierkandt

Contact Phone: (515) 689-3388

Contact Email: vierkandtfarms@windstream.net

Landowner (if different): Hansen Farms, Inc.

Description: DD 120 - Kevin Vierkandt reports issues with neighboring parcel's intake discharging onto his parcel (892009100002) when intake is surcharged. Intake is in fenceline about 8" above ground.

Repair labor, materials and equipment _____

_____

_____

Repaired By: _____ **Date:** _____

Please reference work order # and send statement for services to:

Hardin County Auditor's Office
Attn: Drainage Clerk
1215 Edgington Ave, Suite 1
Eldora, IA 50627
Phone (641) 939-8111
Fax (641) 939-8245

For Office Use Only

Approved: _____ **Date:** _____

7-8-2020

E rd drown spot @ 115th

W rd drown spot @ 115th

7-8-2020

Middle down spot @ 115th

7-15-2020 Wet spot in adjoiners field

7-15-2020 Yellow topped intake just north of fenceline

7-15-2020 W side of missing soil "hump"

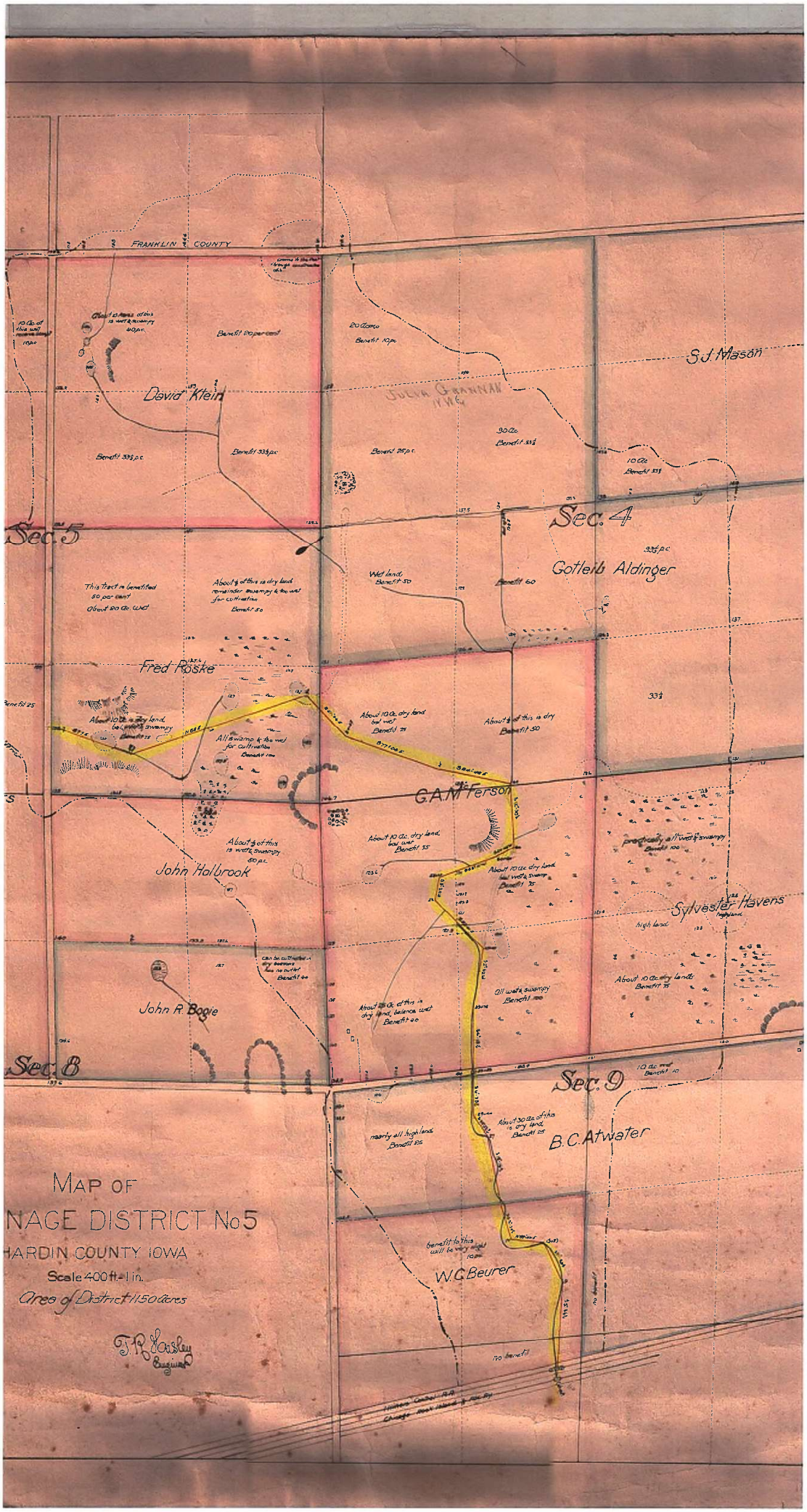
7-15-2020 middle of missing soil "hump"

