

Faribault County, Minnesota

Judicial Ditch #19F

Staff Repair Report

October 2022

FARIBAULT COUNTY
Drainage Dept

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JD19F Open Ditch Repair

BACKGROUND

Judicial Ditch #19F (JD19F) is a combination tile and open ditch system established in 1920 that drains portions of Jo Daviess Township. The outlet for the JD19F open ditch is CD514 in Jo Daviess Section 34.

Several repairs have been completed on the JD19F open ditch. Three different repair reports over 10 years resulted in a full repair of the JD19F open ditch. The first repair petition was filed in 1954. The subsequent repair report generated a profile of the open ditch from the outlet at CD514 upstream to station 60+00. This portion of the open ditch was cleaned, leaving the upper reach of JD19F untouched.

The second repair petition was filed in 1958. The petition filed by landowners called for tree removal and ditch cleaning; however, the ditch cleaning portion of the petition is crossed out in the legal record. The subsequent preliminary repair report does provide a profile of the open ditch from the end of the 1954 repair profile upstream to the beginning of the open ditch. This repair profile does show sediment accumulation in the open ditch, but the Drainage Authority's order for repair only included the cutting and removal of trees and brush from the ditch.

The third repair petition was filed in 1963 citing poor drainage at the top end of the system. The subsequent repair report recommended a repair grade slightly different than the original grade of the ditch. According to the profile, some 4 to 5 feet of sediment was removed from the open ditch. This repair also made several changes to ditch crossings (see Table 1) and called for the side slopes to be flattened from 1:1 to 1.5:1.

Table 1. Changes to road and field crossings and their existing condition.

Station	1954 Condition	1958 Condition	1963 Condition	Existing Condition
11+15 Field Cr.	Twin 24" CMP replaced w/ 60" CMP	Unknown	Unknown	72" CMP. Good
69+00 Field Cr.	Unknown	Twin 34" concrete tiles	Replaced with 72" CMP	72" CMP, poor condition
84+70 335th Ave	Unknown	66" CMP, collapsed	Replaced with 72" CMP	72" CMP, unknown condition
128+10 330th Ave	Unknown	Concrete Box Culvert	Added 30" CMP baseflow culvert	66" CMP, upstream section pulled apart

Many changes to field and road crossings have been made in the past 70 years. The farthest downstream field crossing (station 11+15) is a 72" corrugated metal pipe (CMP) in good condition. This pipe was newly installed in 1954 as a 60" CMP, thus sometime after 1954 it was replaced with the current pipe. The next crossing (station 69+00) is a 72" CMP in poor condition. This is likely the same pipe that was ordered for the 1963 repair and has met its effective life.

The last two crossings are for Jo Daviess township roads. The existing culvert for 335th Ave. (station 84+70) is likely the one ordered for the 1963 repair. Staff are unable to determine the condition of this pipe due to sediment accumulation (Figure 1). Judging by the condition of the field crossing at station 69+00, this culvert is likely to be in poor condition, having serviced the ditch for nearly 60 years. The 330th Ave. (station 128+10) crossing has likely been replaced since the 1963 repair. The 1963 repair report identified the 330th Ave crossing as a concrete box culvert that was above the legal grade of the ditch. Instead of replacing the box culvert, the engineer called for a 30" CMP baseflow culvert be installed at the legal grade adjacent to the existing box culvert. Sometime after 1963 this box culvert and base flow culvert was replaced with a 66" CMP, currently in poor condition. The repair profile also suggests that this culvert was installed above legal grade.



Field Crossing at Station 11+15



Field Crossing at Station 69+00



335th Ave Township Road Crossing.



330th Ave Township Road Crossing.

Figure 1. Photos of the four open ditch crossings. The only crossing that appears to be in fair condition is the field crossing near the outlet at Station 11+15. The field crossing at Station 69+00 is very narrow, in poor condition, and not in regular use. The 335th Ave Township Road crossing is so impacted by sediment that its condition is not able to be assessed. The 330th Ave Township Road crossing is above legal grade and pulling apart on the upstream side.

