

Faribault County, Minnesota

County Ditch #86

Staff Repair Report

August 2021

FARIBAULT COUNTY
Drainage Dept

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CD86 Repair

BACKGROUND

Faribault County Ditch 86 is an all-ditch system that outlets to Faribault County Ditch 85 in Minnesota Lake Township Section 14. CD85 serves as outlets for two private open ditches. One private open ditch essentially extends CD86 further south and east and the second confluences with CD86 in Minnesota Lake Section 12.

A landowner has raised concerns over the flow of water through the CD86 open ditch, citing that the size of the road crossing culverts is causing out of bank flow. The CD86 system was ordered in 1961 and at that time the two 230th St. crossings were span bridges. Either during the construction of the ditch or sometime shortly thereafter, one or both span bridges were replaced with culverts. At that time, several landowners raised concerns that the new culvert replacements significantly reduced the capacity of the open ditch compared to the bridges. A repair petition in 1977 resulted in the appointment of an engineer to address the issue. The engineer determined that the current capacities of the road crossings were not necessarily the limiting factor. The engineer noted that neither the open ditch or the roadway crossings had the capacity to handle 25 year storm events; thus it wouldn't make a difference to upsize the roadway crossings because the current shape of the ditch would still cause out of bank flow. Ultimately the petition was withdrawn, and the issue was resolved by the township agreeing to install a support culvert under the roadway.

The Drainage Department completed a survey of the open ditch and the roadway crossings in July 2020. The channel bottom was mostly firm with some areas of sediment accumulation noted in the upper reaches. The ditch banks were vertical with some sloughing at the toe. Roadway crossings consisted of two culverts where one of the culverts had filled with sediment and only conveyed large flows or no flows. Several areas of sediment delivery from upland sources were also noted. The in-slope and buffer areas were largely devoid of tree growth. Portions of the buffer strip and in-slope of the ditch in Minnesota Lake Section 12 contained small stumps or trees. A small stretch of one side of the ditch in Minnesota Lake Section 13 is impassable by vehicle due to thick tree growth next to a residence.

DATA COLLECTION

The legal grade of the CD86 open ditch was determined from the 1961 original ditch survey and the 1977 repair petition engineers report. Both the 1961 and 1977 reports provided ditch bottom elevations in a mean sea level datum. This datum was slightly adjusted to better match the flowline elevations of the three township road crossings. It was evident that the MN Highway 22 road crossing had been replaced within the last 10 years. The invert elevation for this crossing was not used in the legal grade analysis as it was clearly installed much lower than legal ditch grade.

According to the profiles, some areas upstream of 540th Ave have accumulated sediment at depths ranging from 0 to 1 foot. All roadway crossings consisted of two culverts. In each instance, at least one of the roadway culverts had an invert elevation at or near the legal grade of the ditch.

PROPOSED REPAIR DETAILS

Tree and Brush Removal: Trees, brush, and stumps should be removed from the open ditch in-slope and buffer strip from station 59+50 – 91+00 (east and south side)

Open Ditch Cleaning: Sediment in the channel bottom should be excavated from Station 40+00 to 92+00. Sediment accumulation depth ranges from 0.5 – 1 foot. Levelling of berms may be required to clean the ditch north of 230th St. The berms will need to be restored to their current elevation after repair activities have been completed.

Road Culvert Cleaning: Sediment around and inside roadway culverts should be excavated at MN Highway 22, 540th Ave, and both 230th St. crossings.

Side Inlet Repair: Replace side inlets with alternative side inlet (ASI)

Station 22+00 (N) – Replace 15" CMP with 12" ASI with trash grate top

Station 33+50 (W) – Replace 15" CMP with 12" ASI with trash grate top

Station 41+00 (N) – Build up berm to divert water to culvert under field approach

Station 51+00 (W) – Install 12" ASI with trash grate top. Existing condition is gully through bank.

Tile Outlet Repair: Replace tile outlets with 20' of dual wall, non-perforated tile

Station 8+40 (S) – Existing 10" CMP

Station 17+20 (N) – Existing 10" CMP

Station 26+60 (S) – Existing 12" CMP

Station 56+40 (E) – Existing 8" CMP

Station 58+90 (W) – Existing 10" CMP

Station 67+90 (E) – Existing 8" CMP

Station 77+40 (S) – Existing 6" Concrete

Station 84+40 (N) – Existing 10" CMP

Station 87+30 (S) – Existing 10" Plastic

Station 87+50 (S) – Existing 8" CMP

Station 91+70 (E) – Existing 8" CMP

Ditch Bank Armoring: Approximately 100 feet of the bank at Station 51+00 needs to be armored with riprap, west side of the ditch.

Re-Seeding Disturbed Areas: All buffer strip areas used for spreading spoils should be re-seeded. Plan to broadcast seed on ditch slopes where trees were removed.

TIMELINE

The completion date for this project is October 31, 2022

ESTIMATED COST

Item	Unit	Quant	County Est Unit Price	County Est Amount
Mobilization	LS	1	\$ 1,500.00	\$ 1,500.00
Tree & Brush Removal	LS	1	\$ 15,000.00	\$ 15,000.00
Open Ditch Excavation (4' bottom) & Level Spoils	LF	5200	\$ 3.00	\$ 15,600.00
Road Crossing Cleaning	EA	4	\$ 750.00	\$ 3,000.00
12" Alternative Side Inlet with Trash Grate Top	EA	3	\$ 2,200.00	\$ 6,600.00
Grade water diversion berm at Sta 41+00 (N)	LS	1	\$ 500.00	\$ 500.00
6" Tile Outlet Repair	EA	1	\$ 700.00	\$ 700.00
8" Tile Outlet Repair	EA	4	\$ 900.00	\$ 3,600.00
10" Tile Outlet Repair	EA	5	\$ 800.00	\$ 4,000.00
12" Tile Outlet Repair	EA	1	\$ 900.00	\$ 900.00
Armor Ditch Bank with Riprap and Fabric	Ton	70	\$ 60.00	\$ 4,200.00
Seed Disturbed Areas	Ac	2	\$ 500.00	\$ 1,000.00
Contingency 10%				\$ 5,660.00
				\$ 62,260.00

APPENDICES

Appendix A:	Repair Overview Map
Appendix B:	Plan Profiles



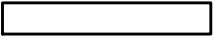
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Faribault County Drainage Department

CD86 Repair

Legend

- Public Open Ditch
- Public Shallow Ditch
- Public Tile
- Alternative Side Inlet
- Tile Outlet Repair
- Tree Removal



1 inch = 500 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.