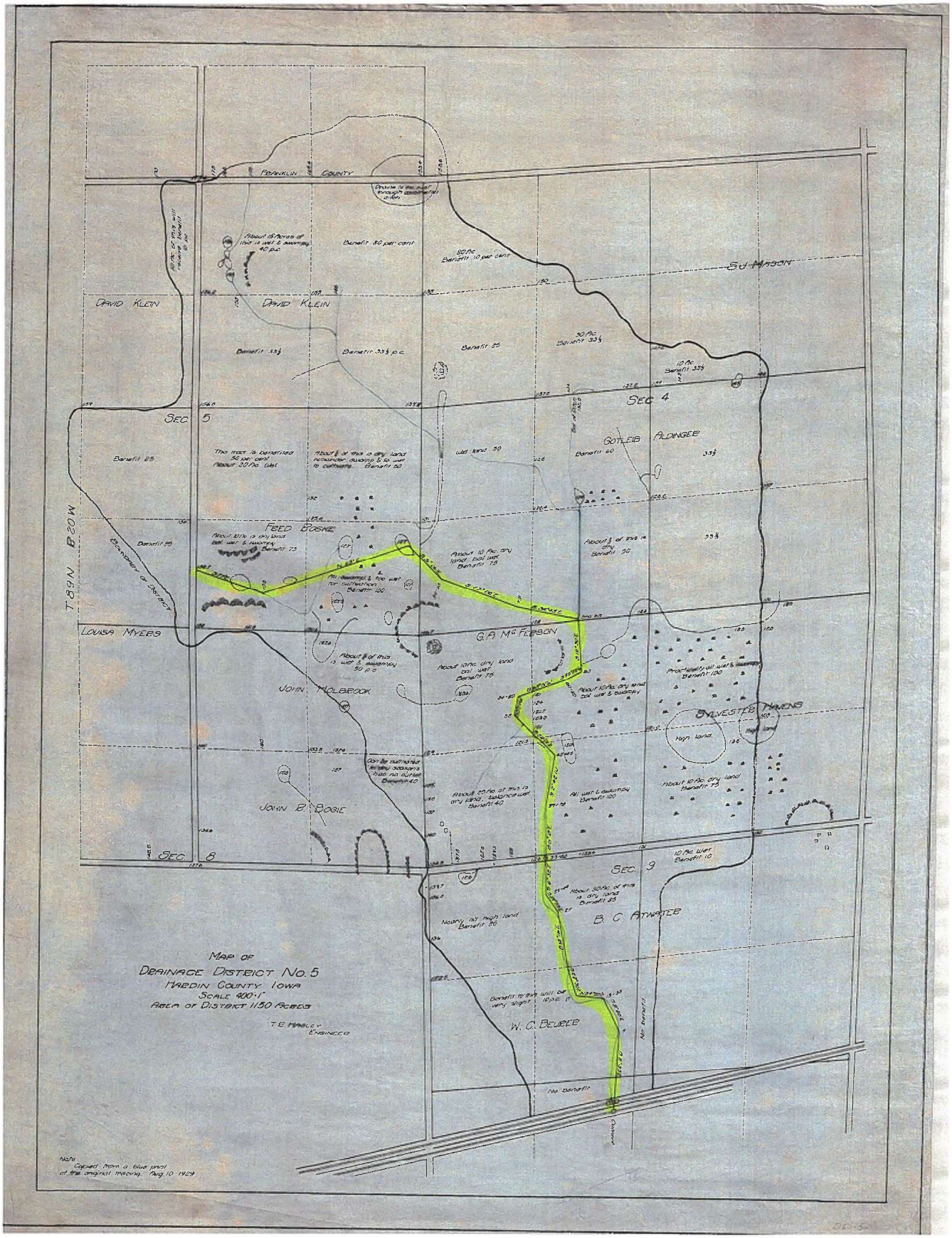
East side of missing soil "hump"