DATA COLLECTION

Drainage Department staff surveyed the open ditch bottom during the summer 2022. Because of the numerous repairs to the open ditch listing multiple repair grades, soil borings in strategic locations were also conducted to better determine the legal grade of the open ditch. Tile outlets, side inlets, and other structures were also surveyed.

It is clear from the survey, soil, borings, and profile of the open ditch that large amounts of sediment have accumulated in the JD19F open ditch. The legal grade from the 1958 repair report provides a more accurate fit for the profile when considering soil borings and existing culvert flowline elevations. The profile from the 1963 repair report would result in multiple crossings above grade and an additional 1.5' of sediment needing to be removed from the open ditch. Even with the higher proposed repair grade, there are still locations where as much as 3 to 3.5' of sediment has accumulated in the channel.



Figure 2. Left: Staff using a soil auger to locate the legal bottom of the open ditch. Right: Sediment accumulation in the open ditch.

PROPOSED REPAIR DETAILS

Open Ditch Cleaning: Remove sediment from the open ditch, level spoils. See profile

1. Main Open Ditch Station 11+00 to 171+00

Field Crossing Removal: Remove and dispose of existing crossing pipe. Restore ditch banks by matching the slope of adjacent banks. Seed and blanket slopes. Level crossing fill material in surrounding area.

1. Main Open Ditch Station 69+00. Remove existing 72" CMP crossing.

Road Crossing Repair: Remove and replace road crossing for 330th Ave. Jo Daviess Township is the road authority. See detail. Side inlet pipes with one apron for the upstream side shall be installed.

1. Main Open Ditch Station 128+00. Replace existing 66" CMP with 100 LF of 72" CMP

Tile Outlet Repair: Replace existing tile outlet pipe with 20 LF of non-perforated HDPE dual wall tile. See detail. Additional tile outlets are in good condition and may only need riprap armoring.

1. Station 9+60 (S) 8" CMP
2. Station 35+50 (E) 24" CMP Branch 34
3. Station 52+50 (N) 15" CMP Branch 53
4. Station 57+45 (N) 8" CMP
5. Station 109+70 (S) 8" CMP
6. Station 124+55 (S) 8" CMP
7. Station 129+35 (N) 6" CMP
8. Station 133+25 (S) 12" CMP
9. Station 142+00 (W) 18" CMP Branch 143
10. Station 142+00 (W) 15" CMP
11. Station 152+00 (W) 8" CMP
12. Station 154+50 (E) 12" concrete tile
13. Station 160+895 (W) 10" CMP
14. Station 167+70 (E) 12" CMP
15. Station 171+00 (N) 24" CMP Main

Remove Headwall: Remove the concrete headwall at the outlet of the Main Tile. Stabilize with riprap.

1. Station 171+00 (N)

Side Inlet Repair: Replace side inlet pipes with Alternative Side Inlet. See detail.

1. Station 1+10 (N) Existing 15" CMP
2. Station 24+80 (W) Existing 15" CMP
3. Station 52+60 (S) Existing 12" CMP
4. Station 54+74 (N) Existing 15" CMP. Need to grade to new location
5. Station 61+50 (S) Existing 12" CMP
6. Station 63+70 (N) Existing 12" CMP
7. Station 74+75 (N) Existing 12" CMP
8. Station 78+80 (S) Existing 12" CMP
9. Station 88+00 (N) Existing 12" and 15" CMP
10. Station 90+90 (W) Existing 15" CMP
11. Station 103+40 (E) Existing 12" CMP
12. Station 109+50 (N) Existing 12" CMP
13. Station 110+00 (S) Existing 12" Dual Wall
14. Station 115+50 (S) Existing 12" CMP

Slough Repair: Pull back slough material, place riprap at toe, re-shape and seed ditch bank.