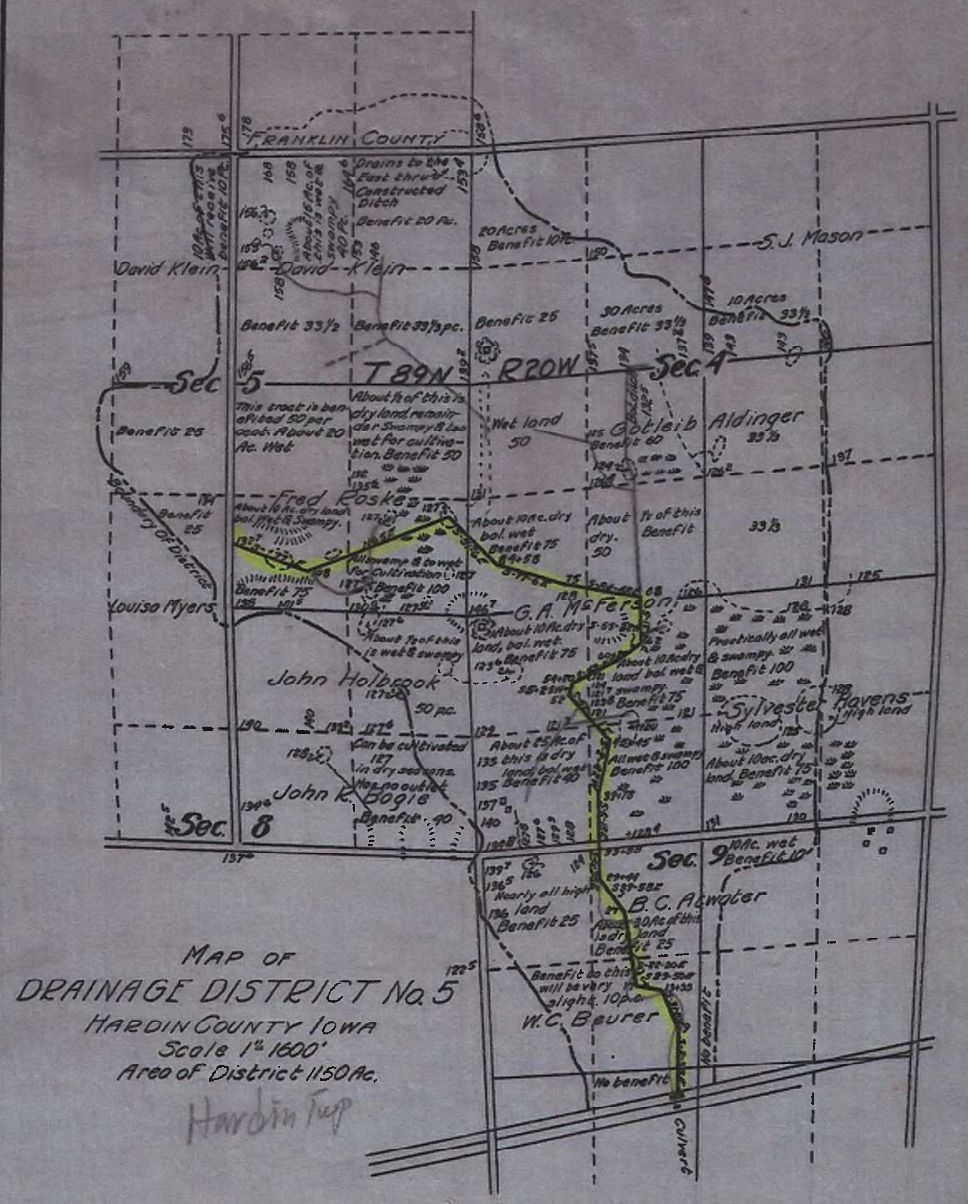
7-15-2020

7-15-2020

"Cat" woven wire fence

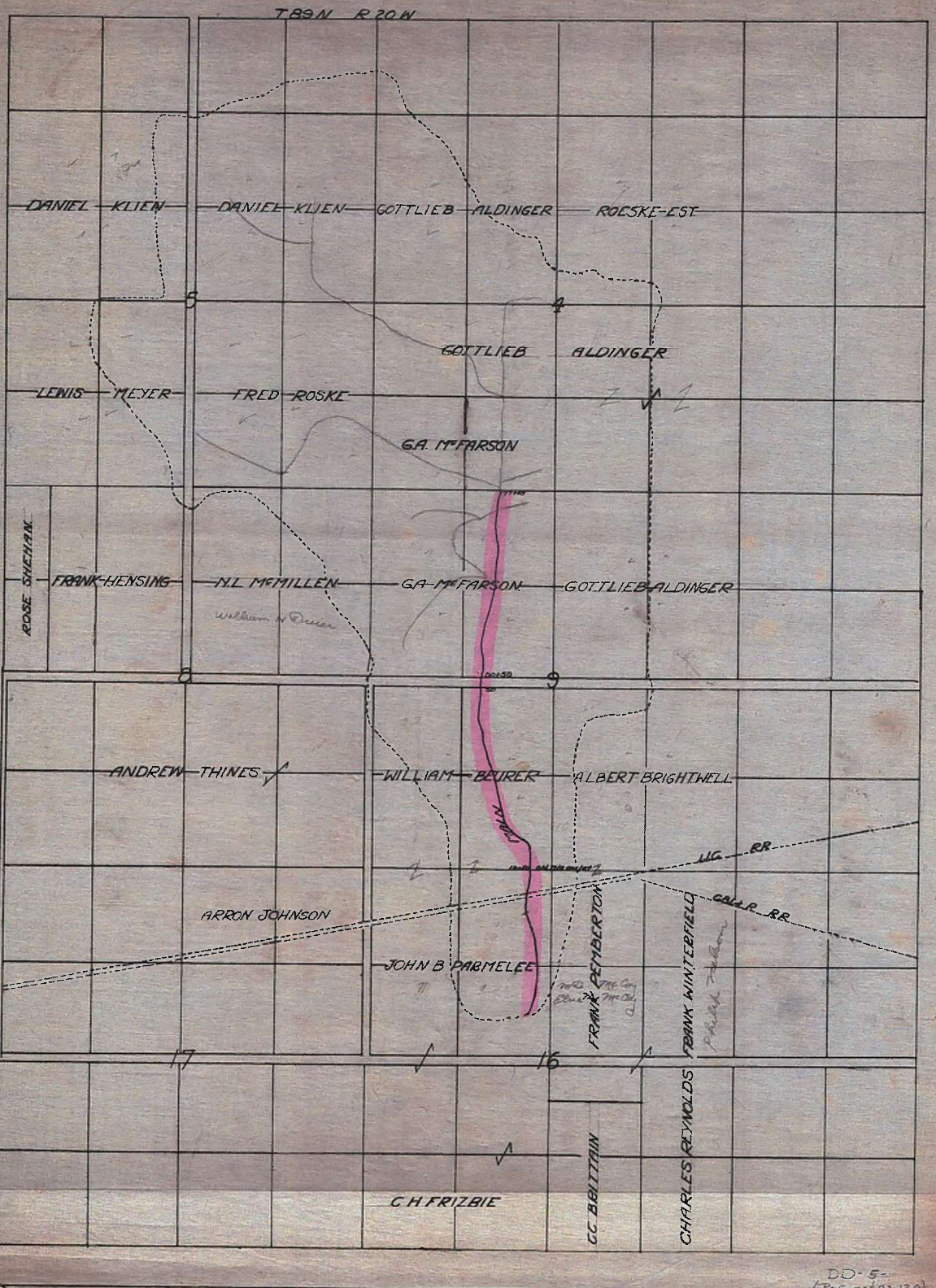

FRANKLIN COUNTY
David Klein
S.J. Mason
Julia Brannan (1 1/2)
Sec. 5
Sec. 4
Gotlieb Aldinger
Fred Roske
G.A. Merson
John Holbrook
Sylvester Havens
John R. Bogie
Sec. 8
Sec. 9
B.C. Atwater
W.C. Beurer
MAP OF
NAGE DISTRICT No 5
HARDIN COUNTY IOWA
Scale 400 ft. = 1 in.
Area of District 1150 acres
T.P. Lasley
Engineer


FRANKLIN COUNTY
SU MASON
DAVID KLEIN
DAVID KLEIN
SEC 5
SEC 4
GOTLEB ALDINGER
FEED BOSKE
LOUISA MYERS
G.A. McFERSON
JOHN HOLBROOK
JOHN E. BOGIE
SEC 8
SEC 9
SYLVESTER HAVENS
B. C ATWATER
W. C. BEUELE
T89N R20W
Boundary of District
MAP OF
DRAINAGE DISTRICT No. 5
HARDIN COUNTY IOWA
SCALE 400'=1"
AREA OF DISTRICT 1150 ACRES
T.E. HANLEY
ENGINEER
Note
Copied from a blue print
of the original tracing. Aug. 10 1929
No benefit
No benefit
Benefit 80 per cent
80 Ac Benefit 10 per cent
Benefit 25
Benefit 33⅓ p.c.
Benefit 25
30 Ac Benefit 33⅓
10 Ac Benefit 33⅓
Benefit 25
This tract is benefited 50 per cent about 30 Ac Wet
About ⅓ of this is dry land remainder swamp & to wet to cultivate. Benefit 50
Wild land 30
Benefit 40
33⅓
Benefit 85
About 10 Ac is dry land bal wet & swampy Benefit 75
About 15 Ac. dry land, bal wet Benefit 75
About ⅓ of this is dry Benefit 30
33⅓
All swamp & too wet for cultivation Benefit 100
About 10 Ac. dry land, bal wet Benefit 75
About ⅓ of this is wet & swampy 50 p.c
About 10 Ac. dry land bal wet & swampy
Practically all wet & swampy Benefit 100
High land
About 10 Ac. dry land Benefit 75
Can be cultivated in dry seasons but no outlet Benefit 40
About 20 Ac of this is dry land, balance wet Benefit 40
All wet & swampy Benefit 100
10 Ac Wet Benefit 10
About 30 Ac of this is dry land Benefit 85
Nearly all high land Benefit 85
Benefit to this will be very slight 10 Ac ±
Benefit 33⅓ p.c.
No benefit
No benefit
Cement


FRANKLIN COUNTY
David Klein
David Klein
S.J. Mason
Sec. 5
T89N
R20W
Sec. 4
Gotlieb Aldinger
Fred Roske
Louise Myers
G.A. McFerson
John Holbrook
Sylvester Havens
John K. Bogie
Sec. 8
Sec. 9
B.C. Atwater
W.C. Beurer
Drains to the East thru Constructed Ditch
Benefit 20 Ac.
20 Acres Benefit 10%
10 Acres Benefit 33⅓
30 Acres Benefit 33⅓
Benefit 33⅓
Benefit 25
This tract is benefited 50 per cent. About 20 Ac. Wet
About ⅔ of this is dry land remainder Swampy & too wet for cultivation. Benefit 50
Wet land 50
About ⅔ of this Benefit 33⅓
About 10 Ac. dry bal. wet & Swampy. Benefit 75
About ⅔ of this dry. 50
Benefit 100
About 10 Ac. dry bal. wet Benefit 75
About 10 Ac. dry land, bal. wet. Benefit 75
Practically all wet & swampy Benefit 100
About ⅔ of this is wet & swampy
50 pc.
Can be cultivated in dry seasons. No outlet Benefit 40
About 25 Ac. of this is dry land, bal. wet Benefit 40
All wet & swamp Benefit 100
High land
About 10 Ac. dry land Benefit 75
10 Ac. wet Benefit 10
Nearly all high land Benefit 25
About 30 Ac. of this is dry land Benefit 25
Benefit to this will be very slight. 10 Ac.
No benefit
Curve
MAP OF
DRAINAGE DISTRICT No. 5
HARDIN COUNTY IOWA
Scale 1" 1600'
Area of District 1150 Ac.
Hardin Twp
#5

PLAT
DRAINAGE DISTRICT
NO 5
RECONSTRUCTION
D.D 120

CONTAINING 1220 ACRES
SCALE 1" = 800'



DD-5-
(Re Const'd 120)

Figure 1: 1922 Main completely exposed and broken above outlet.

Figure 2: Lower 100 feet of 1922 Main.

Figure 3: Lower 100 feet of 1922 Main tile

Figure 4: Large trees and woody brush growing over the lower 200 feet of both Main tiles.

Figure 5: Trees and woody brush over lower 100 feet of 1922 Main tile.

Figure 6: Lower 200 feet of Main travels below bridge and then through heavily wooded area.

Figure 7: Beaver dam below the Main tile outlet.

Figure 8: Signs of beaver action.

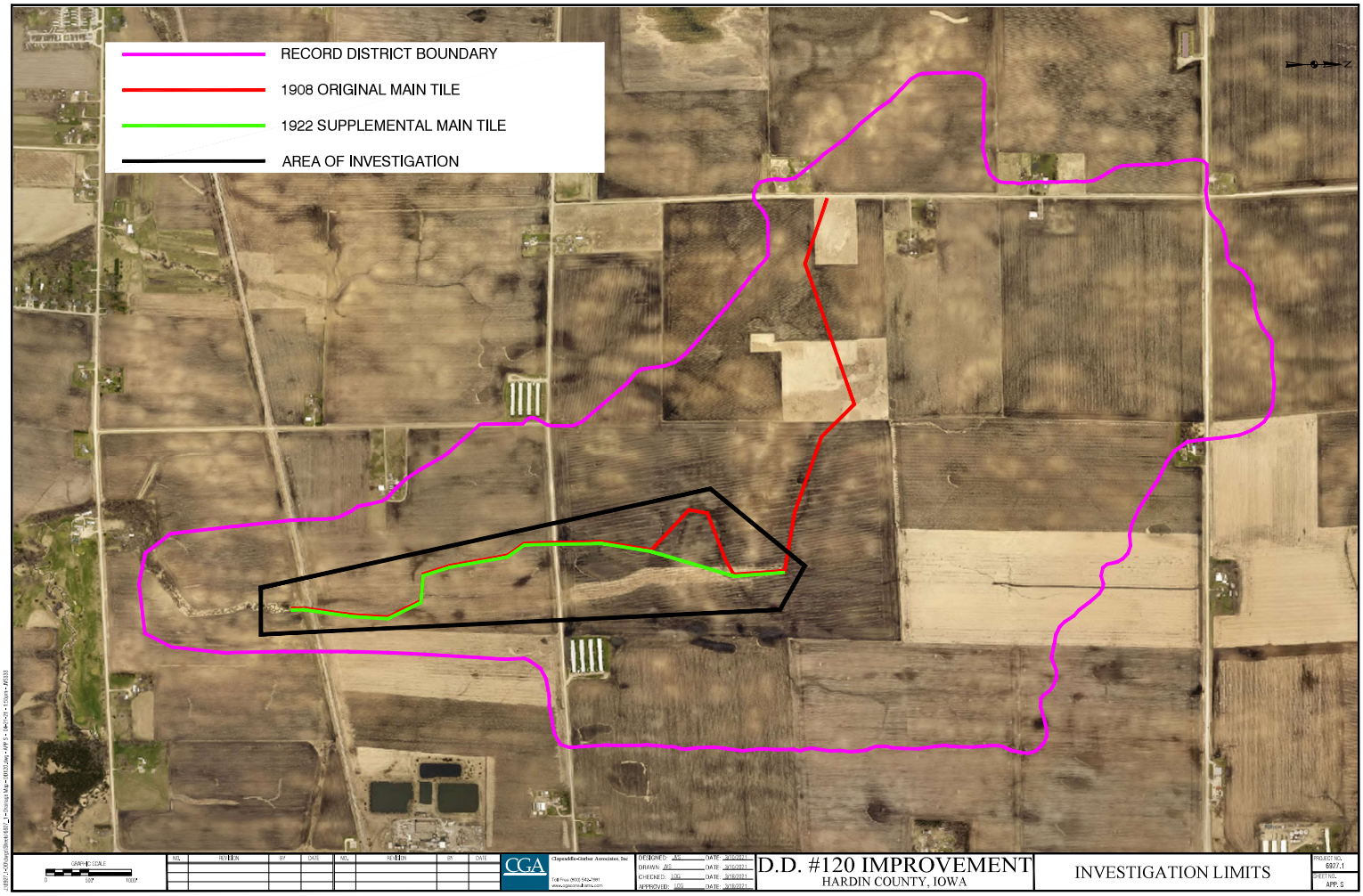
Figure 9: Signs of beaver action.