1. Station 91+50 (E) 80 LF of slough
2. Station 99+75 (E) 50 LF of slough

TIMELINE

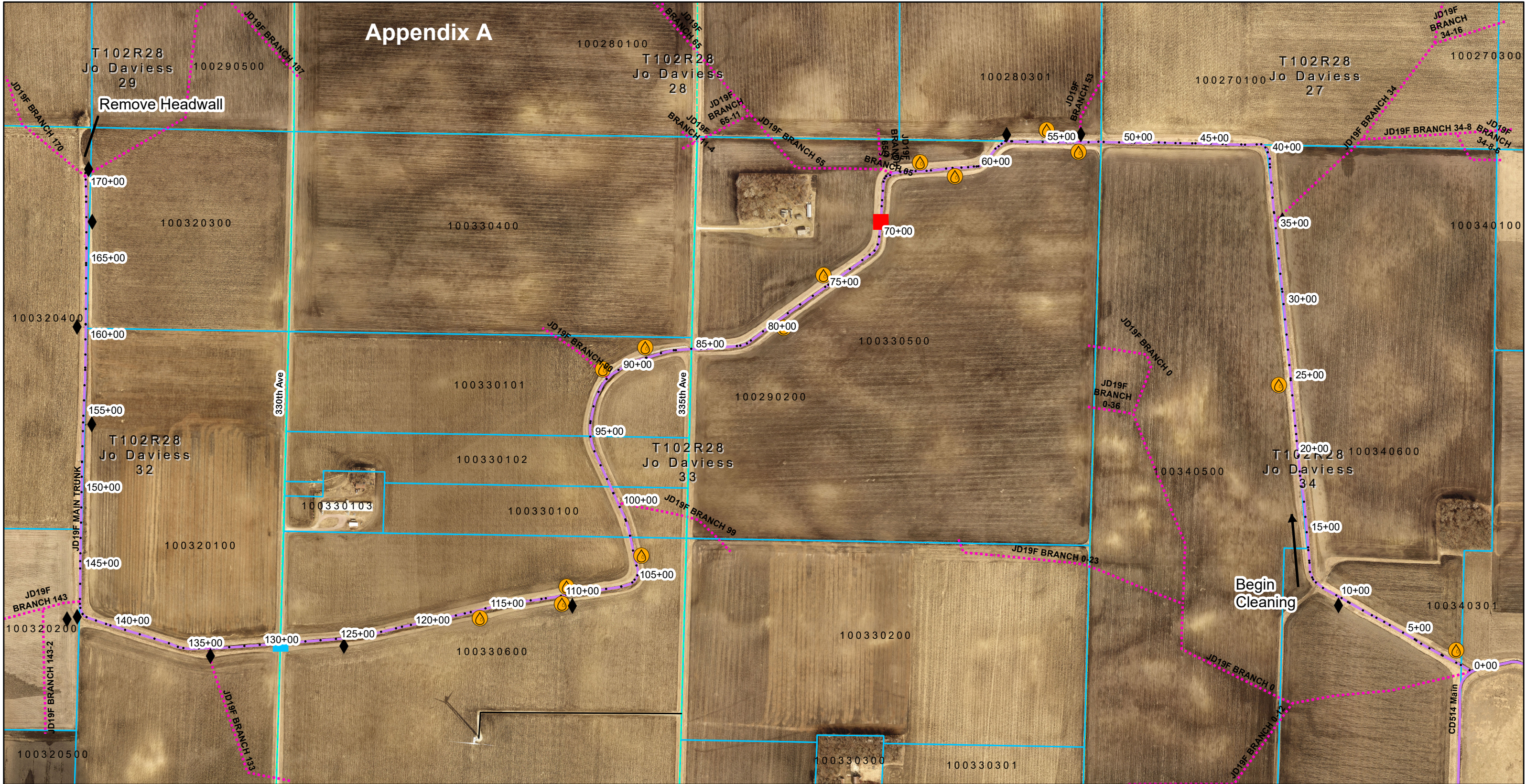
Anticipate landowner meetings in Winter 2023 followed by repair hearing in the Spring 2023. A projected construction schedule would be spring 2023 with a completion date of October 31, 2023.

ESTIMATED COST

Item	Unit	Quant	County Est Unit Price	County Est Amount
Mobilization	LS	1	\$ 5,000.00	\$ 5,000.00
Open ditch cleaning, level spoils	LF	16000	\$ 3.50	\$ 56,000.00
Remove and dispose of existing field crossing, restore banks	EA	1	\$ 750.00	\$ 750.00
F&I 72" CMP for Township road crossing	LF	100	\$ 270.00	\$ 27,000.00
Granular foundation and bedding for road crossing	Ton	150	\$ 30.00	\$ 4,500.00
Class III riprap for road crossing	Ton	60	\$ 60.00	\$ 3,600.00
15" CMP side inlet pipe for road crossing	EA	4	\$ 1,500.00	\$ 6,000.00
15" metal apron for inlet of road crossing	EA	4	\$ 250.00	\$ 1,000.00
Restore Township Road	EA	1	\$ 1,000.00	\$ 1,000.00
Tile outlet repair (6"-12")	EA	10	\$ 900.00	\$ 9,000.00
Tile outlet repair (15"-24")	EA	5	\$ 1,100.00	\$ 5,500.00
Armor existing tile outlet	EA	5	\$ 300.00	\$ 1,500.00
Remove headwall, armor banks	LS	1	\$ 1,000.00	\$ 1,000.00
Slough repair	LF	130	\$ 6.00	\$ 780.00
Riprap for slough repair	Ton	108	\$ 60.00	\$ 6,480.00
Install alternative side inlet	EA	14	\$ 1,700.00	\$ 23,800.00
Contingency 10%				\$ 15,291.00
				\$ 168,201.00

APPENDICES

Appendix A: Overview Map
Appendix B: Profile and Cross Sections.



JD19F Open Ditch Repair

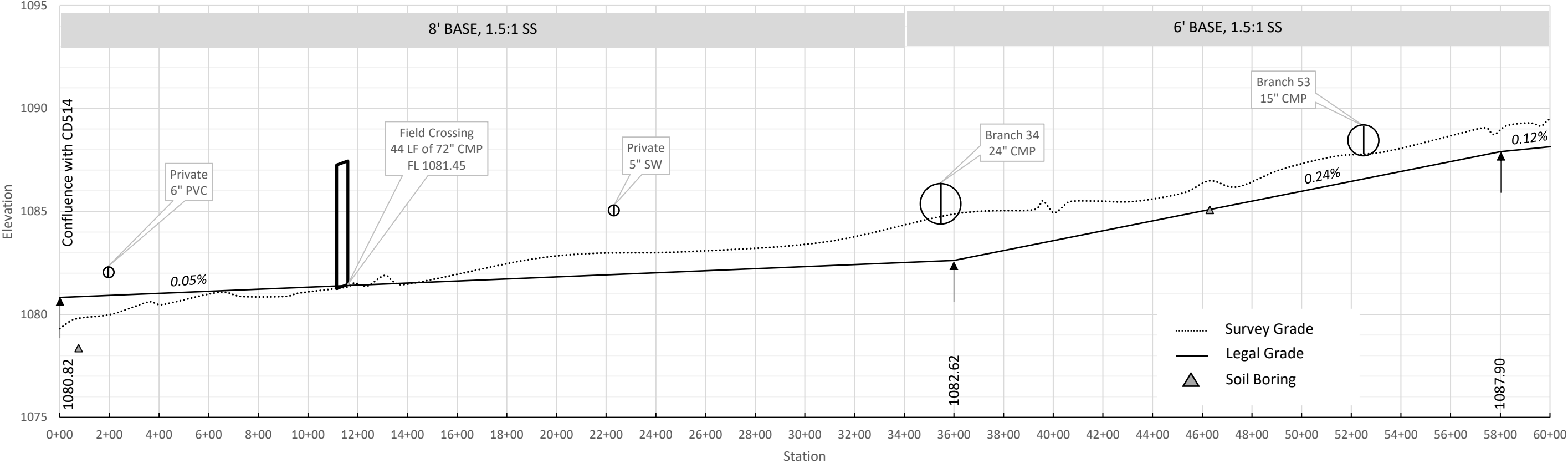
- Public Open Ditch
- Public Tile
- Parcels
- Tile Outlet Repair
- Alternative Side Inlet
- Remove Field Crossing
- Replace Road Crossing