Figure 10: Signs of beaver action.

Figure 11: Pooling between beaver dam and 1922 Main tile outlet.

Figure 12: Pooling between beaver dam and 1922 Main tile outlet.

Figure 13: 1922 Main tile outlet.



GRAPHIC SCALE

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

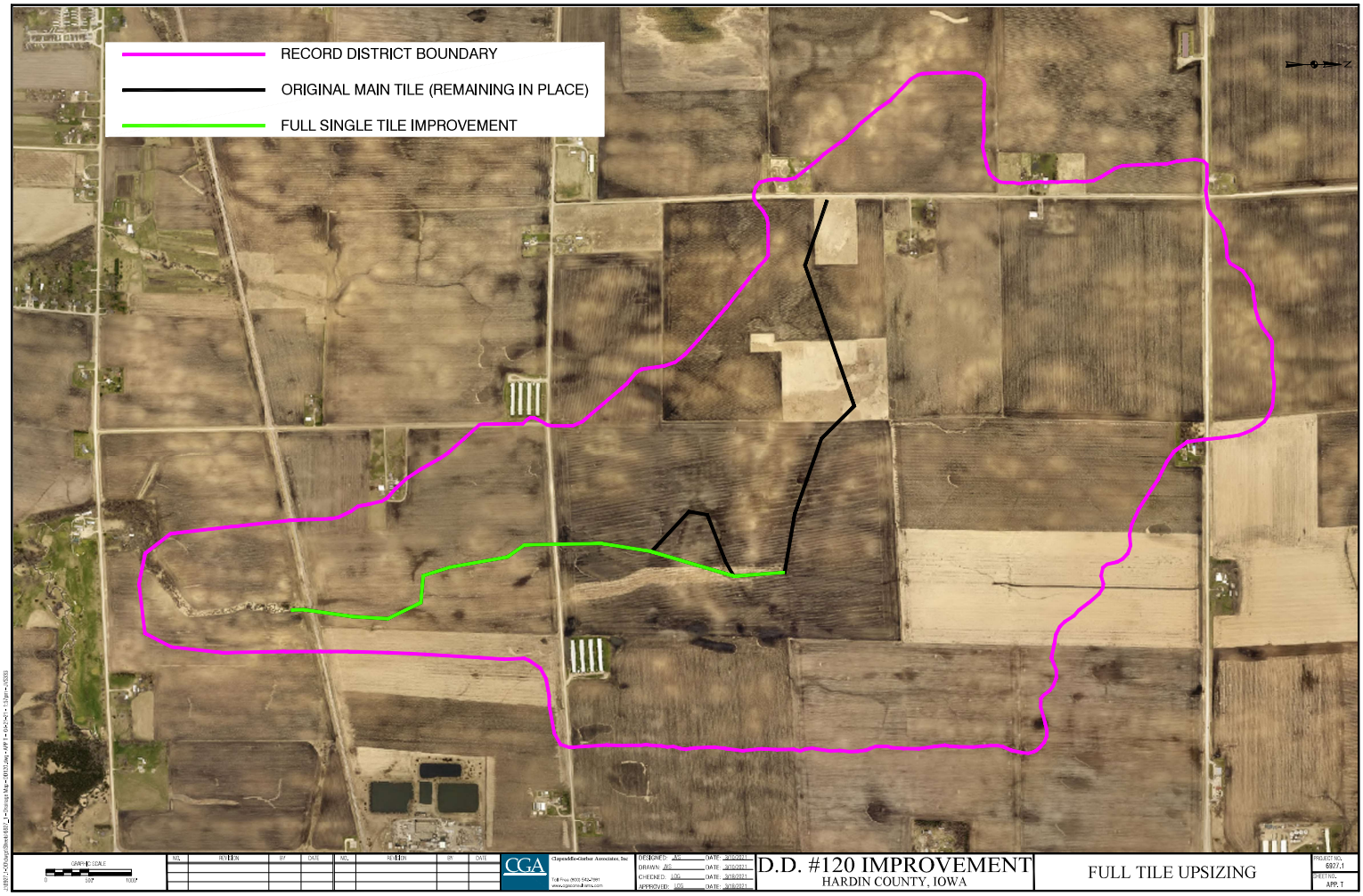
CGA Chapenfeller-Gerber Associates, Inc

DESIGNED: AG DATE: 3/16/2021
DRAWN: AG DATE: 3/16/2021
CHECKED: DG DATE: 3/16/2021
APPROVED: MG DATE: 3/16/2021

D.D. #120 IMPROVEMENT
HARDIN COUNTY, IOWA

INVESTIGATION LIMITS

PROJECT NO.: 6927.1
SHEET NO.: APP. B



GRAPHIC SCALE

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

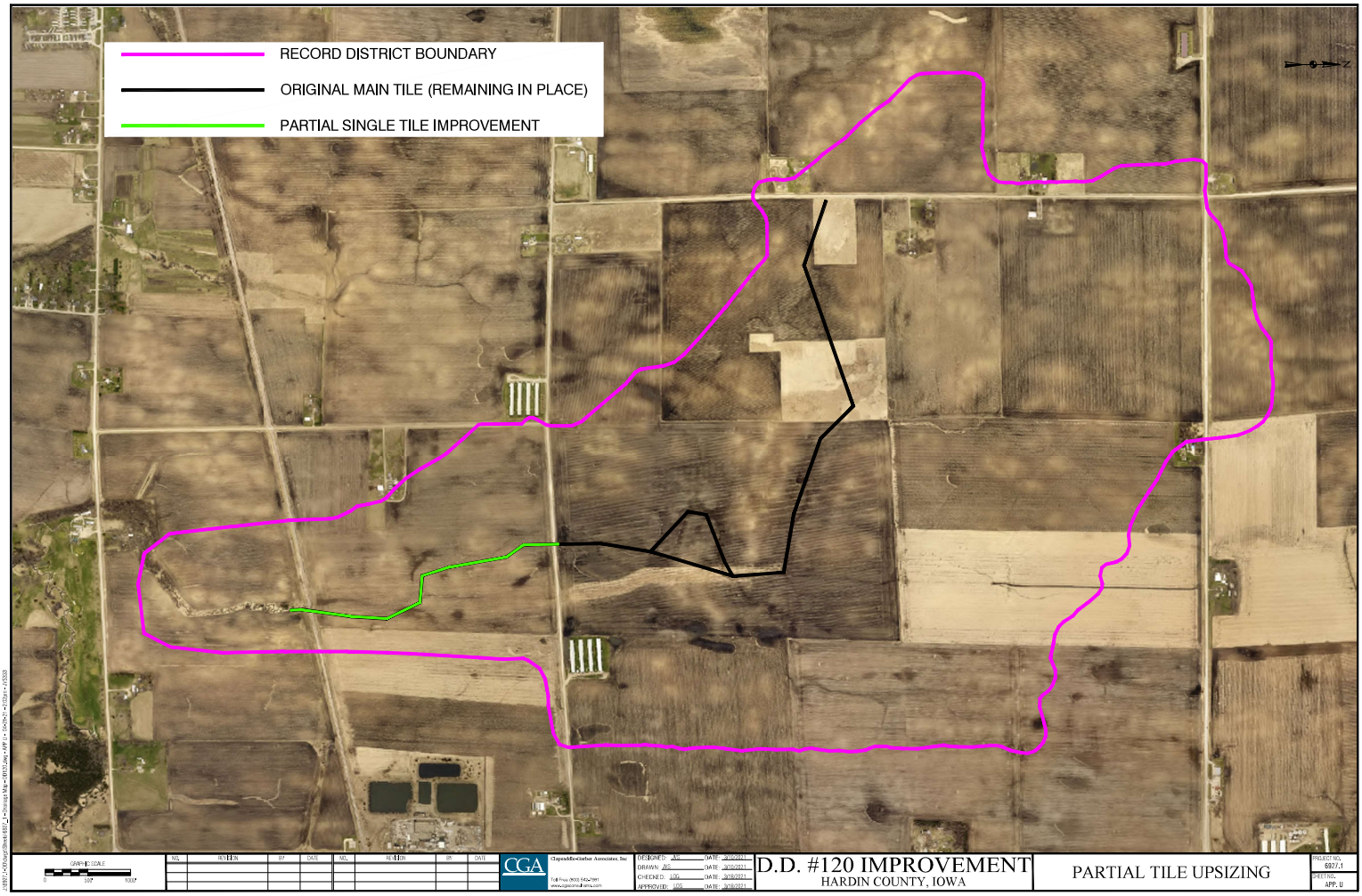
CGA
Chapenfeldt-Gerber Associates, Inc
Toll Free (800) 642-7991
www.cgaconsultants.com

DESIGNED: AG DATE: 3/18/2021
DRAWN: AG DATE: 3/18/2021
CHECKED: DG DATE: 3/18/2021
APPROVED: DG DATE: 3/18/2021

D.D. #120 IMPROVEMENT
HARDIN COUNTY, IOWA

FULL TILE UPSIZING

PROJECT NO.: 6927.1
SHEET NO.: APP. T



GRAPHIC SCALE

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

CGA
Chapman&Cutler Associates, Inc
Toll Free (800) 642-7991
www.cgaconsultants.com

DESIGNED: AG DATE: 3/18/2021
DRAWN: AG DATE: 3/18/2021
CHECKED: DSL DATE: 3/18/2021
APPROVED: MS DATE: 3/18/2021

D.D. #120 IMPROVEMENT
HARDIN COUNTY, IOWA

PARTIAL TILE UPSIZING

PROJECT NO.: 6927.1
SHEET NO.: APP. B

By: J.V.S.
Date: 3/9/2021
Checked By: L.O.G.
Date: 4/21/2021

Engineer's Opinion of Main tile Capacities