1 inch = 600 feet

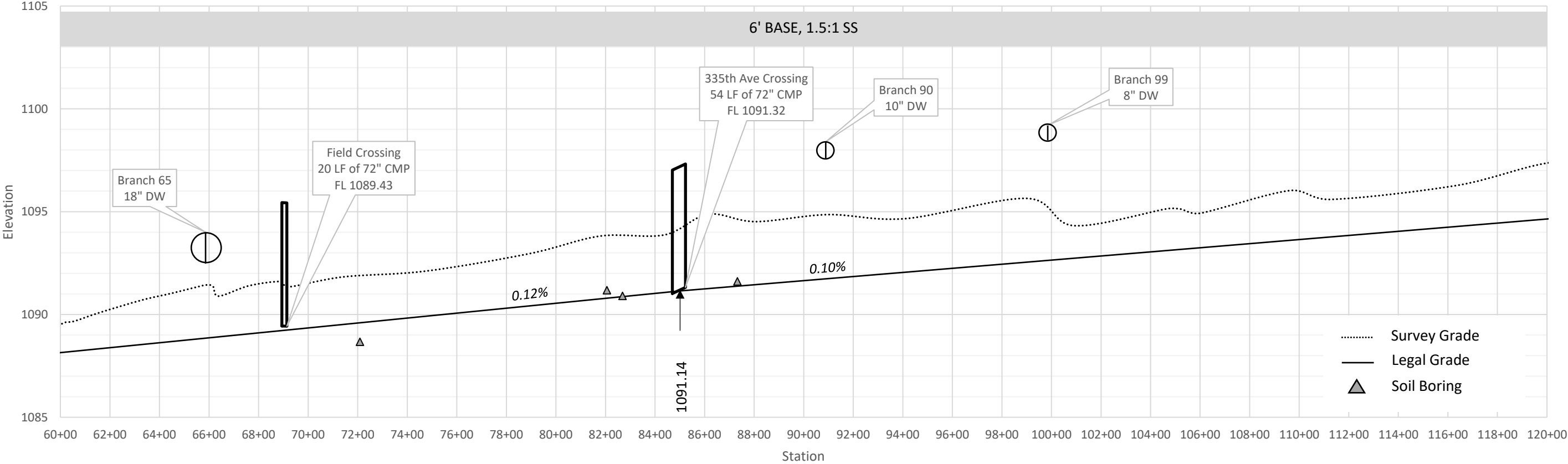
Disclaimer: Faribault County and Faribault County SWCD do not warrant or guarantee accuracy of the GIS data. The data is meant for reference purposes only and should not be used for official decisions. The data contained in the maps were compiled from the best available records that could be found and may contain errors or omissions.