Project: Single Tile Upsizing for D.D. #120

Location: Sections 9 & 16 T89N, R20W Hardin County, Iowa

		EXISTING				IMPROVED						
							1/2" DRAINAGE COEFFICIENT			1" DRAINAGE COEFFICIENT		
MAIN TILE UPSIZING (IMPROVEMENT)	STA. (Original, 1922)	EXISTING DESCRIPTION	INSTALLED TILE SIZE; Original, 1922 (in)	INSTALLED TILE CAPACITY (cfs)	INSTALLED TILE CAPACITY (in/day)	PROPOSED DESCRIPTION	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)
	-1+50,12+73	Tile empties into open channel	18, 20	17.44	0.36	Tile empties into open channel	36	56.0	1.1	42	84.4	1.7
	0+00, 14+00	Original Main tile outlet, 1922 grade change: 0.7% to 0.4%, **Railroad**	18, 20	17.44	0.36	Grade change from 0.7% to 0.3%	36	56.0	1.1	42	84.4	1.7
	20+00, 34+00	Original grade change: 0.3% to 0.06%	18, 20	14.59	0.30	Grade change from 0.3% to 0.18%	36	36.6	0.7	42	55.3	1.1
	22+00, 36+00	1922 size change: 20" to 16"	18, 20	11.40	0.26		36	28.4	0.6	42	42.8	1.0
	23+00, 37+00	1922 Grade change: 0.4% to 0.16%	18,16	7.45	0.18		36	28.4	0.7	42	42.8	1.0
	33+00, 47+00	1922 size change: 16" to 12", **115th Street**	18, 12	5.66	0.13		36	28.4	0.7	42	42.8	1.0
	49+00, 59+00	Original grade change: 0.06% to 0.16%	18, 12	4.01	0.10		36	28.4	0.7	42	42.8	1.0
	68+00, 76+00	Original grade change: 0.16% to 0.25%, Original size change: 18" to 16", 1922 end of tile	18, 12	5.64	0.15	End of Improvement	36	28.4	0.8	42	42.8	1.1
	130+00	End of original Main tile	16	3.85	0.14							