Appendix B

JD19F Main Open Ditch Profile

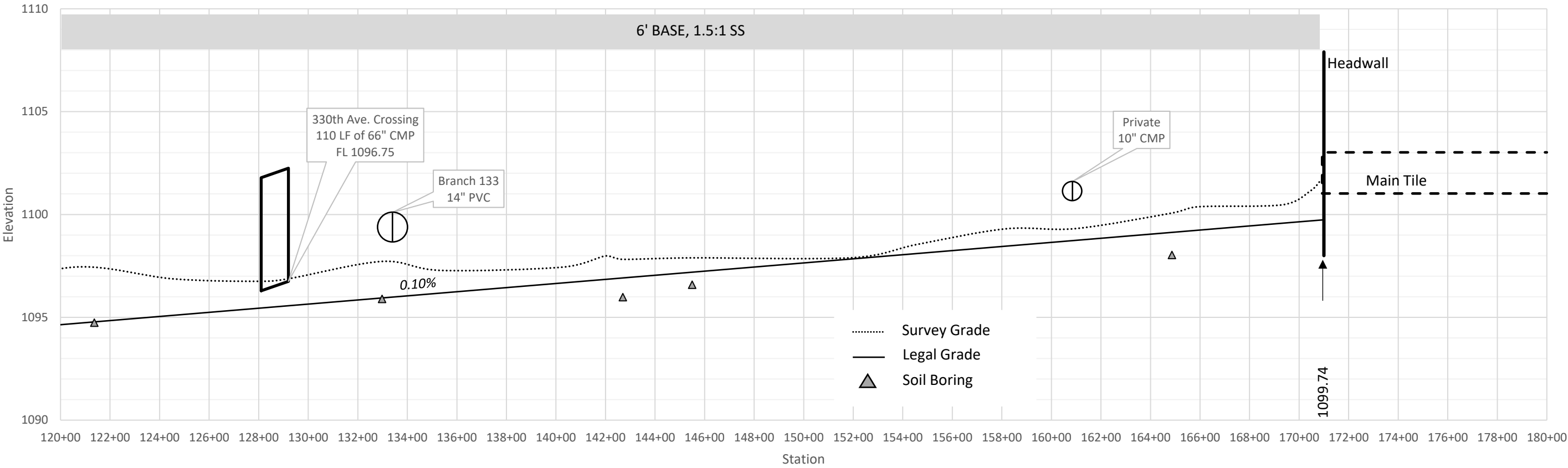


JD19F Main Open Ditch Profile

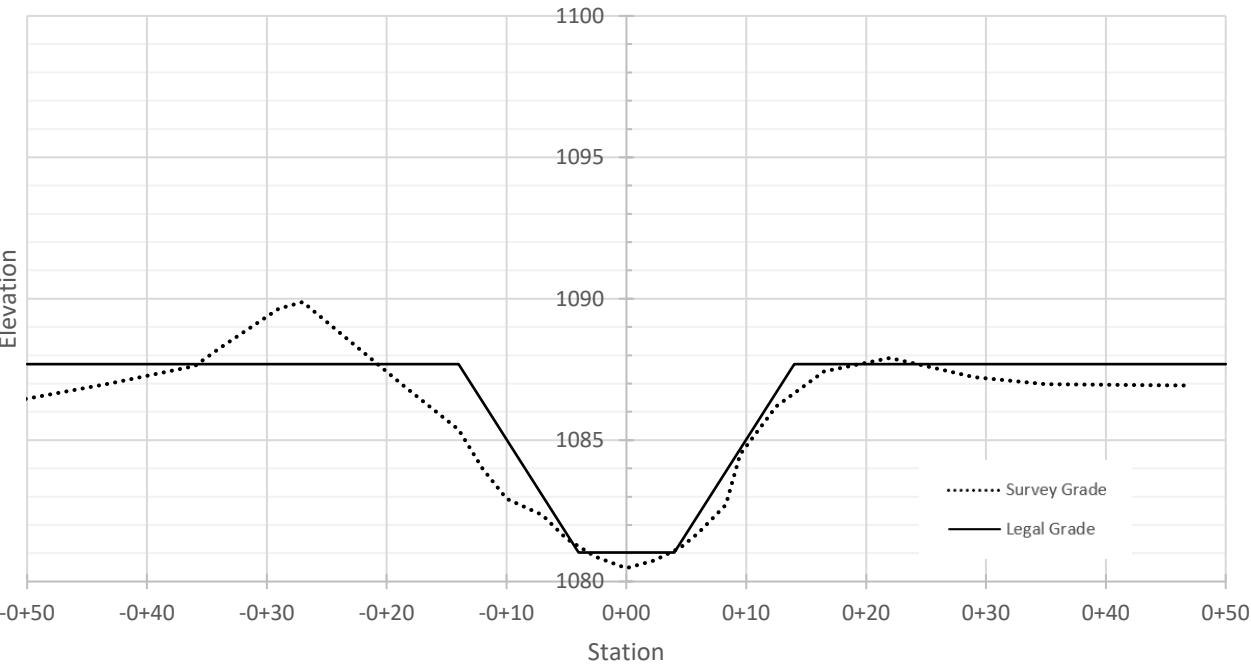


Appendix B

JD19F Main Open Ditch Profile



Station 4+00 Cross Section



Station 61+50 Cross Section