CGA
ENGINEERS • LAND SURVEYORS

By: J.V.S.
Date: 3/9/2021
Checked By: L.O.G.
Date: 4/21/2021

Engineer's Opinion of Probable Construction Cost

Project: Full Single Tile Upsizing for D.D. #120

Location: Sections 9 &16 T89N, R20W Hardin County, Iowa

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

ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost
	DISTRICT CONSTRUCTION COSTS					
101	36" CMP TILE OUTLET	$ 130.00	LF	40	LF	$ 5,200.00
102	36" TRIPLE WALL PPE or RCP TILE	$ 90.00	LF	6140	LF	$ 552,600.00
103	36" DIP TILE W/ STEEL CASING (RAILROAD)	$ 1,000.00	LF	100	LF	$ 100,000.00
104	36" x 16" PPE or RCP REDUCER	$ 2,000.00	EA	1	EA	$ 2,000.00
105	36" RODENT GUARD	$ 1,000.00	EA	1	EA	$ 1,000.00
106	BANK STABILIZATION	$ 60.00	TON	50	TON	$ 3,000.00
107	RAILROAD FLAGGING & INSURANCE	$ 30,000.00	EA	1	EA	$ 30,000.00
108	CONCRETE COLLAR	$ 1,000.00	EA	10	EA	$ 10,000.00
109	PRIVATE TILE CONNECTIONS	$ 500.00	EA	22	EA	$ 11,000.00
110	HICKENBOTTOM INTAKE	$ 1,500.00	EA	6	EA	$ 9,000.00
111	TILE LOCATION	$ 150.00	STA	63	STA	$ 9,450.00
112	TREE REMOVAL	$ 2,000.00	LS	1	LS	$ 2,000.00
113	TILE REMOVAL	$ 5.00	LF	12560	LF	$ 62,800.00
		DISTRICT CONSTRUCTION SUBTOTAL				$ 798,050.00
		Contingency (15%)				$ 119,707.50
		CONSTRUCTION TOTAL				**$ 917,757.50**
		Engr. & Const. Observation (20%)				$ 183,551.50
		DISTRICT TOTAL COST				**$ 1,101,309.00**
	ROAD CROSSING CONSTRUCTION COSTS					
114	36" TILE - OPEN CUT (115TH STREET)	$ 135.00	LF	45	LF	$ 6,075.00
115	TILE ABANDONMENT	$ 100.00	LF	90	LF	$ 9,000.00
116	HICKENBOTTOM INTAKE	$ 1,500.00	EA	2	EA	$ 3,000.00
117	PERMANENT SEEDING AND WARRANTY	$ 2,000.00	LOC	1	LOC	$ 2,000.00
118	TRAFFIC CONTROL	$ 2,000.00	LOC	1	LOC	$ 2,000.00
		ROAD CONSTRUCTION SUBTOTAL				$ 22,075.00
		Contingency (10%)				$ 2,207.50
		ROAD CONSTRUCTION TOTAL				**$ 24,282.50**
		Engr. & Const. Observation (20%)				$ 4,856.50
		ROAD TOTAL COST				**$ 26,490.00**
		TOTAL PROJECT COST				**$ 1,127,799.00**

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

CGA
ENGINEERS • LAND SURVEYORS

By: J.V.S.
Date: 3/9/2021
Checked By: L.O.G.
Date: 4/21/2021

Engineer's Opinion of Probable Construction Cost

Project: Full Single Tile Upsizing for D.D. #120

Location: Sections 9 &16 T89N, R20W Hardin County, Iowa

FULL SINGLE TILE UPSIZING - IMPROVEMENT (1")

ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost
	DISTRICT CONSTRUCTION COSTS					
201	42" CMP TILE OUTLET	$ 140.00	LF	40	LF	$ 5,600.00
202	42" TRIPLE WALL PPE or RCP TILE	$ 120.00	LF	6140	LF	$ 736,800.00
203	42" DIP TILE W/ STEEL CASING (RAILROAD)	$ 1,000.00	LF	100	LF	$ 100,000.00
204	42" x 16" PPE OR RCP REDUCER	$ 2,200.00	EA	1	EA	$ 2,200.00
205	42" RODENT GUARD	$ 1,100.00	EA	1	EA	$ 1,100.00
206	BANK STABILIZATION	$ 60.00	TON	50	TON	$ 3,000.00
207	RAILROAD FLAGGING & INSURANCE	$ 30,000.00	EA	1	EA	$ 30,000.00
208	CONCRETE COLLAR	$ 1,000.00	EA	10	EA	$ 10,000.00
209	PRIVATE TILE CONNECTIONS	$ 500.00	EA	22	EA	$ 11,000.00
210	HICKENBOTTOM INTAKE	$ 1,500.00	EA	6	EA	$ 9,000.00
211	TILE LOCATION	$ 150.00	STA	63	STA	$ 9,450.00
212	TREE REMOVAL	$ 2,000.00	LS	1	LS	$ 2,000.00
213	TILE REMOVAL	$ 5.00	LF	12560	LF	$ 62,800.00
		DISTRICT CONSTRUCTION SUBTOTAL				$ 982,950.00
		Contingency (15%)				$ 147,442.50
		CONSTRUCTION TOTAL				**$ 1,130,392.50**
		Engr. & Const. Observation (20%)				$ 226,078.50
		DISTRICT TOTAL COST				**$ 1,356,471.00**
	ROAD CROSSING CONSTRUCTION COSTS					
214	42" TILE - OPEN CUT (115TH STREET)	$ 165.00	LF	45	LF	$ 7,425.00
215	TILE ABANDONMENT	$ 100.00	LF	90	LF	$ 9,000.00
216	HICKENBOTTOM INTAKE	$ 1,500.00	EA	2	EA	$ 3,000.00
217	PERMANENT SEEDING AND WARRANTY	$ 2,000.00	LOC	1	LOC	$ 2,000.00
218	TRAFFIC CONTROL	$ 2,000.00	LOC	1	LOC	$ 2,000.00
		ROAD CONSTRUCTION SUBTOTAL				$ 23,425.00
		Contingency (15%)				$ 3,513.75
		ROAD CONSTRUCTION TOTAL				**$ 26,938.75**
		Engr. & Const. Observation (20%)				$ 5,387.75
		ROAD TOTAL COST				**$ 30,452.50**
		TOTAL PROJECT COST				**$ 1,386,923.50**

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

CGA
ENGINEERS • LAND SURVEYORS

By: J.V.S.
Date: 3/9/2021
Checked By: L.O.G.
Date: 4/21/2021

Engineer's Opinion of Probable Construction Cost

Project: Partial Single Tile Upsizing for D.D. #120

Location: Sections 9 &16 T89N, R20W Hardin County, Iowa

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

ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost
	DISTRICT CONSTRUCTION COSTS					
301	36" CMP TILE OUTLET	$ 130.00	LF	40	LF	$ 5,200.00
302	36" TRIPLE WALL PPE or RCP TILE	$ 90.00	LF	3340	LF	$ 300,600.00
303	36" DIP TILE w/ STEEL CASING (RAILROAD)	$ 1,000.00	LF	100	LF	$ 100,000.00
304	36" x 18" PPE OR RCP REDUCER	$ 2,100.00	EA	1	EA	$ 2,100.00
305	36" x 12" PPE OR RCP REDUCER	$ 1,800.00	EA	1	EA	$ 1,800.00
306	36" RODENT GUARD	$ 1,000.00	EA	1	EA	$ 1,000.00
307	BANK STABILIZATION	$ 60.00	TON	50	TON	$ 3,000.00
308	RAILROAD FLAGGING & INSURANCE	$ 30,000.00	EA	1	EA	$ 30,000.00
309	CONCRETE COLLAR	$ 1,000.00	EA	6	EA	$ 6,000.00
310	PRIVATE TILE CONNECTIONS	$ 500.00	EA	8	EA	$ 4,000.00
311	HICKENBOTTOM INTAKE	$ 1,500.00	EA	5	EA	$ 7,500.00
312	TILE LOCATION	$ 150.00	STA	69	STA	$ 10,350.00
313	TREE REMOVAL	$ 2,000.00	LS	1	LS	$ 2,000.00
314	TILE REMOVAL	$ 5.00	LF	6960	LF	$ 34,800.00
		DISTRICT CONSTRUCTION SUBTOTAL				$ 508,350.00
		Contingency (15%)				$ 76,252.50
		CONSTRUCTION TOTAL				**$ 584,602.50**
		Engr. & Const. Observation (20%)				$ 116,920.50
		DISTRICT TOTAL COST				**$ 701,523.00**
	ROAD CROSSING CONSTRUCTION COSTS					
315	36" TILE - OPEN CUT (115TH STREET)	$ 135.00	LF	45	LF	$ 6,075.00
316	TILE ABANDONMENT	$ 100.00	LF	90	LF	$ 9,000.00
317	HICKENBOTTOM INTAKE	$ 1,500.00	EA	2	EA	$ 3,000.00
318	PERMANENT SEEDING AND WARRANTY	$ 2,000.00	LOC	1	LOC	$ 2,000.00
319	TRAFFIC CONTROL	$ 2,000.00	LOC	1	LOC	$ 2,000.00
		ROAD CONSTRUCTION SUBTOTAL				$ 22,075.00
		Contingency (15%)				$ 3,311.25
		ROAD CONSTRUCTION TOTAL				**$ 25,386.25**
		Engr. & Const. Observation (20%)				$ 5,077.25
		ROAD TOTAL COST				**$ 28,697.50**
		TOTAL PROJECT COST				**$ 730,220.50**

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

CGA
ENGINEERS • LAND SURVEYORS

By: J.V.S.
Date: 3/9/2021
Checked By: L.O.G.
Date: 4/21/2021

Engineer's Opinion of Probable Construction Cost

Project: Partial Single Tile Upsizing for D.D. #120

Location: Sections 9 &16 T89N, R20W Hardin County, Iowa

PARTIAL SINGLE TILE UPSIZING - IMPROVEMENT (1")

ITEM #	DESCRIPTION	Unit Cost	Units	Quantity	Units	Total Cost
	DISTRICT CONSTRUCTION COSTS					
401	42" CMP TILE OUTLET	$ 140.00	LF	40	LF	$ 5,600.00
402	42" TRIPLE WALL PPE or RCP TILE	$ 120.00	LF	3340	LF	$ 400,800.00
403	42" DIP TILE WITH STEEL CASING (RAILROAD)	$ 1,000.00	LF	100	LF	$ 100,000.00
404	42" x 18" PPE OR RCP REDUCER	$ 2,300.00	EA	1	EA	$ 2,300.00
405	42" x 12" PPE OR RCP REDUCER	$ 1,900.00	EA	1	EA	$ 1,900.00
406	42" RODENT GUARD	$ 1,100.00	EA	1	EA	$ 1,100.00
407	BANK STABILIZATION	$ 60.00	TON	50	TON	$ 3,000.00
408	RAILROAD FLAGGING & INSURANCE	$ 30,000.00	EA	1	EA	$ 30,000.00
409	CONCRETE COLLAR	$ 1,000.00	EA	6	EA	$ 6,000.00
410	PRIVATE TILE CONNECTIONS	$ 500.00	EA	8	EA	$ 4,000.00
411	HICKENBOTTOM INTAKE	$ 1,500.00	EA	5	EA	$ 7,500.00
412	TILE LOCATION	$ 150.00	STA	69	STA	$ 10,350.00
413	TREE REMOVAL	$ 2,000.00	LS	1	LS	$ 2,000.00
414	TILE REMOVAL	$ 5.00	LF	6960	LF	$ 34,800.00
		DISTRICT CONSTRUCTION SUBTOTAL				$ 609,350.00
		Contingency (15%)				$ 91,402.50
		CONSTRUCTION TOTAL				**$ 700,752.50**
		Engr. & Const. Observation (20%)				$ 140,150.50
		DISTRICT TOTAL COST				**$ 840,903.00**
	ROAD CROSSING CONSTRUCTION COSTS					
415	36" TILE - OPEN CUT (115TH STREET)	$ 165.00	LF	45	LF	$ 7,425.00
416	TILE ABANDONMENT	$ 100.00	LF	90	LF	$ 9,000.00
417	HICKENBOTTOM INTAKE	$ 1,500.00	EA	2	EA	$ 3,000.00
418	PERMANENT SEEDING AND WARRANTY	$ 2,000.00	LOC	1	LOC	$ 2,000.00
419	TRAFFIC CONTROL	$ 2,000.00	LOC	1	LOC	$ 2,000.00
		ROAD CONSTRUCTION SUBTOTAL				$ 23,425.00
		Contingency (15%)				$ 3,513.75
		ROAD CONSTRUCTION TOTAL				**$ 26,938.75**
		Engr. & Const. Observation (20%)				$ 5,387.75
		ROAD TOTAL COST				**$ 30,452.50**
		TOTAL PROJECT COST				**$ 871,355.50**

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